



$$2 \times 2 = 4$$



5

# 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 teachers of the government schools of the AGS J&K under the aegis of the Satya Bharti Quality Support Program. 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 TLMs is indeed commendable.

I express my sincere gratitude to Lt Gen DS Hooda (Retd), PVSM, UYSM, AVSM, VSM and Bar, the then General Office Commanding in Chief, Northern Command who, in 2016, invited Bharti Foundation to work with the Army Goodwill Schools in J&K. I also thank Lt Gen VK Joshi, UYSM, AVSM, VRC, SM, ADC, General Office Commanding in Chief, Northern Command, all officers and staff of his Headquarters and its subordinate formations, Brigadier Brajesh Pandey, Principals and teachers of the Army Goodwill Schools, in extending their consent for the launch of this book.

I also express my gratitude to all the leading mentors from Bharti Foundation, whose valuable support and constant motivation has contributed significantly to enhance the quality of this book. In this regards, a special thanks to Mamta Saikia, CEO (Chief Executive Officer), Bharti Foundation for giving a go ahead to the entire project and motivating the entire team by resting undoubtable faith in its competencies and abilities. Heartfelt appreciation goes to Antony Joseph Nellissery, Chief School Excellence, 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, Bharti Foundation at all times is always cherished. I also acknowledge the commendable support by Sameer Shah, Rajdeep Anand and Anil Bhat for the project at all levels.

Last but not the least, this book in its final form is a result of the efforts and creative contributions of Mudasir Shah, Trainer Bharti Foundation in manuscript compilation through a thorough collection, selection and translation of the best TLMs from the schools, Arun Syal in design and type setting, all under the watchful and Chief Editorship and overall project coordination by Veena Tyagi. I am grateful to each one for their significant endeavours in making this book see the light of the day.



**Sumita Shee**

Head - Training and Curriculum  
Bharti Foundation





उत्तर कमान मुख्यालय  
द्वारा - 56 एपीओ  
Headquarters Northern Command  
C/o 56 APO

## MESSAGE FROM THE BRIGADIER

It is heartening that Army Goodwill Schools in collaboration with Bharti Foundation are launching the 'Teaching Learning Material (TLM)' book. Teachers of Army Goodwill Schools and Bharti Foundation have been working collectively to create new learning environments for students, thus allowing education to continue amid pandemic.

The TLM book is an example of dedication, innovation and creativity. It is important for every teacher to use TLM as it helps in better interpretation and understanding of concepts effectively. I congratulate the teachers of Army Goodwill Schools and experts from Bharti Foundation who have contributed towards bringing together and compiling the TLM into a book format for dissemination to all teachers of J&K.

The inter-disciplinary approach applied to most of these TLMs is a testimony to enhance the quality of teaching and learning process and will also serve, as I believe, as inspiration for initiating many more innovations in the field of education.

I am sure that Quality Support Program of Bharti Foundation in collaboration with principals and teachers of Army Goodwill Schools will tirelessly continue to strive towards enhancement of quality education.

**Brijesh Pandey**  
Brigadier (IW) HQNC





## MESSAGE FROM THE CEO

I am delighted to announce the release of the J&K TLM booklet for the Army Goodwill Schools, 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 Army Goodwill Schools in Jammu and Kashmir region, 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 achieve 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 signed an MoU with Project Sadbhawana of Headquarters Northern Command, under the Ministry of Defence, on 21st April' 2016, further renewed on 20th April 2021. As per the MoU, Bharti Foundation is supporting educational initiatives in 43 AGS schools spread across J&K and Ladakh region for enhancing the overall schooling experience of around 14658 students and 659 teachers in 12 districts of the UTs.*

*The Satya Bharti Quality Support Program is currently benefitting over 190,318 students and 7632 teachers across 11 states/ UTs in the country.*

*Data as of 31 August 2021.*



## MESSAGE FROM THE PRINCIPAL

I am happy that Bharti Foundation is releasing this TLM book. This is a very good step to recognise the hard work and innovation of the Army Goodwill School teachers.

Bharti Foundation has contributed immensely to the field of education and has a vital role in promoting the spirit of knowledge and wisdom. We feel privileged at this moment on the release of this book on TLMs created by our teachers. It is indeed a great step towards reaching the epitome of knowledge.

This TLM book will definitely help other teachers and will motivate them to make effective TLM and making the teaching learning process interesting.

I congratulate all teachers whose TLM has been selected and published in this book for benefit of others. I also appreciate efforts of Bharti foundation in supporting our teachers in adopting latest pedagogical techniques and equipping them with 21st century skills.

I hope to see many more innovations and great work done by our Army Goodwill School teachers, thus, leading by an example.

Thank you!

**Ms Ila Upadhyaya**

Principal

AGPS Pahalgam



The initiative of a TLM book by Bharti Foundation which comprises of TLMs submitted by the teachers of Army Goodwill Schools across J&K comes as a boon to the education fraternity. The book beautifully brings together innovation by different teachers, from different topographies in J&K. This book shows best how to reach out to a student in the most efficient way. My praise to all the teachers who have contributed towards this book and made it such a success.

**Mr Syed Abid Rizvi**

Principal

AGS Boniyar





This is a great joy to know that Bharti Foundation is bringing out a TLM book. It is the acknowledgment of the hard work and innovation of our Army Goodwill School teachers.

Bharti Foundation over the years has been playing a vital role in the field of education. This TLM book will definitely help other teachers and will motivate them to enrich their teaching with the TLMs created.

I take this opportunity to congratulate all teachers who have contributed their TLMs and published in this book for the benefit of others. I also appreciate efforts of Bharti Foundation in supporting our teachers in streamlining them with latest skills.

I am sure that these TLMs by our Army Goodwill School teachers will be a pathfinder.



**Mr Biju M.D**

Principal, AGS Potha



It's a moment of gratitude that a book wholly dedicated to TLM is being released by Bharti Foundation, it's one of a kind wherein all the teachers across Army Goodwill Schools have contributed their experiences in the form of TLMs. This step is hugely important as it not only brings to limelight all these beautiful TLMs that have been time tested and effective, but also serves as a guide to other teachers to reach to the next level.



**Mrs Shahida Khan**

Principal, AGS Hanzik



I am glad to know that Bharti Foundation is releasing this TLM book, and that the book will act as reference for all time to help and motivate our teachers and students alike. I am specifically thankful to Bharti Foundation for organising so many capacity building training workshops for our teachers for their professional development, besides, giving many opportunities to our teachers to participate in many national events and helped them to get their good work recognised.



**Mohd Javid**

Principal, AGS Harkabahdur  
Kargil Ladakh.





# 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.

In the series of SBERA awards, there is a 'Teaching Innovation Awards' category for which 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 schools teachers (regular/ para/ adhoc teachers) of the Quality Support Program (QSP) and other selected schools (Non-QSP), for all levels in all subjects are eligible to participate in this competition. A 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 the TLM Selection for the Award

- a. Innovation and creativity:** TLMs which are already in use and commonly available are marked lowest, whereas the TLMs which are created for the first time and innovative are marked highest.
- b. Relevance:** TLMs which are relevant with regard to curriculum and subject taught in the schools are marked highest, whereas those which are not directly linked to the subject knowledge are marked lowest.
- c. Effectiveness and usability:** TLMs which are portable, easily maintained in the classroom, safe for students and of direct use to them are rated higher.
- d. Preparation time and cost:** TLMs prepared in less time and cost are marked higher.
- e. Availability of materials and parts:** TLMs which use less material and its parts are easily available, replaceable and non-exhaustible are marked higher.

## 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 reimbursement.





**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:**

S.No.	Name of Teacher	Name of School	Rank
1	Nargis Khatoon	AGS Harkabahadur	Gold
2	Rafia Kausar	AGS Hamirpur	Gold
3	Fidah Hussain Malik	AGS Bandipora	Gold
4	Tahira Sultan	AGS Sapore	Silver
5	Mohd Ashraf Magray	AGS Ziran	Silver
6	Nuzhat Gojri	AGS Hanzik	Silver
7	Samana Kaneez	AGS Harkabahadur	Bronze
8	Sajjad Hussain	AGS Farona	Bronze
9	Mrs Devender Kaur	AGPS Rajouri	Bronze



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

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



# CONTENT : TLM SERIES...

No.	Name	Page	No.	Name	Page
1	India-Our Country	9	23	Volcano	53
2	Number Nouns (Singular and Plural)	11	24	Making of an Electromagnet	55
3	Concept of Size	13	25	Angles	57
4	स्वर व्यंजन	15	26	Fundamental Duties	59
5	Verbs	17	27	Digestive System	61
6	Shapes	19	28	Secularism	63
7	Formation of Numbers	21	29	Life in a Desert	65
8	Water Cycle	23	30	Solar Energy	67
9	Biodiversity	25	31	Quadrilaterals	69
10	Place Value	27	32	Tobacco (the silent killer)	71
11	National Symbols of India	29	33	Soil Profile	73
12	Parts of a Plant	31	34	Working Model for Finding LCM	75
13	Healthy Foods	33	35	India: Size and Location	77
14	Shapes	35	36	Lines and Angles	79
15	Concept of Bar Graphs	37	37	Structure of DNA	81
16	Fractions	39	38	Curved mirrors	83
17	Water Pollution	41	39	Structure of Methane (CH <sub>4</sub> )	85
18	विलोम शब्द	43	40	Human Circulatory System	87
19	Water Cycle	45	41	Structure of Nephron (Kidney)	89
20	Circles and its Parts	47	42	Working of an Electric Motor	91
21	Floating and Sinking	49	43	DC Generator	93
22	विशेषण	51	44	Soil Erosion	95

The list mentioned above includes some awarded and non awarded TLM under the SBERA category (Formerly called as: Teacher's Innovation Awards). To encourage teachers' efforts, some TLMs are marked as gold and silver medals.





# India – Our Country

TLM  
1



Created by Teacher : Mudasir Hilal

School: Army Goodwill School Hanzik,  
Shariefabad

## TLM for Class 1 Subject – English Topic – India-Our Country

**Brief description:** The main motive of using this TLM in the classroom is to introduce young minds with diversity in our nation. Apart from knowing about national symbols such as National flag, National bird and National animal, students will explore cultural diversity including different festivals, languages and religions that coexist in India with peace and harmony. This TLM is activity-based and, hence, it develops interest among students and they become curious to participate with full fervent and enthusiasm.

**Other concepts that can be taught using this TLM:** Physical boundary of our country and neighbouring countries, unity in diversity with respect to practicing of different religions, colours of our National flag, etc.

**Materials used:** Chart paper, pulses, rice, cotton

**Cost of the material used for making TLM (approx.): ₹5**



### How to make:

1. Draw an outline map of the boundary of India on the chart paper.
2. In the middle of the map draw two concentric circles of radius 3.2 cm and 3.5 cm.
3. Draw 24 spokes of concentric circles giving them the shape of Chakra, like in our National flag.
4. From the center of the chakra, draw two arcs of 5 cm and 8 cm, two above the circle and two below the circle.
5. Connect these arcs (5 cm and 8 cm) and give them shape of hands as shown in the picture.
6. By using glue, paste rice, cotton and pulses to represent different religious symbols.
7. Colour the symbols.
8. You can use waste paper to draw the symbols of religions and colour them.













### How to use:

- Display the chart on the wall, so that students can see it.
- Pointing at the chart, explain that it represents different religions practiced in India.
- Divide the class into four groups. Ask each group to make the chart in collaboration with their respective team members.
- Ask each group to display the chart and speak 2-3 sentences on what they have prepared.



# Number Nouns (Singular and Plural)

TLM  
2

NOUN NUMBER	
<u>Singular</u> (Means one)	<u>Plural</u> (Means many or more than one)
 BALL	 BALLS
 STAR	 STARS
 BAT	 BATS
 TRIANGLE	 TRIANGLES
 BRINJAL	 BRINJALS
 LEAF	 LEAVES

Created by Teacher: Ms Affnan mohi-ud-din

School: Army Goodwill School,  
Boniyar

TLM for Class 1

Subject – English

Topic – Singular and plural nouns

**Brief description:** The TLM is interesting and easier for the students to understand the concept of number nouns. They will be able to define what singular and plural means. Based on their understanding of what each term means, they will be able to differentiate between singular and plural noun.

**Other concepts that can be taught using this TLM:** Geometrical shapes, picture recognition and vocabulary enhancement (naming the shapes and objects in the learning process).

**Materials used:** Used drawing sheet, coloured papers/sheets, glue and markers or sketch pens of different colours

**Cost of the material used for making TLM (approx.):** ₹5





### How to make:

1. Using coloured papers, cut different shapes.
2. Paste these shapes on the used drawing sheet.
3. Label these shapes using different sketch pens, so that the name of the shape is readable or highlighted.

### How to use:

- Hang the drawing sheet on a wall in front of the class so that it will be visible to every student in the class.
- Call students one by one and ask them to count and tell the number of the specific shape or the objects from the sheet.
- Using their responses, count the number of each shape or object and explain them the concept of singular and plural.





# Concept of Size

TLM  
3



Created by Teacher : Ms Ramandeep Kaur

School: Army Goodwill School,  
Boniyar

TLM for Class 1

Subject – Mathematics

Topic – Understanding the concept of size

**Brief description:** Students will be able to understand different sizes using colourful materials. The activity will help in retaining the concept and apply in real-life.

**Other concepts that can be taught using this TLM:** Increasing order, decreasing order, distance in relation to size, concept of greater than and less than.

**Materials used:** Chart paper, sketch pens, cello tape and a pair of scissors.

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





### How to make:

1. Take the chart paper.
2. Cut the shapes of stars of different sizes.
3. Number the stars from 1 to 9 as per their increasing size.
4. Use different colours to fill in the stars.
5. Arrange them on the class board or on a wall/desk as per their increasing size with the help of a tape.

### How to use:

- Introduce the shape of a star by pointing out to any one of the stars displayed on the class board.
- Point out to the second star arranged next to the first and make the students understand difference between the two stars with respect to their size.
- Ask them to name the number on the above mentioned two stars. This will give them idea about smaller and bigger number.
- Students will now be able to differentiate stars by their size and the number assigned to them.
- Keep arranging the stars in the increasing order of their size, that is, by starting from 1 and moving on to 9.
- Conclude by pointing the arrangement of the different sizes from smaller to the largest.





# स्वर व्यंजन

TLM  
4



Created by Teacher : Paramjeet Kaur Sahani

School: Army Goodwill School,  
Boniyar

## TLM for Class 1 Subject – Hindi Topic – स्वर व्यंजन

**Brief description:** This TLM provides an interesting way to understand the otherwise complex concept of स्वर and व्यंजन. Students perform the activity and understand different स्वर and व्यंजन given in the TLM. This also create curiosity among students to explore the concept further.

**Other concepts that can be taught using this TLM:** Concepts of हिंदी व्याकरण, such as संज्ञा, सर्वनाम, कारक, विशेषण।

**Materials used:** Drawing sheet, note book covers, sketch pens, glue and scissors.

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



### How to make:

1. Take a drawing sheet and cut it into 3 circles of different sizes (small, medium and large).
2. Take the notebook cover and cover each circle.
3. Now we have 3 disc shapes with us.
4. Write व्यंजन on the large disc, स्वर on the medium disc and माला on the small disc.
5. Arrange these circles as concentric circles.
6. Arrange in a manner that they can be rotated.

### How to use:

- Rotate the smallest disc where स्वर can be easily seen along with its मात्रा ।
- Rotate the largest disc with व्यंजन written on it to show different व्यंजन ।

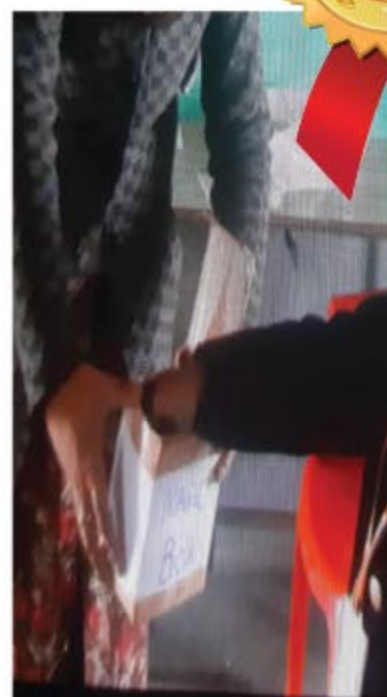
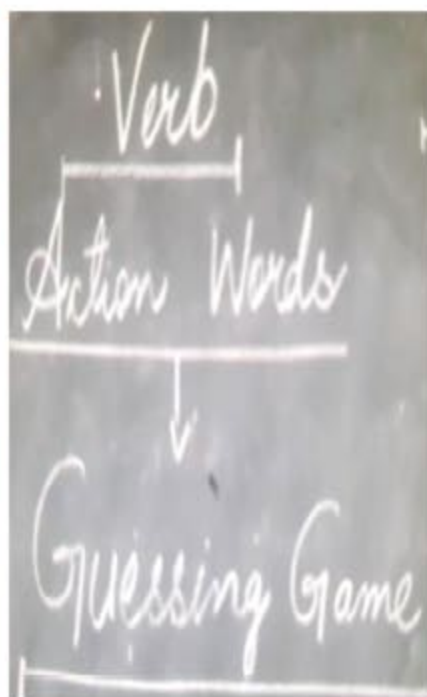




# Verbs

TLM  
5

SBERA  
AWARDED



Created by Teacher : Mrs. Parmeet Kaur

School: Army Goodwill School,  
Boniyar

## TLM for Class 1 Subject – English Topic – Verbs

**Brief description:** The students will be able to participate in the activity and share their observations. They will feel more confident while speaking in the class. The Magic box activity will help students make use of their previous learning and learn verbs in a fun manner.

**Other concepts that can be taught using this TLM:** Name of body parts, internal organs of human body, components of computer.

**Materials used:** Cardboard, pencil, a pair of scissors, an adhesive to paste, paper.

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



### How to make:

1. Take a cardboard. By using a pair of scissors, cut squares of equal measurement.
2. Paste the squares together using an adhesive and make a box.
3. Now, take pieces of paper and make slips with action words written on them.
4. Put all the slips in to the box and close its lid.
5. The magic box is ready.

### How to use:

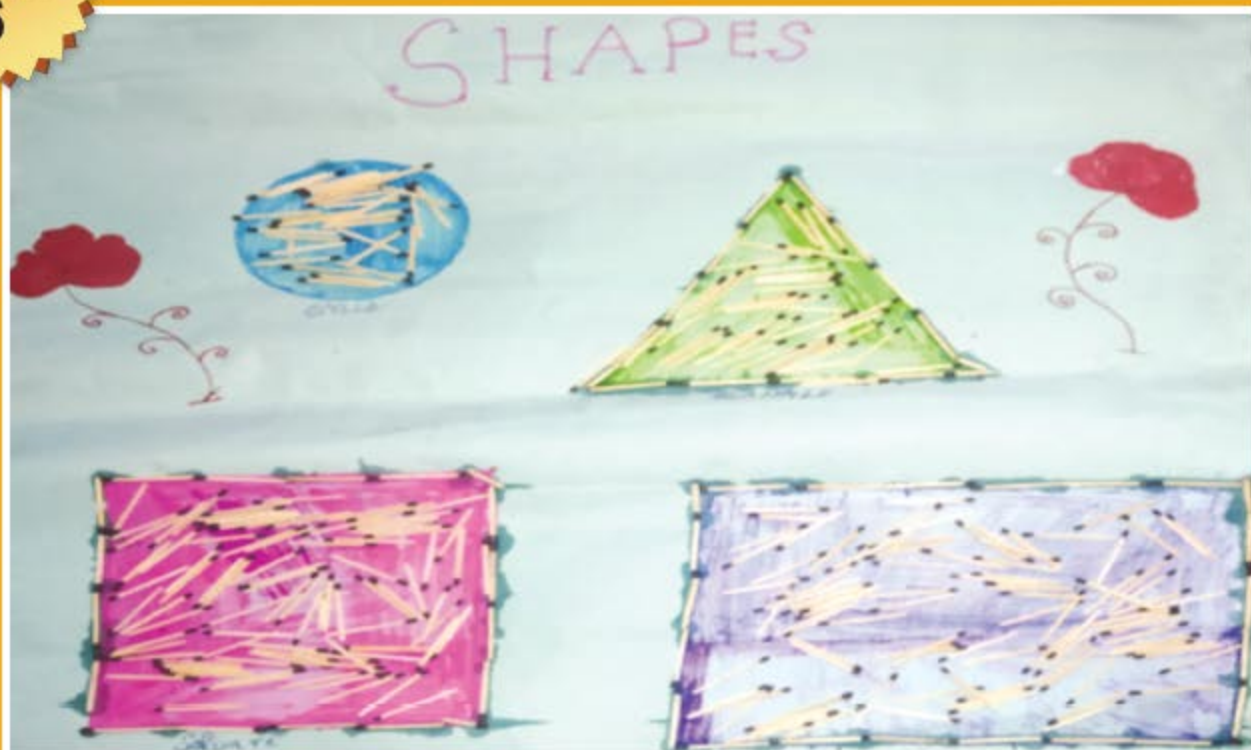
- Ask one student from the class to pick a slip from the box.
- Tell the student to read the action word silently and enact the word using hand sign or gestures, without speaking.
- Now, ask other students to guess the word s/he picked up from the box by guessing as per her/his action.
- Repeat this process for rest of the words by calling different students to enact.
- Start writing the words guessed by students on board.





# Shapes

TLM  
6



Created by Teacher : Miss Nazakat

School: Army Goodwill School,  
Boniyar

## TLM for Class 1 Subject – Mathematics Topic – Shapes

**Brief description:** The students will be able to identify shapes of various things around them. They will be able to understand and memorise names of various shapes. This will help them to identify and name shapes of the objects that are around, such as the shape of their notebook, book, black board and table.

**Other concepts that can be taught using this TLM:** Concept of circles and figures.

**Materials used:** Pencil, chart paper, cardboards, matchsticks and sketch pens.

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



### How to make:

1. Use scale and pencil to draw shapes such as rectangle, square, triangle, circle, line, etc., on different chart papers. Use match sticks to create models of these shapes by pasting them on the cardboards. Students can also create such models by using their own creativity.
2. Colour the shapes with different sketch pens.

### How to use:

- Display the chart or models, etc., to the students.
- Ask the students to observe the shapes.
- Ask them questions based on each shape one by one. For example, ask the students to describe how the shape on the chart or the model looks like.
- Let them guess and relate or share examples from their surroundings.
- As you talk about each shape, introduce the name of the shape and ask them to share a few more examples resembling that shape.





# Formation of Numbers

TLM  
7



Created by Teacher : Sanam Majeed

School: Army Goodwill School, Hanzik

## TLM for Class 2

### Subject – Mathematics

### Topic – Formation of Numbers

**Brief description:** This TLM will give the students a clear understanding about how to put a number on its actual place and how to expand a number easily. As the TLM involve students to perform the activity it makes it interesting for them and helps in the application of their understanding.

**Other concepts that can be taught using this TLM:** Expanded form of numbers, place value of numbers, short form of numbers, short cut methods of solving place value problems.

**Materials used:** White chart paper, few coloured chart papers, a pair of scissors, thumb pins, markers, scale, glue stick and a compass.

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

### How to make:

1. Take the white chart paper and keep it as a base.
2. Take chart papers of three different colours. Using a compass make three equal circles.
3. Cut these circles and paste them on the white chart paper which is kept as the base, using the thumb pins or glue.
4. Cut 3 rectangles, 3 small triangles and 2 squares, 1 small and 1 bigger from the remaining coloured sheets.
5. Paste the circles in a horizontal line on the plain chart paper and pin them at the centre with the thumb pin. This has to be done in a way that the circles can rotate.
6. Using the ruler, divide each circle in 10 segments from the centre, with a marker.
7. Take the 3 cut outs of rectangles and paste them above each circle.
8. Name their places in numbers according to their place value.
9. Take the bigger square and paste it on the top of the sheet and write the topic of the activity.
10. Take the other square cut out and paste it on the top right corner of the white sheet. Write the number whose place value has to be taken.
11. In the circle placed at the ones place mark numbers from 0-9, 00-90 in the tens circle and numbers 000-900 in the hundreds circle.

*Precaution: Use scissors in presence of an adult.*

### How to use:

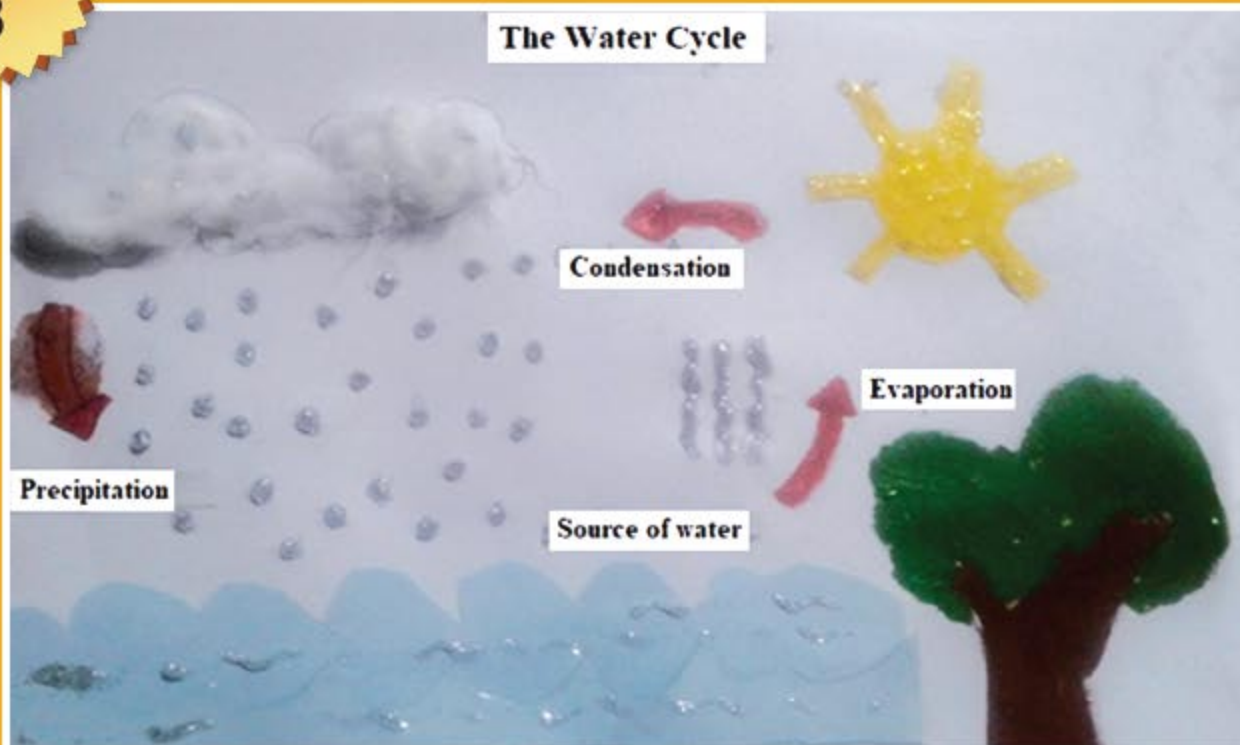
- Pin the TLM on the board in front so that all the students can see it.
- Write a number on the paper at the right corner of the sheet, with a pencil, so, that the TLM can be used to show place value of different numbers.
- Now, call out randomly for students and ask them to tell the place value of the numbers by using the circles.
- Ask them to rotate the circles so that the place value is at the pointer (made of triangle sheet).
- Suppose the number written in square box whose place value is to be taken is 589 then using the small triangles mark their place value in the circles as shown above. This is how to mark place value of the given number.





# Water Cycle

TLM  
8



Created by Teacher : Sumeet Kaur

School: Army Goodwill School, Hanzik

## TLM for Classes 2 & 3

### Subject – Environmental Science (EVS)

### Topic – Water cycle

**Brief description:** Through the TLM students will be able to understand the process of water cycle. Since it is represented pictorially, it will be interesting for them to understand.

**Other concepts that can be taught using this TLM:** Changing states of water (for class 3 onwards), evaporation and condensation.

**Materials used:** A chart paper, pencil, cotton, colours, sparkle glue.

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



### How to make:

1. Create a scenery showing light coloured (white or light grey) clouds, sun in the clouds, tree and a water body under the sky.
2. Use pencil to draw these and sparkle to fill them with colours.
3. Make rain droplets falling from the clouds using sparkle.
4. Make cloud from cotton. (If you want to show light grey clouds then colour the cotton with water colour or use light grey paper).
5. Label the processes involved in water cycle—evaporation, condensation, and precipitation.
6. Label the source of water as well.

### How to use:

- Mount the chart paper on the wall for display. Make sure all students are able to see it.
- Pointing at the processes, explain the water cycle. Explain how water evaporates (evaporation), forms clouds (condensation) and falls as rain (precipitation).
- **Extension of the learning:** Tell students other forms of precipitation such as snowfall, hail stones and dew drops.



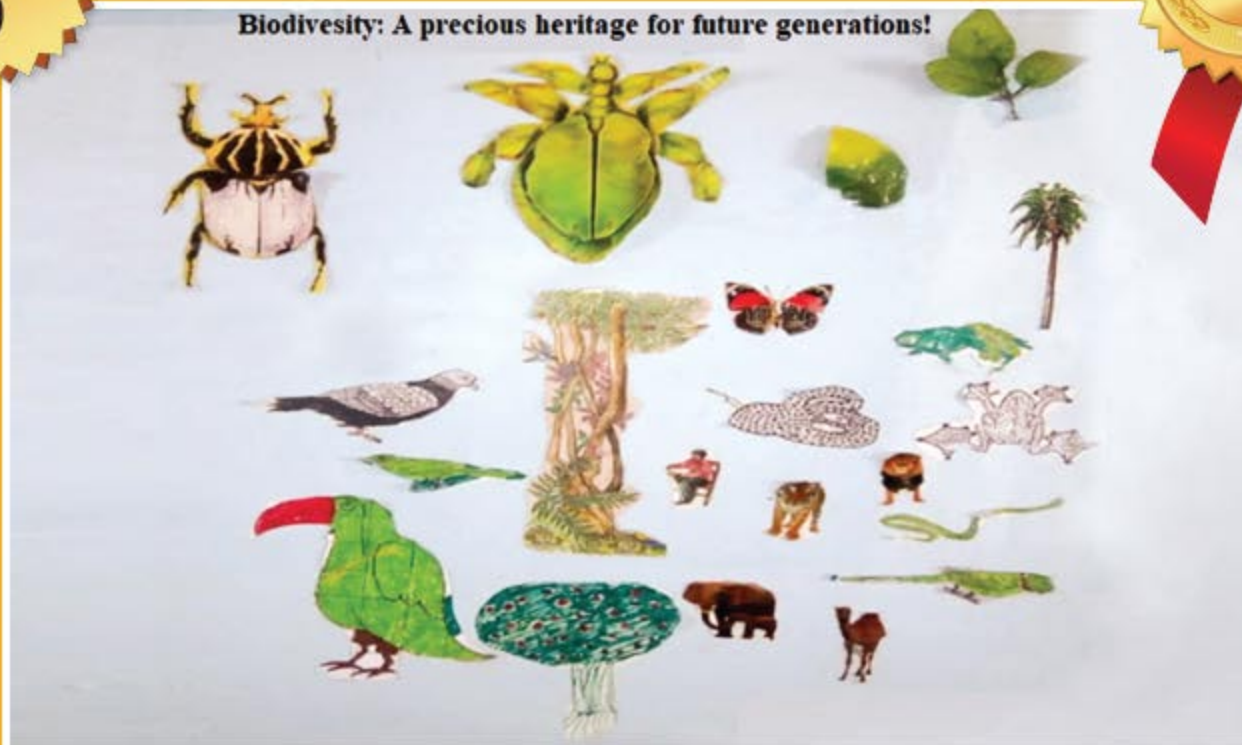


# Biodiversity

TLM  
9

Biodiversity: A precious heritage for future generations!

SBERA  
AWARDED



Created by Teacher : Tabasum Qayoom

School: Army Goodwill School,  
Boniyar

## TLM for Classes 2 & 3 Subject – Environmental Science (EVS) Topic – Biodiversity

**Brief description:** Using the TLM on biodiversity, students were very enthusiastic and curious to know about biodiversity. Students were also able to think of other plants, animals and insects they have seen. They were also made to understand that they are also part of biodiversity.

**Other concepts that can be taught using this TLM:** Living and nonliving things, things around us.

**Materials used:** Chart paper, pencil, eraser, pencil and sketch pen colours.

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



### How to make:

1. Take a chart paper and draw different living organisms on it such as bug, parrot and plants.
2. Colour the living organisms and label them.
3. On the top of the chart paper, write the heading of concept 'Biodiversity: A precious heritage for future generations!'.

### How to use:

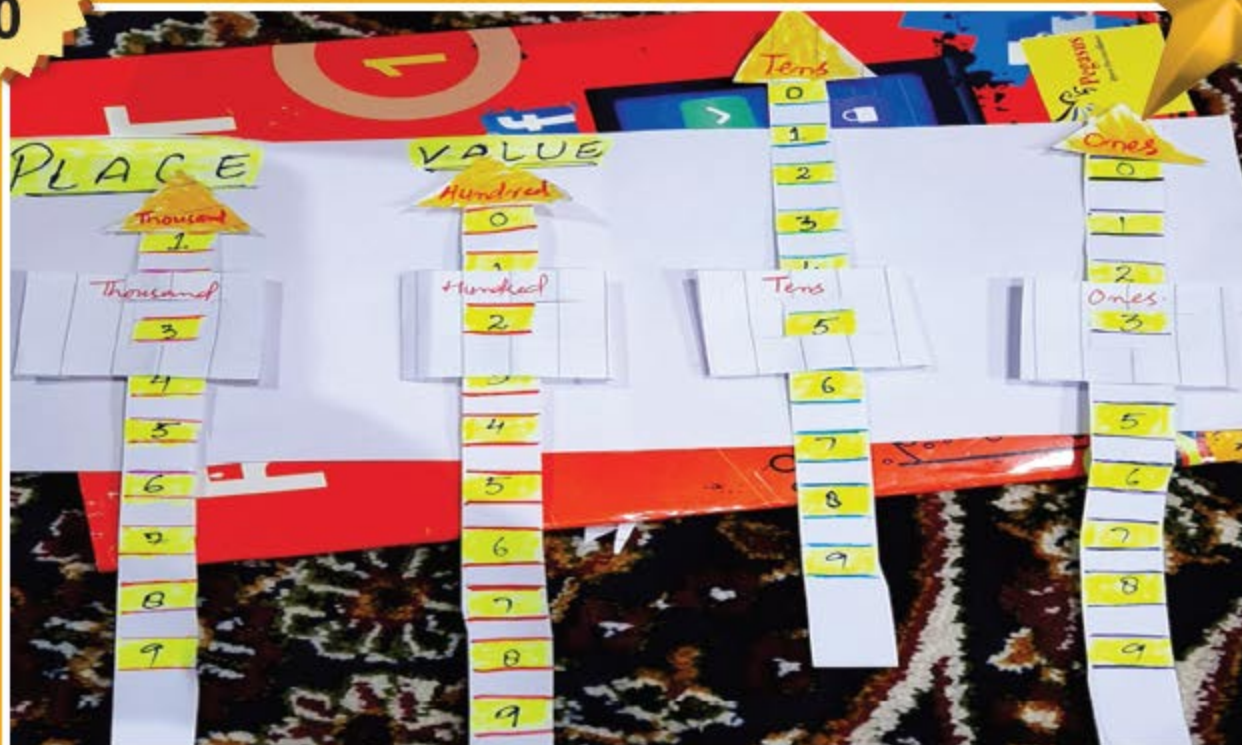
- Display the chart paper to the class so that it is visible to every student.
- Now ask students to list some living things that they see around them.
- Ask them questions such as number of eyes, limbs and the shape of body, etc.
- Note the responses on the board.
- Using their responses and the chart paper, explain the concept of biodiversity.





# Place Value

TLM  
10



Created by Teacher : Arifa Beigh

School: Army Goodwill School,  
Boniya

## TLM for Classes 3 & 4 Subject – Mathematics Topic – Place value

**Brief description:** This TLM can be used to demonstrate the concept of the place value of the number. Students are able to understand the concept easily and using this TLM can tell place value of any number correctly. This TLM, thus, helps students to understand the place value of any number.

**Other concepts that can be taught using this TLM:** Indian as well international place value number system.

**Materials used:** Chart or sheets of paper, pencil, colours and glue.

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



### How to make:

1. Take a sheet of paper and make four slits as shown in the figure.
2. Make hole in each slit, so that number can be seen through them.
3. Make 4 strips from the blank paper and add an arrow head to each, as shown in the picture of the TLM.
4. Write ones, tens, hundreds and thousands on the arrow of the sheets.
5. Write numbers from 0 to 9 on each strip.
6. Pass the arrows from the slits as shown in the figure, use coloured pens while marking the numbers and lines.

### How to use:

- Display it in front of students such as they are able to see it clearly.
- Ask students to tell the number that they are able to see.
- From every strip take first number and write in the same order on black board and then ask students to identify which is ones, tens, hundreds, etc.
- Introduce the concept of place value now.



# National Symbols of India

TLM  
11



Created by Teacher: Ms Ramandeep Kaur

School: Army Goodwill School,  
Boniyar

## TLM for Class 3

Subject – General Knowledge and EVS

Topic – National Symbols of India

**Brief description:** The concept of national symbols is taught with the help of pictures to make it interesting. It gives them the insight to our National symbols, their meaning and importance.

**Other concepts that can be taught using this TLM:** Indian currency and the National flag (as extension activity).

**Materials used:** Scrap paper, white or plain sheets, glue stick, card board, colours and sketch pens, cut outs of national symbols from old books and pen or pencil for labelling.

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

### How to make:

1. Cut a piece of cardboard into a desired size.
2. Paste an equal size of drawing sheet on the cardboard.
3. Take the scrap paper and cut in the form of a tree trunk with branches on which the leaves will be pasted.
4. Take the papers (on which the national symbols will be pasted) and cut them in the shape of leaves.
5. Collect cut outs of our National symbols such as Ashoka chakra, tiger, lotus, peacock and mango from old books or magazines.
6. Paste the parts now. First, paste the national symbols on the leaves and then paste these leaves on the branches of the tree.
7. Finally decorate the TLM with cut outs of nature's background having pictures of birds, flowers and animals, etc.

### How to use:

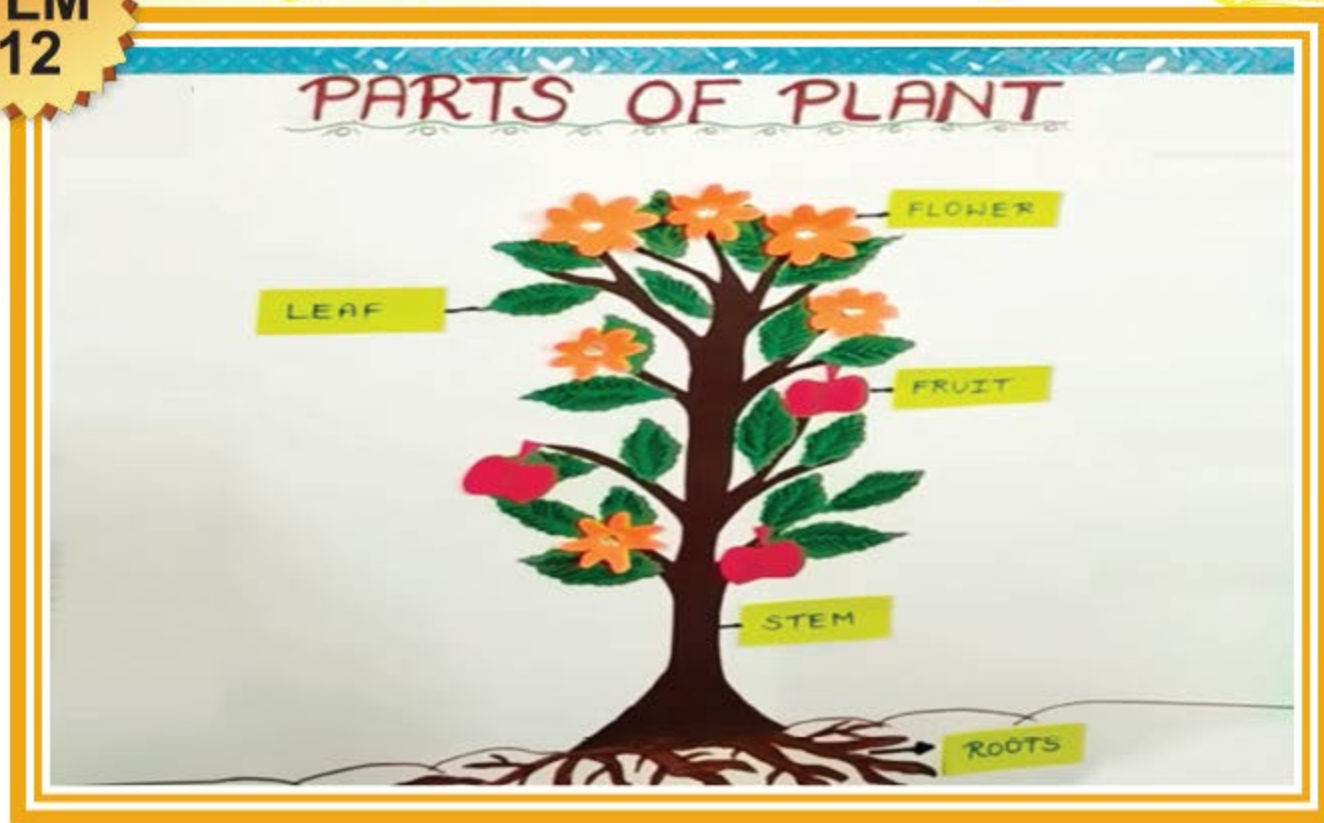
- Mount or display the TLM in the class so that every child is able to see it.
- Using a pointer or a stick, explain each national symbol and its importance for our nation.
- Write the national symbol and what it stands for as given below:
  - a. National emblem: **Ashoka Chakra**
  - b. National animal: **Tiger**
  - c. National bird: **Peacock**
  - d. National fruit: **Mango**
  - e. National tree: **Banyan Tree**
  - f. National currency: **Rupee**
  - g. National flower: **Lotus**





# Parts of a Plant

TLM  
12



Created by Teacher : Masood Khalil Madoodi

School: Army Goodwill School Trehgam,  
Kupwara, KMR

## TLM for Class 3

### Subject – Environmental Science (EVS)

### Topic – Parts of a Plant

**Brief description:** This TLM helps students to easily understand the various parts of a plant. The use of different colours enables students to differentiate between parts of a plant and their functional aspect.

**Other concepts that can be taught using this TLM:** Root system and shoot system.

**Materials used:** Two cardboards, chart paper, colours, glue, sketch pens.

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



### How to make:

1. Take a cardboard and cut out the shapes of different parts of the plant such as roots, stem, leaves, flowers, and fruit.
2. Colour all these shapes differently to represent different parts of the plant. For example, green leaves, dark brown stem, light brown root and red fruit.
3. Take another card board and paste a plain chart paper on it.
4. Paste these shapes or parts of the plants on this cardboard.
5. Write names of different parts on the cardboard.
6. The TLM is now ready for demonstration in the classroom.

### How to use:

- Hang the TLM on the wall or the board so that every student is able to see it.
- With the help of a pointer or a stick, point to the parts of the plant one by one.
- Introduce the parts of the plants and explain.
- **Real life connect:** Relate each part with a live example from the school garden.





# Healthy Foods

TLM  
13



Created by Teacher : Tahira Sultan

School: Army Goodwill School,  
Mazbug Sopore

## TLM for Class 3 Subject – Science Topic – Healthy foods

**Brief description:** Junk food is the best example of an unbalanced diet categorised by a huge proportion of simple carbs, refined sugar, salt, saturated fat and with very low nutritional value. These foods are processed to a great extent where they lose almost all of their vital nutrients, fibre and water content. Healthy food refers to a whole lot of fresh and natural products such as fruits, vegetables, whole grains, lean proteins and good fats that deliver your body with essential nutrients for carrying out several bodily processes, combat sickness and keep diseases at bay. Some of the healthy foods include apples, greens, carrots, oatmeal, whole grain, beans and legumes, fish, eggs, etc.

**Other concepts that can be taught using this TLM:** Balanced diet, vitamins and minerals.

**Materials used:** Drawing sheet, wrappers of junk food, coloured pens, glue.

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



### How to make:

1. Making of this TLM is very easy, make snake and ladder game on a drawing sheet using coloured pens as shown on it and label the diagram accordingly.
2. Use junk food wrappers and stick them on a cardboard with glue as shown.

### How to use:

The theme of this TLM is mainly based on common household games such as snakes and ladders. Students would roll the dice and move their pawns accordingly on the board (as is done in a snakes and ladders game)

### The main points of this TLM are:

- TLM is based on a traditional game, and so, developed a lot of interest among students to learn while playing, the game based TLM made them highly motivated and attentive.
- Developed an awareness among students about healthy food and junk food.
- Students were also involved to make and develop similar TLMs for other concepts.





# Shapes

TLM  
14



Created by Teacher : Tahir Gaffar

School: Army Goodwill School,  
Hajinar, Tangdar

## TLM for Class 3 Subject – Mathematics Topic – Geometrical shapes

**Brief description:** Students were able to understand and identify different geometrical shapes such as sphere, triangle, square, rectangle, cube, cuboid, cone, cylinder, etc. After using this TLM in classroom students were able to identify and classify various objects around them as per their shapes.

**Other concepts that can be taught using this TLM:** Teachers can use this TLM to make students understand basic concepts such as, difference between a circle and a sphere, a cube and a cuboid, square and a rectangle, etc.

**Materials used:** Coloured papers, cardboard, cello tape or glue.

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



### How to make:

1. Take some coloured papers and cardboard and make the shapes as shown in figure.
2. Make a list of shapes that are to be explained in the class.
3. Cut the coloured papers to give them shapes as desired.
4. To make the shapes solid or strong enough use cardboard.
5. You can use glue or cello tape to stick the papers for proper shaping.

### How to use:

- Show the TLM to students and let them first identify various shapes.
- Ask the students to figure out objects around them that resemble these shapes and name them.
- Let the students figure out various objects and relate them with the shapes as shown in the TLM.
- Now tell the proper names of the shapes.
- Ask them to identify objects at their home and school that resemble the shapes they have learnt.





# Concept of Bar Graphs

TLM  
15



Created by Teacher : Yogita Sharma

School: Army Goodwill School, Uri

## TLM for Class 4 Subject – Mathematics Topic – Bar-graphs

**Brief description:** The TLM provides an interesting way to understand the concept of bar graphs. They will perform activities using the TLM to get a deeper understanding of the concept.

**Other concepts that can be taught using this TLM:** Frequency curve and distribution curve.

**Materials used:** Cardboard, drawing papers, sketch pens, white paper, glue.

**Cost of the material used for making TLM (approx.):** ₹25



### How to make:

1. Take a rectangular cardboard.
2. With the help of glue, wrap a drawing sheet around it.
3. Write the number of people having a particular fruit, on a white sheet and paste it on cardboard as shown in the figure.
4. Write name of each fruit in front of the specific block.
5. Stick the bar-shaped cuboidal blocks on the board depicting how many people like to eat a particular fruit.

### How to use:

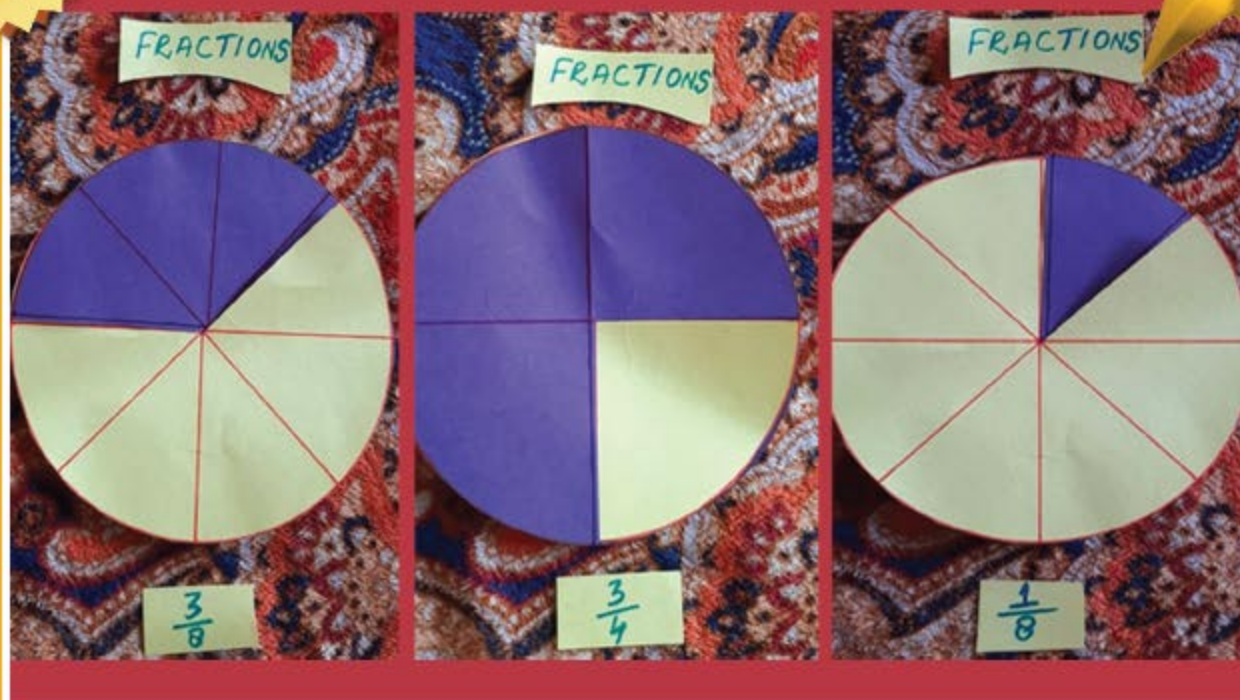
- Let the students first observe the TLM carefully.
- Then demonstrate the TLM to students and help them to understand frequency and distribution of specific fruits.
- Based on their understanding, give them a home task to create a bar graph showing number of students who got marks above 70, 80 and 90 percent in class 3.





# Fractions

TLM  
16



Created by Teacher: Dalbir Singh

School: Army Goodwill School,  
Boniyar

## TLM for Class 4 Subject – Mathematics Topic – Fractions

**Brief description:** Students will be able to understand the concept of fractions through the TLM. They will relate the concept of fractions with their day-to-day life. Learning really becomes fun while using this TLM.

**Other concepts that can be taught using this TLM:** Division and distribution

**Materials used:** Coloured sheets of paper, a compass, pencil, a pair of scissors.

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



### How to make:

1. Take two coloured papers.
2. Make two circles on each paper using a compass
3. Cut them into two circles with the help of compass.
4. Divide the circles into four equal parts and then into eight equal parts.
5. Cut the circle into mid-half or as shown above.
6. The TLM is now ready.

### How to use:

- Display the TLM in the class at a place from where it is visible to all the students.
- Start rotating one circle in such a way that one is able to identify  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ .
- Ask students to observe and tell the fraction that the picture shows.





# Water Pollution

TLM  
17



Created by Teacher: Sheikh Rabiya Nabi

School: Army Goodwill School,  
Boniyar

## TLM for Class 4 Subject – Environmental Science Topic – Water pollution

**Brief description:** Through the TLM students will be able to understand how different unwanted substances get added to clean water and make it polluted. They will learn about some new terms such as water pollution and pollutants.

**Other concepts that can be taught using this TLM:** Importance of pure water

**Materials used:** Polythene, plastic pieces, plastic bottle, iron fillings, detergent, sugar, ink, etc.

**Cost of the material used for making TLM (approx.):** ₹0

All the materials used for this TLM were easily available at home.



### How to make:

1. Take some clean water in the bottle.
2. Place the materials such as ink, iron fillings, detergent, sugar and food colour (to represent pollutants) on the table.
3. Keep all the materials in points 1 and 2 ready for the class activity.

### How to use:

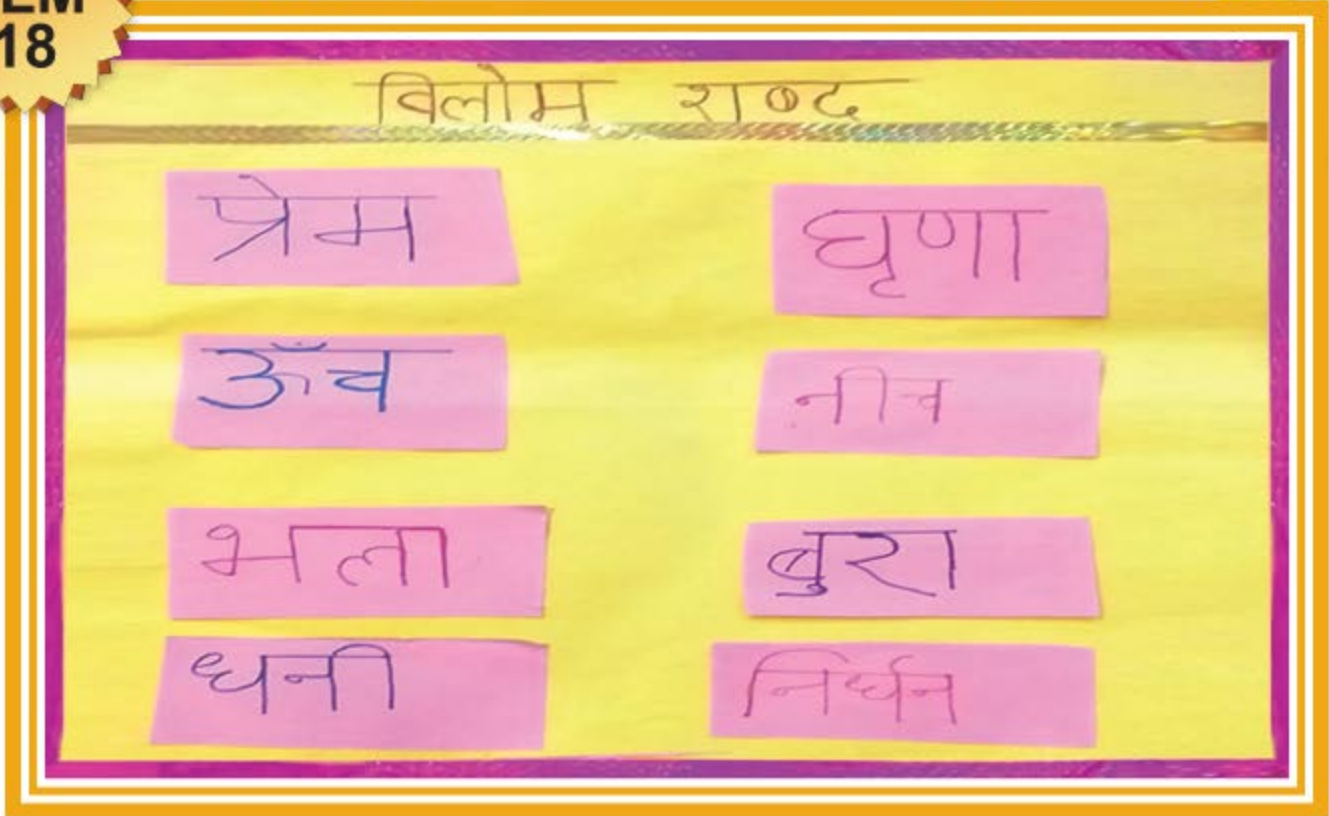
- Keep the materials in the class such that students can see the demonstration.
- Take water in two plastic bottles and show it to the students.
- Now, add the materials/pollutants, one by one in one bottle of water to show how all such materials pollute water.
- Let the other bottle have water without any pollutants added to it.
- Show both the bottles of water and ask students to compare.
- Explain how water gets polluted. Define the term water pollution.





# विलोम शब्द

TLM  
18



Created by Teacher: Ms. Ravinder kaur

School: Army Goodwill School,  
Hanzik Sharifabaad

**TLM for Class 5**  
**Subject – Hindi**  
**Topic – विलोम शब्द**

**Brief description:** The TLM is colourful and attracts the attention of the students. They will be able to understand विलोम शब्द through this TLM.

**Other concepts that can be taught using this TLM:** पर्यायवाची शब्द, लिंग बदलना, वचन बदलना, मुहावरे, अनेक शब्दों के लिये एक शब्द।

**Materials used:** Chart paper, pencils, sketches, tape.

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

### How to make:

1. Take a plain chart on a card board and paste coloured tape to highlight the border of the chart,
2. Take another chart paper of different colour and cut some rectangles from it.
3. Write down words and their विलोम on these rectangular sheets.
4. Now, paste विलोम शब्द in the manner as shown in the TLM.

### How to use:

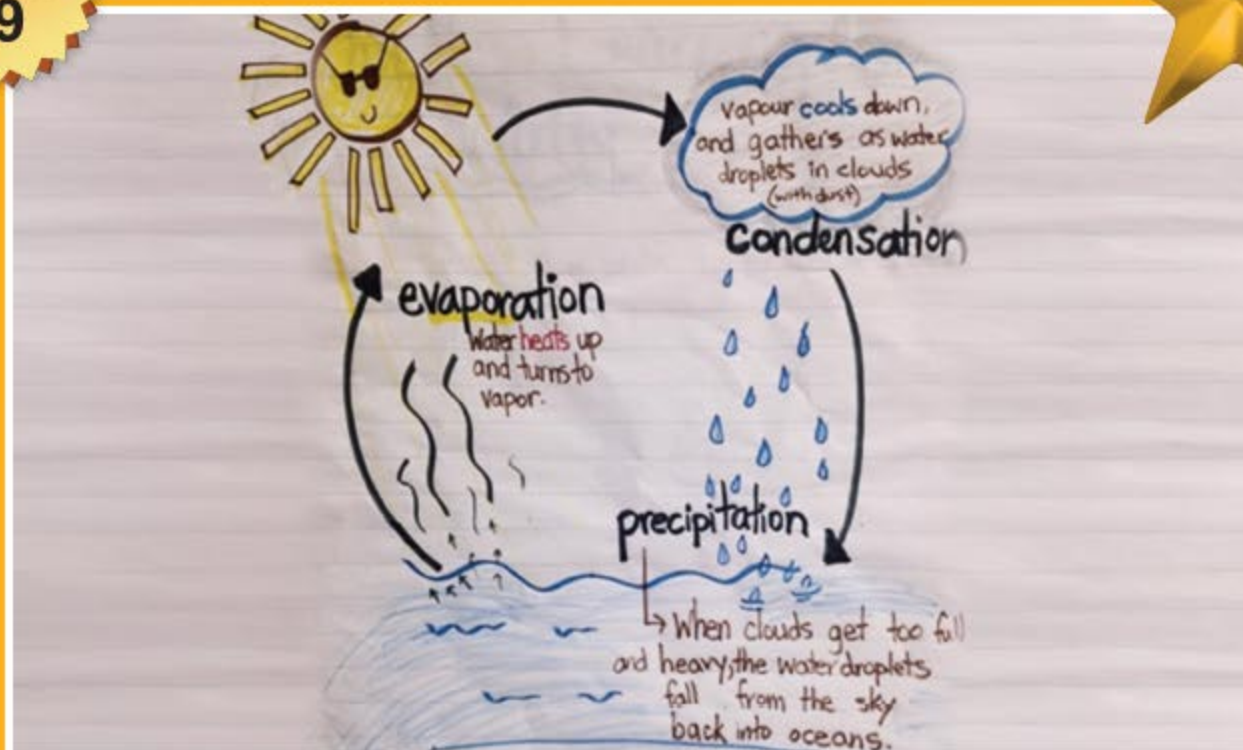
- Display the chart in front of the class so that all the students are able to see it.
- Using a pointer or a stick, discuss the विलोम शब्द.
- Ask students to repeat after you.





# Water Cycle

TLM  
19



Created by Teacher : Miss Rehana Shafi

School: Army Goodwill School,  
Murgund

**TLM for Class 6**  
**Subject – Science**

**Topic – Water cycle (Changes around us)**

**Brief description:** Through the TLM students can visualise the process of water cycle. They will be able to understand the processes that take place in the water cycle and their importance.

**Other concepts that can be taught using this TLM:** Water scarcity, sources of evaporation.

**Materials used:** Chart paper, sketch pens and pencil.

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



### How to make:

1. Take a chart paper and some coloured sketch pens.
2. Draw water cycle on the chart paper using different colours such as blue to represent water, and yellow to represent sun.

### How to use:

- Take the water cycle chart inside the classroom and display it in front of students, ask them what they observe from the chart.
- Let all the students respond.
- Ask the students if they know how rain is formed, how clouds are formed or what happens to the water from rivers or lakes under the effect of sunlight.

*The teacher can ask students to relate their understanding of the concept from their previous classes.*

- Ask similar questions to develop their curiosity.
- Then explain the processes involved in water cycle and their role in the water cycle with the help of the TLM.





# Circles and its Parts

TLM  
20



Created by Teacher : Shubam Mahajan

School: Army Goodwill Public School,  
Rajouri

## TLM for Class 6 Subject – Mathematics Topic – Circles and its parts

**Brief description:** Through the TLM students will be able to develop critical thinking and apply their understanding in the real-life situations.

**Other concepts that can be taught using this TLM:** Composition of earth, latitude and longitude, shape of the earth and Pi charts.

**Materials used:** Cardboard or paper, colours, paper pins and thread.

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

### How to make:

1. Take a cardboard or paper and cut it into the shape of a circle.
2. Draw the different parts of the circle, as given in the TLM, and colour them.
3. Mark the centre using paper pin and four pins at the circumference of the circle as shown.
4. Take a thread and attach it to the centre.

### How to use:

**Following steps can help each and every one in using this TLM:**

- Fix one end of the thread to the centre and other end to the different points on the boundary of the circle. Explain how to locate the radius of the circle through this step.
- Fix the thread to any point/pin of the circumference of the circle.
- Pass it through the centre and connect it to the pin on the other end of the circle.
- Explain the diameter of the circle and semicircle.
- Fix one end of the thread to any point on the circumference of the circle. Attach the other end to any other point of the boundary (not necessarily to pass it from the centre).
- Explain how to find the chord of the circle.
- Fix one end point of a thread to any point on the circumference of the circle. Rotate the thread on the boundary of the circle in such a way that it meets and connects back to the pin from where it started.
- Explain the concept of circumference of the circle.
- For giving the concept of area of the circle, take the thread and cover the whole space on the circle using the thread in such a way that the thread will cover the whole space of the circle. In this way, you will give the concept of area of the circle.
- Similarly, using the pins and thread explain area and sectors of the circle.





# Floating and Sinking

TLM  
21



Created by Teacher : Tafeem Maqbool

School: Army Goodwill School, Boniyar

## TLM for Class 6 Subject – Science Topic – Floating and sinking

**Brief description:** The TLM provides an opportunity to understand the concept of floating and sinking. The students will perform activity and construct their own understanding.

**Other concepts that can be taught using this TLM:** Mass, density and buoyancy.

**Materials used:** Bowl made of transparent glass, pieces of paper, iron nail, matchstick, pin, rubber and pencil.

**Cost of the material used for making TLM (approx.):** ₹5



### How to make:

1. Take a transparent bowl and fill it with water.
2. Take the objects such as paper, iron nail, matchstick to put them in the bowl to show which objects float and which ones sink.

### How to use:

- Divide the class into groups.
- Ask one volunteer from each group to perform the activity.
- Provide any one material to the volunteer and ask them to put it in water and observe what happens.
- Repeat this activity with other groups using different objects. or in groups and hand different objects such as paper, nail and matchstick.
- Explain concept of floating and sinking.





**TLM  
22**



**TLM for Class 6**  
**Subject – Hindi**  
**Topic – विशेषण**

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



### How to make:

1. सफ़ेद रंग के चार्ट पेपर को फूलों के आकार में काटें (जैसा कि चित्र में दिखाया गया है)।
2. रंगीन चार्ट पेपर को चित्रानुसार काटें।
3. अब इन सभी cut outs को बड़े चार्ट पेपर पर चिपकायें (चित्र अवश्य देखें)।
4. सफ़ेद cut outs पर ऐसे शब्द लिखें जो विशेषण दर्शाते हों।
5. रंगीन cut outs पर विशेषण के प्रकार लिखें व समझाएं।

### How to use:

- TLM के माध्यम से छात्रों में हिंदी व्याकरण के प्रति रुचि पैदा की जा सकती है।
- कक्षा में प्रत्येक छात्र को मंच पर बुला कर TLM की सहायता से उन्हें उदाहरण बताने को कहा जा सकता है।
- इससे छात्रों में भाषा के कौशलों की भी वृद्धि होगी।





# Volcano

TLM  
23



Created by Teacher : Tahseena Rafi

School: Army Goodwill School, Uri

## TLM for Class 6 Subject – Geography, Science Topic – Volcano

**Brief description:** The 3-D model helps the students to visualize the structure of a volcano.

**Other concepts that can be taught using this TLM:** Disaster management, types of rocks.

**Materials used:** Cardboard, newspapers, sketch colours, drawing papers, glue.

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



### How to make:

1. Take a square- shaped cardboard.
2. Take some newspapers or waste papers.
3. Wrap them around in such a manner that they form a cone-like structure.
4. Leave a hole in the centre similar to the one present in a volcano.
5. Fix the model on the cardboard with the help of glue.
6. Using drawing sheets, cover the model.
7. Colour the sheets to depict lava (red colour) near the mouth of the volcano and black at the base.

### How to use:

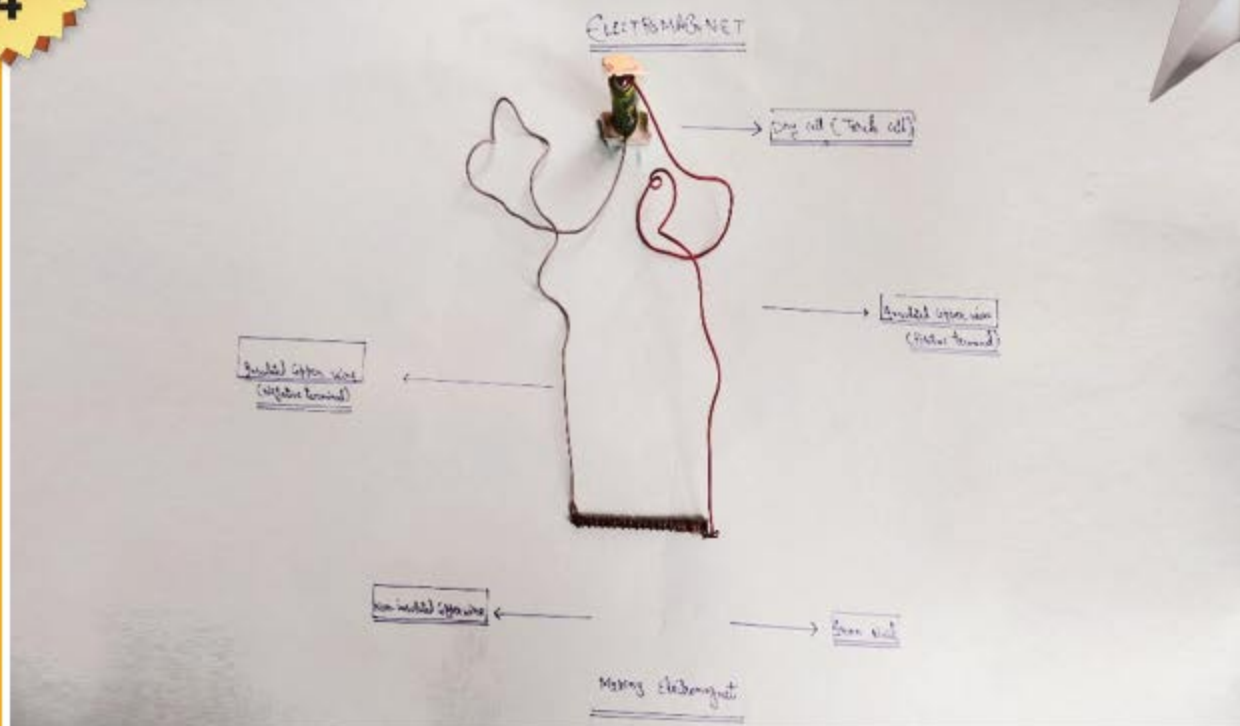
- Display the model in front of the classroom on a table so that every student can see the model clearly.
- Now using the model, explain how a volcano looks like and its structure.
- Encourage students to ask questions to clarify their doubts.





# Making of an Electromagnet

TLM  
24



Created by Teacher : Tanveer Iqbal

School: Army Goodwill School,  
Hanzik Shariefabad (Budgam)

**TLM for Class 6**  
**Subject – Science**

**Topic – Making of an electromagnet**

**Brief description:** The TLM will help students to understand how a simple iron nail can behave as an electromagnet in a circuit. They will understand the structure of a circuit and placement of an iron nail in the conductor to show how it acts as an electromagnet.

**Other concepts that can be taught using this TLM:** Working of electric motors and fans, automobile dynamos for making electricity.

**Materials used:** Iron nail, insulated and non- insulated copper wires, new single torch cell, paper clips and an insulating tape.

**Cost of the material used for making TLM (approx.): ₹35**



### How to make:

1. Take the materials and join them in the form of an electric circuit.
2. Take the wire and bind the wire tightly around the nail, leaving 15 cm of wire free at each end.
3. Remove the insulation from each end of the wire.
4. Tape one end of the wire to the negative terminal and the other end to the positive terminal of the cell.
5. Now, sprinkle a few paper clips around the nail.
6. We will observe that the iron nail behaves like an electromagnet.

### How to use:

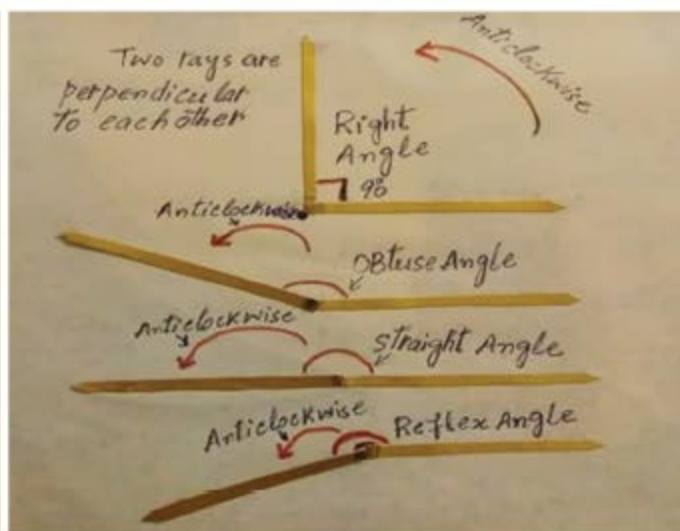
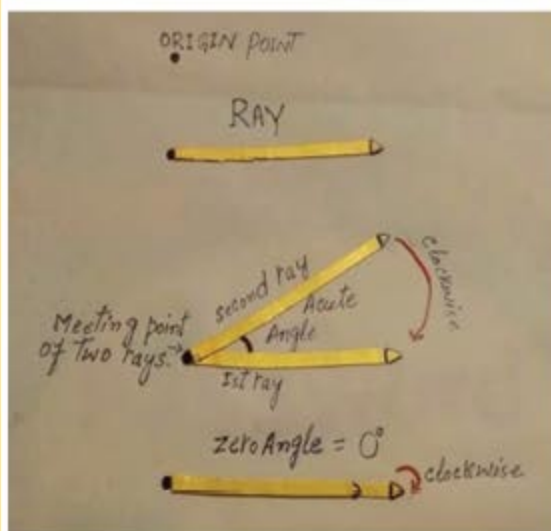
- Display the circuit in front of the class such that every student can observe it.
- Explain step by step procedure of making the electromagnet, material used and its working. Tell them we must always use a new cell and not an old or dead one.
- Complete the circuit, explain that when current passes from the cell to the iron nail, the iron nail starts behaving as an electromagnet.
- Bring paper clips near the iron nail. The paper clips get attracted to the iron nail which shows that iron nail is behaving as a magnet.
- Explain that as soon as electric current is stopped, the iron nail stops behaving like a magnet. This shows that the magnetism shown by the iron nail is temporary in nature.
- Explain that more the wire is coiled around the iron nail, the stronger is the electromagnet.





# Angles

**TLM  
25**



Created by Teacher: Mir Haneefa

School: Army Goodwill School, Hajin

## TLM for Class 6 Subject – Mathematics Topic – Angles

**Brief description:** An angle is the figure formed by two rays called the sides of the angle, sharing a common endpoint called the vertex of the angle. Angles formed by two rays lie in the plane that contains the rays. Angles are also formed by the intersection of two planes. These are called dihedral angles.

**Other concepts that can be taught using this TLM:** Line segment, reflection, refraction and rays.

**Materials used:** Match sticks, white sheet, glue, pencil.

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



### How to make:

1. Take some match sticks or small sticks of any other material and arrange /paste them as shown in the figure.
2. Make acute, obtuse and other angles as shown in figure.

### How to use:

- **Tell students that today they will be learning about 4 different types of angles.**  
Acute angle: Angle whose measure is less than  $90^\circ$ .  
Right angle: Angle whose measure is  $90^\circ$ .  
Obtuse angle: Angle whose measure is greater than  $90^\circ$  but less than  $180^\circ$ .  
Straight angle: Angle whose measure is  $180^\circ$ .
- Begin the presentation with a **right angle**. Demonstrate how a right angle measures  $90^\circ$  as shown. Ask students to name some objects in the room with a right angle. For example: The corner of a book or window.
- Introduce other angles by referring to and comparing them to the right angle.
- Tell students that an **acute angle** is smaller than a right angle, or under  $90^\circ$ , and that an **obtuse angle** is wider than a right angle, or greater than  $90^\circ$ .
- Tell students that when an angle measures exactly  $180^\circ$ , it looks like a straight line and is referred to as **straight angle**.





# Fundamental Duties

TLM  
26



Created by Teacher : Qasir Nazir Khan

School: Army Goodwill School,  
Chandigarh Kupwara

TLM for Class 7

Subject – Social Science

Topic – The Fundamental Duties

**Brief description:** The TLM is used to explain the fundamental duties of the citizens of India. The Fundamental Duties are defined as the moral obligations of all citizens to help promote a spirit of patriotism and to uphold the unity of India. These duties set out in Part IV–A of the Constitution, concerns individuals and the nation. The students will be able to understand fundamental duties enshrined in the constitution so as to be responsible citizens of country India.

**Other concepts that can be taught using this TLM:** Map of India, Indian constitution (basics).

**Materials used:** Drawing paper, some colour pens and a pencil.

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



### How to make:

1. Draw a Map of India on a chart paper along with National Flag as shown.
2. Write some important words related to the fundamental duties, such as responsibility, integrity, Indian Constitution, etc., on the chart paper around the map.

### How to use:

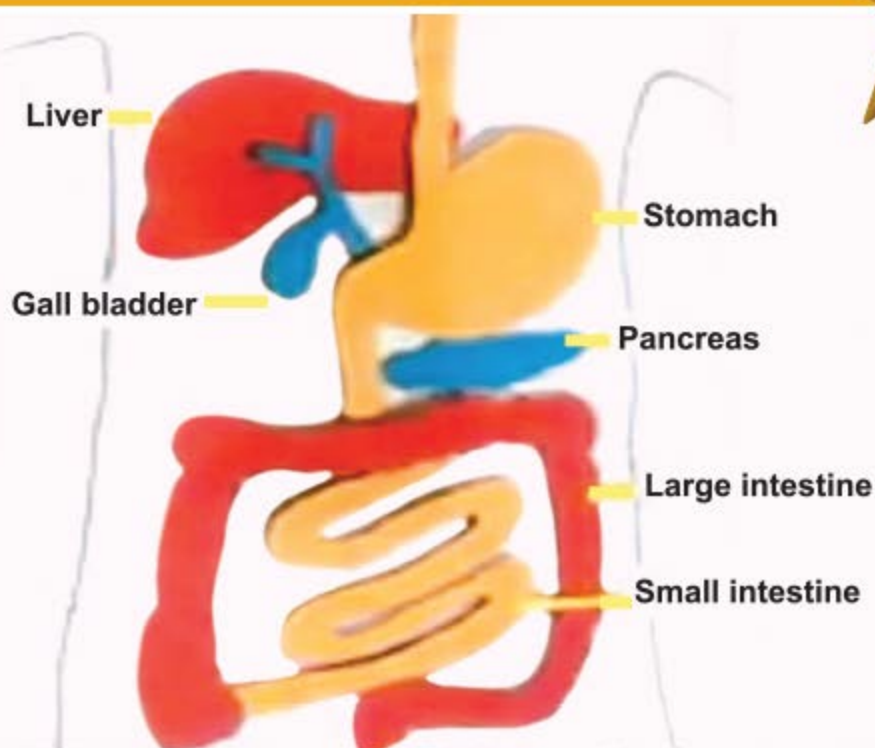
- Display the chart in front of the students to ensure it is visible to everybody in the class.
- Ask students what they know about constitution.
- Wait for responses and then ask students what their responsibilities towards the nation are, encourage all students to share their thoughts on same.
- Introduce the concept of fundamental duties.
- Now, pointing at the terms written on the chart paper, ask the students to read and tell what do they understand by the fundamental duties.
- Take responses and explain what fundamental duties are.





# Digestive System

TLM  
27



Created by Teacher: Tariq Ahmad Sheikh

School: Army Goodwill School,  
Hanzik Sharifaba

## TLM for Class 7 Subject – Science Topic – Digestive System

**Brief description:** The TLM helps the students to visualise the digestive system present inside the body. Through the model they get to understand the organs in the digestive system, how food travels to each organ and how the system works.

**Other concepts that can be taught using this TLM:** Structure of teeth.

**Materials used:** Cardboard, pencil, paper sheets, glue stick, scissors.

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



### How to make:

1. Take a plane sheet of paper and fix it on the cardboard.
2. Take the sheets of paper and cut them into the shape of stomach, liver, small intestine, large intestine, food pipe and pancreas.
3. Fix all these structures over the cardboard to display the digestive system.

### How to use:

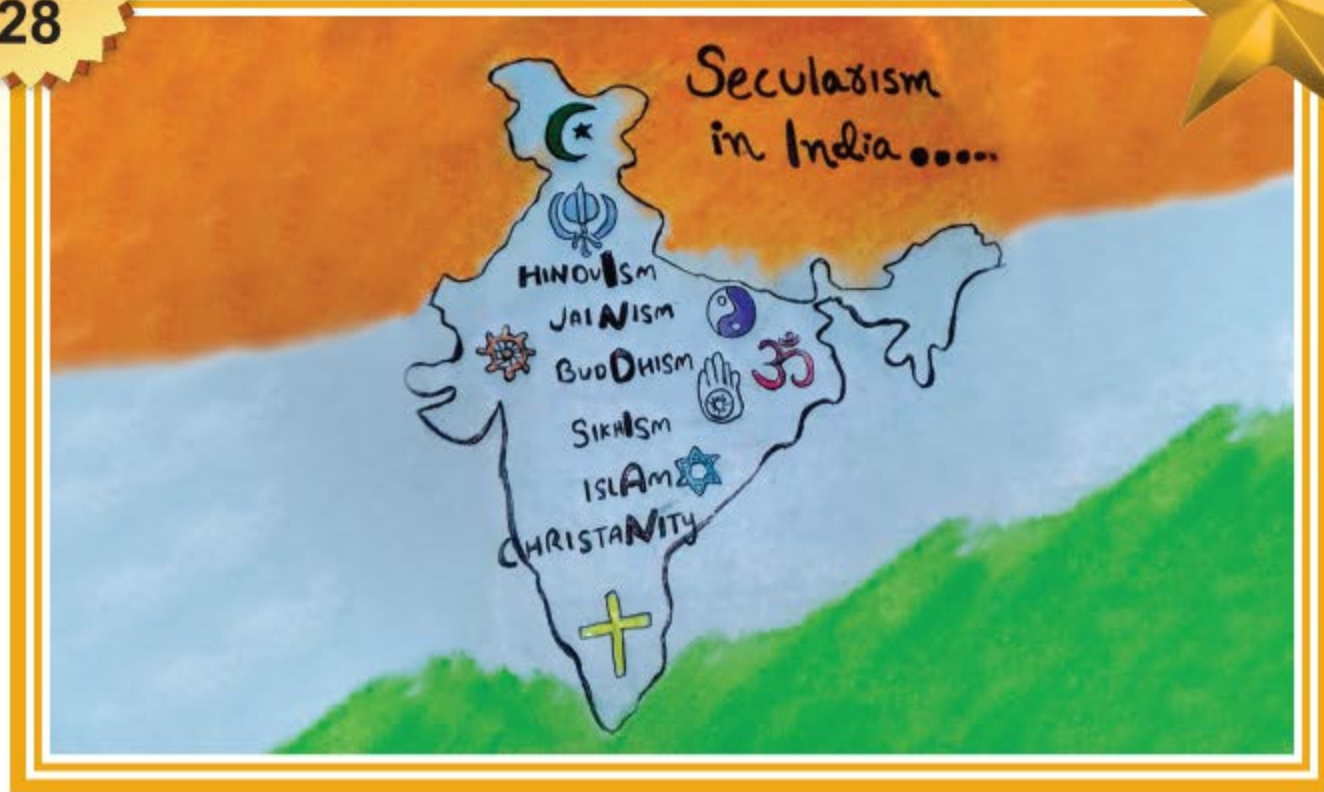
- Bring the self-prepared TLM in the class room and mount it on the wall to display to the students.
- Using a stick or pointer, explain the organs of digestive system.
- Explain how food travels from the mouth to the intestines and finally gets released as faeces from the body.





# Secularism

TLM  
28



Created by Teacher : Rayees Alam

School: Army Goodwill High School,  
Hajinar Tangdhar, Kupwara (Kashmir)

## TLM for Class 7 Subject – Social Science Topic – Secularism

**Brief description:** Through the TLM students will be able to understand what secularism mean. They will understand that in India every religion is respected and there is no pressure on any one to follow any religion. People are free to practice or follow any religion they want to. There is peace and harmony among citizens irrespective of their religion.

**Other concepts that can be taught using this TLM:** Leadership skills, cooperation, fair decision making.

**Materials used:** Chart paper, coloured pens/sketch pens, scale, pencil.

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



### How to make:

1. Take the central ideas of the topic.
2. Collect materials based on the topics such as pictures and quotes.
3. Take a chart paper and draw map of India on it.
4. Outside the map, colour the background in the tricolor.
5. Write Hinduism, Jainism, Buddhism, Sikhism, Islam, Christianity vertically so that they form the word INDIAN.
6. Highlight the letters I, N, D, I, A and N respectively.
7. Place symbols representing these religions.

### How to use:

- Display the chart in front of the students, ensuring that every student can see it.
- Now, ask them to observe it carefully and explain what they think it shows.
- Take responses.
- Explain that these are some of the religions that are followed in India.
- All the religions are respected equally.
- Introduce the term secularism and explain what it means.





# Life in a Desert

TLM  
29



Created by Teacher : Supreet Kaur

School: Army Goodwill School, Hanzik

## TLM for Class 7 Subject – Geography, Science Topic – Life in a desert

**Brief description:** The TLM demonstrates how a desert area/habitat looks like. They will learn about the climate of the desert, water problems faced by people and the vegetation there. They will also get familiarised with the soil type and the survival of different animals. After understanding the water problems, students will become aware of shortage of water and be able to suggest how we can save water.

**Other concepts that can be taught using this TLM:** Landforms, aestivation, water harvesting

**Materials used:** Clay, sand, chopped straw, broom sticks, mud, piece of cloth and a metal ware.

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



### How to make:

1. Collect some sand, straw and hay to show the barren landscape of the desert.
2. Use materials such as broom sticks and mud to show houses in desert.
3. Use some clay to make the desert elements such as animals, plants (such as cactus), and a woman carrying pot of water on her head to explain that women have to travel miles to fetch water.

### How to use:

- Take the model to the class and place it on desk so that it is visible to all the students.
- Divide the class into groups of 4-5 students.
- Ask them to observe the model, discuss in the group and explain what they understand.
- Take responses and explain desert habitat by describing the climate, vegetation, types of houses and scarcity of water and food.
- Talk about problems of water faced by the people in the desert.
- Discuss how important water is for human life and how we can save water.





# Solar Energy

TLM  
30



Created by Teacher: Mohd. Rafiq Mir

School: Army Goodwill School, Bandipora

**TLM for Class 8**

**Subject – Social Science, Science**

**Topic – Solar energy**

**Brief description:** This TLM helps students to understand how the solar energy can be converted into other forms of energy. They will understand the importance of solar energy in various appliances such as solar panels, solar heater and solar cookers.

**Other concepts that can be taught using this TLM:** Electricity and current

**Materials used:** Solar panel, mini DC motor, wire, switch, cardboard, ice-cream sticks, CD-ROM.

**Cost of the material used for making TLM (approx.):** ₹250



### How to make:

1. Make a base with the help of a cardboard and paper on which solar panel can be installed.
2. Take the mini DC motor which can be arranged from any old waste electronic material such as CD-ROM.
3. Install it on upper base and connect it with wire as shown in the TLM.
4. Install the solar panel in such a way that it is connected with the DC Motor.
5. With the help of some pieces of waste paper or cardboard make a windmill. The fan can be made using ice-cream sticks.
6. A switch is also required which completes the circuit and is needed to allow current when functional.

### How to use:

- Take the students outside in the open, during a sunny day.
- Keep the solar panel under direct sunlight.
- Now explain how the sun rays strike the solar panel and excite electrons within the metal to produce electric current.
- Explain them how a DC motor helps in current flow required to rotate the blades of the fan.
- Relate the working of solar panel at homes in producing electricity.





# Quadrilaterals

**TLM  
31**

A Quadrilateral is a closed polygon having 4 sides 4 angles and 4 vertices. The sum of angles of quadrilateral is 360



Not a Quadrilateral



Quadrilateral

There are 4 Types of Quadrilateral, all are having different properties:-

Kite



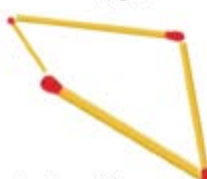
Trapezium



Parallelogram



Irregular

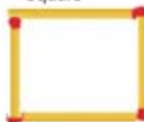


Parallelogram is a quadrilateral having opposite sides equal and parallel

Rectangle



Square



Rhombus



Created by Teacher : Mr Shabir

School: Army Goodwill school, Boniyar

## TLM for Class 8 Subject – Mathematics Topic – Quadrilaterals

**Brief description:** The students become well aware of the quadrilaterals and its types by using the play way method. The TLM will be used to explain the quadrilateral and various properties of quadrilaterals to the students.

**Other concepts that can be taught using this TLM:** Triangles, multiplication table, increasing and decreasing.

**Materials used:** Matchsticks, carboard, glue.

**Cost of the material used for making TLM (approx.): ₹5**



### How to make:

1. Take matchsticks and paste them on the chart paper to show two figures of which one is a quadrilateral and the other is not.
2. Now, make a flow chart from the quadrilateral to represent the four types of quadrilaterals.
3. Arising from a parallelogram, make three types of parallelograms which are rectangle, square and rhombus.

### How to use:

- Take the material used for the TLM to the class.
- Divide the class into groups.
- Provide four matchsticks to each group and ask them to make a figure using them.
- Ask them to tell the name of the figure that they have made.
- Display the TLM and ask the groups to tell if they have made any figure similar to the ones shown in the TLM.
- Introduce the topic and discuss about quadrilaterals.
- Explain that any four-sided closed figure is a quadrilateral.
- Now, ask them to look at the figures that they have made and tell which type of quadrilateral it is.





# Tobacco (the silent killer)

TLM  
32

## CLASS PHOTOGRAPHS



Created by Teacher : Ms Nuzhat

School: Army Goodwill School, Hanzik

**TLM for Class 8**

**Subject – Science**

**Topic – Tobacco (the silent killer)**

**Brief description:** This TLM proved very helpful to make students aware about harmful effects of smoking or other tobacco products. The students became counsellors for their peers, relatives and other family members, explaining how smoking affects our body and its different parts.

**Other concepts that can be taught using this TLM:** Smoking leads to lung cancer, rots lungs, damage internal organs and also affects passive smoker.

**Materials used:** Styrofoam, newspaper, pair of scissors, water colours; pink and black, glue, some cotton.

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



### How to make:

1. Cut the Styrofoam sheet into the shape of human lungs.
2. Paste newspaper with the help of glue on the model of these lungs to get the even shape.
3. After pasting newspaper on the lungs, apply pastel colour, pink for one lung (pink lungs representing lungs of non -smoker) and black for other lung (black lung representing lungs of a smoker).
4. To give a first-hand knowledge/demo about harmful effects of smoking on human body make use of discarded plastic bottle, cotton and cigarette
5. Demonstration: Place cotton inside the transparent plastic bottle with a hole on its cork to hold the lit cigarette.
6. Further press the bottle the same way as human body inhale and exhale during smoking.
7. After demo the colour of cotton changed from white to yellow, it relates to the point as to how actually pink lungs turn into black after smoking.
8. *(Note: Model of lungs is optional, one can draw two lungs on chart as well.)*

### How to use:

The TLM is very easy to prepare and student friendly. It helps to have a long lasting impression on the minds of students about how smoking is a silent killer. Students were able to see themselves with their open eyes the ill effects of smoking. They came to know how a single puff of smoking can be dangerous.





# Soil Profile

**TLM**  
**33**



Created by Teacher : Mr Muneer, Miss Tafeem and Miss Afnan

School: Army Goodwill School, Boniyar

## TLM for Class 8 Subject – Science Topic – Soil profile

**Brief description:** The TLM is a representation of the soil profile which is otherwise not visible to the students. The students will understand how different types of soil are arranged in the soil profile. They will be able to differentiate the layers of the soil on the basis of their texture and colour.

**Other concepts that can be taught using this TLM:** Soil erosion, water table, soil formation.

**Materials used:** A transparent glass jar, small cardboard box, small pebbles, grass, chalk power soil, clayey soil, bigger rocks.

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



### How to make:

1. Take a glass bottle.
2. Take the material in a separate container and mark which one represents which layer of the soil profile.
3. Put the materials from that box in the bottle starting from the bigger rocks, smaller rocks, clay, chalk powder, garden soil and some grass. This should represent the layers in the soil profile.
4. For visualisation you can check image above. The material should be filled in sequence.
5. The TLM is ready.

### How to use:

- Display the TLM in the class so that all the students can see it.
- Let the students observe the TLM for a few minutes.
- Ask them about what they understand from the model.
- Take responses and explain different layers of soil.
- Point towards the labeled pot filled with soil and let them figure out different layers.
- Now let the students read aloud the names of different layers of soil in chronological order as shown in the pot from top to bottom.
- Ask the students to figure out any colour or texture difference among the different layers of soil and discuss with their partner.
- Discuss the difference between the layers of soil and note important points on the board.
- Ask the students to write them down in their notebook.
- Once done, explain and discuss with students the concept of soil profiling.





# Working Model for Finding LCM

TLM  
34

SBERA  
AWARDED



Created by Teacher : Varun Kumar Verma

School: Army Goodwill School,  
Rajouri

## TLM for Class 8 Subject – Mathematics Topic – LCM

**Brief description:** The TLM gives a visual and interactive experience for learning the concept. It develops curiosity among students, thus, helps in developing interest for the topic. It clarifies abstract ideas and allows students to practice and apply new skills.

**Other concepts that can be taught using this TLM:** HCF, number system, Abacus and common factors.

**Materials used:** Thermocol, chart paper, scale/ruler, sketch pens, thumb pins, woollen thread.

**Cost of the material used for making TLM (approx.):** ₹25



### How to make:

1. Take a thermocol sheet and paste a chart paper on it.
2. Using scale, mark inches and put thumb pins on each point represent an inch.
3. Take two woollen threads and tie them in the same manner as shown in the figure.

### How to use:

- After taking the TLM in classroom, demonstrate same in front of students.
- Explain that at every point where multiple of 2 and 3 meets is 6, 12, 18 and so on.
- Explain that 6 is the first common point of multiple of 2 and 3. Therefore, 6 is the LCM of 2 and 3.
- Similarly, explain the LCM of other numbers.





# India: Size and Location

TLM  
35



Created by Teacher: Mudasir Abdullah

School: Army Good will High school  
Hanzik Shariefabad (Budgam)

## TLM for Class 9 Subject – Geography Topic – India: Size and location

**Brief description:** Through the TLM students will be able to understand the concept of world in a better way. It will make them understand how different the countries in the world are and their location in world. They will then understand the location of India, its culture and the different religions.

**Other concepts that can be taught using this TLM:** Latitudinal and longitudinal extent land frontiers, coastal lines, standard Meridian, role of tropic of Cancer and tropic of Capricorn, location of India with respect to Indian ocean, etc.

**Materials used:** Balloon, pieces of paper, newspaper to wrap, glue, pencil, ropes or strings.

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



### How to make:

1. Inflate the balloon.
2. Paste the paper cuttings around it and let it dry.
3. With the help of pencil, draw the outline map of India and other countries of the world. The globe is ready.
4. With the help of small and long strings or ropes, make the base of the globe.
5. Draw the number of longitude and latitudes around the global.

### How to use:

- Place the TLM in front of the students so that they can observe it.
- Explain how the latitudes and longitudes help in understanding the location and size of different countries of the world.
- Discuss how climate of a region or country changes based on the topography or of the physical divisions.
- Explain how Indian Standard Time (IST) can be measured easily with the help of longitudes and latitudes.

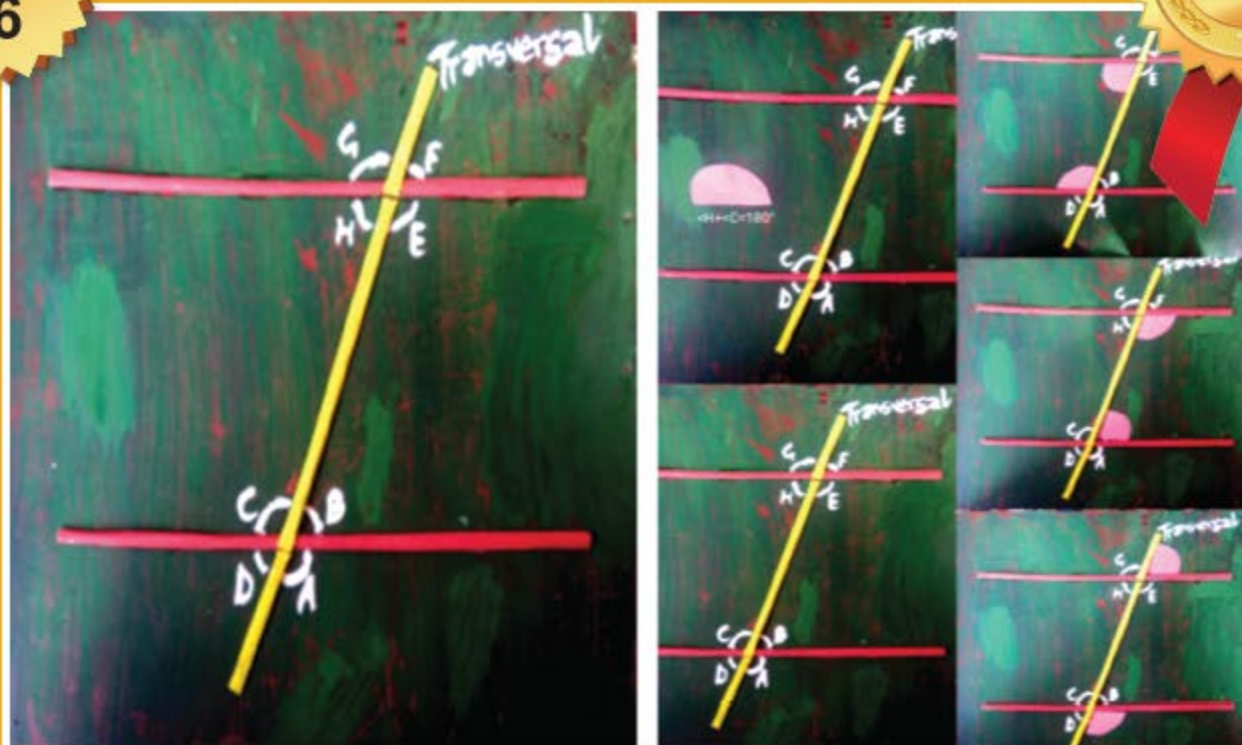




# Lines and Angles

**TLM  
36**

**SBERA  
AWARDED**



Created by Teacher : Nargis Khatoon

School: Army Goodwill High School,  
Harka Bahadur, Kargil (Ladakh)

## TLM for Class 9 Subject – Mathematics Topic – Lines and Angles

**Brief description:** Through the TLM, students can understand the concept of parallel and transversal lines and angles easily. They can differentiate the various angles (interior, exterior, alternate, corresponding, etc.) without any confusion. The use of TLM ensures a healthy and friendly environment in the classroom, participation of every student and creating interest among students.

**Other concepts that can be taught using this TLM:** Difference between parallel lines and non-parallel lines, concept angle, its arms, vertex and the direction of arms, different pairs of angles such as, adjacent angle, vertically opposite angles, linear pair, etc.

**Materials used:** Waste materials such as a piece of plywood, some pieces of plywood, protector, some hard paper, newspapers, glue.

**Cost of the material used for making TLM (approx.):** ₹20 or even 0 if material is available around.





### How to make:

1. Take the plywood and make a rectangle or square base out of it.
2. Roll the newspaper to create thin rolls such as straws.
3. You can colour the board and the rolls to make your TLM more interesting.
4. Paste two rolls of paper on the board such that they are parallel to each other.
5. Paste one more roll such that it is intersecting the both parallel lines which we call as transversal.
6. Cut the hard paper by measuring the angles which are formed by the parallel lines and transversal
7. Finally, you can compare the angles using the measured papers.

### How to use:

- Show the TLM to the students and let them first figure out the kinds of angles formed by the two lines and a transversal. Let them understand and locate interior and exterior angles.
- Students should mark the angles as interior and exterior by drawing same arrangement on paper.
- Use a stick or a pointer to show the angles.
- Using the model explain what alternate interior angles, alternate exterior angle, corresponding angles are.
- Explain that sum of two interior angles on the same side of transversal are supplementary.
- Explain that alternate interior angles and alternate exterior angles are equal.
- These all can be done by comparing the measured hard papers.
- Teacher should guide the students regarding corresponding and supplementary angles, after this let students locate and identify different types of angles.





# Structure of DNA

TLM  
37



Created by Teacher : Mr. Shabir Ahmad

School: Army Goodwill school,  
Anantnag Hyground

**TLM for Class 10**  
**Subject – Science**

**Topic – Structure of DNA (Heredity and Evolution)**

**Brief description:** Through the TLM students will be able to learn about the structure of Double helical structure of DNA. They will also understand the bonding between four types of nucleotides (AGCT). They will understand the genetic code and the basic units or components of DNA. They will also come to learn about different functions of DNA.

**Other concepts that can be taught using this TLM:** Concept of evolution, genes and heredity material, nucleotides and nitrogen bases.

**Materials used:** Straws of red and blue colour, scissors, cello tape, glue.

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



### How to make:

1. Take two coloured straws red and blue and twist them as shown in the figure so as to form a double helix.
2. Use small, coloured straws to represent bonds between nucleotides namely Adenine, Guanine, Cytosine and Thymine.
3. Join the small straws between double helical structures in a way as shown.
4. Label the base pairs and the ends of the structure (3' and 5' ends).
5. Double helical structure of DNA is ready.

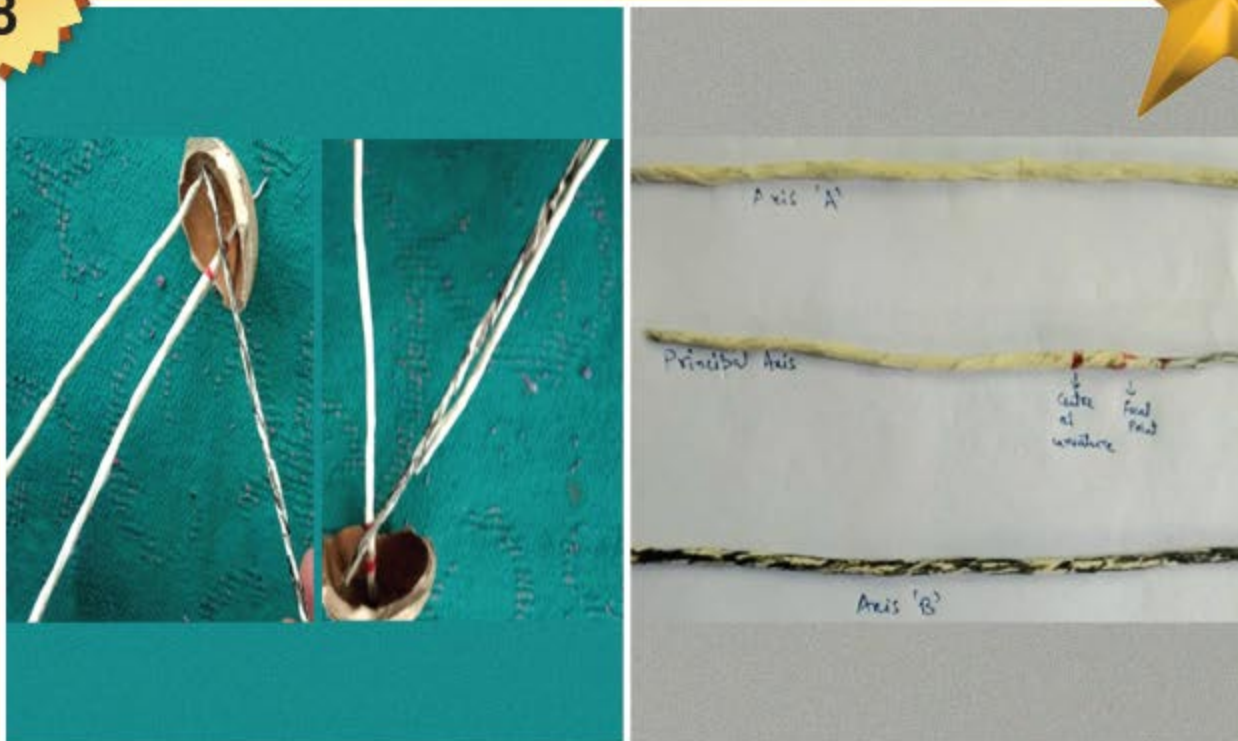
### How to use:

- Hold the model of DNA in front of students and demonstrate.
- Point at the components of the DNA structure while explaining the structure.
- Through the TLM, explain that the DNA double helix model contains six parts. The backbone or sides of the model consists of phosphate molecules alternating with deoxyribose molecules.
- Explain that the nitrogenous bases of the DNA molecule connect only with the deoxyribose molecules and not with the phosphate molecules.



# Curved Mirrors

TLM  
38



Created by Teacher: Mr. Aaqib Mohiuddin Lone

School: Army Goodwill school,  
Boniya

## TLM for Class 10 Subject – Science Topic – Curved mirrors

**Brief description:** Through the TLM the students will be able to learn different aspects regarding curved mirrors, such as a principle axis, pole, focus, centre of curvature, focal length, radius of curvature etc. Students will understand rules of image formation by curved mirrors and different types of images formed by curved mirrors.

**Other concepts that can be taught using this TLM:** Image formation due to reflection and refraction.

**Materials used:** Rubber ball, paper sticks, sketch pens, paper.

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



### How to make:

1. Take a rubber ball and cut a section from it.
2. Take some thin sticks, minimum 3, wrap some paper around them and if possible, colour them.
3. Take one stick and fix it at the centre of the section of the rubber ball. This will act as the principal axis.
4. Mark different points on it, such as centre of curvature, focal point, etc., as shown in the figure.
5. Adjust the paper stick and rubber ball as shown in the figure.
6. The different points marked on the principal axis will indicate different positions.
7. Take another paper stick and place it parallel to the principle axis, it will pass through focus.

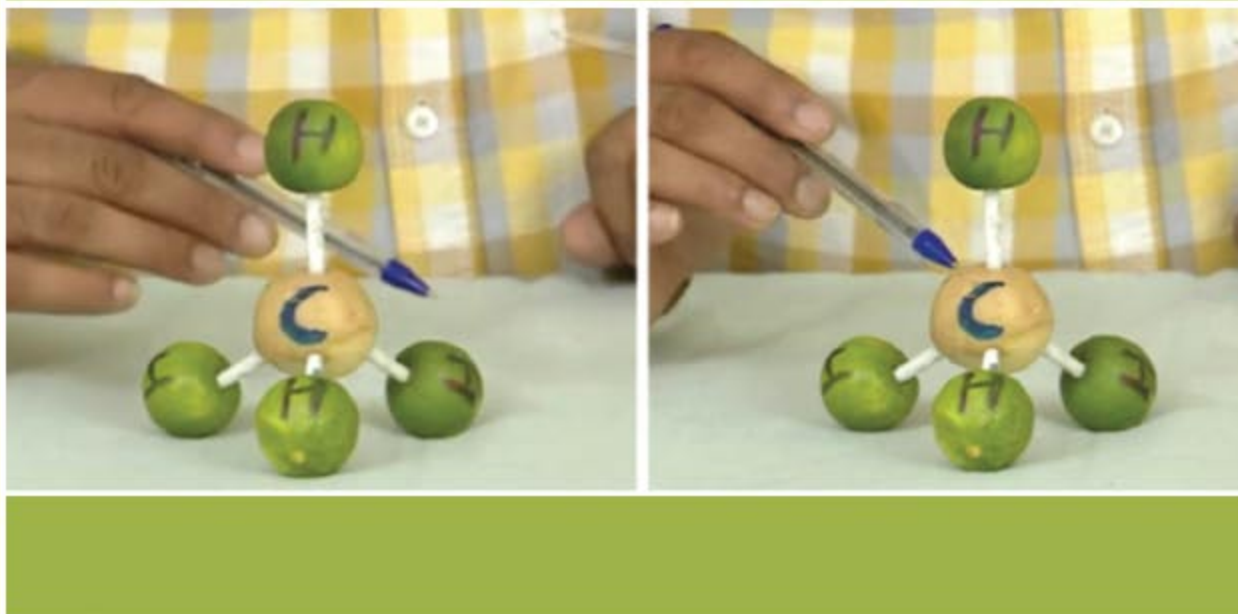
### How to use:

- Display the model in front of the class so that students can observe it.
- Tell them that the curved balls represent the mirrors.
- Using the TLM introduce the terms principle axis, pole, focus, centre of curvature, focal length, radius of curvature and explain them.
- Explain how images are formed in curved mirrors.



# Structure of Methane (CH<sub>4</sub>)

TLM  
39



Created by Teacher : Mr. Irshad Ahmad Lone

School: Army Goodwill school,  
Boniyar

## TLM for Class 10 Subject – Science Topic – Structure of methane

**Brief description:** Through the TLM, students can easily understand the structure of methane. The model represents 3-D view of the structure of methane. With its help, they can understand how carbon atoms are arranged in a methane molecule.

**Other concepts that can be taught using this TLM:** Covalent bond, electronic configuration, structure of hydrocarbons such as ethane, propane, butane, etc., or structure of water and carbon dioxide.

**Materials used:** Five lemons and round ice cream sticks.

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



### How to make:

1. Take five lemons where 4 lemons are of equal size and 1 is larger than the other 4.
2. The Four equal sized lemons will represent the hydrogen atoms and the one bigger in size will represent the carbon atom in a methane molecule.
3. Make four holes at four sides in the bigger lemon (representing carbon atom) with the help of potato borer or knife.
4. Make a hole in each of the small-sized lemons (representing hydrogen atoms).
5. Now, with the help of ice cream sticks or straw pipes, join these four equal sized lemons (hydrogen atoms) with the large sized lemon (carbon atom).
6. This will make a tetrahedral structure of methane.
7. The model of methane or the TLM is ready.

### How to use:

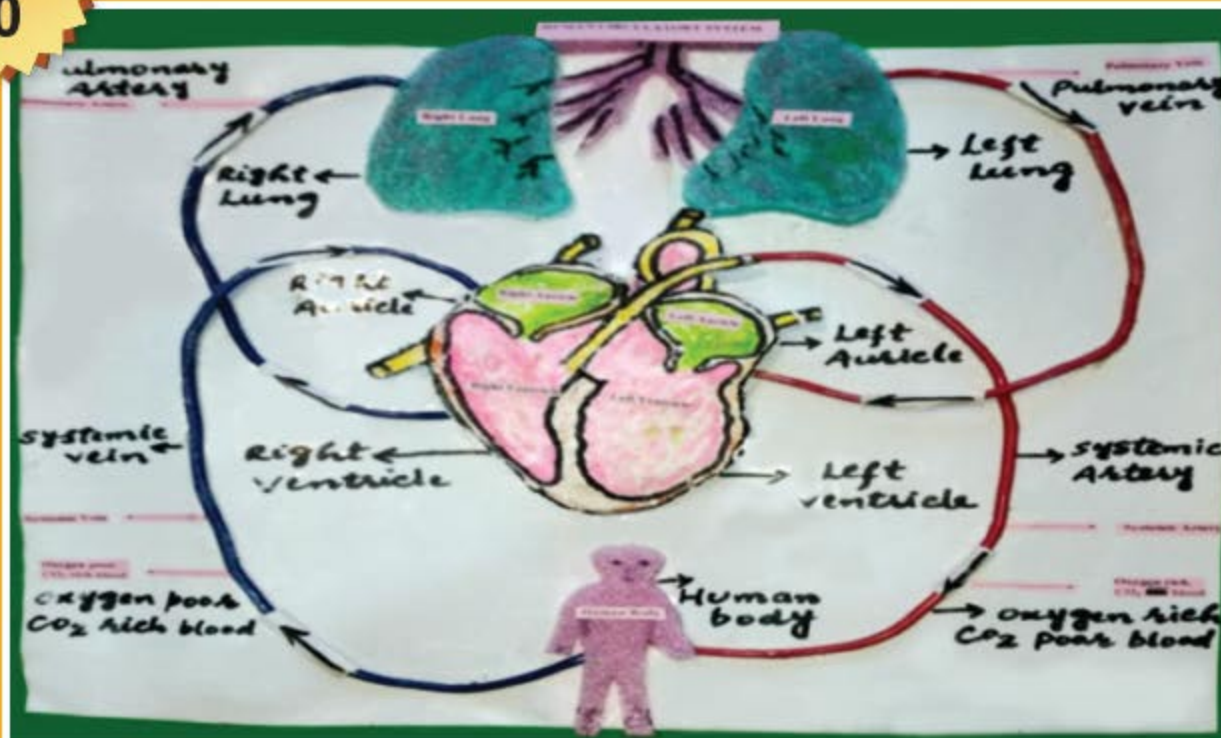
- Place the model in front for the class so that the students can observe it.
- Explain that the four holes in the bigger lemon (carbon atom) are the four valence electrons in a carbon atom, as the electronic configuration of carbon is 2, 4. So it needs four more electrons to complete the outermost shell.
- In the same way explain that single holes in four lemons (hydrogen atoms) represent the single valence electron of the hydrogen atom, as the electronic configuration of hydrogen is 1. So, it needs 1 more electron to complete the outermost shell.
- Now, explain that this carbon atom (bigger lemon) will share its four electrons with four hydrogen atoms (smaller lemons) and thus, completes its outer most shell, i.e., 8. In the same way, every hydrogen atom shares its one electron with carbon atom and completes its outermost shell, i.e., 2. This shows that carbon and hydrogen atoms in methane form a covalent bond by sharing of electrons.





# Human Circulatory System

TLM  
40



Created by Teacher : Mr.Mudassir Wani

School: Army Goodwill High School,  
Hanzik

## TLM for Class 10 Subject – Science

### Topic – Human Circulatory System

**Brief description:** This TLM is very useful for the students in understanding the concepts of blood circulation in a very practical manner. By using this TLM students will learn the structure and functions of human heart. They will understand how the blood is transported via arteries and veins. Besides this they will also learn about the role played by lungs during blood circulation.

**Other concepts that can be taught using this TLM:** Double circulation (systemic circulation + pulmonary circulation), the transport of blood from heart to body parts and back to heart is called systemic circulation, transport of blood from heart to lungs and back to heart is called pulmonary circulation.

**Materials used:** Cardboard, thermocol, red and blue coloured wires, chart paper, glue, colours and a cellotape.

**Cost of the material used for making TLM (approx.):** ₹80



### How to make:

1. Cut a square shaped cardboard of desired size (2 feet or more) and fix a white sheet on the cardboard.
2. Now, make shapes of heart, lungs and human body from a thermocol sheet and paste them on the cardboard.
3. Fix red and blue wires in a proper manner such that red colour depicts the transportation of oxygenated blood and blue colour depicts the transportation of deoxygenated blood. Red and blue colour wires represents arteries and veins in the TLM.
4. Label the different parts of the TLM such as heart, lungs, human body, arteries and veins (red and blue coloured wires) by using paper strips.
5. The TLM is ready to be presented in a classroom setting for proper demonstration.

### How to use:

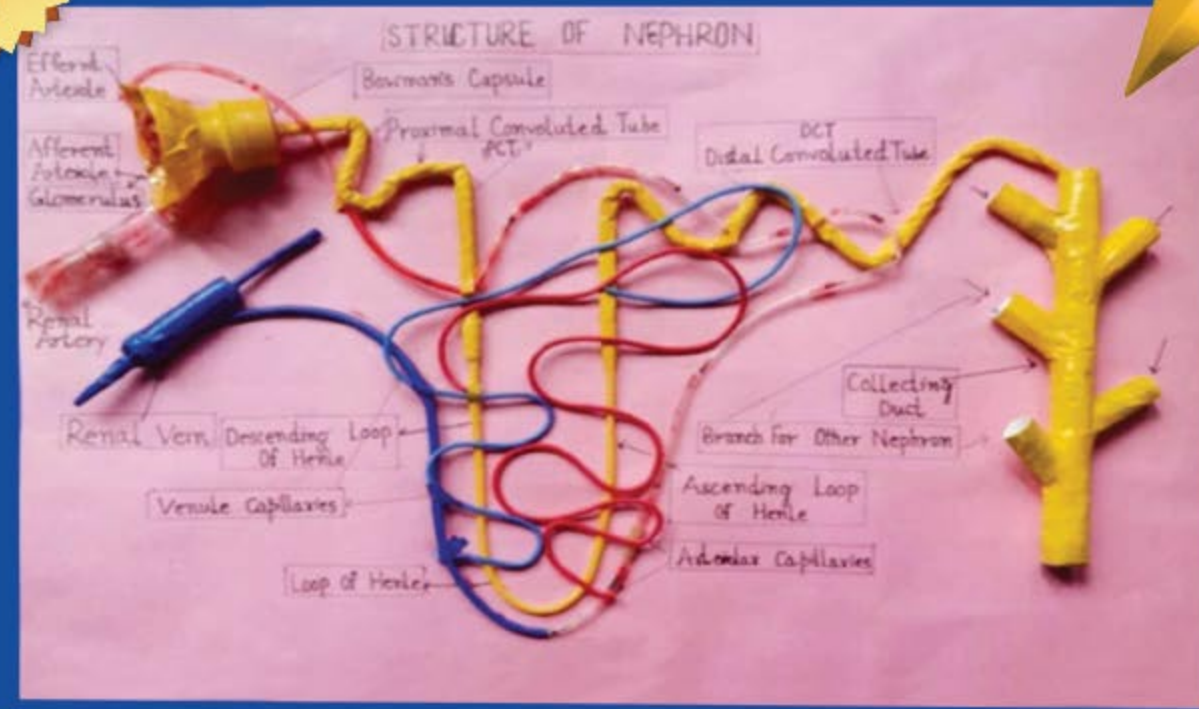
- Carry the TLM in the classroom and hang it on a wall.
- Ask students to observe the model of the heart and listen to the explanation.
- Pointing at the TLM :
  - a. Elaborate the structure of heart and its functions, i.e., transportation.
  - b. Introduce the terms auricles and ventricles and their function of transporting blood from the heart to the body parts and receiving blood from the body parts and lungs respectively.
  - c. Introduce the terms arteries and veins pointing at the red and blue coloured wires in the TLM. Explain that the function of arteries is to carry blood from heart to body parts and function of veins is to carry blood from body parts to heart.
  - d. Describe that the arteries carry oxygenated blood except pulmonary artery which carries deoxygenated blood from heart to lungs and all the veins carry deoxygenated blood except pulmonary vein which carries oxygenated blood from lungs to heart.





# Structure of Nephron (Kidney)

**TLM  
41**



Created by Teacher : Mr. Irshad Sofi

School: Army Goodwill School,  
Mazbug Sopore

## TLM for Class 10 Subject – Science Topic – Structure of Nephron

**Brief description:** The TLM helps the students to visualise the structure of nephron and understand its functions. They will be able to understand the concept of ultra-filtration of blood by Nephrons. This TLM is activity based, thus, will help in attracting the attention of the students and make classroom teaching-learning successful.

**Other concepts that can be taught using this TLM:** Process of excretion, internal structure of kidneys, formation of urine, kidney diseases or kidney failure and kinds of wastes removed through kidneys.

**Materials used:** Materials of low cost (or waste products) such as a transparent plastic bottle, drip set pipes and some waste connecting wires, a piece of cardboard.

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

### How to make:

1. Cut a piece of cardboard into a desired size of 1.5 x 2 feet. Fix an equal size of drawing sheet on the cardboard.
2. Now, cut a piece of plastic bottle from the cap side into a cup-like structure (represent Bowman's Capsule) and fix it at the top left corner of the cardboard.
3. Put one of the drip-set pipes into a coil-like structure which will represent glomerulus and fix it into the cup-like plastic bottle cutting (Bowman's Capsule).
4. Take another thick rubber pipe and fix it to form PCT and DCT.
5. Now make thick pipe using the thick cardboard to represent the collecting tubule.
6. Take two wires of different colours (red and blue) and fix them in the form of capillaries along the PCT and DCT.
7. Finally, label each part.

### How to use:

- Bring the self-prepared TLM in the classroom and mount it on the wall for display.
- Explain it with the help of a stick or place it on the desk so that students can have a close view of it.
- Now, explain the two very important parts of the nephron that is Bowman's capsule and Glomerulus.
- Describe that Bowman's capsule is meant for the collection of wastes out of filtered blood and Glomerulus a highly coiled tubular structure that helps infiltration of blood and, thus, sends back the filtered pure blood into the supply through renal vein.
- Explain every part in the structure of the nephron and their function in filtration of blood and producing urine.

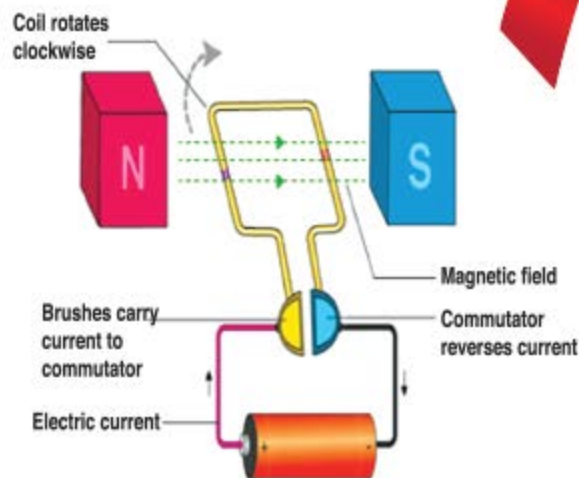




# Working of an Electric Motor

TLM  
42

SBERA  
AWARDED



Created by Teacher : Mr. Fidah Hussain

School: Army Goodwill School,  
Bandipora

## TLM for Class 10 Subject – Science Topic – Electric motor

**Brief description:** Electric motor is a device that converts electrical energy to mechanical energy.

**Magnet poles:** A magnet placed as shown in the figure above, i.e., North pole and South pole creates a magnetic field. **Axle:** The split rings are placed on the axle which can rotate freely.

**Uses of electric motor:** Electric motors are used in a variety of applications. Some of them are listed below.

- (i) Drills      (ii) Water pumps      (iii) Hard disc drives
- (iv) Washing machines      (v) Industrial equipment

**Other concepts that can be taught using this TLM:** Working of electronic circuit, various parts of a motor and their functions.

**Materials used:** Battery, buzzer, switch, tennis ball, wood stand, wire, cliff, charging pin, magnets, etc.

**Cost of the material used for making TLM (approx.):** ₹200

### How to make:

1. The principle of an electric motor is based on the current carrying conductor which produces magnetic field around it. A current carrying conductor is placed perpendicular to the magnetic field so that it experiences a force.
2. Arrange all the materials as shown in the figure.

### How to use:

- First make students understand that a simple motor has the following parts:
  - (i) A power supply – mostly DC for a simple motor
  - (ii) Field magnet – could be a permanent magnet or an electromagnet
  - (iii) An armature or rotor
  - (iv) Commutator
  - (v) Brushes
  - (vi) Axle
- Then explain that working of an electric motor is based on the fact that a current carrying conductor produces a magnetic field around it. For a better understanding make them imagine the following situation.
  - (i) Take two bar magnets and keep the poles facing each other with a small space in between. Now, take a small length of a conducting wire and make a loop.
  - (ii) Keep this loop in between the space between the magnets such that it is still within the sphere of influence of the magnets.
  - (iii) Now for the last bit. Connect the ends of the loop to battery terminals. Once electricity flows through the circuit, you will notice that your loop “moves”.
  - (iv) Ask, ‘Why does this happen?’
  - (v) Explanation: The magnetic field of the magnets interferes with that produced due to electric current flowing in the conductor. Since, the loop has become a magnet, one side of it will be attracted to the north pole of the magnet and the other to the south pole. This causes the loop to continuously rotate. This is the principle of working of an electric motor. (Source: Byjus website).
- Using this TLM generates curiosity among students to understand functioning of an electric motor easily.





# DC Generator

TLM  
43

SBERA  
AWARDED



Created by Teacher: Mr. Fidah Hussain

School: Army Goodwill School,  
Bandipora

## TLM for Class 10 Subject – Science Topic – DC Generator

**Brief description:** Electrical generators are standalone machines that provide electricity when power from the local grid is unavailable. A DC generator stands for direct current electric generator. A DC generator produces direct current. A DC generator is also called DC dynamo.

**Other concepts that can be taught using this TLM:** Current, working of motor, power input and power output.

**Materials used:** Marker, old CD, cello tape, rubber band, DC motor, metal wire, sun board.

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



### How to make:

1. Make the base using small piece of card board.
2. one side of card board is attached with double sided sticky tape.
3. To the other side of tape all other parts will be held (used hot glue for extra strength).
4. For the flywheel use old CDs (2 of them are coupled together).
5. The other side of cap is glued to this flywheel.
6. Handle is made to rotate the flywheel by gluing a small handle (plastic tube).
7. Install the DC motor as shown in the figure.
8. Connect the motor and bulb with wires as shown.
9. Simply rotate the CD using handle provided.
10. The LED bulb will glow.
11. sometimes if the connections between motor and panel is not proper then try rotating anti-clockwise.

### How to use:

Take this TLM into classroom and show it to students. Show the students different parts of DC generator and explain them the construction of manual DC generator. Connect the wires and start rotating the wheel, let the students understand how the mechanical energy gets converted to electrical energy. Let students rotate the wheel and experience how the LED bulb lights when wheel is rotated.





# Soil Erosion

TLM  
44

SBERA  
AWARDED



Created by Teacher : Rafia Kousar

School: PWS Hamirpur

## TLM for Class 10 Subject – Science Topic – Soil Erosion

**Brief description:** Denudation of the soil cover and subsequent washing down is known as soil erosion. **Causes of soil erosion:**

1. Human activities such as deforestation, overgrazing, construction and mining, etc.
2. Natural forces such as wind, glacier and water, heavily in action, leads to soil erosion.
3. The running water cuts through clayey soils and makes deep channels as 'gullies'. The land becomes unfit for cultivation, this process is called gully erosion and the land is called bad land or ravines in the Chambal basin.
4. Sometimes, water flows as a sheet over large areas down a slope. It leads to the washing away of the top soil. This process is called sheet erosion.
5. Wind blows loose soil off flat or sloping land, and is called wind erosion.
6. Defective methods of farming.

**Other concepts that can be taught using this TLM:** Difference between various types of soil and consequences of deforestation.

**Materials used:** Drawing sheet, colour pens, thermocol sheet, cardboard, empty transparent bottles, water, some soil and pins.

**Cost of the material used for making TLM (approx.): ₹70**





### How to make:

1. Prepare three of the plastic bottles by cutting a rectangular hole roughly 6 cm x 20 cm along the side of the bottle.
2. Stick the bottles to the wood making sure that the necks of the three bottles protrude a little over the edge of the board.
3. Fill the first bottle with garden soil and the other two with a soil and compost mixture. Press down firmly to compact it.
4. Leave the first bottle as is.
5. Cover the top of the soil in the second bottle with the mulch (bark chips, dead leaves and sticks etc).
6. Plant seedlings in the third bottle. Make sure you plant them tightly together and press down firmly to compact the soil.
7. Cut the other three bottles in half, horizontally and keep the bottom halves.
8. Make two small holes opposite each other, nearest the cut side of the bottle.
9. Cut three pieces of string, roughly 25 cm long and insert each end into the holes. Tie a knot on the ends to secure them. This will form a "bucket" to collect the water.
10. Hang them over the necks of each of the three bottles on the board.
11. Slowly pour equal amounts of water into each of the bottles. Pour the water through the end furthest from the neck of the bottle.

### How to use:

- First of all make a diagram depicting soil erosion on blackboard. Let the students understand the concept.
- Now, show the TLM to students and tell them to observe the phenomenon of soil erosion by making the TLM operative.
- Let the students ask questions and discuss the various steps of soil erosion with each other.
- Ask students if they can explain the process of soil erosion with the help of TLM.
- Observe the students and give constructive feedback.





## ANNEXURE : LIST OF SBERA AWARDEES



### Innovative TLM Awards at HQ Norther Command - 2016-17:

S.No.	Name of Teacher	Name of School	Rank	Level
1	Ms. Deehan Cholkait	AGS Bogdang	Gold	Primary
2	Miss Parmeet Kaur	AGS Boniyar	Silver	Primary
3	Ms. Abida	AGS Uri	Bronze	Primary
4	Ms. Yangchan Palkit	AGS Karu	Gold	Middle
5	Mr. Farooq Ahmad Lone	AGS Khanabal	Silver	Middle
6	Ms. Stanzin Chorol	AGS ParthaPur	Bronze	Middle
7	Mr. Varun Kumar	AGPS Rajouri	Gold	Secondary
8	Ms. Namrata Sharma	AGPS Rajouri	Silver	Secondary
9	Mr. Imtiyaz Ahmad Bhat	AGPS Pahalgam	Bronze	Secondary



## ANNEXURE : LIST OF SBERA AWARDEES



### Satya Bharti Innovative Teachers' Awards - 2017-18:

S.No.	Name of Teacher	Name of School	Position	Level
1	Mrs Bandana Pathania	AGS Wuzur	Gold	Primary
2	Miss Dechan Choskit	AGS Bogdang	Silver	
3	Mr Romal Kapur	AGS, Potha	Bronze	
4	Miss Rafia Kouser	AGS Hamirpur	Consolation	
5	Mr Mohd Mehmood Khan	AGS, Sagra	Consolation	
6	Miss Parveena Akhtar	AGS, Naugam	Merit Cert	Elementary
7	Mrs Mumtaz	AGS, Sopore	Gold	
8	Miss Tabausum Qayoom	AGS, boniyar	Silver	
9	Mrs Manisha Sahani	AGPS, Rajouri	Bronze	
10	Miss Farhana Mehraj	AGS, Hanzik	Consolation	
11	Miss Yangchang Palkit	AGS, Karu	Merit Cert	Sr. Secondary
12	Mr Mohd Ashraf Magrey	AGS, Ziran	Gold	
13	Miss Qurat Ul Ali Akhter,	AGS, Harkabahadur	Silver	
14	Miss Sunita Mishra	AGPS, Rajouri	Bronze	
15	Mr Muzaffar Bashir Mir	AGPS, Pahalgam	Consolation	
16	Mr Fidha Hussain Malik	AGS, Bandipura	Merit Cert	
17	Mr Shehzad Khan	AGS, Hamirpur	Merit Cert	





# STUDY SKILLS WORKSHOPS



Workshop on Stress Management



Workshop on Goal Setting



Workshop on Exam Writing



Workshop on Concentration



Workshop on Time Management



Workshop on Communication



# STUDENT ENGAGEMENT ACTIVITIES



International Yoga Day



World Environment Day



Math Week



World Earth Day



Independence Day Celebration





$$2 \times 2 = 4$$



5



## 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 21<sup>st</sup>-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 –



**Students' Empowerment**



**School Leadership and Teachers' Engagement**



**Parents' and Community Involvement**



**School Environment**

**bharti**  
Bharti Foundation

 **satya bharti quality  
support program**

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