

## A LETTER TO TEACHERS

Dear teachers,

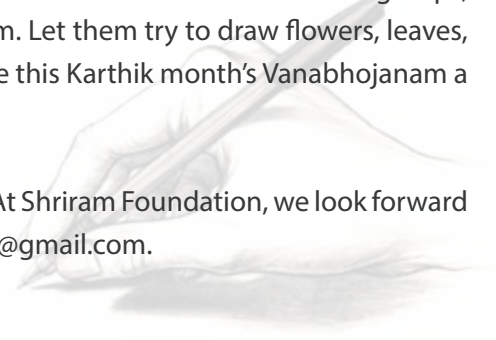
Greetings from Shriram Foundation!

As we all know, there is a lot to learn from Mother Nature. You can enrich the learning of the children in your charge by taking them for school picnics to gardens and fields. Besides playing games, singing songs and having fun, involve your students in cooking a picnic lunch, in serving and cleaning up. Have them walk around in small groups, taking notes about the kinds of plants and insects that they see around them. Let them try to draw flowers, leaves, butterflies by observing them. You too can join them in these activities. Make this Karthik month's Vanabhojanam a memorable outing for your students.

Write to us with photos about your school's special Vanabhojanam initiative. At Shriram Foundation, we look forward to hearing from you about your experiences. Write to us at [m100.shriramfdn@gmail.com](mailto:m100.shriramfdn@gmail.com).

Warm regards

Editor



## WISE WORDS

*Here are some proverbs, sayings and quotations from all over the world to inspire you. You may write or display them on your blackboards or notice boards, explain and discuss them with your students.*

**"Winning doesn't always mean being first. Winning means you're doing better than you've done before."**

**– Bonnie Blair**

**"Time is not measured by the passing of years but by what one does, what one feels, and what one achieves."**

**– Pandit Jawaharlal Nehru**

## TEACHER TIP

### How to help a Child overcome Shyness

Shyness should be treated as a personality trait, not a fault. Shy children must not be criticised. Instead, try to empathize with the child, and show that you understand how they feel, so that they do not feel ashamed. Building a child's confidence will go a long way in helping him or her overcome shyness. Encouraging them for their achievements and pointing out all their good qualities will help them build their identity and develop their individualism.

Put the children in pairs or in small groups and give them activities that require interaction. If the activity is enjoyable, the children in the group will quickly bond over them.

Encourage interaction between the children in small ways, such as telling a child to say hello to another child, or even to wave at another child. To go further, suggest to a child or a group of children to include another child in whatever game they are playing.

If you are asking a shy child to speak in class, or to answer a question, give them plenty of time to gather their thoughts, overcome their nervousness and speak up. Try and observe the children who are shy, and keep a daily record of their behaviour. That way you can measure the progress they have made.



**STORY OF THE MONTH**

**Elimination of Violence against Women**

The International Day for the Elimination of Violence Against Women falls on 25th November. It is a day that is dedicated to the spreading of awareness and elimination of violence against women. Women all over the world are subject to many different kinds of abuse and violence; physical, sexual, verbal and emotional, both in the domestic and public spheres.

The key to eliminating violence against women is to empower women and to eliminate gender inequality.

Here is an inspiring story of a woman who overcame violence done to her to lead a meaningful life. Dr Sunitha Krishnan has been a social worker almost her entire life, spending her childhood teaching dance to mentally challenged children. When she was twelve years old, she was violently attacked by a group of men. Despite the trauma she had suffered, she still had the strength to start an anti-trafficking organisation called Prajwala which works with the police and other law enforcement to combat exploitation, and also rescues and rehabilitates victims of exploitation. She is the first Indian to win the Nelson Mandela-Graca Machel Innovations Award.



**Classroom activity:**

What kinds of violence do women in India face? Call for a classroom discussion based on student’s understanding and experience.

Have students in High School look through newspapers for inspiring stories like that of Sunita Krishnan, and make a scrap book of these articles. The class can also do further research on the subject concerning the laws that are in place, how the police handle such cases, how society handles such situations and what kind of help victims of such crimes receive. At the end, there can be a class discussion on the situation in India, regarding the protection of women.

**DID YOU KNOW?**

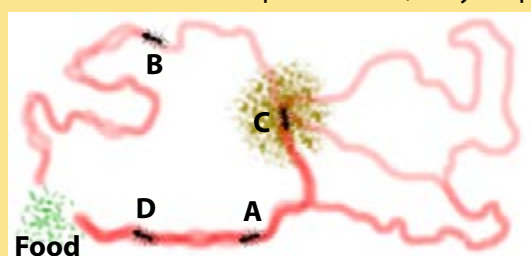
**How ants find food**

Have you ever wondered how an ant colony often marches in a straight line between their anthill and the food source? The answer lies in a clever use of pheromones.

“Pheromones is a chemical substance, produced and released by organisms such as ants, bees etc. to communicate with each other. They produce numerous different pheromones, each with its own different purpose.”

Now let us find out how they do it.

A scout ant, say A, first leaves the nest in search of food. It makes a random search, leaving a trail of pheromones, until it discovers a food source. It takes a chunk of food and returns to its nest following its own pheromone. On the way back to the nest, it guides its nest-mates by laying down more pheromone, creating a trail with an even stronger scent. When other ants encounter the trail of pheromone, they stop their own search and start following the trail. In the following picture, ant D discovers the double-strength trail left by ant A and starts to follow it. Ant C comes across the trail left by D and follows that trail, which will ultimately lead to A’s trail as well. If a pheromone trail leads an ant back to the nest without any food, it turns around and follows the trail in the opposite direction.



This will continue until the food is over. Some ants will still find the trail, but since the food at the end of the trail is depleted, none will head back to the nest while reinforcing the trail. The scent trail will decay quickly and eventually disappear.

As time passes, many paths between the nest and the food are explored, but since the scent on the shortest path is reinforced more than the rest, it quickly becomes the most common path. Soon all of the ants walk in a file along it.

**PUZZLE**

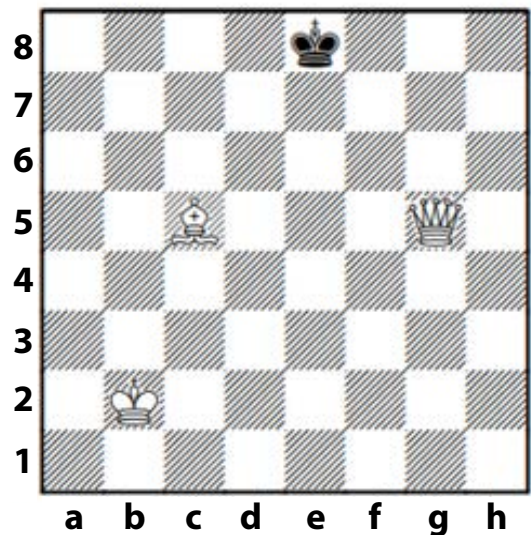
**Brain Teasers**

Math puzzles and brain teasers help students develop inductive and deductive thinking skills. Please share this puzzle with your upper primary students.

- Boys of a class are made to stand in a straight line. One boy who is 19th in order from both the ends is chosen as the class leader. How many boys are there in the class?
- You work at a fruit factory. There are 3 baskets in front of you. One basket contains only APPLES. One basket contains only ORANGES. The third basket contains both APPLES AND ORANGES. And each basket is labelled every day. One reads "apples", one reads "oranges", and one reads "apples and oranges".

One day the labelling machine doesn't work properly and has now labelled ALL boxes incorrectly. If you can only take out and look at just one of the pieces of fruit from just one of the baskets, which basket would you choose so that you can label all of them correctly?

- Here is a simple Chess puzzle. Can you checkmate in just one move? It is White's turn to play. (Tip: You can also use the position of boxes to introduce the concept of Coordinate Geometry.)

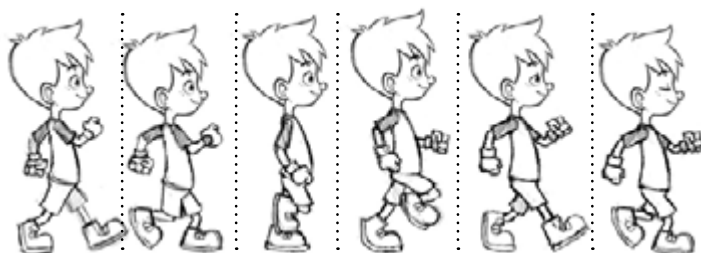


**CREATIVE CORNER**

**Flip Book**

Teaching your children about the art of animation is very simple and so much fun! With just a few simple supplies, you can create a small flip book and talk about the very basics of animation with them.

**Things needed:** Old unused notebook /A small stack of paper, Stapler, Glue/Cellotape, Sketch pen



- You can use any old notebook or bind your own stack of paper using glue, stapler, or cellotape.
- Now it is time to sit down and sketch out your vision. Here, for example, let us bring life to a simple DOT!
- Start on one side of the notebook. Draw a small dot on the right bottom of the paper.
- Draw another dot a little farther to the left on the next page and repeat the same by changing the position and size of the dot till the last page in any pattern.

- Once you are done, flip the pages of the book very fast starting with the first page. Watch your simple stop motion animation!

**IN THE NEWS**

**Innovative Indonesia**

*It is important for children to know what's happening in the world around them. You may think of conducting a "News Discussion time" in your classrooms once a week! To start with, you can use this small snippet!*

Reducing plastic waste has always been a hard nut to crack in every country. It is because plastic is cheap, durable and is found in almost every household item. An Indonesian-based start-up, Evoware, has come up with a biodegradable and edible solution to this environmental threat.

After exploring many options, the company settled on seaweed as their raw material. In addition to being completely compostable, it is also very sustainable. According to Evoware, as much as 40 tons of seaweed can be grown in an area the size of a baseball field. It also helps

reduce ocean acidity by absorbing harmful greenhouse gases like carbon dioxide. Evoware confirms the packaging contains no chemicals and is safe to consume. In addition to wrapping fast food items, it can also be used for household things like sachets of instant coffee. Consumers need to simply drop the entire packaging into the hot water. The odourless, tasteless, packet just melts away, leaving behind no trace of its existence.

These edible wrappers may not have any taste. However, the single-use cups, called Ello Jello, that can be used to serve cold drinks are available in four flavours — orange, lychee, peppermint, and green tea. And the best part is if



Ello Jello (Photo Credit: Evoware)

the customers do not like to consume the wrapper/cup, they can throw them away. The wrapper/cup will automatically disintegrate within 30 days!

\*Source: <https://www.dogonews.com/2017/10/8/evoware-hopes-to-reduce-plastic-waste-with-edible-seaweed-wrappers-and-ello-jello-cups>



Edible wrapping and pouches (Photo Credit: Evoware)

**THEME FOR THE MONTH**

**Children's Day**

On the occasion of Children's Day Let us celebrate the birthday of Pandit Jawaharlal Nehru and honour his memory. Jawaharlal Nehru was called Chacha Nehru by the children of India, due to the love they had for him, which he returned wholeheartedly.

Nehru wrote and had published a letter addressed to the children of the world and in it he conveyed how he saw and all that he felt about children.

"If you were with me, I would love to talk to you about this beautiful world of ours, about flowers, trees, birds, animals, stars, mountains, glaciers and all the other beautiful things that surround us in the world."

In his letter, Pandit Nehru tells the children to appreciate the world that they live in, and nature, unlike adults. "You must have read many fairy tales and stories of long ago. But the world itself is the greatest fairy tale and story of adventure that was ever written. Only we must have eyes to see and ears to hear and a mind that opens out to the life and beauty of the world." He goes on to write about how adults are too focused on building barriers, and dividing themselves, and as a result "live in prisons of their own making". Children, however, are different, and will not see these differences until they become older, and they learn about these boundaries from their elders.

To celebrate Children's Day in schools, the teachers often put up shows and performances for the students, like quizzes, comedy performances, dances, or plays, with the children sitting in the audience. The students could also partake in enjoyable activities with their teachers like art and craft, games and dance, purely for their amusement.



**THEME FOR THE MONTH****World Toilet Day**

World Toilet Day is celebrated on 19th November. The purpose behind World Toilet Day is to mobilise action to tackle the issue of sanitation.

Toilets are environmentally draining as they use a lot of water, and the waste is made into sewage and is useless as manure, as it contains harmful pathogens, and is harmful to the environment.

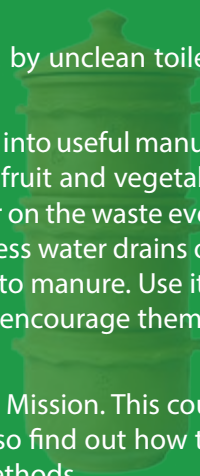
However, dry toilets provide the answer to this situation. A dry toilet's bowl has two chambers provided for solid and liquid waste. The liquid is diluted with water and becomes a nutrient for plants. Solid waste falls into a pit below, and is covered with a handful of sand from a bucket that is kept next to it. After six months, the toilet is closed, and another toilet is used. Two toilets can be built at a time, so one can be used while the other is closed. The toilet is left shut for six months, where the solid waste reduces in volume a great deal as it dries, and dry solid human waste is free of pathogens. Subsequently, after the six month period, the waste is harvested and used as manure.

**Activities:**

Observe World Toilet Day by talking about hygiene and sanitation, about diseases spread by unclean toilets, about sewage getting flushed into water bodies and contaminating them.

Start a simple composting pit in school to demonstrate how organic waste can be converted into useful manure. Install a large earthen vase in some corner of the school campus. Add dried leaves, sticks, fruit and vegetable peels, egg shells etc. into it every day. Do not add leftover cooked food. Sprinkle some water on the waste every day. Stir the mixture with a long stick every week. Keep the vase closed but ensure that excess water drains out through the porous pot. In about three to four months the organic waste will have turned to manure. Use it in the garden. This kind of activity would interest the students in nature and gardening, and encourage them to use their hands, and spend time outdoors.

Another activity that they could participate in is the Swachh Bharat Abhiyan or Clean India Mission. This could help cultivate a sense of social responsibility and environmental awareness. They could also find out how the waste is being disposed of, and do research on environmentally friendly waste-disposal methods.

**TEACHER ASSESSMENT JUNE 2017: High School Science Answer Key**

Given below are the answers for questions 5 - 9 of the High School science assessments. Each question is followed by an explanation of the answer.

**Q5. It is raining heavily. The wiper of the car was working.**

**It cleaned the car glass from outside. Yet, Kumar notices that the front glass and windows of the car becomes cloudy from inside. Why does this happen?**

**Here are a few answers he got from his friends and elders.**

1. When it rains the glass always gets cloudy from inside.
2. The temperature outside is more than the temperature on the inside.
3. The temperature outside is less than the temperature inside the car.
4. If we use air conditioners while driving in the rain, glass gets smoky from inside.

**Identify the choice that explains the correct reason.**

- a. 4    b. 2 and 4    c. 3    d. 1

**Answer :** The cloudiness on the glass is because of condensation.

When it rains, it is cooler outside than it is inside the vehicle. Therefore the water vapour around the vehicle tends to condense and settle on the glass. This gives a cloudy appearance. When the air conditioner is on, we reduce the temperature on the inside of the vehicle and prevent condensation from happening. Hence the correct choice is C.

**Q 6. Kumar's observation in the previous question is similar to which of the following?**

- a. Water evaporating from a tray left in a room for a few days.
- b. Clothes taking longer to dry on a cloudy day.
- c. Water condensing on the outside of a glass that contains cold water in it.
- d. Boiling water on a stove that produces vapour.

**Answer :** The correct choice is C.

Explanation same as previous question.

**Q7. A balloon is filled with helium gas. Which of the following instruments will you use to find the pressure of the gas?**

- a. Anemometer
- b. Barometer
- c. Odometer
- d. Spectrophotometer

**Answer:** Factual. The instrument used for measuring Pressure is Barometer.

B is the correct choice.

Anemometer: measuring wind speed

Odometer: for measuring distance travelled by a vehicle

Spectrophotometer: measures the amount of light reflected by any sample.

**Q8. Metals produce a ringing sound. Identify the term that represents this property.**

- a. Lustrous
- b. Ductile
- c. Sonorous
- d. Malleable

**Answer:** Choice is C.

Lustre: shine, Ductile: a metal can be drawn into thin wires

Malleable: a metal can be beaten into thin sheets

**Q9. The speed of a truck is 54 km/h while the speed of a moving car is 20 m/s. Arjun thinks it is the truck that is moving faster than the car. Is there an error in Arjun's comparison?**

- a. Yes. A truck cannot move faster than a car.
- b. Yes. The speed is in different units. We cannot compare them.
- c. Yes. A truck is bigger. So it moves slower.
- d. No. He is right. The speed of the truck is 54 but the car is 20.

**Answer:** Choice is B.

The units are different. To compare, the speed of both the vehicles has to be converted to the same unit.

54km/h is  $54\text{km}/3600 \text{ seconds} = 54000\text{m} / 3600 \text{ s} = 15\text{m} / \text{s}$

Or

$20 \text{ m} / \text{s} = 20 \times 1/1000 \text{ km} / \text{s} = 0.020 \text{ km} / \text{s} = 0.020 \text{ km} / 1 / 3600 \text{ hr} = 72\text{km} / \text{h}$

## QUIZ

## General Science

- 1) What is the biggest planet in our solar system?
- 2) What is the chemical symbol for the element oxygen?
- 3) Another name for tidal wave is a .....
- 4) What is the name of the long part that hangs from an elephants face?
- 5) True or false? DNA is the shortened term of 'Deoxyribonucleic acid'?
- 6) What is the name of the element with the chemical symbol 'He'?
- 7) What is the molten rock that erupts from a volcano called?
- 8) True or false? Curd is produced by bacterial fermentation of milk.
- 9) Is the compound 'HCl' an acid or base?
- 10) True or false? Dogs are herbivores.

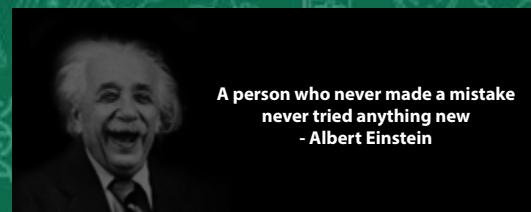
### ANSWERS

- |            |                                   |
|------------|-----------------------------------|
| 1. Jupiter | 7. Lava                           |
| 2. O       | 8. True                           |
| 3. Tsunami | 9. An acid<br>(Hydrochloric acid) |
| 4. A trunk | 10. False                         |
| 5. True    | (They are omnivores)              |
| 6. Helium  |                                   |

## ANSWERS

### PUZZLE - Brain Teasers

1. Number of boys in the class =  $(18 + 1 + 18) = 37$  boys
2. Take a piece of fruit from the "apples and oranges" basket. If it's an apple then you know that is the "apples" basket since ALL THE BASKETS ARE LABELLED INCORRECTLY. This means the basket marked "oranges" must have "apples and oranges" in it as it cannot contain "oranges". Hence, the basket marked "apples" can contain "oranges" only.
3. Move the white 'Queen' from G5 to E7.



Dear Science Teachers,

Welcome to the November edition of Science at School – the monthly magazine especially for you! In this edition, we bring to you a newly introduced Question Corner and much more!

## In the Classroom: Science through Experiments

How do you think reflection of light is related to the broadband internet connections we use? Find the answer through this fun and interesting experiment. You can demonstrate it in the classroom while you are teaching students about 'Light'!

You can begin with the question, "Is it possible to bend light?"

All you need for this experiment is, a plastic bottle with a small hole in the lid, water and a torch/laser light.

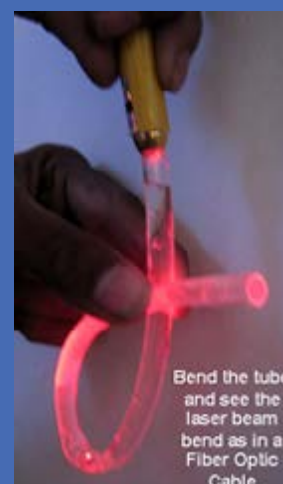
Fill water in the bottle and then tilt it such that you can see a curved water jet coming out of the hole. Shine light through the bottom of the bottle as shown in the picture. You can see a jet of light coming through the hole!

Another variation of this experiment can be done using a laser light, a plastic tube, cello tape and some water.

Seal one end of the plastic tube with cello-tape. Pour water through the other end and fill the tube. Now shine the laser light through the open end of the tube and you will see that light travels through the tube and a spot of light appears on the other side. What we observe here is called total internal reflection.

This simple experiment illustrates the principle behind fibre optics - the most used technology currently to transfer information across distances. Just as in our experiment, optical glass fibres are used by companies like BSNL and Airtel to carry data in a binary form.

\*Source: <http://www.arvindguptatoys.com/toys/fiberoptics.html>



## Science in the News: And this year's prize goes to....

What were the most important discoveries this year? What is that scientific work, which has helped us gain a better understanding of the world around us? With these questions in mind, the Nobel Prizes are awarded each year in various fields.

### Medicine:

This year's Nobel prize in Medicine is shared by 3 scientists from the USA, Jeffrey C. Hall, Michael Rosbash and Michael W. Young, for discovering how the circadian clocks work at the cellular level.

### Physics:

How did the universe come into existence? Is it possible to find more about it today, billions of years after the Earth came into being? Using very careful experiments and working with researchers across the world, three scientists from USA, Rainer Weiss, Barry C. Barish and Kip S. Thorne identified gravitational waves, which help us understand the history of the Universe. They share this year's Nobel Prize in Physics.

### Chemistry:

How much can you zoom into a live cell? It turns out that with the creation of the cryo-electron microscope (shown in the picture alongside), you can freeze molecules-in-action and look into them at the details of the atomic level! This discovery has been awarded the Nobel Prize in Chemistry and is shared by Jacques Dubochet (Switzerland), Joachim Frank (USA) and Richard Henderson (UK).



Curiosity is the fuel for discovery,  
inquiry and learning.



## Science Newsletter for teachers

### Discovery of the Month: Circadian Rhythm

Have you ever woken up early on a Sunday morning, just to realize that it's not a working day, so you can catch some more sleep? Ever wondered why you are tired, yet unable to sleep after watching a late-night movie? You would be surprised to know that the answer to these questions, lies in a set of your brain cells that act as the body's internal time-keeper. These cells are known to control the circadian rhythm – the body's sleep and wake cycle over 24 hours.



These body clocks do not have gears and hands like the ones in your watches, but instead proteins that regulate their own production. The 'battery' that controls this body clock is nothing but natural light. During daytime, this clock tells our body to be awake and alert, while in darkness, it signals tiredness and sleep.

While the 'master clock' is present in the brain region called the suprachiasmatic nucleus, it has been found that such internal clocks are there in almost every cell of the body. And more surprisingly, it's not just human beings but also micro-organisms, plants and other animals have their own versions of these 'clocks'.

The story of its discovery is a simple yet powerful one to remind us that science begins with curiosity and questioning. You must have all observed the mimosa plant (thottasinungi in Tamil and atti-patti in Telugu) closing its leaves in the evenings and opening them in the day. During the 18th century, the astronomer, Jean Jacques d'Ortous de Mairan noticed this and wondered what would happen if the plant was kept in complete darkness. He found that independent of sunlight, the leaves continued to follow their normal cycle of closing and opening. This led him to propose that the plants must have their own biological clock.

From this discovery, began a chain of events that led to the finding that most living beings have such 'clocks'. Scientists believe that these clocks must have evolved as a mechanism of energy conservation for the body.

So, once you have set a regular sleeping and waking time, you don't need that alarm anymore, your brain already has one!



**Classroom Activity:** Ask students to observe any of the plants/animals in their surroundings and write 5 questions which come to their mind.

### Special Feature: Curious questions, Simple answers

#### Why do people fall ill when the seasons change?

With the winter and rainy season setting in, we see that suddenly many people around us are catching a cold or a fever. We often think that we catch a cold if we go out in cold weather, which is actually not true.

Here are some of the reasons why cold weather makes us ill:

- **Viral infection:** The reason behind falling ill is an infection by a virus. This virus spreads more effectively in a cold and dry environment.
- **Mucus drying out:** The mucus in our nose acts like a security gate against diseases-causing germs. In winter, it dries out, giving the germs a free-pass into the body.
- **Staying indoors:** We tend to stay indoors during cold weather, hence we are in contact with more people, so the virus spreads easily.

So, stay healthy this winter by washing your hands often, getting enough sleep and exercise and spending time outdoors wearing warm clothes!

Why not start a question corner in your own class and send us your students' questions? Mail it to us at [m100.shriramfdn@gmail.com](mailto:m100.shriramfdn@gmail.com). We will feature your question and the answer in the next edition of Chalkboard.

