

TOPIC: Work and Energy

Pre-Content/content Post-Content	Learning outcomes/Objectives	
	General	Specific
Pre-Content Work, energy and law of conservation of mechanical energy. Content Kinetic energy, potential energy, conservation of mechanical energy, power, commercial unit of energy. Post Content Numerical on kinetic energy, potential energy, power and commercial unit of energy.	Students will be able to: -comprehend the different forms of energy. -comprehend the meaning of potential energy. -understand that energy gets converted from one form to another. -apply the concept of power to understand the electricity bill.	Students will be able to: -understand the concept of kinetic energy. -express kinetic energy mathematically. -analyse the concept of potential energy. -list examples showing conversion of potential to kinetic energy -express potential energy mathematically. -solve numerical on the formulae of kinetic energy and potential energy. -State law of conservation of mechanical energy. -comprehend the meaning of power. -express power mathematically. -solve numerical on the formula of power. - identify Kilowatt hour as the commercial unit of energy. - co-relate S.I. unit of energy with the commercial unit of energy.

Home Work /Assignments can be given on the concepts of work and energy.

NCERT questions discussed in the class and also given as home task.

AND PROGRESS

Teacher's Activity	Student's Activity	Teacher's observation and Remedial
Teacher will ask students to analyse the dependence of kinetic energy on speed of an object. <u>Annexure 11(A)</u> demonstrate an activity to show that kinetic energy is directly proportional to the mass of the object discuss various examples of potential energy stored in an object and how it gets converted to kinetic energy. discuss the concept of conservation of mechanical energy and situations where this law can be applied. explain and express Power mathematically discuss the need and importance of commercial unit of energy. Encourage the students to express 1 Joule in terms of kilowatt-hour. provide students with the challenging numerical problems and conceptual problems from the NCERT book and worksheets.	Students will: analyse and identify that the relation between kinetic energy and speed is direct but not linear. <u>Annexure 11(a)</u> perform the activity and record the observations analyse the situations involving objects possessing potential energy. comprehend the statement of law and apply the law to analyse the given situations. comprehend the definition and the formula of power and solve numerical problems based on it. co-relate their electricity bills with the amount of energy consumed by electrical appliances at their home. find the relation between Joule and Kilowatt-hour. solve the questions by applying concepts and formulae.	

Teaching Aids: NCERT, Internet access, Worksheets.

Methodology/Innovative: Discussion, situation based interaction.

Interdisciplinary Links: Mathematics and English.

HOD

Coordinator

Vice-Principal

Principal

Annexure 11 A, (a) – 4. Which ball has more kinetic energy?

Subject	Science
Class	IX
Chapter/Unit	Chapter -11, Work and Energy
Topic	Kinetic energy
Time	20 Minutes
Nature of Activity	Pair work

What will I learn (Learning Outcome)?

To verify that kinetic energy is directly proportional to the mass of an object

Skills: Analyzing and Creating

What I have to do?

To demonstrate an activity to show that a massive/heavier ball has more kinetic energy and hence covers more distance while moving.

What do I require?

Two balls of same size- plastic and heavier ball , inclined surface , measuring tape.

What do I need to know?

The kinetic energy is possessed by virtue of the motion. kinetic energy is (i) directly proportional to the mass of the object and (ii) proportional to the square of the speed of the object.

➤ **Teacher's Activity**

Teacher will :

1. discuss the definition of kinetic energy.
2. will explain the steps of the activity.
3. make pairs and ensure that each participant in pair performs the activity .

How will I proceed?

➤ **Students activity**

1. An inclined surface and a support is arranged.
2. The plastic ball is kept on top of the inclined surface and allowed to roll down.
3. The distance covered by the plastic ball is measured using measuring tape
4. Then, a heavier ball is put on top of the inclined surface and is allowed to roll down.
Again, the distance is measured.

What have I observed?

S. No	Type of ball	Distance covered
1.	Plastic	
2.	Heavier	

What have I learnt?

- 1.Theball travelled more distance.
2. More the mass of the object.....the kinetic energy.

What am I curious to learn?

- If two balls of same masses are taken and made to slide down the inclined plane with different speeds, would the distance covered be different? Is there a relation between kinetic energy and speed of the object?

Let me evaluate myself

Q.1. What do you understand by kinetic energy?

Q.2. Explain how mass of an object affects the amount of kinetic energy .

Q.3. Give five instances when a body possesses only kinetic energy.

Q.4. When the ball starts rolling down the inclined plane, does it have only kinetic energy? Justify your answer by giving reason.

Q.5. Can we convert kinetic energy to potential energy? Give an example to support your answer.
