

Force, Work and Energy

The Achiever's Sheet

Think and answer: -

1. Explain the difference between work and force using examples from everyday activities. How does the application of force result in work being done?
2. Imagine you are pushing a heavy box across the floor. Describe how the force you apply changes the box's position and does work. Include details about the direction of force and the movement of the box.
3. Discuss the concept of energy transfer when a ball is thrown into the air. Explain how the force applied to the ball results in kinetic energy and potential energy at different points in its flight.
4. Suppose you are lifting a backpack onto a table. Explain how you use energy to do work against gravity. Describe the changes in potential energy of the backpack as you lift it.
5. Compare and contrast kinetic energy and potential energy. Provide examples of each type of energy and explain how they relate to different types of movement and position.
6. Discuss the role of friction in relation to work and energy. How does friction affect the amount of force needed to move an object, and what happens to the energy involved?
7. Imagine you are riding a bicycle uphill. Describe how your muscles apply force to the pedals and how this force is converted into mechanical energy to move the bicycle against gravity.
8. Explain the concept of mechanical advantage in simple machines like levers or pulleys. How does using a lever or pulley change the amount of force needed to do work?

9. Discuss the conservation of energy principle in relation to a pendulum swinging. Explain how potential energy converts to kinetic energy and back again during each swing.

10. Suppose you are compressing a spring-loaded toy. Describe how the force applied to compress the spring stores potential energy. Explain what happens when the spring is released.

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