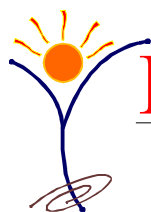


YOUNG SCIENTIST ACTIVITY BOOK

CLASS - IV

Sample Pages



EDUHEAL FOUNDATION
• LEARNING FOR LIFE •

DISCOVER • INVENT • EXPERIMENT • EXPLORE

CLASS - IV

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SYLLABUS GUIDELINES

CLASS - IV

Questions	Key concepts	Activities/ Processes
1. Family and Friends 1.1 RELATIONSHIPS <i>Your mother as a child</i> When your mother was your age who were the relatives she lived with? <i>Where do babies come from?</i> Have you seen a newborn baby - where did she come from? Where does the puppy/ kitten/ calf/ chick come from? Do you know of people who are looking after/ have adopted a child?	Change with time in people residing together. Family tree today. From the mother's body; mother-child relationship; Foster parents and adoption	Asking questions from mother about her childhood. Story telling and discussion.
My extended family Are there things you learn from your family members? What? Do you do anything different from other members of your family? Do all your family members live with you all the time? When do you meet members of your family who do not live with you? What festivals do you celebrate together?	Family as a microcosm; (Family values – gender, earning capacity, decision making, caste, religion perceptions etc.); changes in family value system – lead to changes in society; Festivals and family gatherings	Discussion on family values, habits within family; discussion on family occasions.
Feeling around with eyes shut With your eyes and ears closed can you identify the people/animals living with you merely by touching/smelling? By touching can you tell if anything is cold/hot, wet/ dry, smooth/ rough, sticky/slippery, soft/hard? Are there some things which you are not allowed to touch? Do you feel uncomfortable when some people touch you?	Sensitivity to people who are differently abled; Senses of smell and touch;; emotional response to a caress/slap; 'good' and 'bad' touch.	Guessing game: Group activity where children touch different things with their eyes shut.
1. 2 Work and play <i>Fun and fights at play!</i> Do you play the same games at school that you play at home? What things do you use to play with? Does the school provide these? Do you fight while you play? How do you decide the rules for the games? Does anyone stop you from playing? Who and why? Do you play with every child (boys and girls) in your neighbourhood? Are you stopped from playing with certain children?	Different games at home and school. Play as a way of social negotiation; rules of each game; fights and the need to negotiate – ideas of fair play. Restrictions on play; playmates from children of different gender or class/caste backgrounds.	Discussing and planning rules for local games and playing together in groups; writing them down.



How they learnt their skills In your area do you know the people who do the following: make pots/stitch clothes/ make shoes/cure people/ build bridges/ embroider/fly planes/ repair cycles/ drive buses, etc? How well do you know them – their names, family etc? What tools do they use for their work? Where did they learn how to do these things?	Different occupations in the local region/ country; who does what work. Gender and work.	Drawing people with their professional tools; talking to some people and describe how they learnt their skills
Fun at the fair/Circus Have you been to a fair or a circus? Which is the item you liked best – was it a ride, a game, something you saw/ate/bought? When do you fly kites? How do you make them fly?	Ways of recreation.	Kite-making and kiteflying activity in groups, making tops, writing a paragraph about an experience in a fair/circus.
1.3 Animals Animals and their friends Which animals like to move around in groups? Which animals are shy and do not come near you? Have you seen animals playing with or riding on different animals?	Herds; group behaviour; animal-human intreraction.	Observation of flowers and the insects that visit them, drawing the flowers, insects,; discussion on colour, fragrance.
Who is attracted to flowers? Why do bees/butterflies come to flowers? How do people collect the honey from bee hives?	Honey from flowers; bee hive and basic idea of honey collection.	Listing and classification of animals with and without ears; with and without hair; drawing them; feeling them.
Long ears or short? Which animals have ears? Which animals have hair on their body?	Some animals have external ears. They also have hair.	
1.4 PLANTS Roots of plants Do all plants need water to grow? Which part of the plant absorbs water from the soil? When you tug at grass, why does it not come out easily? Why do plants/trees not get uprooted when there is a strong wind? Which roots are eaten by people during famine when nothing else grows?	Plants need water; roots absorb water and hold it to the ground. Roots eaten normally by people like carrots, radish, sweet potato, and during famine. Aerial roots of some plants	Observation, collection, drawing of roots of different types, Observing trees/plants whose roots are affected by activities like construction/ paving/ plastering. Observation and discussion about swinging on <i>pipal/bargad</i> aerial roots.
Flowers Which plants around us have flowers? Do they come only at some times of the year? How is the bud different from the flower? What are the different kinds of flowers we have seen – shapes, colours, petals, aroma, etc? What do we use flowers for? Do you eat any flower? Have you seen flowers motif painted on clothes, walls, floors, pots, animals? Who sells flowers in our area? Where do these come from? How are flowers sold - for how much?	Flowering plants; seasons; obser- vation of buds blossoming into flow- ers; different shapes, colours, pet- als, aroma, etc.Flowers used in eve- ryday life, festivals, etc. Floral mo- tifs and designs on clothes, animals, pots, walls, etc. Knowing the local flower seller; some idea of the local unit of meas- urement (by cubit, fixed garland, each stem, etc.) and cost.	Drawing flower motifs for clothes, animals, pots, etc. Making floral decorations; Observing the flowers and buds, noting similarities and differences; observing /smelling and feeling different flowers.



Whom do trees belong to? Which plants/trees around you are looked after by people – by whom? Which are not? Whom do they belong to? Who eats the fruit of trees that grow wild?	Neighbourhood and its plants; wild and domestic plants; Fruits eaten by people living in forests. Cutting trees.	Listing of some common trees in the neighbourhood; discussion about ownership of trees; fruits that are not eaten by us.
2. FOOD How we get our food How does food reach us? Who grows it? How you seen vegetables and fruits growing? How you seen plants of rice/ wheat/ dal etc? What are the spices do you know? Which spices can we recognize by smelling or tasting.	From field to <i>mandi</i> - from market to house; grown by farmers; fruit trees, vegetables, cereals, pulses, oil seeds; Spices	Listing plants children know that provide them food; bringing samples; common spices, observing and drawing samples, recognizing them by smell and taste.
Special occasions When do many people eat together? What food is eaten? Who cooks it? How is it served? Does you get a mid day meal meal in school? - What items? Who provides the mid day meal?	Community eating; Mid day meal (where applicable). Cultural diversity in foods associated with special occasions like festivals, family celebrations/ ceremonies etc. Boarding school.	Discussion on occasions at which there is community eating; Listing of the different foods eaten at different occasions; drawing and descriptions of the large utensil used on such occasions
Tongue and Teeth How do we taste different foods? How do teeth help us to eat – are all teeth similar? Which teeth have I dropped and how are the new ones different?	Taste, tongue; teeth – types, milk teeth, permanent teeth. Tongue and speech.	Observation of each other's teeth, tongue and mouth; counting teeth; drawing; experiments with different tasting items.
Teeth, beaks and claws Are the teeth of other animals similar to ours? Can we tell what birds eat by looking at their beaks? Are the claws of birds also different? Is their shape related to the food they eat?	Teeth in some common animals; beaks and claws of birds – relationship with food they eat.	Observation and drawings of beaks, claws and teeth of different animals, birds, etc.
3. SHELTER Houses then and now Do you live in houses similar to ones your grandparents lived in ? Are houses now made of similar materials as was used then? What are the differences?	House change over time; rural and urban differences, multi-storeyed houses along with slums in cities. Materials used have changed.	Making models of houses; collection of materials used to make houses. Drawing pictures of old and new buildings.
Garbage? What do you do with waste in your house? Where do you throw it? Do you reuse any waste materials? Who takes away the garbage?	Waste materials, waste in our houses, urban/rural waste. Reduce garbage.	Listing things thrown away as garbage, waste. Discussion on reduction of waste.
Where animals live Do animals live in shelters? Which animals live in water? On land? Underground? Are there any animals that we see only at night? Where do they go during the day? Do we know of animals that make their own shelter?	Diversity in animal habitat and shelters. Some structures like webs have other purposes.	Discussion, listing of animals with respect to their habitat and shelter.; making birds nests with scrap materials, making caves, rat holes etc in mud/sand pits.



When birds make nests When and why do birds make their shelter? Do all birds make nests? Where do different birds nest - when do they fly away? With what different materials do birds make their nests?	Birds make nests for laying eggs. Nesting habits of different birds vary. Different materials are used for nests.	Discussion, listing of animals with respect to their habitat and shelter.; making birds nests with scrap materials, making caves, rat holes etc in mud/sand pits.
Mapping our neighbourhood Who are my neighbors? Do I have any of the following near my house – a school, grocery shop, market, well, river or pond? Where are they with respect to your house?	Introduction to the concept of giving directions with respect to any landmark; also a preliminary mapping process, further use of use of symbols, use of a scale.	Observation of a bird's nest and drawing pictures. Songs and poems; dance and movement to simulate bird flight.
4. WATER Water fit for drinking What are the major natural sources of water in your area? Is the water fit for drinking – do you clean it at home? Do you know how dirty water can make you ill? Why do we not drink seawater? How is salt separated from seawater?	Natural sources; inland water and sea water; potable water; diarrhoea and other common water borne diseases, safe handling of water, purification of water.	Discussion, enquiry from friends and counting number of steps and estimation of distance for making a preliminary map.
Water sources Where do you see large amounts of water in your neighborhood? Is it a tank/pond/canal/river/ dam? What do men/ women / children / animals do with the water there? Is it used for bathing/washing? Who bathes/washes there and who does not? How can we ensure that this water is not made dirty?	Reservoirs, canals, dams etc.; Different public activities at water bodies; protection of water bodies. Water as a scarce resource and the struggle for acquiring it (those who can exploit resources by digging deeper and deeper wells).	Discussion with the elders/health personnel about pollution of natural sources of water and its effects; demonstration/ group activity of simple methods of water purification; separation of salt from saline water.
Do you find factories/ people dumping garbage or harmful materials rivers or seas? Are some animals also facing problems due to what we do to the rivers or seas?	Rivers and seas; seasonal change in water flow; animals in the sea/river. Water pollution and harmful effects on animals.	Visit to the natural sources of water in the local area and observing what uses the water is put to. Discussion, and writing letters/making posters highlighting the misuse of the water body.
Our river/sea Which is the river closest to our locality? Do we find any change in the water flow in different seasons? Which are the big rivers we know of? Have you seen the sea? Which are the animals found in the sea/river?	Basic processes of evaporation and condensation	Drawing/Painting/Make a model of a water body in the neighbourhood (using scrap materials) as well as the animals found in the river/sea.
Water vanishes when heated? Why do puddles dry? In which season do wet clothes dry easily? When do they dry with difficulty? Have you seen and wondered where water droplets on the outside of a cold glass of water came from?	Use of animals for transport; sensitivity towards animals.	Activity on water drying up from a wet cloth or dish of water in different conditions such as sunlight and shade.



5. TRAVEL <i>Animals for transport</i> Have you traveled on a tonga / horse carriage? How is it different from travelling on a bus? Are the horses well looked after? Have you seen a horseshoe? Why is it used? What materials have you seen being transported using animals? Are there any special occasions when you ride on animals?	Use of animals for transport; sensitivity towards animals.	Enacting instances of animals used for transport and people riding them.
<i>Paying for travel</i> How do you pay for our travel by train/bus/boat etc? Who issues/checks the bus /rail ticket? Which currency notes and coins have you seen? Pictures of which animals can we see on a ten rupee note? Which symbol is found on every coin? How many scripts can you recognise on a note? Who is the person whose face is shown on every currency note? What coins/notes did our grandparents use when they were young?	Familiarity with currency notes and coins, national symbols, recognizing some language scripts; Introduction to Mahatma Gandhi Old coins, change.	Enactment of a bus journey. Comparison of coins and currency notes; /Tracing of coins. Designing a school emblem/logo.
<i>Travel to another place</i> Do you know anyone who has traveled very far from your village/city? Why did they go so far? What are they doing there? How do they travel when they visit your family?	Different land forms, languages, clothing, food habits, some idea of another country (only through a story/imaginary narrative).	Reading and listening, discussion, writing about a traveling experience of oneself or visiting relatives.
6. Things We Make And Do <i>Building materials and tools</i> How are bricks made? What tools have you seen being used for making a wall or a house? Is there a bridge to cross while coming to school? What kinds of bridges have we seen and where? How many kinds of bridges can we make?	Process of making involves raw materials, tools, labour, energy—changes over time in these and in environment too. Materials and tools used for construction; Different skills of people at engaged in a construction activity.	Making bricks; drawing and talking about different tools. Observing, drawing and describing different bridges and how people make their own local bridges from ropes, bamboo and logs of wood. Making toy bridges in school.

Honey Factory

How does the little busy bee
Improve each shining hour,
And gather honey all the day
From every opening flower!

Honeybees use nectar to make honey. Nectar is almost 80% water with some sugars. Bees get nectar from flowers. Nectar is the clear liquid that drops from the end of the flower when plucked..



They use their long, tubelike tongues like straws to suck the nectar out of the flowers and they store it in their "honey stomachs". Bees actually have two stomachs, their honey stomach which they use like a

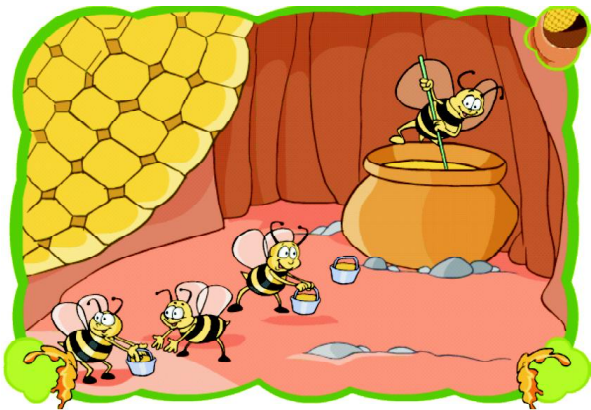
nectar backpack and their regular stomach. The honey stomach holds almost 70 mg of nectar and when full, it weighs almost as much as the bee does. Honeybees must visit between 100 and 1500 flowers in order to fill their honey stomachs.





The honeybees return to the hive and pass the nectar onto other worker bees. These bees suck the nectar from the honeybee's stomach through their mouths. These "house bees" "chew" the nectar for about half an hour. During this time, they break the large sugar in

the nectar into simple sugars so that it is both easily digestible for the bees and less likely to be attacked by bacteria while it is stored within the hive. The bees then spread the nectar throughout the honeycombs where water evaporates from it, making it a thicker syrup. The bees make the nectar dry



even faster by fanning it with their wings. Once the honey is enough, the bees seal off the cell of the honeycomb with a plug of wax. The honey is stored until it is eaten. In one year, a colony of bees eats between 54 and 95 kilograms of honey.

So, now you know that the sweet honey which we take is the result of long, tough labour of small honey bees.



Make Your Own Bird



- ☺ First draw an oval for the body and another smaller one for the head.
- ☺ Join the head and body together and add the beak, feet and tail. Remember to make the beak and feet according to what type of foods it will eat.
- ☺ Add the wing shape.
- ☺ Complete the bird by drawing a dark line around the bird, erasing extra lines and adding feather marking.
- ☺ Add colour to your bird and then draw an appropriate background.



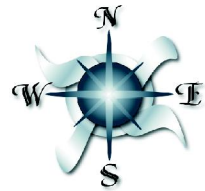
- ☺ A water bird can be drawn by drawing two ovals and leaving enough space to make a longer neck.
- ☺ Join the shapes and put in the beak, eye and tail.
- ☺ Next add the foot and wing.
- ☺ Finish as above.

Show Me The Direction

In order to know which way the wind is blowing, you'll need a compass. You might like to make your own.

You'll Need These Materials :

- A flat area where the sun shines directly (no shade)
- A straight stick
- Four heavy stones (about the size of tennis balls)
- A few smaller stones for marking



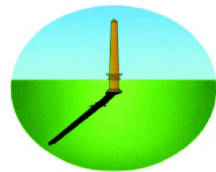
What To Do?

Locate a flat sunny space near your weather station. Begin by digging a hole about six inches deep. Bury the base of the stick. The stick should now be standing up to a height of about 30 cms.

The first thing you'll need to do is locate "North."

Before school in the morning, place a small marking stone at the end of the shadow cast by the stick.

After school, later in the afternoon, the shadow should be about the same length as it was in the morning, but in a different direction. Place a marking stone at the end of the afternoon shadow. Position your right foot on the morning stone and your left foot on the afternoon stone. Your body now faces south.



Another way to think of this is that the two shadows meet at the stick to form an "arrow" pointing south.

Once you have located "south," place one of the four heavy stones on the ground, about 30 cms in front of the stick. Place a second stone in the "north" position by tracing a straight line opposite away from south. Position "east" and "west" carefully opposite from each other. Be sure that they are equally distant from "north" and "south." You can use your compass to find wind direction and other weather data.



Jagadish Chandra Bose

Jagadish Chandra Bose was a great scientist whose work and inventions put India on the science map of the world.

Jagadish Chandra Bose was born on 30th November 1858, in West Bengal. Jagadish was a curious child. He would listen to the local farmers and fishermen and would ask lots of questions about the world around him. He also loved playing games and cricket was his favourite sport.



At the age of 9, Jagadish moved away to Kolkata to study. All the other boys in his school spoke English and Jagadish was teased. He was very lonely so he would spend his time studying frogs and fishes and watching how plants and flowers grow. He did well in his studies and his teachers liked him. Jagadish then went on to study physics at Calcutta University. He was still very interested in biology and botany, the study of plants. When he completed his degree he travelled to London to study further. He graduated in natural sciences at Cambridge University in 1884.

Jagadish believed that plants were alive and felt pain like any other living thing, but he didn't have any instrument to prove it.

He was very skilled in electricity so he invented his own instruments and did indeed prove that plants were living beings. The most amazing instrument he invented was the crescograph, used to measure the rate of growth of a plant.

Jagadish also knew that water is essential to plants. He discovered that the root of a plant absorbs water, even when the root is cut, the plant stem continues to take in water.

Jagadish found the answers to many questions concerning plants.



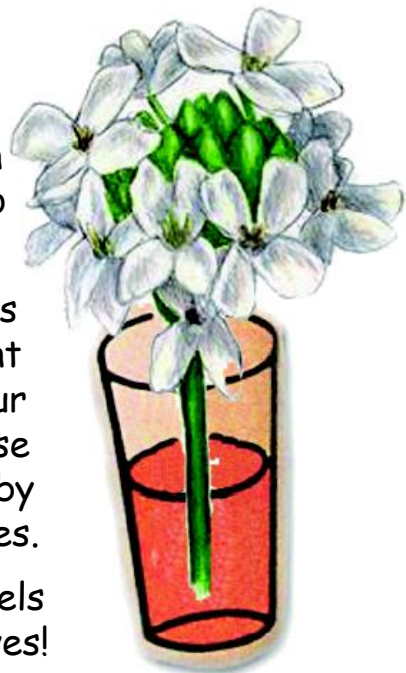
You Can Prove Mr. Bose Findings

All You Need Is

- ☺ A stalk of fresh white periwinkle with leaves
 - ☺ A knife
 - ☺ Coloured ink, paint powder or food colouring
 - ☺ A glass
1. Ask an adult to help you slice a bit from the end of the periwinkle stick with the knife.
 2. Fill your glass with about 2 cm of water and add a couple of drops of ink, paint powder or food colouring. Mix the water and stand your periwinkle stalk in the glass.
 3. Put the glass somewhere in warm and light, like a windowsill, and leave it for a day.
 4. After a day, take the periwinkle out of the glass and wash the end of it under a running tap. Lay the periwinkle on a table surface and ask an adult to help you slice the stalk into six pieces.

You'll notice that the periwinkle stalk has changed colour! Look at the pieces of plant you have sliced. Can you see dots of colour inside? These dots have appeared because the coloured water has been sucked up by the stalk and has travelled to the leaves.

You have just discovered how water travels through the stalk of a plant and to its leaves!



The Soap-Propelled Boat

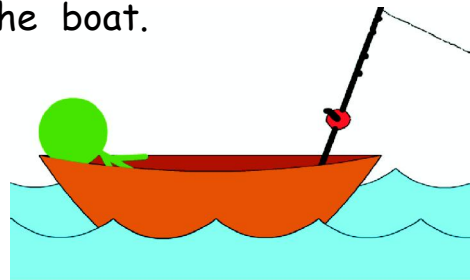
Have you ever gone for boating on a river like the Ganga, Brahmaputra or any lake nearby your home ? Have you ever imagined what makes the boat move on water ? An engine, an oar or a sail usually propels a boat. But here you are going to propel a boat with the help of soap. Let's see how:

What You'll Need:

- ☺ Card
- ☺ Scissors
- ☺ A dish full of water
- ☺ Liquid detergent

What To Do:

- ☺ Cut out a boat shape from the card.
(Make it about 6cm long and 4cm wide)
- ☺ Make a notch at the back of the boat.
- ☺ Place the boat gently on the water in the dish.
- ☺ Pour a little detergent into the notch in the end of the boat.



Your boat should zip across the water...Now pour little detergent in front of your boat. See what happens.

What's Happening?

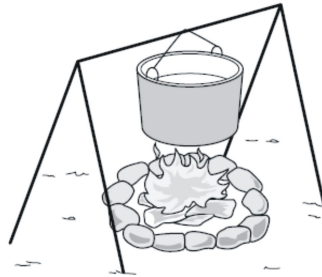
Water molecules are strongly attracted to each other and stick close together, especially on the surface. This creates a strong but flexible "skin" on the water's surface that we call surface tension. Adding soap disrupts the arrangement of the water molecules and breaks the skin, making the boat go forward.

Nationwide Interactive Science Olympiad, 2007

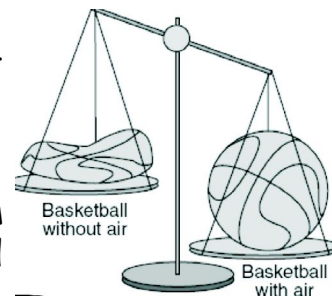
Sample Paper

SCIENCE

1. Which of these natural resources comes from plants?
(a) Steel (b) Aluminium
(c) Cement (d) Wood
2. What will happen to the water in the pot if left over the fire?



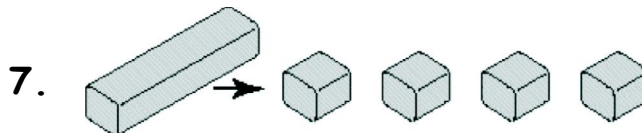
- (a) Water will turn into a solid
(b) The water will turn into a liquid
(c) The water will turn into ashes
(d) The water will turn into gas
3. What part of an apple tree becomes the fruit?
(a) The stems (b) The roots
(c) The leaves (d) The flower
4. The given picture best shows that air has -
(a) oxygen (b) moisture
(c) mass (d) energy



5. Leaves on some trees change colours from green to yellow and from orange to red during -
(a) Spring (b) Autumn (c) Summer (d) Winter



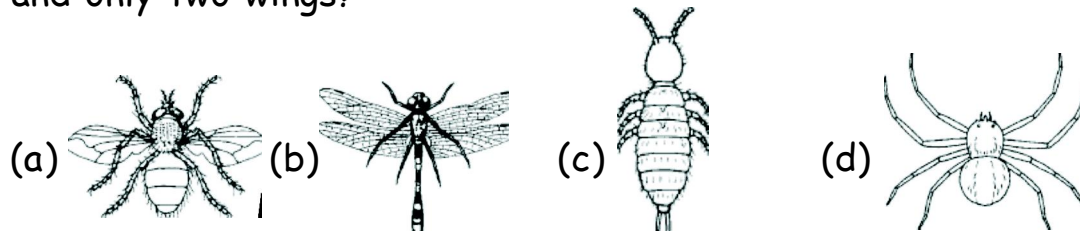
6. Which of these birds has the most triangular beak?



7. The picture shows a stick of clay. When the clay was cut into pieces, which of these was the only thing that changed?

- (a) Its softness (b) Its stickiness
(c) Its colour (d) Its shape

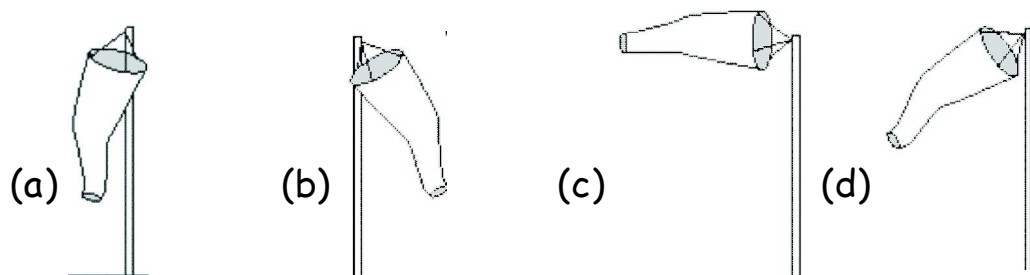
8. Which of these animals should be in a group that has six legs and only two wings?



9. Which of these is more important for plants than for animals in order to live?

- (a) A place to live (b) Sunlight
(c) Air (d) Water

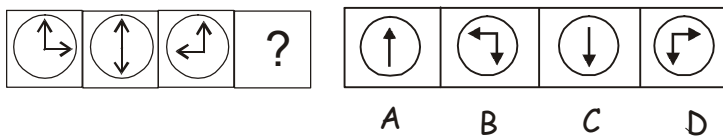
10. Which of these shows the fastest blowing wind?



MENTAL ABILITY

Direction (Question 11): In this question, a series is given with one term missing. Choose the correct alternative from the given ones that will complete the series.

11. Question Figures Answer Figures

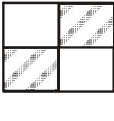


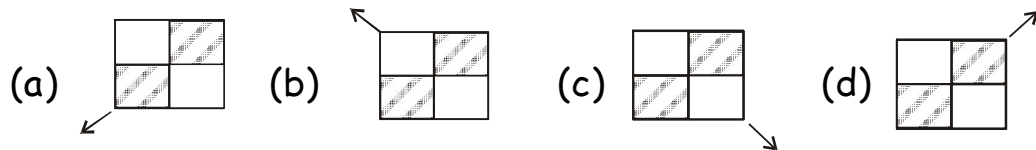
12. Mouse is related to cat in the same way as cat is related to?

- (a) Elephant (b) Horse (c) Dog (d) Rat

13. Find the odd one out.

- (a) Cone (b) Cylinder (c) Sphere (d) Rectangle

14. The image of a figure in water is seen as . What is the actual figure?



15. Which of the number has 5 in ten's place?

- (a) 256 (b) 255
(c) 207 (d) Both (a) and (b)

COMPUTER

16. CPU stands for

- (a) CD-run on memory (b) Call powers up
(c) Create programs user (d) Central processing unit



17. A place in the computer system where data and programs are temporarily stored
(a) Paste (b) Open (c) Memory (d) Pocket
18. A key that will erase information from the computer's memory and characters on the screen.
(a) Edit (b) Delete key (c) Dummy out (d) Trust key
19. The primary device that a computer uses to store information.
(a) TV (b) suitcase (c) desk (d) hard drive
20. 1024 bytes equals
(a) 1 Kilo byte (KB) (b) 1 Mega byte (MB)
(d) 1 Giga byte (d) 1 Character

Answer key :-

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (d) | 2. (d) | 3. (d) | 4. (c) | 5. (b) |
| 6. (a) | 7. (d) | 8. (a) | 9. (b) | 10. (c) |
| 11. (a) | 12. (c) | 13. (d) | 14. (d) | 15. (d) |
| 16. (d) | 17. (c) | 18. (b) | 19. (d) | 20. (a) |

