

**Identifying Energy Transformations***Use with textbook pages 202-205.*

Place a number on the diagram to indicate where an energy transfer or transformation is occurring. In the table below, list the type of energy that is being produced and the energy transformation steps that occurred. One example is completed for you.

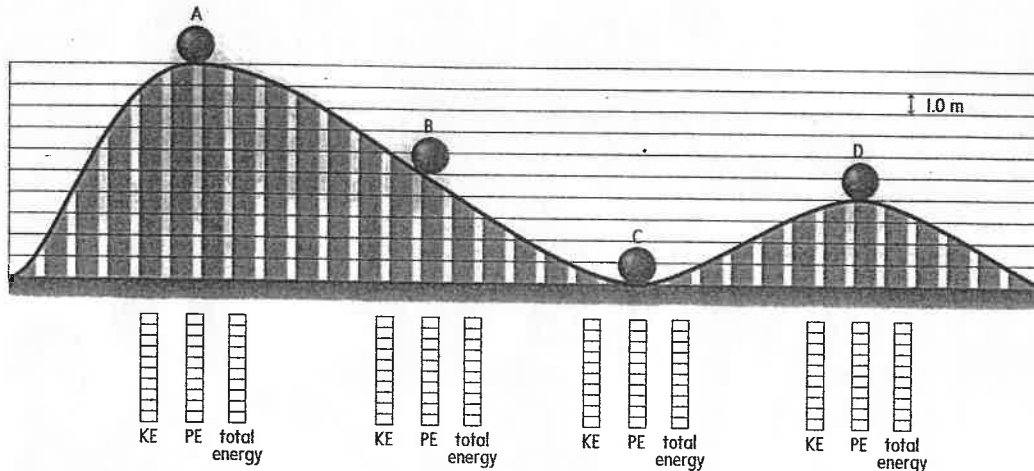
Description of Object	Energy Transfers or Transformations
An MP3 player is producing sound	electrical kinetic → mechanical kinetic → sound
A ball is thrown	
A lamp is giving off light	
Children are playing	
Hot food is sitting on a table	
A dog is barking	
Ice cubes are melting	
A TV is on	
A wood-burning fireplace is warming a room	
The Sun is shining	

## Modelling Conservation of Energy

Use with textbook pages 209-214.

A 1.0 kg ball is released from rest at point A on a frictionless track, as shown on the diagram below.

- Shade the bar graphs below each labelled point to indicate the kinetic energy, potential energy, and total energy of the ball. Each square in the bar graphs represents 10 J of energy.



- Explain what is happening to the energy in the system as the ball moves between each point.

a) From A to B

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b) From B to C

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c) From C to D

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- How would the graphs differ if there was friction between the ball and track?

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## Displacement and Velocity Worksheet

Show all work as you solve the following problems.

1. Calculate the total displacement of a mouse walking along a ruler, if it begins at the location  $x = 5\text{cm}$ , and then does the following:
  - It walks to  $x = 12\text{cm}$
  - It then walks a displacement of  $-8\text{cm}$
  - Lastly, it walks to the location  $x = 7\text{cm}$
2. Find the average velocity (in  $\text{m/s}$ ) of a bicyclist that starts 150 meters north of town and is 1200 meters north of town after 30.0 minutes.
3. Explain what is wrong with the following statement: A man walked at an average velocity of  $5.2\text{m/s}$ .
4. A school bus takes 0.53 hours to reach the school from your house. If the average speed of the bus is  $19\text{km/h}$ , what is the displacement of the bus during the trip?
5. A girl participating in cross-country spends the afternoon practicing, and ends the practice completely tired from her hard work, despite the fact that her average velocity during the practice was  $0.0\text{m/s}$ . Explain how this situation is possible. ✓
6. A hiker is at the bottom of a canyon facing the canyon wall closest to her. She is 280.5 meters from the wall and the sound of her voice travels at  $340\text{ m/s}$  at that location. How long after she shouts will she hear her echo? (Be careful to consider why echoes happen.)

