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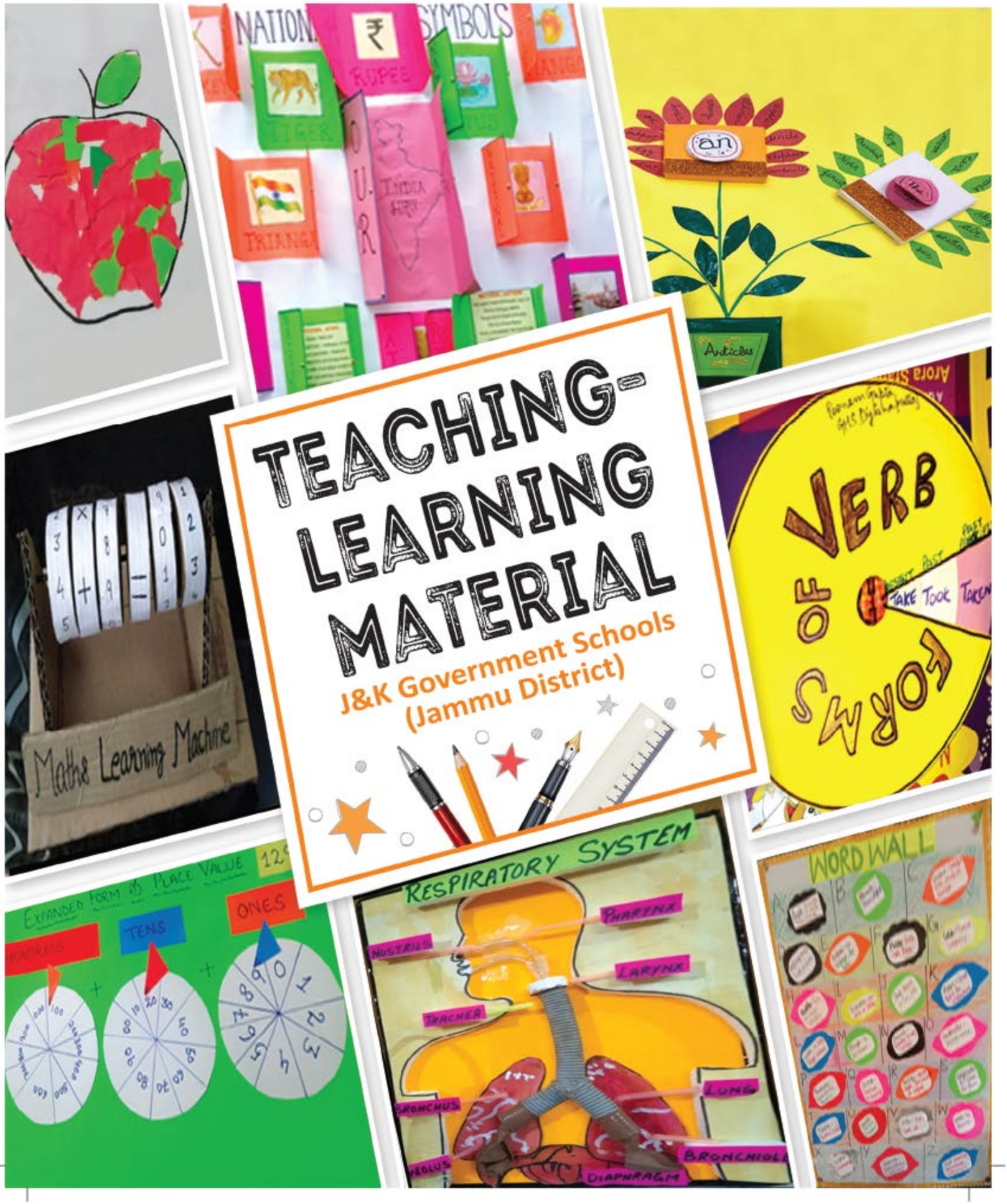
satya bharti quality support program



TEACHING-LEARNING MATERIAL

J&K Government Schools (Jammu District)

ACKNOWLEDGEMENT

"Creativity is the key to success in the future, and primary education is where teachers can bring creativity in children at that level."

APJ Abdul Kalam

At the outset, I would like to acknowledge the inspirational force behind this book - the principals and the teachers of Government schools of Jammu district. Their passionate efforts towards enriching the teaching-learning process on a day to day basis and painstakingly engaging students to achieve their potential, with low/ no cost teaching learning materials (TLMs) is indeed commendable.

I express my sincere gratitude to Suraj Singh Rathore, chief education officer (CEO) Jammu district for his extensive support and consent for the launch of this booklet. I also express my sincere thanks to the Zonal education officers of Jammu district, principals and teachers of the Government schools Jammu district, in extending their consent for the launch of this book.

A special thanks to Mamta Saikia, chief executive officer (CEO), Bharti Foundation for motivating the entire team by vesting undoubtable faith in its competencies and abilities.

My heartfelt appreciation goes to Antony Joseph Nellissery, chief school excellence (CSE), Bharti Foundation, for being the guiding light behind the entire process of creation of this book. The unwavering support of Binu Nair, chief school operations (CSO), Bharti Foundation and Sameer Shah, deputy general manager-quality support program (DGM-QSP), Bharti Foundation at all times is always cherished.

I also acknowledge the commendable support by Rajdeep Anand, Regional Head and Anil Bhat Project Head. Last but not the least, this book in its final form is a result of the efforts of Muhammad Mudasir Shah, Trainer Bharti Foundation, all academic mentors and Chief Editorship by Veena Tyagi, Sr. Manager-Training, QSP, Bharti Foundation. I am grateful to each one for their significant endeavours in making this book see the light of the day.

Sumita Shee

Sumita Shee
Head - Training and Curriculum
Bharti Foundation

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MESSAGE BY THE CHIEF EDUCATION OFFICER

It is heartening to know that Bharti Foundation is releasing the TLM booklet. This booklet is an acknowledgement of the creative and innovative work of our government school teachers, in Jammu. The use of TLM while teaching is important as it gives better understanding of the concepts. Besides this, it has positive influence over the teachers and students alike.

Bharti Foundation also conducts the Satya Bharti Educational Rockstar Achievers' awards which not only provides a platform for teachers to showcase their innovative teaching practices, but also recognises the good work done by them.

I congratulate all those teachers whose TLMs have been selected for publication in the TLM booklet for being the change makers.

I also congratulate Team Bharti Foundation for the wonderful work they are doing in the partnered government schools in Jammu district.

My best wishes to Team Bharti Foundation and all the participants for their good work!

Suraj Singh Rathore
Chief Education Officer
Jammu

MESSAGE FROM THE CEO

I am delighted to announce the release of the J&K teaching learning material (TLM) booklet for the government schools, J&K, another one in the series of the *Teaching - Learning Material* booklets. The book is a product of innovative work undertaken by the teachers working in the government schools Jammu, partnering under the aegis of the Satya Bharti Quality Support Program of Bharti Foundation.

The book is a compilation of the best TLMs that have been created using an interdisciplinary approach in a cost-effective manner. These can be easily replicated for use by other teachers, for virtual teaching too, which is the current norm.

We hope that the book serves as a platform for showcasing the talent of participating teachers as well as a medium for sharing good practices. Through this book, we endeavour to motivate many more teachers about the potential of innovative practices and experimentation. Such innovations can play an important role in enhancing students' engagement with the teaching-learning processes and achieveing better learning outcomes.

I want to extend my congratulations to the teachers who have contributed to this book, for their excellent efforts.

I hope you find the compilation inspirational!

Kind regards,

Mamta Saikia
Chief Executive Officer
Bharti Foundation

Bharti Foundation is partnering with the Department of School Education, Jammu, Jammu & Kashmir since 22nd March 2016 to implement Satya Bharti Quality Support Program. The partnership is with 45 select government schools for enhancing the overall schooling experience. Presently, (as on January 2022), we are working with more than 10000 students and approximately 950 teachers in these 45 schools.

National footprint: The Satya Bharti Quality Support Program is currently (Jan' 22) reaching out to more than 2.3 lac students, 9 thousand teachers in approximately 700 partner schools spread across 11 states/ UT.

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MESSAGES BY THE ZONAL EDUCATION OFFICERS

I am indeed happy to know that Bharti Foundation is releasing the TLM book. This TLM book is not only an acknowledgement of the good works done by our teachers, but also a wonderful platform provided by Bharti Foundation to recognise the creative and innovative work of teachers.

I am sure that the content of the book will project future trends in education, and help and inspire teachers to incorporate innovative ideas for the progress in educational field and a vibrant teaching–learning experience.

I extend my best wishes for the successful publication of this TLM book!

Smt. Sushila Sharma
Zonal Education Officer, Zone: Bhalwal

The use of TLM for effective teaching–learning process is important and need of the hour.

I would take this as an opportunity to congratulate Team Bharti Foundation for putting so much of efforts in collecting the TLMs and then publishing the same for the benefit of other teachers. I hope more teachers will now use TLMs and in the process also get recognition for their work.

Smt. Veena Tikoo
Zonal Education Officer, Zone: Gandhi Nagar, Jammu

The TLM book released by Bharti Foundation contains the original work of teachers from government schools, Jammu. It reflects the need to move from traditional teaching practices to more innovative ways of the teaching–learning process. This book will be a source of change, as it will inspire educators to work creatively and innovatively. I congratulate all teachers whose TLM has been published in this book and Bharti Foundation for the great work done in government schools of Jammu district.

Charanjit Singh
Zonal Education Officer, Zone: Dansal

MESSAGES BY THE PRINCIPALS/HEAD MASTERS

This book on TLMs by teachers of government schools of Jammu, indeed is the result of great efforts of Bharti Foundation both in terms of training the teachers and consolidation and selection of best TLMs for publication. I extend my heartiest congratulations to all teachers whose innovative work has been selected for publication in this book.

I also congratulate Team Bharti Foundation for their quality work!

Mrs Sultan Kousar
Principal, GGHSS Kandoli Nagrota

I am so glad to see Bharti Foundation is going to launch the TLM book. This book will help and inspire other teachers in terms of making the teaching–learning process effective and engaging.
Congratulations to all teachers and Team Bharti Foundation for the wonderful work done!

Pinki Gupta
Principal, GHSS Khanna Chhargal, Jammu

Apart from many other inspiring activities that Bharti Foundation does in our schools, it is a highly appreciative step to showcase the good works done by our teachers. Bharti Foundation has been constantly training our teachers and conducting workshops, and this book is the result of all those wonderful efforts. Congratulations to all for making the publication of this book possible!

Manjeet Kaur
Head Master, GMS Gorakh Nagar, Jammu

Showcasing and publication of the creative TLMs by teachers will motivate many others and inspire them to replicate the best practices for effective teaching. I congratulate all educators for their creative contribution in this book. Indeed a great work done by Bharti Foundation, which is the driving force behind this wonderful initiative!

Mrs Davinder Kaur
Head Master, GHS Digiana

SATYA BHARTI EDUCATIONAL ROCKSTAR ACHIEVERS' (SBERA) AWARDS

An initiative of Bharti Foundation

Under the Satya Bharti Quality Support Program, Bharti Foundation works along with Government schools, its leadership and teachers, to support them in articulating and achieving their goals towards creating better schooling experience for their students. SBERA awards are one such effort by Bharti Foundation to recognise and motivate the hard work of the teachers.

With a focus on recognising innovation in teaching practices the Satya Bharti Educational Rockstar Achievers' awards, by Bharti Foundation organises competitions across government schools in selected states. Teaching Learning Materials (TLMs) are an important tool in the entire educational process for which there have been long tradition of creative and innovative practices among teachers. Complex concepts and processes in languages, mathematics, science and social science have been explained easily by the use of different TLMs. All government schools' teachers are eligible to participate in this competition. The participating teacher has to give an undertaking that the TLM is his/ her original creation and that it has not been copied fully from any other source.

Criteria for shortlisting best TLMs

a. Innovation and creativity: TLMs which are created with an original idea and innovation.

b. Relevance: TLMs which are relevant with regard to curriculum and subject taught in the schools.

c. Effectiveness and usability: TLMs which are portable, easily maintained in the classroom, safe for students and of direct use to them.

d. Preparation time and cost: TLMs prepared in less time and cost low/no cost.

e. Availability of materials and parts: TLMs which use less material and their parts are easily available, replaceable and non-exhaustible.

Process for Participation

a. Nomination: school teacher shall fill up nomination form and submit it to the district education department through Head of School.

b. No travel and conveyance claims are subject to reimbursment by Bharti Foundation.

c. The awarded TLMs are selected by the government nominated jury and Bharti Foundation has no role in it except for providing the platform for conducting the competition.

Gallery: SBERA awards were initially called as Innovative TLM Awards in 2016, Satya Bharti Innovative Teachers Award later in 2017-19. Now, in 2020-21 they are called Satya Bharti Educational Rockstar Achievers' award.

The following are the SBERA awardees of the year 2018-19 : DISTRICT LEVEL

S. No.	Name of Teacher	Name of School	Category	Position
1	Suresh Kumari	GMS Jourain	Primary/Elementry	First
2	Manpreet Kaur	MS Gorakh Nagar	Primary/Elementry	Second
3	Rashmi Sharma	GMS Bhalwal	Primary/Elementry	Third
4	Jastinder Kaur	PS Kaku De Kothey	Primary/Elementry	Third
5	Ekta Nanda	GHS Raipur Satwari	High/Higher sec	First
6	Prerna Sambyal	GGHSS Bishnah	High/Higher sec	Second
7	Meenakshi Jamwal	GGHS Domana	High/Higher sec	Third

Disclaimer: Bharti Foundation has taken utmost care to name all the 2018–19 teacher awardees- In case the name of any teacher has been left out, it is purely unintentional and hence, in such a case Bharti Foundation is not liable to any dispute whatsoever.

There are many TLMs in this book from the year 2020–21, when due to COVID-19 SBERA awards did not happen. However, to recognise the efforts of teachers, team Bharti Foundation has given gold and silver medals in the book.

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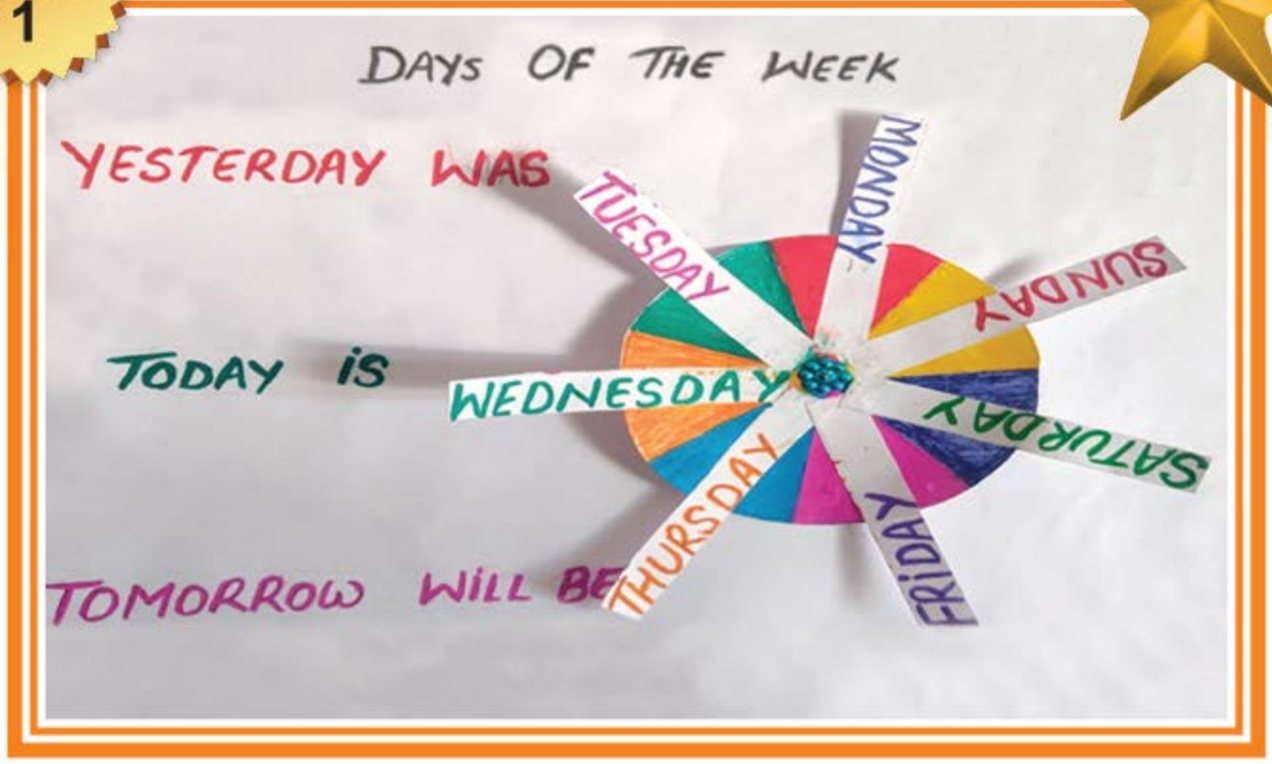
The list mentioned above includes some awarded and non-awarded TLMs under the SBERA category (formerly called Teacher's Innovation Awards). TLMs are marked as gold and silver medals are to encourage efforts made by the teachers.

Days of the Week

TLM 1



Created by Teacher: Ms Rajni Devi **School: GHSS Khanna Chargal**

TLM for Class 1
Subject – English
Topic – Days of the week

Brief description: This TLM will help students to memorise the days of the week and will also help them to understand what day comes before and after a particular day. Tell them that the days in a week are Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday; repeat with Monday. Such a week may be called a planetary week. The students will be able to learn days of the week in a playway method by rotating the wheel of the TLM and, should be able to figure out what comes before and after a particular day.

Other concepts that can be taught using this TLM: Months of the year, seasons in a year, integers, etc.

Materials used: Drawing sheets, one white sheet, coloured pens, cardboard, pins, scissors

Cost of the material used for making TLM (approx.): ₹30

How to make:

1. Take a drawing sheet. Cut out a circle from another sheet, colour it and fix it on the drawing sheet with the help of a pin to make the wheel.
2. Now, cut out seven strips from the white sheet.
3. Write the days of the week on these strips: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday.
4. Fix the strips on the wheel in a way as shown in the figure.

How to use:

- Take this TLM into the classroom and show it to the students.
- Rotate the wheel and tell the students, "Today is _____". Wait for a while and let the students respond.
- Move the wheel and ask them what day was yesterday, pointing towards the arrow on the TLM, move the wheel again and ask next question, let the students answer it.
- Repeat the process by rotating the wheel many times till the students remember and learn the names of the days.

Recognising Colours

TLM 2

SBERA AWARDED

Created by Teacher: Ms Jastinder Kaur **School: GPS Kaku de Kothey Arnia**

TLM for Class 1
Subject – English
Topic – Recognising Colours

Brief description: This TLM will help the students to memorise colours and will also help them to be creative. In a classroom when we use such kind of TLM and involve the students in activities, it is being observed that such an interactive TLM will help the students to:

- Be more creative
- Understand the concept in a play-way method
- Enjoy a more vibrant classroom environment

Other concepts that can be taught using this TLM: Hindi lessons, fruit names/colour names, poems, nature study, etc.

Materials used: Drawing sheet, colour sheets, glue, stones, coloured threads, scissors

Cost of the material used for making TLM (approx.): ₹30

How to make:

1. Draw any picture on a drawing sheet.
2. Choose different colour sheets and cut them in small pieces with the help of scissors.
3. Using the glue, paste these pieces on the picture which we have drawn, as shown in the TLM.
4. For the second TLM, wrap the small stones with different coloured threads.

How to use:

- Take this TLM into the classroom and show it to the students.
- This kind of TLM can be used while teaching the students about colours. Colouring fruits and vegetables can make it interesting and interactive both.

Understanding Alphabets and Opposite Words

TLM 3

Created by Teacher: Ms Bindu Gandotra **School: GHS Domana**

TLM for Class 1
Subject – English
Topic – Understanding alphabets and opposite words

Brief description: This TLM is meant for children in the age group of 4–6 years and has been successfully administered during classroom teaching. It appeals to the pre-schoolers as well as makes them comfortable in the classroom. It is helpful to inculcate their interest to learn the basic concepts through a playway method. Such TLMs provide healthy classroom atmosphere for effective learning.

Other concepts that can be taught using this TLM: Concept of colours, names and combinations, about the moon and stars – why we see them at night, different shapes, and so on.

Materials used: Chart papers of different colours, cardboard sheet, Fevicol/glue, sketch pens, sparkle tubes, few craft decorators, woollen thread, any circular object and a pair of scissors

Cost of the material used for making TLM (approx.): ₹30

How to make:

(A) Smiley with Capital and Small Letters:

1. Take a cardboard sheet and yellow chart paper. Put them together.
2. Draw a circle with the help of any circular object on both the cardboard and yellow sheet.
3. Cut both the circles with the help of the cutter.
4. Draw the features of a smiley.
5. Now write down the capital letters on the smiley face, encircle them and half cut them with the help of the cutter to make small windows as shown.
6. Now paste the smiley on the round cardboard sheet with the help of Fevicol/glue.
7. Now open each small window and write down respective small letters under the capital letters. This way, both capital and small letters are written on the smiley.
8. Finally, use sparkle colours to write down headings, 'ALPHABET' and 'CAPITAL LETTERS'. Use black sketch pen to colour its features.

(B) Moon and Stars (showing opposite words):

1. Draw the shape of half moon on a white chart. Then cut it.
2. Now, draw stars on other chart papers of different colours. Use the same coloured chart paper for making pair of stars.
3. Use different sketch pens for writing the opposite words.
4. Hang the stars in pairs with the help of woollen thread as shown in the TLM.

How to use:

- This can be used individually during classroom teaching.
- As these are familiar objects for the student, they will easily get motivated and start to learn.

The use of phases of moon (the part and the full moon cuttings) and stars can be correlated to the night sky and make students even more attentive towards their learning.

Shapes

TLM 4

Created by Teacher: Ms Asyia Pervaiz **School: GBMS Gorakh Nagar**

TLM for Class 1
Subject – Mathematics
Topic – Shapes

Brief description: : This TLM will help students to understand the concept of shapes and recognise different types of shapes. Give a brief to them about shapes as shapes are the outline of objects and ask simple questions such as what is the shape of your book, etc. This TLM develops curiosity among students and helps them to learn in a playway method.

Other concepts that can be taught using this TLM: Recognition of colours, etc.

Materials used: Used cardboard box, drawing sheet, colour papers, glue, stone, coloured threads, waste ice-cream spoons, cutter

Cost of the material used for making TLM (approx.): ₹15

How to make:

1. Take any used cardboard box and paste white paper on as shown in the picture. Using coloured tape, one can decorate the borders of the box.
2. Make small cuts with the help of the cutter, and write the names of shapes, e.g., triangle, star, oval, etc., below the cuts.
3. Use waste ice-cream spoons for fixing the shapes on the cuts as shown in the picture.

How to use:

- Take this TLM into the classroom and show it to the students. This kind of TLM can be used while teaching the students about shapes.
- Let the students observe different shapes of the TLM and relate it with the objects around them.
- Tell them that the whiteboard is like a rectangle and the chalk box like a cube. Help them in relating these objects with the shapes.
- Now name the shapes and ask them to identify similar shapes around them.

National Symbols

TLM 5

Created by Teacher: Indu Sharma **School: GHS Sarote**

TLM for Class 2
Subject – EVS and General Knowledge
Topic – National symbols

Brief description: The Republic of India has several official national symbols including a historical document, a flag, an emblem, an anthem and a memorial tower as well as several national heroes. The design of the national flag was officially adopted by the Constituent Assembly just before the independence on 22 July 1947. Other symbols that were designated on various occasions include the national animal, bird, fruit and tree.

Other concepts that can be taught using this TLM: National heritage, symbols, colours, etc.

Materials used: Coloured pens and sheets, white sheets, images of the national symbols

Cost of the material used for making TLM (approx.): ₹40

How to make:

1. Take a cardboard measuring 80 cm by 50 cm. Paste a white sheet on it.
2. Now cut the coloured sheets into small pieces and paste them on the white cardboard as shown in the TLM.
3. Paste the images of the national symbols on the coloured pieces and also label them.

How to use:

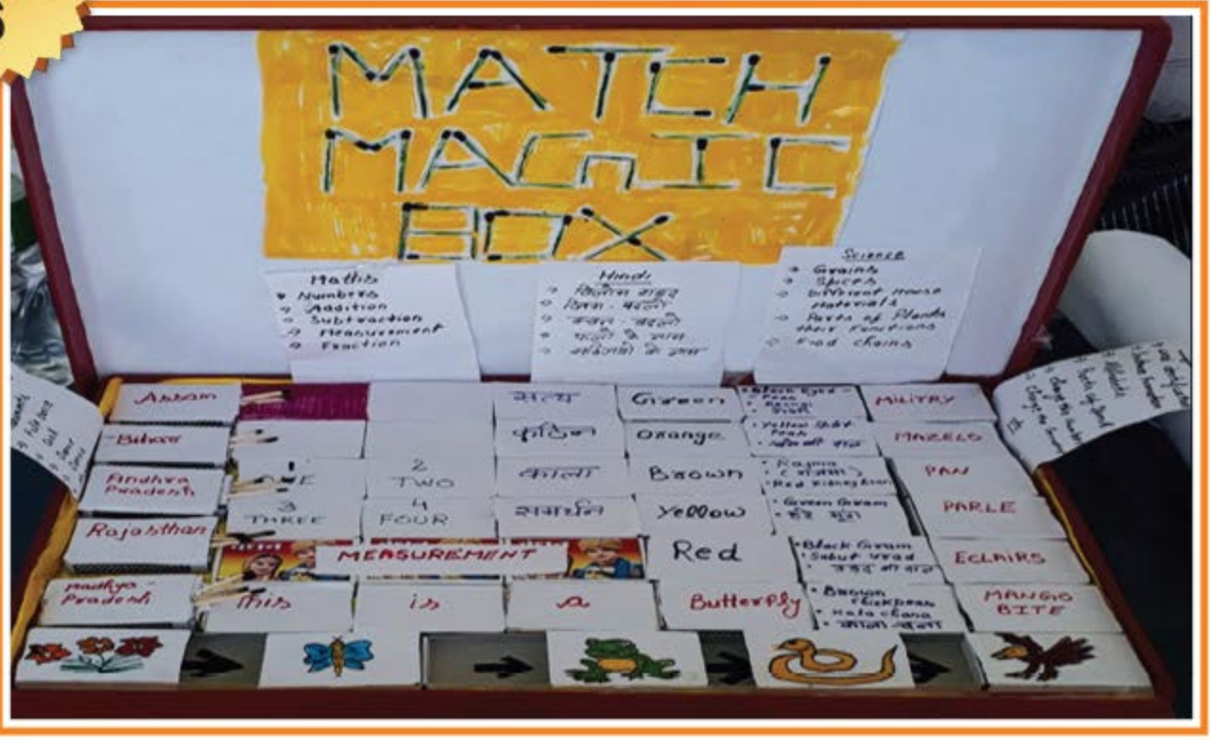
- National flag of India – *Tiranga*
- National anthem of India – *Jana Gana Mana*
- National song of India – *Vande Mataram*
- National river of India – Ganges
- National flower of India – Indian Lotus
- National fruit of India – Mango
- National tree of India – Indian Banyan
- National animal of India – Bengal Tiger

Take the TLM into the classroom and display it in front of the students.

- Tell them to identify the various symbols.
- Now tell them that these symbols are the national symbols of our country.
- Let the students read these symbols aloud.
- Now ask them questions such as what is our national flower, animal, bird, etc.

Basic Mathematical Calculations (Maths Magic Box)

TLM 6



Created by Teacher: Suresh Kumari **School: GMS Jourian**

TLM for Class 3 & 4
Subject – Mathematics
Topic – Basic maths calculations

Brief description: Using the Maths Magic Box to learn basic mathematical calculations helps the students to understand the concept in an easy way. It enhances their learning power. The students will show keen interest in learning. They will love to take part in the activity. They can easily connect themselves to a new topic which motivates them to bring the materials from home, and this will enhance their observation skills.

Other concepts that can be taught using this TLM:

S.St.: States and their capitals, monuments, folk dances, dresses, rivers, etc.
Maths: Numbers, addition, subtraction, measurement, fraction
English: Alphabets, change the number, change the gender, opposites, vegetable names, fruit names, word identification, sentence formation, parts of speech

Materials used: Used empty matchbox, shoebox, coloured pens, white sheets, glue, cutter, wrappers, all other things easily available at home and in the surroundings of the students depending on the topic or what subject the teacher chooses for the activity

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Ask the students to bring one used empty matchbox from home.
2. After collecting it from every student, take a sheet of paper.
3. Cut the paper to the size so as to cover the outer box and inner drawer box of the matchbox, separately, by using the glue. Prepare all the matchboxes in the same manner.
4. Write the words related to your topic on the matchboxes.
5. Then put all those matchboxes in the shoebox and paste a slip having the title of the activity as shown.

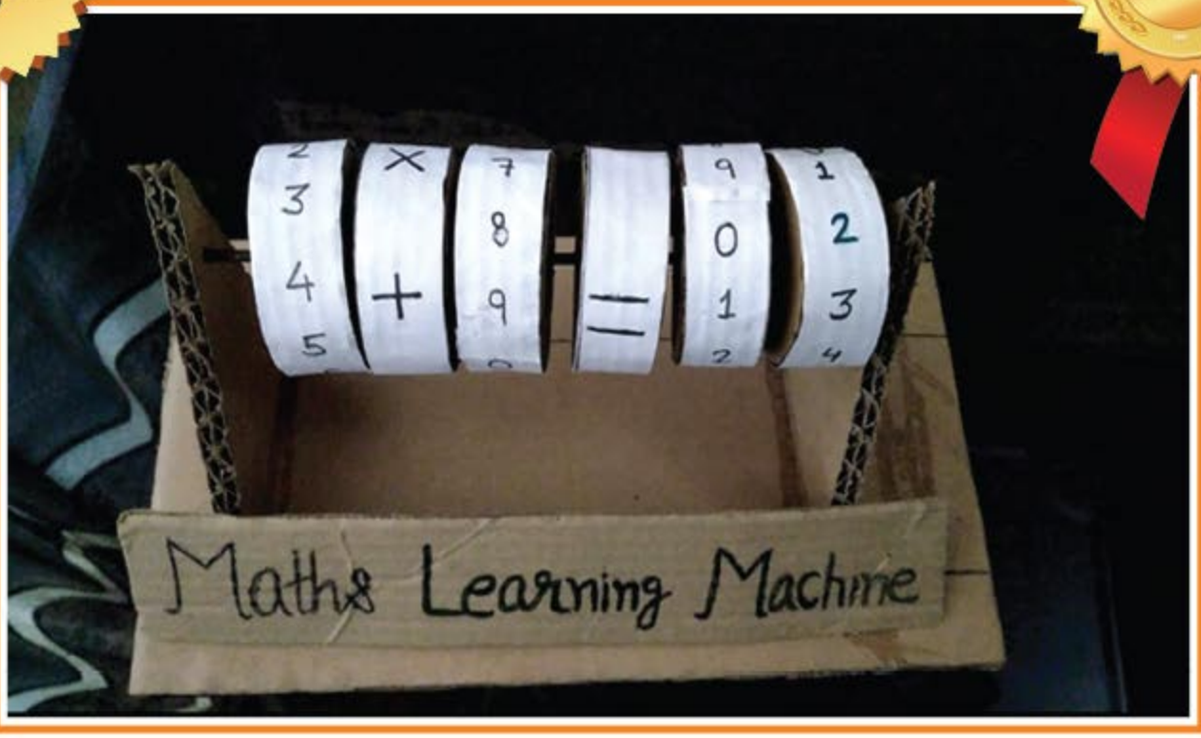
How to use:

- It can be used for individual, pair or group activity.
- After pulling out all the inner drawer boxes of the matchboxes, the teacher can jumble them out and as an activity, ask the students to arrange or put them back in their matching ones.

Basic Mathematical Operations (Maths Learning Machine)

TLM 7

SBERA AWARDED



Created by Teacher: Suresh Kumari **School: GMS Jourian**

TLM for Class 2
Subject – Mathematics
Topic – Basic maths operations

Brief description: Using the Maths Learning Machine, the students will be able to do basic mathematical calculations such as addition, subtraction, multiplication and division in an easy way. The students will show keen interest in learning. In fact, this TLM generates curiosity in learning and makes doing mathematical calculations fun.

Other concepts that can be taught using this TLM: Number system

Materials used: Waste cardboard piece, stick, coloured pen, white sheets, cutter

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take a cardboard piece and cut it in such a way that on cardboard base, you can erect cardboard pillars for holding a stick.
2. Make circular rings from the cardboard and paste white paper on them.
3. Write numbers and symbols on the rings as shown in the TLM.
4. Put the rings in the order as shown in the TLM.

How to use:

- Show this TLM to the students and ask them to rotate the rings and do exact calculations.
- It is better that the teacher should demonstrate the TLM before the students and then let the students learn by themselves.
- Start by first doing addition and then subtraction, and when this is understood by the students, then perform multiplication and division.

संज्ञा (Noun)

TLM 8

Created by Teacher: Anita Dogra **School:** GMS Marakhari

TLM for Class 2
Subject – हिंदी
Topic – संज्ञा

Brief description: जब अध्यापिका द्वारा TLM का प्रयोग किया गया, तो छात्रों ने बनाए गए TLM के माध्यम द्वारा व्यक्ति, वस्तु और स्थान की जानकारी प्राप्त की।

Other concepts that can be taught using this TLM: शब्द, वाक्य, सर्वनाम, आदि

Materials used: सर्वप्रथम बच्चों को उनके आसपास की पड़ी वस्तुओं के बारे में प्रश्न पूछें गए। जिनका बच्चों ने संतोषजनक उत्तर दिया। बच्चों ने आसपास विद्यमान वस्तुओं की सहायता से TLM में प्रदर्शित संज्ञा की परिभाषा तथा शब्दों की जानकारी प्राप्त की।

Cost of the material used for making TLM (approx.): ₹20

How to make:

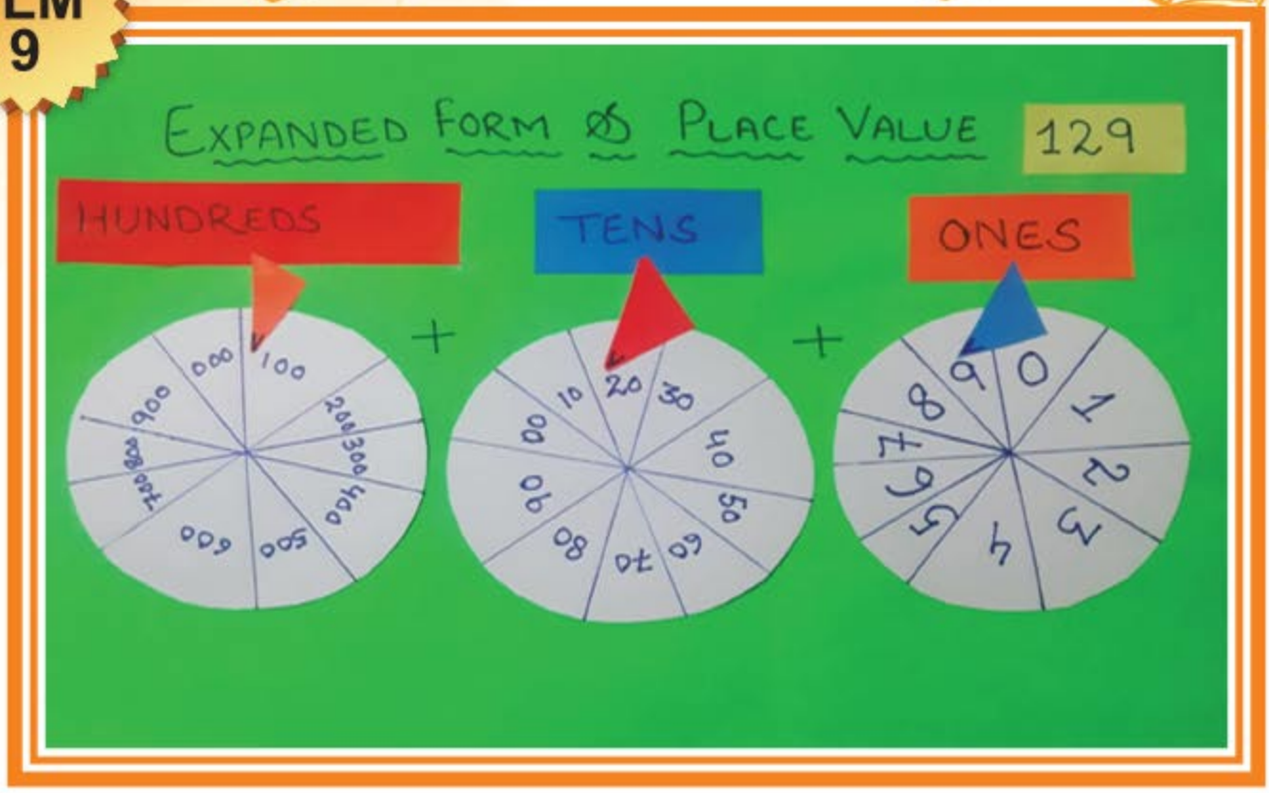
1. बच्चों को TLM दिखाया गया ।
2. TLM चित्र में संज्ञा के रूप में गुड़िया को प्रस्तुत किया गया । जैसे, एक गुड़िया अनेक गुड़ियाँ।
3. दूसरी अवधारणा संज्ञा द्वारा सर्वनाम की अवधारणा । जैसे, गुड़िया के स्थान पर वह का प्रयोग करना या यह का प्रयोग करना । जैसे, गुड़िया का नाम मुन्नी है। वह गाती है।

How to use:

- बच्चों को TLM दिखाया गया ।
- TLM चित्र में संज्ञा के रूप में गुड़िया को प्रस्तुत किया गया ।

Expanded Form and Place Value

TLM 9



Created by Teacher: Meenakshi Jamwal **School: GGHS Domana**

TLM for Class 3
Subject – Mathematics
Topic – Expanded form and place value

Brief description: Place value is the value of each digit in a number. For example, the digit 5 in 350 represents 5 tens or 50; however, the digit 5 in 5,006 represents 5 thousands or 5,000. It is important that the students understand that whilst a digit can be the same, its value depends on where it is in the number. The students were able to assign place value to a given number and write its expanded form.

Other concepts that can be taught using this TLM: Addition, subtraction, fractions, number system

Materials used: Thermocol sheet, coloured sheets, cutter, thumb pins

Cost of the material used for making TLM (approx.): ₹20

How to make:

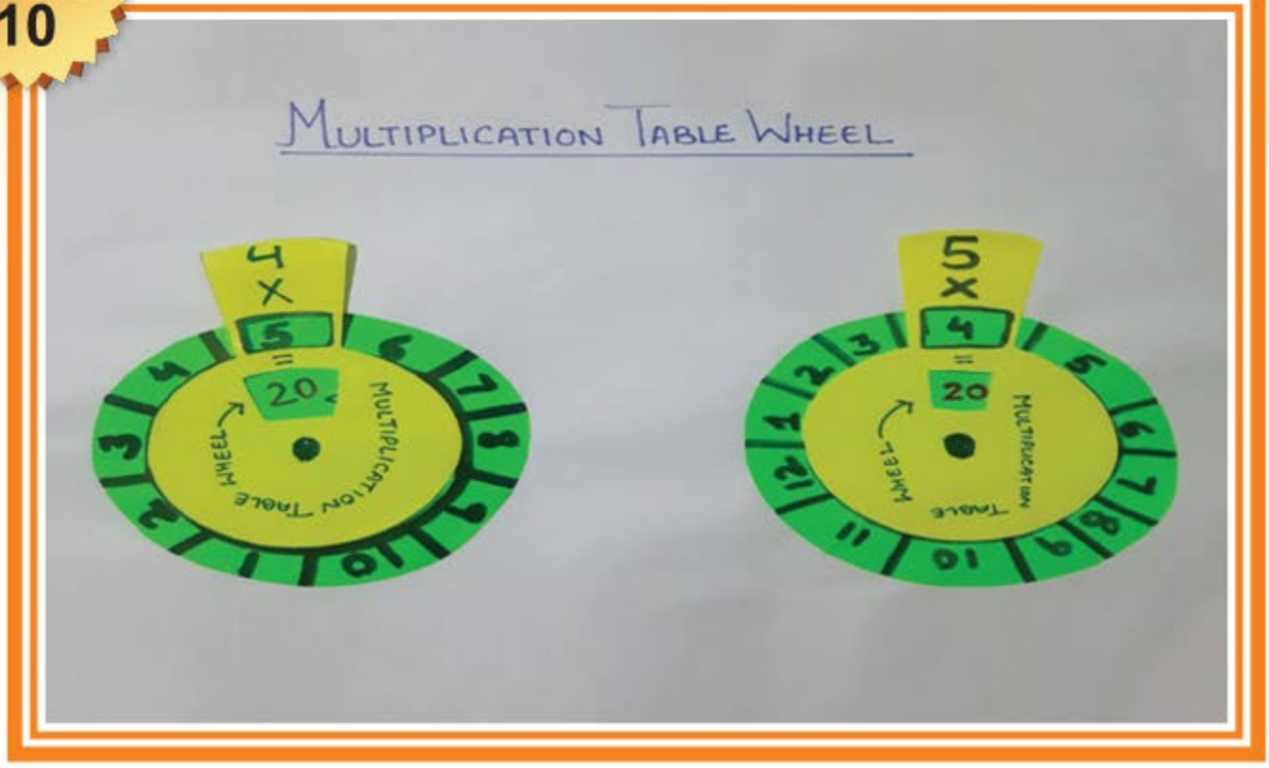
1. Take a white sheet, and cut it in such a way that you are able to make three circular shapes of equal diameter.
2. Divide each circle into 10 equal sections.
3. Put all the three circles on thermocol sheet with the help of thumb pins as shown.
4. The first circle, from the right, represents digits at once place; fix an arrow on it with the help of thumb pins as shown.
5. Similarly, the second and third circles will represent digits at tens and hundreds places, respectively.
6. Fix arrows on the second and third circles as shown in the TLM.

How to use:

- The teachers will give a number to the students to represent its expanded form and place value. Suppose the teacher gives number 129.
- Then there are 1 hundreds, 2 tens and 9 ones in the number.
- Ask students to rotate the hundred wheel and arrow it on 1. Then, similarly, rotate the tens and ones wheels and arrow them on 2 and 9, respectively.

Multiplication Table Wheel

TLM 10



Created by Teacher: Meenakshi Jamwal **School: GGHS Domana**

TLM for Class 3
Subject – Mathematics
Topic – Multiplication table wheel

Brief description: : A multiplication wheel puzzle basically has two wheels that you can turn around to know the answer to multiplication puzzle. The one we will be making can do multiplication of 2 through 5 tables for numbers 1 to 12.

Other concepts that can be taught using this TLM: Addition, fractions, number system, division

Materials used: Thermocol sheet, coloured sheets, thumb pins, cutter

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Cut a circle of 10 cm radius from the coloured sheet. Divide it into 10 equal sections and number each section from 1 to 10.
2. Cut another small circle of 8 cm radius with two cut-out holes as shown.
3. Now write the multiples of numbers 1 through 10 on the larger circle in such a manner that the numbers are visible through the cut-out holes as we move the smaller circle.
4. Put together both circles by inserting pin on the top such that they get attached firmly and can rotate freely.

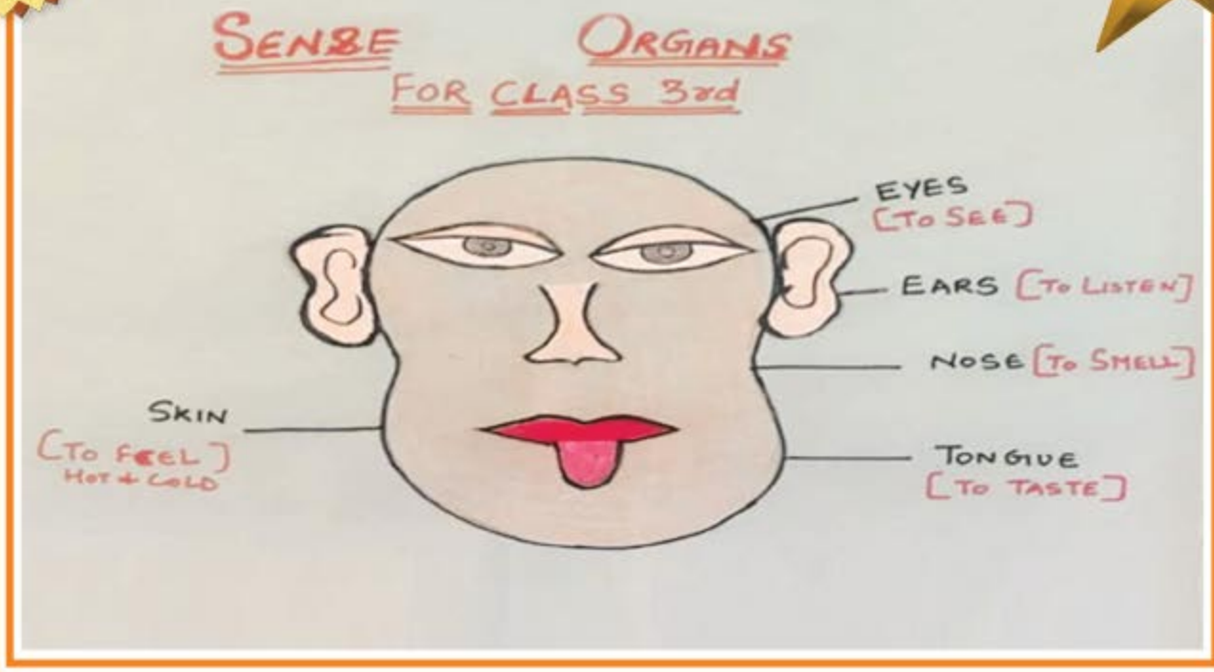
How to use:

Multiplication is when you take one number and add it together a number of times. This is why multiplication is sometimes called 'times'. Essentially, to multiply numbers is to add groups of a number. Multiplying means repeated addition of a number. (The number must all be the same before we can use it to multiply.)

- Ask the students a multiplication quiz (e.g., 9 X 5 = __) and give answer using the multiplication wheel.
- To know the answer to multiplication problem, turn the top wheel so that outermost hole aligns with the multiplicand (e.g., 9) and the hole next to the multiplier (e.g., 5) shows the answer.

Sense Organs

TLM 11



Created by Teacher: Deenakshi Sharma **School: GMS Bain Bajalta**

TLM for Class 3
Subject – Science
Topic – Sense organs

Brief description: Sense organs are specialised organs that help to perceive the world around us. They are an integral part of our lives, and these are the only way that enables us to perceive the environment.
Sense organs provide the required data for interpretation through various organs and a network of nerves in response to a particular physical phenomenon. These senses govern our association and our interaction with the environment. *(Source: Internet)*

Other concepts that can be taught using this TLM: Parts of body

Materials used: Marker, cardboard, drawing sheet, colour pens, ball pen

Cost of the material used for making TLM (approx.): ₹10

How to make:

1. Take a drawing sheet, and draw on it various sense organs, using marker and colour pens, as shown in the TLM.
2. Label the diagram as shown.
3. Paste this sheet on cardboard.

How to use:

- Ask the students what they observe from the TLM. Tell them what is the function of the eyes, the nose, the ears, the tongue and the skin.
- Let the students answer and discuss. Now show them the TLM again and observe from the chart what functions of various sense organs are.

Shapes

TLM 12

Created by Teacher: Priya Mahajan and Shareef Hussain

School: GLHS Bain Bajalta and GMS Dhoon

TLM for Classes 3 to 5
Subject – Mathematics
Topic – Shapes

Brief description: In geometry, a shape can be defined as the form of an object or its outline, outer boundary or outer surface. By using this TLM, the students could easily

- Understand the properties of different 2D and 3D shapes,
- Recognise different 2D and 3D shapes and
- Know the interior angles of regular polygons.

Other concepts that can be taught using this TLM: Area, perimeter, diagonal, diameter, etc.

Materials used: Marker, drawing sheet, colour pens, ball pen, cardboard, scissors, pencil, ruler

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take a drawing sheet and draw on it various geometric shapes as shown in the TLM.
2. For 3D shapes, all you need are paper, scissors, a pencil, a ruler and tape. There are six common 3D shapes.
   - o Cube
   - o Cuboid (rectangular)
   - o Cone
   - o Square-based pyramid
   - o Triangular prism (tent shaped)
   - o Octahedron (diamond-like shape)

   To make each of these 3D shapes, an 8 1/2 x 11 sheet of paper has been used.
   For making different shapes, you may click on the following link for more clarity:
   https://teachbesideme.com/3d-paper-shapes/

How to use:

- Show various shapes to the students and let them observe.
- Ask them what are different materials available in their classroom having similar shapes.
- Let the students identify and also make shapes similarly.
- Show the students videos also on how to make 3D shapes, and let them make and label various shapes accordingly.

Vocabulary

TLM 13

Created by Teacher: Ramnee Mahajan **School: GHS Bathandi**

TLM for Class 5
Subject – English
Topic – Vocabulary

Brief description: This TLM will help the students to learn how to increase the vocabulary and improve pronunciation. Also the students will learn new words; thus, this will inculcate reading habits among the students.

Other concepts that can be taught using this TLM: Synonyms, antonyms, word meaning, English grammar, etc.

Materials used: Marker, chart paper, coloured drawing sheets, colour pens, ball pen, glitter crayons, decorative tape, glue

Cost of the material used for making TLM (approx.): ₹50

How to make:

1. Take chart paper and cut the coloured sheets into small pieces. Fold these pieces.
2. Write on them the English alphabets by using colour pens. Then write words with their meanings inside the slips.
3. Now paste/fix these slips on the chart paper alphabetically as shown in the TLM.
4. Make the word wall also in a similar way. Write the words on coloured paper slips with their meanings and paste it on the word wall as shown in the TLM.
5. Now, you can decorate them by using the marker, decorative tape and glitter crayons.

How to use:

- Show this TLM to the students, and let them guess what the TLM is all about.
- Tell them to read the words on the word wall and also read the meanings.
- Ask them to think of any word and its meaning. Tell them to write the words with their meaning on paper and make a word wall in similar manner.
- Guide them how to use dictionary to know the meaning of words.
- Also tell them to read the words loudly and correct their pronunciation by reciting the same words. Appreciate all students for their responses.
- Give them an assignment to find new words also.

Water Pollution

TLM 14

SBERA AWARDED

Created by Teacher: Ms Rajni Devi **School: GPS Roopnagar Digiana**

TLM for Class 5
Subject – Science
Topic – Water pollution

Brief description: Water pollution occurs when harmful substances – often chemicals or microorganisms – contaminate streams, rivers, lakes, oceans, aquifers or other waterbodies, degrading water quality and rendering it toxic to humans or the environment. Since water is called 'fluid of life', we need to prevent it from being polluted. Various causes of water pollution can be discussed using the above TLM model.

Other concepts that can be taught using this TLM: Various types of pollution, how to keep our earth clean, natural resources

Materials used: Drawing sheet, colour pens, ball pen, straws, other waste material

Cost of the material used for making TLM (approx.): ₹50

How to make:

1. Take two cardboard pieces of equal size.
2. On one cardboard, draw a river. Then take some pieces of newspaper, etc. and paste them on the cardboard as shown.
3. Colour both the cardboard pieces as shown using colour pens.
4. Use waste material to make a factory building and the waste water coming from it as shown in the TLM.
5. Use straws to make smoke chimneys on the top of the factory.

How to use:

- Show this TLM to the students, and let them guess what the TLM is all about.
- Tell them how water will get polluted if we allow pollutants from factories and other sources drain into water.
- Let the students think and come up with the causes of pollution. Appreciate all students to write the causes of water pollution, taking ideas from the TLM shown to them.

Dresses of the People in Different Parts of the Country (India)

TLM 15

Created by Teacher: Ms Roopali **School: GLHS Bain Bajalta**

TLM for Class 5
Subject – Environmental Sciences
Topic – Dresses

Brief description: : Clothing in India is influenced by different ethnicity, geography, climate and cultural traditions of the people of each region of India. This TLM will help the students to understand cultures of different regions of our country and the way people dress up in these regions.

Other concepts that can be taught using this TLM: Culture, diversity

Materials used: Drawing sheet, cardboard, colour pens, ball pen

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take the drawing sheet and draw on it people wearing different Indian dresses as shown in the TLM.
2. Label each dress with its state.
3. Paste the drawing sheet paper on cardboard.

How to use:

- Show this TLM to the students, and let them guess the name of different kinds of dresses worn by people in various regions.
- Help them to understand cultural diversity. This TLM will develop curiosity among students.

Note: Use of this TLM can be made even more interesting by making it a practical application of *performing arts*. The students can be asked to wear such dresses and enact some cultural aspect.

Uses of Forests

TLM 16

Created by Teacher: Ms Tanika Gupta **School: GMS Jajjar Kotli**

TLM for Class 5
Subject – Science
Topic – Uses of forests

Brief description: Forests cover about 30% of the earth's land surface. Forests are very useful for humanity.

- Forests provide us fresh air.
- Forests keep the earth cool by reducing global warming.
- Forests provide homes for humans and animals.
- Forests are important in maintaining the climatic conditions.
- They prevent soil erosion and control floods.

Other concepts that can be taught using this TLM: How forests put a check on spread of deserts, how forests prevent noise pollution and what jobs are associated with afforestation

Materials used: Drawing sheet, colour pens, cardboard, pins

Cost of the material used for making TLM (approx.): ₹30

How to make:

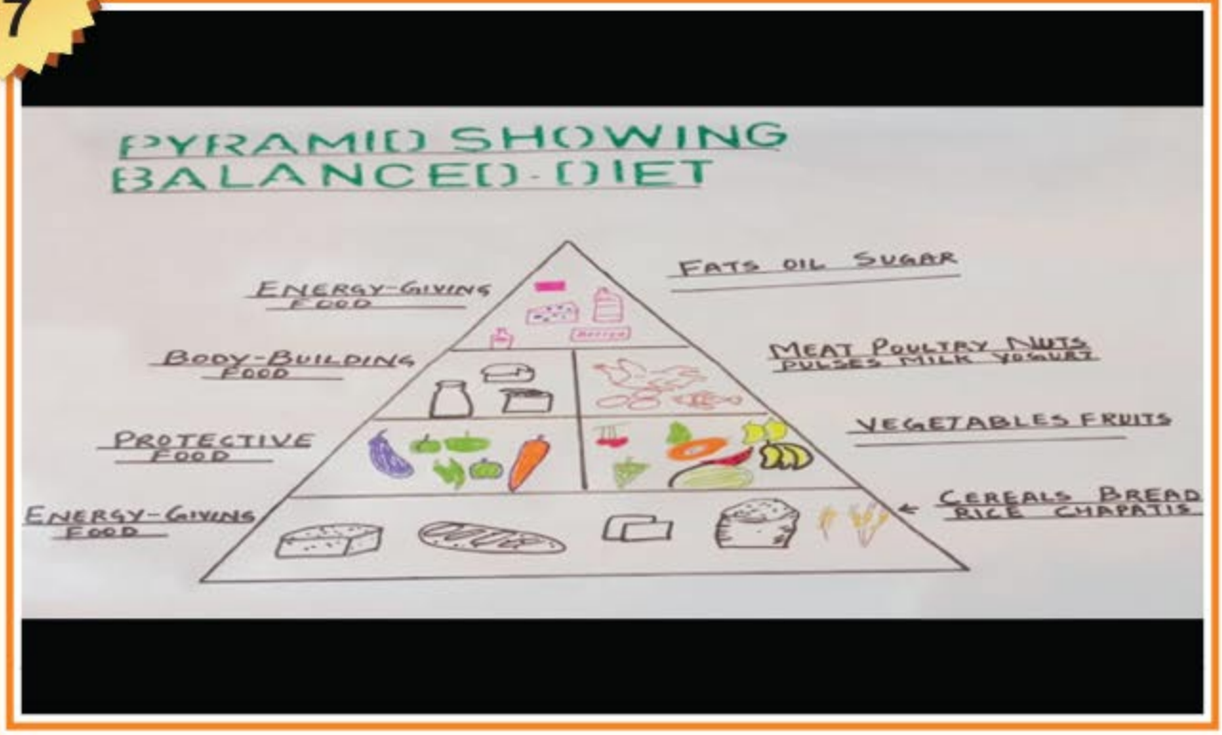
1. Take a drawing sheet and draw a tree on it.
2. Draw the things that we get from forests around the tree as shown in the TLM.
3. Take colour pens and colour the diagram as shown to make it vibrant.
4. Fix the sheet on the cardboard using pins.

How to use:

- Take this TLM into the classroom to show it to the students.
- Ask the students what they can see in the chart, and let them guess what the pictures on the drawing sheet convey. Let them discuss and think for few minutes.
- Once they are done, introduce the topic by discussing relevant comments of the students on the TLM.

Balanced Diet

TLM 17



Created by Teacher: Nargis Sheikh **School: GHS Bathindi**

TLM for Class 5
Subject – Science
Topic – Balanced Diet

Brief description: A balanced diet is one that contains an adequate quantity of all the nutrients required by our body. A balanced diet should contain food items with different nutritional value to fulfil our nutritional requirements. Using this TLM, the students will get aware of the health and hygiene. They will understand the importance of various nutrients in adequate proportion in their diet. They will become aware about the diseases caused by the deficiency of nutrient.

Other concepts that can be taught using this TLM: Deficiency diseases, nutrition, etc.

Materials used: Drawing sheet, colour pens, ball pen

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take a white drawing sheet and draw a pyramid on it.
2. Label the various sections of the pyramid by using the ball pen or colour pens, as shown in the TLM.
3. Draw various food items and use different colour pens to colour them and write the nutritional value.

How to use:

- While teaching the chapter on nutrition in Class 5, we can use the food pyramid chart in the class so that the students can understand the importance of a balanced diet. They will also understand what is the importance of various nutrients in our body.
- Show the TLM to the students, and explain them the importance of various nutrients such as proteins, carbohydrates, vitamins, etc. in our body.
- Ask them what the different nutrients present in their daily food are.

Inside the Earth

TLM 18

Created by Teacher: Ms Surekha Rani Jamwal **School: MS Bhalwal**

TLM for Class 5
Subject – Environmental Science
Topic – Inside the earth

Brief description: Earth's interior is generally divided into three major layers: the crust, the mantle, and the core. The TLM shows an overview of these three layers of Earth.

Other concepts that can be taught using this TLM:

- To show model of earth
- To show continents
- To show oceans
- To show thickness of different layers of Earth

Materials used: Empty plastic spherical ball, slime, Fevicol, sketch pens

Cost of the material used for making TLM (approx.): ₹30

How to make:

1. Take the ball and cover it with a plane paper.
2. With poster colours (blue and green) paint different portions of white paper to show continents and oceans (this is Crust of Earth).
3. With the help of the paper bag, make the second layer of Earth, i.e., the Mantle.
4. Take aluminium foil and make the third and innermost layer of Earth, i.e., the Core.
5. For a smooth finish of the model, use orange clay for showing Mantle and red clay for Core.
6. The TLM is ready to use for effective classroom teaching.

How to use:

- Show the TLM to students and let them figure out different layers of Earth as visible in the picture.
- Ask students what they know abot these different layers.
- Let students delebrate and discuss the TLM.

Explain to the students about the three main layers of Earth as following: The hard, brittle crust extends from Earth's surface to the so-called Mohorovicic discontinuity, nicknamed as Moho. The Moho is not located at a uniform depth, but about 10 kilometres (6 miles) below the seafloor and about 35 kilometres (22 miles) beneath the surface of the continents. Beneath the Moho is the mantle, the viscous layer that makes up more than half of Earth's volume. The mantle is divided from the core by the Gutenberg discontinuity, about 2,880 kilometres (1,798 miles) beneath Earth's surface. The outer core is molten, mostly filled with liquid iron and nickel, while the inner core is solid and much denser than either iron or nickel at the surface.

Nutrients

TLM 19

SBERA AWARDED

Created by Teacher: Deenakshi Sharma **School: GHS Bain Bajalta**

TLM for Class 6
Subject – Science
Topic – Nutrients: Vitamins

Brief description: Vitamins are organic compounds that people need in small quantities. Most vitamins that we need come from foods because the body either does not produce them or produces in a very little amount. Each organism has different vitamin requirements. This TLM will help the students understand importance of various vitamins and diseases caused by their deficiency.

Other concepts that can be taught using this TLM: Importance of vitamins, essential and non-essential vitamins

Materials used: Cardboard, white paper, sketch pens, cutter, screw

Cost of the material used for making TLM (approx.): ₹15

How to make:

1. Take a sheet of white paper and cut out three circles of different sizes, using a cutter, as shown in the TLM.
2. With the help of a screw, fix them at the centre of the cardboard.
3. Label all the three pieces as shown in the TLM.

How to use:

- Show the TLM to the students and tell them to rotate the smallest paper wheel.
- Let them discuss vitamins A, B, C, D, E and K, and read aloud the diseases caused by their deficiency.
- Let the students discuss the food rich in the vitamins.
- Let the students one by one discuss all vitamins, diseases caused by their deficiency and food rich in particular vitamins.

Articles

TLM 20

Created by Teacher: Rahat Nazir **School: GHS Bathandi**

TLM for Class 6
Subject – English
Topic – Articles

Brief description: The articles in English are the definite article *the* and the indefinite articles *a* and *an*. The definite article is used when the speaker believes that the listener knows the identity of the noun's referent (because it is obvious, because it is common knowledge or because it is mentioned in the same sentence or an earlier sentence). The indefinite article is used when the speaker believes that the listener does not have to be told the identity of the referent. (Source: Wikipedia)
Using the above TLM, the students will be able to state the definition of an article and will recognise that articles are always used with nouns. Also they will be able to use these articles correctly in sentences.

Other concepts that can be taught using this TLM: Specific nouns, vowels, etc.

Materials used: Cardboard, coloured paper, sketch pens, scissors, glossy pens, four small waste pieces of thermocol, chart paper

Cost of the material used for making TLM (approx.): ₹30

How to make:

1. Take four small waste pieces of thermocol, cardboard and a chart paper.
2. Paste the chart paper on the cardboard.
3. Cut small pieces of the coloured paper to wrap around the thermocol pieces.
4. Now make a tree-like structure on the cardboard using the four thermocol pieces and coloured paper as shown in the TLM.
5. Also cut out few leaves from green-coloured paper, and label the articles on the pieces of thermocol and nouns on the leaves as shown in the TLM.

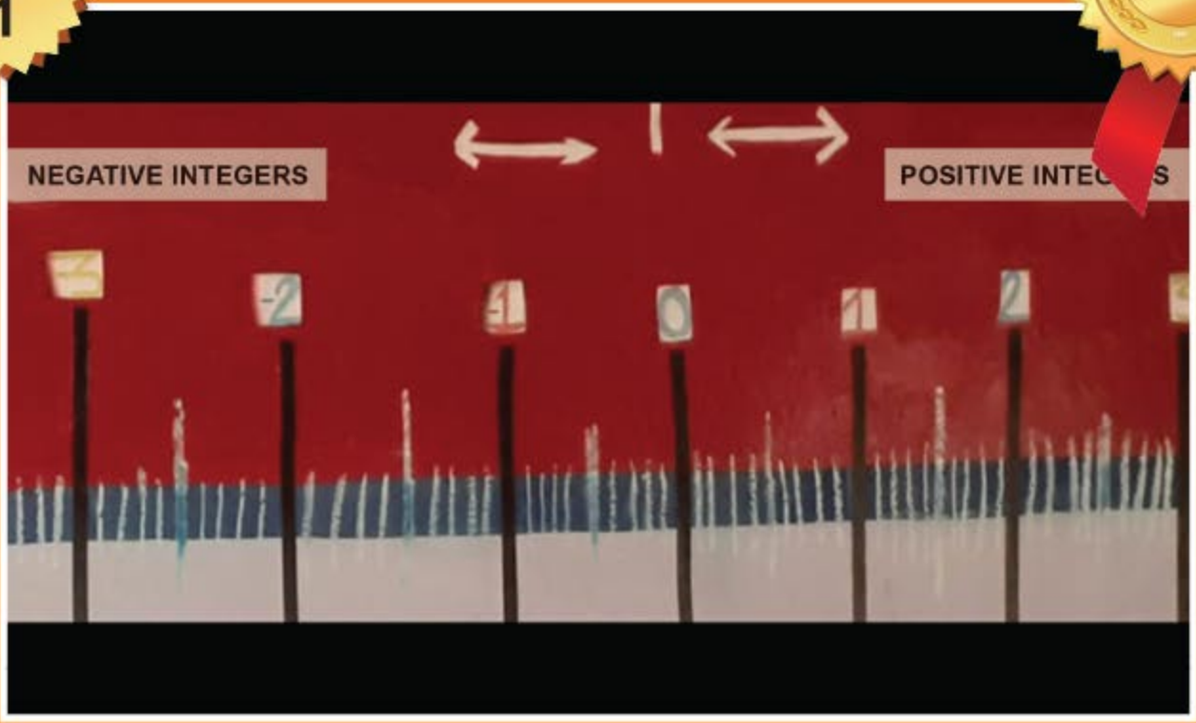
How to use:

- Start with the definition of the articles.
- Use the articles a, an and the, e.g., a bat, an apple, a van, the Sun, etc., and make students understand how and where to use these in sentences.

Integers

TLM 21

SBERA AWARDED



Created by Teacher: Parminder Kaur **School: GMS Marakhari**

TLM for Class 6
Subject – Mathematics
Topic – Integers

Brief description: In maths, integers are the numbers which can be positive, negative or zero, but cannot be a fraction. These numbers are used to perform various arithmetic operations, such as addition, subtraction, multiplication and division. The examples of integers are 1, 2, 5, 8, −9, −12, etc. The symbol of integers is "Z" (Source: Wikipedia). Using the above TLM to learn integers makes the understanding of the topic lucid and helps in learning by a play way method.

Other concepts that can be taught using this TLM: Natural numbers, whole numbers, number line, addition, subtraction, etc.

Materials used: Cardboard, white paper, sketch pen, cutter, pen, coloured tape, duct tape

Cost of the material used for making TLM (approx.): ₹30

How to make:

1. Paste white paper on the cardboard piece. Fix horizontally on it the contrasting coloured tape for making a number line.
2. Take duct tape. Cut it into 20 thin small strips of the same size and fix these equidistantly and vertically on the coloured tape representing the number line.
3. Cut small square pieces of the white paper. Paste these pieces on the vertical strips and write numbers 1, 2, 3, … on the square pieces, showing positive integers and negative integers.
4. Include other markings as shown in the TLM to make the number line.

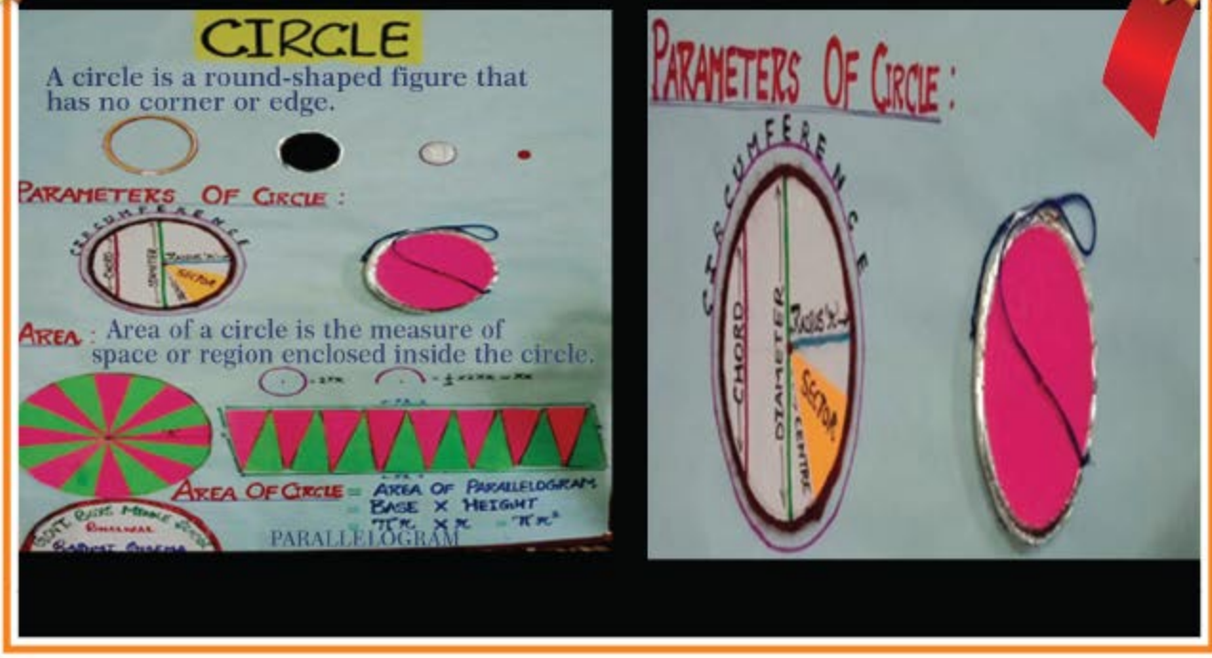
How to use:

- Show the TLM to the students.
- Help them to understand the concepts of predecessor, successor, addition and subtraction using the number line. This will enhance confidence in the students.
- Let the students figure out positive and negative integers on the number line.
- Also let them do some basic maths calculations, and guide them wherever necessary for better understanding.

Circle

TLM 22

SBERA AWARDED



Created by Teacher: Rashmi Sharma **School: GMS Bhalwal**

TLM for Class 6
Subject – Mathematics
Topic – Circle

Brief description: : A circle is a closed two-dimensional figure in which the set of all the points in the plane is equidistant from a given point called “centre”. Every line that passes through the circle forms the line of reflection symmetry. Also, it has rotational symmetry around the centre for every angle. By using this TLM, the students will be able to understand the concept of circle.

Other concepts that can be taught using this TLM: Meaning of area, concept of semicircle, shape and area of parallelogram.

Materials used: Thermocol, coloured chart paper, thread, wool, cardboard, paper pins, bangle, round biscuits, coin, bindi

Cost of the material used for making TLM (approx.): ₹50

How to make:

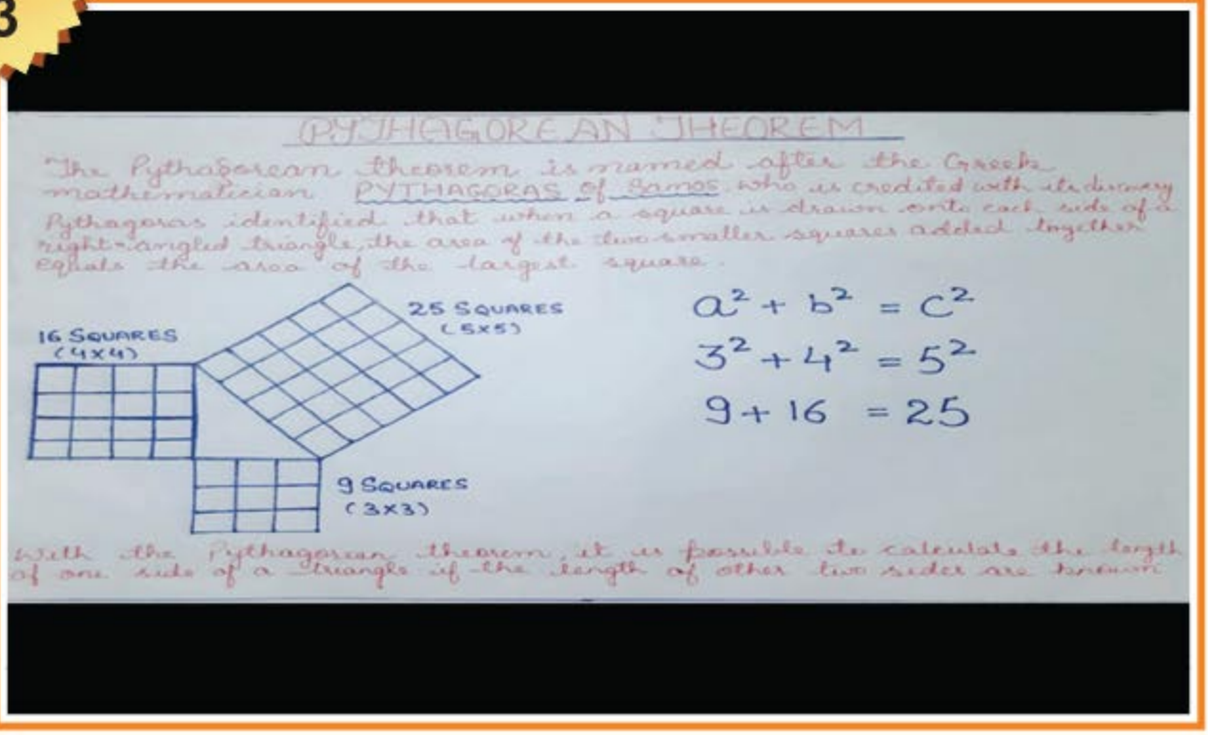
1. Take a thermocol sheet of rectangular shape and paste coloured chart paper on it.
2. Now, paste different circular items of our daily use on it, e.g., coins, bindis, bangles, etc.
3. Cut a circular piece from cardboard and draw different parameters of a circle on it. Then use wool of different colours for showing different parameters.
4. Make a 3D model of the circle with the help of thermocol and coloured paper. Use paper pins to show the boundary and centre of the circle. With the help of thread, we can show different parameters of the circle.
5. For the proof of area of a circle, we have to cut two circles of equal radii. Now divide the area of both circles into 16 equal parts. Paste one of the circles on the chart and arrange the other circle's 16 parts in a rectangular formation. We almost get a parallelogram.

How to use:

- This TLM can be hung on a wall, but it should be approachable to students or we can place it on a table as well.
- Now, the teacher will demonstrate the TLM.
- The teacher will explain the shape of a circle by showing the items of daily use.
- The teacher will show the students a 3D vision to practically demonstrate the different parameters of a circle by using thread rather than the traditional chalk and talk method.
- By using this TLM, the students will also come to know that how the area of a circle comes to be equal to the area of a parallelogram, i.e., (πr^2).

Pythagorean Theorem

TLM 23



Created by Teacher: Meenakshi Jamwal **School: GGHS Domana**

TLM for Class 7
Subject – Mathematics
Topic – Pythagorean Theorem

Brief description: The Pythagorean Theorem, the well-known geometric theorem, states that the sum of the squares on the legs of a right triangle is equal to the square on the hypotenuse (the side opposite the right angle) or in familiar algebraic notation, $a^2 + b^2 = c^2$. After using this TLM, the students were able to

- Understand the Pythagorean Theorem.
- Use the Pythagorean Theorem to find side lengths of right triangles.
- Use the Pythagorean Theorem to find areas of right triangles.
- Apply the Pythagorean Theorem to find the perimeter and area of triangles on a grid.

Other concepts that can be taught using this TLM:

- Precisely describe, classify and understand relationships among types of two- and three-dimensional objects using their defining properties
- Understand relationships among the angles, side lengths, perimeters, areas and volumes of similar objects

Materials used: Drawing paper, scale, pen

Cost of the material used for making TLM (approx.): ₹15

How to make:

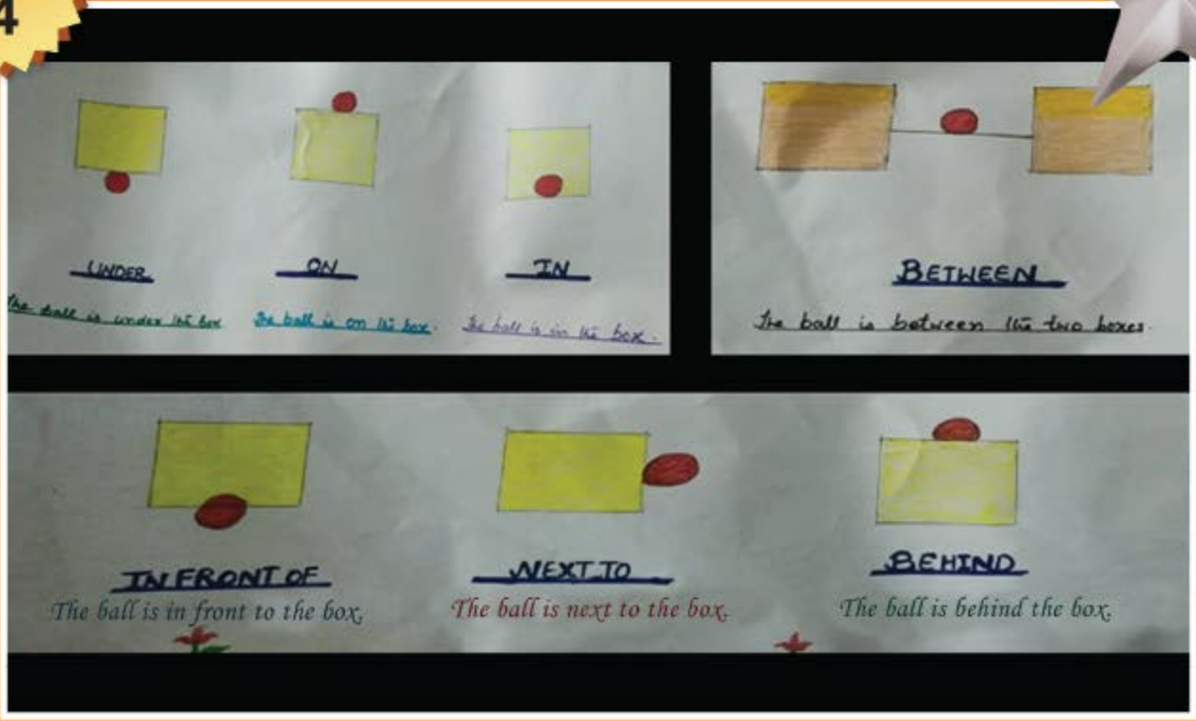
1. First, on drawing paper, draw a right-angled triangle whose altitude is 4 cm, base 3 cm and hypotenuse 5 cm, using the scale and pen.
2. Now draw a square with base as side as shown in the TLM. Similarly, draw two more squares with altitude and hypotenuse as sides.
3. Divide each square into small squares each of 1 cm2 area as shown.

How to use:

- First show the chart (TLM) to the students and ask them what they observe.
- Now make them understand that this TLM can be used to show the calculation to prove the Pythagorean theorem as follows:
  - The number of 1 cm squares in the square drawn on the side of 3 cm is 9.
  - The number of 1 cm squares in the square drawn on the side of 4 cm is 16.
  - The sum of squares on these two sides is 9 + 16 = 25.
  - The number of 1 cm squares in square drawn on the side of 5 cm (hypotenuse) is 25.
  - Therefore, square on the hypotenuse of the right triangle = sum of the squares on the remaining two sides. Hence, the Pythagorean theorem is verified for the right triangle.

Prepositions

TLM 24



Created by Teacher: Ritu Patiyal **School: GMS Seri Kalan**

TLM for Class 7
Subject – English
Topic – Prepositions

Brief description: A preposition is a word or group of words used before a noun, a pronoun or a noun phrase to show direction, time, place, location, spatial relationships or to introduce an object. A few examples of prepositions are 'in', 'at', 'on', 'of' and 'to'. Prepositions in English are highly idiomatic.

Other concepts that can be taught using this TLM: Simple prepositions, double prepositions

Materials used: Drawing sheet, pencil, rubber, scale, sketch pens, coloured tape

Cost of the material used for making TLM (approx.): ₹40

How to make:

Make the chart as shown, using the materials mentioned. However, it is good to use a table and a ball in the classroom to make the students understand prepositions in, at, on, etc., and then show the TLM to make them understand the meaning of different prepositions and their use in sentences.

How to use:

- Take this TLM in the classroom and show it to the students.
- Using the TLM, ask them what prepositions, under, on, in, between, behind, etc., indicate.
- Let the students answer.
- Explain all the terms and guide them how to use prepositions in various sentences.

Ecosystem

TLM 25

SBERA AWARDED

Created by Teacher: Ms Manmohan Kaur **School: GHS Deeli Gandhinagar**

TLM for Class 7
Subject – Science and Social Studies
Topic – Ecosystem

Brief description: It is said that visual presentation gives more knowledge than auditory information. Thus, this TLM will help the students to understand mountains, glaciers, compact settlements, scattered settlements, tributaries, lakes, pollution, roadways, etc. in detail, and they will also be able to relate these things with daily life (such as Why is forestation important to prevent soil erosion? How are rivers formed?).

Other concepts that can be taught using this TLM: Modes of transportation – roadways, waterways, etc., types of crops – rice, wheat, etc., terrain in plain and mountainous areas, etc.

Materials used: Chart, two black sketch pens, colours, all other materials are waste materials such as cardboard, thermocol, that is taken from TV case packaging, newspapers, toothpicks, etc.

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. First, we will start making the mountain ranges. Here, newspapers have been used to make the mountains as this will help in recycling newspapers as well as making the TLM. This is the link that shows how to make mountains using newspapers:
   https://drive.google.com/file/d/1LxtU0slbsgdi3M6W00AThAp1MbYRTcc/view?usp=drivesdk

2. Second, we will make a river, tributaries using colours (any type of colours), factory (to show the source of air pollution), buildings (which will show city life and compact houses), rural area (for showing small and scattered houses), fields, farmer's house and trees. We will also show some aquatic animals in the river. All these things are made using waste materials such as thermocol, waste cardboards, etc. For this step of the TLM, see the link below:
   https://drive.google.com/file/d/1LynKEbMTP_EPshRmnE0zPqYLFMHMPLpB/view?usp=drivesdk

3. We will make the glaciers using leftover cotton. The link is mentioned below:
   https://drive.google.com/file/d/1M2SVGFVA⊠MxKCT2Wzwd1mF5WiaOj9dk5/view?usp=drivesdk

4. In this step, we will make the tress with the help of green-coloured leftover paper and toothpicks. We will make the topic board with the title written on it: Natural Environment (Ecosystem). For this step of the TLM, see the link below:
   https://drive.google.com/file/d/1WbRE906fmqLFnE1x5Nh25U8c2Pt55JsA/view?usp=drivesdk

   Now, the TLM is prepared. It is a very low-cost and easy-to-make TLM. This is the video link for viewing the whole TLM.
   https://drive.google.com/file/d/1WVnGk7kZBm_4DZ_Icve80lRmHSOu0gCc/view?usp=drivesdk

How to use:

- The TLM can be used in various ways, e.g., while discussing geography, we can easily define many topics such as geographical conditions of mountains, plains, glaciers, rivers, etc.
- Ecosystem and environmental topics can also be taught through this TLM. A brief description of differences between urban settlements and rural settlements can also be given. It helps us understand why population in urban areas is high and how it affects nature.
- This TLM can also be used to clear the concept of pollution. The students can learn what soil erosion is and how it can be prevented, and many more things can be taught. A description for using this model is given below in the form of a link.
  https://drive.google.com/file/d/1WU_A87jXR2fzHkPY4JjtneV_5BSHsvdB/view?usp=drivesdk

How is Sound Produced

TLM 26

SBERA AWARDED

Created by Teacher: Ekta Nanda **School: GHS Raipur Satwari**

TLM for Class 8
Subject – Science
Topic – How is sound produced

Brief description: Sound is a pressure wave which is created by a vibrating object. Vibrations set particles in the surrounding medium in vibrational motion, thus transporting energy through the medium. By using such type of TLM, it is easy to clear the concepts regarding the topic, enables the students to proceed towards concrete learning and makes learning joyful too.

Other concepts that can be taught using this TLM: Concept of vibration, concepts of vibrating bodies, vibration produces sound, etc.

Materials used: Balloon, used plastic bottle, old broken pen

Cost of the material used for making TLM (approx.): ₹10

How to make:

1. Take any old broken pen, a balloon and any old empty plastic bottle. (In the TLM, a small cold drink bottle has been used.)
2. Cut the bottle from the neck and remove its cap.
3. Use only the tube (empty centre part) of the pen and remove other parts.
4. Connect one side of the balloon to the one side of the pen opening and the other side of the balloon to the open mouth of the cut plastic bottle.

How to use:

- First, show this TLM to the students or preferably try that the students will make their own.
- Now blow air from the open end of the pen by stretching the balloon downwards or upwards, with bottle neck holding in your hand, so that you feel vibrations on the balloon and then you will hear some sound. That is how sound is produced by a vibrating body.

Landforms

TLM 27

Created by Teacher: Safeena Akhtar **School: GHS Bain Bajalta**

TLM for Class 8
Subject – Geography
Topic – Landforms

Brief description: Mountains, hills, plateaus and plains are the four major types of landforms. Minor landforms include buttes, canyons, valleys and basins. Tectonic plate movement under the Earth can create landforms by pushing up mountains and hills. This TLM gives a basic understanding of various types of landforms, such as mountains, plains, peninsulas, oceans, etc.

Other concepts that can be taught using this TLM: Distribution of water resources, mountain ranges, etc.

Materials used: Drawing sheet, pencil, rubber, scale, sketch pens/colours, coloured tape

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take the drawing sheet.
2. Using the pencil and rubber, draw the various types of landforms in such a manner that it gives a 3D feel, as shown in the TLM.
3. Colour the landforms by using sketch pens/colours to make it more vibrant.
4. Then label the various landforms as shown.

How to use:

- Show the TLM to the students.
- Ask them what they understand from this. Appreciate the students for their responses and finally introduce the topic.
- Tell the students what they are able to see in the TLM are various landforms.

Rainwater Harvesting Filtration Plant

TLM 28

SBERA AWARDED

Created by Teacher: Ms Priya Tickoo **School: MS Bhalwal**

TLM for Class 8
Subject – Science
Topic – Rainwater harvesting

Brief description: Rainwater harvesting is the simple process or technology used to conserve rainwater by collecting, storing, conveying and purifying of the rainwater that runs off from rooftops, parks, roads, open grounds, etc., for later use.
The process of rainwater harvesting involves the collection and the storage of rainwater with the help of artificially designed systems that run off naturally or man-made catchment areas like- the rooftop, compounds, rock surface, hill slopes, artificially repaired impervious or semi-pervious land surface.

Other concepts that can be taught using this TLM: Purification of water from an impure sample, water conservation, steps involved in filtration of water.

Materials used: A cardboard, plastic tray, few small plastic cups, sketch pens

Cost of the material used for making TLM (approx.): ₹50

How to make:

1. Place the cardboard as model of a building.
2. Keep a plastic container with small holes on the building model representing the roof top.
3. Arrange four plastic bowls with holes systematically, first containing cotton, second containing granules and pebbles, third containing coal and fourth containing sand.
4. Keep these arranged bowls on a plastic glass and then place them adjacent to the building model.
5. As we pour the dirty water on the rooftop it passes through the levels of filtration (cotton, pebbles, coal, sand) and the filtered water gets collected in the tank (the plastic glass)
   Hence, the TLM successfully works.

How to use:

Show the students different parts of the rainwater harvesting plant with the help of the TLM created. Explain that a rainwater harvesting system consists of the following components:

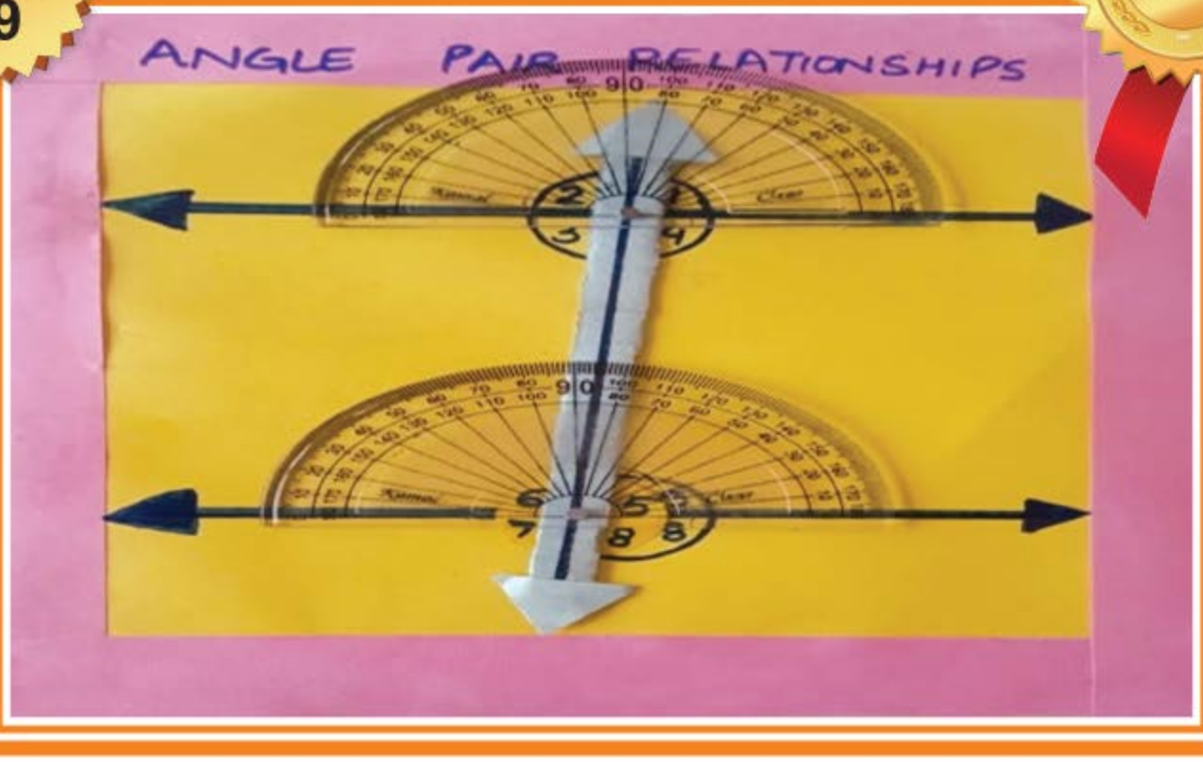
- Catchment- Used to collect and store the captured rainwater.
- Conveyance system – Used to transport the harvested water from the catchment to the recharge zone.
- Flush- Used to flush out the first spell of rain.
- Filter – Used for filtering the collected rainwater and remove pollutants.
- Tanks and the recharge structures: Used to store the filtered water which is ready to use.

Show students how rainwater harvesting is a sustainable process that helps in preserving water for future needs. Let them discuss why water scarcity is a major concern in today's scenario and how the process of rainwater harvesting is an efficient way to conserve water.

Angle Pair Relationship

TLM 29

SBERA AWARDED



Created by Teacher: Smt Garima Rani **School: GHSS Khanna Chargal**

TLM for Class 9
Subject – Mathematics
Topic – Angle pair relationship

Brief description: *Students can easily learn the concept of angle pair relationship by using the above TLM, when two lines are intersected by a transverse line*. When the lines are parallel, the corresponding angles are congruent. When two lines are cut by a transversal, the pairs of angles on one side of the transversal and inside the two lines are called the *consecutive interior angles*.

Other concepts that can be taught using this TLM: Linear pair angles are supplementary, vertically opposite angles, parallel lines, semicircle, cord, line segments

Materials used: Cardboard, coloured chart paper, two protectors, ruler, glue, marker

Cost of the material used for making TLM (approx.): ₹100

How to make:

1. Take a cardboard piece of length 22 cm and breadth 24 cm, and paste yellow chart paper on it as shown.
2. Take another piece of cardboard with thickness 0.8 cm and length 17 cm, and paste it vertically on the yellow paper as shown in the TLM. Draw a vertical line with a blue marker on it and locate the midpoint.
3. Draw two parallel lines in such a way that the transverse cuts them as shown in the figure. Fix the two protectors in the same way as in the TLM, and name the angles between the parallel lines using the marker.

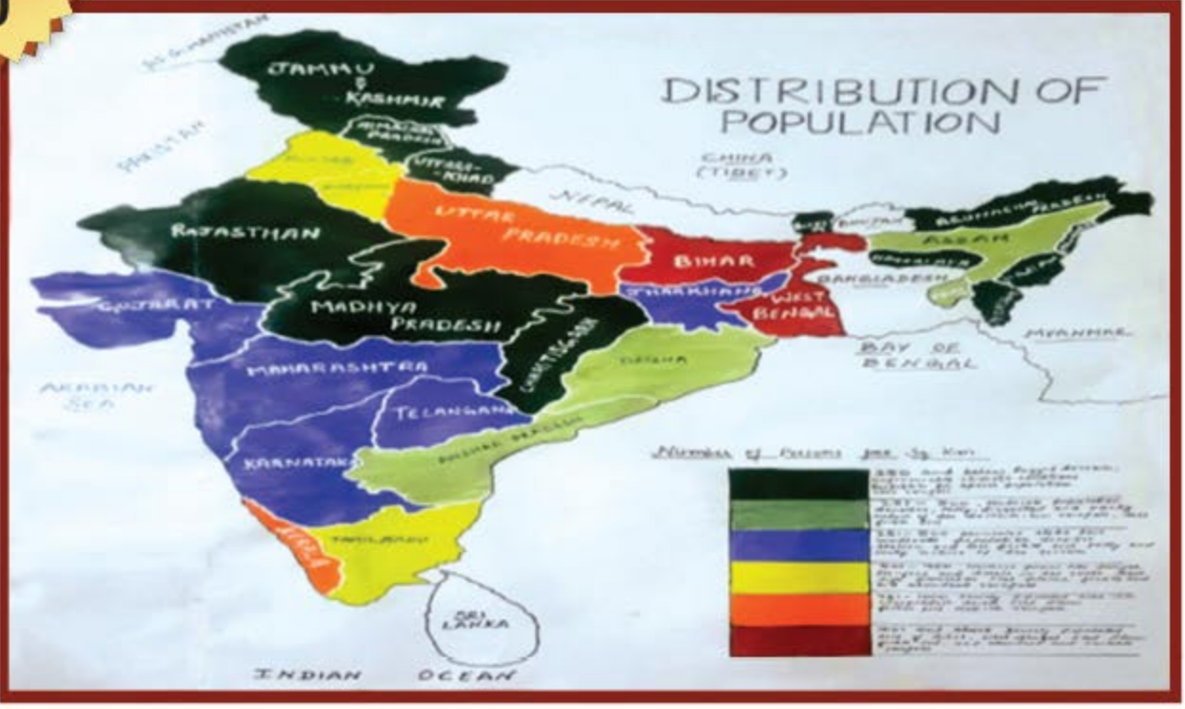
How to use:

- Show this TLM to the students.
- With the help of the TLM, explain them that when a transversal intersects two parallel lines, eight angles are produced. The eight angles will together form four pairs of corresponding angles. Corresponding angles are congruent. All angles that have the same position with regard to the parallel lines and the transversal are corresponding pairs.

- The angles that are in the area between the parallel lines are called interior angles, whereas the angles that are on the outside of the two parallel lines are called exterior angles. The angles that are on the opposite sides of the transversal are called alternate angles. All angles that are either exterior angles, interior angles, alternate angles or corresponding angles are all congruent.

Population Distribution

TLM 30



Created by Teacher: Manmohan Kaur **School: GHS Deeli Gandhinagar**

TLM for Class 9
Subject – Geography
Topic – Population distribution

Brief description: The students will learn about the increasing population of Indian states. They will get to know about the states which are densely and sparsely populated. The students will also be able to know the reason behind increasing population and relation between geographical conditions and human settlements.

Other concepts that can be taught using this TLM: Neighbouring countries of India, peninsular region, Indian Ocean, Bay of Bengal, etc.

Materials used: Cardboard, chart paper, sketch pens, pencil, ruler, glue, marker

Cost of the material used for making TLM (approx.): ₹10

How to make:

1. Take a full white chart and draw the outline of India with a light-coloured pencil. Once the outline has been drawn, darken the outline and draw the state boundaries.
2. With the help of a black sketchpen and other colours, colour the map as follow: red colour to make densely populated area – Bihar and West Bengal, orange colour – Kerala and Uttar Pradesh; yellow – Tamil Nadu, Punjab and Haryana; purple and light green – Gujarat, Maharashtra, Karnataka, Telangana, Andhra Pradesh, Odisha, Assam, Tripura and Jharkhand; dark green – Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Rajasthan, Madhya Pradesh, Chhattisgarh, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram and Meghalaya.
3. Make an index and then define the different colours according to the states, showing population distribution. This will make the concept of high, low and moderate population clear to the students.

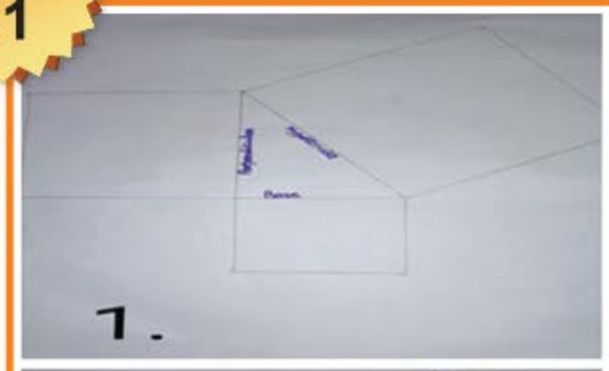
How to use:

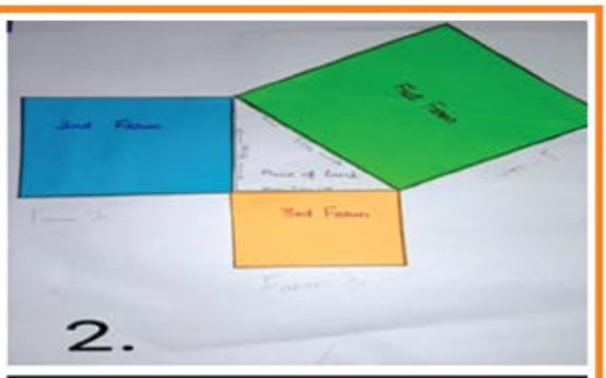
- This TLM can be used to make the distribution of population of India easy to understand for the students.
- The concept can be made clear by using the colours depicting different states. Colours also make it attractive and interesting for the learners. It is very easy to grab the attention of students in the class, using this TLM, and it also helps to reduce distractions for them.

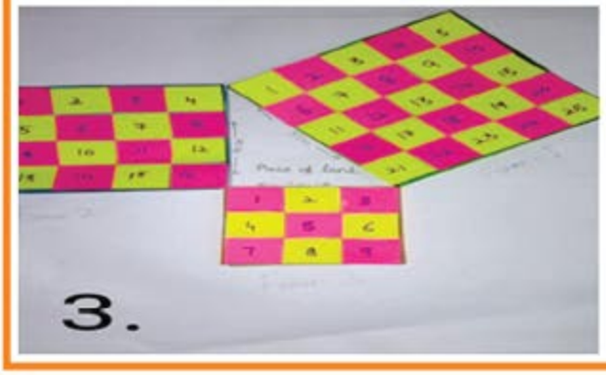
https://drive.google.com/file/d/1My1qkFSbvgz0fGEgyGtm7Y_4QUZW9r8/view?usp=drivesdk

Pythagoras Theroem

TLM 31







Created by Teacher: Ms Rashmi Sharma **Name of School: MS Bhalwal**

TLM for Class 9

Subject – Mathematics

Topic – Understanding Pythagoras theorem

Brief description: According to the Pythagoras theorem, the square of the **hypotenuse is equal to the sum of the squares of the other two sides of a triangle**. As students consider Math a boring and tough subject, we can arouse interest in them by using this TLM. By this innovative TLM we can increase their interest and concentration so that they are very clear about the topic. By using this TLM, students were able to differentiate between different aspects of a right-angled triangle besides finding the area and the perimeter of the square easily.

Other concepts that can be taught using this TLM:

- Aspects of Right-Angled triangle.
- Area of the square.
- Perimeter of the square.
- Square root of the numbers.

Materials used: Chart papers of varied colours, card board sheet, Fevicol, sketch pens, biscuits

Cost of the material used for making TLM (approx.): ₹30

How to make:

This TLM can be made by following these steps:-

1. Take a plain chart or a sheet of paper and draw a right-angled triangle on it. Now, write its sides as Base, Perpendicular, and Hypotenuse. Draw squares on these sides and paste different coloured chart paper on each square drawn on these sides.
2. Name these squares drawn on each side as Farm-1, Farm-2, and Farm-3 for better clarification of students.
3. Divide each square (farm) into small squares of unit length.
4. Take coloured sheets such as, pink and yellow and cut them according to the size of the small squares drawn on all three Farms and paste them on the squares drawn on the farms one by one alternately.
5. Now, our TLM is ready. We can count easily the number of coloured squares used on each farm and can prove the Pythagoras theorem.
6. For students' activity or more clarification of the students, we can use any square- shaped object such as, square-shaped biscuits, stamps, etc., on the squares drawn on the perpendicular, hypotenuse and base.

How to use:

- This TLM can be used in the classroom by hanging it on the board or wall or placing it on the table in front of the students such that it is visible to the whole class.
- Firstly, the teacher will practically demonstrate the different aspects of a right-angled triangle and then will start his topic.
- By using this TLM, the students will understand the proof of the Pythagoras Theorem and its application in mathematics.

Composition of atoms of first 18 elements and their electronic distribution

TLM 32

SBERA AWARDED

Created by Teacher: Ms Mamta Verma **Name of School: GHS Ranjanthati**

TLM for Class 9

Subject – Science

Topic – Composition of atoms

Brief description: The electron configuration of an element describes how electrons are distributed in its atomic orbitals. Electron configurations of atoms follow a standard notation in which all electron-containing atomic subshells (with the number of electrons they hold written in superscript) are placed in a sequence. The TLM explains about electronic configuration of elements in an interesting way.

Other concepts that can be taught using this TLM:

- Structure of atoms
- How planets revolve around the sun.
- Why chemical reactions occur.
- Understanding of solar system.
- Fundamental particles in chemistry.
- Periodic table

Materials used: Chart papers of varied colours, cardboard sheet, some waste material, pens, threads; small sized spherical balls made of waste material, colour pens.

Cost of the material used for making TLM (approx.): ₹30

How to make:

This TLM can be made by following these steps:-

1. Making of baseboard using some waste cardboard material.
2. Use of flash cards of elements, symbols and numbers as shown in the figure.
3. Label K, L, N shells, valence card and make the arrangement as shown in the figure.

How to use:

- This TLM can be used in the classroom by showing the model of structure of atom to students by placing the TLM on the table in front of the students such that it is visible to the whole class.
- Firstly, the teacher will practically demonstrate the model of structure of atom and will help them how to configure electrons amoung various shells of atoms.
- By using this TLM, the students will understand the elleptical orbits and how electrons move in these orbits.
- Also, the teacher must relate the concept of electronic configuration to the arrangement of elements in periodic table.

An atom is composed of two regions: the nucleus, which is in the center of the atom and contains protons and neutrons, and the outer region of the atom, which holds its electrons in orbit around the nucleus.Protons and neutrons have approximately the same mass, about 1.67×10^{-24} grams, which scientists define as one atomic mass unit (amu) or one Dalton. Each electron has a negative charge (-1) equal to the positive charge of a proton (+1). Neutrons are uncharged particles found within the nucleus.

Adverbs

TLM 33

SBERA AWARDED

Created by Teacher: Harpreet Reen **School: GHS Digiana**

TLM for Class 9
Subject – English
Topic – Adverbs

Brief description: An adverb is a word or an expression that modifies a verb, an adjective, another adverb, a determiner, a clause, a preposition or a sentence. Adverbs typically express manner, place, time, frequency, degree, level of certainty, etc., answering questions such as how, in what way, when, where and to what extent. *(Source: Wikipedia)*
The students get a clear picture of the topic, and it makes learning more interesting and fun. They will find this way of learning effective and long-term and enjoy the class more through the usage of the TLM.

Other concepts that can be taught using this TLM: Pronunciation, paragraph writing, grammar, etc.

Materials used: Drawing sheet, florescent sheets, glue, marker, scissors, other stationery (pencil, eraser, sharpener)

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take a white drawing sheet.
2. Make a colourful and attractive picture (such as a flower pot, etc.) on it.
3. Write the main terms of the topic as shown in the TLM. Carefully label all the parts as shown.

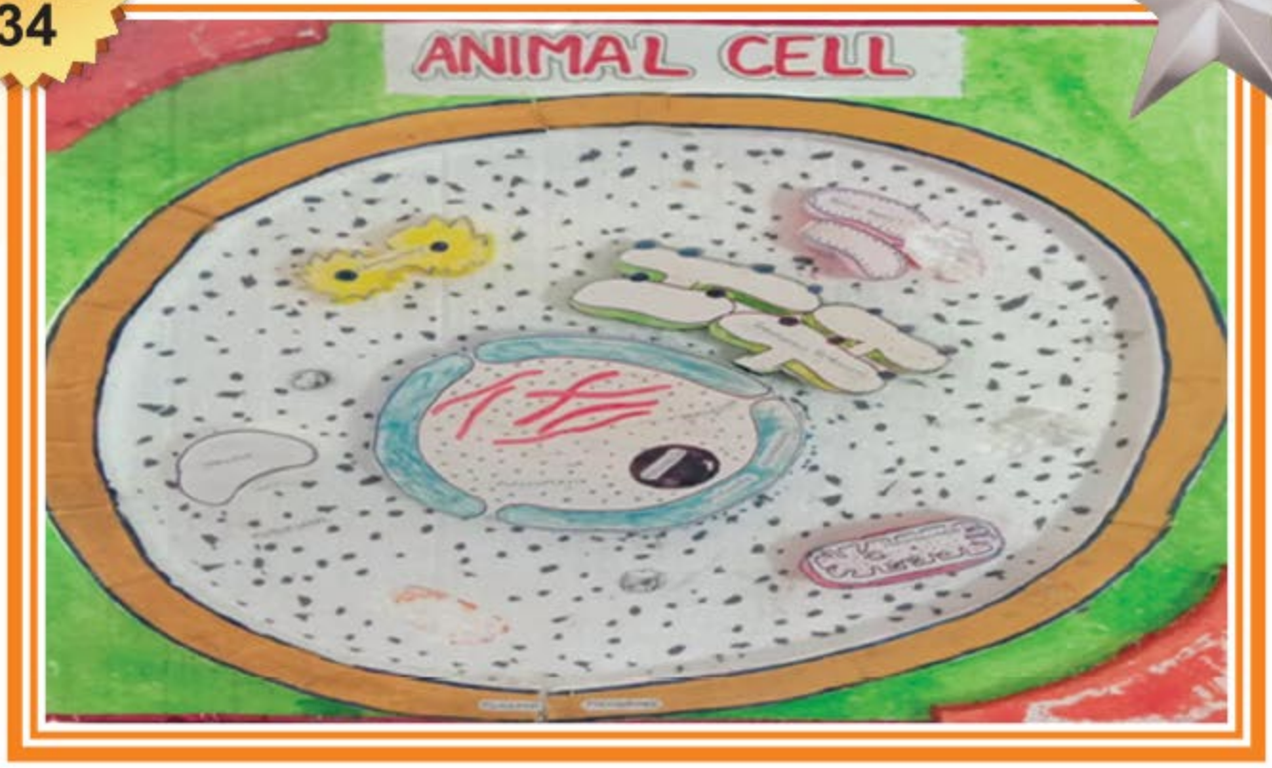
How to use: A few examples of adverbs as given below can be used to explain to the students.

o *Early*: She arrived *early* for the meeting. o *First*: When I bake, I make cookies *first*. o *Last*: When I clean, I do laundry *last*. o *Later*: I will stop by *later* to see how you are doing. o *Never*: He *never* wants to go to the park with me.

- Display the TLM in the classroom.
- Announce the topic and explain.
- Make the students read out the TLM.
- Make them understand the gist of the topic.

Animal Cell

TLM 34



Created by Teacher: Ms Naresh Sharma

School: GMS Jajjar Kotli

TLM for Class 10
Subject – Science
Topic – Animal cell

Brief description: *The TLM explains about an animal cell. An animal cell is a type of eukaryotic cell that lacks a cell wall and has a true membrane-bound nucleus along with other cellular organelles.* The TLM also gives brief idea about different organelles found in an animal cell which carry out specific functions necessary for a cell to function properly.

Other concepts that can be taught using this TLM: Difference between prokaryotic cell and eukaryotic cells, organelles in cells

Materials used: Drawing sheet, colour pens, thermocol sheets, cardboard, glue

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take a drawing sheet and draw the structure of a cell on it.
2. Label different organelles of the cell.
3. Cut a thermocol sheet into pieces to make 3D shapes of cell organelles and paste these in the cell as shown in the TLM.
4. Use colour pens to colour the diagram as shown to make it vibrant.

How to use:

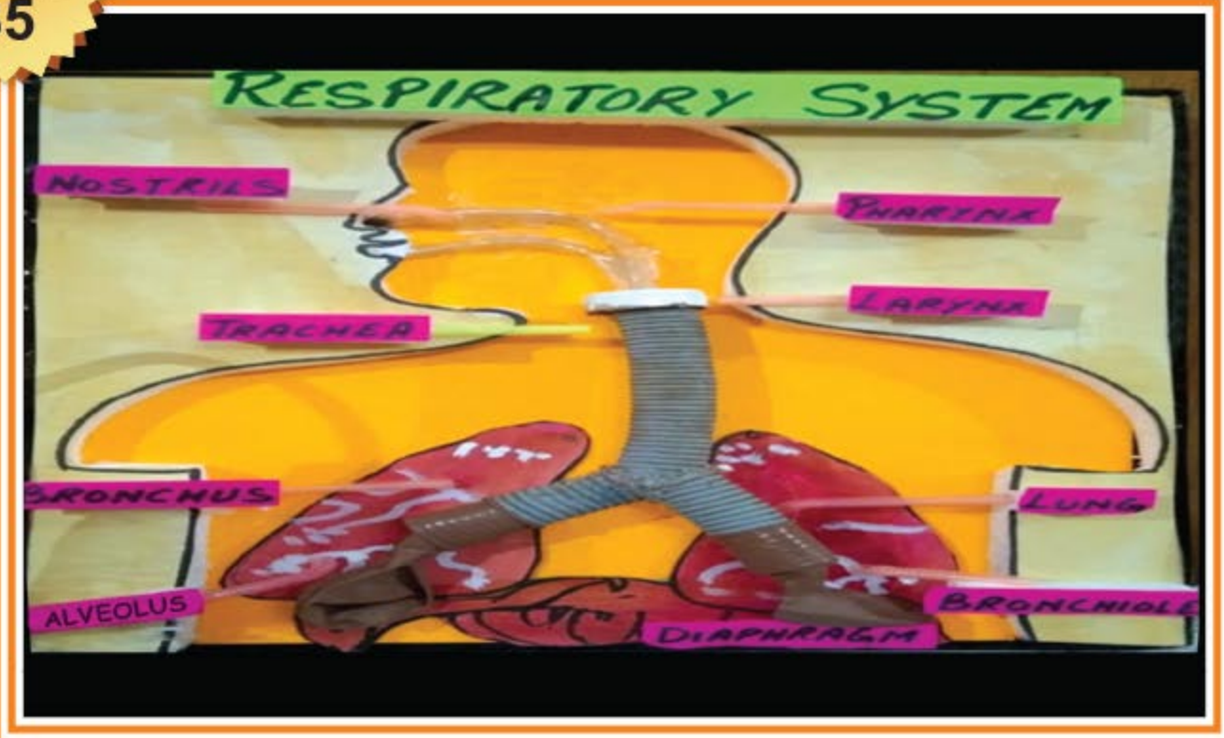
- Bring this TLM into the classroom for display.
- Ask students to identify the different organelles of a cell.
- Play a quiz by asking questions such as which organelles have what functions. Let them discuss down important points.
- Now, tell the students if they can draw similar diagram of the cell in their notebook without seeing the TLM. Once they are done, show them the TLM again to compare.

Note: Do explain that animal cells range in size from a few microscopic microns to few millimetres. The largest known animal cell is the ostrich egg, which can stretch over 5.1 inches across and weighs about 1.4 kilograms. This is in stark contrast to the neuron in the human body, which is just 100 microns across.

The shape of animal cells also varies, such as flat, oval or rod-shaped. Most of the cells are microscopic in size and exhibit the presence of DNA inside the nucleus. They also comprise other membrane-bound organelles and cellular structures.

Respiratory System

TLM 35



Created by Teacher: Ms Prerna Samyal **School: GBHSS Bishnah**

TLM for Class 10
Subject – Science
Topic – Respiratory system

Brief description: This TLM gives an overview of the structure and organisation of the respiratory system. With the help of this TLM, the students were able to understand the process of respiration and all the parts of the respiratory system easily as they were able to see the actual model of the respiratory system which enhanced their enthusiasm and excitement to learn about the topic.

Other concepts that can be taught using this TLM: Digestive system, internal parts of our body

Materials used: A cardboard, thermocol, chart paper, plastic straws, bottle cap, waste plastic bottle, balloons, waste plastic pipes, colours, glue, cutter

Cost of the material used for making TLM (approx.): ₹50
(Most of the things used were the waste materials found in the house)

How to make:

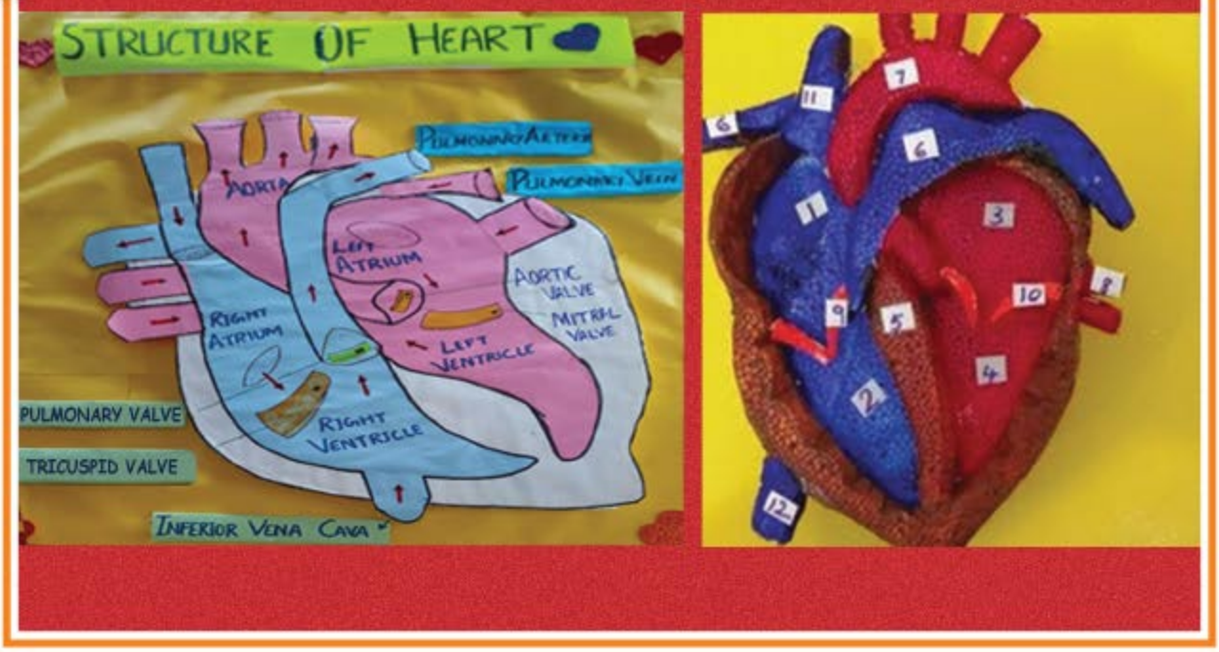
1. Take a piece of thermocol and trace and cut out the shape of the head and chest of a human body, with the help of a cutter.
2. Take a piece of cardboard, paste a coloured chart paper on it and then paste the outer part of the thermocol piece (i.e. left after cutting out the head and the chest) on the cardboard with glue.
3. Cut the thin plastic pipes into two small pieces to make the nasal cavity. Attach a bottle cap at the end of the pipes and further attach the bottle cap with a thick plastic pipe which forms the trachea. Then attach two small thick plastic pipes at the end of it which will represent primary bronchi. Close the ends of both thick plastic pipes with balloons as shown.
4. Take a chart paper and cut it in the shape of lungs. Draw and colour bronchioles and alveoli on it and paste this cut-out below the structure of primary bronchi on the cardboard. Also, make the diaphragm with the chart paper and paste it on the cardboard as shown.
5. Connect the outlet of the thin plastic pipes coming from the nostrils into a waste plastic bottle.

How to use:

- The process by which a living being utilises the food to get energy is called respiration. Respiration is an oxidation-reduction reaction in which carbohydrate is oxidised to produce energy. Mitochondrion is the site of respiration, and the energy released is stored in the form of adenosine triphosphate (ATP). Show the students how actually the process of respiration i.e., breathing in and breathing out takes place along with contraction and expansion of lungs.
- Explain them how the inhaled air reaches the lungs through air pipe (trachea). The students get a complete understanding how the process of respiration happens.

Structure of Human Heart

TLM 36



Created by Teacher: Ms Priya Tickoo **School: GMS Bhalwal**

TLM for Class 10
Subject – Science
Topic – Structure of human heart

Brief description: The human heart is one of the most important organs responsible for sustaining life. It is a muscular organ with four chambers. The size of the heart is about the size of a clenched fist. The human heart functions throughout a person's lifespan and is one of the most robust and hardest working muscles in the human body.

- The human heart is four chambered.
- The two smaller upper chambers are called atria and the larger lower chambers are called ventricles.
- Both are separated by the coronary sulcus.
- The left atrium is smaller than the right atrium, and both are separated by a thin muscular wall called interatrial septum.
- The left and right ventricles are separated by thick-walled interventricular septum.

Other concepts that can be taught using this TLM: Functions of human heart, oxygenated and deoxygenated blood, etc.

Materials used: Cardboard, white drawing sheet, colour pens

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take a rectangular-shaped cardboard and paste a white drawing sheet on it.
2. With the help of a pencil, draw the outline of the human heart.
3. Now, colour the parts of the human heart as shown in the picture.
4. Label various parts of the human heart.

How to use:

- Show the TLM to the students.
- Let them identify it as the structure of the heart.
- Point towards various parts of the human heart.
- Show the four chambers of the heart and also explain the functions of various parts of the heart.
- If possible also show a 3D video of the human heart to the students so that they will understand its functions and structure clearly.
- Ask them to draw the structure of the heart as shown in the TLM and label it.

Rainwater Harvesting

TLM 37

SBERA AWARDED

Created by Teacher: Shaveta Sharma **School: GBHSS Bishnah**

TLM for Class 10
Subject – Science
Topic – Rainwater harvesting

Brief description: Rainwater harvesting is a simple process or technology used to conserve rainwater by collecting, storing, and purifying of rainwater that runs off from rooftops, parks, roads, open grounds, etc. for later use.

Other concepts that can be taught using this TLM: Rainfall patterns, uses of water

Materials used: Cardboard, ply board, thermocol, chart paper, plastic tray/dish, Fevicol/glue, colour tape, submersible pump, pipe, collection tank

Cost of the material used for making TLM (approx.): ₹100

How to make:

1. Take a rectangular ply board and paste thermocol and chart on it.
2. Now take a cardboard and make a house from it.
3. To make the roof of the house, fix a plastic tray on the roof.
4. Take a pipe and insert its one end in the plastic tray (roof) and the other end in the collection tank.
5. Now connect one end of the submersible pump with the collection tank and the other with the rooftop (representing clouds).

Note: The waste water from collection tank can be used for many household purposes such as gardening, cleaning, etc. A recharge pit attached to a collection tank helps to replenish ground-water by recharging the underground aquifers.

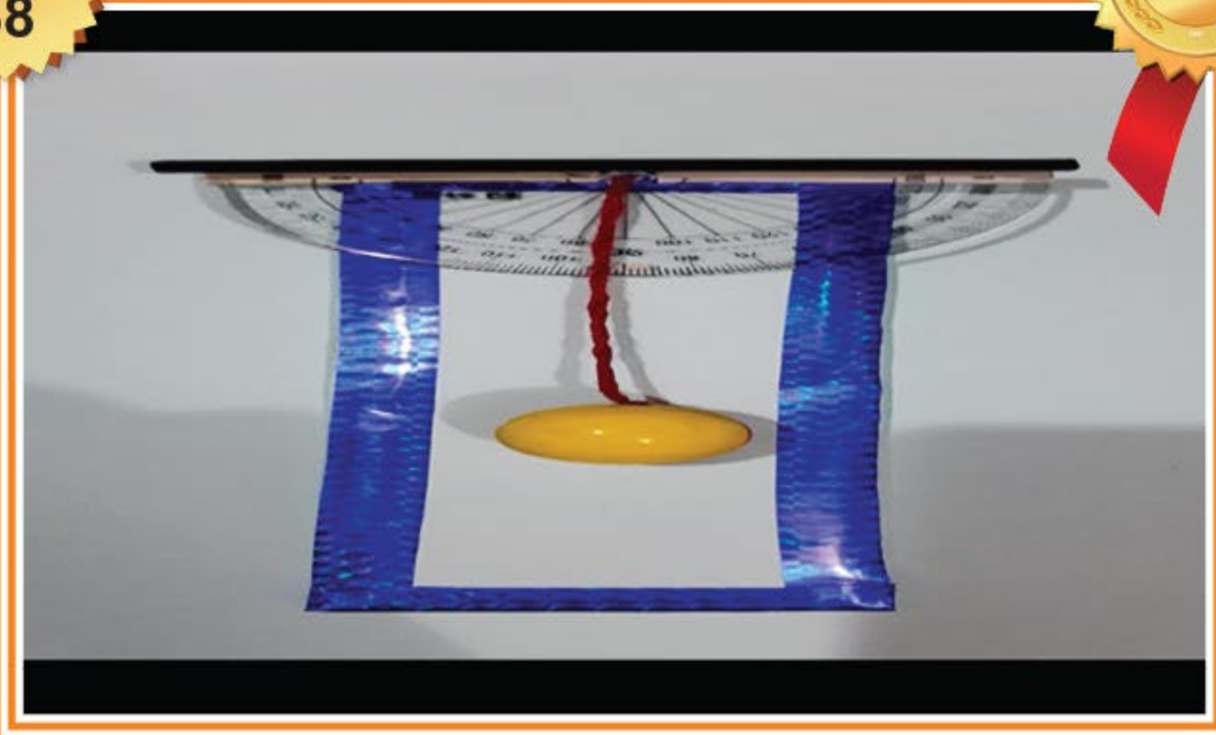
How to use:

- As we switch on the pump the water will fill the container and move on to the top of the roof (representing clouds).
- From the roof, the water will collect in the collection tank.
- This collected water can be used for different purposes.

Trigonometry – Clinometer

TLM 38

SBERA AWARDED



Created by Teacher: Ms Meenakshi Jamwal

School: GHS Domana

TLM for Class 10

Subject – Mathematics

Topic – Measurement of angles of elevation and deviation with clinometer

Brief description: The students show keen interest in learning trigonometry. They actively take part in the activity. It enhances their understanding power and helps in inculcation of a new concept in an easy manner. The students learn how to determine the angle of elevation and angle of deviation.

Other concepts that can be taught using this TLM: Angles, simple pendulum

Materials used: Small pipe or drinking straw, cardboard, thread, weight, screw, protractor

Cost of the material used for making TLM (approx.): ₹30

How to make:

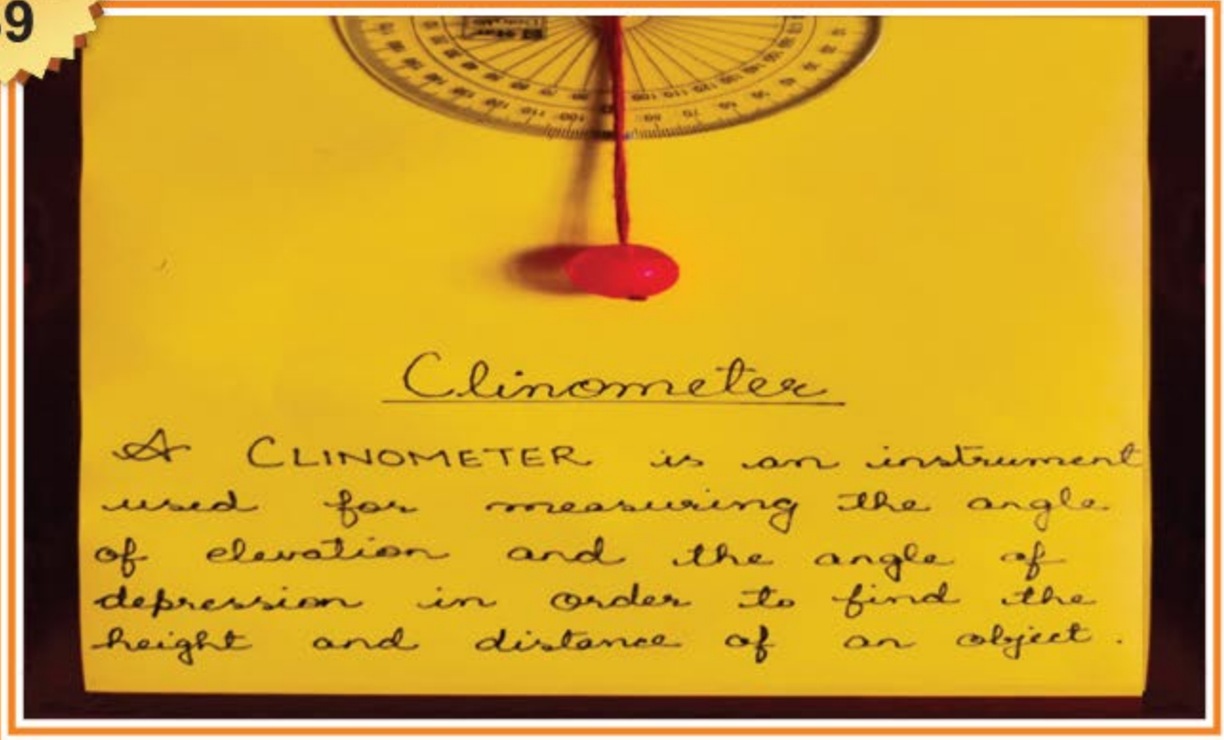
1. Take a rectangular cardboard and fix a protractor on it.
2. Fix a hollow pipe along the diameter of the protractor.
3. Punch a hole at the centre of the protractor.
4. Suspend a weight from a small screw fixed at the centre of the protractor.
5. Ensure that the weight at the end of the string hangs below the protractor.

How to use:

- For determining the height of an object, measure the distance of the object from you. Let it be *d*.
- Look through the hollow pipe/straw at the top of the object by rotating it gradually. Make sure that you can clearly see the top of the object.
- Hold the clinometer steady and record the angle which the string makes on the scale of the clinometer. This angle is the required angle of elevation or depression; let it be θ.
- Use trigonometric ratio,
  tan θ = height/distance = h/d. for the calculation of angle of elevation or depression.

Clinometer : Trigonometry (Height & Distance)

TLM 39



Created by Teacher: Ms Meenakshi Jamwal **School: GHS Domana**

TLM for Class 10

Subject – Mathematics

Topic – Measurement of height and distance using a clinometer

Brief description: A clinometer is a simple device used **to measure angles**. It can be used to measure the slope of a specific terrain, the height of a building or tree, or the declination of a celestial body. Students will be able to find the height and distance of a given object without actually measuring it.

Other concepts that can be taught using this TLM: Height and distance measurements without actual measurement.

Materials used: Chart papers, card board sheet, protactor, a small string, a small ball or any other object to be used as object for the activity, sketch pens

Cost of the material used for making TLM (approx.): ₹10

How to make:

1. Prepare a semi-circular protractor with the help of geometry box using a cardboard. Mark degrees in sexagesimal scale with 0° at the lowest and 10 to 90° proceeding both clockwise and anti-clockwise or take a readymade protractor from your geometry box.
2. Fix it on a cardboard.
3. Fix a hollow pipe along the diameter of it.
4. Punch a hole at the centre of the semicircle.
5. Suspend a weight (ball or the other object you chose) from a small nail fixed to the centre.
6. Ensure that the weight at the end of the string hangs below the protractor.

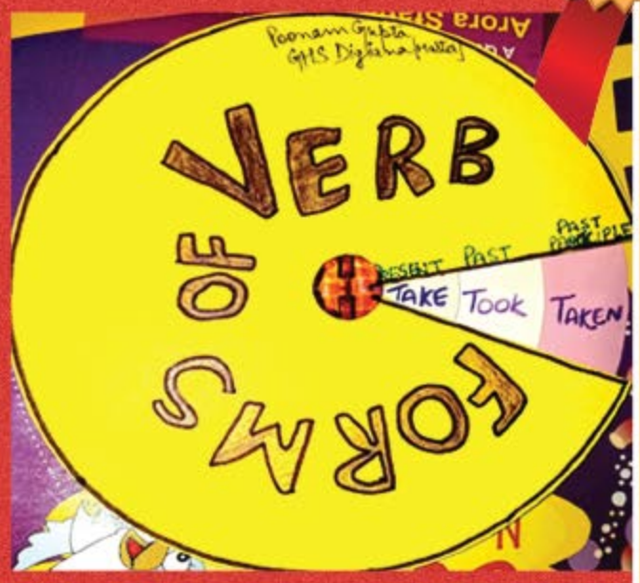
How to use:

1. Pick a spot to measure your object such as a telephone pole. You should be away from your object such that you can see the top of it, and you need to be on level ground with the base of the object. An example of the position of the object: Set something down by your feet once you've picked your spot, that ways you can easily come back to it.
2. Look through the straw of your clinometer at the top of the light pole (or whatever object you're measuring). The weighted string should hang down freely, crossing the protractor portion of the clinometer. Read the angle shown, and subtract from 90° to find your angle of vision from your eye to the top of the pole (it can be helpful here to have another person to read the measurement while you look through the straw). Record your results on a paper.
3. Once you have your angle of vision, use your tape measure to find the distance from the spot you're standing to the base of the object you're measuring (another person comes in handy here, too!). You must know how far away you are to accurately calculate the height.
4. The last piece of data you need to calculate the height of your object is the height from the ground to your eye (your eye-height).

Articles and Forms of Verb

TLM 40

SBERA AWARDED



Created by Teacher: Mrs Poonam Gupta **School: GHS Digiana**

TLM for Class 10
Subject – English
Topic – Grammar

Brief description: Articles are words that define a noun as specific or unspecific. A verb is a word that in syntax conveys an action, an occurrence or a state of being. Such TLM helps the students understand different forms of verb and use of articles in sentences.

Other concepts that can be taught using this TLM: Formation of sentences, words, etc.

Materials used: A cardboard piece, thermocol, chart paper, scissors, colour sheets, colours, glue

Cost of the material used for making TLM (approx.): ₹15,
(Most of the things used in the TLM were the waste materials found in the house.)

How to make:

First TLM

1. Take a chart paper and paste it on the thermocol sheet by using the glue.
2. With the help of scissors, cut out petals and circles from the colour sheets to make flowers as shown in the TLM. Also, cut out the colour sheet to make a flower pot.
3. On the pot, write 'Articles' and on flowers, write examples of articles.

Second TLM

1. For the second TLM showing the forms of verbs, cut the sheet in circular shape as shown.
2. Cut out a triangular piece from the circular sheet.
3. Arrange the sheets and label them as shown in the figure.

How to use:

- Show the TLM to the students and let them guess what the TLM is about.
- Tell them how we use articles in sentences and what are the different forms of verbs.
- After showing them the TLM, tell them to read a paragraph from the English textbook and find out how articles and verbs have been used. Ask the students to underline articles and verbs for better understanding.

Three dimensional structure of an atom

TLM 41

SBERA AWARDED

Created by Teacher: Ms Aparna Sabharwal **School: GHSS Gharota**

TLM for Class 11
Subject – Chemistry
Topic – Bohr's model of atom

Brief description: Bohr model of the atom was proposed by Neil Bohr in 1915. It came into existence with the modification of Rutherford's model of an atom. Rutherford's model introduced the nuclear model of an atom, in which he explained that a nucleus (positively charged) is surrounded by negatively charged electrons. Rutherford basically explained the nucleus of an atom and Bohr modified that model into electrons and their energy levels. Bohr's theory explains that electrons move in fixed orbitals (shells) and not anywhere in between, it also explains that each orbit (shell) has a fixed energy level.

Other concepts that can be taught using this TLM: Electronic configuration of atoms, concept of orbitals, 3D shapes in space, subatomic particles

Materials used: Chart papers, cardboard sheet, bangles, ball and sketch pens

Cost of the material used for making TLM (approx.): ₹10

How to make:

1. Cover the bangles, with increasing sizes, with different colours of wool.
2. Sticking beads to bangles with help of Bohrs formula
3. Gluing bangles to thermo chart
4. Making a ball using foil and sticking it to chart
5. Labelling of the shells shown

How to use:

- Show the model to the students and let them discuss and understand about the structure of atom.
- Now, introduce the concept of Bohrs model of atom and relate it with the shown TLM.
- Let students figure out the shells and the electrons revolving in them from the model.
- Give them insight of electronic configuration and make them understand the formula behind it.
- Let them reflect how negative charge of electrons is balanced by positive charge of protons.

Education – Etymological Meaning

TLM 42

Created by Teacher: Monika Mahajan **School:** GBHSS Bishnah

TLM for Class 11
Subject – Education
Topic – Etymological meaning of education

Brief description: The word education is derived from the Latin word "educare" which means to bring up. Another Latin word "educere" means to bring forth. Therefore, education means to bring forth as well as bring up. To introduce the concept in the class, using the above TLM will be exciting and interesting for the students.

Other concepts that can be taught using this TLM: Meaning of various Latin words, definition of education from Gandhiji and other educators' perspective

Materials used: Drawing sheets of different colours, colour pens, cardboard sheet, glue, ribbon, pins

Cost of the material used for making TLM (approx.): ₹20

How to make:

1. Take drawing sheets of different colours.
2. Cut the sheets to make cards of different shapes as shown.
3. Write the concept and the details on the cards.
4. Organise the cards on the cardboard, using glue, ribbon and pins as shown in the TLM.

How to use:

- This TLM is very easy to carry and use in the classroom. Simply, one needs to hang this TLM in the classroom in such a way that it is visible to all the students.
- Let the students observe the TLM and relate different words and try to define the word education in their own ways. This will make them both curious and creative.
- Finally introduce the concept in the classroom.

Note: The teacher or an elder should properly supervise the students while using sharp objects such as a cutter or a pair of scissors for the activities.

LIST OF SBERA AWARDEES - ZONAL LEVEL

Zone Gandhinagar (2021-22)

S.No.	Name of Teacher	Name of School	Category	Position
1	Smt. Prerna Sharma	GHS Bishnah	High/HSS	First
2	Smt. Baljeet Kaur	GHS Digiana	High/HSS	First
3	Smt. Garima Rani	GHSS Khanna Chargal	High/HSS	Second
4	Smt. Shaveta Rani	GBHSS Bishnah	High/HSS	Second
5	Smt. Poonam Gupta	GHS Digiana	High/HSS	Third
6	Smt. Harpreet Reen	GHS Digiana	High/HSS	Third
7	Smt Manmohan Kaur	GHS Deeli	Primary/Middle	First
8	Smt. Manpreet Kaur	GBMS Gorakh Nagar	Primary/Middle	First
9	Smt. Deenakshi Sharma	GLHS Bain Bajalta	Primary/Middle	Second
10	Smt. Rajni Devi	GPS Roop Nagar	Primary/Middle	Second
11	Smt. Teena Sohal	GMS Marakhari	Primary/Middle	Third
12	Smt. Rajni Devi	GHS Digiana	Primary/Middle	Third

LIST OF SBERA AWARDEES - ZONAL LEVEL

Zone Bhalwal (2021-22)

S.No.	Name of Teacher	Name of School	Category	Position
1	Surekha Rani	GMS Bhalwal	Primary	First
2	Neeraj Sharma	GPS Rewaliwala	Primary	Second
3	Shital Choudhary	GHS Kangrail	Primary	Third
4	Meenakshi Rajput	GPS Kote garhi	Primary	Third
5	Priya Tickoo	GMS Bhalwal	Elementary	Second
6	Rashmi Sharma	GMS Bhalwal	Elementary	First
7	Nirmal Kumari	GMS Mishriwala	Elementary	Third
8	Sakshi Kapoor	GHSS Gharota	Elementary	Third
9	Meenakshi Jamwal	GGHS Domana	Sec./Sr. Sec.	First
10	Mamta Verma	GHS Ranjan Thati	Sec./Sr. Sec.	Second
11	Aparna Sabharwal	GHSS Gharota	Sec./Sr. Sec.	Third

PICTURE GALLERY - SBERA

bharti
Bharti Foundation

satya bharti quality support program

PICTURE GALLERY - SBERA

ABOUT BHARTI FOUNDATION

Bharti Foundation was set up in the year 2000 as the philanthropic arm of Bharti Enterprises. It implements and supports programs in primary/elementary, secondary and higher education as well as sanitation.

THE SATYA BHARTI QUALITY SUPPORT PROGRAM aims to improve the overall school quality in government schools in partnership with the state governments. It supports students, teachers, parents and administrators to transform schools into vibrant and integrated institutions of learning and ensuring holistic development by bringing in co-scholastic interventions. The core-philosophy of the program is that if schools become engaging and happy spaces, it would result in the holistic development of students as they acquire leadership, communication, collaboration, and other 21st-Century skills along with academic learning.

This program engages school leadership, teachers, students and communities to enhance the overall schooling experience in partner government schools by incorporating best practices from Satya Bharti Schools. To facilitate sustainable change, the program broadly intervenes in four areas –

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satya bharti quality support program

Airtel NCR Campus, Plot No. 16, B Wing (1st Floor), Udyog Vihar, Phase IV, Gurugram - 122015 (Haryana)
:+91-124-4823500 | : bharti.foundation@bhartifoundation.org I Website: www.bhartifoundation.org

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