

# Annexure 1

## JODO GYAN KIT

### Introduction

Mathematics has been feared by people over the centuries. Today also countless children in our country fear Mathematics. It is felt as a dry and difficult subject. Yet we feel that mathematics is imperative part of our curriculum as it develops reasoning and logical thinking. It leads us to see beautiful patterns and symmetries in the world around us. It empowers us to understand the mysteries of the world- whether of astronomy or of genetics. It also helps us to participate in today's world as responsible citizens by critically examining various issues.

How do we make this birthright of every child a real possibility- that is the challenge?

### Need for Math Kit

We strongly believe that by changing the way we teach in the class, we can help children to eradicate Math Phobia from their minds. To make Mathematics understandable and more enjoyable for the children Jodo Gyan Math Kit has been introduced. The main aim of using these kits is to facilitate children to understand that Mathematics is not just collection of rules for any basic operation such as addition or multiplication but a way of thinking and reasoning.

### Learning Outcomes of Math kit

The children develop;

- Number sense
- Numeral recognition
- Forward counting
- Backward Counting
- Four basic operations
- Fractions
- Tables
- Geometrical shapes
- Spatial understanding
- Place Value
- Addition and subtraction facts
- Decimals
- Factors & Multiples
- H.C.F & L.C.M
- Solving puzzles
- Measurement
- Patterns & symmetry
- Estimation

- Area
- Perimeter
- Square & Cube Numbers
- Solving word problems
- Mental Arithmetic
- Sorting
- Lines and Angles

## Use of Math Kit material given to students

- **Aakar Parivar**: Aakar Parivar contains five different shapes: circle, semi-circle, square, rectangle, and triangle, each in different colours. These shapes give small children a mathematically rich environment to develop the important pre-number concept of seriation. Children enjoy making a line of the same shapes which they can be encouraged to arrange in increasing or decreasing order of size
- **Ganit Rack - double/single rod**: Ganit rack aims at developing number sense. This helps children to automatize addition and subtraction up to 20. The children become acquainted to number facts up to 10.
- **Jodo blocks**: Jodo blocks or Jodo cubes can be connected on all six sides. The cubes can be used to develop number sense, counting, addition, subtraction, multiplication, area, odd numbers, even numbers and square numbers, cube numbers and lot more.
- **Searching for 100**: It is a board game to develop a sense of the ten-base structure of our number system. The game is expected to be played by those who have some familiarity with numbers up to 100 but may not be very thorough with the number facts of 100. Playing with this number board promotes the development of number sense and a sense of relationship between numbers. Children who initially add ten, by using fingers, suddenly start adding by tens directly.
- **Ganitmala (small)**: Ganitmala helps in discovering the ten-based structure of number system and develop number sense up to 100. Ganitmala is a powerful tool which can be used to develop the mental model of number line. It also develops addition, subtraction and tables.
- **Jodo straws**: A set of 32 3-way, 12 4-way and 12 5-way connectors and 120 straws in four colours and three sizes to give children hands-on experience of constructing squares, rectangles and other polygons and to create 3-dimensional shapes of their imagination. It can be used to explore the symmetry of space and also to demonstrate simple molecular structures.
- **Place Value Cards**: These cards consist of sets of units, tens, hundreds and thousands cards to make any digit up to 4 digit number. It helps children to develop quantity value of numbers based on expanded notation.

- **Fraction Kit:** Fraction Kit helps in developing understanding of denominator, numerator and equivalent fractions. It also enhances the understanding of fraction notation including that of proper and improper fractions. It is also helpful in teaching operations on fractions.
- **Juggling:** The card and dice game for mental addition and subtraction involving number facts of 5, 8 and 2. It enhances mental agility and quick calculations. The aim of the game is for each player to win as many cards as possible by using addition and subtraction facts.

### Use of Math Kit material from Math Lab

- **Number cards:** 100 number cards with hooks to support numeral recognition. To be used along with the Ganitmala
- **Number Catchers:** It is a set of bamboo-made holding apparatus to do multiplication horizontally on the Ganitmala. With the use of number catchers, children can understand what 3 times 6 means or what 7 times 8 means. The number catcher also helps to see pattern in multiplication tables due to color coding in Ganitmala. This can also be used to develop an understanding of common multiples of 10 and other numbers.
- **Rangometry:** Rangometry kit includes triangles, squares, hexagons, trapeziums, thin rhombus and fat rhombus in 6 bright colours to make repeatable patterns called tessellations. It encourages the students to develop sense of pattern recognition, development of creativity and hands-on feeling for geometrical concepts. Using these kit children can also find the angle of each shape. They also enjoy making shapes from other shapes. This includes making bigger triangles from the smaller triangles and discovering the number pattern in it. They can also try to make other shapes such as hexagon using other shapes.
- **A Set of Three Dice - one domino, one numeral with dots and one only numeral:** These rubber dice are useful for children at the nursery level to develop cardinality and the first step towards numeral recognition. It is also helpful in developing number sense up to 5 and the meaning of zero. It is also very useful for making the transition from iconic to numeral representation of numbers.
- **Dice- Dodecahedron:** This rubber based dice with numerals up to 10 including 0 to be used for number recognition and number sense development in game activities.
- **Dienes Block:** These blocks can be for teaching place value and other operations such as decimals.
- **Math mat - 10/10:** A 10x10 specially designed rubber mat with inserts for learning the multiplication tables effortlessly.
- **Balance:** A hand-held balance with weights for children to understand the meaning of balancing, including that of equations and the need for standard units for

measurement. It contains weights of 20g, 10g, 5g, 2g and 1g. 10 Plastic cubes of 1 gm each.

- **GeoBoard:** Square plastic board with pins to understand geometric properties of polygons and circles.
- **Triangle/Quadrilateral Sorting Kit:** A set of triangles/quadrilaterals made so as to help children go over from a visual to an analytical understanding of geometrical shapes.
- **Solid Shape Box:** A set of 10 solid shapes in wood to help children learn about plane and curved surfaces and relations between 3-D and 2-D shapes through activities.
- **Tessellation Kit:** Apart from triangles, squares and hexagons, it contains pentagons, heptagons, Octagons and Dodecagons. It is useful for making patterns and discovering all the regular polygons that can tessellate.
- **Tangram:** The seven pieces of tangram challenges the child's imagination. They are cut out from a square, but they can be put together to form thousands of shapes, which can be seen to represent different objects and activities around us. This puzzle was created in China. It can be used to make different geometrical shapes such as square , triangle and parallelogram etc
- **Soma Cube:** A wooden puzzle consisting seven shapes to be put together to make cube.

## Annexure 2

# INTEGRATED APPROACH TO LEARNING

### Introduction

The globalization of education has a big impact on the entire spectrum of education, right from primary to higher education. The knowledge-linked economy demands education that is vibrant, useful and of quality. We should not teach but cultivate the *skills for learning* and also encourage independent thinking processes, to enhance critical analytical abilities of students. This is the main reason that the educationists have stressed on Integrated approach to learning as the basis of the curriculum.

### Meaning of integrated approach to learning

The integrated approach to learning implies teaching and learning by relating disciplines to a more comprehensive manner and not to teach separate subjects as to involve students in direct, purposeful and meaningful learning. The students will be provided with various approaches and flexible ways to learn content or subject with skills and attitudes as interrelated activities across the disciplines. These activities can be arranged with different styles of teaching and learning combined with technology to bring about a whole and connected matter rather than a series of separate subjects. The teacher may utilize problem – based, inquiry-based, project-based learning, and other approaches with appropriate arrangements. The students will be promoted to learn in accordance with their interests through individualized and group learning. The teacher will be a manager helping to monitor and facilitate the students and to make them becoming more independent problem-solver. Assessment and evaluation are also planned in relation with the integration scheme which can be either in a theme or a topic.

### Aims and Objectives of the integrated approach to learning

- To make teaching focused on the student's self-directed learning to fulfill his/her potentiality.
- To arrange learning activities for the inculcation of ethics and moral understandings including the development of the student's desirable characteristics.
- To arrange and provide appropriate learning environment for the promotion of happy learning.
- To develop reasoning and thinking skills amongst the children.
- Imbibe in students mind learning process that gives exposure to how to communicate intelligently.

## FAQ's

- **What is an Integrated Curriculum?**

Integrated curriculum is basically adding another element to existing materials or activities. What usually ends up happening is the child adds that element to their play or exploration. And that stimulates more curiosity and possibilities, which exercises their thinking skills.

- **How an Integrated Curriculum Helps Children Learn**

An integrated curriculum is a great idea for kids because children become more engaged in different activities that combine different skills. This type of learning is more meaningful for the children as each one feels positive about their accomplishment in the scheme of the overall project. This is a more balanced learning approach as opposed to learning an isolated subject.

- **Does an Integrated Curriculum Create Confusion?**

Some parents may fear that an integrated curriculum might somehow cause children confusion because they're dealing with more than one subject. But it really doesn't create confusion. The key is to keep it simple. As children develop their skills you can challenge them a little by adding another small element, like putting that grocery list in an envelope, which exercises fine motor skills.

- **Advantages**

There are plenty of advantages to this approach of teaching. You are encouraging children's thinking skills. And once you as a parent practice blending things together, you find it easier to think of things to add to an activity. Through one experience you are helping to develop a variety of areas in children's development.

- **Can Parents Use This Approach at Home?**

It's very possible that parents are already doing integrated curriculum without realizing it. One of the first things we do with children is we sing to them, and there we have rhythm and language, which are roots for math and reading skills. Add numbers like the song "5 Little Monkeys" and you have blended, or integrated counting with language. Now for 3, 4, and 5 year olds you can give your child a small clipboard with a pad of paper and a pen and they can make their own grocery list when you're doing yours. Or we can have 3 good sized containers that we label with a piece of paper "wood", "plastic", and "metal". Throughout the day they can put whatever they find in the appropriate container. We've integrated sense of

touch, or sensory, to pre-reading skills to even math because there's a possibility that one container will get full and there you have some measuring.

Some inferences made from the English book of Class I that will make the parents feel that there is no need to have separate EVS books.

The book starts with the topic of '**Animals**' in which 'panda' is described in details. This lesson will be a basis of talking about animals since children are curious about animals. They will get to know about many things around the world. For e.g. They will know that pandas are found in China which is another country. This can introduce them the concept of different countries. Teacher will ask and develop the curiosity of the children about the fact that why giant pandas are not found in India. The children will be sensitized to the fact that some difference must be there between the two countries.

The next lesson is a poem on 'Rain' where there is a mention of clouds, water, plants, rivers, lakes, floods and crops. Each one of them becomes a talking point in the class. With such a discussion happening who needs a special EVS book?

In unit IV there is a discussion on '**School**' which can cover all aspects of a child's schooling. The best part is that this unit deals with the games and fun that the child can have in school. It is the best way for the child to have an imaginary picture of school which is great fun and he would look forward to coming to school.

Unit V is related to the theme of '**Food**' with a poem on crocodile's dinner. Through fun the child discusses the food requirements of his own self and the animals around him.

Unit VI on '**Doing things**' not only deals with verbs but also discusses wheel and its role in transport in the bygone days. Unit VII is on '**Cats**' and helps the child not only in learning adjectives but also helps him to create a story with the help of the objects that he sees in his environment.

Unit VIII is a very endearing subject for the kids. It talks about the various excuses the animals make for not wanting to do something. When we talk of developing thinking skills among children, this is a very interesting way.

Unit IX deals with '**Gentle Giants**' and the child gets exposed to big animals. It is very common to study the topic called '**Our helpers**' in EVS. This book talks about them through a story of Zunid and Zaheeda. People like drivers, astronauts, rock star, doctor, painter, teacher etc. have been introduced.

When we talk of environment around us, language gets automatically used both in verbal and written form. Children should never compartmentalize subjects like EVS

and English at such a tender age. After all whatever he sees around him should also be expressed in language. These two are inextricably linked. When we decide to facilitate (not teach) learning of language, we can create stories from the topic of environment. The entire topic could be woven around a few characters (human beings, animals or birds) with whom the child can identify easily. Once he identifies his own place also in the bigger schema. He would not only be able to grasp the topic but also internalize it. Personal experiences and opinions are very important for learning at every stage. The same sentiment was expressed by Bloom in his taxonomy. Learner not only has to recall and understand but also apply it to real life situations. After that he has to go to the next level and evaluate the concept in question with his own past experiences so that he can form an opinion himself. Finally he is able to synthesize it which is a higher order skill. Synthesis can only happen when the child understands that environmental science is not 'Out there' but it is 'Right Here'.

Integrated learning is just one more step towards achieving it.

**Some inferences made from the English book of Class II that will make parents feel that there is no need to have separate EVS books.**

Similarly the English books of class II cover such vast knowledge of scientific concepts that they become self sufficient to meet the learning outcomes as expected of that age range. Unit 1 covers the topic '**Bees**' which is definitely going to give an insight to the children about the different types of bees. The teacher while teaching the chapter will talk about the life cycle of bees. This will make the child learn language as well as study EVS without specially designed books.

Unit II talks about '**Tigers**' and undoubtedly this chapter will make the children understand about the life, habitat and the survival needs of the tiger. The child while reading this chapter will be exposed to various other wild animals. Thus the EVS topic of animals will be covered in detail with this topic.

Unit III is a poem '**On the farm**' and it will definitely educate the children about the farm animals and what all things we get from the farm animals. In this poem words like 'thistles', 'gully' and 'creek' etc have been used. The teachers while discussing the meaning will explain the geographical terms like valleys and streams. So just ponder why we need a separate EVS book.

Unit IV deals with '**Looking at colors**' which not only will make the children understand about colors but will also develop the child's understanding about how sun gives us light and how sun's rays can make many different colors. The concept of rainbow will be explained to the children. It is science at its best!

Unit V covers the topic '**Looking at the pictures**'. It can relate to the surroundings and whatever places, people they observe in the surroundings can be talked about. Thus unconsciously students will be learning EVS in English period. Why compartmentalize the learning then?

Unit VI is a poem '**Sounds around us**'. This poem will not only expose the children to new vocabulary but will expose the children to the phenomenon of sounds.

Unit VII covers the topic '**Ears**'. In the process of acquiring the language the children will also come to know about our sense organs. The parts of the ear and function of the ear will be dealt in the class. Thus learning will focus on understanding scientific concepts as well as acquisition of language.

Unit VIII deals with '**Chinese Dragons**'. It mentions about important Chinese festivals. Thus in the process of reading the chapter, the children will acquire knowledge about different festivals. They will come to know that there are different festivals in different countries. They will also get exposed to the lifestyle of people in China. Teacher will also talk about the geographical location, population and other features of the country. Thus tremendous learning will take place in an attempt to study language.

Unit IX is '**Homes around the world**'. Through this chapter, the concept of 'Shelter' will be touched in details. Children will come to know about different forms of houses and what is the relevance of shelter in our lives. We all can recall this chapter in our EVS books.

Unit X is a chapter titled '**Rubbish**'. After reading this chapter the children will develop consciousness that we should throw rubbish only in the dustbin. Children will learn to follow practices to avoid wastage. This can also be related to saving the environment by recycling different things. Children will be exposed to reduce, recharge and recycle of waste material.

Unit XI covers the topic '**Chinese Pen Friends**'. Besides teaching good vocabulary, the fundamentals about writing and sending a letter will be discussed. Children will also come to know about the different stages of writing a letter, posting it, putting a stamp on it, postman collecting it and delivering it to the addressee. The meaning of pen friends will also be discussed. The life style of Chinese people can also be discussed.

Unit XII talks about '**Roman Times**'. With the globalization of the economy it becomes imperative for all of us to know about other countries. Through this chapter life of people in Rome will be discussed.

Thus in the English period the children will be learning EVS also.

## Themes for the month

Thematic teaching is a deliberate departure from the usual class room method of teaching and aims at taking a holistic view of the curriculum and making teaching and learning an enjoyable experience. Thus another attempt to make the child aware of environmental science without prescribing a separate book for the same is thematic teaching. A theme is taken up every month in a class and various activities are planned to make the children understand and gather all the relevant information relating to the theme.

### Class I themes for the year

- The theme for the month of April is **Top Tips**. It will cover basic etiquettes, cleanliness, more about my body and My Family. At this level, the EVS books can not cover more information than these.
- In the month of May- June, the children will be exposed to different living and non living things through the theme '**Living World**'.
- The theme of '**Akar Pariwar**' will be taken up in the month of July and it will expose the children to all geometrical information that remains when location scale and rotational effects are filtered out from an object. Children always try to find one or the other similarity between two things. For a child learning begins with shapes. Learning becomes convenient for them with the help of shapes. Lessons learnt through shapes are stamped indelibly on their tender minds.
- In the month of August theme of '**Calender Pages**' will be taken up in the class. It will give the children vast information on the change of weather. Traditional books of EVS will always include the chapter 'Eat and Fit'. This information will be given to the children this month and different ways to have a healthy life will be taught. If environmental awareness is made to the children in this manner, why make them carry one extra book in the bag of EVS?
- The month of October will revolve around the theme '**Community Helpers**'. It will develop awareness among the children about the people who help us. The concept of neighborhood and community will also be elaborated to the children.
- In the month of November children will be taught good hygiene, self care and road safety rules through the theme 'Fair Care'. The theme will be introduced through various activities which will develop consciousness of the children towards the topic.
- The month of December will develop awareness of the children for the whole world through the theme '**WORLD AROUND**'. The children will come to know about various land forms. My town and outer space.
- The month of January will raise the curiosity of the children about the aspect of growing in plant life and animal life with the theme '**What's Growing**'.

- The month of February will generate understanding among the children about the different ways that we use to communicate with each other. All the modern **Means of communication** will be explained to the children. The children will also develop consciousness about the way the animals communicate. Different animal sounds will be taken up in this month.

These themes clearly indicate that children will learn a lot about environmental science without a prescribed book

### **Class II themes for the year**

- The month of April will start with the topic '**New Beginnings**'. Children will be made aware of the fact that everyday is a new beginning and change is the law of nature and a constant phenomenon. We all need to have new dreams and hopes.
- The month of May-June will develop awareness of the children regarding cats and kittens, tigers, lions and leopards through the theme '**Cat's**'. The habitat' life and eating habits of these animals will be discussed in details. The concept of carnivores and herbivores will also be covered in details.
- The month of July with its theme '**Rhimjhim**' will cover the geographical topic of storms and thunders. Children will be made aware of these natural disasters, their causes and strategies that can be used to cope up such kinds of natural calamities. It will also talk about the pleasantness of the monsoon season.
- In the month of August the children will be equipped with some strategies to keep the environment green with the theme' **Going Green**'. The children will be encouraged to use environment friendly ways to go green.
- The theme for the month of September is '**Habitats and Landforms**'. It will give the children lot of awareness on living world, forests, mountains and human habitats.
- The month of October will make the children aware of the directions with the theme 'Maps'. The advantages of using a map will be explained and information pertaining to my country and map at globe will be imparted to the students.
- The month of November will touch the sensitivity of the students and give them information about different kinds of pollution and give them solution to reduce them. In the process of explaining them about noise pollution, water pollution, air pollution, topic of biodiversity will also be discussed.
- '**Histories Mysteries**' will be explained to the children in the month of December. The children will become aware of ancient history and life of early man. The children will be sensitized to the difficulties faced by early man and

struggle undertaken by people to invent new things to make our life peaceful and comfortable.

- The theme of '**Kings and Legends**' will be covered in the month of January. Children will be given information about famous kings and legends.
- The theme of '**Helping Hands**' will be taken up in the month of Feb. The value oriented education will be given to the children to express a word of kindness and various ways of helping the community will also be discussed.

Thus it is obvious from the above discussion that we need to follow the concept of integrated curriculum. The thematic teaching covers each and every area of cognitive skills besides equipping the children with essential life skills.

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