InterActions Unit 2 Cycle 2 Sample Quiz KEY

REMEMBER exams are given for the last cycle in a unit. They are comprehensive. So practice taking the Unit 2 Cycle 1 quiz again along with this practice exam.

1. When the motion energy of an object is decreasing, the object is

    a. speeding up

    b. not moving

    c. slowing down

    d. moving at constant speed

    The motion energy of an object increases when the speed of the object increases and decreases when the speed of the object decreases. To answer this test question you need to understand how the motion energy of an object is related to the speed of the object.

2. Which type of interaction increases the thermal energy of the interacting objects?

    a. applied

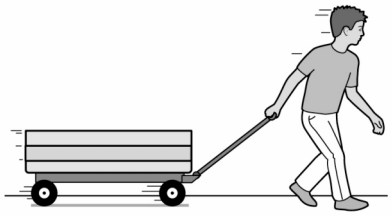
    b. friction

    c. elastic

    d. mechanical wave

    During a friction interaction between two objects, both objects increase their thermal energy. To answer this question you need to know what happens to the energy in a friction interaction.

3. A boy pulls a wagon at constant speed. The interaction between the boy and the wagon is



   a. a drag interaction.

   b. a friction interaction.

   c. an elastic interaction.

   d. an applied interaction.

   To answer this question you need to understand the different types of mechanical interactions, particularly what an applied interaction is. Use the Scientists' Consensus sheets to review interaction types.

4. A boy pulls a wagon at constant speed. The motion energy of the wagon

   a. increases.

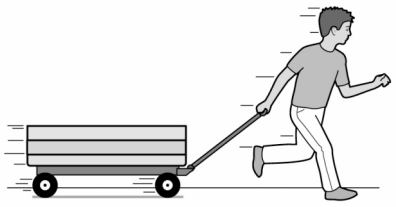
   b. decreases.

   c. doesn't change.

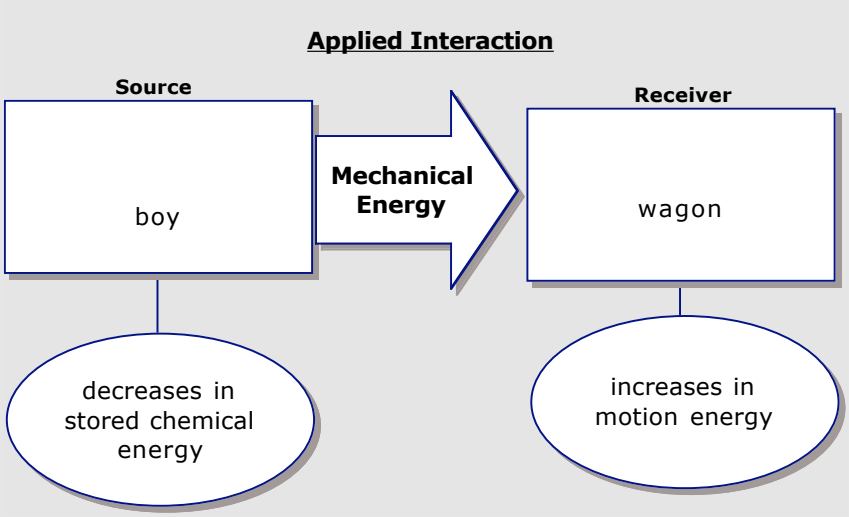
   d. There is not enough information to answer the question.

   The motion energy doesn't change because the speed of the wagon is not changing. To answer this question you need to know the relationship between speed and motion energy.

5. Now the boy speeds up as he pulls the wagon. Fill out the energy diagram for the wagon as it is pulled faster and faster by the boy.



The answer to this is listed below



To answer this question you need to know how to describe an applied interaction with an energy diagram. See the Scientists' Consensus sheets on mechanical interactions for assistance.

6. A marble is dropped in shampoo. During this drag interaction

   a. the marble speeds up and the shampoo slows down.

   b. the shampoo speeds up and the marble slows down.

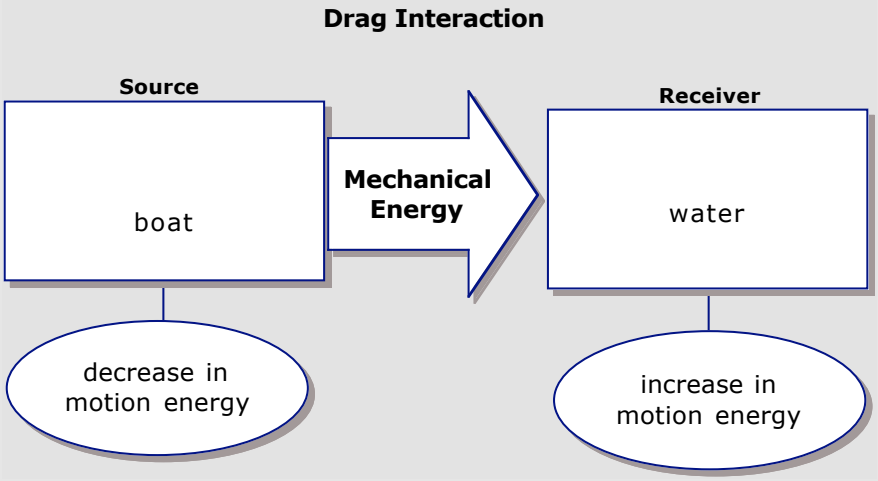
   c. both the marble and the shampoo slow down.

   d. both the marble and the shampoo speed up

To answer this question you need to know what happens during a drag interaction. See the Scientists' Consensus sheet on Mechanical Interactions for assistance.

7. A boat slows down in the water. Fill out the energy diagram of the situation

The answer to this is listed below



To answer this question you need to be able to describe the drag interaction between an object and water using an energy description. See the Scientists' Consensus sheet on Mechanical Interactions for assistance.

8. If the frequency of a primary earthquake wave increases then

   a. the earthquake has more energy and could transfer more energy to the surface causing more damage to buildings.

   b. .the earthquake has less energy and could transfer less energy to the surface causing less damage to buildings.

   c. the earthquake has the same energy and the affects when it reaches the surface would not change.

   d. it will be more likely for the earthquake to transfer its energy below Earth's surface.

The frequency of a wave increases the energy increases. An earthquake wave with more energy could then transfer more energy to the buildings on the surface causing more damage to them. To answer this question you need to understand the relationship between energy and frequency.

9. Two identical guitar strings are plucked. Both vibrate with the same frequency and wavelength. One string has an amplitude of 2 mm, the other has an amplitude of 3 mm. Which statement is true.

    a. The waves have the same energy.

    b. The smaller amplitude has less energy.

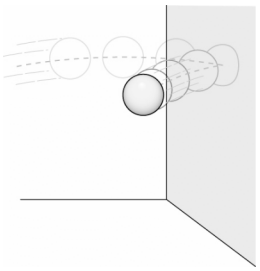
    c. The smaller amplitude has more energy.

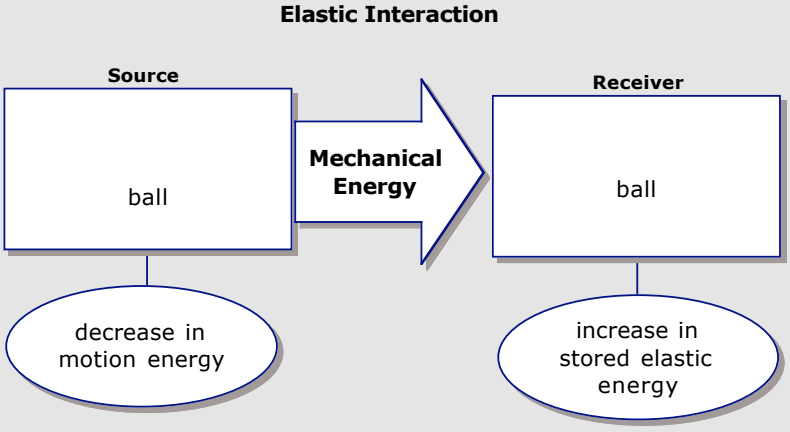
    d. The smaller amplitude has greater pitch.

    e. The larger amplitude has greater pitch.

    The energy increases as the amplitude increases. Answers d and e are incorrect because the pitch of a wave is related to the frequency of the wave, and the frequency of both waves is the same. To answer this question you need to know the relationship between energy and amplitude.

10. A ball is thrown at a wall and bounces off. As the ball first reaches the wall it slows down, momentarily stops, and then speeds up in the opposite direction as it leaves the wall. Fill out the energy diagram describing the interaction between the ball and the wall as the ball is slowing down. Explain why the ball slows down.

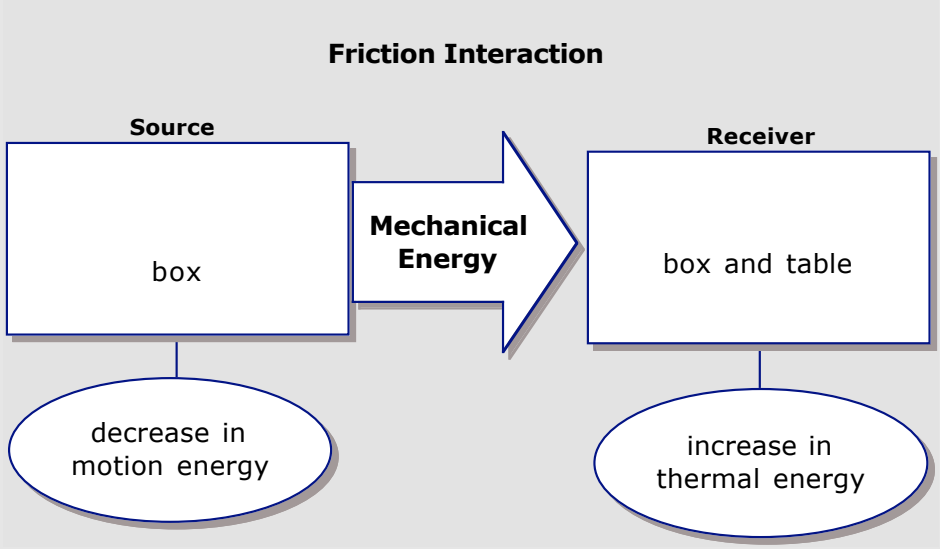




The ball decreases in motion energy as it first interacts with the wall because it transfers mechanical energy to increasing its stored elastic energy. (Note, there is also some sound energy produced when the ball hits the wall)

To answer this test question you need to be able to describe an elastic interaction using an energy diagram and explain it. See the Scientists' Consensus sheet on Mechanical Interactions for assistance.

11. Naguib slides a box of chocolates across the table to Gertrude. The box of chocolates slows down and comes to rest just in front of Gertrude. Fill out the energy diagram below describing the interaction between the box and the table. Analyze and explain why the box slows down.



The box slows down because it transfers mechanical energy to the table and the box increasing their thermal energy during this friction interaction.

To answer this test question you need to be able to describe a friction interaction using energy diagrams and explain it. Use the Scientists' Consensus sheets on Mechanical Interactions for assistance.