

CLASS : IX (CBSE)

WORKSHEET-1

SUBJECT : PHYSICS

NAME OF THE STUDENT:

SEC:

ROLL NO.

DATE:

SOUND

I. ANSWER THE FOLLOWING QUESTIONS:

1. What is sound?
2. With the help of an activity show that vibrating objects produce sound.
3. How does sound propagate in a medium?
4. Why are sound waves called as mechanical wave?
5. Propagation of sound can be visualized as propagation of density variations or pressure variations in the medium. Comment.
6. Sound cannot travel through vacuum, demonstrate by an experiment.
7. With the help of an activity show that **SOUND WAVES ARE LONGITUDINAL WAVES**
8. Light is a transverse wave but it is not a mechanical wave. Why?
9. Differentiate between longitudinal and transverse wave.
10. How can we describe a sound wave?
11. Diagrammatically represent that Sound propagates as density or pressure variations
12. Show the sound wave in graphic form
13. A violin and a flute may both be played at the same time in an orchestra. Both sounds travel through the same medium, that is, air and arrive at our ear at the same time. Both sounds travel at the same speed irrespective of the source. But the sounds we receive are different. List the characteristics of sound which make them different from each other. On what factors do they depend.
14. How is a high pitched sound different from a low pitched sound. Support your answer graphically.
15. How is a louder sound different from a softer sound. Support your answer graphically
16. How can we distinguish one sound from another having the same pitch and loudness.
17. Differentiate between a tone and a note.
18. Differentiate between a musical sound and noise.
19. We sometimes use the terms “loudness” and “intensity” interchangeably, are they the same. Comment.
20. The sound of a thunder is heard a little later than the flash of light is seen.
21. On what factors does the speed of sound depend?
22. Write a short note on sonic boom.
23. With the help of an activity show that sound waves follow laws of reflection.
24. What is echo?
25. For hearing distinct echoes, what should be the minimum distance of the obstacle from the source of sound?
26. What is the cause of rolling of thunder?
27. What is reverberation? How is it reduced?
28. Give few uses of multiple reflection of sound.
29. Megaphones or loudhailers, horns, musical instruments such as trumpets and *shehanais*, send sound in a particular direction without spreading it in all directions How?
30. How does the sound of the patient’s heartbeat reaches the doctor’s ears in stethoscopes?

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WORKSHEET-2

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Match the column

Column A (Frequency)	Column B (Sound range they fall)
5 Hz	Audible range
25000 Hz	Infrasonic range
25 Hz	Ultrasonic range
250 Hz	
10 Hz	
120000 Hz	

Match the column

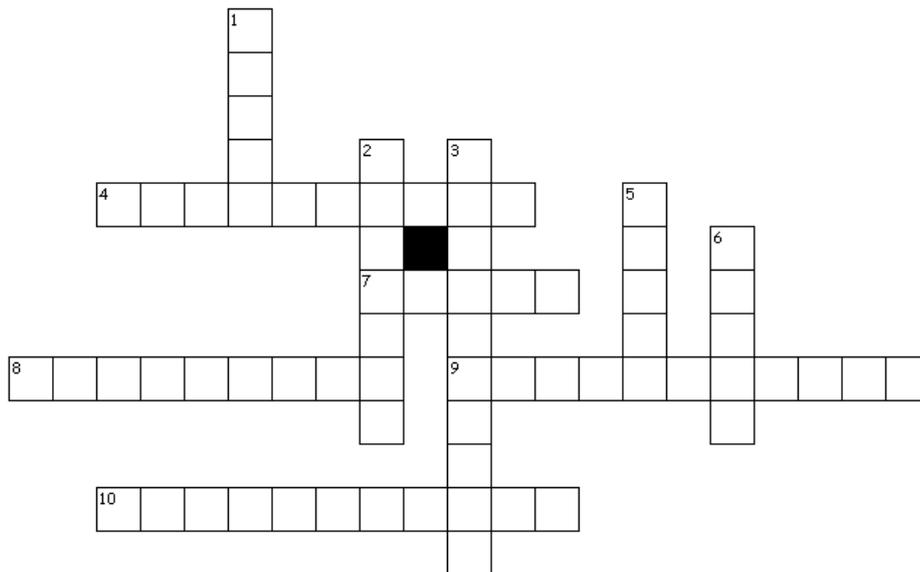
Column A	Column B
The maximum disturbance caused by the wave	wavelength
The distance travelled by a wave per second	frequency
The no of complete vibrations per sec	Velocity
The distance between one crest of wave and next one	Amplitude
When we change a feeble sound to loud sound, we increase its	Time period
When we change the pitch, what is getting changed	

II) Table type question

Sound velocity	Frequency	Wavelength	Time period	Audible/Ultrasonic/Infrasonic
330 m/s	550Hz	?	?	?
	500hz	68m	?	?
343.4m/s	?	1.7 cm	?	?

III) Fill in the blanks

1. Sound waves travel in vacuum
2. The speed of sound depends on And
3. The soft and porous materials are bad Of sound
4. The speed of the highly penetrating ultrasonic waves are those of audible sound waves
5. The sound are produced before the main shock wave of earth quake



Crossword Puzzle Across

4. It is used break kidney stones into fine grains
7. The unit of frequency
8. The loudness of the sound depends on this
9. Medical instrument used by the doctors for listening to heartbeats
10. It is the region of low pressure in longitudinal wave

Down

1. Apparatus used to find the depth of the sea
2. It converts sound wave frequency into electrical impulses
3. A vibrating simple pendulum produces this type of sound
5. It is the sensation of a frequency
6. Elevation in a transverse wave

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WORKSHEET-3

SUBJECT : PHYSICS

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1. The ceilings of concert halls, conference halls and cinema halls are curved. Why?
2. What is the audible range of sound for human beings?
3. We cannot hear the vibrations of a pendulum while the vibrations of the wings of a bee are audible to us. Why?
4. It is observed that some animals get disturbed before earthquakes. How?
5. How are moths able to escape capture?
6. How is infrasonic wave different from ultrasonic wave?
7. Discuss few applications of ultrasound in industries and medicine.
8. Ultrasounds are able to travel along well defined paths even in the presence of obstacles.
9. Ultrasound is generally used to clean parts located in hard-to-reach places. How?
10. Ultrasounds can be used to detect cracks and flaws in metal blocks. How?
11. Name the instrument which uses ultrasonic waves for getting images of internal organs of the human body. How does it function?
12. What is ultrasonography? Give its uses.
13. What is echocardiography?
14. What is SONAR. Name the three parameters which can be measured using it. How does the sonar work? What is this technique called and why?
15. How do bats search out prey and fly in dark night?
16. How do we hear?
17. Draw the well labeled diagram showing the internal structure of human ear.
18. Arrange the speed of sound in Steel, water and air in ascending order?
19. What is the relation between frequency and time period of the wave?
20. Sound waves are transverse waves. True or False?
21. Arrange the speed of these waves in air in descending order a) light b) Sound c) Supersonic aircraft?
22. What is an echo?
23. What are three characteristics of the sound?
24. What is the audible range of sound frequencies for human ear?
25. What is Reflection of sound?

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WORKSHEET-4

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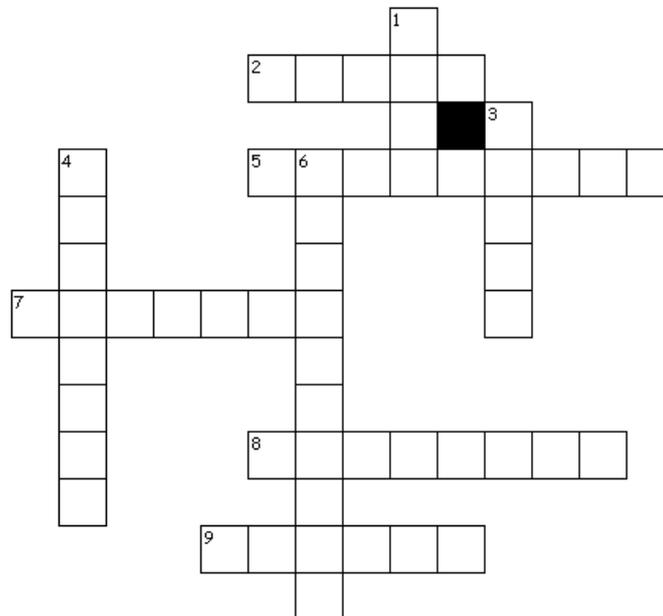
DATE:

WORK AND ENERGY

I. Fill in the blanks

1. 1 Kilo Watt hour of energy is equal to _____ Joule
2. Power is the rate of doing _____. And its unit is _____
3. Work done by the force can be _____ and _____.
4. The water stored in the reservoir of the tank possessed _____ energy
5. The total energy of the swinging pendulum remains _____ at all the points
6. When the body falls freely towards earth ,potential energy of the body _____while kinetic energy of the body_____. The total remains _____at all the point during the motion

II. Crossword Puzzle



Across

2. The scientist with whom unit of power is named
5. The kinetic energy of the body depends on mass and this quantity
7. The energy possessed by the car moving on the road
8. The Bigger unit of power
9. Work and power are these quantities

Down

1. The work done by the earth on the satellite moving in circular path
3. Solar water heater converts this energy into heat energy
4. The gravitation potential energy is present because of this
6. In hydroelectric power house, the potential energy of the water is finally transformed to this energy

III. Table type question

A body of mass 10 kg falls from the height 10 m towards the earth. Given $g=10\text{m/s}^2$

Height from earth(m)	10m	?	?	2m
Potential energy(J)	?	?	500J	?
Kinetic energy(J)	?	1000J	?	?
Mechanical energy (J)	?	?	?	?

IV) Match the column

Column A (Energy Conversion)	Column B (Converters)
Chemical energy into Mechanical energy	Electric Generator
Heat energy into Mechanical engine	Electric Motor
Mechanical energy into Electrical energy	Car engine
Electrical energy to Mechanical energy	Steam engine
Light energy into electrical energy	Electric bulb
Electrical energy into light energy	Solar Cell

V) Table type question

A force 10 N act on the body and body is displaced by 10 m. The angle between force and displacement are given below. Calculate the work done

Angle	30	45	60	90
Work done	?	?	?	?

VI) Choose the correct option:

- The unit of work is joule. The other physical quantity that has same unit is
 (a) power (b) velocity (c) energy (d) force
- The spring will have maximum potential energy when
 (a) it is pulled out (b) it is compressed
 (c) both (a) and (b) (d) neither (a) nor (b)
- The energy possessed by an oscillating pendulum of a clock is
 (a) kinetic energy (b) potential energy
 (c) restoring energy. (d) mechanical energy

4. The gravitational potential energy of an object is due to
 - (a) its mass
 - (b) its acceleration due to gravity
 - (c) its height above the earth's surface
 - (d) all of the above.
5. A ball is dropped from a height of 10 m.
 - (a) Its potential energy increases and kinetic energy decreases during the falls
 - (b) Its potential energy is equal to the kinetic energy during the fall.
 - (c) The potential energy decreases and the kinetic energy increases during the fall.
 - (d) The potential energy is 0 and kinetic energy is maximum while it is falling.
6. If the velocity of a body is doubled its kinetic energy
 - (a) gets doubled
 - (b) becomes half
 - (c) does not change
 - (d) becomes 4 times
7. How much time will be required to perform 520 J of work at the rate of 20 W?
 - (a) 24s
 - (b) 16s
 - (c) 20 s
 - (d) 26 s
8. A student carries a bag weighing 5 kg from the ground floor to his class on the first floor that is 2 m high. The work done by the boy is
 - (a) 1 J
 - (b) 10 J
 - (c) 100 J
 - (d) 1000 J
9. The work done is $\neq 0$ if
 - (a) The body shows displacement in the opposite direction of the force applied.
 - (b) The body shows displacement in the same direction as that of the force applied.
 - (c) The body shows a displacement in perpendicular direction to the force applied.
 - (d) The body moves obliquely to the direction of the force applied.
10. One unit of electrical energy is equal to
 - (a) $3.6 \times 10^5 \text{J}$
 - (b) $3.6 \times 10^6 \text{J}$
 - (c) $36 \times 10^5 \text{J}$
 - (d) both (b) and (c)

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WORKSHEET-5

SUBJECT : PHYSICS

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WORK AND ENERGY

I. ANSWER THE FOLLOWING QUESTIONS:

1. What do you understand by transformation of energy? Explain with the help of suitable example?
2. List two essential conditions for work to be done.
3. Define energy.
4. Define work. Write an expression of work in terms of force and displacement. State SI unit of work done.
5. Compare the kinetic energies of two objects of masses 10kg and 50kg respectively but having same momentum.
6. What is a work done on a body moving in a circular path?
7. Identify the state the type of energy transformation in the following cases:
 - a. Riding a bicycle
 - b. Burning of cracker
8. Define potential energy. Write an expression for potential energy. Write the SI unit of potential energy.
9. What is work done by the force of gravity on a satellite moving round the earth? Justify the answer?
10. Define kinetic energy. Write an expression for kinetic energy. Write the SI unit of kinetic energy.
11. What is unit of energy?
12. The total energy when a body falls freely towards earth remains constant. True or false.
13. What do you mean by kinetic energy of the body?
14. If the mass of the body is doubled and velocity is made halved, the kinetic energy will become?
15. Potential energy is a vector quantity True or false.
16. When the force acts at right angle to the direction of motion, what is the work done by the force?
17. What is Power?
18. What is Law of conservation of energy?
19. Define 1 Watt of power. A lamp consumes 1000J of electrical energy in 10s. Calculate its power.
20. Name the two types of mechanical energy. Give two examples when an object possesses both types of energies.
21. Name the two types of mechanical energy. Give two examples when an object possesses both types of energies.
22. Calculate the amount of work required to stop a car of 1000kg moving with a speed of 72km/h?

HOT QUESTIONS.

1. Does the gravitational potential energy of a body depend on the path along which the body is moved, while going from one point to another? Illustrate your answer with the help of suitable example?
2. An object thrown at a certain angle to the ground moves in a curved path and falls back to the ground. The initial and the final points of the path of the object lie on the same horizontal line? What is the work done by the force of gravity on the object?
3. State the kind of energy transformation that takes place in the following devices:
 - a. Solar battery
 - b. Electric motor
 - c. Microphone
 - d. Thermal power plant
 - e. Hydroelectric power plant
4. Can a body have energy without momentum? Explain?
5. Can a body have momentum without having energy? Explain?
6. Calculate the kinetic energy of a car of mass 750kg moving with a velocity of 54km/. Find the new kinetic energy of a car if passenger of mass 50kg sit in the car?
7. Establish a relationship between momentum and kinetic energy of a body?
8. An electric bulb of 100 W is used for 8 h per day. Calculate the 'units' of energy consumed in one day by the bulb?
9. Find the energy possessed by an object of mass 10 kg when it is at a height of 2 m above the ground. Given, $g = 10 \text{ m/s}^2$
10. An engineer is asked to design a playground slide such that the speed a child reaches at the bottom does not exceed 4.0 m/s. Determine the maximum height that the slide can be.?Given, $g = 9.8 \text{ m/s}^2$.
11. A rocket is moving up with a velocity v . If the velocity of this rocket is suddenly tripled, what will be the ratio of two kinetic energies?
12. A force of 10 N displaces a body by a distance of 3 m at an angle 60° to its own direction. Find the amount of work done.