InterActions Unit 3 Chapter 1 Sample Quiz

Use your Scientists' Consensus Ideas sheets for assistance.

1. A wagon is being pulled in a straight line. The forces exerted on the wagon are balanced. The wagon

    a. speeds up.

    b. slows down.

    c. moves with a constant speed.

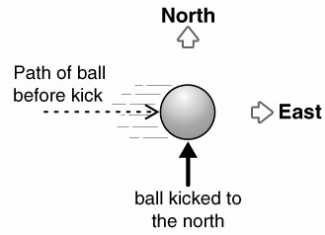
2. A wagon is being pulled in a straight line. The forces exerted on the wagon are unbalanced in the direction opposite to its motion. The wagon

    a. speeds up.

    b. slows down.

    c. moves with a constant speed.

3. A ball is rolling to the east. It is given a quick kick to the north. After the kick the ball



    a. keeps rolling to the east.

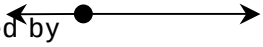
    b. rolls only to the north

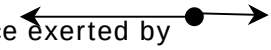
    c. keeps rolling but changes its direction.

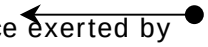
    d. there is not enough information to say how the ball moves.

4. Kevin pushes a large box across the floor. He pushes the box with a constant force and the box moves with a constant speed. Which force diagram best describes the situation.

   a. force exerted by Kevin on box  force exerted by floor on box

   b. force exerted by Kevin on box  force exerted by floor on box

   c. force exerted by Kevin on box  force exerted by floor on box

   d. force exerted by Kevin on box 

5. You push a box on a smooth, smooth ice rink. Imagine the ice is frictionless. While you push

   a. force is transferred to the box.

   b. energy is transferred to the box.

   c. force and energy are transferred to the box.

   d. neither force nor energy are transferred to the box.

6. You push a box on a smooth, smooth ice rink. Imagine the ice is frictionless. Which statement is true

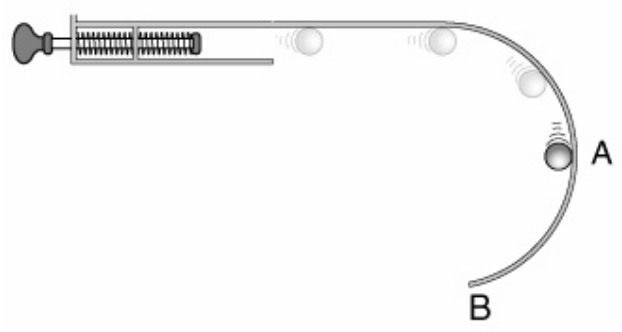
    a. The box speeds up.

    b. The box moves at a constant speed.

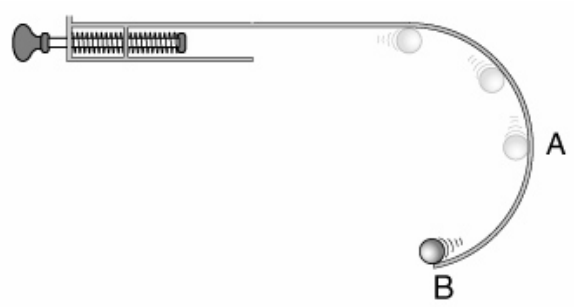
    c. The box slows down.

    d. There is not enough information to say.

7. Michael launches a marble in his marble launcher. The launcher pushes the marble to the circular wall. The marble is in contact with the wall while moving. Draw and label the force(s) exerted on the marble when it reaches point A. Don't forget to label your force arrows.



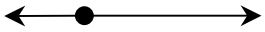
8. Draw the path the marble takes when it reaches the end of the wall at point B.



9. There is a quarter on a table. Allison quickly pushes the quarter. The quarter speeds up while Allison is pushing it.

Below is an analysis and explanation of why the quarter sped up while Allison pushed it. Read the analysis and explanation and then evaluate it.

Analysis: There is an applied interaction between the quarter and Allison, and a friction interaction between the quarter and the table.



force exerted by Allison on quarter — force exerted by table on quarter

Explanation: There is an applied force exerted by Allison on the quarter and a friction force exerted by the table on the quarter. The applied force by Allison on the quarter is greater than the friction force from the table on the quarter. Since the forces on the quarter are not balanced in the direction of motion, the quarter speeds up in the direction of the unbalanced force, in other words the direction that Allison pushes it.

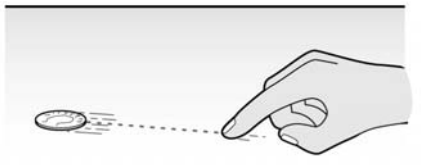
Evaluate the analysis and explanation of why the quarter starts to speed up. If the analysis and/or explanation are poor, make them good.

I. Are the interacting objects and their interaction types are correctly identified? If not, correct it.

II. Does the force diagram correctly show the forces exerted on the object? If not, correct it.

III. Does the written explanation includes all the appropriate scientific ideas; none of the important ones are missing? If not, correct it.

10. Allison pushed a quarter. It slid across the table top toward Robert. The quarter slowed down and eventually stopped very close to Robert.



Explain why the quarter slowed down as it moved toward Robert.

11. Two identical low friction cars are filled with different amounts of wood. Car A has a much greater mass than car B. Both cars are given the same initial push. Which car slows down faster?

    a. Car B slows down faster because it has less mass.

    b. Car B slows down faster because it has more mass.

    c. Car B slows down at the same rate as Car A since they were given the same initial push.

    d. Car A slows down faster because it has more mass.

    e. Car A slows down faster because it has less mass.

12. Imagine two identical low friction cars. One car has a larger constant force exerted on it than the other. Which car speeds up more quickly?

a. Car A speeds up more quickly because it has a smaller force exerted on it.

b. Car A speeds up more quickly because it has a larger force exerted on it.

c. Car A and B speed up at the same rate because they both the same mass.

d. Car B speeds up more quickly because it has a smaller force exerted on it.

e. Car B speeds up more quickly because it has a larger force exerted on it.