सत्यमेव जयते

Department of School Education & Literacy
Ministry of Education
Government of India

TOY-BASED PEDAGOGY

Toy-Based Pedagogy

A Handbook

Learning for Fun, Joy and
Holistic Development

Part – I

धर्मेन्द्र प्रधान
ଧର୍ମେନ୍ଦ୍ର ପ୍ରଧାନ
Dharmendra Pradhan

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

मंत्री
शिक्षा; कौशल विकास
और उद्यमशीलता
भारत सरकार

Minister
Education; Skill Development
& Entrepreneurship
Government of India

MESSAGE

India is a land of rich cultural treasure and vivid colours. This is reflected in the abundance of indigenous toys and games found in every part of the country. They are colourful, energetic and lively source of pleasure and have great prospects of contributing in the journey of rejigging our classroom environment. We are well aware that a critical focus of the National Education Policy (NEP) 2020 is to transform the education imparted in our schools to a more experiential, holistic, learner-oriented and enjoyable one.

Honourable Prime Minister Shri Narendra Modi Ji has made a clarion call to adopt our indigenous toys and games as pedagogical tools which not only have cultural connect but also helps in building various life-skills and psychomotor skills among the children at a young age. Indeed, our country is home to several toy clusters and is blessed by the presence of artisans who produce a myriad diversity of indigenous toys. It is of utmost importance that we make use of these toys in our teaching-learning processes as far as possible.

It is a matter of great pleasure that the National Council of Educational Research and Training (NCERT) has developed a comprehensive handbook on Toy-Based Pedagogy. This handbook covers key aspects of Toy-Based Pedagogy and is replete with exemplars of various kinds which have the potential to transform the existing teaching-learning into a holistic and enjoyable process. This handbook is envisaged to be used by all the teachers and parents in creating a more joyful teaching atmosphere and also evolve new toys and games in the process. As we move forward to transform our curriculum, this handbook can prove to be an excellent source of new ideas and strategies in this direction. I wish that this handbook will help in achieving these goals.

(Dharmendra Pradhan)

MOE - Room No. 301, 'C' Wing, 3rd Floor, Shastri Bhavan, New Delhi-110 001, Phone : 91-11-23782387, Fax : 91-11-23382365
MSDE - Room No. 516, 5th Floor, Shram Shakti Bhawan, Rafi Marg, New Delhi-110001, Phone : 91-11-23465810, Fax : 011-23465825
E-mail : minister.sm@gov.in, minister-msde@gov.in

आज़ादी का अमृत महोत्सव

अन्नपूर्णा देवी
ANNPURNA DEVI

सत्यमेव जयते

राज्य मंत्री
शिक्षा मंत्रालय
भारत सरकार
MINISTER OF STATE
FOR EDUCATION
GOVERNMENT OF INDIA

संदेश

हमारे देश में स्वदेशी खिलौनों और खेलों की समृद्ध परंपरा रही है। भारत के विभिन्न राज्यों में विशेष खिलौने-समूह हैं जहां बड़ी संख्या में स्थानीय खिलौनों का उत्पादन किया जाता है। आम तौर पर, जब हम खिलौनों के बारे में सोचते हैं, तो हम मनोरंजन के बारे में सोचते हैं और अक्सर उनसे सीखने की क्षमता को नकार देते हैं। मुझे खुशी है कि अब हम खिलौनों और खेलों की इस छिपी क्षमता की खोज की दिशा में आगे बढ़ रहे हैं जो हमारी भूमि के लिए स्वदेशी हैं और इस प्रकार, खतरे से मुक्त भी हैं, स्थानीय रूप से प्राप्त सामग्री से बने हैं और उनमें समृद्ध सांस्कृतिक विरासत भी है।

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद (एनसीईआरटी) ने खिलौना आधारित शिक्षाशास्त्र पर एक व्यापक पुस्तिका विकसित की है। मुझे खुशी है कि एनसीईआरटी ने देश में खिलौना-आधारित शिक्षाशास्त्र को बढ़ावा देने के इस मिशन को आगे बढ़ाने की पहल की है, जिसमें हमारे स्वदेशी खिलौनों और खेलों को हमारी कक्षाओं में पेश किया गया है और इस तरह कक्षाओं की गुणवत्ता और वातावरण में परिवर्तनकारी बदलाव आएगें।

खिलौना-आधारित शिक्षाशास्त्र की यह पुस्तिका हमारे देश के विभिन्न हिस्सों में उपलब्ध खिलौनों की विस्तृत विविधता को शामिल करती है और उनके विभिन्न उदाहरण प्रदान करती है। इन खिलौनों और नाटकों में हमें एक समग्र और मनोरंजक शिक्षा प्रणाली की ओर ले जाने की क्षमता है। मुझे विश्वास है कि इस पुस्तिका का सभी हितधारकों विशेषकर हमारे शिक्षकों द्वारा गर्मजोशी से स्वागत किया जाएगा।

(अन्नपूर्णा देवी)

Office : Room No. 126, 'C' Wing, Shastri Bhavan, New Delhi-110 001
Phone : 91-11-23384073, 23386163, Fax : 91-11-23385112
E-mail : mosedu-ad@gov.in

अनीता करवल, भा.प्र.से
सचिव

Anita Karwal, IAS
Secretary

सत्यमेव जयते

स्कूल शिक्षा और साक्षरता विभाग
शिक्षा मंत्रालय
भारत सरकार
Department of School Education & Literacy
Ministry of Education
Government of India

MESSAGE

The National Education Policy (NEP) 2020 envisions a joyful and flexible pedagogy to make education more experiential and enjoyable. It highlights the need to understand not just what the children learn but also how they learn it. The Education system in our country needs to delimit its focus from content to the process of acquiring crucial skills such as critical thinking and problem solving and thus, we need to find new ways to learn and to teach. NEP states in clear terms that "Pedagogy must evolve to make education more experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centred, discussion-based, flexible, and, of course, enjoyable" (NEP: 4.25).

It is a matter of great pleasure that NCERT has come up with a handbook on Toy-Based Pedagogy. It is a much-needed initiative which has an immense potential to contribute to the enhancement and enrichment of the teaching-learning processes in our classrooms. As we undertake various measures to implement NEP 2020 in its right spirit, this handbook shall prove really helpful in our pursuit of transforming the pedagogy accordingly. I am sure that the stakeholders including teachers and parents will find the handbook interesting and useful.

Happy reading!

(Anita Karwal)

124 'सी' विंग, शास्त्री भवन, नई दिल्ली–110001
124 'C' Wing, Shastri Bhawan, New Delhi-110001
Telephone: +91-11-23382587, +91-11-23381104 Fax : +91-11-23387589
E-mail: secy.sel@nic.in

Foreword

The National Education Policy (NEP) 2020 lays a great emphasis on bringing remarkable transformations in India's education system so as to ensure the availability and access of universal high quality education to everyone. The overall impetus of the reforms in curriculum and pedagogy are to ensure that learners are actively and joyfully engaged in the learning process. Children's abilities can be nurtured in an effective manner if the process of learning is made enjoyable. We all are aware that toys and games attract and fascinate everyone, especially children, and also boost the development of various skills unknowingly. To ensure that the learning process is enjoyable and fun, and to support various stakeholders viz. the curriculum developers, the teachers, and the parents, this handbook on Toy-Based Pedagogy has been developed by the NCERT. The handbook not only describes the basic framework of Toy-Based Pedagogy and Experiential Learning, but also discusses how a variety of toys, especially India's rich wealth of indigenous toys and games can be used at different stages to help develop many competencies in young children.

This handbook is a result of the collective efforts of its Development Team consisting of the representatives of several ministries, Invest India, Center for Creative Learning (CCL), Central Board of Secondary Education (CBSE), National Institute of Design (NID), Children's University, Gujarat, many practitioners from the field, NCERT faculty members, as well as subject matter experts, teachers and teacher-educators. The handbook is suggestive only and can be adapted or adopted by the curriculum developers and the teachers as per their needs and requirements. The Council appreciates the efforts of the Development Team and its faculty members in the preparation of this important document. The Council also welcomes comments and suggestions from the users for further enhancing the quality and usability of this handbook.

I sincerely expect that the states and UTs will work in the direction of using/ adapting this handbook to promote indigenous toys and games and use them in relevant local contexts wherever applicable. This will certainly help us in promoting and preserving the rich cultural heritage of our country, in addition to ensuring that the learning process in our classrooms is holistic, enjoyable and engaging as envisioned in NEP 2020.

Prof. Dinesh Prasad Saklani
Director
National Council of Educational
Research and Training

New Delhi
5th September 2022

Preface

Literacy is not the end of education nor even the beginning. It is only one of the means by which one can be educated. I would therefore begin the child's education by teaching it is a useful handicraft and enabling it to produce from the moment it begins its training.
– Mahatama Gandhi

Toy-Based Pedagogy is based on the principle that toys are not just for entertainment or recreation, but can also be used as a learning resource for the mental, physical, social and emotional development of the child. Toys can open up and ignite the mind of the child. These guidelines on Toy-Based Pedagogy have been designed to promote integration of toys and its pedagogy into the curriculum in School Education, Early Childhood Care and Education and Teacher Education. This document contains a road map for curriculum developers, teachers and teacher educators on the various aspects of Toy-Based Pedagogy. This handbook is divided into two parts-

Part-I – contains the concept and understanding of Toy-Based Pedagogy spread over chapters on variety of indigenous toys, stage-wise perspective of Toy-Based Pedagogy, experiential learning, mapping of toys with competencies at different stages and also the way forward.

Part- II – contains annexures including lists and images of toys mapped with learning of different concepts and learning outcomes across the stages.

There is a lot of interconnection between the document on Toy-Based Pedagogy and across the annexures. So, for detailed understanding about children's developmental stages, types of toys, toys in various cultural contexts, the teachers, curriculum developers and other readers need to connect to different chapters in the first part and mapping of toys in the second part in spiral manner.

This handbook will be helpful for all those who are willing and ready to take on the initiative to implement Toy-Based Pedagogy for children and move towards fun-filled, engaging and stress-free learning for their holistic development.

Ranjana Arora
Professor & Head
Department of Curriculum
Studies and Development,
National Council of Educational
Research and Training

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The Council also recognises the support of the teachers who participated in the workshop to give their feedback about the toys in the preparation of Annexure I(C). The Council also acknowledges all the creators of Creative Commons for the pictures of the toys used in the guidelines and the annexures.

Glossary

Assessment: Assessment is a comprehensive process of collecting, interpreting, and recording information regarding the progress of child during the learning process. Assessment looks at learning in a continuum spread over a long duration in time and space, and has the potential to enhance teaching-learning besides doing away with the fear of external examination.

Competency: Competencies are statements that specify what children will know, be able to do, or be able demonstrate when they have completed or participated in a course or program.

Concept: Concept is a label given to a set of ideas, thoughts, or notion characterized by specific features.

Early literacy: Early Literacy is what children know about reading and writing before they read or write.

Experiential learning: Experiential learning occurs when learners are actively engaged in the selected experiences provided to them. During the learning process the children are encouraged to participate by posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning.

Formative assessment: Formative assessment refers to a wide variety of methods that teachers use in the classroom to conduct in-process evaluations of student comprehension, learning needs, and academic progress during a lesson, unit, or course.

Foundational Numeracy: The ability to read and write and perform basic operations with numbers.

Fine Motor Skills: is the coordination of small muscles in movements usually involving coordination of hands and fingers with eyes.

Gross motor skills: Gross motor skills are the abilities required to control the large muscles of the body for walking, running, sitting, crawling, and other activities.

Holistic development: Development of intellectual, mental, physical, emotional, and social abilities.

Indigenous: Indigenous refers to having originated or being developed/produced from the natural or manmade material available locally.

Interdisciplinary: Interdisciplinary approach focuses on understanding of themes and ideas that cut across disciplines. It also enables the learners to understand the connections between different disciplines and their relationship to the real world[UNESCO IBE, 2022].

Learning outcomes: Learning outcomes are statements that describe the knowledge, skills, and attitudes that students should acquire by the end of a particular assignment, class, course, or program, and help students understand why that knowledge and those skills will be useful to them.

Life Skills: Life skills are defined as a set of abilities, attitudes, and socio-emotional competencies that enable individuals to learn, make informed decisions, and exercise rights to lead a healthy and productive life and subsequently become agents of change.

Literacy: Literacy is the ability to identify, understand, interpret, create, communicate, and compute, using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society (UNESCO, 2004; 2017).

Multidisciplinary: Multidisciplinary approach primarily focuses on the perspectives of different disciplines that can be used to understand and illustrate a topic, theme, or issue [UNESCO IBE, 2022].

Multilingual Class: Multilingual class refers to a group of individuals having different first languages/ mother tongues/ home languages, who have come together to achieve common learning goals.

Numeracy: It encompasses the ability to use mathematical understanding and skills to solve problems and develop a critical viewpoint with appropriate reasoning.

Pedagogy: Pedagogy refers to a set of methods and strategies used to enable learning to take place and provide opportunities to learners for acquisition of knowledge, skills, attitudes and dispositions within a particular social and material context.

Play: Play refers to the child's engagement with toys or games.

Problem Solving: Problem-solving is the act of defining a problem; determining the cause of the problem; identifying, prioritizing, selecting an appropriate solution from amongst alternatives; and implementing the solution.

Sensory and Perceptual Development: Development of the five senses through visual, auditory, and kinesthetic experiences.

Toy: Toy refers to local, indigenous popular toy or game or a puppet which children love to play with, create, listen to, touch, and watch such as tops, dolls, racing cars, rattles, airplanes, kites, dancing and singing puppets, etc.

Development Team

Members from Ministries and other Organizations

Shri Abhay Jere, *Chief Innovation Officer*, Ministry of Education

Dr. Anju Kauwr Chazot, MGI School, Ahmedabad, Gujarat (*Expert Practitioner*)

Dr. Gayatri Menon, Discipline Lead, B.Des. Foundation Programme, NID, Ahmedabad

Shri Harshad P.Shah, *Former Vice Chancellor*, Children's University, Gujarat

Prof. Manish Jain, IIT, Gandhi Nagar, Ahmedabad (*Expert Practitioner*)

Ms. Mudita Mishra, *Additional Development Commissioner (Handicrafts)*, Office of Development Commissioner, R. K. Puram, Sector-1, New Delhi.

Dr. Praggya M.Singh, *Joint Secretary*, CBSE

Late Shri Pramod Kumar T.K., *Joint Secretary*, CBSE

Prof. Sudarshan Khanna, NID, Ahmedabad (*Expert Faculty*)

Mr. Suryamani Mishra, *Member NIPCCD*, Ministry of Women and Child Development

Dr. Sweta Singh, *Joint Secretary*, CBSE

Mr. Uday Singh Meena, *Representative from Ministry of Textiles/cottage industry*

Ms. Varada Taneja, *Assistant Vice President*, Invest India

Members from NCERT

Prof. Anjni Koul, Department of Education in Science and Mathematics

Mr. Arnab Sen, NERIE, Shillong

Prof. Ashutosh Wazalwar, Department of Education in Science and Mathematics

Dr. K V Sridevi, Department of Curriculum Studies and Development

Dr. K. Vijayan, Department of Teacher Education

Prof. Padma Yadav, Department of Elementary Education

Prof. Pawan Sudhir, *Head*, Department of Education in Arts and Aesthetics

Prof. R. Meghanathan, Department of Education in Languages

Mr. R.R. Koireng, Department of Curriculum Studies and Development

Prof. Ranjana Arora, *Head*, Department of Curriculum Studies and Development

Dr. Romila Soni, Department of Elementary Education
Prof. Seema Shukla Ojha, Department of Education in Social Sciences
Prof. Suniti Sanwal, *Head*, Department of Elementary Education
Dr. Tulika Dey, NERIE, Shillong

ACADEMIC AND TECHNICAL SUPPORT

Dr. Akhilesh Mishra, *Senior Consultant*
Dr. Charu Saini, *Senior Consultant*
Mr. Saket Bahuguna, *Consultant*
Mr. Yuvraj Singh, *Consultant*
Ms. Ishita Bhushan, *JPF*
Ms. Madhu Sharma, *JPF*
Ms. Mimansa Gupta, *JPF*
Ms. Pooja Sharma, *JPF*
Ms. Shalini Chowdhary, *JPF*
Ms. Ujjwal Kumari, *JPF*
Mr. Girish Goyal, *DTP Operator*

Contents

Toys, Games and Play in the Child's World of Learning

1

1.1 Childhood and Toys

One cannot forget the joyfulness of one's childhood. Childhood is the stage of our life in which the smallest of things gives immense pleasure. Children often do not feel happy with costly things if it does not arouse any curiosity in them. If we remember our childhood days, we can say, we were happy with things which we could collect on our own, be it a piece of copper wire or a pebble or some caps of bottles. We were often ready to play with our friends without knowing that we were learning a lot through those plays, toys and games.

Figure 1.1

Now, that beautiful phase of our lives which we have walked past comes before us when we observe our children as a teacher or a parent/guardian or a caregiver. As we did in our childhood, our children also love to create boats and aeroplanes from paper; They like to take rides on a tricycle, enjoy splashing water, try to catch soap bubbles, love the company of pets, play with colourful toys, and get engaged with board games and electronic games for hours.

Figure 1.2

Toys and games are for all ages: children from birth to 18 years and even beyond. It is an inherent nature of children to repeatedly engage in things that give them joy and this helps them in unknowingly developing various skills. Toys attract and fascinate children due to their colours, make, design and size and have a special appeal because a child can touch and explore them. These play a major role in fulfilling the need for creative expression which is inherent in every child.

Children often learn many concepts and skills while engaging in play activities. While creating a boat or a cap with paper, one may find the children talking- 'do this way otherwise your boat will lose its balance' or 'you have made this cap very small in comparison to the size of your head'. These kinds of dialogues among children is a sign of learning. They




often learn scientific concepts, such as estimation classification, comparison, and, social ethics, just by playing with their peers, by creating toys and by also interacting with them.

Toys help children inculcate various values and skills. The values of sharing, empathy, love, care etc. and the skills of decision making, team-building, problem solving etc. are developed in children through toys and games. It has been observed that teaching-learning with suitable and appropriate toys across all the stages supports growth and development of children. A study was conducted to gauge the impact of toys and the following findings were obtained (Children's University, 2018).

- Children's attendance improved.
- They developed liking towards academic subjects that they once found difficult.
- They became more organized.
- They began caring for, sharing and respecting each other.
- They understood the importance of hygiene.
- Their decision-making ability improved.
- They developed new and creative ways to solve problems.
- Above all, they developed the virtues of honesty, the spirit of sportsmanship and patience.
- They learned to accept defeat and laud the winner.
- Their logical thinking got encouraged and observation and memory skills got enhanced.
- Their readiness to face challenges increased.
- Their spatial awareness enhanced.
- Problem solving, matching and sorting skills got improved.
- Improved their manual dexterity.

The outcomes of the above mentioned research may raise the following questions in the minds of the curriculum developers, teachers and other stakeholders. Can we utilize the power of play to ensure that learning happens in a joyful manner

Figure 1.3

in our classrooms or homes? Can we make children understand concepts in Mathematics, Social Sciences, Science, etc. through toys and games? Can we utilize toys and games to develop in children sensitivity towards environment, climate change, inclusion, values, skills in a more organised way but in a joyful manner without burdening children with the load of non-comprehension?

Figure 1.4


Yes, we as parents, guardians, caregivers, curriculum developers, and teachers can do so through **Toy-based pedagogy**. The word '**Toy**' used with pedagogy here refers to local, indigenous, popular toys and puppets which children love to **play** with, create, listen to and watch, such as tops, dolls, racing cars, rattles, aeroplane, kites, dancing and singing puppets, etc. Here, it also refers to street games such as *lukka-chuppi*, *satapu*, etc, and board games such as Chess, Ludo as well as electronic and constructive games.

The word '**Play**' used here refers to the child's engagement with toys or games. Using toys and games, one can create a conducive environment for learning in which a child learns without any fear and with much interest and curiosity.

1.2 History of Toys

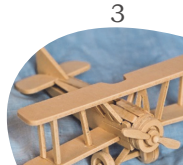
India has a rich history of toys. Since the Harappan Civilization, i.e. around 5000 B.C., toys have existed in India. The best-known clay toys from the Indus Valley civilization are figures of monkey and bullock. Chess was invented in India and was known as *Ashtapada* which means 64 squares. A few years later, the game was called *Chaturanga* (quadripartite). In 600 CE, this game was learnt by the Persians and was renamed as S*hatranj*. Carrom has also been said to have its origins in the Indian subcontinent. It is a board game in which players strike and let their tokens to go into the pockets attached to the board. This is popularly played throughout South Asia and in a few Middle-eastern countries.

Figure 1.5

Snakes & Ladders, a famous game, which is popular among children and adults even in the present time was called Moksha Patam in ancient times. This game of vice and virtues was used to teach good values to children. The snakes represented vice and the ladders represent virtues. Another game, which is popular even today - (Playing cards) also have its origins in ancient India, and was called Krida-Patram. It was made of cloth pieces, and showcased ancient designs from the Ramayana and Mahabharata.

Though ancient polo finds its origin in Central Asia, it was Manipur in India that set the foundation for modern polo. *Kho-Kho*, also known as the 'game of chase', was earlier played in Maharashtra. It is one of the most popular traditional Indian sports. Under the Kho-Kho Federation of India, the first kho-kho championship was organized in 1959. In 1982, it was included in the Indian Olympic Association. Kabaddi is an old sport which dates back to around 4,000 years. It was started in Tamil Nadu and developed from ancient village defence tactics and group hunting.

A timeline in the history of world toys including contributions of India is given below:






Indigenous toys and games can play a major role in developing cultural understanding and cultural expression among students at all school stages. Our indigenous toys and games have transformed and evolved over the centuries. The traditional Indian toys and games were closely linked to the objects of our day – to – day life and were inspired by the nature itself. Many of these toys and game traditions are still an integral part of our festivals and celebrations. People fly kites on Sankranti, Basant Panchami as well as on Independence Day. The display of beautiful dolls on Dussehra is a common tradition in India, especially in South India, where the festival is celebrated for 10 days and culminates on the day of Vijayadashami or Dussehra. The *Kandhei Jatra* or Toy Fair is a traditional festival celebrated every year in the state of Odisha. The festival is three centuries old and is related to the oldest Jagannath temple in the city. In North Indian weddings, many a time the mandap (wedding altar) is decorated with small wooden toys. Hence, the use of toys and games in education will help children to connect with their cultural heritage, to understand and respect the diversity of Indian culture, and to imbibe the 'Bharatiya Sanskriti'. Thus, the inclusion of indigenous toys and games in the teaching- learning process can help students connect with their cultural roots, if implemented effectively. When education is connected to local culture and ethos, it becomes sustainable and motivates both the children and the parents to continue education.

1.3 Toy-based Learning and Toy-based Pedagogy

Toy-based Learning comes under the broad gamut of Play-based Learning. Play is a process, while board games, toys or field games are objects on which play operates. Children play for fun and enjoyment, and in this process they also learn. Given the interest, children take part in play naturally, play is often used in the education system for enhancing learning of the children. Though the description of play-based learning as given in literature takes care of toys and puppets yet it broadly can be seen as an overarching process which is very flexible and can be understood in different forms- role play, art-integrated learning, experiential learning etc.

Here in these guidelines, we are focussing on Toy-based learning and broadening the meaning of toys by encompassing a variety of toys viz. moving and static, puppets, local street games, board games, electronic games, etc. Under Toy-based pedagogy, the focus is on the use of indigenous toys, games and puppets for enhancing learning as well as fun for children.

1.4 Why Toy-based Pedagogy?

> 'When I bring to you coloured toys, my child, I understand why there is such a play of colours on clouds, on water, and why flowers are painted in tints…when I give coloured toys to you, my child'
>
> *Rabindranath Tagore*

Toys are objects from which children draw happiness and joy, and get entertained. They also simultaneously explore the world around them, educate themselves, role-play, and learn to express their emotions while playing with toys. However, many parents and teachers think that toys are for play


and entertainment which can divert the childrens attention. In their opinion, during study time, children should not engage with toys, otherwise they will not concentrate on studies. Therefore, in many homes, one can observe that play-time and study-time are segregated. We need to break this myth that toys only have entertainment value objects for our children. We need to change our mindset that children cannot study with toys. We should never underestimate the power of toys when it comes to learning. Children learn more through creative play because it engages their senses. It stimulates them and make them eager to continue exploring more about the world around them.

Toys have a great potential to help children in their holistic development. Some of the major benefits of toys are as follows:

1.4.1 Toys Can Spark Creativity and Imagination:

Toys that can be played with help children's brain expand and think comprehensively. This, in turn, helps them to see the world more broadly. Creativity is very important to nurture and help children learn to think out of the box. When children use blocks, dolls, animal toys, balls, mini-cars, or pretend toys, they start creating stories and living out scenarios in their mind.

1.4.2 Toys help in Multidisciplinary and Interdisciplinary Learning:

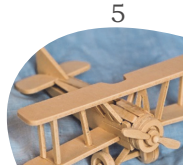
Children construct knowledge from their surroundings. Toys give them opportunities to explore Science, Technology, Engineering, Arts, and Mathematics. Whether a toy is simple or complex, it has a lesson for the child to learn. When a child builds a tower with blocks and eventually watches it fall to the ground, he/she learns some concepts in physics (eg. gravity) and also thinks about a solution to stop this fall. A puzzle stimulates children's brains and help them explore patterns.

1.4.3 Toys strengthen Motor Development:

When children hold a toy and manipulate it, they are practicing their motor skills and strengthening their hand-eye coordination. This helps them advance through the stages of physical development. Toys that require them to push, pull, grab, pinch, turn, or otherwise use their hands and body to make it do something are instrumental in a child's growth.

1.4.4 Toys and Play help in Social and Emotional development:

Children associate their toys with love, attention, and happiness. So, when they show affection with their toys, they are cultivating and fostering sweet childhood memories. In turn, they also associate their peers or parents who play with them and their toys as parts of these emotional connections. Talks with parents during play about social and emotional behaviours expected by the society help children acquire important values such as tolerance, patience, team work, etc. Toys can help children in projecting their emotions if they need to talk about anything that troubles or scares them. Children who spend hours in wonderful play with their toys tend to have a healthier and happier childhood which they can look back to with fondness. This can help them make their transition to adulthood easier as they have fully been able to experience being a child.






1.4.5 Toys and Play have a Therapeutic-Effect

When children start growing up, they begin facing different kinds of problems like low confidence, low self-esteem, indentity crisis etc. due to many factors which include peer pressure, physical changes etc. These problems are often compounded by adults when they don't understand or respond to their children's feelings or pay heed to what they are attempting to communicate. As a result of lack of support from the parents, this "communication gap" gets widened and children start restricting their expressions before the adults. In such situations, play works as a medium for expressing feelings, exploring relationships, describing experiences, disclosing wishes and self-fulfillment. The problems children experience generally reflect the kind of person they are. Therefore, play therapy matches the dynamic inner structure of the child with an equally dynamic approach. In play therapy, children get an opportunity to express their inner world. Emotionally significant experiences can be expressed more comfortably and safely through the symbolic representation that toys and games provide. The use of toys enables children to transfer guilt, fantasies, anxieties and fears to objects rather than people which further helps them in changing what may be unmanageable in reality to manageable situations and also learning to cope. Given the opportunity, children will express their feelings and needs through play in a manner similar to that of adults. However, it is important that children have ready access to play materials selected for the purpose of encouraging expression. All toys and materials do not automatically encourage children's expression or exploration of their needs, feelings, and experiences. Therefore, appropriate attention should be paid while selecting the toys.

1.5 Integration of Toy-based Pedagogy in Curriculum

Curriculum encompasses all the activities children do in school, home and other curricular sites, which lead to achievement of learning outcomes. These activities often have a basis in the child's own experiences, syllabi, textbooks, other learning resources and pedagogies that the teachers and parents/caregivers use to transact various concepts/skills.

With the changing employment needs and opportunities in the global ecosystem, it is becoming increasingly critical that children not only learn, but also learn how to learn. School education must move towards achieving goals of making children learn about how to think critically and solve problems, develop creative and multidisciplinary abilities, and learn how to innovate, adapt, and absorb new material in novel and changing fields. This will require less focus on and reduction in the content.

National Education Policy 2020 states that curriculum content will be reduced in each subject to its core essentials, to make space for critical thinking and more holistic, inquiry-based, discovery-based, discussion-based, and analysis-based learning. The mandated content will focus on key concepts, ideas, applications, and problem-solving. Teaching and learning will be conducted in a more interactive manner; questions will be encouraged, and classroom sessions will regularly contain more fun, creative, collaborative, and exploratory activities for students for deeper and more experiential learning (NEP 2020, para 4.5)



In the light of the above discussion, children need to be given varied learning experiences in the classroom and beyond the classroom such as creating and playing with toys and games, solving puzzles, watching and organising puppet shows, field visits, story-telling sessions, etc. As said earlier, many of these experiences can be provided using toy-based pedagogy. Toy-based pedagogy is a teaching-learning approach based on learning through toys, games and puppets. Integration of toys and games for learning helps in simplifying, clarifying and concretizing abstract concepts. Toy integration in the curriculum provides a means to bridge content of different subjects seamlessly in a logical and learner-centric manner. Use of toys and games as pedagogy can be an efficient tool in developing 21st-century skills like creative and critical thinking, reasoning, problem-solving, communication skills, and adaptability.

Educational use of toys, especially the indigenous toys is both economical as well as relevant for enhancing understanding about our culture. The exposure of learners to these toys and games in a formal setting brings cultural awareness, enhances cultural expression and opens multiple avenues for the revival and promotion of traditional toys and games.

As a curriculum developer, you may be writing syllabi, textbooks and many other relevant materials for children in school education. Though you may be using toys or games for making a reference for developing concepts through toys or about a principle on which a toy is working, a comprehensive use of toys and games in the present curriculum has not been very visible. However, in view of the perspective of experiential learning to be integrated across the stages as envisaged in the National Education Policy 2020, here are some basic guidelines on integrating Toy-based pedagogy in the curriculum:

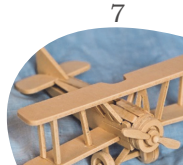
1.5.1 Toy-based Pedagogy in School Curriculum

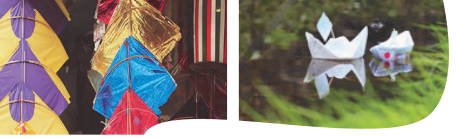
a. Understanding Historical Perspective of Toys:

A thorough understanding of historical perspectives and pedagogic value of local and indigenous toys, games and puppets need to be developed before integrating these into the curriculum. When we talk of toys in school education, our focus is mainly on indigenous toys and games. Toys such as spinning top which is popularly known as lattoo, firki, kites, dug-dugi, phirni the pinwheel, magic cards, flying birds, magic snake, etc. are some of the examples which are delightful play objects used in our country. Papier mache toys and clay toys are another variety of toys which are found across the Indian panorama. Indian dolls and puppets also have an interesting range as toys which are as diverse as our culture and have a huge potential to address most of the curricular needs at the school level. Additionally, there is a great variety of Indian toys and games, such as board games, mechanical toys and robots which are specifically designed keeping learning and developmental needs of the learner in view. Identification of toys, puppets and games to be used at the appropriate school stages and in different subject areas needs to be done through a group of curriculum developers from different disciplines.

b. Analysis of Toys, Games and Puppets:

Adequate analysis of the toys, games and puppets for including them in the





curriculum is required prior to writing content revolving around toy-based pedagogy. This analysis should be based on the following criteria:

(i). **Availability and accessibility**- It means that the toy is available locally and within the reach of children and teachers; that the toy can be created using local material; that the toy is safe for children of different age groups; that the toy is cost effective, etc. Locally available toys for Children With Special Needs also need to be identified and needs to find a place across the teaching-learning resources including textbooks.

Figure 1.6

(ii). **Academic value:** Toys need to be mapped with the learning outcomes/ concepts/skills while taking care of its interdisciplinary and multidisciplinary usage and the stages at which children are studying. For example, for the play-based learning of children at the foundational stage, stuffed dolls or soft toys may be identified for making the class interesting and joyful. The curriculum developers and teachers need to see what learning outcomes may be achieved using toys as pedagogic objects, what concepts and skills can be developed in addition to the joy the children feel while playing with these toys, what are the cross cutting issues, such as values, inclusion, life skills, etc which can be addressed through these.

c. Writing of Content:

After assessing the academic value and other aspects of some of the toys to be included in the curriculum, content related to a concept/learning outcome can be written, including the toy and its description and suggestive pedagogy. The developmental characteristics of each stage viz.foundational, preparatory, middle and secondary need to be taken care of while giving space to toy-based pedagogy in the curriculum.

For example, if you are writing a chapter which includes a story of 'a small child who helps others' for Class I language textbook, you may suggest in the chapter itself that this story may be told using dolls (mother doll, child doll, etc.), so that children will enjoy listening to stories observing dolls performing various characters. Similarly, curriculum developers of mathematics may include board games or other toys or activities related to the creation of toys for making children learn mathematical concepts in a play way manner.

While writing the content , the following instructions need to be included for identifying or making the toys:

- Material for making toys must be cost effective or of no cost, so that there is no burden on the children or on the school.
- Material must be locally available and ecologically sustainable.
- Children should be given opportunity to innovate using waste material.
- Material must be non-hazardous and safe for the children.



d. Activities related to creation of Toys:

Curriculum developers may also include activities related to creation or making of toys e.g., Kite, Airplane, Boat, Cap, etc. integrating it with content related to shapes in Mathematics (at the foundational stage) or projectile motion in Science (at the secondary stage) or poetry in Language (at any stage).

Figure 1.7

e. Toys, Games and Puppets as Themes in Curriculum:

Besides, their usage as a pedagogical tool, some toys/puppets/games may also be used as topics or themes in the syllabus itself, for example, a theme on 'Story of a Kite'(for the preparatory stage), 'Puppetry art of Rajasthan' (at the middle stage) or 'Toys and Culture' (at the secondary stage) may be included.

f. Core Concerns:

While including toys/puppets/games in the syllabus or textbooks, it must be ensured that it is indigenous and within our Constitutional Framework (in tune with the values of social justice, equality etc.), promotes sensitivity towards environmental protection, is gender sensitive or gender neutral, enhances scientific temperament, does not make publicity of any brand, etc.

g. Flexibility:

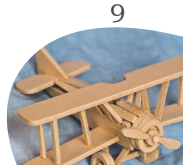
The approach used while integrating toys should be flexible in nature and should provide the learners some opportunities like exploring, imagining, observing, creating, expressing and most importantly engaging and playing with. The process from making toys to playing with the toys, has the potential to make learning experiential. The role of the curriculum developers and the teachers is to create spaces for linking the new concept/s in making of toys and using toys, strategically and appropriately.

h. Skill-based Learning:

Toys and games as an integral part of the learning process surely sparks and gears up the process of cognitive, psycho-motor and emotional development of every learner including Children with Special Needs. The skill of creating toys and games has another added benefit. This can help students, especially at the secondary stage gain vocational skills, especially craftspersonship, handling of tools, making and managing of tools, knowledge and skills to use regional resources, etc. This process of integrating indigenous toys and games will not only make learning joyful but also help students develop various skills.

i. Assessment:

Assessment questions in the textbooks and other learning material may be created keeping toys in focus, so that children can easily imagine and solve






questions without any stress. An example could be as follows:

A toy car starts from one corner of a room and in 10 seconds, travels 20-centimetre distance, and reaches another corner of the room. What is the velocity?

A. 1 cm/sec
B. 2 cm/sec
C. 3 cm/sec
D. 4 cm/sec

Students will be able to relate their experiences to solving this problem. A similar question may be given using higher units and also different means of transport that children observe in their environment.

j. Criteria for Selection of Toys/ Games:

For selecting a suitable toy or game, the following needs to be kept in mind:

- The toy or game is safe for the child's age, well-constructed and durable.
- It is appealing and interesting to the child.
- It is suitable for the child's physical capabilities.
- Hazardous toys should be used under adult supervision only.
- The toy should not have any shock or heat hazard (in case of electrical toys).
- It should not have sharp or pointy edges.
- It should be made of non-hazardous material. These can be checked for the standard practice of labelling art materials or chronic health hazards, commonly known as ASTM D-4236.
- In case of street/outdoor games to be used for pedagogy, safety of children by the teachers and parents need to be ensured.
- The circular issued by the Ministry of Education regarding safe use of toys to be adhered to in this regard. **(Annexure-II)**

k. Vocational Education and Toy-based Pedagogy

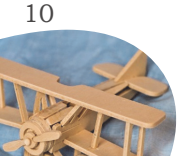
- While developing content on employability skills, toy-based pedagogy needs to be integrated to develop skills such as critical thinking, communication skills, interpersonal and intrapersonal skills.
- Separate vocational courses on manufacturing various toys depending upon their make and material may be created for the secondary stages.
- With a view to develop basic vocational skills and creating interest in vocational courses, 10 bagless days or internship programme in schools with local craftsperson has been recommended in NEP 2020. School children may be given an opportunity to learn toy-making in the schools during these 10 bagless days or internship days with the help of local toy makers.

1.5.2 Toy-based Pedagogy in Teacher Education Curriculum

The implementation of school curriculum is in the hands of the teachers. For this, the teachers not only need to develop a mindset but also necessary skills to implement toy-based pedagogy in the schools. It is required to revisit teacher education curriculum at two levels; Pre-service and in-service. Some guidelines for creating a space for toy-based pedagogy in teacher education are as follows:

a. Pre-service Teacher Education Curriculum

- The children's world of toys not only provides for recreational or fun moments but also the process of maturing. Toys equally act as a medium for imparting a rudimentary level of wisdom to our children just





like books do in school. Hence, instead of undermining their significance in the development of our children, there is a need to include them as core components in the process of child-development. Hence, the pedagogy courses in pre-service teacher education programme need to include content and activities related to experiential learning and toy-based pedagogy, so that from the pre-service level itself, the teachers will get well-versed with this pedagogy.

- School-internship programmes must guide student-teachers on taking classes integrating toy-based pedagogy.
- Community work in teacher education programmes need to include survey by the student-teachers on toy-pockets in the local area and also understanding about the local toys and their manufacturing.
- For curriculum at the post-graduate level in teacher education, the course on curriculum development needs to provide adequate space to the development of school curriculum integrating toy-based pedagogy. Also, research (dissertation) needs to be conducted on toys and their educational values, toys for children with special needs and use of toys for addressing the cross cutting issues.

b. In-service Teacher Education Curriculum

- Pedagogy modules for different subject areas across the stages need to integrate toy-based pedagogy as a part of experiential learning in the form of activities related to a variety of indigenous toys, games and puppets.
- The sessions in in-service teacher capacity building programme must include creating cost effective toys, games and puppets, mapping of toys with learning outcomes, etc.
- Multidisciplinary perspective of toy-based pedagogy needs to be given space in modules for teachers at the secondary stage, for example, a single game may be created in a manner such that it can be used for different subject areas. A game like Snakes and Ladders may be created to learn various concepts in Mathematics and also the periodic table in Chemistry.

With a view to provide more details on the toys, puppets and games, and the developmental stages for play-based learning, chapters on different aspects of toy-based pedagogy, including a variety of toys, games and puppets, play based and experiential learning, and toys at different stages are included in the following chapters.

Exemplar Activity for Teachers to be included in Curriculum

Figure 1.8

What is a toy and how is it different from a science model or a TLM?

Reflect on the following:

a. In the images above, can you identify which one is a toy, a game and a science model?

b. Note the similarities and differences between the three.

c. Can a toy be a science model and vice-versa? If so, how?

d. Can a game integrate both a toy and a science model?

2 Indigenous Toys, Games and Puppets

2.1 What do we mean by Indigenous/ Traditional Toys and Games?

A distinctive tradition of toys and games is found in every region of India. The traditional figurines and toy-like artifacts, with which Indians are acquainted have existed all through the centuries. The wide range of such artifacts and figures have been existing since ancient times and have maintained a remarkable historical continuity. These toys and games depict our environment, culture, traditions and practices. These toys mainly are of animals, birds, fish, human figures in costumes, human figures engaged in work, abstract forms and miniature items of everyday use such as cooking vessels, ritual objects, etc. There are also musical and mechanical toys, mobiles, dolls and a host of other toys. The Indian toy makers use almost every available material, from alluvial soil to wood, from waste paper to rags, from clothes, canes, grass and bamboo shafts to scrap material like old tins to make toys.

2.2 How are these Toys useful for Children?

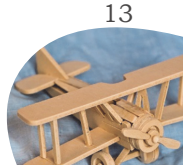
- Material used in traditional toy making has a wide variety in terms of their texture, colour, form and style of treatment. These toys provide the children their first exposure to form and texture, colour and design, and light and sound.
- Simple traditional toys provide children an opportunity to use their imagination to create characters and situations drawn from real life or from the world of fantasy.
- Due to their inherent diversity, Indian toys have the potential to encourage the imagination of the child and subconsciously the child also learns simple educational concepts and acquires understanding of cross-cutting issues such as gender, inclusion, etc.
- Traditional toys also help in learning about the life and culture of a particular place.
- Traditional toys in India are very closely associated with the concepts of Science and Technology and may be used as educational aids in classroom teaching.

2.3 Grouping of Indigenous Toys

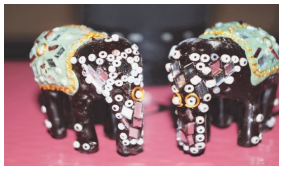
Indigenous Toys can be grouped according to the material from which they are made, for example, clay, wood, bamboo, metal, cloth rags, paper, papier mache and others. These materials are easily available, and are inexpensive, ecologically sustainable and safe for children to play with. Toys can also be classified according to the region or states to which they belong.




S. No.	Material	States/UTs	Examples
1.	Clay  Figure 2.1  Figure 2.2	Assam	Figures of gods, goddesses, and animals
		Gujarat	Figures of humans and animals
		West Bengal	Realistic human figures and miniature village scenes Toys in traditional costumes of various communities and occupational groups generally known as Costume dolls
		Bihar	Herds of elephants or a group of dancers surrounding a particular person
2.	Wood  Wooden Crafts of Arunachal Pradesh Figure 2.3	Andhra Pradesh	Kondapalli Toys of Deities -Dashavatara set and caparisoned elephant are some of the popular toys. Besides figures dressed in local costume engaged in activities such as cooking, churning milk,
			drumming and others familiar to village children also fall under the category of indigenous toys.
		Karna-taka	Chennapatnam toys are of bright colours
		Odisha	Fish Toy
3.	Grass  Figure 2.4	Bihar	Dolls, elephants, hanging toys with sikki grass. Hanging toys also known as mobiles
		Tamil Nadu	Grass Mat of Pattamdai in Trunelveli district of Tamil Nadu






4.	Cloth  Figure 2.5	Gujarat	Torans (door hangings with animal toys and flower toys). Dolls depicting brides and bridegrooms
		Rajasthan	Dolls, Stuffed Toys or Rag Dolls and puppets
		Ladakh	Dolls in traditional costume sitting on a Yak
		Manipur	Dolls in dancing posture
5.	Shell  Handicrafts of Andaman and Nicobar Islands Figure 2.6	Costal States/ UTs	Animal Figures
6.	Paper  Figure 2.7  Figure 2.8	Delhi	Pinwheel, birds, kinetic toys
7.	Metal  Figure 2.9	Odisha	The figures include peacocks, chameleons, cobras, crabs, horses, deer and other friends from the animal kingdom. Human figures are also made. A toy bull made of bell metal in Odisha is a famous toy.
8.	Glass  Figure 2.10	Uttar Pradesh	Marble balls, bangles, animal figures, etc.


2.4 Indigenous Games

In early times people used to live full, rich, balanced lives. Their lives were not an endless round of day-to-day struggle for survival. Generally, there was plenty of time for reinforcing, adapting and developing their culture through recreational activities such as songs, dances, storytelling, carving, weaving, making drums and rattles, visiting, and playing games. Local games were often very popular in India as they engage children and adults for a longer duration. These games were generally played to promote agility, strength, balance, reflexes, hand-eye coordination, accuracy, strategy, intuition and patience along with drawing joy and developing skills of problem solving, decision making and managing interpersonal relations. Traditional indigenous games teach valuable skills combining mental and physical wellbeing.

India has a rich culture consisting of games played on ground and board games. Some of the Indian games have also received international recognition.

2.4.1 Board Games: These are the games which can be played on the floor or on a tabletop for example checker, chess, pachisi, chaupar, ludo, etc. These games typically use movable pieces placed on a pre-marked board (playing surface) and often include elements of tables, cards, role-playing, and miniatures games as well. In board games, a minimum of two players are required to play opposite each other. In checkers, a player wins by capturing all the opposite pieces, while ludo often ends by sending the tokens onto the finish line. There are many varieties of board games which represent real-life situations. Board games can be used to transact many concepts in Science, Social Science, Mathematics, Languages, etc. For example, Snake and Ladders game can be redesigned to learn traffic rules, basic mathematical operations and various concepts in Environmental Studies. These games can be explored by the teachers and curriculum developers to map these with various concepts and skills and can be used for making children learn subject-specific concepts and cross-cutting issues such as values, inclusion, etc. These can also be redesigned as per the needs and contexts of children. These games help in developing the following competencies and skills:

- Planning
- Problem Solving
- Decision Making
- Logical Thinking
- Reflective Thinking
- Emotional Intelligence
- How to Deal with Mistakes
- Deferring Gratification
- Cooperation
- Competition

Famous Indigenous Board Games

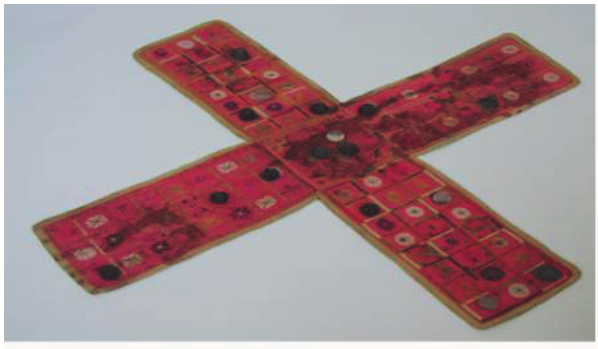
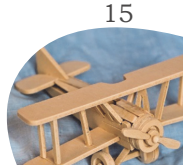


Figure 2.11

Chaupar: Chaupar is an ancient game widely considered to be originated in India. It is an Indian game of 14th Century. This is a cross and circle board game which resembles 'pachisi', another ancient game of India.






Method: The board is made of wood or cloth, with wooden pawns and six cowry shells to be used to determine each player's move. Use of three-four-sided dice in Pachisi differentiates Chaupar from Pachisi.

Pedagogic Importance: It may be used to develop mathematical skills, strategising, decision making, concentration, etc.

Ludo: Ludo game has its origin in the ancient Gupta Empire that existed in the sixth century in India, where it started as the Pachisi game. Its modern rules were adopted in England (Great Britain) at the end of the nineteenth century.

Method: The game is played between 2 to 4 players., The objective of the game is simple: each player gets 4 tokens, these tokens must make a full turn of the board and then make it to the finish line. Whoever gets all the four tokens to the end first is the winner.

Pedagogic Importance: It may be used to develop mathematical skills, decision making, concentration, etc.

Pallankuzhi: It is an ancient game mostly played in South India. It actually originated from Tamil Nadu but was later played in other southern states like Kerala, Andhra Pradesh, and Karnataka and even in Srilanka and Malaysia.

Figure 2.12

Method: The game consists of a rectangular board which consists of 2 horizontal columns and 7 vertical columns in each horizontal column. Hence, there are 14 cup-like columns. Cowry shells or tamarind seeds were used to play this game.

Pedagogic Importance: It helps in developing observation skills, analytical thinking, planning and developing strategies, and problem solving.

Chess: Chess, which originated in India, is one of the world's most popular strategy games.

Method: Chess pieces are divided into two different coloured sets, generally white and black. Two players can play this game. Each set consists of 16 pieces: one king, one queen, two rooks, two bishops, two knights, and eight pawns. A piece is moved to either an unoccupied square or one occupied by an opponent's piece on a board marked with black and white squares. A player may capture an opponents's piece and remove it from play.

Pedagogic Importance: It can be used for students at the middle and secondary stages. Playing chess promotes brain growth–specifically, it fuels dendrite growth, and it stimulates both sides of the brain. In addition, Chess develops a plethora of valuable skills, including focus and concentration, planning and foresight, logical thinking, etc.

2.4.2 Street Games:

These are played in the streets or in the neighbourhood. These are usually simple play time activities for children in the most convenient venues. Some street games have risen to the level of organized tournaments, such as Kabaddi and Kho-Kho. When street games are based on organized sports, the rules are highly modified to fit the situation.

Lattoo: Lattoo is a popular game played in India using a spinning top. This simple game came into existence in 3500 BC. In the beginning, tops were made of clay. Later, children began to use tops made




of wood. Today, a variety of designed and coloured tops are available.

Method: There is a string which helps to spin the top and then helps to lift up the spinning *top.* Usually, two or more players can play this game.

Pedagogic Importance: Principles of circular motion, centre of gravity etc. can be learnt with the help of Lattoo in a play way manner.

Figure 2.13

Stapoo /Hopscotch: This hopping game is a popular outdoor game in many states of India. In Tamil Nadu, it is famous by the name *Nondi. Method:* The game involves drawing a grid on the ground and numbering it. Children take turns and throw an object, usually a small stone, onto the numbered blocks. They have to hop across the blocks to pick up the object jumping on one/two legs to finish the lap, taking care not to step on the border lines.

Pedagogic Importance: It is a group game. It is also popular as Kith Kith game. Through this game children can learn the skills of balance, precision and decision making.

Figure 2.14

Lagori games: Lagori (pitthu), game involves a rubber ball and a pile of seven flat stones stacked upon one another.

Method: It is usually played between two teams, with a minimum of 3 players and a maximum of nine players in each team. The name of this game varies from region to regio n. Each team has 3 players getting 3 chances each, which means a total nine chances per team. The players have to knock down the stones from a distance of 20 ft with the ball. If a team is unable to knock down the stones, then the chance is given to the next team. The aim of the opposite team is to strike any player of the throwing team with the ball, below knee level. This sport is more popular in the rural parts of the country.

Pedagogic Importance: This game leads to development of problem solving, team spirit, decision making, eye-hand coordination, etc.

Figure 2.15

Gutte: Gutte is a game, which is generally played by children with their friends in the neighbourhood or in the streets.

Method: This is a simple game, which is played in many parts of our country and is known by different names. It consists of 5 pieces of small stones. It requires you to toss and spin one stone in the air and




pick other stone from the ground before the airborne stone touches the ground. The process is repeated until an airborne stone strikes the ground. The process gets trickier when there are more than one stone in air.

Pedagogic Importance: It is simple and inexpensive. Any number of people can play this game. This game may be used to develop and enhance eye-hand coordination, concentration, decision making, etc.,

Figure 2.16

Kancha: Kancha is another interesting and inexpensive game in India. It is a favourite game among children and adolescents, and is played using coloured glass marbles known as 'Kancha'.

Method: The game involves a player hitting the selected target marble using one of his/her marbles. Traditionally, the winner of the game takes away all the marbles from the losing players. The marble is held between the right hand and the forefinger of the left hand. The finger is pulled backward and is released with pressure almost in a spring action. There are various versions of the game from an easy to the complicated ones.

Pedagogic Importance- Kancha may be customised to strengthen children's foundational literacy and numeracy. On

Pedagogic Exemplar -1

Teacher has asked children to bring Ludo. 6 children brought Ludo in the classroom, and the teacher sets up 6 groups with four members each of the six groups. She guides them to play with two dice. Initially, their pawns or tokens are at home. They have to get six on the dice to come out of the home. In case of two dice, they have to add dots on both the dice and accordingly move ahead. They have to go all the way around the board and get all four pawns/ tokens to the home to win. Along the way, one player can block other players and capture

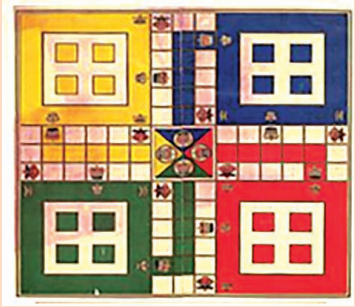


Figure 2.18

players. Through this strategy game, teacher successfully makes children learn following mathematical skills at the Foundational Stage:

Counting: When the children roll out the dice, they count the dots on each dice, in this way they practice counting with an authentic purpose (to see how far to move)

Addition: Since this is a game that allows two dice to be added together to determine the number of spaces to be moved, children also practice addition.

One to One Correspondence: Children practice one to one correspondence when they move their pawns/tokens. Children advance one space per number. So, if they roll a six, they could only move six spaces. With enough help and practice, children learn to move one space per number rolled.

Doubles: When children work with two dice sometimes, they roll two of the same number. They are introduced to the term, "doubles". This helps in beginning the foundation for multiplication.




plain kancha, alphabets or numbers can be painted. Children love to learn while playing. Kancha helps in developing eye-hand coordination and fine and gross motor skills.

2.4.3 Games which are now included at the international level

Figure 2.17

Pachisi: The national board game of India is known as Pachisi, or the game of Twenty-Five. The name comes from the Indian word pachisi, which means twenty-five, the highest score that can be earned in the game. It has been played for more than 1,200 years. Although the game of Parcheesi is related to Pachisi, Parcheesi is the U.S. version of the game, and is much simpler. Pachisi actually came from the older game called Chaupar, which is still played in India today. Its pedagogic importance may be understood by the following example.

Figure 2.19

Kabaddi: Kabaddi is a team sport of India.

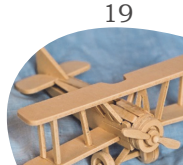
Method: There are 2 teams with 7 seven players in each team. The aim of the game is that a single player from a team has to run into the opposing team's half of a court, touch as many defenders as possible, and return to their own court. All of this must be done without being tackled by the defenders and most importantly in a single breath. Players are taken out of the game if they are tackled but can be brought back into the game for each point scored by their team from tackle.

Figure 2.20

Pedagogic Importance: Playing Kabaddi, children develop physical stamina and control over their breathing. They also learn decision making along with building muscles, increasing the lung capacity necessary for fitness and to hold the long notes in songs, burning off extra energy and releasing any stress.

Kho Kho: Kho Kho is a popular street game invented in India.

Method: It is played by teams of selected 12 players out of 15. From, amongst the 12 players, 9 enter the field and sit on






their knees and the remaining 3 players try to avoid being touched by members of the opposing team. It is the next popular tag game after kabaddi. Kho-Kho is a traditional Indian sport, which is one of the oldest forms of outdoor sport, dating back to prehistoric India. It is most often played by school children in India and is a competitive game.

Figure 2.21

Pedagogic Importance: Playing Kho-Kho, children develop physical stamina and they also learn decision making through this game.

Gilli Danda: Gilli Danda is a thrilling game which originated in India. This game requires two sticks.

Method: The smaller stick should be an oval-shaped wooden piece known as Gilli and the longer stick is known as danda. The player needs to use the danda to hit the Gilli at the raised end, which then flips in the air. When it is in the air, the player needs to hit the Gilli, as far as possible. Then, the player runs to touch a point outside the circle before the Gilli is taken by another player. The secret of winning this game lies in how well is the gilli raised and hit. It can be played by any number of players.

Pedagogic Importance: This helps in enhancing Eye-hand coordination, decision making, estimation and measurement of distance, and also in learning concepts related to projectile motion, etc.

2.5 Puppets

In modern times, educationists all over the world have realised the potential of puppetry as a medium of communication. Many institutions and individuals in India involve students and teachers in the use of puppetry for communicating educational concepts.

Figure 2.22

A Puppet is one of the most remarkable and ingenious inventions of the human society. India is said to be the home of traditional puppets. The earliest reference to the art of puppetry is found in the Tamil classic '*Silappadikaaram*' written around the 1st or 2nd century B.C. Almost all types of puppets are found in India. Puppetry throughout the ages has held an important place in traditional entertainment. Like traditional theatre, themes for puppet theatre are mostly based on the epics and legends. Puppets from different parts of the country have their own identity.

Regional styles of painting and sculpture are reflected in them. Puppets can be broadly classified into four categories based on the mode of manipulation. These are marionettes, shadow puppets, rod puppets and glove puppets. Finger and fist puppets, humanettes and water puppets are also some of the popular forms of puppetry today.

String Puppets: India has a rich and ancient tradition of string puppets or marionettes. Marionettes having jointed limbs controlled by strings allow far greater flexibility and are, therefore, the most articulate of the puppets. Rajasthan, Odisha, Karnataka and Tamil Nadu are some of the regions where this form of puppetry has flourished. The traditional puppets of Rajasthan are known as Kathputli. The string puppets of Karnataka are called Gombeyatta. Puppets from Tamil Nadu, known as Bommalattam combine the techniques of both rod and string puppets.

Figure 2.23

Glove Puppets- The tradition of glove puppets in India is popular in Uttar Pradesh, Odisha, West Bengal and Kerala. In Uttar Pradesh, glove puppet plays usually present social themes, whereas in Odisha such plays are based on stories of Radha and Krishna. In Odisha, the puppeteer plays the dholak with one hand and manipulates the puppet with the other. The delivery of the dialogues, the movement of the puppet and the beat of the dholak are well synchronised and create a dramatic atmosphere.

Figure 2.24

Rod Puppets: Rod puppets are an extension of glove-puppets, but often much larger and supported and manipulated by rods from below. This form of puppetry now is found mostly in West Bengal and Odisha. In Nadia district of West Bengal, rod-puppets used to be of human size like the Bunraku puppets of Japan. This form is now almost extinct. Elements of rod and string puppets are combined in this form of puppetry.

Shadow Puppets: Shadow puppets are flat figures. They are cut out of leather, which has been treated to make it translucent. Shadow puppets are pressed

Figure 2.25




against the screen with a strong source of light behind it. The manipulation between the light and the screen makes silhouettes or colourful shadows, as the case may be, for the viewers who sit in front of the screen. This tradition of shadow puppets survives in Odisha, Kerala, Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu.

The shadow puppet theatre of Odisha and Kerala draws heavily upon themes from the Ramayana while those of Andhra Pradesh and Karnataka adapt episodes from the Mahabharata and local legends. The shadow theatre of Karnataka is known as Togalu Gombeyatta. Tholu Bommalatta, Andhra Pradesh's shadow theatre has the richest and strongest tradition. The music is dominantly influenced by the classical music of the region and the theme of the puppet plays are drawn from the Ramayana, the Mahabharata and the Puranas. The most theatrically exciting is the Ravanachhaya of Odisha. The puppets are in one piece and have no joints. Ravanachhaya puppets are smaller in size—the largest are not more than two feet and have no jointed limbs, they create very sensitive and lyrical shadows. The music is simple, but the literary text including the vocal accompaniment is very much influenced by the Odissi music. The theme of the puppet play is exclusively drawn from the Rama legend.

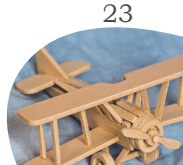
Pedagogic Importance of Puppetry

- Puppetry can be used to motivate children with emotional and physical challenges to develop their mental and physical faculties.
- Puppetry can also be used to conduct awareness programmes about the conservation of the natural and cultural environment, climate changes, cleanliness drives, gender concerns, inclusion, etc. These programmes aim at sensitising the students about the beauty in word, sound, form, colour and movement. The aesthetic satisfaction derived from making of puppets and communicating through them helps in the all-round development of the personality of the child.
- Stories adapted from Puranic literature, local myths and legends usually form the content of traditional puppet theatre in India which, in turn, imbibes elements of all creative expressions like painting, sculpture, music, dance, drama, etc.
- Puppetry can help teachers across the stages for the teaching -learning of all the subject areas integrating theatre. It will be very useful for language and Social Science education.
- Awareness on cross- cutting issues such as gender, inclusion, equity, social justice, etc. can be generated through puppetry not only among the students but also among their parents and the overall community.
- Regular puppet shows on the local problems- wastage of water, wastage of food, cleanliness, etc. may be organised in schools with the help of children, wherein parents and community may be invited to watch them and hence generate awareness. Schools may function as *Samajik Chetna Kendra,* which is one of the important concerns of NEP 2020 – using toys and puppets as a medium of creating awareness and understanding over local and social issues.

2.6 Toys and Play Materials from Nature

Natural materials should be an integral element of children's play. Young children can be connected with nature more easily

if we engage them in collecting materials from nature and help them create and construct toys using a variety of natural materials such as *leaves, feathers, rocks, stones, tree barks, shells, wood shavings, potters clay, flowers, seeds, pinecones, and corncobs*. Teachers, Parents and Caregivers should ensure that all the natural materials are safe for the children. Bringing natural materials into the classroom right from the preschool stage helps children to know about their immediate surroundings and environment, and bring *'Environmental Awareness'* among them which indirectly engages them with natural resources. It also lets children know how to care for natural environment and develop respect for plants, trees, and other living things. Children also get sensory stimulation while they explore, observe, discover, and play with natural materials. Do-it-yourself or DIY toys are easy to develop using natural materials as it boosts imaginative ideas and encourages children to become critical thinkers and connect with nature.



3 National Education Policy (NEP 2020) and Experiential Learning

NEP 2020 recommends that, "in all stages, experiential learning will be adopted, including hands-on learning, arts-integrated and sports-integrated education, story-telling-based pedagogy, among others, as standard pedagogy within each subject, and with explorations of relations among different subjects. To close the gap in achievement of learning outcomes, classroom transactions will shift, towards competency-based learning and education. The assessment tools (including assessment "as", "of", and "for" learning) will also be aligned with the learning outcomes, capabilities, and dispositions as specified for each subject of a given class" (NEP 2020, para 4.6).

Some Indian education philosophers had also expressed their agreement towards experiential learning which helps in holistic development of children. **Mahatma Gandhi,** wrote in his book Nai Talim that *'work and knowledge should go together'*. Children should be taught craft (work) not mechanically but scientifically (with reason and evidence) as it would develop the intellect of the child. According to Gandhi ji, *'the brain must be educated through the hand.'* **Sri Aurobindo** believed that learning happens best in a *free and creative environment* that aids and allows development of child's interest, creativity, mental, moral, and aesthetic sense. **J Krishnamurthy** was of the view that since the purpose of learning is to develop a questioning mind and spirit, the teacher has to free himself from mindless repetition of content and practices.

Experiential learning, in very general terms, refers to acquiring knowledge through personal experiences. It is one of the most fun-filled, engaging, and effective ways to understand new concepts. This helps in moving away from rote memorization and provides children with hands on experiences.

3.1 Experiential Learning

- Experiential learning occurs when learners are exposed to selected experiences – such as toys, games, projects, crafts, etc., followed-up by reflection, critical analysis and synthesis. During this process learners take initiatives, make decisions and are accountable for the results.
- This process keeps learners actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning.
- This leads to the development and nurturance of relationships - learner to self, learner to others and learner to the world at large.
- While adopting experiential learning, teachers and learners may create or



innovate something or may experience failure at some stage or may learn something very new and unique. Outcomes of experience cannot be predicted totally. The design of the learning experience facilitates learning from natural consequences, mistakes and successes.

- The teacher's primary roles include creating situations for suitable experiences, posing problems, setting boundaries, supporting learners, ensuring physical and emotional safety, and facilitating the learning process.
- In this process spontaneous learning happens.
- Teachers need to be aware of their biases, judgments and pre-conceptions, and how these influence the learner.

This approach to learning can be used with children as young as these of preschool age and extend well into teacher education programmes. There are many types of experiential learning methods, all of which use real-world applications to enable students to think critically about abstract concepts and derive the ability to apply them to solve real world problems. Some forms are c*lassroom activities-dialogue, discussion, group work, learning by doing, role play, drama, experiments in classroom and lab projects, independent research beyond the lab or classroom etc.*

This may be understood from a real case integrating toy-based pedagogy leading to experiential learning drawn from a classroom observation:

`Pedagogic Exemplar-2

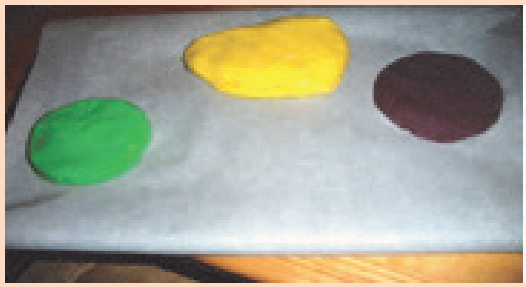


Figure 3.1

A teacher brought some clay and colours and placed before a class of 22 students of age-group 7-8 years. She said, with this clay and colours, you

Figure 3.2

have to create some objects which you find in the market. This you have to do in a group of 4. You have to form your

Figure 3.3

own group. After saying this, she kept silent. For a few minutes, the class was also silent. After a few minutes, one child asked, "Can we work with our friends?', Other child asked, "Who will distribute this clay and colour?'. Teacher said, 'you all have to decide and distribute'. One child offered help




and instructed the class to make their own groups with their friends, then she distributed the clay equally in the groups. Colours were less, so they shared the colours one by one. Five Groups were formed: two children were left. Two groups decided to involve them. Other groups objected on the issue of more members in two groups. Children discussed and resolved this issue. So, work started. Discussion in each group took place. Highlights are as follow:

- They observe many objects in the market - like dresses, books, toys, fruits and vegetable etc.
- Making of these objects with clays may be difficult, e.g., How to make dress with clay? However, dolls, books, etc. can be made

Each group decided to create one or two toys. Discussion was not stopped. Everyone was suggesting improvement in the making of the objects with justification based on his/her experience. So, after two hours, they created: a bottle (blue colour), rectangular shape -chocolate (brown colour), car type structure, pizza type shape and mango and grapes

The teacher appreciating their efforts asked one group to interact with another group. All the groups assessed each other and also reflected upon the strength and weakness of their own work. One group which undertook the preparation of pizza type object assessed the group on mango and grapes and observed that by looking or touching, one can identify the shape of mango, but not pizza. Then discussion took place on the shape of pizza like dishes, as plenty of these are available, so they started thinking, what they can add to make pizza more identifiable. They also discussed that pizza looks like thick roti. Then discussion was also held on why we like pizza, whether it is good for health. The teachers was noting down opinions and views of children for tracking the holistic progress in children. Children then came to the teacher to ask her opinion. Two children asked the teacher, 'Do you also like pizza?' 'Is it not good for health?' The teacher said, "I will tell you the ingredients from which pizza is made and also will explain about weather conditions which correspond to our eating habits. Rest of the decisions you have to take."

In the above case, experiential learning occurred as children were exposed to a situation for creating their own toys.

During this process children took initiative, made decisions and felt accountable for results. This process kept learners actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning. This led to development and nurturance of relationships - learner to self, learner to others and learner to the world at large. The teacher played a role in creating situations for suitable experiences, posing problems, setting boundaries, supporting learners, ensuring physical and emotional safety, and facilitating the learning process. In this process spontaneous learning happened. The teacher was aware of their biases, judgments and pre-conceptions, their influences, hence was trying to teach them how these influence the learner.

3.2 Benefits of Experiential Learning:

Experiential Learning has immense potential for developing holistic personality of students facilitating:

- Independence, creativity and self-reliance leading to development of life skills and values



- Self-criticism and self-evaluation are in-built components
- Openness to experience and others ideas
- Participatory approach and appreciation of diversity and inclusion
- Inculcation of self-discipline
- A fun learning environment helping the learner to retain lessons for a longer period

Experiential learning develops children into innovative and creative problem solvers, with the ability to collaborate with peers and others, as well as find new ways to deal with the new situations they will face. In that sense they will be future-ready, productive and active civic members of our society. To enable this to happen, we can create classrooms where experiential learning is practiced. In such a classroom you will find children excitedly engaged in challenging and purposeful tasks linked to curricular objectives, especially the higher order ones. They will address problems that are relevant to them, acquire information that matters, compare and contrast what they discover, and use their thinking abilities to make sense of what they are learning. These experiences will provide them with an opportunity to reflect, create and apply what they are learning – and over a period become active co-creators of their own learning with support from the teacher.

3.3 Developmental Stages and Play Based Learning

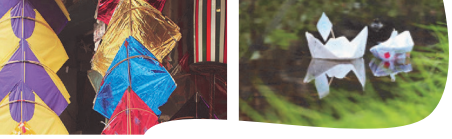
Play comes naturally to children. Play is as vital to the children's wellbeing as eating, breathing and sleeping. Play is a path to learning and it gives boost to self-esteem. It gives space to children in which they explore and manipulate the objects in their own way. Play is a process which occurs with familiar and favourite objects which children want to explore and enables them to supply their own meanings to play activities. Play requires a child's active participation. According to Albert Einstein, *"Play is the highest form of research"*.

Elkonin attributed the power of play to support the development of intentional, self-regulatory behaviours not only to the rules children need to follow when playing with toys, puppets or games but also to the fact that the roles children play are mostly the roles of adults (teachers, parents, doctors, drivers, chefs, and others) engaged in socially desirable behaviours. By imitating these behaviours during play, children learn to adjust their actions to meet the norms associated with the behaviours of role models, thus practicing planning, self-monitoring, and reflection essential for intentional behaviours (Elkonin 1978).

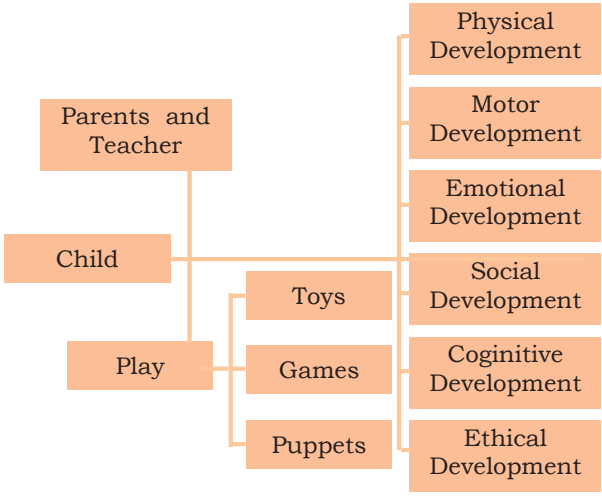
According to Vygotsky (1967), "Play is helpful in the development of language and thought. Mental structures are formed through the use of signs and tools, and play helps in this formation. Play also frees the child from the constraints of the real world that surrounds the child".

If teachers or parents use the process of play for making children learn as per targets they set for them, then this process operates under the mentorship of the adult and is termed as play-based or toy-based pedagogy. Play involves child's planning for role play (imitating teacher's role, parents' role, etc.), local games such as hide and seek, observation, construction or deconstruction of toys, or solving puzzles, etc.

This leads to physical, emotional, social, motor, cognitive and ethical




development as parents and teachers provide support while mending the gaps. This relationship may be seen as follows:



3.3.1 Types of Play:

Plays can broadly be categorised into six types in which children like to get engaged with:

a. Exploratory Play for Children in the Age Group of 1-5 years

Exploratory play motivates children to explore objects, toys and games, rather than playing with them – for example, touching and throwing a stuffed toy, putting a rattle or block in their mouth or looking at a monkey doll's long hands. At this stage of play, children are learning about their world through different shapes, colours, sizes and textures.

b. Cause-and-effect Play for Children in the Age Group of 2-10 years

A stage comes in children's play process, when they play with toys that need an action to produce the desired result – for example, pressing a button to play music, blowing a balloon, etc. This type of play teaches children that their actions have effects and gives them a sense of control in their play.

c. Functional Play for Children in the Age Group of 2-18 years

This is learning how to play with and use toys in the way they were designed – for example, pushing a toy cart, winding a key in a toy to make it dance, beating a drum, bringing a toy phone to the ear, throwing a ball, releasing a top from the string, etc.

d. Constructive play for Children in the Age Group of 3-18 years

This is when children build or make things. It involves working towards a goal or product – for example, completing a jigsaw puzzle, making a tower out of blocks, or drawing a picture, making a castle from the cards or sand or clay, weaving beads into a garland, etc.

e. Physical play for Children in the Age Group of 3-18 years

Physical play is the favourite play of children, when they do things like running, catching and throwing balls, climbing over each other, wrestling, rolling around and even pretending to fight. Physical play helps children develop many skills. Mostly children like this kind of play because it's fun!

These help young children:

- understand the limits of their strength
- explore their changing positions in space
- find out what other children will and won't let them do
- work out social relationships as they play roles, take turns and sort out personal boundaries.

f. Pretend play for Children in the Age Group of 3-18 years

Children naturally like to pretend. When they pretend and use their imaginations during play, they actually take a step towards their socialisation. Examples of this type of play include pretending to



feed a doll, dressing up like parents or superheroes, pretending to be driving the car or whistling like traffic police or watering plants or working like a farmer in the agricultural fields, etc, Pretend play happens later in development – usually around two- three years of age in typically developing children. It's the most sophisticated form of play. There are lots of simple, everyday pretend actions a child can learn to use in pretend play, like driving a car, riding a horse or banging a drum. Once your child can do some pretend actions, you can develop their imaginative and pretend play skills by breaking the pretend play activity into steps. You can also use written or picture instructions to help your child understand what to do. You might want to make it funny – for example, try using a hair brush instead of a spoon to feed a teddy bear. You can also encourage your child to join in with a fun game of 'let's pretend'. This type of play also includes role-play. You can encourage role-play by taking your child's favourite story and getting your child and others to act it out. You can give the children costumes and suggest changes to the characters' voices and gestures. By slowly introducing new themes and gradually changing parts of the play, you can guide your child towards independent, creative, dramatic play.

3.3.2 Social Play:

In addition to these six types of play described above, children also show ability to play with others which is defined as social play. Social play also follows developmental stages. The stages are outlined below.

a. Playing alone (solitary play)

This is when children play alone and independently, when they don't try to get close to other children and don't pay attention to what others are doing. In this kind of play, they use their toys and games and many times they play pretending that they are playing with someone.

b. Playing alongside (parallel play)

Children at this stage of play start to play alongside other children, and might use the same or similar toys as those around them.

c. Playing and sharing with others (associative play)

In this stage of play, children interact with other children – giving, taking and sharing play materials. This usually starts at around three years of age in typically developing children.

d. Playing and cooperating (cooperative play)

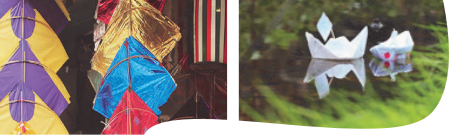
Playing cooperatively with others includes playing games with rules, making up rules, and working together on something, like building a cubby house or making a sandcastle. Cooperative play can become quite complex and involves communication skills.

3.4 Toys for Children with Special Needs

Teachers and Curriculum developers need to have knowledge about specially designed toys for addressing the needs of Children with Special Needs (Divyang). Details about different types of toys useful for CWSN are given below. However, these are inclusive toys, which can be used by all the children at the appropriate stages:

a. Cause and Effect Toys:

These toys work as stimuli (cause) to generate response (effect) from children (for example: push a button and sound will come out). Some of the more common causal toys are: shape sorters, pop-up



toys, sprinklers, light-up toys, toys that make noise when squeezed, etc. These toys help promote visual motor and grasping skills of children with autism. Using these toys, children get an opportunity for hand-eye coordination, sensory exploration and repeat sequences.

b. Puzzles:

There are various types of puzzles for children like connecting puzzles (jigsaw) where pieces fit into each other, non-connecting puzzles (knobs or pegs) where pieces do not fit each other, etc. In puzzles, children have to pick up, grasp and place pieces or blocks to either complete a picture or model. Puzzles offer many developmental benefits that give children a chance to learn new skills while they work towards a goal. Puzzles also improve cognitive development as they help children learn strategy, choice and understanding of how pieces fit together to form a larger picture.

c. Fidget Toys:

These types of toys are good for children with ADD or ADHD, These toys are feasible options for children to keep their hands and fingers busy while the brain is engaged. These toys can effectively help with self-regulation, promote focus and concentration, decrease stress and provide tactile awareness. Examples of Fidget toys are play dough, squeezable balls, etc.

d. Oral Motor Stimulators:

Oral motor toys are designed to either go in or engage a child's mouth. These toys can be effective stimulators for children who crave chewing or struggle with oral motor difficulty. Chewy tubes, chewable jewellery, wooden and warbling bird whistles, blowing bubbles, are some of the examples of these types of toys.

e. Sensory Toys:

Children who suffer from sensory processing disorder are under-responsive to sensation and often need to feel intense outside sensations like texture, touch, pressure and speed. Sensory toys like light up toys, water or sand tables, finger paint, mini trampolines or personal bouncers offer a quick sensory response to help children calm down and focus their attention. It's important to make sure a child is experiencing the sensory response he/she desires. If a child craves more of or a different response, he/she may misuse a toy in order to achieve it, which may be dangerous. Selecting the right type of toys for a child's specific needs is a fun way to teach self-management techniques and learn new skills.

3.5 Do It Yourself (DIY) Toys

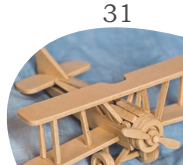
Figure 3.4

DIY is a method of creating/building/developing things by oneself. Materials like paper, wood, cloths, clay etc. can be used for making DIY toys. In our childhood, we have experienced the joy of making drawings on paper. Today, paper is so much a part of our day-to-day life that we tend to take it for granted. It is used for a variety of purposes such as for writing, drawing and painting, making


greeting cards, Origami and, of course, for printing. It is an exciting and versatile craft medium and is available in different textures and colours. Creative activities using waste paper involve the children in producing a variety of toys.

All traditional toys in India are very closely associated with the concepts of Science and Technology and have great potential as educational aids in classroom teaching. Toys use more than one scientific principle and the classroom is the best place to understand these through discussions initiated by the teacher. Since paper is an inexpensive, easily available and a safe material to play with, experiments have been conducted to give the joy of learning to a child through creative use of waste paper.

Children may also be motivated to create toys using clay, cloth, wood and natural fibre. In the coastal states/UTs shells of different shapes and hues are found all along the sea coast of India. In these areas, children may be motivated to create toys made up of these shells.



4 Mapping of Toys with Concepts, Competencies and Learning Outcomes

Children learn through play without any stress and pressure and it helps in their holistic development. To be able to use toys and games for learning in a systematic and planned way, teachers or parents need to first identify the concepts they want their child to learn, competencies to be developed and learning outcomes to be achieved by the child. After identifying the concepts and competencies, selection of toys or games or puppets may be made. This mapping of toys with concepts will give you remarkable results once the child starts playing with the toys. For example-
Concept identified – Learning about colours
Toy selected - Wooden blocks of different colours

A child of age 6 years, while learning about colours will develop competencies such as observation and grouping and achieve learning outcomes – identifying colours with names, mapping the coloured blocks with objects of same colour they have seen. In this process, the child will also add some new words (colours and objects' names) in his/her vocabulary.

In these guidelines, a mapping of various toys with the concepts, competencies and learning outcomes from birth to 3 years, foundational stage (3-8 years), preparatory stage (9-11 years), middle stage (12-14 years and secondary stage (15-18 years) has been given in Annexure-I. This may be used in consonance with the developmental stages and the types of play given in chapter -3. While using this mapping, selection or creation of toys/games/puppets may be done in the existing contexts in different states/UT.

Stagewise pedagogic use of toys is given in the following paragraphs:

4.1 Foundational and Preparatory Stages

As per NEP 2020, para 4.2 states that "The Foundational Stage will consist of five years of flexible, multilevel, play/activity-based learning and the curriculum and pedagogy of ECCE as mentioned in para 1.2. The Preparatory Stage will comprise three years of education building on the play, discovery, and activity-based pedagogical and curricular style of the Foundational Stage, and will also begin to incorporate some light text books as well as aspects of more formal but interactive classroom learning, in order to lay a solid groundwork across subjects, including reading, writing, speaking, physical education, art, languages, science, and mathematics".

Toys often give children emotional satisfaction, and it keeps them occupied and prevents boredom. They help children learn, practice and develop new skills all the time. Toys help children to explore, investigate, and experiment. They teach them about how things are made, how they work and how to take care of their possessions. At the same time, they teach them to cooperate with others, make friends and work in harmony.

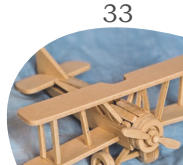



Children are quite young at the foundational and preparatory stage (3 to 11 Years). At this age group they learn quite fast and from their surrounding. That's why school and home should be on the same page while planning the learning experiences. Playing with toys and other types of games give them opportunities to learn with fun wherever they are. All children should get adequate chances for exploration, observation and manipulating objects and toys. They should be exposed to lots of concrete material and hands-on experiences across the foundational and preparatory stage of school education.

Teachers dealing with children at the foundational stage may plan and select toys to teach the concepts/skills across the foundational and the preparatory stages under the three goals and learning outcomes as given in NIPUN Guidelines and Framework. The document can be accessed at the following weblink: https://www.education.gov.in/sites/upload_files/mhrd/files/nipun_bharat_eng1.pdf). In Annexure I (A) examples of toys mapped with three developmental goals are given.

Mapping the concepts with appropriate toys makes teaching-learning process easier and joyful for all the children. Toys mapped with concepts and skills also enables teachers to plan their teaching learning activities in a manner to provide optimum opportunities to children to reflect on their emotions, stress and anxieties. For effective implementation of toy-based pedagogy, teachers must list out the concepts for each stage and identify the toys and resources, and accordingly create an environment where children can learn within their own contexts in a joyful manner. The toys sorted out for different concepts/skills may be collected with the help of children, parents and community and arranged at an appropriate open shelf in the school or classroom itself. Otherwise, the teacher can prepare toys with the help of parents and children with low-cost, and no cost material and keep this collection in the classroom while simultaneously motivating children to create their own innovative toys. Teachers, parents/guardians, and other stakeholders may refer to different resources like books or websites, (for eg. https://www.arvindguptatoys.com/toys.html) for learning how to create a variety of toys with locally available material. Some of the benefits of playing with toys and games at the foundational and preparatory stages are as follows:

- Toys promote cognitive (including linguistic and creative), motor, socio-emotional and aesthetic development of the children.
- Board games teach children to follow simple rules and enhance concepts of Maths and Language in a fun way.
- Complex puzzles encourage experimentation with cause and effect, strategic thinking and problem solving.
- The use of craft materials such as clay, beads, collage materials, paint, washable inkpads and stamps, washable markers, and scissors support creative expression and aesthetic awareness.
- Complex construction sets and accessories allow children to experiment with how things fit and work together, increase their fine motor skills, and express their creativity.
- Fitness and fun materials such as balls, beanbags, and jump ropes help children gain self-confidence, exercise, release tension, have fun with others and develop fine and gross motor skills.






Examples of some of the indigenous toys which can be used at the foundational and preparatory stages drawn from different states are given in the following paragraphs. These indigenous toys have been used by children for entertainment and as a way to understand the world around them.

Dhingli - Cotton dolls: Dhingli is one of the traditional toy dolls from Gujarat. It is made of cotton and decorated with embroidered clothes in different shades of attractive colours like red, blue, green, yellow etc. These are available in small and large sizes. The doll can be used for drama play: they are also used by very small children to nap with to feel secure.

Rasoi: Rasoi is a set of kitchen utensils used for play by children in many parts of India especially in Gujarat. They are made of wood and painted to look attractive and appealing. These can be placed in drama play corner in the classroom. Play with the kitchen toys helps in developing communication, problem solving, self-expression and fine motor skills.

Ring Set Puzzle: Ring set puzzle is a toy with seriated rings, it is made up of wood. It is one of the famous toys in Karnataka. This toy can be used to learn pre-mathematical concept of seriation, creativity, communication, problem solving, self-expression, fine motor skills and gross motor skills, understanding of colour, shape etc. in children. In between the cities of Bengaluru and Mysuru in Karnataka, lies Channapatna, also known as “gombegala ooru” or “toy town”, which is famous all over the world for its unique wooden toys. Channapatna toys are made from natural products like wood using natural vegetable dyes. These toys are a manifestation of a 200-year-old craft. Finer instruments and a lot of handwork goes into carving a wooden toy.

Rocking horse: The rocking horse made of wood is also a famous toy of Karnataka. It can be placed in an indoor or outdoor play area for children. Rural carpenters, who specialize in toy making, craft these beautiful wooden toys. Making a wooden toy is a tedious process which starts from sketching the toy figure on a piece of wood. The sketch is cast by a pencil on the lighter wood like walnut, sandal, rosewood or ebony. After sketching, the figure is chiselled out from the wooden piece using small working instruments and then given a perfect shape. This toy helps children in developing socio-emotional skills, creativity, communication, problem solving, self-expression, fine motor skills and gross motor skills. A list of toys and concept mapping from Age 0 to 3 and Foundational Stage to Grade 5 has been given in Annexure-I (A).

4.1.1. Creating Toys from Low cost/No cost materials/resources

The best toys are selected based on their appropriateness for the child’s age, development and interests. Engaging toys can be homemade or made from readily available items such as fabric, bottles, cardboard boxes, yarn, cooking pans, bangles, pipe cleaners, and pinecones - the options are practically limitless. This is especially important to keep in mind economically challenged communities. However, these materials are very good for DIY toys as it challenges children in terms of their critical thinking, creativity and problem-solving skills.

In Annexure I(A), mapping of different toys with the three developmental goals and competencies have been given. In a similar manner, teachers or parents



may try to explore and find out the level, concepts/competencies and learning outcomes associated with some DIY toys that can be created in the classroom in the format suggested in Tables below:

Table 4.1: Paper Toys

Name of the toy	Level/ Stage	Concepts/ competencies/ skills	Learning outcomes accomplished
Paper Boat			
Paper Rocket			
Papier Mache Toys			
Paper dolls			
Masks			
Kites			
Pin wheel			

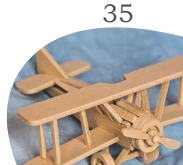
Table 4.2: Clay toys

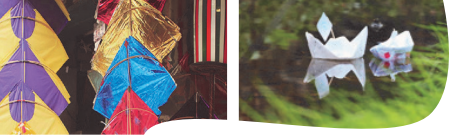
Name of the toy/ materials	Concepts/ skills	Level/ Stage	Learning outcomes accomplished
Potter's Clay			
Home-made play dough			
Ready-made plasticine/ dough			

Table 4.3: Cardboard Toys

Name of the toy	Level/ Stage	Concepts/ skills	Learning outcomes accomplished
Spinner			
Clock			
Board games			

At the foundational and preparatory stages, when children are curious and active, the games and toys used during classroom processes must be entertaining and joyful. Besides bringing fun, toys should help in active learning. Traditional Indian games are cost- savvy and well suited for young children. There are games and toys that are meant for all occasions and for all round development of children. Active games develop strength and coordination; thinking games develop reasoning and problem-solving skills; group games sharpen language and communication skills among children. The games which involve many participants help children learn how to get along with others and learn to play by a prescribed set of rules. There are many traditional toys and games across all the states and regions of the country which can be included in the classroom processes at the foundational and preparatory stage of school education. Popular games like *pithoo*, four corners, dog and the bone, hopscotch, rope jumping (popularly known as skipping) must be included in the curriculum and pedagogy of the first two stages as defined under NEP 2020. Toys and board games are not only meant to keep children engaged and entertained, but also develop and enhance many other critical skills; that we generally refer to as 21st century skills.





4.2 Middle and Secondary Stages

At the middle stage (classes 6 to 8) and at the secondary stage (classes 9 to 12), all subjects can be learnt by integrating toys of different nature. Subjects like Social Sciences, History, Psychology, Geography, Philosophy, Political Science, Economics, Mathematics, Languages: Hindi, English, Regional, Foreign, Accounts, Business Studies, Entrepreneurship, Science: Biology, Chemistry, Physics, Environmental studies, Information Technology, and Artificial Intelligence etc. can be taught with the help of innovative toys in labs, classrooms and even in online classes.

In the language classrooms, teachers may place different kinds of toys before the children and ask them to have a dialogue with them. This will help them in expressing themselves and improving their communication as well as mental health.

4.3 Pedagogical Usage of the Toys created at Centre for Creative Learning (CCL), IIT, Gandhi Nagar

Toys have a great potential in terms of their pedagogical value. They can be used as an important pedagogical tool to engage the learners inside and outside the classroom. The pedagogical usage of some of the toys developed at Centre for Creative Learning, IIT Gandhinagar have been given in the boxes in section 4.3.

Pedagogic Examplar-4

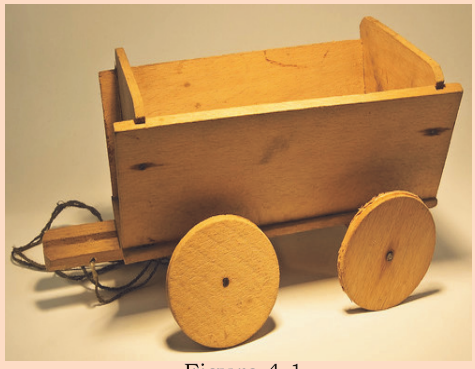


Figure 4.1

Interdisciplinary and Multidisciplinary Approaches

A small wooden cart can be used to teach concepts related to distance, measurement of distance, motion, acceleration, velocity, etc. together in mathematics and physics and also help children understand agricultural practices in geography. At the same time the same toy can help children visualise life in a village and create a poem or help children to learn autobiographical pieces on their own.

Pedagogic Examplar-5

Another example is the game of *'stapoo'(hop scotch)*. On one side it can be used to teach about balance and coordination in biology and on the other side it will help in learning of square/square roots in mathematics. Integration of Business Games for Accountancy, Business studies, Entrepreneurship, Economics, Financial Literacy, etc. can be another example of integrating games with subjects. Toys, games and puppets are very useful for addressing social-personal aspects of learner's personality. We find children often talk to toys, many a times they share their grievances with toys rather than adults.




Pedagogic Exemplar- 6

A single local toy can be used as pedagogic tool for different stages

Foundation Stage- language learning- creating meaningful contexts - discussion topic- birds in the environment, colours, material of the toy, drawing, role play on various themes, poetry, story telling, counting identifying shapes, etc.

Middle stage - Project on historical perspective of the toy, etc.

Nilambi - Gujarat

Figure 4.2

Secondary Stage - Project on exploring similar kinds of toys in nearby states/UTs and their manufacturing aspects or on modernization of this toy

Preparatory Stage - language learning, use of this toy in different ways with different material, concept of balance - relation with day-to-day life- learning addition, multiplication, etc.

CPD for Teachers- Designing an activity using this toy for pre-school children for motivating them to discuss and understand 'why we should not waste food?'

There may be a toy on a great personality or festival celebration or working toy

There may be a toy on great personality or festival celebration or working toy

Balancing Bird

- The very first way is exploratory where the students get exposed to the toy.
- Multi-sensory activities: Visual- Observe the colour, shape (regular/irregular). Describe the toy in words (verbal and written) using as many as adjectives possible. Tactile - Feel the material and speak about it- soft/hard, smooth/rough, flexible/rigid etc.

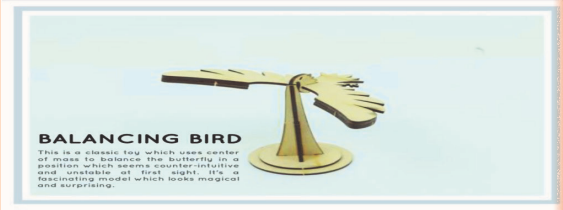


Figure 4.3

- Once these observations are over, the students can observe the balancing act of the bird on the tower. First, they make their down assumptions as to how it is getting balanced.
- The scientific concept of centre of mass and also centre of gravity (both at the same position) can be explained.
- Students can now play with the toy by changing its centre of mass by placing small weights on one of the wings (weights can be very small crumpled papers of different sizes) and observe what happens to position of the bird and comment. (The centre of mass will shift and the bird will fall).




- They can go one step further by finding out a perfect pair of weights from the weights that they have created to balance the bird. It can be even one big weight on one side and two small ones on the other to balance the bird so that it still hangs from its beak.
- For the last point, they can write their observations in the form of a table.
- Overall, they can write a paragraph which is a blend of scientific facts and their experience.

GEAR LAMP

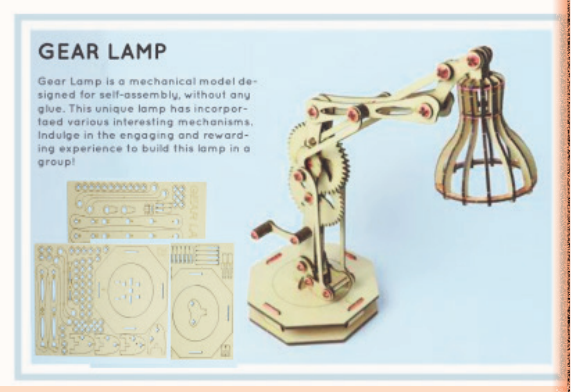


Figure 4.4

- The assembly of this toy itself will be enriching for grade 6 students, they will use critical thinking skills while doing so. After assembling the toy, they can understand:
- How many types of simple machines are in this toy and name them?
- How many screws are seen in this?
- Which are the movable parts and non-movable parts of this toy?
- Once the lamp is placed inside, try winding and unwinding it to see when can you get the best light/ brightness on your paper.
- Lamp can be placed in different positions and will cast a shadow on the object chosen- students need to find out the length of the shadow. (Grade 9-10)

SWIMMING FROG

Figure 4.5

- The frog after assembly can be observed to learn the mechanism used for it to move.
- Which parts are actually moving?
- How many types of simple machines are used in this and identify them?
- Observe it when you roll the wheel in the forward direction and then vice versa.
- Data analysis can happen here as they roll it once, twice, thrice, etc and see the distance the frog travels. Graphically represent this data.
- Observe the frog and its movement to learn the limbs and body structure of this amphibian.

DOUBLE HAND PUMP

Figure 4.6

- Tell students they have 20 litres of water for a day. Ask them to allocate that water for different activities. Make a



pie-chart of their water allocation.

- Give students hand out of water usage by different sectors and different regions.
- Learn about the water budget. Roughly only 3% of the water is freshwater and is available for our use. Groundwater is only 0.6%.
- Take water dispenser and fill it with 250 ml water. Make small groups and tell students to pump maximum amount of water. Record multiple times. Graph the data and explore the relationship. Use the displacement pump from soap dispenser to understand the working of displacement pump.

2D FLEXAGON

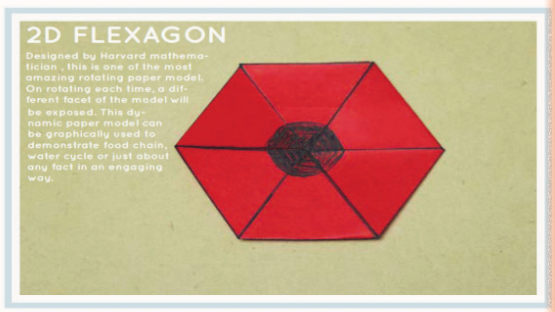


Figure 4.7

- Children can be given recycled paper to play with.
- Basic origami folds can be taught.
- Once children are proficient with the basic folds, they can be taught to draw the pattern for a flexagon.
- Some 2D and 3D shapes can be reinforced here
- For this they will have to measure and draw lines according to the pattern.
- Children can be shown how this would be useful in depicting the food chain.
- They can think about other topics of interest that could be drawn on the flexagon.
- They can be taught to scale up or down depending on the size required by them.
- After preparing the illustrations on the lined patterns drawn by them, they can make the folds and prepare the flexagon.
- Students can present this to their classmates
- Questions for the children:
- How would thickness of paper impact the effectiveness of folding and rotating of the flexagon?
- What else could be depicted besides food chain?
- What else could a flexagon be useful for? (Stress buster)

5 Implementing Toy-based Pedagogy: The Way Forward

5.1 Challenges of Implementing Toy-based Pedagogy

- The majority of preschools and schools in the country lack suitable play materials such as puzzles, blocks, dolls, outdoor play equipment etc. In the absence of toys and play materials there would obviously be difficulty in adopting child centred, play based, and activity-based approach to learning which leads to an adherence to rote learning where the child remains a passive learner and not an active and joyful learner.
- As mentioned earlier, the mindset of a majority of teachers and parents still does not allow them to look at toys for their pedagogic value. This is a major challenge in the implementation of toy-based pedagogy, which can be addressed through awareness and advocacy programmes.
- Existing templates of textbooks create very less space for toys and games, which lead towards information-oriented pedagogy rather than experiential learning.
- Increasing popularity of tech-based toys and games is another challenge, as many a time children become addicted to them.

5.2 Addressing the Challenges of Implementation of Toy-based pedagogy

5.2.1 Changing Mindset towards Indigenous Toys and Games-

Mindset is our outlook or view towards the world. It is the way we look at things. One can say that mindset is the expression of the beliefs that we have. So, it is reflected in everything we do. If a teacher or parent says, 'toys will waste your time', it reflects their negative mindset towards the use of toys. Teachers and parents with such a mindset generally believe in textbook dominated learning and traditional forms of examination. However, if a parent or teacher arranges a variety of toys for children and provide freedom to them for learning in the manner they want to learn, it reflects his/her belief in the child's agency and capabilities. Toys, though an integral part of our childhood, need to be promoted in schools as pedagogic objects besides their fun and entertainment value. For this, some steps which may be taken by the states/UT education agencies and schools are given below:

5.2.1.1 Creating Awareness

a. School Walls

- Schools can identify toys being manufactured locally and also some of the toys which are the specialty of the district or the state.
- These toys can be procured with the help of community and parents for the schools and displayed at some suitable place for creating awareness.
- The walls of the schools or classrooms may be painted showing heritage, indigenous toys famous in the district or the state, which would nurture children's self-confidence.



b. Creating and setting up a Toy Area/ DIY Area in a classroom

- Toy Area or Toy Library can be created in every school either in every class or at other suitable place. It should have some low-cost materials with which toys can be created by children.

PEDAGOGIC EXEMPLAR-3

Class 4- Teacher may ask children to make boat, plane or cap with newspaper as per their choice. They are further asked to identify shapes in the toys they have created. The teacher may ask them to write a few lines on the toys they have created or made. Next day or later, she may ask to make groups of toys such as CAPS, PLANES and BOATS and share writing about the toys and discuss about shapes of the toys and other aspects. Teacher may also ask children to assess their peers.

- Teachers and parents need to take initiative to set up Toy Area along with DIY (Do It Yourself) material and toys in the classroom and at home. Children need plenty of opportunities for spontaneous play activities and they enjoy playing in a safe area. It may act as a laboratory for young children, where they try, explore and manipulate objects in their own way.
- Creating a Toy Area has its own importance to provide a space for quiet play in a small group and giving children their own play space. At the same time, it becomes easy for the teacher to observe children exploring the toys. This Toy Area should have developmentally appropriate toys and the toys should be sufficient in quantity, so that five to six children can easily play and share them. Proper shelves with duly labelled boxes with pictures for toy storage would help the child in easily accessing their favourite toys and also keep the toys back to their storage after play is over. Children also learn to take care of their possessions when a proper storage system is created for their favourite toys.
- The toys and materials for DIY area or Toy Area could be ice-cream sticks, lace strings, magnet blocks, dressing frames, colourful gears, colour mixers slides/papers/paints, matching cards, sensory materials, DIY musical instruments, number cards to create calendar, alphabet stencils to create fun words and so on. In short, this Toy Area should have easily manageable manipulatives and materials for children to create and construct. The materials can be rotated so that children do not get bored and they get sufficient chance to explore all the colours/shapes and objects. This DIY area/ Toy Area needs to be well stocked with materials and must be neat and organised.

c. Parent-Teacher Meeting

- In parent-teacher meetings, special session on the importance of toys may be taken by a teacher or school principal.

d. Toy-fair

- Toy-fair may be planned with the help of children and community members at suitable place in the community, in which children may be given opportunity to exhibit innovative toys created by them and what they learnt in the process. DEOs or BEOs may be requested to give certificate to talented children.




- Craftspersons may also be invited to show locally made puppets, toys and games so that school-community linkages may be strengthened.
- Success stories of entrepreneurs in the area of toy-making may be shared and demonstrated in the toy fair.
- Puppet shows may be arranged by the children on some social concerns such as swachhata or nutrition, etc.
- India Toy Fair was conducted in the year 2020-21. Details are available on the following weblink - https://theindiatoyfair.in/.

e. Role of Media

- Stories of toy-makers need to be showcased on media.
- Anecdotes and interviews including their experiences of childhood with toys need to be published in print and also electronic media.
- Programmes on careers related to toy-making also need to be telecast.

f. Toys and Inclusive Education

- In every attempt for creating awareness about toy-based pedagogy, care should be taken to avoide stereotypes related to toys, such as separate toys for girls (dolls, kitchen set, etc.) and boys (balls, gilli-danda, etc.). Toys need to be seen as objects for entertainment and learning for children and also for promoting inclusive education.

5.2.3 Innovating Toys

- For motivating our youth to come out with innovative toys corresponding with the present day needs of developing 21st century skills, programmes such as Toycathon needs to be conducted periodically. Some of the benefits that stem from this would be:
  a. Indigenous and traditional toys can be adapted in modern form for sustainable use
  b. Growth of indigenous toy industry for providing cost effective toys to every child
  c. More employment opportunities for youth
  d. New courses centering around toy-making for the secondary and higher stage of education as per NEP 2020 perspective.
- In 2020-21, Toycathon was conducted by Ministry of Education, details of which are available on the following link- TOYCATHON 2021 (https://toycathon.mic.gov.in/)
- Innovating cost-effective indigenous electronic toys for motivating children to learn through games.

5.2.4 Popularisation of Toy-based Pedagogy

- There are some annual events such as Kala Utsav, State level and National level Science Exhibitions. In these events Toys and Games may be kept as themes to provide children opportunities to create models, paintings, etc.

5.2.5 Research

- In view of the lack of appropriate research in the area of toy-based pedagogy, it is of utmost importance that research must be conducted in the following manner-
  a. Action research by teachers to observe impact of specific local toys and also of DIY toys on the development of various competencies and concepts in different subject areas.
  b. Fundamental research to explore different dimensions and use of toy-based pedagogy in different



contexts and stages need to be done by the education departments in universities and multidisciplinary colleges.

5.2.6 Capacity Building of Teachers and Teacher Educators

Capacity building of teachers and teacher educators at every stage on Toy-Based Pedagogy needs to be ensured by the concerned organisation in the States/UTs across the stages. NCERT has brought out Modules on Toy-Based Pedagogy for Primary Teachers and also teachers teaching at Secondary Stage. These modules are available on DIKSHA platform. Efforts may be made by the States/UTs to conduct face-to-face and online programmes under Continuous Professional Development (as envisaged in NEP 2020) at the state and district level on Toy-Based Pedagogy in which locally available toys may be included.

5.2.7 Sensitisation of School Heads

Principals of schools and also functionaries at the state/district and block levels need to be sensitised through webinars and tutorials. This will help them understand joy of learning through toys by children.

5.2.8 Development and Dissemination of Resources

Development of relevant resources giving illustrations and examples of use of local and innovative toys for teaching and learning of different concepts and cross-cutting issues need to be undertaken by the educational institutions, teachers and researchers. These need to be in physical and digital forms. These will help others to learn toy-based pedagogy and also produce innovative resources related to their contexts. DIKSHA Portal need to be used for better dissemination of these resources.

5.2.9 Introducing new courses and skills in School and Teacher Education

Toy-based pedagogy has the potential to inculcate design thinking skills along with many other skills like critical thinking, problem solving, decision making, etc. It is therefore, important to introduce various elements of design thinking right from the foundational stage connecting it with creation of toys within some situations, where child can think of a new design of an already existing toy to fit into a new situation.

> Design Thinking is a process that provides a solution-based approach to solving problems. It's extremely useful in tackling complex problems that are ill-defined or unknown, by understanding the human needs involved, by re-framing the problem in human-centric ways, by creating many ideas in brainstorming sessions, and by adopting a hands-on approach in prototyping and testing
>
> Source: The 5 Stages in the Design Thinking Process | Interaction Design Foundation (IxDF) (interaction-design.org)

5.2.10 Promoting Vocational Skills

As per the NEP 2020, internships need to be organised for school children under vocational education from Class 6 onwards. Moreover, NEP 2020 also recommends 10 bagless days, in which children learn vocational skills with local craftspersons.

Toy-Based Pedagogy may help children to identify their area of interest for taking up internships. Moreover, internships may also be undertaken on toy-making, toy-colouring, toy-packaging, etc. if opportunities are available in the locality.




5.2.11 Transforming Assessment

Implementation of Toy-Based Pedagogy requires reforms in assessment. Some of the questions in examination and project activities need to be developed centering around toys. Questions may be asked giving examples of local games and toys. Since children relate toys with their day-to-day life, questions with toys or games in focus could make children think about their contexts and solve the questions in play-way manner. In languages, writing of stories on toys and games may be made part of annual examinations. This will help in tracking holistic progress of children on every aspect of their personality and learning outcomes.



Bibliography:

1. Axline, V.M. (1947). Play therapy: The Inner Dynamics of Childhood. Cambridge, MA: Houghton Mifflin.
2. Badiger S. (2015). Indigenous Games and its Importance. International Journal of Creative Research Thoughts. Volume 8, Issue 8 . pp. 1807-1820.
3. Brown, W. Normal (1964). The Indian Games of Pachisi, Chaupar and Chausar. Available at: https://www.penn.museum/documents/publications/expedition/PDFs/6-3/The%20Indian.pdf
4. Guha S. & Murthy K. (2017) Understanding the Role of Toys in Child Development: Special Focus on Traditional Channapatna Toys. Indian Journal of Applied Research. Vol, 7, Issue 7, 406-410
5. Landreth, G.L., Homeyer, L., Glover, G., & Sweeney, D. (1996). Play Therapy Interventions with Children's Problems. Northvale, NJ: Jason Aronson
6. MacDonell A. A. (1898). The Origin and Early History of Chess. The Journal of the Royal Asiatic Society of Great Britain and Ireland , pp. 117-141 . Cambridge University Press Stable URL: https://www.jstor.org/stable/25207939
7. Misra, S., & Gupta, P. (2015). Toys and Safety Regulations. Centre for Consumer Studies, Indian Institute of Public Administration, New Delhi. Available at https://consumeraffairs.nic.in/sites/default/files/file-uploads/consumer_information/Toy.pdf
8. Topsfield, A. (1985). The Indian Game of Snakes and Ladders. Artibus Asiae, 46(3), 203–226. https://doi.org/10.2307/3250203
9. UNESCO International Bureau of Education (IBE). 2022. Glossary of Curriculum Terminology. Geneva: UNESCO IBE. Available at http://www.ibe.unesco.org/en/glossary-curriculum-terminology/
10. http://ccrtindia.gov.in/ccrt_publications/Pub_Traditional_Toys.pdf
11. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
12. https://files.eric.ed.gov/fulltext/EJ1070266.pdf
13. https://aphilomathsjournal.wordpress.com/2015/11/30/popular-games-sports-that-originated-in-ancient-india/

TOY-BASED PEDAGOGY

Learning for Fun, Joy and
Holistic Development

Mapping of Toys and Games with Concepts/Skills/
Competencies at Different Stages

Part – II



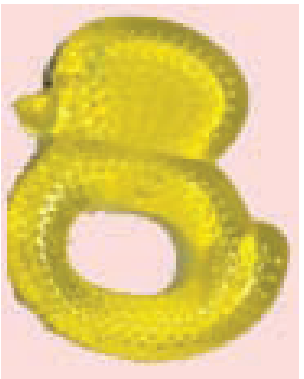

Mapping of Toys with Concepts, Competencies and Learning outcomes at the Foundational and Preparatory Stages

1. Indoor Toys And Games For 0 To 3 years

A. SENSORY DEVELOPMENT

Goal 3: Children are involved learners and connect with their immediate environment

S.No.	Area	Competencies/ Skills	Name of the Toy	Toy Image	Suggestive Activities/ Ideas for using low-cost toys
1.	**Sense of Sight**	• Observation and Exploration. • Stimulates vision. • Develops attention span. • Develops observation and listening skills. • Develops fine motor skills.	Crib Mobiles (Patterns/Geometric shapes/ musical) Encourage focus and attention and Jhoomars		• Attach soothing musical mobile toys above the crib / paalna of an infant. Swing it a little and watch the child enjoy mobile. • Create more such mobile toys using colourful fabric and bells to produce sounds. • Let the child operate the toys and watch it play, grasp it and enjoy the music. • Identify sound and colour. • Track and watch movement.


S.No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys
2.	**Sense of Touch**	• Observation and Exploration. • Develops sense of touch. • Develops eye-hand coordination. • Develops concepts of color, shape and size.	Soothers/ Teething Toys/ chewing on Toys		• Let the child grasp and chew the teething toys.
			Squeeze Toys/ squeezable balls		• Let the child do Grasping, holding and squeezing.
			Fabric Toys		• Looking at different colours, patterns and textures. • Let children express their feelings using the toys. • Pretend play. • Role play. • Dramatization of stories/rhymes using fabric toys.



S.No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys
3.	**Sense of Listening**	• Develops aesthetic sense. • Develops eye-hand coordination.	Wooden Rattles		• Collect empty match boxes and prepare match box rattles filling with seeds etc. • Sound discrimination activity by using different rattles (the direction from which the sound originates, hearing and repeating sound sequences can be one of the activities that parent/caregiver can do). • Let children grasp and hold rattles, shake it as it strengthens the child's motor abilities. • See the baby move her/his body parts as the adult shakes the rattle. • Slowly move the rattle across the children of vision and let the child track the rattle as it moves across her line of sight. • Sing a song as you move/shake the rattle.
B.	**MOTOR, COGNITIVE, LANGUAGE & SOCIO EMOTIONAL DEVELOPMENT**				


Goal 1: Children maintain good health and wellbeing.

Goal 2: Children become effective communicators.

Goal 3: Children are involved learners and connect with their immediate environment

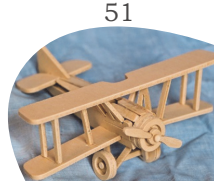

S.No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys
4.	**Cognitive & Motor Development/ Skill**	• Develops the concept of big/ large, colors. • Develops fine muscle control and coordination.	Large coloured and seriated rings		• Sit with the child while he/she engaged with his/her toys. • Let the child match the colours and stack the rings and talk about its colour. • Throw and catch the rings. • Throw the ring in the target.
		• Develops grasping skills.	Large coloured and seriated rings.		





S.No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys
5.	**Cognitive & Language Development/ Skill**	• Develops concepts of colour, shape and size. • Develops eye-hand coordination. • Develops Sensory skills, Observation. and Emergent Literacy skills.	Washable squeeze bathing Toys and Picture Books Floating toys.		• Let the child explore and play with bathing toys. • Talk about the toys while bathing the child and matching bathing a fun. • Let the child sprinkle and pour water. • Name the parts of the body of the child while bathing, feeding or dressing him/her. For example, when you are looking at the child say, 'I see two big eyes', look at the child's eyes and move closer to them. Similarly say 'I see a nose', touch the child's nose. Then ask, 'where is your nose?' Induce him/her to respond. Do the same with the eyes, hands, ears, chin, arms, legs, feet, mouth, chest etc. Play a game 'touch your head', now. • 'touch your feet' and so on. At first touch your own hands and feet as you give the instruction and then gradually encourage the child to respond. • Talk to the child frequently and ask questions about his/her needs, his toys, his likes or on the story you have just narrated or while you are still narrating it.


S.No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys
					• Draw attention to toys/objects and actions. Show action pictures and encourage the child to observe the details of these and to talk about them. Ask questions to elicit different answers covering various details.
6.	**Cognitive Development.**	• Develops problem-solving skills and ordering skills	Nesting Toys		• Picking items and placing in place. • Talking about colours and position.
7.	**Fine Motor & Creative Development**	• Develops aesthetic sense, listening skill. • Discriminates sounds.	Musical toy		• Singing rhymes and playing the musical toy. • Using the musical toy as a prop during role play and story dramatization.



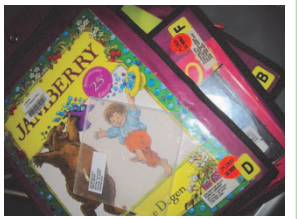

S.No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys
8.	**Motor development**	• Develops fine muscle coordination. • Strengthens fine motor skills.	Soft textured balls	 	• Throw and catch. • Talk about colour in the ball. • Roll the ball. • Give the child a ball, a skipping rope, an old used tyre, or an empty drum and allow the child to play freely.
		• Balance and Coordination.	Rocking Horse		• Practice transferring object from one hand to the other while riding the rocking hourse.
		• Strengthens gross muscles.	Push and Pull Toys		• Let the child push the toy and walk and Pulling the toy around on the ground. • Talking about parts of the pulling toys.


S.No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys
9.	**Language and Emergent Literacy Social and Emotional Development**	• Develops emergent literacy. • Listening and speaking skill. • Develops self-concept.	Vinyl Board Books Unbreakable mirrors for babies to look at		• Looking at big books and describing the pictures. • Read to the child from picture books. Encourage the child to browse through the books. • Talk to the child about the events of the day, weather changes, plants, animals, insects, about festivals and celebrations. • Let the child look at the mirror and talk about his/her face.

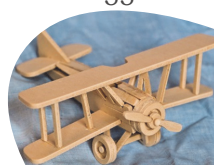

2. INDOOR TOYS AND GAMES FOR FOUNDATIONAL STAGE (Preschool 1,2, and Balvatika- 3 to 6 years)

S. No.	Area	Competencies/ Skills	Name of the Toy	Toy Image	Suggestive Activities for Teachers and Children	Learning Outcomes (LO)
A. SENSORY DEVELOPMENT						
Goal 3: Children are involved learners and connect with their immediate environment						
1.	**Sense of Listening**	• Discriminates different sounds skill. • Develops auditory sense. • Develops listening skills.	Sound Boxes (Montessori apparatus)		• Matching of similar sound boxes. • Seriate the sound boxes from loudest to softest and vice-a-versa.	• Uses senses for knowing and understanding the environment.

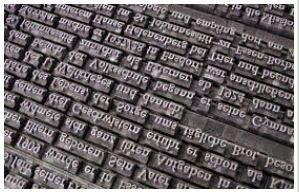


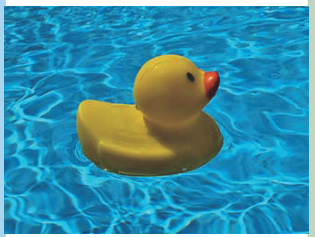

S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
						• Listens to others and responds, demonstrating some social conventions like eye-contact, turn taking, etc. • Follows one to two simple oral instructions.
		• Identifies listening and speaking skills. • Emergent literacy.	Audio story books Audio Rhymes Small/ little picture books (different concepts).		• Read aloud. • Looking at picture books.	• Develops ability to discriminate through the five senses by matching and identification.
		• Develops listening and speaking skills;. • Social development. • Dramatic play. • Develops early number concept.	Toy telephone		• Learning to say names, address and telephone numbers. • Dialing number. • Dramatization – giving news or advertisement or songs on the radio. • Making a card board telephone.	• Listens attentively for 10-15 minutes. • Describes the physical features in her own language. • Uses language to communicate his/her interests.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
2.	**Sense of Smell**	• Sharpens smelling sense. • Differentiates between pleasant and unpleasant smell.	Smell box / Tray Smell Book		• Matching of similar boxes. • Sort pleasant and unpleasant small objects. • Talking about particular smell and related objects.	• Uses senses for knowing and understanding the environment.
3.	**Sense of Touch**	• Develops enhanced sense of touch. • Identify different textures and classifies them into hard, soft, smooth or rough.	Textured/ Fabric Picture Book		• Touching and talking about different textures.	• Uses senses for knowing and understanding the environment. • Uses senses for knowing and understanding the environment.
				 		• Observes and explores objects and events with curiosity. • Uses one-to-one correspondence.




S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Textured letters		• Develop letter perception using following suggestive activities; • Tracing finger over textured letters. • Printing with letters • Tracing around the texture letters. • Saying the sound of each letter in the book. • Matching of letters. • Measuring sand in cups. • Counting the filled cups and transferring to the other container. • Allow the child to play in sand, making holes, hiding his/her fingers in the sand. • Give him/her a few containers, sieves, funnel, spoon to fill the sand and play. • Keep the sand moist and provide sticks, flowers, leaves, pebbles, seeds, shells for playing.	
		• Develops sense of touch. • Develops concept of measurement and thinking skills.	Toys for sand play			


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
		• Develops sense of touch and thinking skills. • Explores and uses early science skills. • Understands concept of floating/ sinking. • Understands properties of water.	Toys for water play	 	• Play with water. • Floating and sinks. • What is soluble...., what is not. • Allow the child to play in water. Drop a few objects in the bucket and ask the child to pick them and give them to you. when he/she does this ask him/ her whether the object was floating on the water or at the bottom of the bucket. • Talk to the child about the uses and importance of water. Put some salt, sugar, sand, pebbles, in different containers containing water and thereby demonstrate that some things dissolve while others don't.	• Compares and classifies objects by more than three factors like shape, color and size etc. • Compares two objects in terms of their weight. • Compares capacities of two vessels like bottles, glasses, bucket etc.



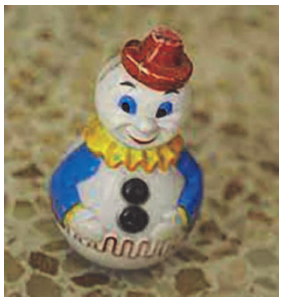


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
					• Get the child to wash his/her handkerchief and put it to dry in the sun. Talk to the child and let the child see how heat makes the water evaporate from the hanky. Allow the child to play in water. Give the child, a few containers or vessels, in which the child can fill water and throw around.	
4.	**Sense of Sight**	• Develops observation and sorting skill.	Pop up visual		• Talking about 'What is different ' and why? • Describing pictures/ shapes on the cards.	• Demonstrates a developing understanding that print runs from left to right and top to bottom, turns pages from left to right. • Demonstrates awareness and appreciates beauty in the environment.

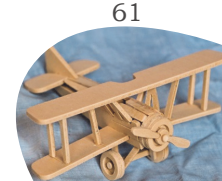

S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
B. COGNITIVE DEVELOPMENT						
Goal 3: Children are involved learners and connect with their immediate environment						
5.	**Cognitive Skills-Problem Solving**	• Develops problem solving skill, critical thinking. • Develops fine motor coordination and dexterity.	Jigsaw puzzles		• Recognition of various parts of the picture. • Talking about the complete picture. • Saying the initial sound of each completed picture.	• Uses thinking skills to solve simple problems such as completing 3-4/4-5-piece puzzle. • Classifies a group of objects by two or more category and then by another.
6.		• Develops Pre-number and number concept. • Develops one to one correspondence.	Nesting Dolls	  	• Ordering the dolls in size /height (biggest to smallest, tallest to shortest). • Putting/ nesting the doll within each other. • Touch and count each doll, giving number to each doll.	• Arranges objects in a particular order. • Recognizes patterns and copies them. • Observes and explores objects and events with curiosity.





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
		• Develops problem solving skill. • Strengthens eye-hand coordination. • Prepares for pencil grip.	Wooden Maze		• Traces fingers. through the maze. • Tells/creates a story about the maze.	• Exhibits eye-hand coordination in threading, stringing, lacing etc. • Uses vocabulary like half of object/water.
			Vegetable and Fruits (cut into two) with wooden knife		• Fruit and vegetable matching. • Identification and naming of fruits/ vegetable.	
		• Develops dramatic and imaginative play. • Develops eye-hand coordination.	Balancing Doll/man		• Counting the number of lids and the number of revolutions made by the doll. • Provide a plank for balancing. • Following direction: Clockwise, anti-clockwise. • Recognition of the raw materials used, starting their other uses. • Preparing a plastic/ fabric balancing doll.	• Exhibits eye-hand coordination.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
6.	**Cognitive Skills-Reasoning**	• Develops understanding of the relations or associations. • Skill of comparison.	Relation-ship or associa-tion cards (what goes together cards)		• Make associative cards, i.e., a card with a dog and puppy, a cat and a kitten. Mix these cards and teach the child to select and match them. • Matching, sorting describing and make associates between cards.	• Observes, re-members and recalls 4-5 ob-jects at a time. • Arranges ob-jects/ pictures in a order. • Recognizes pat-terns and copy them. • Uses one-to-one correspon-dence.
7.	**Cognitive Skills-Classifica-tion**	• Develops sorting and problem solving skill.	Picture cards/ small miniatures (animals/ transport/ vegetables/ fruits etc.) for sorting		• Sorting of picture cards into one/two / three categories. • Talking about each picture. • Playing 'game who' • Game identifying the picture and saying the name and saying the initial sound of each picture.	• Classifies a group of objects by two or more categories and then by another.





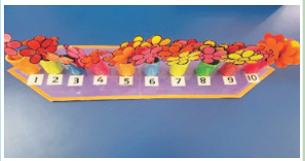
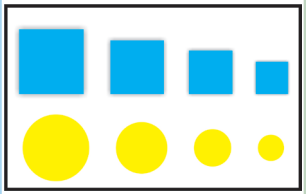

S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
	Cognitive Skills- Observation	• Visually discriminates the objects/ pictures. • Observation and exploration. • Concept of classification.	Odd man out cards	 	• Classify objects visually on known concepts. • Visually discriminate the objects compare the objects to each other.	• Develops ability to observe, remember and recall few objects at a time. • Observes objects and events with curiosity to understand the immediate surroundings.
8.	**Cognitive Skills- Sequential thinking**		Sequence story cards, Sequence Event Cards and pattern cards			• Names and seriates. • Seriates/ arranges 3-4/4–5 picture cards/ objects in a sequence.
			Pattern Making		• Arranging cards in sequence.	• Arranges objects/ pictures in an order. • Recognizes patterns and copies them.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
9.	**Cognitive Skill- Memory**	• Memory and Observation.	Memory Cards		• Looking at the cards and identify the missing card/ picture/shape.	• Solves problems and conflicts with much ease. • Recognises, names and copies (not necessarily precise) few letters/ numerals. • Creates new patterns.
			Shape dominos			
10	**Pre-Number Concept**	• Develops colour and size concept. • Develops problem solving, ordering and counting skills.	Bigger Ring Stack with a greater number of colorful and shaded rings		• Match the colours and stack the rings and talk about its colour. • Throw and catch the rings. • Throw the ring in the target. • Count the Rings. • Tracing around the rings and then coloring inside the drawn shape. • Talking about size of drawn shapes and filling colour from darkest to lightest.	• Matches, identifies and names different colors, shapes. • Differentiates between big-small, more or less, long-short, fat thin etc. • Uses positional words in his/ her daily vocabulary like on- under and top bottom.





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
11.	**Number Sense**	• Develops number sense by matching number to quantities. • Recognise numbers. • Develops writing readiness.	Textured Numbers	 	• Sorting numeral cards and matching with corresponding number cards. • Matching textured numbers into a number calendar. • Keeping number counters buttons/ beneath. • Corresponding textured numbers • Hunting texture numbers. • Number stories using number cards/ texture number.	• Counts up to 5/10/20 and recognizes numerals up to 5/10/20.
		• Develops problem-solving skills, hand–eye coordination. • Counting, Numeral recognition. • Pre-Number and Number concepts.	Number Blocks		• Building number blocks. • placing corresponding objects/pebble again of each number blocks as they are bid out in order. • Touching and counting objects/ counters.	• Counts up to 5/10/20 and recognizes numerals up to 5/10/20.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
					• Encircle number of dots on the cards according to the number called out. • Calling out 'digit' and children will show their fingers • Show the number card and let children count that number of objects.	
			Number splints		• Touching the rod -each colored section and describing the number.	• Counts up to 5/10/20 and recognizes numerals up to 5/10/20.
			Abacus		• Touching and counting the beads.	
			Seriation Toys for different Dimensions (Height, Length, Size, Volume, Quantity)		• Seriate toys in order. • Talks about how s/he has done it using mathematical vocabulary.	• Names and seriates. • Seriates/ arranges 3-4/4–5 picture cards/ objects in a sequence.





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Number peg Board/ Inset Board			• Can count forward and backward from a particular number up to 5/9. • Identifies numerals with numbers and writes numerals up to 5/10.
			Magnetic Numerals Sandpaper Numerals			
			Toy telephone; walkie-talkie (tech aided)		• Learning to say names, address and telephone numbers. • Dramatization – giving news or advertisement or songs on the radio. • Making a card board telephone.	
			'Fit-in' Toys		• Naming the shapes. • recognizing different colours. • Recognizing differences in shapes of various articles. • Classification of objects into groups.	• Exhibits fine motor skills and simple eye-hand coordination.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
12.	**World around Us**	• Dramatic and imaginative play. • Identification of animal, birds, colors and parts of the body. • Development of various concepts like animals, modes of transport, birds, color concept etc.	Wood Toy animals and action figures, vehicles, fruits, vegetables, birds, insects, etc.	 	• Taking a project on animals. • Making animals and bird sounds • Singing a song. • Telling a story. • Let the child identify and name different animals, birds, toy cars and so on, by showing and pointing towards them and also by imitating the animal's movement and sound. • Ask the child to imitate sounds and movements of different animals like those of a dog, cow, cat and bird.	• Describes self. • Recognises and expresses feelings that are appropriate to the situations. • Shows empathy, sympathy, and caring for others. • Demonstrates self-control, cooperation, helping, sharing in large/ small groups. • Follows basic rules of safety at home, school and play ground. • Sings short and simple songs on animals, transport etc.



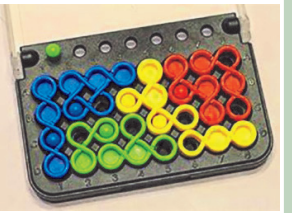


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
						• Show the child toy animals. Ask the child to identify them, name them and talk about them.
C. PHYSICAL & MOTOR DEVELOPMENT						
Goal 1: Children maintain good health and wellbeing						
13.	**Gross Motor Skills**	• Develops social skills. • Learns how to share, follow rules.	Push and Pull Toys			• Demonstrates self-control, cooperation, helping, sharing in large/ small groups. • Follows basic rules of safety at home, school and play ground. • Demonstrates basic gross motors skills with greater coordination (running, jumping, hopping, galloping, throwing, kicking, and catching skills). • Explores space, and participates actively.
			Friction Toys			
			Indoor crawling tunnel			
			Big Balls		• Throw and catch. • Talk about colour in the ball. • Roll and ball.	


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
		• Using body creatively to music. • Spatial senses.	Dance mats with light			
14.	**Fine motor**	• Extend imagination. • Develops dexterity and problem-solving skills. • Writing readiness.	Block Building and Construction set		• Give the child blocks and encourage the child to play with them by pilling them up, arranging them like a train, a building and so on. • Blocks can be made with cardboard or by sticking two match-boxes together.	• Exhibits eye-hand coordination and dexterity in joining dots, copying, scribbling, coloring, threading, stringing, tearing, tracing along the outline, pasting, lacing etc.
			Colourful shape tiles		• Let the child create designs/patterns using different tiles. • Let the child sort/ classify different shapes on the basis of color/shape/size.	
			Buttoning Frames			
			Zipper Frames			



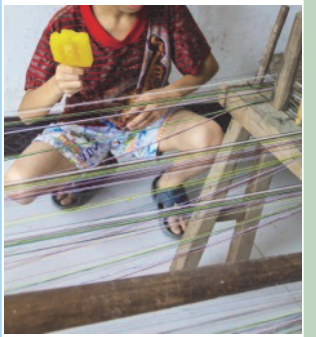


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Snap button Frames			
			Child Friendly scissors		• Give the child blunt pair of scissors and paper with simple straight lines. Ask the child to try and cut on the lines.	
15.	**Fine motor & Creative Development**	• Develops creative expression. • Develops mathematics and science concepts like, dry-wet, more-less, concept of volume.	Play dough, Plasticine, Clay		• Give the child some modeling clay and guide the child to make shapes like a ball, stick, vegetables and utensils etc.	• Explores space, and participates actively and expresses creatively in music and movement activities. • Uses various body movements.
16.	**Fine motor & Thinking Skill**	• Develops writing readiness and critical thinking skill. • Eye-hand coordination.	Pegboard games	 		• Exhibits fine motor skills and simple eye-hand coordination.

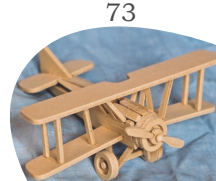

S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Strings and Beads with big holes Strings and Beads with small holes		• Give the child a string or a threaded needle and a few flowers and beads. Encourage the child to make a necklace or a garland.	• Exhibits fine motor skills and simple eye-hand coordination. • Identifies the unit of repeat in a simple pattern and extends the pattern. • Creates new patterns.
		• Understands how things fit together. • Spatial relation • Problem solving • Eye-hand coordination.	Things to build with --soft blocks		• Builds tower. • Counting of blocks. • Ordering of blocks. • Colour concept.	• Arranges 3–4 objects. • Compares two objects in terms of their lengths as longer than/ shorter than, taller than/ shorter than.
17.	**Fine Motor & Muscle Coordination**	• Develops eye-hand coordination and fine motor skill. • Writing readiness.	Hammering Toy		• Let the child use a child friendly hammer to knock down and fit the colourful cylinders in the appropriate holes. • Let the children count the cylinders.	• Exhibits fine motor skills and performs tasks that require more complex eye-hand coordination.



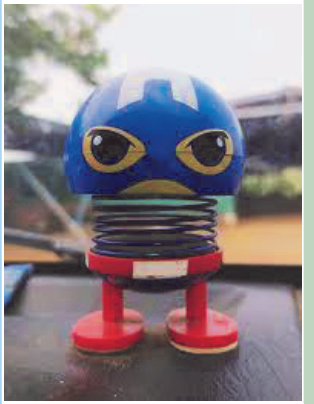


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Lacing Toys such as wooden shoe for practice lacing			• Exhibits fine motor skills and performs tasks that require more complex eye-hand coordination.
			Weaving Toys/Board			• Exhibits fine motor skills and performs tasks that require more complex eye-hand coordination.
			Ball and string		• Develop Space/Size concept through following suggestive activities: ♦ Counting. ♦ Catching the ball using strings of different lengths. ♦ Place the child five feet away from you, then throw a ball to him/her to catch. Ask the child to throw the ball back to you.	• Demonstrates basic gross motors skills with greater coordination (running, jumping, hopping, galloping, throwing, kicking, and catching skills).


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
					• Keeping the child a few feet away from you, give him/her ball to kick towards you and you kick it back. • Throw a ball in front of the child; ask him/her to catch it. Let him/her throw the ball in front, sideways and backwards.	• Exhibits eye-hand coordination and dexterity in joining dots, copying, scribbling, colouring, threading, stringing, tearing, tracing along the outline, pasting, lacing etc. • Explores space, participates actively and expresses creatively in music and movement activities.
			Tops/ Phirki		• Let children spin tops or whirligig. • See whose spins the longest.	• Exhibits fine motor skills and performs tasks that require more complex eye-hand coordination.




S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Threading Blocks/ Shapes		• Counting. • Threading competitions.	
		• Fine muscle coordination. • Develops concepts of color and parts of the body.	Spring toys		• Following direction of movement. • Dancing with the couple. • Counting as many times the toy jumps or springs up. • Creating story on the toy. • Singing a song on the spring toy.	


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
D. ASTHETIC & CREATIVE AND SOCIO EMOTIONAL DEVELOPMENT						
Goal 1: Children maintain good health and wellbeing Goal 3: Children are involved learners and connect with their immediate environment						
18.	**Creative Development and Aesthetic Expression**	• Develops senses, extends creativity and imagination. • Develops early reading and writing readiness.	Art Kit/Art supplies		• Give the child paper or a slate and crayon pencils, chalk or charcoal to scribble and indulge in free-hand drawing. • Give the child opportunities to paint with a brush and water colours. String painting can be taught. Dip the string in colour and keep it on the paper, fold the paper, hold one end of the string and pull it out. Lady's finger or potatoes can be cut in different shapes, then dipped in colour and pressed on the paper to make different block designs.	• Explores space, participates actively and expresses creatively in music and movement activities. • Demonstrates awareness and appreciate beauty in the environment.





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
					• Imprinting can also be taught. Take a leaf, back side up and place a paper over it, gently rub with a crayon, charcoal or pencil. An impression of the leaf will emerge on the paper. • Draw simple shapes and figures like a circle, a square, an apple, a glass, or a house. Ask the child to fill in with colour. Let him/her try to do it within the lines. • Encourage the child to make different designs and figures on the floor or on a slate. • Give the child an incomplete picture and ask him/her to complete it. For example, a picture of an elephant without a trunk or kettle without a handle. On showing the picture	


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
					ask the child to identify the missing part, he/she may then be encouraged to complete it.	
			Molding- Colorful Straws for molding and designing			• Draws some basic shapes.
			Paper toys and Craft- Origami/ paper folding			• Exhibits fine motor skills and performs tasks that require more complex eye-hand coordination.
			Easel (for individual, pair and four children)			• Draws, scribbles and describes. • Draws some basic shapes. • Copies some print/symbols and makes well defined strokes. • Uses a pincer grip (coordination of the index finger and thumb to





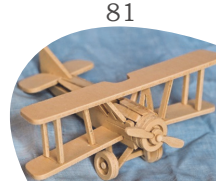
S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
						• hold an item) to hold and manipulate tools for drawing painting and writing.
			Kinetic sand / dough			• Draws some basic shapes.
		• Develops aesthetic sense and creativity. • Develops Space Concept (In/ Out).	Pop up toys		• Act like pop up toys and jump and sit.	• Explores and participates in music, dance and creative movement. • Uses senses to strengthen fingers and hands.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
19.	**Creative Development, Social and Emotional development**	• Aesthetic development.	Musical instruments like *Xylophones, Drums Rhythm Instruments*		• Counting. • Singing songs. • Playing musical chairs.	• Explores and participates in music, dance and creative movement.
		• Develops ideas for dramatic and imaginative play.	*Tambourine Maracas*		• Give the child a toy drum to play with. • Let the child sing a rhyme as he/she plays on it. • Involve the child in household work. Encourage him/her in keeping the house clean, washing clothes, cutting vegetables, watering plants and so on.	
			Doll House Dress-up clothing for pretend play; Doll accessories; action figures; Play food, Toy utensils,		• Naming and arranging the furniture and stating its use. • Memory game for children: Children to recall the articles of furniture. • Counting. • Visual perception: following directions.	• Uses words such as — please, thank you, sorry – in the right contexts without reminders. • Expresses own preferences and interests.




S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			toy tools and real-life accessories such as child-friendly doll house, market set up store, child-sized mops/ brooms, etc.		• Encourage the child take a doll, pretend to feed the doll and put the doll to sleep. Make the doll sleep on the bed constructed. The child will play with you and then construct things and play on his own. • Give the child a blunt pair of scissors and paper and let the child cut the paper in any manner he/she likes.	• Takes responsibility and makes choices. • Demonstrates self-control, cooperation, helping, sharing in large/small groups. • Talks in full sentences. • Communicates needs and thoughts. • Knows a wide-range of rhymes, poems and songs. • Answers questions, to give information and asks questions to find information or seek an explanation.
			Masks		• Recognizing different facial features. • Creating a mask out of chart paper. • Story telling.	• Exhibits fine motor skills with precision and control.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
E. FOUNDATIONAL LITERACY (READING & WRITING READINESS)						
Goal 2: Children become effective communicators						
20.	**Reading Readiness**	• Develops language skills. • Enhances imagination and creativity. • Identifies Animals and other characters by their sounds and movement.	Puppets and simple Puppet theatre, soft toys		• Story telling. • Dramatization. • Singing songs. • Providing accessories during block play. (Have children build a mini zoo). • Imitating and acting out the animals.	• Uses positional words in his/ her daily vocabulary like on- under and top bottom. • Pretends to read using picture cues and prior knowledge. • Decodes or sounds out a few familiar letter symbols. • Demonstrates a developing understanding that print runs from left to right and top to bottom, turns pages from left to right. • Draws, scribbles and describes.
		• Develops fine motor control as children manip-ulate puppets.			• Conceptual games. • Matching identical symbols e.g. large and small elephants.	• Gains understanding of the written language being

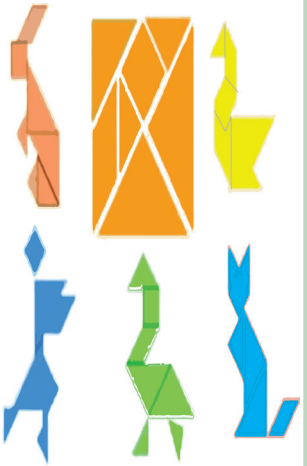






S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
		• Develops concepts of shape, size, color, texture, and body parts. • Learns story telling.			• Classifying animals of the same size. • Following sequence of animals' characters in a story. • Encourage the child to learn to make finger puppets, some mobiles and toys with locally available materials. Allow the child to manipulate and play imaginatively.	meaningful and that it can be read out 'and pretends to read own writing. • Uses invented characters to write.
21.	**Reading &Writing Readiness**		Magnetic letters			• Learns to form words and simple sentences uses magnetic letters.

3. INDOOR TOYS AND GAMES FOR GRADES I AND II (AGE 6 TO 8 YEARS)

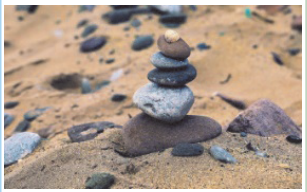
S. No.	Area	Concepts/Skills	Name of the Toy/ Game/play activity	Toy Image	Suggestive Activities/ Ideas for using low-cost toys	Learning Outcomes (LO)
A.	**SENSORY DEVELOPMENT**					
	Sense of Sight	• Develops ability to focus and concentrate.	Puzzles with increasing level of			• Differentiates between small and capital


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
		• Develops keen sense of observation (leading to curiosity). • Develops visual mental map and a sense of direction in space.	complexity Tangram Mini telescope Binoculars, Magnifying glass Dart board and other aim and shoot game	 		letters in print or Braille. • Classifies objects into groups based on a few physical attributes such as shape, size and other observable properties. • Describes basic 3D and 2D shapes with their observable characteristics. • Identifies simple observable features (e.g., shape, colour, texture, aroma) of leaves, trunk and bark of plants in immediate surroundings.





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
		• Ability to focus and concentrate. • Develops keen sense of hearing (leading to curiosity). • Learns to differentiate sounds. • Develops a sense of rhythm and harmony.	Musical instruments: tabla, drums, harmonium, xylophone, flute, mini piano	 and  and 		• Listens to instructions and draws a picture. • Sings songs or rhymes with action.
B.	**PHYSICAL DEVELOPMENT**					


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
3.	**Gross motor**	• Use entire body for activities . • Promotes ability to balance. • Develops quick reflex actions.	Outdoor traditional games such as Hide and Seek, Run and Chase, gillidanda, pithoo, chain-chain, hopscotch etc. Cycling Skipping rope Skating Balancing beam Gardening kit Indoor basketball, table football etc. Outdoor play equipment like slides, see saw, swing etc. Water games	   		• Participates in games and sports to strengthen and extend gross motor skills. • Takes initiative, participates in group and individual games, follows rules and cooperates in team. • Follows complex instructions/ rules; frames their own rules for invented games and activities. • Selects games/play equipments according to their own choice, preference and interest.



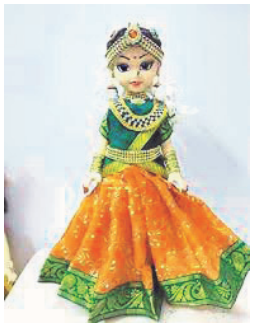


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
4.	**Fine motor**	• Develops eye-hand coordination. • Learns to work with small parts. • Develops ability to coordinate and work together with both hands.	Construc-tions kits, mechano sets, train assembly set, solar kit (con-struction set using solar ener-gy) 3D puzzles, jenga bal-ancing toy Spinning top String games Marble play Origami Craft and DIY kits: bead work, simple weaving, making miniature models, toys, acces-sories etc.	  		• Displays fine motor skills with accuracy and control. • Demonstrates precision in fine motor activities, drawing, coloring, writing, etc. • Uses coordinated movements while using writing/ coloring.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
C.	**COGNITIVE DEVELOPMENT**					
5.	**Logical thinking**	• Develops an understanding of cause and effect. • Understands rules and structures. • Develops a sense of time. • Ability to analyse and take decisions accordingly.	Traditional games such as pachisi, dashavatara cards, pallangizhi Memory cards and games board games: ludo, chess, card games etc	 / 		• Observes rules in games (local, indoor, outdoor) and other collective tasks. • Identifies directions, location of objects/places in simple maps (of home/ classroom/ school) using signs/symbols/ verbally.
6.	**Communication and language**	• Develops vocabulary and context of use.	Traditional dolls from different materials, masks shadow puppets, string puppets, muppets, mini theatre soft toys, miniature figurines, vehicles, animals,	 / 		• Responds to comprehension questions related to stories and poems, in home language/ Hindi/ English or sign language, orally and in writing (phrases/short sentences). • Describes the physical features of





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			birds, house etc. Sequential pretend play with dolls, doctor set, kitchen set etc. tents and Storytelling mats, textile books.	   		various solids/ shapes in her own language. For example- a ball rolls, a box slides etc.

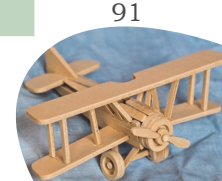

S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
				  		
7.	**Knowl-edge**	• Develops an understanding of the world around them.	Knowledge based activity and games for knowing about nature, geography, sentence building etc. (simple flash cards,			• Collects, records and interprets simple information by looking at visuals.





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			board games, augmented reality games)			
D.	**CREATIVE DEVELOPMENT**					
8.	**Self-Expression**	• Ability to express themselves through different art mediums. • Ability to express themselves through words.	Exploring and expressing with art material: clay, dough, paints, brush, paper	 		• Takes initiative in creative activities. • Displays fine motor skills with accuracy and control, engages in art integrated activities/ drawing/ colouring, collage making etc.
			Playing and making using natural sand and clay Expressing			


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			themselves and making using assorted waste material such as plastic bottles, caps, matchsticks, toothpick, waste cloth, broom sticks, rubber bands, coconut shells, walnut shells etc.			
9.	**Craftsmanship**	• Develops attention span and patience. • Learns to work with different materials and tools (in a safe manner).	Weaving with paper strips, woolen threads. Bead work with beads and thread Pottery wheel for children Craft kits/ DIY kits Traditional toy making	  		• Displays fine motor skills with accuracy and control, engages in art integrated activities/ drawing/ colouring, collage making etc.




S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
E.	**SOCIAL-EMOTIONAL DEVELOPMENT**					
10.	**Emotional development**	• Develops emotional awareness about self. • Learns to manage emotions. • Develops empathy for others.	games on expressing different moods and emotions Games about knowing each other Learning to manage emotions associated with winning and losing through games			• Observes rules in games (local, indoor, outdoor) and other collective tasks. • Takes care that conflict doesn't arise during play or activities, makes rules beforehand, resolves minor conflicts independently with the help of adults.
11.	**Social Development**	• Learns to share with others. • Develops ability to coordinate with others. • Learns to work together as a team.	Card games, carrom when played in teams Traditional games such as Kabaddi, kho-kho, chor-police etc Party games			• Identifies relationships with and among family members. • Describes need of food for people of different age groups; animals and birds, availability.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
						• of food and water and use of water at home and surroundings. • Describes roles of family members, family influences (traits/features/ habits/ practices), need for living together, through oral/ written/other ways.



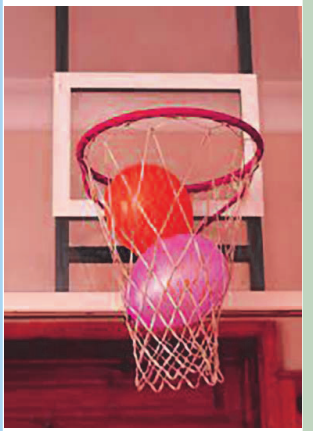


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)

4. TOYS FOR OUTDOOR PLAY for Preschool, and Balvatika and Grades I and II, Age 3 to 8 year

(Physical and Motor Development)

Goal 1: Children maintain good health and wellbeing

S. No.	Area	Competencies/ Skills	Name of the Toy	Toy Image	Suggestive Activities/ Ideas for using low-cost toys	Learning Outcomes (LO)
1.	**Gross Motor Development**	• Develops the skill of balancing. • Understand the complex instructions. • Remembers the squence of steps.	Tricycles/ Three-wheeled scooters			• Participates in games and sports to strengthen and extend gross motor skills. • Takes initiative, participates in group and individual games, follows rules and cooperates in team. • Follows complex instructions/ rules; starts creating his/her own rules.
			Child-sized Basketball hoops			




			Hula-hoops			• Selects games/ play equipment according to their own choice, preference and interest.
			Bowling Sets			• Follows complex instructions/ rules; Starts creating their own rules.
			Jungle Gym			
			Swings			

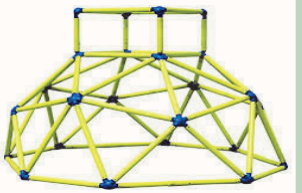


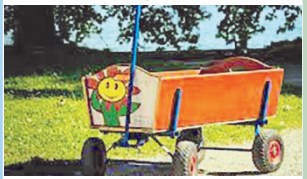

S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Slides			• Patience.
			See-saw			
			Wagon to fill and pull			• Participates in games and sports to strengthen and extend gross motor skills.


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Gardening tools to dig and rake			• Uses one-to-one correspondence.
			Moving big boxes to crawl through			
			Balls of different shapes and sizes			
			Balance beam		• Encourage the child to walk on balance beam laying on the ground. Hold the child's hand, if necessary.	





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Walking rope for creative Movements	 / 		
			Climbing materials and equipment			
			Climbing ladder			
			Crawling tunnel			
			Taller Climbers with soft material underneath			
			Plastic bats and Balls			


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
			Wagons and Wheel barrows	 / 		• Wheel barrow race. • Devising a simple wheel barrow out of wire.
			Bean Bags			


NOTE: Most of the outdoor play equipment is common for the foundational stage till grade 2




S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
5. TOYS/PLAY EQUIPMENT FOR OUTDOOR/INDOOR PLAY for Grades III, IV and V, Age 8 To 11 Years						
1	**Sense and Observation**	• Develops observation and exploration and sense span.	Learn with Magnets		• Create different activities for children and let them play.	**EVS** • Records observations / experiences/ information for objects, activities, phenomena, places visited in different ways and predicts patterns in activities/ phenomena. • Identifies signs, location of objects/places and guides for the directions w.r.t landmark in school/ neighbourhood using maps etc.
			Reflection of light		• Teachers let them play with reflective materials and prepare activities.	


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
2	**Mathe-matical Shapes**	• Observation.	Geometrical solids		• Teachers explain and show how different shapes look like.	**Maths** • Acquires understanding about shapes. • Explores the area and perimeter of simple geometrical shapes in terms of given shape as a unit. • Estimates the volume of a solid body in known units.
3	**Sense and Observa-tion**	• Psycho-motor skills, grasping power, eye-hand coordination.	4 × 4 square puzzle 5 × 5 square puzzle Pegboard puzzle Crazy Cubes		• Teachers explain and show how it works.	• Acquires understanding about fractions.
4	**Mathe-matical shapes**	• Psycho-motor skills, grasping power, hand and eye coordination.	Tower Puzzle		• Teachers explain and show how it works.	• Acquires understanding about shapes around. • Explores the area and perimeter of simple geometrical



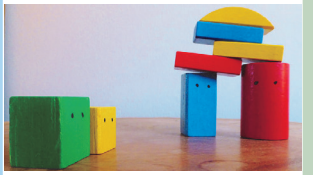


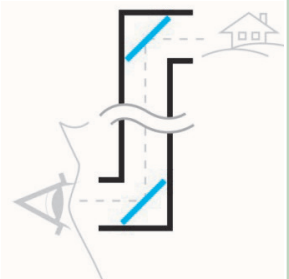
S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
						• shapes in terms of given shape as a unit. • Estimates the volume of a solid body in known units.
			Make a Cube			**Maths** • Makes cube/ cuboids using the given nets. • Shows the concept of symmetry by reflection through paper folding paper, cutting, ink blots, etc.
5	**Grasping and eye-hand coor-dination**	• Learns and explores.	Children's Play Tent House		• Teachers explain and show how it works.	**EVS** • Creates designs, models and simple maps using local/ waste material.
		• Psycho-motor skills, grasping power, hand and eye coordination.	Jigsaw Puzzles			


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
6	**Art and Craft**	• Grasping power, eye-hand coordination.	Hand Puppets		• Teachers explain and show how it works.	• Creates posters, designs, models, set ups, local dishes, sketches, maps.
7	**Self-discovery, eye-hand coordination, logic building and learning**	• Fine motor skills & curiosity.	Wooden Spin Tops		• Teachers explain and show how it works.	• Records observations and experiences; information in an organised manner.
8	**Shapes, Stimulates curiosity, sensory, self-expression & fine motor skills**	• Psycho-motor skills, grasping power, eye-hand coordination.	Hydraulic Crane STEM STEAM Educational DIY Building Construction Activity Toy Microscope STEM STEAM Educational DIY Build-		• Teachers explain and show how it works.	**STEAM** • Explains the use of technology and the process of assembling the parts. • Designs, models, set ups, sketches, maps of local DIY toys.





S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
9	**Imagination, logical thinking, and eye-hand coordination**	• Cultivates Creativity & Imagination.	2 Color Wooden Dominos Blocks Set		• Teachers explain and show how it works.	**Art** • groups objects, materials, activities for features and properties such as– shape, taste, colour, texture, sound, traits etc.
10	**Motor Skill, Mental Exercise, Observed Coordination, Communication skills**	• Cultivates Creativity & Imagination.	Building Blocks for children with Wheel		• Teachers explain and show how it works.	**STEAM** • Explains the use of technology and the process of accessing basic needs. • Creates posters, designs, models, set ups, local dishes, sketches, maps. • Teachers explain and show how it works.
11	**Finger strength, fine motor skill and creativity**	• Cultivates Creativity & Imagination.	Big Size House Building Blocks with Windows		• Teachers explain and show how it works.	


S. No.	Area	Competencies/Skills	Name of the Toy	Toy Image	Suggestive Activities/Ideas for using low-cost toys	Learning Outcomes (LO)
12	**Motor Skill, Mental Exercise, Observed-Coordination, Communication skills**	• Cultivates Creativity & Imagination.	Educational DIY Building Construction Activity Toy Game Kit			
DO IT YOUR SELF						
13	**Scientific attitude**	• Observation, motor, mechno, hand eye coordination, grasping.	Pin Hole Camera		• Teachers explain and show how it works.	**EVS** • Guesses properties, conditions of phenomena, estimates spatial quantities (distance, area, volume, weight etc.) and time in simple standard units and verifies using simple tools/set ups.
14	**Exploration, Psycho motor skills, grasping power, hand and eye coordination**	• Observation, motor, mechno, eye-hand coordination, grasping.	Make a Periscope Make a Lens Camera Solve a Pythagoras theorem	 	• Teachers explain and show how it works.	





Mapping of Toys with Concepts, Competencies and Learning Outcomes at Middle Stage (Grades VI, VII & VIII) (Age Group 11 to 14 years)

S. No.	Area	Objective/s	Concepts/Competencies/ Learning Outcomes	Name of the toy	Toy	Suggestive Activities
1	**Life skills and Culture**	• To Learn by doing	• Observation • Creativity	Mukhota Self-created Toy		• Can be used for storytelling, role play on social themes. • Learn about different cultures.
2	**History**	• To develop artistic and cognitive abilities of children through multi-sensory a pproach that promotes experiential learning	• Building connection between traditional and modern toys • Developing cognitive and creative	Harappan Toys		• Reconstruction of ancient toys of the world's oldest Harappan Civilization with clay, Plaster of Paris, eco-friendly material, wooden sticks and wheels, paper mache.




S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
			thinking skills, psycho motor skills • Understanding 3D volume			
3	**Coding skills**	• To understand the fundamentals of computer programming in a fun way.	• Basic coding skills, • Aptitude and logic building • Developing values, life skills like empathy, patience and creativity	Code Imbibe		• Manipulating the movement of the card to acquire a positive virtue.
4	**Mathematics**	• To learn concepts of Mathematics in a play-way method. • To boosting the child's confidence • To solves equations in a play-way method	• Observation and calculation skills. • Sharpens the child'sfocus and concentration • Improve mental calculations	Spin 'O' Wheel		• Find roots of an equation by calculating it mentally without pen and paper.

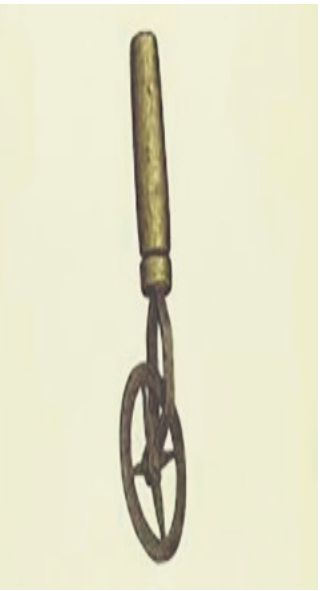



S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
			without using pen and paper • Imbibe the value of team work			
5	**Language Learning**	• To learn tenses in a fun filled manner	• Exploring and understanding the concept of Tenses	Tense Mania Puzzle		• Each participant is required to pick up rings marked with sentences in different 'Tenses' one after the other and place them on the correct spot within the stipulated time.
6	**Geography**	• To enhance Geographical skills	• Identification and exploration	Explore the Mysteries of Nature		• Students will pick the flag on which the name of the landform is written and will keep the flag on the specific landform on the collage after piercing the flag sticking into the eraser. After this process the student will find the flag depicting the features of the same landform and will

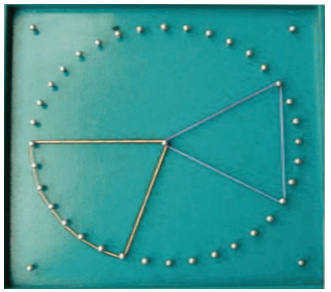



S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
						place it beside the flag depicting the title of the landform.
7	**Government initiatives and Indian Culture**	• To create awareness about Indian culture of different regions of the country.	• Knowledge of Indian culture. • Understanding and celebration of indigenous culture imbibing Indian ethos	Brain driller Online Game		• Quiz based on different government initiatives and culture of Indian States. • Quiz on Indian Traditions and practices.
8	**STEM learning**	• To enable children to develop critical and logical thinking	• Coding, critical thinking and skills to innovate	Atal Tinkering Lab Toy		• Sculpt ideas through hands-on activities. • Freedom to assemble and de-assemble.
9	**Sustainable Living**	• To sensitize children about 17 Sustainable Development Goals (SDG)	• Social & Environmental skills	Eco crusaders **Board Game**		• Best out of waste to reuse, reduce and recycle the natural resources. • Tree plantation. • Cleanliness drive.




S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
10	**Art and Craft, Mathematics and Science**	• To Demonstrate the formation of white light.	• Angles, Circular Motion and Dispersion of Light • Geometrical Skills, Scientific Skills	Rainbow Wheel		• As the child switches on the toy, the wheel starts rotating and the seven colours of the rainbow merge together and turn into white colour.
11	**Mensuration (i.e., circumference of a circle)**	• To learn the circumference of the circle and distance covered in number of revolutions.	• Observation, estimation, • Imagination and exploration.	Trundle Wheelt		• Students will measure the distance covered from one point to the other point by using trundle wheel and understand the concept of distance covered by the number of revolutions while playing with the wheel.

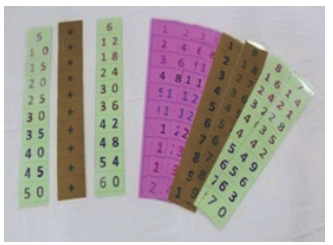



S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
12	**Elementary shapes (Circles)**	• To learn all terms related to circle and its properties.	• Observation, exploration and creation	Circular Geo Board		• Students will explore and understand the concepts of infinite radius, diameters and chords by using threads or rubber bands. They will use it to understand all the properties related to circle. • (Proofs of all concepts related to circle).
13	**Elementary Shapes (Triangles)**	• To learns different categories of triangle (Obtuse, Acute, Right angle triangles)	• Observation, imagination and exploration	Fun with movable triangles		• Students will play with the scales and move the sides to make different kind of triangles. This can better be played in teams of two by taking turns to understand angles and angle sum properties of triangle.




S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
14	**Social science**	• To enhance awareness of the Indian art and culture and respect for the same.	• Awareness of India's extraordinary and rich craft traditions • Understanding the linkages between our identity, heritage and local crafts. • Respect for the craftsperson and appreciation of the craftsmanship of the objects. • Knowledge of the materials and process for making toys with clay.	Terracotta toys from different regions of India	 	• Students may be given terracotta toys to observe and clay to make some figures and objects of their choice such as, birds, basket, animals, pots, human figures, etc.First they make objects of their choice and then work on the details. The teacher can facilitate as and when required. • They can decorate their objects further by pinching, incising and applique (for eyes and nose). They may also paint the objects once they are dry. • Learn more about birds, animals, objects, etc.

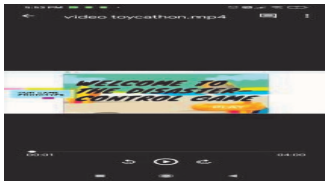



S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
15	**Life Skills**	• To Develop spatial skills • To enhance logical Reasoning	• Critical thinking, • Problem solving, • Spatial skills	Tangram		• Art Integration with subjects. • Using different craft material. • Use shapes and figures to create multiple designs, etc.
16	**Life Skills**	• To develop spatial skills • To enhance logical reasoning • To use in mensuration as square units	• Spatial skills. • Critical thinking • Problem solving	Pantomimes		• Art integration. • Bandha Art—Using the same square units to create different perimeters. • Measure different perimeters. Relate the concept of these images with perimeter in mathematics.
17	**Mathematics**	• To enhance flexible thinking, problem solving and creative skills.	• Logical thinking • Problem solving • Creative skills.	Number Strips		• Play a table game to write tables of two-digit numbers with the help of given number strips.



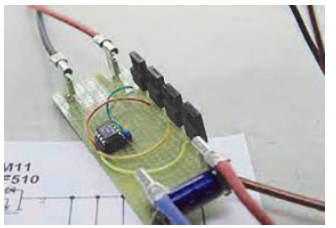

Mapping of Toys for the Concepts, Skills, Competencies in Children of the Secondary Stage (Grades IX, X, XI & XII) (Age Group 14 to 18 years)

S. No.	Area	Objective/s	Concepts/ Competencies/ Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
1.	**Science and Culture**	• To understand the concept of Laws of Reflection in a play-way method • To correlate the scientific concept learned with ancient epic Mahabharata	• Concentration and focus • Eye- hand coordination • Practical skills	*Arjun ka Lakshya* **Innovative Toy**		• The player has to hit the same target (fish eye) with the reflection of a mounted laser beam caused by a mirror.
2	**Indian culture and Heritage**	• To sensitize children about the culture and heritage of India. (puppetry tradition of our country) • To reconnect with history and bring alive the glory of the past.	• Creative and Cognitive Skills • Sensitivity towards Indian Culture & Heritage	Indian Masks Traditional Toys		• Folktales and stories of history, tribal masks can be narrated using these masks which bring alive the glory of ourpast. • Role Play. • Experiential learning. • Art integrated learning.


S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
3	**Disaster Management**	• To enable the students to know about disasters, their occurrence and preparedness.	• Competitive and decision making • Focus and concentration • Digital Skills	Disaster Digital Manual Online Gaming		• It is a digital ready reckoner and training manual on disaster preparedness and management. • It is an android game app that can be used and played by all age groups. The game is about what to do when disaster strikes.
4	**Conservation of water**	• To create awareness about water conservation. • To find ways to solve problems associated with water/waste water at the community level	• Motor skills • Cognitive skills • Communication skills • Environmental skills • Life skills	Drains and Springs Board Game		• The game is played with the rolling of dice. • The players move the pawn on the board according to the number. • The player who gets a drain will come down to a lower number and knows the reason for wasting water. • The player who gets a spring will move up by one number and will get the credit of using water efficiently.

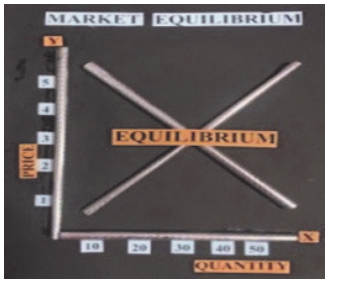



S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
						multiple of 5, then that many steps backward. If the answer is a multiple of both, then the player will not move. In this way the one who reaches the finishing point first, will be the winner.
5	**Emotional Intelligence**	• To enhance players' emotional intelligence through introspection and decision-making	• Able to identify better ways of dealing with emotions while enhancing self-awareness and decision making.	Mental health game/ toy-self-revival kit	 	• The game is played by introspecting ones' positive or negative attributes and identifying better ways of dealing with the same. This game enhances the players' emotional management skills and hones their emotional intelligence, self-awareness, introspection and decision making.


S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
6	**Physics, Art and Craft**	• To develop a balloon powered car.	• Pressure, force, Newton's Third Law of Motion. • Scientific and creative skills.	Balloon Car		• Student will blow air into the balloon with the help of a wooden straw. The car will move forward by air escaping from the balloon in backward direction.
7.	**Chemistry and Mathematics**	• To learn about various molecular structures in a fun way.	• Molecular Structures of various compounds bonding and bond angle. • Analytical Skills and Imaginative skills	Clay Modeling 13-18 years		• Students will enjoy making various Molecular structures with the help of colorful clay dough.
8	**Science (Physics)**	• To introduce the concept of circuit	• Observation, coordination and Analytical skills.	Metal wire loop circuit		• By doing themselves students will understand the logic. • of open and closed circuit.





S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
9	**Economics Market equilibrium under perfect competition**	• To enable students to understand how consumers and producers interact in the market and how the price is determined.	• Observation, Understanding, • Exploring • Interpreting	Two swords playing in the market		• Students will try to understand the concept of price equilibrium under perfect competition with the help of the model. • They will place the rod at various places to understand the concept of excess demand and excess supply.
10	**Memory and ethical values**	• To develop respect and love for the diversity of our country	• Exploration and social skills	Card board and dice game. Journey through states of India		• Game among three children at a time as a race to win the crown at the destination.
11	**Valuing life on earth**	• To understand the importance of ecological balance and biodiversity	• Observation, analysis, decision making	Eco-cube		• Students can explore different habitats.



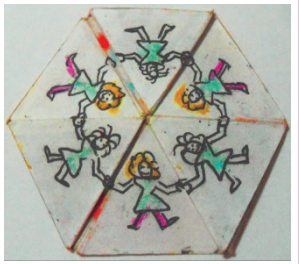

S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
12.	**Social science**	• To create awareness about local pottery craft tradition. • To appreciate the skills of craft persons and respecting their contribution to the society. • To create an understanding of historical analysis	• Observation and Analysis	Miniature pottery from different regions of India	 	• Students may be given miniature potteries from different parts of the country. They can study and draw the different pottery shapes of ancient India, such as, those of the Harappan culture and asked questions such as:like, Are the shapes still found in India? What were the objects used for? Students can be asked to sketch some of the motifs made on ancient pots such as: water designs, plant and animal designs and can be asked to observe if potters use similar designs today?



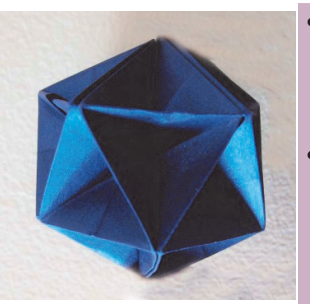

S. No.	Area	Objective/s	Concepts/Competencies/Learning Outcomes	Name of the toy	Toy Image	Suggestive Activities
13.	**Social science**	• To understand the history of clothing and awareness of clothing in different regions of India. • To analyse changes in clothing. • To familiarise with debates over clothing in colonial India. • To understanding Swadeshi and the movement for Khadi.	• Observation and Analysis	Costume dolls from different times regions of India.	 	• The teacher may show how clothing has a history, and how it is linked to questions of cultural identity. The teacher may also discuss how clothing has been the focus of intense social battles and how it is linked to Swadeshi and the movement forKhadi.

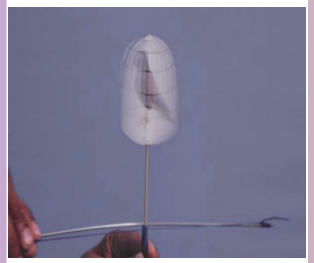
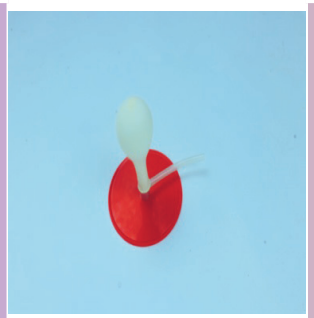
Mapping of 66 Toys developed by Centre for Creative Learning, IIT Gandhi Nagar
Weblink: https://ccl.iitgn.ac.in/ For details about CCL and its Toys

These Toys have been discussed with teachers across the stages in a workshop mode for mapping them with suggested activities and learning outcomes

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
1	**Mathematics**	**Geometry, Triangles, Computational origami**	**For Grade- 6 to 10** • Identifies various geometrical shapes. • Designs scientific concepts in creative manner. **For Grade 2 to 5** • Enhances critical thinking to arrive at a conclusion. • Describes sides and corner of polygons	2D Flexagon To buy, visit: https://ccl.iitgn.ac.in/order		• Flexagons are great toys, and can be used to depict an equation, a scientific fact, or a story. • On rotating each time, a different facet of the model will be exposed. Flexagons are made by folding strips of paper that can be flexed or folded in certain ways to reveal faces besides the two that were originally on the back and front. • Can you make a food chain using a flexagon? You can draw Grass>Deer>Jackal>Lion to show this.	• Paper

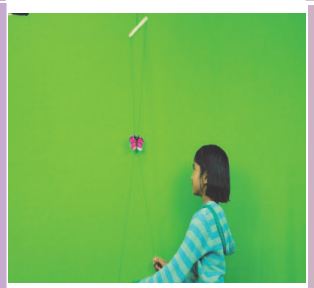



S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
2	**Maths**	**Tetra-hedron, Geome-try, Tri-angles, Compu-tational origami.** **• To in-troduce triangle geome-try**	**For Grade- 5-9** • Identifies var-ious geometri-cal shapes. • Design scien-tific concepts in creative manner. • Make pattern & design. • Make cube & hexagon shape. • Problem Solv-ing based on money, mea-surement, fractions etc.	3D Flexagon To buy, visit: https://ccl.iitgn.ac.in/order		• Flexagons are great toys and can be used to depict an equation, a scientific fact, or a story. • On rotating each time, a differ-ent facet of the model will be exposed. This dynamic paper model can be graphically used to demonstrate food chain and water cycle or just about any fact in an engaging way. Four different images come to the front one after the other when you rotate (or flex) it. • In the provided chart, you have designs for four different flexa-gons (from left to right): • Insects • Life Cycle of a Butterfly • Female butterfly laying eggs • Larva (caterpillar) • Pupa (chrysalis) • Butterfly coming out of pupa • - Evolution • Ocean vegetation - 3000 mil-lion years ago • Marine animals, 600 million years ago • Dinosaurs, 250 million years ago • Rise of mammals 70 million years ago • Food Cycle • Butterfly	• Ghumakkad • Paper Sheet

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• Frog • Snake • Eagle • (Frog eats butterfly, snake eats frog, and eagle eats snake)	
3	**EVS and Science**	**Persistence of Vision**	**Grade 5** • Appreciates the beauty of nature; colours and light. **For Grade 6 to 10** • Understands the concept of persistence of vision.	Bird in cage To buy, visit: https://ccl.iitgn.ac.in/order		• Hold the hard straw with one hand and move the bow to-and-fro with the other hand. The kebab stick will rotate very fast and we will the bird in the cage! • Try with other images. Come up with your own combinations of images. The card does not have to be round or rectangular! Experiment with different shapes. coloured paper also makes interesting effects; try black paper with brightly coloured chalk drawings.	• Kabab stick, glue, cycle spoke, thread, bird image, PVC pipe.
4	**Maths EVS and Science**	**Pressure, Friction**	**Grade 6 to 11** • Application of the concept of pressure. • Synthesises the concept of pressure and friction.	CD hovercraft To buyQ, visit: https://ccl.iitgn.ac.in/order		• Inflate the balloon and let it go on the ground or table. • Hovercrafts create a cushion of air beneath them, and can glide on both water and land, making them an amphibian vehicle. Unlike a helicopter, the objective of a hovercraft fan is not to completely lift it in air, but to just create a cushion of air beneath it on which it can glide. Therefore, it uses much less energy compared to a helicopter. • Can be given as project work to the students.	• CD, hard strow, medium balloon, rubber band glue.




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
5	**Science**	**Persistence of Vision, Wagon Wheel Effect**	**Grade 5** • Appreciates the beauty of nature; colours and light. **For Grade 6 to 10** • Understands the concept of persistence of vision.	CD stroboscope To buy, visit: https://ccl.iitgn.ac.in/order		• Change the size of the hole. Does it make any difference? • Rotate the CD on the marble and see some amazing patterns! • Stroboscopic effect may lead to unsafe situations in workplaces with fast moving or rotating machinery. If the frequency of fast rotating machinery or moving parts coincides with the frequency, or multiples of the frequency, of the light modulation, the machinery can appear to be stationary, or to move with another speed, potentially leading to hazardous situations. • Because of the illusion that the stroboscopic effect can give to moving machinery, it is advised that single-phase lighting is avoided. For example, a factory that is lit from a single-phase supply with basic lighting will have a flicker of 100 or 120 Hz (depending on country, 50 Hz x 2 in Europe, 60 Hz x 2 in US, double the nominal frequency), thus any machinery rotating at multiples of 50 or 60 Hz (3000–3600rpm) may appear to not be turning, increasing the risk of injury to an operator.	• CD, hard glue • Marbles

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
6	**EVS and Science**	**Friction, Gravity**	**Grade- 3 to 5** • Can create a story. • Enhanced language competencies. • Can create. scientific temperament. **For Grade 6 to 11** • Can design a model to show the concept of friction and gravity and to unify the two types of forces i.e., friction and gravity.	Climbing butterfly To buy, visit: https://ccl.iitgn.ac.in/order		• When you pull the left thread, the associated straw tilts to the left and aligns with the thread. In this situation, normal force acting on the right straw increases. The frictional force also increases between the right straw and thread. Therefore the butterfly holds its position for the right thread and climb on the left thread. As soon as the threads are released, the butterfly slides down because there is not enough friction to hold it in its place. • What is the minimum amount of tension required to just climb the butterfly up?	• Ice Cream Stick • Hard Straw Plastic Beads • Butterfly Image • Glue • Thread
7	**EVS and Science**	**Centrifugal Force, Rotation**	**Grade 5 to 8** • Can create a story. • Can understand the scientific concepts. • Can apply the scientific concepts.	Dancing man To buy, visit: https://ccl.iitgn.ac.in/order		• On twirling the stick, man will move his hands and legs – executing a dance! The dance movements are the result of centrifugal force acting on the man at the joints. • When you sit on a merry-go-round, you feel that you would go outwards if you release the grip. But actually, you would go in a tangential direction at that moment.	• PVC Small Stopper • Man cut out • Kebab stick

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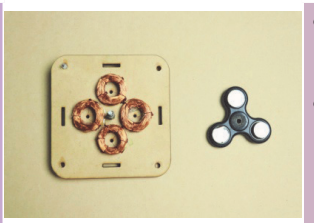
						• Decorate and paint your dancing man with bright colours or make a dancing woman!	
8	**EVS and Science**	**Electricity and Magnetism, Electromagnetic Induction**	**Grade 6 to 12** • Can demonstrate and apply the concept of electromagnetic induction.	Fidget generator To buy, visit: https://ccl.iitgn.ac.in/order		• When we rotate the fidget spinner, the LEDs light up. • Whenever there is a relative motion between a conductor and a magnet (either the magnet moves or the conductor moves), there is a voltage generated across the conductor. This was first discovered by Michael Faraday in 1831. • The magnets attached to the fidget spinner are rotating on the coils during the spin. The generated voltage lights up the LEDs. Amount of voltage generated is directly proportional to the speed of rotation and the number of turns in the coil. Therefore, we should either spin the fidget spinner fast or have more turns in our coils if we want our LED bulb to glow brighter. • It can be given as project work to the students.	• Copper Wires • LEDs • Fidget Spinner, 3 Neodymium Magnet • Rubber Band • Glue • MDF Sheet.

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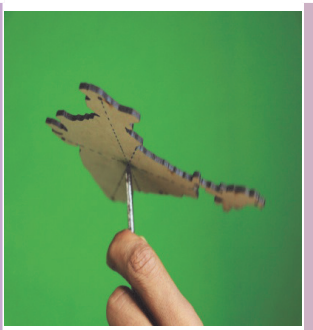
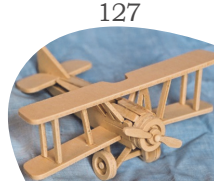
						• The electricity you are getting in your house or school is also produced in the same way. For example, in a hydroelectric powerplant, the coil is attached to turbine. It is rotated by throwing water on the turbine blades, producing electricity.	
9	**EVS and Science**	**Centre of mass, Centre of gravity**	**Grade 5 to 10** • Can understand and apply the concept of centre of mass and gravity and formation of democratic alliances in different parts of the country.	Centre of mass of a random shape To buy, visit: https://ccl.iitgn.ac.in/order		• The center of mass is the point about which an object will balance if you try to rest it on your fingertip. Or if you hang an object, for example a picture frame from a nail, the center of mass will hang directly below the nail. For symmetrical objects, finding the center of mass is relatively easy. For example, for a rectangle, you know the center of mass is in the middle of the rectangle and you can find that with a ruler. • If you hang a shape from a single point, you know the center of mass will always rest directly below that point. So, if you hang a shape from two different points (one at a time) and draw a line straight down from	• INDIA map, Dog shape (MDF)






S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						each point, the center of mass is where those lines intersect. • Take a piece of string, about one foot long, and tie a paper clip to each end. You can use any small object such as a metal washer on one end—this will serve as a weight—and any other small, pointy object like a needle or pushpin on the other end—this will be used to puncture the paper. • Start with an easy shape: Cut out a rectangular piece of cardboard. Make sure it remains stiff and flat. Can you guess where the center of mass of the rectangle is? If so, use a ruler to measure where you think it will be and mark this spot with your pencil. • Punch several small holes around the edge of the paper. Make them as close to the edge as possible without ripping the paper. (This is important for the accuracy of this technique)	

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• Now poke one end of the paper clip (or pushpin) through one of the holes to act like a hanging hook. Make sure the paper can swing easily from the hook (Rotate it back and forth a few times to loosen the hole if necessary). • Hold on to your hook and hold the paper up against the wall. Let the paper swing freely and make sure the string can hang straight down and does not get stuck. Use a pencil and ruler to draw a straight line on the paper along the string. Repeat the process several more times with different holes. • Now try with an irregular shape on card paper and then cut it out using scissors.	
10	**EVS and Science**	**Angular Momentum, Torque, Moment of Inertia, Gyroscope**	**Grade 11** • Understands the concept of rotational motion and related terms such as angular momentum, torque and Gyroscope.	Gyroscope with fidget To buy, visit: https://ccl.iitgn.ac.in/order		• The CD falls down when you try to balance it but when you rotate the fidget spinner, the CD stands for a long time. • The spinner acts like a gyroscope because of conservation of angular momentum. The CD also starts to rotate slowly on the ground. That is why gyroscopes are used for maintaining orientation in rockets and ships.	• CD • Hard Glue • Fidget spinner

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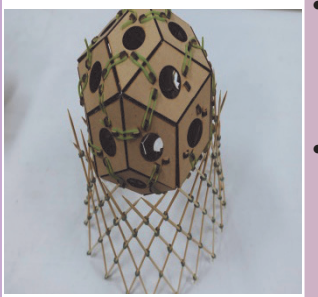
11	**EVS, Science and Maths**	**Wave, Friction, Sine curve, Helix**	**For Grade- 1 & 2** • Understanding spatial Relation (long-short). • Measurements of length using non standard units. • Enhance creativity among students. **For Grade 6 to 9** • Can understand and explain the phenomenon of wave and friction.	Helical snake To buy, visit: https://ccl.iitgn.ac.in/order		• Gravity pulls the straw pieces down when the wire is held vertically. Because of the helical structure of the wire, pieces of straw go down slowly due to friction. The colourful straws blend into one another and form a continuous crystal-like structure. The structure also looks like a sine curve when we see it from the side. • The height descended by a straw piece in one complete turn is called the pitch of the helix. When you stretch the wire, the pitch increases. On compressing it, the pitch decreases. • Take a metal spring (which is a regular helix) in which there is some distance between the consecutive turns. Dip it in ink, and roll it on the floor. The spring would trace a straight line on the floor!	• Plastic Beads • Metal Wire
12	**Maths (middle, secondary)**	**3D Shapes, Hyperboloid, Patterning Skills**	• Senior Secondary **Grade-11 & 12** • Enhanced creativity, critical thinking and problem	Stick hyperboloid To buy, visit: https://ccl.iitgn.ac.in/order		• This structure is called a hyperboloid and can be constructed by rotating a hyperbola. • You can also imagine it as a twisted cylinder. Take two discs and make equal holes	

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			solving approach in the students to understand carius 3 - D structures			on the circumference of both discs. Connect both discs with threads in between. When the thread is not twisted, you can see a cylinder. Now twist the two discs in opposite directions and you can see a hyperboloid (continue twisting and you would get a double cone). • Therefore, a hyperboloid can be made entirely from straight lines (although it is a doubly curved surface). If you see the hyperboloid from the top, you can see a circle. You can change the radius of the circle by flexing the hyperboloid. The hyperboloid can be pressed completely to form a planar structure. • The hyperboloid has important real-world architectural and engineering applications. The most common use is in the shape of cooling towers. • The crossing points are closer together near the "waist" of the hyperboloid and further apart as you move towards the ends of the sticks. Can you calculate the exact distances using trigonometry?	• Kebab Stick • Rubber Band




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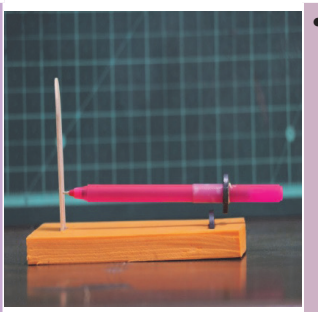
13	**EVS and Science**	**Magnetic forces, North and south poles, Levitation**	**Grade 6 to 10** Can Undertand, demonstrate, synthesise and apply the concept of magnetism	Levitating pen To buy, visit: https://ccl.iitgn.ac.in/order		• The magnets on the EVA base attract it forward but the ice-cream stick at the front doesn't let the pen go forward. The upward repulsion between the magnets balances the force of gravity and prevent it from falling down. • But it is not really magnetic levitation as the pen is balanced on the ice-cream stick from its tip and not suspended in air entirely due to magnetic field. If you remove the ice-cream stick, the pen falls immediately. When you rotate the pen, it rotates for long time due to low friction at the tip. • If you look closely, you can see that the ring magnet has four surfaces but a magnet generally has two poles (north and south). So what is the position of those poles? • Can be assigned as project work for students	• 3 Ring Magnets • Pen • EVA Sheet • Ice Cream Stick

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14	**EVS and Science**	**Magnetism**	**Grade 6 to 10** • Understands, demonstrates, synthesises and applies the concept of magnetism.	Magnetic kite To buy, visit: https://ccl.iitgn.ac.in/order		• Trans rapid in China is the fastest commercial train. It has a top speed of 430 km/h. How does it achieve so high a speed? It floats in air without touching the track. Such a heavy train floats in air due to magnetic forces! Japan is also testing maglev trains, which have recorded the highest ever speeds, over 600 km/h during testing! • The paperclip inserted inside the kite is pulled up the magnet at the top of the stick. The length of the string is adjusted such that the kite doesn't touch the magnet and at the same time, it is attracted by the magnet at the top. If the distance becomes more, the kite would just fall on the ground. In this case, the kite floats in the air. • This looks a very simple toy but requires a good degree of precision and trials to make it. Try with different magnets and different things instead of paper clip. Also try to make bigger or smaller versions. • Can be assigned as project work for students.	• Cylindrical Neodymium Magnet, Paper Clip, Kite Image, Thread, MDF Sheet.




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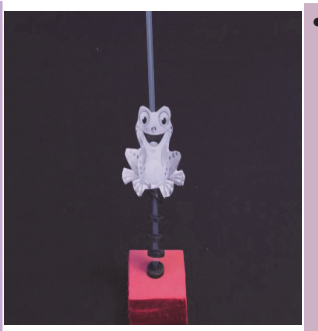
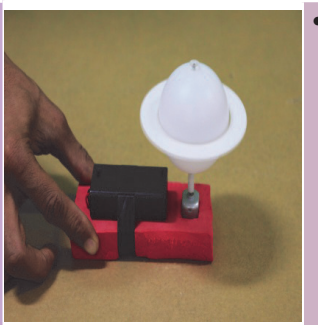
15	**EVS and Science**	**Magnetic Potential, Energy, Poles of a Magnet, Attraction and Repulsion**	**Grade 6 to 10** • Understands, demonstrates, synthesises and applies the concept of magnetism. •	Magnetic spring frog To buy, visit: https://ccl.iitgn.ac.in/order		• The magnets are placed such that same poles of magnets are towards each other. Therefore, the magnets repel each other when they are brought closer. The whole system acts somewhat like a spring. When you bring the magnets closer, you have to apply some force to keep them together. As soon as you stop applying the force, the magnets regain their original position and move away from each other. • The work done by you in bringing the magnets closer is stored as potential energy. On releasing the magnets, the potential energy gets released in the form of kinetic energy making the frog jump! • Can be assigned as project work for students.	• Frog Image, Ring Magnet, EVA, Hard Straw
16	**EVS and Science**	**Torque, Weight, Friction**	**Grade 11** • Can understand the concept of torque, weight and friction simultaneously.	Mechanical hula hoop To buy, visit: https://ccl.iitgn.ac.in/order		• What makes a hula-hoop spin around a person's waist? When you rotate the hula loop, you exert an upward force (from the hips) and another force which keeps it rotating. Friction between the hoop and your clothes slows the hoop down. But it is friction which also	• DC Toy Motor, Battery Cell Holder, Plastic Ball, Spoke, Empty Ball Pen Refill, Thick Paper, PVC small Stoper.

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						helps to keep the hula-hoop up on your body while gravity pulls it down. • In case of our mechanical hula hoop, your waist motion is replaced by the spinning motor which hits the paper disc and provides the necessary force to spin it and supposedly defy gravity. • Decorate the ball and discs such that they actually look like saturn and its rings. Try with different shapes of rings. The hole also doesn't have to be circular. Try with a square hole instead.	
17	**EVS and Science**	**2D motion, Vibrations, Force, Circular Motion**	**Grade 9 & 11** • Can understand and apply the concept of force and circular motion. **Grade 11** • Can understand the concept of force and circular motion.	Pencil spinner To buy, visit: https://ccl.iitgn.ac.in/order		• As you rub the stick on the pencil, vibrations are generated in the pencil. These vibrations rotate the paper square at the end of the pencil. • The square can be rotated in two directions. Play with the toy and figure out how you can rotate it in a particular direction. • Would the square still rotate if you hold the pencil firmly below the notches?	

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18	**EVS and Science**	**Sound, Vibration**	**For Class 5** • Can understand the concept of working of musical instruments in a playful manner. **Grade 6 -10** • Can understand and demonstrate the phenomenon of sound generation through vibration.	Puppeteer whistle To buy, visit: https://ccl.iitgn.ac.in/order		• Sound is produced when something vibrates. The vibrating body causes the medium around it to vibrate (air in this case) and you hear the sound. The paper strip has some space to move up and down due to the placed matchstick. When you blow, the paper strip vibrates up and down very quickly - producing the sound. • Modify the same model- use different types of paper strips, different width of paper strips, plastic instead of paper, different thickness of matchstick, etc.	• 2 Ice Cream Sticks, Rubber Band, Match Stick.
19	**EVS and Science**	**Friction**	**For Grade 1 & 2** • Enhanced language competency through story telling. **For Grade 6 to 8**	Rabbit train To buy, visit: https://ccl.iitgn.ac.in/order		• The string loop passes from the sides of the matchbox. When you pull the left side of the string, matchbox tilts to that side and gets aligned with the thread. In this situation, normal force acting on the right string increases. Hence, the frictional force also increases between the right string and the matchbox.	• Rabbit Image • Thread

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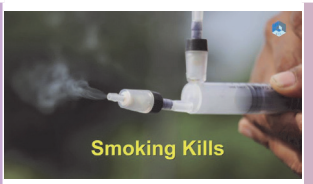
			• Exhibits creativity in designing models using eco-friendly resources. • Understands to concept of friction.			• Therefore the matchbox holds its position for the right string and moves on the left thread. The mechanism moves only in one direction and you will have to bring it back once it reaches the end. • If there is no friction, would it move at all?	
20	**EVS and Science**	**Pressure, Harmful Effects of Smoking, Valves**	**Grade 4** • Concept of air pollution. **Grade 6 to 10** • Plans and conducts investigations or experiments to arrive at and verify the facts, principles, phenomena of pressure. • Relates processes and phenomena which causes pressure at valves due to	Smoking kills To buy, visit: https://ccl.iitgn.ac.in/order		• When the cigarette is finished, you can see the black, greasy tar deposited on the cotton. The syringes also become brown in colour, due to deposition of tar. • Weigh the model before and after the experiment. A single cigarette results in deposition of 27 mg of tar! For unfiltered cigarettes, (beedi), 55 mg tar is deposited for the same amount of smoking. • This tar sticks inside the lungs when somebody smokes a cigarette. Over time, a healthy pink lung turns grey and eventually becomes black as more tar	• 10ml Syringe, 5ml Syringe, 2 One way valve, Glue

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			smoking exhibits values of rational thinking while taking decisions, respect for life.			• accumulates. This results in lung diseases such as emphysema, chronic bronchitis, and lung cancer. • The tar also paralyzes the cilia in the lungs. Cilia are tiny, hair-like structures that line the trachea. They help trap pollutants, but when they're damaged, the toxins in tar can travel deeper into the lungs. The toxins are also carried into the bloodstream and begin moving to other parts of your body. They can affect every organ in the body and beyond cancer, can lead to heart disease, diabetes etc.	
21	**EVS and Science**	**Newton's Third Law, Torque**	**Grade 9 -** • Can understand the concept of law of motion. **Grade 11-** • To understand the concept of torque.	Straw spinner To buy, visit: https://ccl.iitgn.ac.in/order		• When you blow air inside the straw, it goes to the spinner straw as the end of the blowing straw is closed by fingers. The air comes out from the two cuts in the spinner straw. This air pushes the straw in opposite direction. This is called Newton's third law of motion. • Newton's third law says that whenever you apply a force on any object, the object applies the same force on you, in the opposite direction. In this case,	• Straw, Kabab Stick, Cello Tape

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						the object on which you are applying force is the air. And the air applies the same amount of force on the straw, in the opposite direction. The air would exert force on the straw in the direction opposite to the flow of air. The diagonally opposite cuts would ensure that both the forces try to rotate the straw in the same direction. • Try changing the direction of rotation of the straw. • Can you rotate it with only hole in a spinner straw? You will observe that at the start, If the open slit of blowing straw is facing the closed end of spinning straw, it will not spin. • Can you do some modification in the blowing straw to make the toy spin in any starting position? • An interesting observation is that even though there is a lot of open space for air to go out from the junction of two straws, it only goes towards spinning straw and finally comes out of the holes. This is due to the low pressure created because of the high speed of air (Bernoulli's principle). The	




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						surrounding atmospheric air will also enter from the junction of two straws due to this low pressure. You can observe that by holding a paper strip near the junction. The strip will bend towards the junction. • The same thing can be seen in a gas stove. The pipe connecting the gas inlet to the burner is open (just after the nozzle). Still no gas spreads in the room. On the contrary, the atmospheric air (which contains oxygen) is mixed with the LPG gas, helping it to burn efficiently. • Attach this straw spinner at the end of the Double Straw Spinner and you can make a hybrid spinner.	
22	**Maths**	**Geometry, Patterns To create designs within the circle**	**Grade 4 & 5** • Can correlate diameter and radius. • Can find the area and circumference.	Curve stitch cardioid To buy, visit: https://ccl.iitgn.ac.in/order		• Notice your mug carefully the next time you go for coffee. The light from the bulb is reflected inside the mug and forms a bright arc on the coffee - and it looks suspiciously like a cardioid curve!!	• MDF Sheet • Thread

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• In this toy, connections are formed between (n, 2n) pair. The curve form by making paired connections by multiplying the number with 2 is called a cardioid. • A cardioid is a curve traced by a point on the perimeter of a circle that is rolling around a fixed circle (radius of both circles are the same). • In this toy, which curve do you get by forming between (n, 3n) pairs? This curve is called a nephroid, which is traced by a point on the perimeter of a circle that is rolling around a fixed circle (radius of the fixed circle is double the rotating circle).	
23	**EVS and Science**	Mechanical Advantage	**GRADE 8-9** • The learner understands the concept of Mechanical Advantage and relates it to the knowledge of machines in real life situations.	Gear jack To buy, visit: https://ccl.iitgn.ac.in/order		• In a normal car jack, you have to spin the screw for a long time and and then jack moves up a little distance. The jack therefore provides mechanical advantage and you are able to lift the car easily.	• MDF Sheet, Rubber Bands.




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• In this deployable structure, a small rotation of the gear results in a large movement of object at the top - due to the scissor-like structures. The more scissors you add at the top, the more distance is covered in a single rotation of the handle. • So what's the catch? Can you add as many scissors as you want? No. The more the number of scis sors, the more effort required to rotate the handle! Therefore, this machine can be said to have negative mechanical advantage. • This is also used in various real-life applications where you want to increase the amount of movement/rotation, for example, the hand blender. You have to move the handle for a small distance and the blender rotates for a long time. • But always remember that if the distance is increased, you'll have to exert a large amount of force (for example, a gear cycle in a higher gear). There is really no such thing as a free lunch!	

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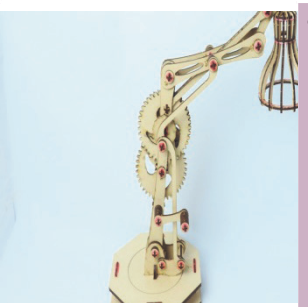
24	**EVS and Science**	Gear mechanism, Mechanical Advantage, Circular to Linear Motion, Dynamic Mechanism	**Grade 9** • The learner understands the concept of linear motion and circular motion.	Gear lamp To buy, visit: https://ccl.iitgn.ac.in/order		• The gear system in the lamp is arranged in such a way that it gives mechanical advantage during the motion of the lamp. The handle is attached to a small gear which in turn is connected to larger gears. The whole arm containing the gears also moves along with movements at joints. When the arm rises, the angle of the lamp holder also changes, all from a single source of rotation. • Calculate the gear ratio for every gear combination involved in the model. The gear attached to the handle is 4 times smaller than the next connected gear. Therefore, the gear ratio is 4. Similarly, the next gear assembly has a gear ratio of 4. So overall the gear lamp has a gear ratio of 4 x 4 = 16. • The children can assemble the parts to make a gear lamp as an activity.	• MDF Sheet, Rubber Bands.

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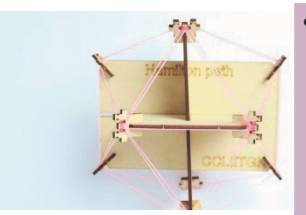
25	**Maths**	Geometry, Logical Reasoning, Creative Thinking	**GRADE** It is an interesting model but does not match with the syllabus at present in secondary level. Though, it is a very creative model of Mathematics) for additional learning	Hamilton Path To buy, visit: https://ccl.iitgn.ac.in/order		• A path that visits each vertex exactly once is called a Hamiltonian path. The corners of three interlocking golden rectangles (the length and breadth are in golden ratio, 1.618) form the vertices of an icosahedron, one of the five Platonic solids. Icosahedron has five triangular faces meeting at each vertex. All the five platonic solids have hamiltonian cycle connecting their vertices. • Explore Hamiltonian path for other Platonic solids. • Can you figure out a path in icosahedron which covers all the edges exactly once? • Note that in the Hamiltonian cycle, you covered all the vertices, not the edges. An Eulerian path is a trail that visits every edge exactly once (allowing revisiting of vertices). • Among all the Platonic solids, only Octahedron can have Eulerian path. While solving the famous Seven Bridges of Königsberg problem, Euler showed a graph can have an Eulerian path only if all the vertices in the graph have an	• Mdf Sheet, • Thread, • Rubber Bands

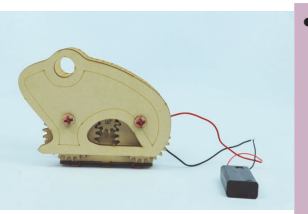
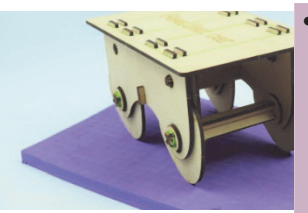
S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						even degree (which means the number of edges connected at a vertex). In Icosahedron, 5 edges meets at all the 12 vertices, hence it can't have Eulerian path.	
26	**EVS and Science**	Pressure, Pascal's Law, Mechanical Advantage, One-way Valve, Force	**GRADE 9 and 10** • The learner understands the working of Hydraulic JCB, recalls the knowledge of concepts like Pressure, Force, Pascal's Law. • The learner correlates the same with the real life situations.	Hydraulic JCB To buy, visit: https://ccl.iitgn.ac.in/order		• The classic definition of a machine is anything that makes our work easier. Alternatively, the ratio of the force produced by a machine to the force applied to it must be greater than 1. This ratio is called the mechanical advantage of the machine. In this JCB, the syringes in your hand (which are used to control the JCB) are smaller than the syringes fitted in the arms of the JCB. • Can you notice that the smaller syringe have to be pushed multiple times to move the bigger syringe for a small distance? This is what gives this machine its mechanical advantage. You require a smaller force to push the smaller syringe. But this same force is multiplied at the other end and moves the bigger syringe. This is called Pascal's law. According to Pascal's Law,	• MDF Sheet, Felxi pipes, Syringes.




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						pressure change at any point in a liquid (like water or oil) is transmitted throughout the liquid such that the same change occurs everywhere. As the area at the other end is more, this same pressure results into a bigger force (Force = Pressure x Area). • Hydraulic lift used to lift cars at car washes is also based on Pascal's law. But how is a small force able to lift a car? Where does the energy come from? Actually you spend the same amount of energy in lifting the car. It's just that the small force is applied for a larger distance. The lifting piston moves a large distance in downward direction to lift the car slightly upwards. Similarly, you need to move the smaller piston for a long distance to push the bigger syringe forward for a small distance.	

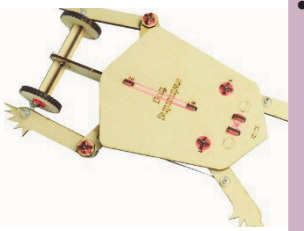
S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• This is where the one-way valves come in. To completely fill the bigger syringe, you need to move the smaller syringe multiple times. And when the smaller syringe is pulled back, you want the water to come from the reservoir (glass or bottle) and not from the bigger syringe. The valves don't allow water to flow back from the bigger syringe to the smaller syringe. And slowly, the syringe is filled completely with water! • Have you ever tried the gear bicycle? How are you able to climb up a hill using a gear bicycle compared to a normal one? Where does the extra energy come from? The gear bicycle surely doesn't have a battery or engine. Relate it to the JCB we just discussed. • Try changing the size of the syringes and see the difference. What happens if you insert a bigger syringe at the input and a smaller syringe at the out-put?	

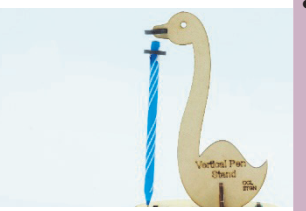



S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
27	**EVS and Science**	Distance, Speed and Time, DC Motor, Circular to Linear Motion	**GRADE 8, 9 and 10** • It is an innovative toy for learners. • They can correlate the concepts of distance, speed ,time, DC motor by hands on activity. • The learner also recognises how circular motion is changed into linear motion.	Mechanical frog To buy, visit: https://ccl.iitgn.ac.in/order		• With every rotation of the motor, the frog moves forward for a small distance. When the frog-shaped pieces touch the ground, they act like an anchor and the body of the frog moves forward. In the next cycle, the body touches the ground and the frog-shaped pieces are displaced forward. This cycle repeats and the frog keeps hopping forward! • How much does each leg move in one step (in terms of the radius of the gear)? • Organize a race for different frogs (you can also make other frogs by cutting card board in shapes given in the MDF sheet.)	• BO Motor, Electic wire, Battery Cell Holder, MDF Sheet.
28	**Maths**		• It is a useful and creative toy. **Grades 4 to 8** • The student	Rouleaux's car To buy, visit: https://ccl.iitgn.ac.in/order		• If you put a book on a triangle (or a square) and rotate it, the book would move up and down. What should you use to keep the book at the same level? The first choice is a circle. But can you think of any other shape which would be of constant width?	• MDF Sheet • Rubber Bands

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
			differentiates among different geometrical identies and shapes like triangle, square and circle. • The student identifies those circular shapes of the wheels which help in increasing the speed of the car.			• The wheel is formed by rounding the sides of an equilateral triangle. This shape is called the Reuleaux triangle. • The Reauleux triangle is called a curve of constant width. It means that for every pair of parallel lines touching the shape without crossing it, it will always have the same distance from each other. Add another pair of supporting parallel lines to the old ones and we obtain a square. The wheel performs a complete rotation while staying within the square and at all times touching all four sides of the square. • Take a circular wheel of diameter 7 cm and a Reauleux triangle, also of width 9 cm. Compare the perimeters of both shapes. • Can you create the constant width shape from the regular pentagon? Is it necessary that the pentagon should be regular? • People have made real bicycles with Reauleux triangles as wheels, literally reinventing the wheel!	

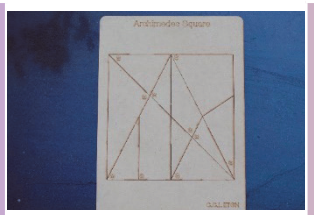
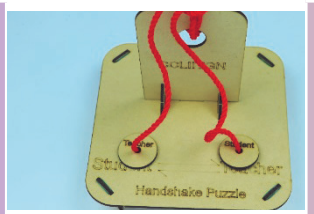
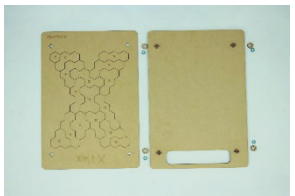



S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• There are also solids of constant width. The obvious one is the sphere but if you make a solid by rotating the Reauleux triangle, the resulting solid would also be of constant width. You can also make a solid of constant width starting from a tetrahedron (Meissner tetrahedron). • The area of any solid of constant width is π x (height)	
29	EVS and Science	Mechanics, Gears	• Can understand the concept of conversion of circular motion to linear motion.	Swimming frog To buy, visit: https://ccl.iitgn.ac.in/order		• The legs of the frog are connected to the rear wheel such that when you push the frog forward, the legs make a linear motion. They move forward and backward, mimicking the swimming movement of legs. • So circular motion is converted into linear motion. The legs, in turn, are connected to the hands which also move when you move the frog. And the frog looks like swimming on the floor. • Make similar toys using cardboard. Cut out the pieces and make different motions.	• MDF Sheet • Cycle Spoke • PVC small stopper • Rubber Bands

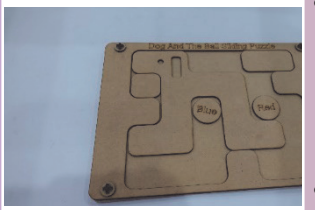
S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
30	EVS and Science	Geometry, Trigonometry	• Can understand basic trigonometry and projection.	Tilt stick To buy, visit: https://ccl.iitgn.ac.in/order		• The stick passes through the hole, but not all at the same time. First the bottom part goes in, and then gradually the entire stick passes through the hole. If the entire stick had to pass through at the same time, the hole had to be a straight line. But as different parts of the stick pass at different times, the hole is a curved slot. • The projection of a line on a plane is generally a line, and not a curve. Because the stick is slightly tilted and generates a shape called hyperboloid while rotating. The projection of this hyperboloid on a plane is a hyper bola. Therefore the hole you see is in the shape of a hyperbola. • Although hyperboloid is a (doubly) curved surface, it can be made entirely with the help of straight lines.	• MDF Sheet • Rubber Bands
31	EVS and Science	Magnetism, Simple Harmonic Motion, Stability	• Can understand simple harmonic motion with the help of magnet.	Vertical pen stand To buy, visit: https://ccl.iitgn.ac.in/order		• The magnets of the pen stand and the pen are placed such that they attract each other. This means that the opposite poles of the magnet (north-south) face each other.	• 2 Ring Magnet • Pen • Small Rubber Band • MDF Sheet

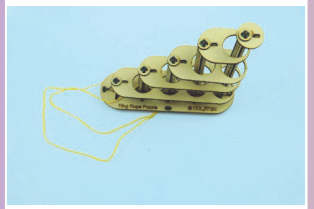
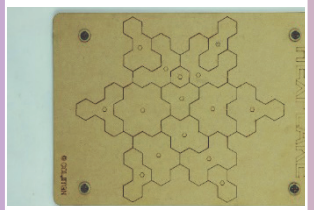
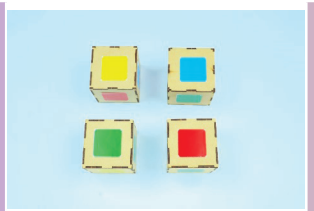



S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• How much should be the force of attraction between the magnets to keep the pen vertical? • This pen stand is an example of a stable equilibrium. The upright position is the equilibrium position as the force of gravity is balanced by the normal reaction from the ground. Whenever the pen tries to move away from the equilibrium position, the magnetic force brings it back. If the magnets are in repelling position, the equilibrium is not stable. Even in this case, the equilibrium position is the upright position as the force of gravity (and some downward repulsion force) is still balanced by the normal reaction from the ground. But it is an unstable equilibrium. As soon as the pen moves away from the vertical position, the magnetic repulsion force sends it further away from the equilibrium point, instead of bringing it back.	

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
32	Maths	Geometric shapes, Critical Thinking, Logical Reasoning	• Explore various permutation and combinations to make the required figure.	Archimedes square To buy, visit: https://ccl.iitgn.ac.in/order		• How many unique ways can you arrange the pieces to make a square? This problem of computational geometry was only recently solved by a mathematician from Cornell University, Bill Cutler. He showed that there are a total of 17,152 solutions.	
33	Maths	Spatial Thinking, Logical Reasoning, Hand Eye Coordination	• Eye and hand coordination.	Handshake Puzzle To buy, visit: https://ccl.iitgn.ac.in/order		• If you see carefully, the rope goes through the hole to the other side but again comes back to the initial side of the partition. Therefore, it looks impossible at first, but if you keep at it, you will surely succeed!"	• MDF Sheet • Thread • Rubber Bands
34	Maths	Spatial Thinking, Logical reasoning, Geometric Shapes	• Identifies the figures and patterns. • Explores multiple solutions to solve the puzzle.	X-Hex puzzle To buy, visit: https://ccl.iitgn.ac.in/order		• This puzzle consists of 16 polyhexes. Each piece has hexagons ranging from 1 to 5 which can be joined to make a shape resembling a big X. • This puzzle uses the monohex, the dihex, the three trihexes, and the ten one-sided tetrahexes, for a total of 52 hexagons. • Can you figure some pattern to create multiple solutions? • The total number of shapes possible by joining different hexagons increases exponentially with the number of hexagons.	• MDF Sheet • Rubber Bands




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
35	Maths	Spatial Thinking, Logical Reasoning, Hand Eye Coordination	• Develops logical reasoning. • Develops creative thinking.	Arrow sliding puzzle To buy, visit: https://ccl.iitgn.ac.in/order		• At the beginning, all the nine pieces are contained in a 3 x 3 grid with arrows pointing inwards. The challenge is to slide the pieces so that all the arrows point outwards. You can only slide the pieces to the empty cells. Notice that there are two types of cells in the puzzle - (i) 9 square-shaped cells in 3 x 3 grid and (ii) 2 square cells with rounded corners at the top and bottom of the grid. • The puzzle pieces are also of two types. Among the total nine pieces, only 3 have rounded corners which can fit into the top and bottom cells.	• MDF Sheet • Rubber Bands
36	Maths	Spatial Thinking, Logical Reasoning, Hand Eye Coordination	• Develops eye and hand coordination. • Develops critical power.	Dog and ball sliding puzzle To buy, visit: https://ccl.iitgn.ac.in/order		• In this sliding puzzle, the dog looks like he's playing with a ball. The goal is to exchange the position of the two balls by sliding the pieces. • To start the puzzle with an easy level, you can remove the large and small obstacle pieces. After solving this, you may put them back into position and count the number of moves it takes to exchange the balls!	• MDF Sheet • Rubber Bands,

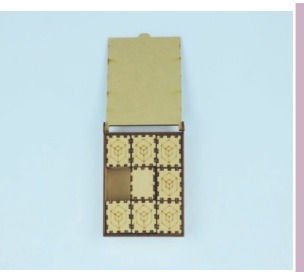
S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
37	Maths	Binary Counting, Power of Exponent, Logical Reasoning, Spatial Thinking, Hand Eye Coordination	• Develops logical reasoning.	Ring rope To buy, visit: https://ccl.iitgn.ac.in/order		• The goal is to remove the rope from the puzzle. This is called a disentanglement puzzle, a type of mechanical puzzle that involves disentangling one piece of puzzle from another. The reverse problem of reassembling the puzzle can be as hard as—or even harder than—disentanglement. • A similar puzzle involving disentangling rings from a rod was originally used by French peasants to lock their suitcases.	• MDF Sheet • Thread • Rubber Bands
38	Maths	Spatial Thinking, Logical Reasoning, Geometric Shapes	• Explores alternative/ multiple solutions of a problem.	Hexflake To buy, visit: https://ccl.iitgn.ac.in/order		• Take all the pieces out and try to rearrange them inside the 'Hexflake' to solve the puzzle - take the picture of your solution and try to solve it in another way. • This puzzle uses the three trihexes and the seven tetrahexes, for a total of 37 hexagons.	• MDF Sheet • Rubber Bands
39	Maths	Critical Thinking, Logical Reasoning, Permutation and Combination, Spatial Cognition	• Explores various combinations and permutations to find a solution.	Stack it up To buy, visit: https://ccl.iitgn.ac.in/order		• You have four cubes with four different colors on each cube. And you have to stack the cubes in a column such that there is a different color on the	• MDF Sheet • Hard Glue • Stickers

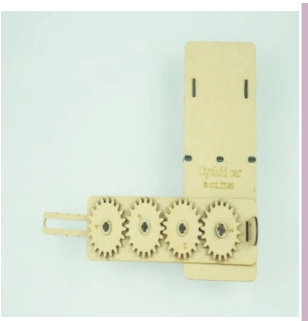



S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						all the four sides of the column. With 24 positions of each cube (6 faces and 4 positions), it makes a total of 3,31,776 possible arrangements (24x24x24x24). • Clearly, lot of trial and error is required to get to the solution but there is a way to solve this in eight moves or less by applying graph theory! • You can create your own version of the puzzle by coloring the cubes differently. The only constraint is that all cubes should have at least four colors. • But out of all these possible versions, ony 10% are solvable. So make your your puzzle and try your luck!	
40	Maths	Spatial Thinking, Mensuration, Pythagoras Theorem, Area of Triangle, Square,	• Understands the concept of mensuration.	T-puzzle To buy, visit: https://ccl.iitgn.ac.in/order		• Using the 4 pieces, create the capital letter 'T' without gaps or overlaps. Record the amount of time it takes you to do so. Take it a step ahead by trying to make shapes other than T, there are a 100+ possibilities!	• MDF Sheet

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
		rectangle, Parallel-ogram, trapezium, Logical reasoning Geometric Shapes, Hand Eye Coordina-tion					
41	Maths	Spatial Thinking, Logical reasoning, Geometric Shapes	**Primary** • Acquires understand-ing about 2D shapes.	Tangram To buy, visit: https://ccl.iitgn.ac.in/order		• Take out the pieces from the sheet and rearrange them to form the different patterns.	• MDF Sheet
			• Fills a given-region leaving no gaps using a tile of a giv-en shape.			• The only proven strategy for solving tangram problems is trial and error -- rearranging the shapes in multiple com-binations until the answer strikes you. • There are two conditions, however, that you must keep in mind while making these arrangements - you must use all the pieces and none of the pieces can overlap.	

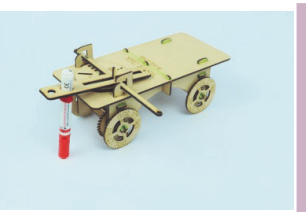



S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
42	Maths	Critical Thinking, Logical Reasoning, Permutation and Combination, Spatial Cognition	• Puzzle solving skills • Develops critical thinking, logical reasoning spatial cognition at different levels. • At a higher level used for understanding permutation and combination. .	Up it up To buy, visit: https://ccl.iitgn.ac.in/order		• The puzzle consists of eight identical cubes in a 3 x 3 grid with an empty middle cell. You can roll a cube at a time into the empty space. A move consists in rolling a cube to an empty cell and the aim is to invert all eight cubes upside down. In how many moves you can solve this puzzle? • The creator of the puzzle, John Harris, has reported a 38-move solution to this puzzle. In reference to the empty cell, the cubes are named up, down left and right (U, D, L, R). Roll the cubes according to the sequence given below: • URDL, DRUL, LDRR, UULD, RUL; LDR, ULDD, RRUL, LDRU, LURD • Each cube has 6 sides. Therefore eight cubes have 6^8 = 1,679,616 possible orientations. In the 3x3 grid, possible number of positions will be 9 x 6^8 = 15,116,544. This is the possible number of orientations you can have with the 8 cubes! • Try to find a solution having moves lesser than the given solution (of 38 moves).	• MDF Sheet • Hard Glue

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
43	EVS and Science	Trigonometry, Circle, Rolling of a Circle	**Upper primary / Secondary -** • Relating translation motion and Rotational motion.	Cycloid car To buy, visit: https://ccl.iitgn.ac.in/order		• A cycloid is the curve traced by a point on the rim of a circular wheel as the wheel rolls along a straight line. In the car, the cycloid curve is generated when the length of the rotating stick is equal to the diameter of the car wheel. You can also change the length of the rotating stick holding the pen and get different kinds of curves (called trochoids). • In this case, the gears connecting the axle and the rotating disc have same number of teeth. What would happen to the curve if the number of teeth in both gears is different?	• MDF Sheet • Rubber Bands
44	Maths (secondary)	Probability	**Secondary** • Calculates empirical probability through experiments.	Non-transitive dice To buy, visit: https://ccl.iitgn.ac.in/order		• Out of the 3 dice, you can always find a dice which can beat the other one! • In this case, Dice A will beat Dice B, Dice B will beat Dice C but Dice C will beat Dice A. • Take out the pieces from the sheet and make two sets of dice A, B, and C. For the first part of the game, take only one set (one dice of each kind - A, B and C) and keep the second set aside. The first player chooses	




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						any one dice from the set and second player would choose from the remaining dice. Both players roll their dice. The player who rolls the higher number wins. Play this game atleast 20 times. Note down the winning dice each time. • Try other combinations of dice (A vs B, B vs C and C vs A) and find out which dice is most powerful. • The dice A, B and C are called non-transitive dice. A set of dice is nontransitive if A is better than B, B is better than C but then C is better than A. So the order of the dice is cyclic and there is no single dice which can trump the other two dice. • A>B>C>A. • This is like the game of rock-paper-scissors where scissors can win over paper, rock over scissors and then paper over rock. Just like our dice, no option is the best in this game.	• MDF Sheet • Hard Glue

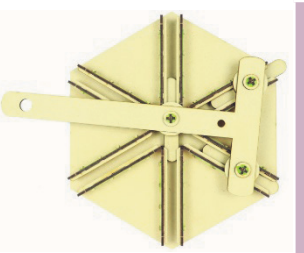
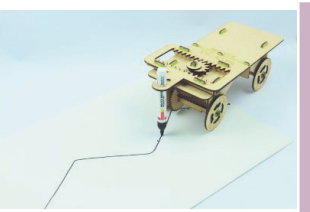
S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• If we calculate the probability of A winning over B (and B over C and C over A), it is 7/12. It can be seen by drawing the different outcomes of the dice and seeing which dice would win in each outcome. • Now take the second set also in the game. Now you have two copies of each dice A, B, and C. Now each player chooses two dice (both of them should be same. For example, a player can choose both A dice but can't choose one A and one B dice). • The sum of two dice would be compared for both the players. In this case, we would see that the cyclic order would get reversed. This means that now A<B<C<A	
45	Maths	Trigonometry, Definition of Sine Curve, Length of an arc	**Higher secondary** • Can understand the sine curve in trigonometry, trigonometry with a unit circle and simple harmonic motion in physics.	Sine wave car To buy, visit: https://ccl.iitgn.ac.in/order		• The gear fixed on the axle of the car rotates with the wheels of the car in the same vertical plane. Another gear is joined to this gear in the horizontal plane. A circular disc is attached with this gear on the top. Therefore, this disc rotates in the horizontal plane when the car moves in any direction. The stick on the disc moves	• MDF Sheet • Rubber Bands




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
			At secondary level: • A toy which can be used for gifted students and extended learning. • Children can be given the idea of concepts used at higher levels.			the module on the top (on which the pen is attached) in a straight line. So the car moves forward and the pen moves in a perpendicular direction to it. So theoretically, the car could make any curve. So why does it make the sine curve? • Because it is the definition of a sine curve. When the wheel of the car moves θ, the car moves rθ (r is the radius of the wheel) in the forward direction. And the module shifts Rsinθ (R is the radius of the top disc) in the perpendicular direction to the mo tion of the car. The pen, therefore, draws the graph of Rsinθ vs rθ which is a sine curve. (y = Rsinθ ; x = rθ • y = R. sin(x/r) which is the equation of a sine curve. • Try changing the amplitude and frequency of the curve. What effect would you see on the curve if the wheels of the car were made smaller? • How does the gear ratio (ratio of number of teeth of two gears) affect the frequency of curve?"	

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
46	Maths	Ellipse, Four Bar Mechanism	**Higher secondary** • Can draw and understand ellipses of different sizes . **At secondary level:** • A toy which can be used for gifted students and extended learning. • Children can be given te idea of concepts introduced at higher level .	4 trammel To buy, visit: https://ccl.iitgn.ac.in/order		• You can draw an ellipse using this trammel of Archimedes. The two shuttles move back and forth in perpendicular channels and the end point of handle moves in an ellipse. • A trammel is a mechanism that generates the shape of an ellipse. Archimedes developed this great device 2000 years back to draw an ellipse. • It consists of two shuttles which are confined ("trammelled") to channels (or rails) and a rod which is attached to the shuttles at fixed move back and forth, each along its channel, the end of the rod moves in an elliptical path. The handle goes round and round. The pieces look like they would crash into each other but they never do. It is also similar to the motion of a 4-stroke engine and crankshaft. • You can change the shape of the ellipse (called the eccentricity) by moving the point where the pen is attached. Can you find out the point where the pen would draw a circle? • You can also prove mathematically that the locus of the pen is an ellipse.	• MDF Sheet • Rubber Bands




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• x = (p+q) cosΘ • y = q sinΘ • Therefore, x^2 / (p+q)^2 + y^2/ q^2 = 1 • It is also an example of a lever that switches back and forth from a first class lever to a second class lever.	
47	Maths	Ellipse, Six Bar Mechanism	**Higher secondary.** • Can draw and understand ellipses of different sizes. .	6 trammel To buy, visit: https://ccl.iitgn.ac.in/order		• This is another version of the trammel of Archimedes. It has three shuttles instead of two which move in different channels to produce an ellipse. • The shuttles move along three axes. There is a major axis and other two are at offset of 120°. Can you identify which one is the major axis?	• MDF Sheet • Rubber Bands
48	Maths	Trigonometry, Length of an arc	**For extended learning** • A toy which can be used for gifted students and extended learning. • Children can be given te idea of concepts introduced at higher level. .	Triangular wave car To buy, visit: https://ccl.iitgn.ac.in/order			

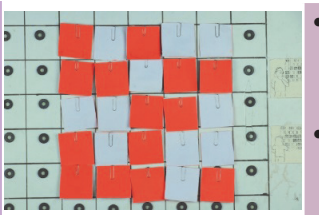
S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• The gear fixed on the axle of the car rotates with the wheels of the car in the same vertical plane. Another gear is joined to this gear in the horizontal plane. A circular (sector of a circle) disc is attached with this gear on the top. Therefore, this disc rotates in the horizontal plane when the car moves in any direction. • The stick on the disc moves the module on the top (on which the pen is attached) in a straight line. So the car moves forward and the pen moves in a perpendicular direction to it. So theoretically, the car could make any curve. So why does it make the triangular curve? • When the wheel of the car moves θ, the car moves rθ (r is the radius of the wheel) in the forward direction. And the module shifts Rθ (R is the radius of the top disc) in the perpendicular direction to the motion of the car. The pen, therefore, draws the graph of Rθ vs rθ which is a triangular curve (y = Rθ ; x = rθ • y = R. (x/r) = (R/r). x, which is the equation of a straight line)	• MDF Sheet • Rubber Bands




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
49	Maths	Trisection of Angle, Congruency of Triangles	**Middle and secondary level** • Extended learning for trisection of angle.	Trisector To buy, visit: https://ccl.iitgn.ac.in/order		• This mechanism for trisecting an angle is called the Laisant's Compass, proposed by M. Laisant in 1875. • The lengths are chosen so that OB = OC = OD = OA and CS' = BS' = AS = DS, with S and S' as joints permitted to slide in straight grooves along the two trisecting bars. • Therefore, △OBS', △ODS and △OAS are congruent. Hence, ∠BOS' = ∠DOS = ∠SOA, dividing ∠BOA in three equal parts.	• MDF Sheet • M3 Nuts
50	EVS and Science	Laws of Lever	**Class 8 to 10:** • Conducts simple investigations to seek answers to queries. **Class 10** • Applies scientific concepts in daily life and solving problems.	Lever system To buy, visit: https://ccl.iitgn.ac.in/order		• A lever amplifies an input force to provide a greater output force. The ratio of the output force to the input force is called the mechanical advantage of the lever. The effort arm is equal to the distance from the fulcrum to the point of applied effort, and the load arm is equal to the distance from the fulcrum to the load weight (which is to be lifted). • Effort (force applied by you) multiplied by the length of the effort arm is equal to the load multiplied by the length of the load arm. This means that the longer the effort end, the less	

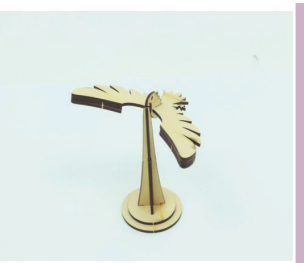
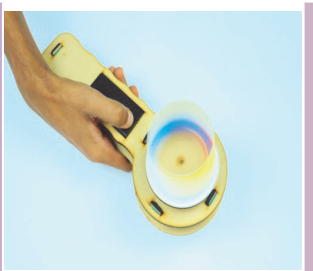
S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
			Class 11 • Plans and conducts investigations and experiments to arrive at and verify the facts, principles, phenomena, or to seek answers to queries on their own.			the force required to raise the load. Therefore, if you are trying to lift a particularly heavy stone, it is best to use a longer stick. • If two children are playing on a seesaw, and their weights are different, should the heavier child sit near the fulcrum or away from it, to balance the seesaw?	• Ring Magnets • Rubber Band • MDF Sheet
51	EVS and Science	Optics, Reflection, Plane mirror	**Class 6/7/9/10** • Explains processes and phenomena. • Applies scientific concepts in daily life and solving problems.	Periscope To buy, visit: https://ccl.iitgn.ac.in/order		• A periscope is an optical instrument that allows objects that are not in direct line of sight to be viewed. It works on the law of reflection. The light from the object falls on one mirror and is reflected. The reflected light then falls on another mirror and is again reflected and finally reaches the human eye. Therefore, the periscope is used to see objects which are directly not in sight. For example, if you are near a high wall, you can't see what's happening on the other side of the wall. But you can easily see beyond the wall using the periscope.	• MDF Sheet • 2 pieces of Mirror Acrylic, Rubber Band




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
52	Maths + Computer	Counting, Odd and Even Numbers, Patterns and Relationships, Rows and Columns, Coordinates Parity Check, Computational thinking	**Primary and upper primary** • Develops the understanding of odd and even numbers, patterns and identifies and recognizes patterns and relationship.	Card flip magic To buy, visit: https://ccl.iitgn.ac.in/order		• When data is stored on a disk or transmitted from one computer to another, • we usually assume that it doesn't get changed in the process. But sometimes things go wrong and the data is changed accidentally. This is a magic trick in which the demonstrator is magically able to figure which one out of dozens of cards has been turned over, using the same methods that computers use to figure out if an error has occurred in data transmission and storage. • Ask somebody from the audience to lay out the cards in a 5 × 5 grid. Casually add another row and column "just to make it a little harder". These extra cards are the key to the trick. While adding this extra row and column, make sure that you have an even number of colored cards in all rows and columns (keep in mind that 0 is an even number). The extra	

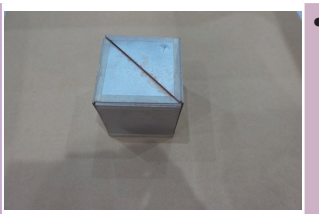
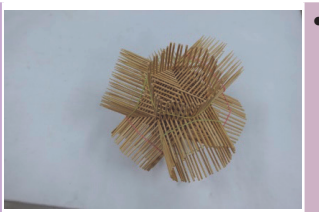
S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						card added is called the “parity” card. • Close your eyes and ask someone from the audience to flip one of the cards from the grid. After the flip, the row and column containing the changed card would have odd number of colored cards. Therefore, the intersection of row and column having odd number of colored card is the location of the flipped card. • One interesting thing to notice is that when you place the last card at the lower right corner, the even parity of the column above would automatically ensure the even parity of the row to its left. Computers also add a “parity” bit to make sure that the data hasn’t corrupted during transmission. Adding the extra parity bit helps to detect the error during storage and transmission.	

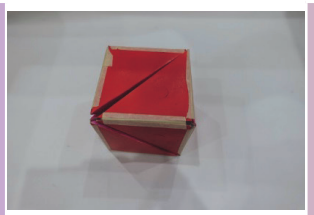



S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
53	EVS and Science	Centre of mass, centre of gravity	• Explains processes and phenomena centre of mass and centre of gravity.	Balancing bird To buy, visit: https://ccl.iitgn.ac.in/order		• Any object can be balanced on its center of mass. The bird is symmetrical on the left and right side. Therefore, the center of mass would be definitely on the center line.. By attaching the MDF parts below the wings, the center of mass comes exactly on the beak. Therefore, the bird gets balanced on the beak. When you try to balance the bird without attaching the parts below its wings, it won't balance because the center of mass would lie slightly below on the center line.	• MDF Sheet • Small Rubber Band • Glue
54	EVS and Science	Rotational motion, centripetal force, centrifugal force	**Secondary and higher secondary** • Understands processes and phenomena related to centrifugal force.	Centrifugal dustbin To buy, visit: https://ccl.iitgn.ac.in/order		• Any object, when rotated, tries to fly out due to centrifugal force. The waste particles in the paper cup will also fly out • when it starts to rotate. Due to this, the waste will stick to the walls of the cup. Even when you turn this Dustbin upside down, the waste doesn't fall down.	• DC Toy Motor • Battery Holder • Paper Cup • Glue • Rubber Band • MDF Sheet

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• Which force balances the force of gravity when you turn the dustbin upside down? The centrifugal force acts away from the center and therefore, can't balance gravity. It is the frictional force which acts in the upward direction. The normal reaction increases due to the rotation which in turn increases the frictional force.	
55	Maths	Mensuration, Alphabets, Geometry, Logical Reasoning, Critical Thinking	**Primary** • Acquires understanding about 2D shapes. • Fills a given region leaving no gaps usinga tile of a given shape.	ABCD of math To buy, visit: https://ccl.iitgn.ac.in/order		• Convert the alphabets to square! This can be done for all the 26 English alphabets. It is also a great way to understand different geometrical shapes.	• MDF Sheet
56	EVS and Science	Gear Systems	A PUZZLE : SECONDARY LEVEL: • Develops critical thinking, logical reasoning spatial cognition at different levels.	Fun with gears- India map To buy, visit: https://ccl.iitgn.ac.in/order		• The front side of the box consists of 20 squares, on which the map of India is engraved. Each square is connected with a different gear at the back. All the 20 gears are of equal size and having equal numbers of teeth. At the back side, all the gears are connected with its upper. lower, left and right sided neighbour gears.	




S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
						• Now, attach a handle to the centre most gear or any one gear, but if it is with centre most then it will work comparatively smoothly. While rotating the handle from the back side of the box, Wall the gears will also rotate and at the front side all the square parts will also rotate. So, the map of India becomes perfectly aligned, at a particular point of position of the squares, during their rotation. • Can be used in geography lab.	• MDF Sheet
57	Maths	Geometry, spatial reasoning, cube, hexagon	**Upper primary** • Identifies various (3-D) objects like sphere, cube, cuboid, cylinder, cone.	Inside out cube To buy, visit: https://ccl.iitgn.ac.in/order		• This toy can be inverted inside out without cutting! Along the way you will also see a hexagon. Try to solve the puzzle!	• MDF Sheet • Tape
58	Maths	Geometry, spatial reasoning, hexagon	**Upper primary** • Identifies various (3-D) objects like sphere, cube, cuboid, cylinder, cone.	Hexa stick To buy, visit: https://ccl.iitgn.ac.in/order		• With simple kebab sticks, make a mesmerising 3d mesh of sticks with interweaved hexagonal cylinders!	• Kebab Sticks • Rubber band

S. No.	Area	Objectives	Grade, LO, Competencies	Toy	Visual of toy/s	Suggestive Activities/Ideas for using	Materials Required
59	Maths	Geometry, spatial reasoning	**Upper primary** • Identifies various (3-D) objects like sphere, cube, cuboid, cylinder, cone.	12 pyramid cube To buy, visit: https://ccl.iitgn.ac.in/order		• The cube can be made using 12 identical pyramids whose volume is 1/12th of the cube. Try to make the cube by turning the pieces and solve the puzzle. Along the way you will encounter other interesting shapes!	• GSM Paper • Tape
60	EVS and Science	Sound, vibrations	**Upper primary and secondary** • Understands, processes and phenomena of production of sound.	Balloon bugle To buy, visit: https://ccl.iitgn.ac.in/order		• Stretch the balloon on the mouth of the bottle by holding the pipe and blow into the pipe. You will see the membrane vibrating and a loud sound!	• Balloon • PVC Pipe • Rubber band
61	EVS and Science	Sound	**Primary and upper primary** • Conducts simple investigations and experiments to seek answer to queries. • Understands processes and phenomenon of transmission of sound.	Toy stethoscope To buy, visit: https://ccl.iitgn.ac.in/order		• Place the membrane on the chest of your friend and put your ear on the other end to hear heartbeats!	• PVC Pipe • Balloon • Rubber band • Plastic funnel • Glue




Circular issued by the Ministry of Education regarding safe use of toys

F. No. 11-29/2020-Sch.4
Government of India
Ministry of Education
(Department of School Education & Literacy)
*****

Shastri Bhawan, New Delhi
Dated the 11th February, 2021

CIRCULAR

The Government of India has taken up an initiative to use toys as a tool for education. It is felt that toys do not only entertain children, but they play an important role in their physical and mental development. Toys are helpful in stimulating children's interest, curiosity and thinking skills. The Government has initiated the process for the preparation of National Curriculum Frameworks (NCFs) for School Education and Early Childhood Care and Education under the National Education Policy, 2020, which would, *inter-alia*, include curriculum development for use of toys in pedagogy and as learning resources in pre-school and school education. Appropriate activities would be included in the toy-based pedagogy and the NCERT textbooks based on the NCFs. Implementation of the toy-based pedagogy and carrying out the activities included in the NCERT textbooks would necessitate the availability and use of various kinds of toys for the children in schools.

2. The State/UT Governments and Autonomous Organisations under the Ministry of Education would be purchasing/ preparing toys for children in the schools functioning under their respective jurisdiction. Since the toys would be used by children, it is essential to ensure that these toys are made of such material and quality as may not be harmful or hazardous to such children. The Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade has issued the Toys (Quality Control) Order, 2020 dated the 25th February, 2020 as amended vide the Toys (Quality Control) First Amendment Order, 2020 dated the 15th September, 2020 and the Toys (Quality Control) Second Amendment Order, 2020 dated the 11th December 2020 (copies enclosed) specifying the Indian Standard for toys. The provisions of the aforesaid order, as reproduced hereunder, need to be followed scrupulously while purchasing/preparing toys for pre-schools and schools, including all public and private schools in the State/UT (*It may be noted that the "Bureau" hereunder refers to the Bureau of Indian Standards*):

> "3. **Conformity to standard and compulsory use of Standard Mark** – The goods or articles specified in the column (1) of the Table below shall conform to the corresponding Indian Standard (s) mentioned in the column (2) of the Tables and shall bear the Standard Mark under a licence from the Bureau as per Scheme-1 of Schedule-II of BIS (Conformity Assessment) Regulations, 2018:
>
> Provided that nothing in this order shall apply to goods or articles meant for export.
>
> Provided further that nothing in this Order shall apply to goods or articles manufactured and sold by Artisans registered with Office of the Development Commissioner (Handicrafts), under Ministry of Textiles, Government of India.



Provided further that nothing in this Order shall apply to goods or articles manufactured and sold by Registered proprietor and Authorized user of a product registered as Geographical Indication by the Registrar of Geographical Indications, Office of Controller General of Patents, Designs and Trademarks (CGPDTM), under Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India.

4. **Certification and enforcement authority** – The Bureau shall be the certifying and enforcement authority for the goods or articles specified in column (1) of the following Table:

TABLE

Goods or articles	Indian Standard	Title of Indian Standard
(1)	(2)	(3)
Toys	IS 9873(Part 1): 2018	Safety of Toys Part 1 Safety Aspects Related to Mechanical and Physical Properties.
	IS 9873(Part 2): 2017	Safety of Toys Part 2 Flammability
	IS 9873(Part 3): 2017	Safety Requirements for Toys part 3 Migration of Certain Elements.
	IS 9873(Part 4): 2017	Safety of Toys Part 4 Swings, Slides and Similar Activity Toys for Indoor and Outdoor Family Domestic Use.
	IS 9873(Part 7): 2017	Safety of Toys Part 7 Requirements and Test Methods for Finger Paints.
	IS 9873(Part 9): 2017	Safety of Toys Part 9 Certain Phthalates Esters in Toys and Children's Products.
	IS 15644: 2006	Safety of Electric Toys.

Note: For the purposes of Table, the latest version of Indian Standards including the amendments issued thereof, as notified by the Bureau from time to time, shall apply from date of such notification."

(Anita Karwal)
Secretary,
Department of School Education & Literacy,
Government of India
Tel. 011- 23382587 011- 23381104

1. All States and Union Territories (Secretary, School Education).
2. Chairman, CBSE.
3. Director, NCERT.
4. Commissioner, KVS.
5. Commissioner, NVS.
6. Joint Director, CTSA.
7. Director, Bal Bhawan. New Delhi.




Copy to:

Secretary, Ministry of Women & Child Development, Shastri Bhavan, New Delhi. They may like to issue similar instructions for Anganwadis.

Copy, for information, to :

Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade (Sh. Anil Agrawal, Joint Secretary), Udyog Bhavan, New Delhi.

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2022