



From the Editor's desk

Dear colleagues and families,

We are back again with 'Scribbles Summer Special'. The issue is packed with various activities and health guidelines for all ages to beat the heat, stay safe and keep you and your family engaged. Dive into thrilling science projects, unleash creativity with DIY crafts, and embark on unforgettable journeys through Tamil Nadu's vibrant landscapes.

As we embrace the sun-kissed moments, let's revel in the joy of wanderlust and relaxation. Whether it's a sandy escape or a serene staycation, let this season be a canvas for unforgettable memories and cherished experiences.

Whether you're seeking adventure or relaxation, let this season be a celebration of discovery and joy. So grab your sunscreen, join together with your loved ones, and make this summer memorable.

Happy holidays!

Best regards,

Narayan Sethuramon





Dos and don'ts for Summer Vacation

During summer vacation in India, it's important for children to stay safe, healthy, and engaged. Here are some dos and don'ts to consider:

Dos:

- **Stay hydrated:** Encourage children to drink plenty of water throughout the day, especially during hot weather.
- **Wear sunscreen:** Apply sunscreen with a high SPF before going outdoors to protect against harmful UV rays.
- **Dress appropriately:** Wear lightweight, loose-fitting clothing made of breathable fabrics to stay cool.
- **Stay indoors during peak sun hours:** Avoid outdoor activities during the hottest part of the day, typically between 10 a.m. and 4 p.m.
- **Engage in indoor activities:** Encourage children to pursue indoor hobbies such as reading, painting, or playing board games to avoid excessive sun exposure.
- **Plan outdoor activities in the morning or evening:** If outdoor activities are planned, schedule them during the cooler hours of the day.
- **Eat light and nutritious meals:** Consume a balanced diet rich in fruits, vegetables, and fluids to maintain energy levels and stay healthy.
- **Learn new skills:** Use the summer break to explore new interests or develop existing talents through classes or workshops.
- **Stay connected with friends and family:** Maintain social connections through phone calls, video chats, or outdoor gatherings.
- **Practice safety measures:** Follow safety guidelines when engaging in outdoor activities such as swimming, cycling, or playing sports.

Don'ts:

- **Avoid excessive sun exposure:** Limit outdoor activities during peak sun hours to prevent heat-related illnesses such as heatstroke or sunburn.
- **Don't consume unhealthy snacks:** Avoid excessive consumption of sugary or fried snacks and opt for healthier alternatives like fruits or nuts.
- **Don't neglect personal hygiene:** Maintain good hygiene practices by taking regular baths, washing hands frequently, and wearing clean clothes.
- **Don't overexert yourself:** Avoid strenuous activities or overexertion, especially in extreme heat to prevent dehydration and fatigue.
- **Don't spend excessive time on screens:** Limit screen time and encourage children to engage in physical activities, creative pursuits, or educational endeavours.
- **Don't neglect mental well-being:** Pay attention to children's emotional well-being and provide support if they experience stress, anxiety, or boredom during the summer break.
- **Don't forget to have fun:** Encourage children to enjoy their summer vacation while staying safe and healthy.

Popsicle Counting

Circle the correct number of popsicles you see in each group.



2 3 1 4



3 4 2 5



2 3 5 4



5 4 6 3

Watermelon Matching Game



6



4



7



5



3



Learn about time

Draw the hands on the clocks to show the time.



10:30



5:00



2:15



12:00



6:30



4:45



8:15



3:00



7:30

Learn about time

Match the clock face to the analog clock



5:00



9:45



6:30



3:15



11:30



7:45



10:00



2:00

Learn about time

Fill in the blanks to make all 3 times in a row match.



or



or _____ o'clock



or



or _____ o'clock



or



or 4 o'clock

What is your favorite time of day?



or

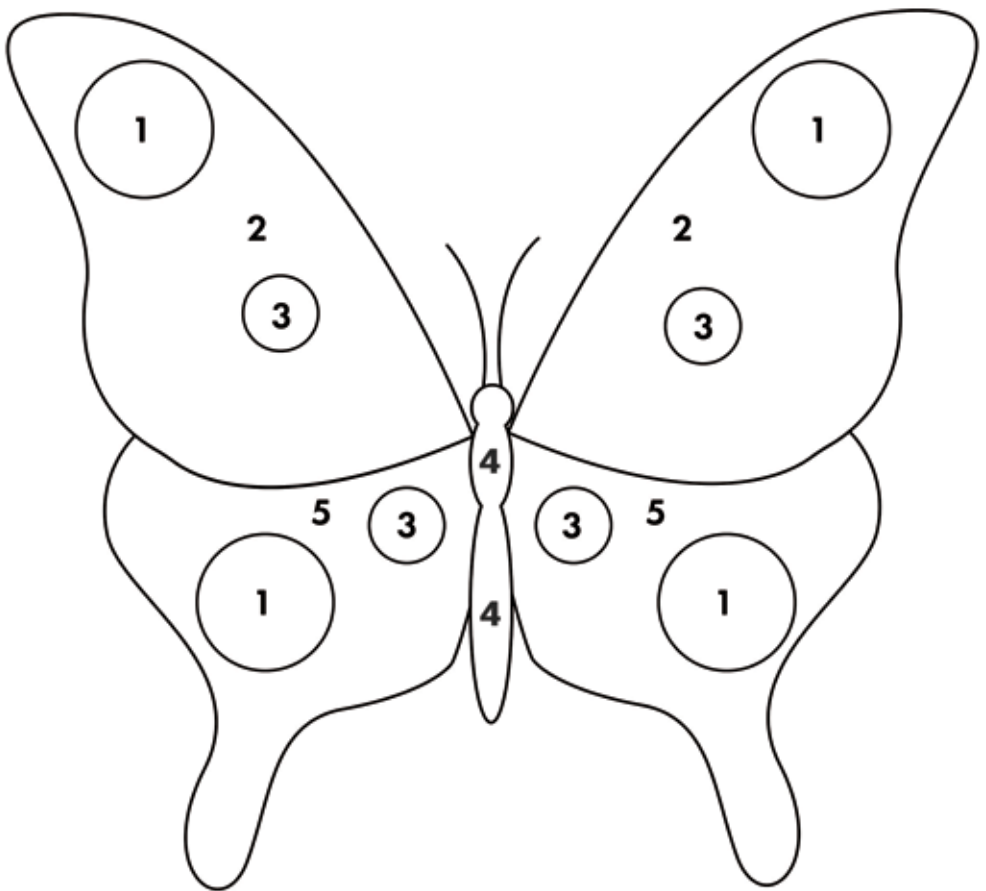


or _____ o'clock

Colour by Number

Colour the butterfly by number: Fill in the picture below using the colours indicated by the numbers.

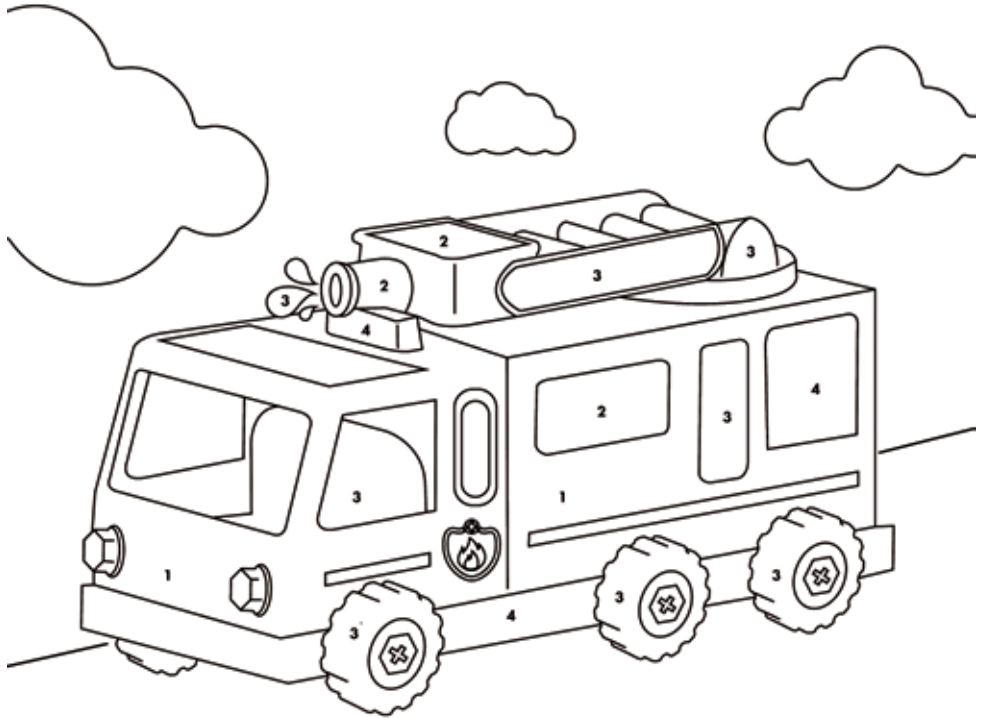
- 1 Purple
- 2 Blue
- 3 Pink
- 4 Green
- 5 Orange



Colour by Number

Fill in the fire truck using the colours indicated by the numbers; then colour the rest of the picture.

- 1 Red 2 Yellow 3 Blue 4 Gray



Spot the seven differences



Answers in page no 48

Spot the eight differences



Answers in page no 48

Riddle Time - How Smart You Really Are?



- I am an odd number. Take away a letter and I become even. What number am I?
- What question can you never answer yes to?
- Which is heavier: a ton of bricks or a ton of feathers?
- What five-letter word becomes shorter when you add two letters to it?
- A word I know contains six letters, remove one letter and 12 remain. What is it?
- What would you find in the middle of Toronto?
- What 4-letter word can be written forward, backwards or upside down and can still be read from left to right?
- What can run but never walk, has a mouth but never talk, has a head but never weeps, has a bed but never sleeps?
- I turn once; what is out will not get in. I turn again; what is in will not get out. What am I?
- I have lakes with no water, mountains without stone and cities without buildings. What am I?



- Seven
- Are you asleep yet?
- Neither—they both weigh a ton
- Short
- Dozens
- The letter "o"
- NOON
- A river
- A key
- A map

Quiz

1. Who wrote the famous novel series "Harry Potter"?
2. What is the chemical symbol for water?
3. What is the largest planet in our solar system?
4. What is the capital city of France?
5. Who painted the Mona Lisa?
6. What is the powerhouse of the cell?
7. In which year did the Titanic sink?
8. What is the chemical symbol for gold?
9. Who was the Ancient Greek God of the Sun?
10. Which planet is known as the "Red Planet"?



- Answers for Quiz:**
1. JK Rowling
 2. H₂O
 3. Jupiter
 4. Paris
 5. Leonardo da Vinci
 6. The mitochondria
 7. 1912
 8. Au
 9. Apollo
 10. Mars



Word Scramble

1. LLBA
2. NWMMISGI
3. RYUBG
4. EBALBSAL
5. UNR
6. NIW
7. WHRTO
8. AKBSLLTAEB
9. ELOS
10. TBA
11. INGGGOJ
12. AKRTAE
13. OPLIYCMS
14. EACR
15. CHTCA
16. FGLO
17. UPJM
18. PNISRT
19. MTEA
20. NEICPOOITMT

- Answers:**
1. BALL
 2. SWIMMING
 3. RUGBY
 4. BASEBALL
 5. RUN
 6. WIN
 7. THROW
 8. BASKETBALL
 9. LOSE
 10. BAT
 11. JOGGING
 12. KARATE
 13. OLYMPICS
 14. RACE
 15. CATCH
 16. GOLF
 17. JUMP
 18. SPRINT
 19. TEAM
 20. COMPETITION

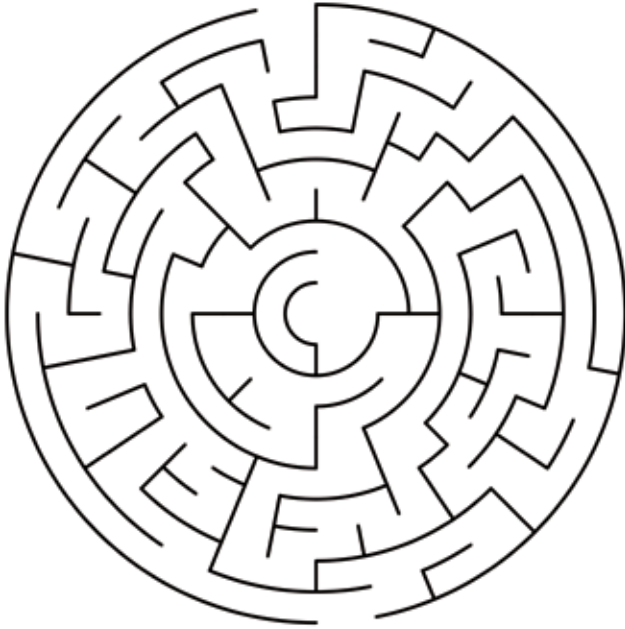
Holiday-themed puzzle

Words can be found horizontally, vertically, or diagonally, forwards or backward. Have fun!

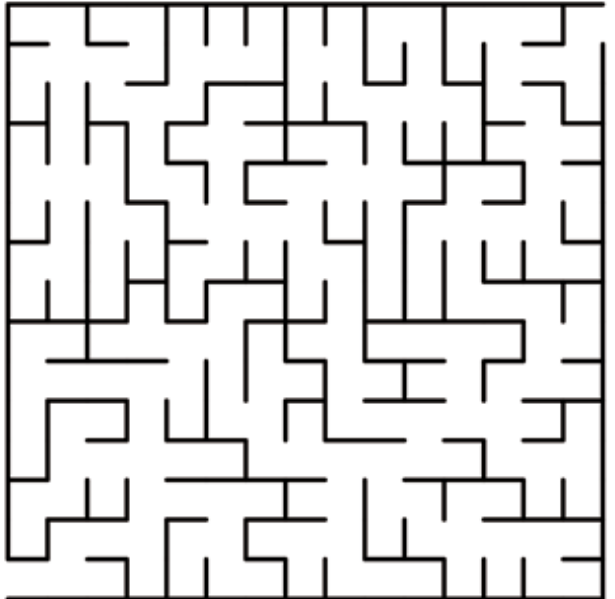
Y T R E E G A R L A N D
 C A N D Y C A N E S R T
 A W R E A T H P R E S E
 R E I N D E E R O E C R
 O S N O W M A N I S L O
 L N T I C P I N E C O N E
 A O G I F T S E L F R U
 F I R L U T O E L F C I
 K R A O T S U O T O T S
 E E R B A L T E R A T S
 S T O C K I N G S E A S
 N O E L P R E S E N T S

Answers:
 1. TREE
 2. GARLAND
 3. CANDY
 4. CANES
 5. WREATH
 6. REINDEER
 7. SNOWMAN
 8. PINECONE
 9. GIFTS
 10. ELF
 11. STOCKINGS
 12. NOEL
 13. PRESENTS

Maze



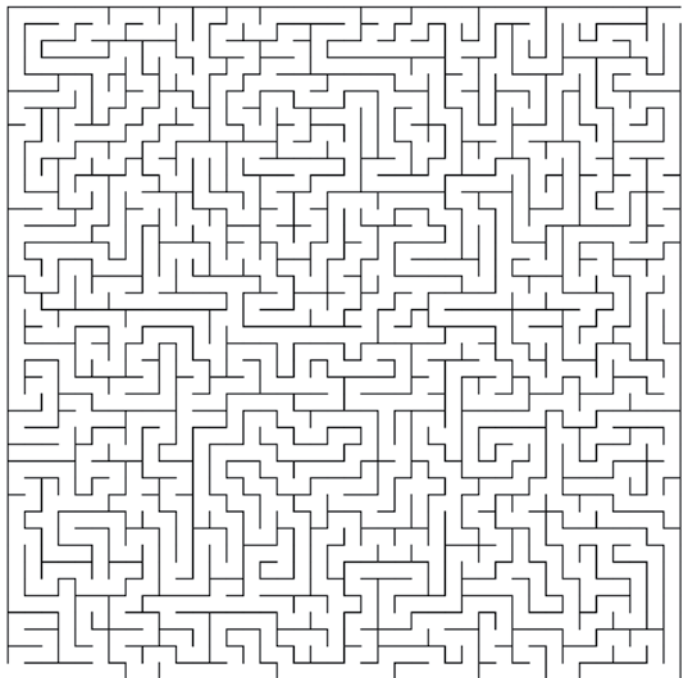
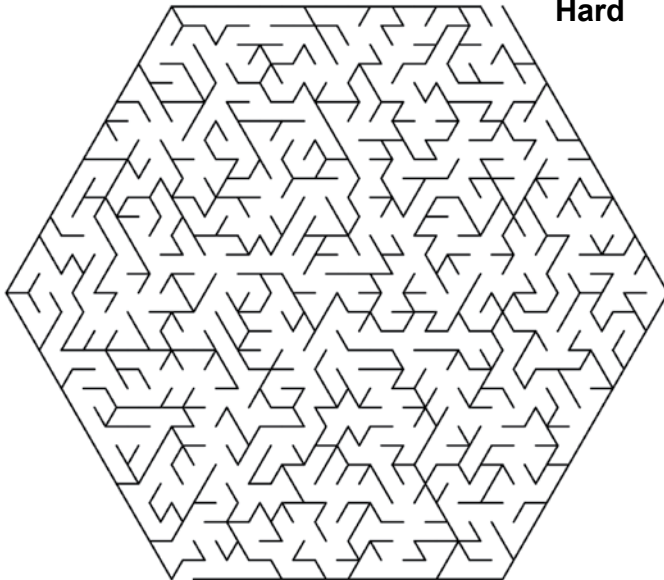
Easy



Medium

Maze

Hard



Ultra Hard

Sudoku

6					9			4
	8	9	5				1	6
5				6		3		9
8	3	1				7		5
	2						6	
9		7				8	4	2
2		6		1				8
3	7				6	9	2	
1			3					7

Easy

1	9	4	3	8	2	6	5	7
3	7	8	4	5	6	9	2	1
2	5	6	9	1	7	4	3	8
9	6	7	1	3	5	8	4	2
4	2	5	7	9	8	1	6	3
8	3	1	6	2	4	7	9	5
5	4	2	8	6	1	3	7	9
7	8	9	5	4	3	2	1	6
6	1	3	2	7	9	5	8	4

Answer

Sudoku

	8	7	3		4			
	3		5				4	
								7
					2	4	5	
	9	6		1		8	3	
	2	5	8					
8								
	5				7		1	
			2		1	7	6	

Hard

9	4	3	2	5	1	7	6	8
6	5	2	4	8	7	9	1	3
8	7	1	6	9	3	5	2	4
3	2	5	8	4	6	1	7	9
4	9	6	7	1	5	8	3	2
7	1	8	9	3	2	4	5	6
5	6	4	1	2	9	3	8	7
2	3	9	5	7	8	6	4	1
1	8	7	3	6	4	2	9	5

Answer

Sudoku

	9	6			8			
1								3
			9		2		8	
	5	7	8					9
3					9	1	6	
	2		3		5			
7								4
			2			5	9	

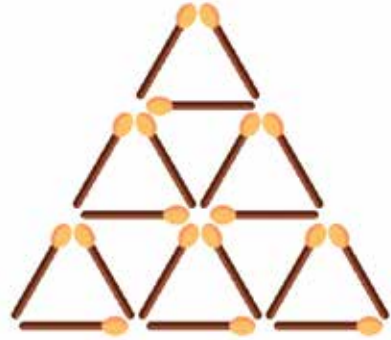
Extra hard

4	6	3	2	8	7	5	9	1
7	8	5	1	9	6	2	3	4
9	2	1	3	4	5	8	7	6
3	4	2	5	7	9	1	6	8
8	1	9	4	6	3	7	5	2
6	5	7	8	2	1	3	4	9
5	3	4	9	1	2	6	8	7
1	7	8	6	5	4	9	2	3
2	9	6	7	3	8	4	1	5

Answer

Matchstick puzzles

$$\begin{array}{l}
 3 \times 9 = 5 \\
 8 \times 3 = 16 \\
 5 \times 8 = 36
 \end{array}$$

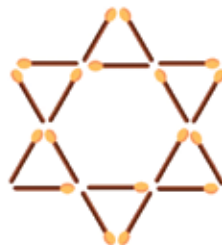


Move one match stick to get the correct equality.

Remove five match sticks to get five equal triangles.

$$\begin{array}{l}
 2 + 2 + 5 + 6 = 16 \\
 5 + 5 + 5 + 4 = 28 \\
 1 + 2 + 3 + 8 = 21
 \end{array}$$

Move one match stick to get the correct equality.



Move six match sticks to get six equal diamonds.

DIY: Crafts for kids to boost their creativity

Shell Crafts

If you are planning any coast trips this summer, make sure you stock up on lots of shells! These shell people are so easy to make and are fun to play with, too.

Materials required:

- Shells
- Lolly sticks (mine were shaped like people)
- String for hair
- Washi tape
- Glitter
- Pens
- Shiny button stickers
- Glue gun / Strong glue

Start by getting your lolly sticks ready, use extra wide ones.

Stick Washi tape on the sticks to make their clothes, legs and feet and then draw some eyes and a mouth with a pen.

Make the hair out of the string.

Then, glue the hair and shells on with a glue gun to make sure they don't fall off.

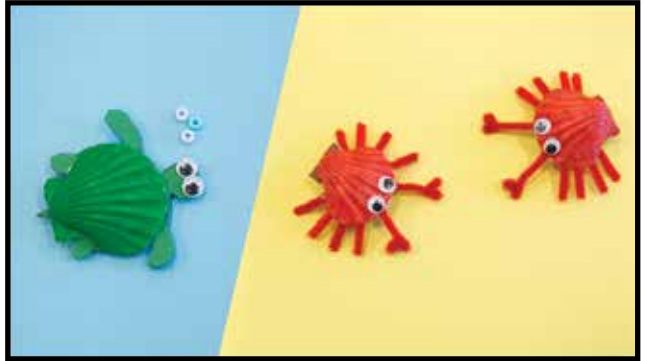
Then, make a little stage for them and use them as puppets.



Seashell Crab and Turtle Magnets

Materials required:

1. Wiggly Eyes
2. Fuzzy Sticks
3. Craft Foam
4. Scissors
5. Glue
6. Magnets



Step 1

Gather your materials

Step 2

Paint seashells.

Create The Crabs:

Step 3

Cut fuzzy sticks to create the legs of your crabs, and glue them to the underside of the seashell.

Step 4

Glue a magnet on the bottom of the seashells.

Tip! Glue a bit of craft foam to the bottom to adhere the magnets to.



Create The Turtle:

Step 5

Cut a turtle shape out of craft foam and glue to the underside of the seashell.

Step 6

Glue a magnet to the bottom of the turtle.

Step 7

Glue on wiggly eyes to bring your creations to life! Your turtle and crabs are now complete!



Ice Cream Cone Garland

Make an ice cream cone garland out of yarn and paper for decoration

Materials required:

- Brown craft paper
- Brown sharpie
- Ruler
- 6 plate or similar circle template
- Twine
- Pencil
- Scissors
- 1 red pom pom and 1 pink

Yarn in rainbow colours:

Bernat Super Value Yarn in Peacock and Light Damson

Red Heart Yarn in Cherry Red, Bright Yellow, Pumpkin, Spring Green, and Paddy Green



Instructions to make:

- Cut 1 piece of yarn about 12 cm long of each colour and set it aside. This will be used to tie the middle of the pom pom. Since one of your hands will be occupied with yarn, cutting this first is easiest.
- Wrap one colour yarn around the palm of your hand around 150 times and then trim the ends.
- Next, slide the pre-cut piece of yarn through your fingers and slide the yarn off your hand. Tie the piece you slid through tightly. Double knot.
- Gently flip over the bundle of yarn and bring the two pieces you just tied to the other side to do the same, double-knotting them.
- Then, use your scissors to cut the loops to create a pom pom.
- Finally, trim the pom pom. Hang onto the “tail”, which is the piece that holds the yarn together and is tied on both sides. Trim the pom pom into the shape desired.
- Do not cut the tail, that is what you will use to hang the cones. If you do cut it, simply tie another one on, very tightly.
- Make one pom pom with each colour of yarn.
- Next, make the paper ice cream cones. Cut one 5 x 5 piece of kraft paper for each colour pom pom.
- Use the brown Sharpie to draw grided lines on each square of paper.
- Now, cut the paper square into a cone shape. Free-hand it or use a plate as a circle guide to create an arched side to the paper.
- Next, roll each paper into a cone shape and secure the edges with hot glue.
- Now it’s time to make the ice cream cones! Attach the pom pom to the paper cones by putting hot glue into the top of the cone. Set the pom pom on top, pushing it somewhat down into the cone so the glue catches the yarn.
- Keep the tail on top and not in the cone to create a loop by knotting to hang.
- After each cone is made, string them up on the twine. Measure the length needed for the twine and add about 12. Add a slip knot to each end and slide the cones onto the twine. Hang as desired.
- Finally, add pom pom cherries to the top of each ice cream cone. To get the “cherries” to sit straight, add them on after the cones are hung on the twine. Add a white or pink pom pom to the red ice cream cone to make the cherry stand out more.
- Finally, hang the finished garland on a mantle or a deck. This would be adorable for an ice cream party!

Glitter Sea Shell Picture Frame

This glitter sea shell frame is so beautiful, you won't believe how easy it was to put together!

Equipment

- Glue gun

Materials

- Shells
- Extra Fine Glitter
- Wooden Frame
- Mod Podge

Instructions



1. Apply a thin coat of Mod Podge onto a shell.



2. Sprinkle a layer of extra fine glitter on top of the shell. Repeat these steps with the rest of the seashells. Leave them to dry completely.



3. Using a glue gun, arrange and glue the shells to the picture frame. Add another layer of Mod Podge on top of the shells to seal in the glitter (optional)



4. Your glitter seashell picture frame is complete!

How To Make Paper Flying Machine

What You Need:

- 1 regular plastic straw
- 3x5' index card
(or cardstock cut to size)
- Scissors • Tape

What You Do:

1. Cut the index card into three strips that are 1' wide and 5' long (you might want an adult or someone older than you to help you with this).
2. Overlap the edges of two of the strips by about one inch, and tape them together. Now you have one long strip. Bring the two edges of the long strip together, overlap them, and tape them together to make a loop.
3. Make a smaller loop with the last index card strip by overlapping the edge and taping together.
4. Set the straw inside of the small loop, so the end of the straw sticks just outside of the end of the paper loop. Tape the straw to the inside of the small loop.
5. Tape the other end of the straw to the inside of the large paper loop. Make sure that the straw is set evenly inside of each loop, not to one side or the other, so your flying machine will be balanced. Also, be sure that the openings of the straw are not taped shut.
6. To fly your glider, hold it with your thumb and index finger, and toss it in the air at a slight upwards angle.



What Happened:

Your glider was able to fly when you pushed it forward. Force is the word scientists use to talk about different kinds of pushes and pulls. Different forces create motion (anything that is moving has motion). Flight is a kind of motion. Your glider flew a long way, didn't it? All of the thinnest parts of the machine were the ones that needed to be pushed through the air. Air is light, but it still has weight. You had to use force to make your flying machine cut through the air, and because of the way you made it, it worked really well! A little bit of force made the glider go a long way. What do you think you could do to make your flying machine even better? Could you make it lighter by using a shorter straw? Try it out.

Make an Anemometer

What is an Anemometer?

An anemometer is a device used to measure wind speed and pressure. It is derived from the Greek word 'anemos' meaning wind. The first anemometer was invented by Leon Battista Alberti in the year 1450. In the later years, there were many versions and designs of the anemometer. An anemometer measures the wind speed in miles per hour, kilometres per hour and meters per second. There are various types of anemometers such as a sonic anemometer, laser doppler anemometer, plate and tube anemometer, vane anemometer, etc.

An anemometer is used in weather stations, airports, agricultural sectors, etc. Most importantly, it is used in ships to track the wind speed. It is extremely beneficial for meteorologists in studying the pattern of winds. The best example of an anemometer is made from cups that rotate as the wind flows. The stronger the winds, the faster it rotates. The total number of cups rotated can be used to calculate the wind speed.

Materials Required

- Five disposable cups
- A pencil
- Two straws
- A glue
- A punching machine
- A table fan



Procedure

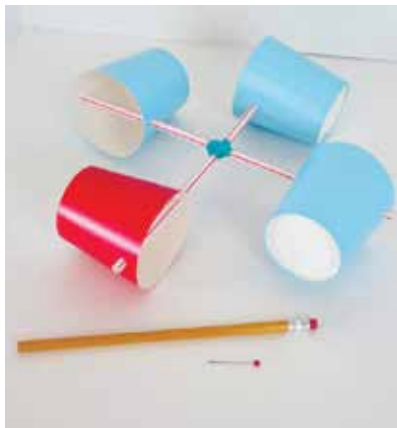
- Take a disposable cup and make four holes opposite each other using a punching machine.
- Take a straw and pierce through two holes, followed by another straw piercing the other two holes of the cup.
- Take four disposable cups and paste them on the arms of the four straws using glue.
- The cups should be placed either in a clockwise direction or anti-clockwise direction, but make sure that all the four cups are in the same direction.
- Then, take a pencil and insert it at the center of the cup placed in between the four cups.
- Keep the cups in front of a table fan and observe the changes.

Result

- It was observed that the rotation of the cup increases when the flow of wind becomes stronger. With this, you can count the number of rotations by an anemometer within a minute or an hour. Besides this, you can also observe the speed at which the cups rotate depending on the flow of wind.

Some of the interesting facts about an anemometer are mentioned below:

- It is used in meteorology and aerodynamics to measure wind speed.
- The first anemometer was invented in the year 1450.
- The most commonly used cup anemometer is to teach how wind rotates.
- The four cup anemometer was invented by Thomas Romney Robinson in 1850.
- An anemometer is also used to measure the gas stream and check the ventilation.
- Ships use an anemometer to track the movement of the wind.
- Recreational activities like surfing, kayaking, paragliding, etc., use the device to measure the wind speed.
- The unit of measurement used to measure the wind speed is the knot.
- It is widely used to measure wind speed in weather stations.
- An anemometer is used to measure the wind speed in velocity-related experiments.
- It helps in predicting in which direction the wind is moving.



Kazoo Fun

THE SCIENCE BEHIND IT:

The kazoo you made is like an instrument with 2 basic parts; one that vibrates and increases the volume. To have sound, 3 things are required: a source of vibration, a column for sound to travel through, and something to receive the vibrating air, which is our ear. When you talk, sounds are made when the air you breathe out travels over the vocal cords in your throat, causing them to vibrate. The vibrating vocal cords cause vibrations in the air, creating waves. When the airwaves hit your ear, your eardrum vibrates and sends a message to your brain interpreting it as sound.

When you hum into your kazoo, the tube strengthens the volume of the vibrating paper so that your ear picks it up as sound.

So, can you give a scientific answer to the philosophical question, “When a tree falls in the forest, and nobody is there to hear it, does it make a sound?”

MATERIALS:

- Cardboard tube (toilet paper or paper towel)
- Wax paper and other plastic bags and papers
- Rubber band
- Pencil, sharpened (or something pointed to make a hole in the tube)
- Scissors



INSTRUCTIONS:

- Step 1.** Cut a piece of wax paper so that it is a hand width larger than the opening of the tube.
- Step 2.** Place the piece of wax paper over the end of the tube and secure it in place using a rubber band. It should be loose and not pulled extremely tight.
- Step 3.** Use a sharpened pencil to create a hole in the tube so it is closer to the end of the tube with the wax paper wrapped around it. This is your mouthpiece.
- Step 4.** Hum (do not blow) through the mouthpiece. Try blowing through the end of the tube to test the difference.
- Step 5.** Try using other materials in place of the wax paper and try moving the placement of the mouthpiece hole.



Colour Explosion

Oil and water do not mix because oil is not soluble in water, and water is not soluble in oil. When you added drops of food colouring into the oil, they did not mix because food colouring is water-based, not oil-based. When you stirred up the oil with food colouring, you should have noticed that the large food-colouring drops broke apart into lots and lots of smaller food colouring droplets. Then, when the oil was poured into the water, it floated on top of the water because oil is less dense (lighter) than water. The tiny water-based droplets of food colouring are denser than the oil, so they begin to sink into the oil layer. Food colouring is soluble in water, so once the droplets reach the water, they dissolve and create a colourful display as they sink to the bottom. Cold tap water was used to slow the action down. If you let the container sit long enough, all the colours will merge to create one solid colour of water.

MATERIALS:

- 2 clear containers, glasses, or jars (the taller and narrower the better)
- Food coloring (different colors)
- Cooking oil—enough to make a 2cm layer in the container
- Spoon
- Cold tap water

VOCABULARY:

Density—the measure of how compressed an object or substance is. The density is equal to the mass of an object divided by its volume.

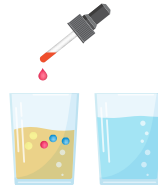
Soluble—able to be dissolved in.

INSTRUCTIONS:

STEP 1. Fill a clear container $\frac{3}{4}$ full of cold tap water.

STEP 2. Fill a second container with a $\frac{1}{2}$ - $\frac{3}{4}$ -inch layer of cooking oil.

STEP 3. Add 2 drops of red, blue, and yellow food colouring to the cooking oil. If you do not have all 3, then just use the colours you have. Observe. What do you notice?



STEP 4. Use a spoon to vigorously mix the oil and food colouring.

What do you observe?

STEP 5. Slowly pour the oil with the tiny food colouring droplets into the glass with the cold water. Wait and watch (1-3 minutes).

STEP 6. Try it again with warm water, different-size glasses, smaller food-colouring droplets, etc.



Solar water purifier at home

When water evaporates from the ocean, it leaves salt behind. If you had no fresh water to drink, you could distil (or purify) ocean water by using evaporation. Here's how:

What You Need:

- Water
- Salt
- Large bowl
- Short glass or beaker.
- Plastic wrap
- Masking tape
- Rock (or other small weight)



What You Do:

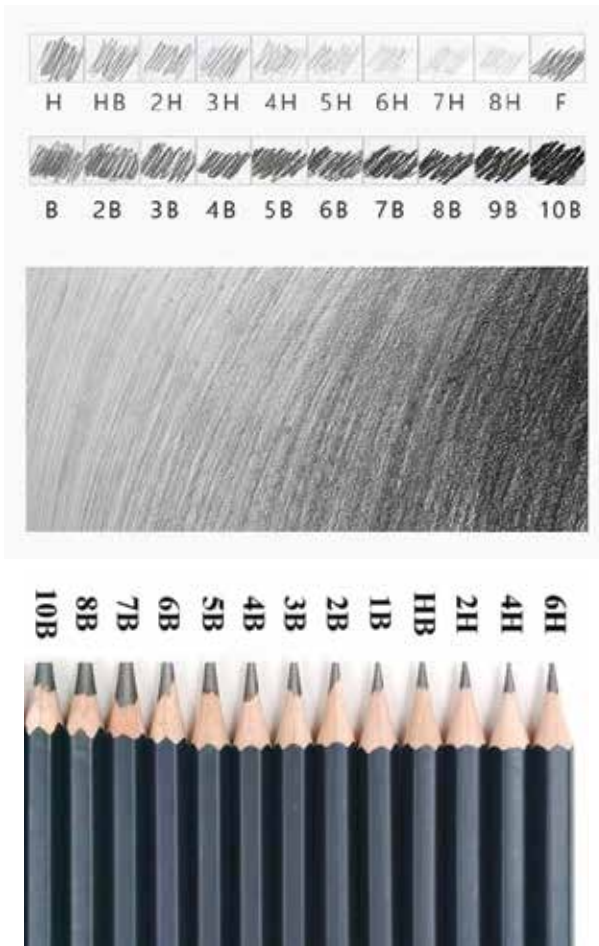
1. Add salt to two cups of water and stir until it dissolves, then pour it into a large bowl.
2. Place a short glass in the middle of the bowl. (This glass should be shorter than the rim of the bowl but taller than the level of the saltwater.)
3. Now cover the bowl with plastic wrap, taping the edges, if necessary, to get a tight seal. Place a small rock or other weight on top of the plastic directly over the glass in the bowl. This helps you collect the distilled water in the glass.
4. Put the bowl outside in the sun. Leave it for several hours, or the whole day. When you recheck it, there will be water in the cup. Taste it to find out if it's salty or fresh! (You can also use electricity to test it for saltiness by making a saltwater circuit.)

What Happened?

The sun warmed the water in the bowl until it evaporated, becoming a gas. When the gas rose and hit the plastic it condensed there in droplets (like water vapor condenses into clouds). The droplets rolled down the plastic toward the weight and eventually fell into the glass (like rain falling from the sky). The salt was left behind in the bowl, making the water in the glass pure enough to drink.

Know about your pencil

The pencil's history dates back to ancient Greece and Rome, where early versions utilised lead sticks encased in a wooden shaft. However, it wasn't until the 16th century that graphite, a less toxic alternative, became the standard material. In the 18th century, the discovery of graphite deposits in England revolutionised pencil production, leading to the modern pencil. Today, pencils come in various types, including graphite pencils, coloured pencils, charcoal pencils, and mechanical pencils. Graphite pencils range from hard (H) to soft (B) lead, offering versatility in shading and line thickness. Coloured pencils feature pigmented cores for artistic expression, while charcoal pencils provide rich, dark lines ideal for sketching and shading.



Varieties of railway engines in India

Indian railway engines are fascinating machines that pull trains across the vast and diverse landscape of India. There are different types of engines used over the years.

Steam Engines: Steam engines were the first type to be used in Indian railways. They run on steam generated by burning coal or wood. However, steam engines are no longer in regular use in Indian railways, except for heritage and tourist trains.

Diesel Engines: Diesel engines are widely used in Indian railways. They run on diesel fuel and are known for their efficiency and power. These engines are commonly used for freight trains and passenger trains on non-electrified routes.

Electric Engines: Electric engines are powered by electricity and are used on electrified railway lines. India has an extensive network of electrified routes, especially in densely populated and urban areas. Electric engines are known for their speed and eco-friendliness.

Types of Engines: Indian railway engines can be classified based on their purpose and design. Some common types include:

Goods Engines: These engines are designed to haul freight trains carrying goods and materials.

Passenger Engines: Passenger engines are built to pull trains carrying passengers. They are often faster and more comfortable than goods engines.

Shunting Engines: Shunting engines are used to move railway carriages within yards and depots, and help to assemble trains.





High-Speed Engines: These engines are designed for high-speed trains, which can travel at speeds of up to 160-200 km/h or more.

Uses of Railway Engines:

Hauling freight: Engines pull trains loaded with goods such as coal, grains, and industrial materials.

Transporting passengers: Engines pull passenger trains, making travel convenient and accessible to millions of people.

Economic growth: Railways play a crucial role in the economic development of India by facilitating trade and transportation of goods across the country.

Tourism: Heritage trains powered by steam engines attract tourists to experience the nostalgia of train travel.

Gauge	Power	Load	Class	Subtype
W	D	M	3	A
Service Gauge	Traction Used	Traffic Type	Power/Version	Arbitrary
W Broad Gauge Y Meter Gauge Z Narrow Gauge N Narrower Gauge (Z = 2' 6" N = 2')	D Diesel A AC Electric C DC Electric CA AC+DC Dual B Battery	P Passenger G Goods M Mixed S Shunter U DMU/MEMU	Power Rating Diesels (-WDM2x) Number x 1000hp Version Number Electrics+WDM2x	Incremental Power Rating (Diesels Only) Variants, Models Variations (All)

The most common words used currently are:

The first letter – The Gauge it Runs on - W means Broad Gauge track (1676 mm), Y represents Meter Gauge, Z is 2'6 Narrow Gauge, and N is 2 Narrow Gauge

The second letter – what fuel it uses - D denotes a Diesel and A denotes an AC loco running on 25 kV 50 Hz Alternating Current (AC)

The third letter – what it hauls - P means passenger, G means Goods, M means Multi or Mixed, and S denotes shunting

The Fourth Number – Version/Power - this number generally denotes the chronological order or the “serial” or “version” in which the locomotive was introduced.

Electric Vehicles Acronyms

Electric vehicles (EVs) are automobiles propelled by electric motors, powered by rechargeable batteries or fuel cells. They offer eco-friendly transportation, emitting zero tailpipe emissions, and reducing air pollution and dependency on fossil fuels. EVs are gaining popularity due to advancing technology, government incentives, and growing environmental consciousness, revolutionising the automotive industry. The parlance of this new technology can be head-spinning so here we will learn about a few acronyms used in the electric vehicle.

EV

Let's start with a simple one. EV means an electric vehicle, as opposed to one powered by petrol and diesel.



BEV

People in the car industry like to use this one. It stands for battery electric vehicle, but we just call them EVs.

ICE

Internal combustion engine vehicles have an engine powered by fossil fuel (petrol or diesel) in which the combustion of a fuel occurs with an oxidiser in a combustion chamber.

PHEV

Plug-in hybrid electric vehicle, or a hybrid with a bigger battery that you can plug in to charge, giving you a short, say 20-mile, electric-only range. Amazing tax-dodging mpg figures in the official tests, not so amazing in real life... unless you plug in every night and use the car exclusively for short trips.

MHEV

The mild hybrid EV is the very bottom rung of the electrified vehicle ladder. A small electric motor assists the engine but doesn't have enough gumption to push the car on its own. MHEVs usually manage a fuel saving of about 10 percent compared with a pure petrol car.

REX

REX Refers to range extenders or small internal combustion engines used as generators to recharge EV batteries on the move. The engine can be run at its

most efficient rpm, converting fuel to electricity, which is fed to the motors that supply the motive force.

Volts, amps, and watts

We're going to go full science teacher on you and use an analogy. Imagine a river: the volts are how the river flows, the amps are how much water is flowing, and the watts are how easily it will carry you downstream.

kW

Logical, metric countries use kilowatts to measure power from petrol and diesel engines. For the rest of us, a kilowatt is 1,000 watts and is the most common measure of power in an EV. A kilowatt is equal to about 1.34 bhp.

kWh

Stands for kilowatt hours and can cut two ways - how much power you've used (which a utility bill does), or how much capacity there is in a battery. For instance, a Tesla Model S has 100kWh of capacity, of which you'll be able to use about 90 because fully depleting a battery is a great way to ruin it forever.

AC and DC

AC stands for alternate current, and DC stands for direct current. ACs are better for long-distance transmission because they can easily be transformed (to a higher voltage, and lower current, so fewer heat losses). Transforming DC power is a faff but, because DC charging stations can be as big as they need to be, they can employ high-voltage power, giant transformers, and rectifiers and get huge power - up to 350kW.

Slow, fast, and rapid charging

Slow or level 1 charging is when you use a regular wall plug. Fast or level 2 refers to street chargers and the boxes you can install in your house or office, which go up to 7.4KW on normal 240V single-phase AC or 22kW on industrial three-phase. Rapid or level 3 is the high-power DC supply, the sort you'll find at motorway services and dedicated charging areas, from 50kW up to 360kW.

WLTP

Stands for Worldwide Harmonised Light Vehicle Test Procedure. A way to test new cars is to see how much





fuel, or energy, they use, how much greenhouse gas they expel, and how far they get on one tank/charge. More accurate than the old NEDC standard, but still optimistic.

Regen

Shorthand for regenerative braking. Electric motors work by using electricity and magnets to spin a shaft. So, if you were to spin it manually, say, by coasting, you will then generate electricity because generators are motors operating the opposite way.

Range

How far you'll get in your car from the amount of energy you put into it. So, it's been fuel from a tank for most of your life, now it's a battery.

Range anxiety

The fear of being very far from home, without enough power to make it to a charging station. In the short term, the solution is more rapid charge stations, in the long term, better energy density and more efficient cars should ease our furrowed brows.

Li-ion

A contraction of lithium-ion refers to the chemical makeup of a typical battery pack. The 12V brick used to start your petrol-powered car is a lead-acid battery, but lithium-ion is now the global norm for powering new EVs.

Solid-state battery

The next big step in battery tech holds more energy than an equivalent-sized lithium battery, or the same amount of energy but in a smaller and lighter pack. They're easier to cool, too, which means you can charge them quickly before they get too hot. At least five years until any come to market.

Supercapacitor

Supercapacitors can charge and discharge more quickly than regular batteries - good for bursts of speed - and cars tolerate more charge and discharge cycles, but they're still not as energy-dense as batteries, so you're unlikely to see them as direct battery replacements. More likely to supplement a petrol engine's performance.

FCEV

Fuel cell electric vehicles, like the Toyota Mirai. Separating hydrogen and oxygen takes a lot of energy, but reuniting them in just the right way releases energy. You can burn hydrogen, but in a hydrogen fuel cell, you generate electricity to drive an electric motor. It's also easier to move H₂ over long distances than electricity.

Places to visit in Tamil Nadu

The state of Tamil Nadu is located in the southern region of India. It is one of the most prominent tourist destinations in the country. The state is blessed with exceptional scenic beauty in the form of unblemished beaches, soaring high mountains, lush green forests, and much more. In addition, Tamil Nadu is also home to several famous tourist landmarks, notable historical sites, significant festivals, regional events, etc. If you wish to witness the rich cultural, historical, and natural glory of South India, then Tamil Nadu is a must-visit location.

Mudumalai

If you are a wildlife enthusiast? Or is it wilderness in general that attracts you? So, Mudumalai is the place for you to explore. It's one of the most visited tourist attractions in Tamil Nadu and it is known for its magnificent flora and fauna. Exciting wildlife sightings can also be on your cards as you may come across jackals, leopards, tigers and many more such exotic animals at the Mudumalai National Park. Even the Needle Rock Viewpoint and the Theppakadu Elephant Camp are worth visiting when you are here.



Dhanushkodi

If you want to know of one of the best places to visit in Tamil Nadu that is both serene, quiet, and spectacular, then Dhanushkodi is the name. It's a lovely beach town away from the urban crowd and even for some solitude. You should definitely visit the Dhanushkodi Beach, Kothandaraswamy Temple, Gulf of Mannar Marine National Park, and Shri Ram Sethu's Viewpoint when you are here.

Meghamalai

Megamalai or Meghamalai is a beautiful hill town in the Theni District of Tamil Nadu. It is one of the offbeat hill stations in South India, and among the top places to visit near Madurai. Popularly called Highways Mountains, Meghamalai is an unexplored paradise in the Western Ghats and very little known even to the people of Tamil Nadu. It is also known as 'Paccha Kumachi' meaning 'Green Peaks' in the local Tamil language. The town was called High Wavys during the British period. Later, locals call it Megamalai since the peak is always covered with clouds. If you are looking for a calm and tranquil weekend from the hustle-bustle of city life, Megamalai is one of the perfect places to visit in Tamil Nadu. With an elevation of 1500 m above sea level, Vellimalai forms the heart of the Meghamalai Mountain range. Silver-lined clouds gently resting on green hilltops are a common sight here. This region is also the abode of the river Vaigai.



Kalrayan Hills

Kalrayan Hills, also known as Kalvarayan Hills, is located in the Salem district of Tamil Nadu. The mountain is known for its beautiful scenery, rich biodiversity and cultural significance, making it a popular tourist destination in Tamil Nadu. The Hills is characterised by lush forests, rugged hills and beautiful scenery. The area has many waterfalls, streams and valleys that add to the natural beauty. Visitors can enjoy great views and enjoy activities such as trekking and hiking. Offering camping, rock climbing and rope climbing options, the mountain allows guests to participate in outdoor activities. Some of the famous waterfalls in the area are Agaya Gangai Waterfall, Pachaimalai Waterfall and Kollimalai Waterfall which are perfect places for relaxation. Kalrayan Hills is located 50 km from Salem Junction.

Pichavaram

Pichavaram Mangrove is a sprawling mangrove forest located between the prominent estuaries of the Vellar and Coleroon Rivers. Spanning over 1100 hectares, it features a labyrinth of waterways, making it one of the world's largest mangrove jungles. The area sustains diverse flora and fauna and provides vital ecological services. The boat convolves into this never-ending maze of mangroves, leaving you with remnants of amazement. It not only offers waterscape and backwater cruises but also another rare sight – the mangrove trees are permanently rooted in a few feet of water. The site hosts a natural hybrid species, *Rhizophora annamalayana*, which is derived from two species of *Rhizophora*: *R.apiculata* and another natural hybrid *R.mucronata*. The nearest railway station to Pichavaram is Chidambaram from where it is accessible by road.



Pollachi

If you are searching for cool places in summer in Tamil Nadu, then Pollachi should be on your wish list. One of the most offbeat tourist places, Pollachi is located down south in Coimbatore. The incredible natural beauty and the greenery of this location is worth all the praise. The beautiful lakes, the unending lines of the coconut trees, and lush greenery are everything that can make you feel relaxed and wonderful. The Pollachi Ayyappan Temple and Parambikulam Tiger Reserve are worth visiting.

While these are some of the best places to visit in Tamil Nadu with family, there are many more that you can visit with your loved ones. Each place has its worth, and visiting them gives you a chance to experience the best of Tamil Nadu. In the upcoming issues, we will come up with various other holiday destinations in other states across India.



Long Service awardees

*Left to right – S Gopu, Wg Cdr K Dhandapani, U Ganapathi, M Manikandan,
MN Baskaran, N Palanisamy, A Vaithiswaran, P Aravindan*



Performance Awardees

Standing – left to right – R Nethaji, P Aravindan, K Kumar, S Sethuraman, P Ramalingam, S Sathishkumar, S Manickaraja, E Venugopal, K Balasubramanian, S Vaithiyathan, K Rajasekar, S Sriraj, A Vaithiswaran, M Prasath, S Sapthagiri, N Manibalan, P Vijayakumar, B Namachivayam, S Gopu.

Sitting – left to right – J Srinivasan Rangan, D Jayaprakash, Wg Cdr K Dhandapani, D Balasubramanian, MN Baskaran, N Palanisamy, A Jaisankar, MK Sreedhar.

Group Annual Day Awards



Lifetime Achievement award: *RB Satish Kumar.*



Long service awardees: (L to R): *R Padmanabhan, N Krishnamoorthy, N Kumar, Vijay Sankar, M Raman and V Srinivas.*



Long service awardees: (L to R): N Sabaa Thanneermalai, N Seshadri, V Joseph Chelladurai, R Sathyanarayanan, V Srinivasan, N Kumar, Vijay Sankar, K Karnan, A Dinakaran, LR Madhava Krishnan, R Srinivasan, R Jeyaseelan, P L Alagappan and K Anandh.



Employees of the year: (L to R): Ramadevi Ravi, S Ganesh Kumar, Dr Krishna Kumar Rangachari, N Kumar, Vijay Sankar, T Sankar, G Sankara Subramanian, GVV Ramesh Babu and M Sathiyamoorthy.



Special Recognition Award: G Sankar, K Ramesh, L Kamalesh, V Ramesh, Dr Krishna Kumar Rangachari, N Kumar, Vijay Sankar, G Sankara Subramanian, P Manivannan, S Padmanabhan, S M Syed Imraan, A Daniel Jeyaseelan, M Aravinth and Chetan Prabhu.

The Sanmar Group Annual Safety Awards 2023





Special Recognition Award: (L to R): Lt. Col Kartik Datt, A Sarathy, KV Neelakantan, Dr Amarnath Ananthanarayanan, N Kumar, Vijay Sankar, R Ganesh, K Vijayakumar, S Sathish, N Rajinikanth and S Sathiya Karthi.





Special Recognition Award: (L to R): *Narayan Sethuramon, N Kumar, Vijay Sankar, Sriram V, B Mathialagan, Ramadevi Ravi and M Milton Asirvadham.*

Answers for spot the difference



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