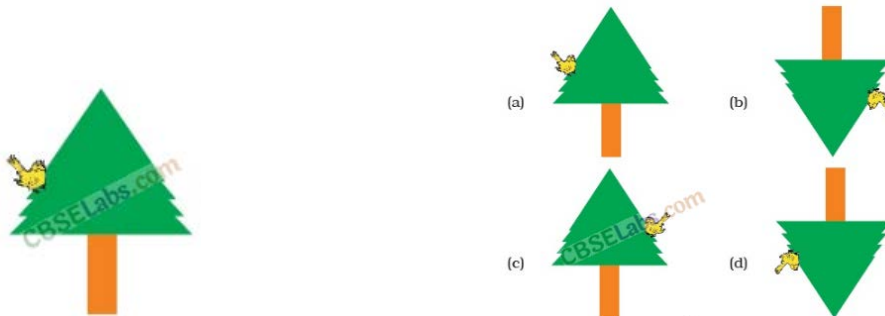


## CLASS VI SCIENCE

- Write adaption qualities and habitat of
  - Camel
  - Fish
  - Polar bear
  - Lion
  - Deer
- How does Dolphin breathe in water?
- Write the adaptation in aquatic plants due to which
  - submerged leaves can bend in the flowing water.
  - leaves can float on the surface of water.
- Explain different type of motions with proper example.
- Four children measure the length of a table which was about 2 m. Each of them used different ways to measure it.
  - Sam measured it with a half metre long thread.
  - with a 15 cm scale from her geometry box.
  - Reena measured it using her hand span.
  - Salim measured it using a 5 m long measuring tape.Which one of them would get the most accurate length? Give reason for your answer.
- A student observes a tree given in figure through a pinhole camera. Which of the diagrams given in figures (a) to (d), depicts the image seen by her correctly?



- A student had a ball, a screen and a torch in working condition. He tried to form a shadow of the ball on the screen by placing them at different positions. Sometimes the shadow was not obtained. Explain.
- A torch is not functioning, though contact points in the torch are in working condition. What can be the possible reasons for this? Mention any three.
- How the electricity was discovered?
- Draw the arrangement of torch with its switch.



## HOME WORK FOR WINTER BREAK

## CLASS VII

## SUBJECT SCIENCE

Curriculum Aligned Competency Based Test ItemsCASE I

Geeta measured the pulse rate of four students.  
The table below shows her findings.

	Pulse rate of the student (beats per minute)		
	1st Reading	2nd Reading	3rd Reading
Student 1	74	73	74
Student 2	80	78	79
Student 3	72	72	78
Student 4	72	71	72

**Q1.** Which student has the highest pulse rate?

- A. Student 1    B. Student 2    C. Student 3    D. Student 4

**Q2.** Why did Geeta measure the pulse rate of each student thrice?

**Q.3** Geeta made an error in one of the readings. Which one is it most likely to be?

- A. Student 1 reading 3                      B. Student 2 reading 1  
C. Student 3 reading 3                      D. Student 4 reading 2

CASE II

The table shows the heart rate of a student before and after different types of exercise.

	Number of heart beats per minute	
	Before exercise	Just after exercise
Exercise 1	92	135
Exercise 2	88	105
Exercise 3	90	155
Exercise 4	92	115

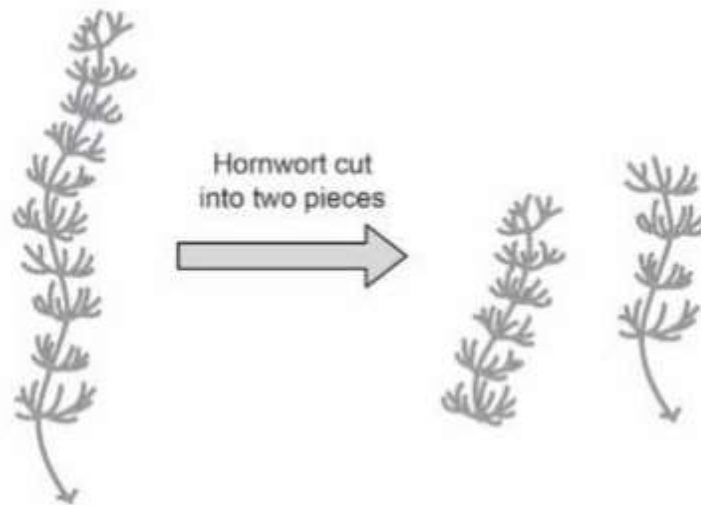
**Q1.** Which exercise resulted in the maximum change in heart rate?

- A. Exercise 1    B. Exercise 4    C. Exercise 2    D. Exercise 3

**Q2.** The normal heart rate for an adult human is 60-100 beats per minute. Why does the heart rate vary among individuals?

### CASE III

Shekhar cut the stem of a hornwort plant into two pieces.  
He placed both the pieces under water.  
After a week, Shekhar found both the pieces growing as new plants.



**Q1.** What can be concluded from the activity?

- A. Hornworts can survive only under water
- B. Hornworts can absorb nutrients through leafs.
- C. Hornworts bear spores that help it to reproduce.
- D. Hornworts can reproduce by vegetative propagation.

**Q2.** How can Shekhar confirm the result of his activity?

**Q3.** Which of these statements is true about the two new hornworts?

Circle 'Yes' or 'No' for the correct response.

Is this statement correct?	Yes or No
They are exact copies of each other.	Yes/No
They will grow differently than the original plant.	Yes/No
They will have a different life span than the original plant.	Yes/No

**Q4.** Which question will help answer if a plant reproduces sexually?

- A. Does the plant bear seeds in its fruit?
- B. Does the plant have buds on its leaf?
- C. Does the plant bear nodules on its root?
- D. Does the plant have nodes on its stem?

### CASE IV

The table shows the distance travelled by a car in half an hour.

TIME	0-10 min	10-20 min	20-30 min
DISTANCE TRAVELLED BY CAR	3 km	5km	10 km

**Q1.** Draw the distance-time graph to show how the car travelled.

**Q2.** What can be concluded about the car from the table?

- A. It stopped moving after 30 minutes.
- B. It had a uniform motion throughout the journey.
- C. It travelled with decreasing speed throughout the journey.
- D. It travelled at the highest speed between 10 and 20 minutes

**Q3.** What was the average speed of the car during its journey?

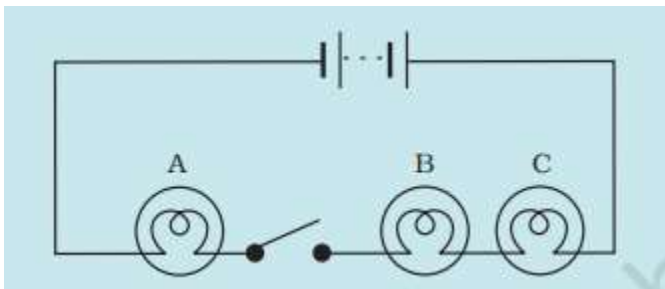
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**Q4.** Which of these labels on an electric device confirms standard quality?



**CASE V**

In the circuit shown in Figure



- (i) Would any of the bulb glow when the switch is in the 'OFF' position?
- (ii) What will be the order in which the bulbs A, B and C will glow when the switch is moved to the 'ON' position

## HOME WORK FOR WINTER BREAK

CLASS VIII

SUBJECT SCIENCE

**Curriculum Aligned Competency Based Test Items**

The table shows two groups of natural resources.

Wildlife Sanctuary	National Park
Protects certain specific species of animals	Protects all plants, animals, landscape and historical objects
Restricts killing and capturing of animals	Restricts all kinds of disturbances for animals, plants and historical objects
Visitors are allowed without permission	Visitors are allowed only after authorized permission
Found in all types of terrain	Found in all types of terrain

**Q1.** Radha visited a protected forest area where she can –

- Enter at her own will
- Can collect samples of herbs

Which type of protected forest area did Radha visit? Explain your answer.

**Q2.** Which of these statements is supported by the table?

- A. Mining is allowed in National Parks.
- B. Zoo is an example of a Wildlife Sanctuary.
- C. National Parks are larger than Wildlife Sanctuaries.
- D. Wildlife Sanctuaries are always found in river basins.

**Q3.** A tiger Reserve is a forest area where the tiger population is protected. Why did Indian government declare parts of many forests as Tiger Reserves?

- A. Tiger is a mammal.
- B. Tiger is our national animal.
- C. Tiger is an endangered species.
- D. Tiger is the top predator of forest ecosystems.

**Q4.** Which of these are the effects of deforestation? Circle 'Yes' or 'No' for the correct response.

Is this an effect of deforestation?	Yes or No
Decrease in the fertility of soil	Yes/No
Decrease in the occurrence of floods	Yes/No
Increase in the occurrence of droughts	Yes/No

**Q5.** Which of these books keeps a record of all the endangered animals and plants?

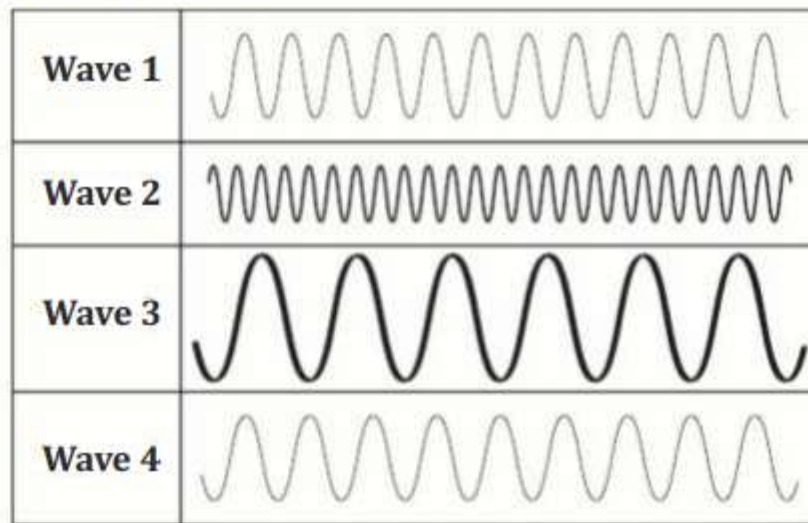
A. Red Data Book

B. Blue Data Boo

C. White Data Book

D. Green Data Book

The picture shows four sound waves.



**Q1.** Which sound wave has the highest pitch?

**Q2.** Which of these is true about the four sound waves? Circle 'Yes' or 'No' to mark your responses.

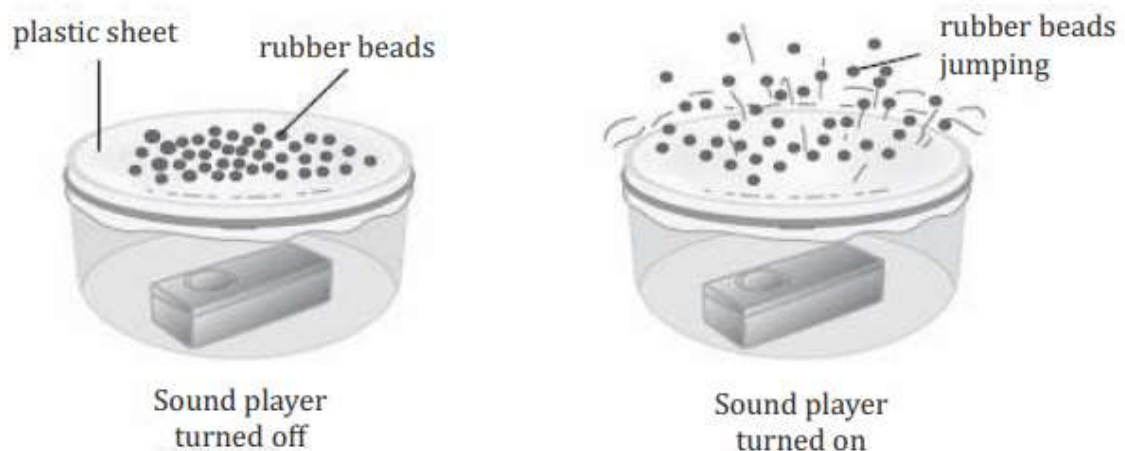
Is the statement true?	Yes or No
Wave 3 is the loudest.	Yes/No
Wave 1 and wave 4 have nearly the same loudness.	Yes/No
Wave 2 and wave 3 have the same loudness.	Yes/No

Raghav kept a mini sound player in each of two similar containers.

He then tightly covered both the containers with stretched plastic sheets.

He placed some tiny rubber beads on the surface of the sheets.

The picture shows what Raghav noticed when he turned on the sound player.



**Q1.** Which of these questions can be answered using the result of Raghav's activity ?

A. Does sound travel as waves?

B. Does sound produce vibration?

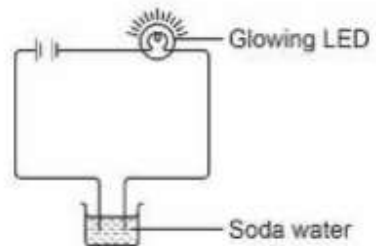
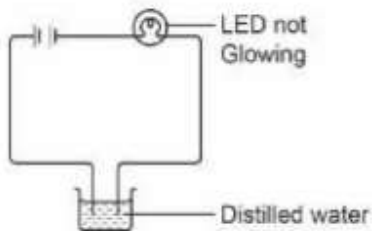
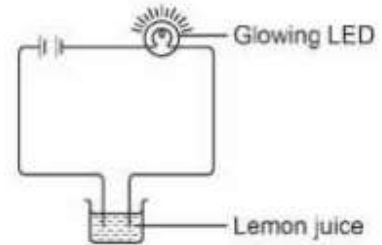
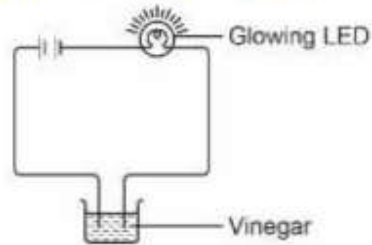
C. Does sound travel through vacuum?

D. Does sound travel faster in solids than in gases?

**Q2.** Would the result of Raghav's activity change if fewer beads had been used? Explain your answer.

**Rashmi made separate electric circuits with four different solutions.**

**The pictures show what she found.**



**Q1.** What can be concluded from her activity?

- A. LED glows only in solutions
- B. All four solutions are insulators of electricity
- C. All four solutions are good conductors of electricity
- D. Acids and bases are good conductors of electricity

**Q2.** Which safety precaution must Rashmi follow while doing this activity?

- A. Wear boots
- B. Wear goggles
- C. Wear headphones
- D. Wear rubber gloves

## KENDRIYA VIDYALAYA NO 4 ONGC VADODARA

### Class 9 Science

#### Chapter Work and energy

#### Competency based Questions

1. Compare the power at which each of the following is moving upwards against the force of gravity?

(I) a butterfly of mass 1.0 g that flies upward at a rate of 4 m/s.

(II) a 250 g squirrel climbing up on a tree at a rate of 4 m/s.

2. A boy is moving on a straight road against a frictional force of 5 N. After traveling a distance of 1.5 km he forgot the correct path at a round about of radius 100 m. However, he moves on the circular path for one and half cycle and then he moves forward up to 2.0 km. Calculate the work done by him.

3. A man X goes to the top of a building by a vertical spiral staircase. Another man Y of the same mass goes to the top of the same building by a slanting ladder. Which of the two does more work against gravity and why?

4. In a moving train a coin is thrown inside the train, what happens to the kinetic energy of the coin, does it depend on the speed of the train?

5. In loading a lorry, a porter lifts a carton of 150 N each through a height of 1.0 m.

(a) How much work does he do in lifting one carton?

(b) How much energy is transferred when one carton is lifted?

(c) If the porter lifts 5 cartons per minute, at what power he is working?

6. Ten girls of a dance troupe lift a 90 kg friend to a height of 1.5 m and hold it in an event.

(a) How much work done by them in lifting the friend? (b) How much work do they do in just holding her.

(c) Why do they get tired while holding her?

7. It is said that work is done upon an object whenever a force acts upon it and displaces it. For example if a plough is moved across a field, usually a bullock or a tractor supplies the force to do the work on the plough. Energy is acquired by the object upon which work is done and this energy is known as mechanical energy. This implies that mechanical energy is the energy possessed by an object due to its motion or due to its position. Mechanical energy can be either kinetic energy (energy of motion) or potential energy (stored energy of position). A moving ball, for example, possesses mechanical energy due to both its high speed and its vertical position above the ground. The total amount of mechanical energy is the sum of the potential energy and the kinetic energy. This sum is simply referred to as the total mechanical energy (TME)

Total Mechanical Energy = Potential Energy + Kinetic Energy

A form of potential energy is gravitational potential energy. There is a direct relation between the gravitational potential energy and the mass of an object. Objects with more mass have greater gravitational potential energy.

There is also a direct relation between gravitational potential energy and the height of the object. The greater the height, the greater is the gravitational potential energy. These relationships are expressed by the following equation.

Potential energy (gravitational) = mass  $\times$  g  $\times$  height

where m - mass of the object g - acceleration due to gravity h - height of the object

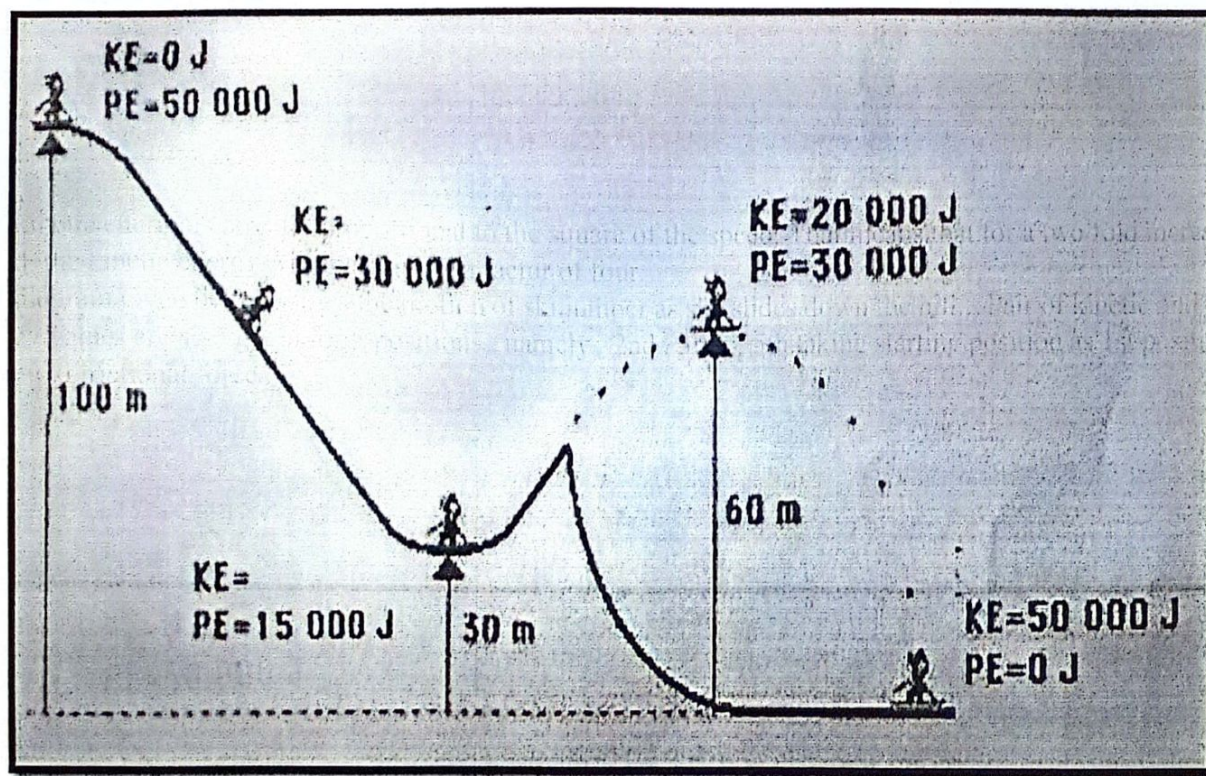
Since the gravitational potential energy is directly proportional to the height of the object, doubling of the height will result in the doubling of the gravitational potential energy. A tripling of the height, will result in tripling of the gravitational potential energy.

Kinetic energy is the energy of motion and depends upon two variables - mass (m) of the object and speed (v) of the object. The following equation is used to represent the kinetic energy of an object.

Kinetic energy =  $\frac{1}{2} mv^2$

The kinetic energy is directly proportional to the square of the speed. That means that for a two fold increase in speed, the kinetic energy will increase by a factor of four.

The diagram given below shows the motion of ski jumper as she slides down the hill... Pair of kinetic and potential energy values are also given for 5 positions, namely, 2nd, 3rd, 5th taking starting position as 1st position. assume 0 frictional force.



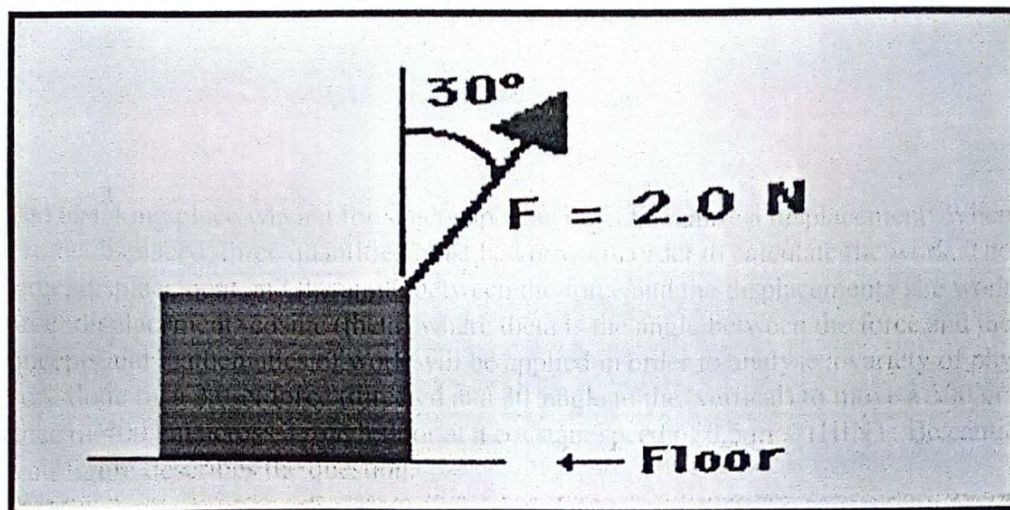
What would be the kinetic energy possessed by the ski player at position 2nd and 3<sup>rd</sup> respectively ?

- (A) 30,000 J, 35,000 J
- (B) 20000 J, 35000 J
- (C) 20,000 J, 15,000 J
- (D) 50,000 J, 0J

A cart is loaded with a brick and pulled at constant speed along inclined plane to a height of  $0.45 \text{ m}$ . If the mass of the loaded cart is  $3.0 \text{ kg}$ , the potential energy of the loaded cart will be (take  $g = 9.8 \text{ m/s}^2$ )

- (A) 13.53 J
- (B) 13.23 J
- (C) 13.93 J
- (D) 13.13 J

Work is described as taking place when a force acts upon an object to cause a displacement. When a force acts to cause an object to be displaced, three quantities must be known in order to calculate the work. Those three quantities are force, displacement and the angle between the force and the displacement. The work is subsequently calculated as  $\text{force} \times \text{displacement} \times \cos(\theta)$  where  $\theta$  is the angle between the force and the displacement vectors. The concepts and mathematics of work will be applied in order to analyse a variety of physical situations. Calculate the work done by a 2.0-N force (directed at a  $30^\circ$  angle to the vertical) to move a 500 gram box a horizontal distance of 400 cm across a rough floor at a constant speed of 0.5 m/s. (HINT: Be cautious with the units.) Following figure describes the question.



A tired squirrel of mass 1kg does push ups by applying a force to elevate it's centre of mass by 5cm as shown in the following figure. Estimate the number of push ups that a tired squirrel must do in order to do appropriately 5.0 J of work. Take  $g = 10 \text{ ms}^{-2}$

