Name Date Class

SECTION 3 Reinforcement

Newton's Third Law

Directions: *Complete the table by naming the action and reaction forces in the following examples.*

Example	Action force	Reaction force
1. A flying bird		
2. Two bumper cars collide		
3. Holding your hand out the window of a moving car		
4. Walking		
5. Touching your finger to your nose		

Directions: *Complete the following sentences using the correct terms or phrases.*

6. Newton's third law states, "For every action, there is an equal but _____."

7. There is no _____ in time between the action and the reaction.

8. One reason it's often easy to miss an action-reaction pair is because of the _____ of one of the objects.

9. Action-reaction forces are always the same _____ but are in opposite _____.

10. When you swim in water, your arms push the water _____. The water reacts by pushing _____ on your arms, causing your body to accelerate _____.

Directions: *Answer the following question using complete sentences.*

11. How could the action force of a canoe moving through water be increased?

_____

_____

_____

_____

Meeting Individual Needs

Newton's 3rd Law
Physics Name _____ Period_____

Choose the best answer for each question from the choices below. *Be clear about which answer you are circling—none of this trying to circle 2 answers and be sloppy so I'll just count it correct*

1. Newton's 3rd Law states…
   a. Objects in motion stay in motion and objects at rest stay at rest
   b. Force is equal to mass times acceleration
   c. For each action there is an equal and opposite reaction

_____

2. An archer shoots an arrow. The action force is the bowstring against the arrow, The reaction force is…
   a. Air resistance against the bow
   b. Arrow's push against the bowstring
   c. Grip of the archer's hand on the bow

_____

3. A player catches a ball. The action force is the impact of the ball against the player's glove. The reaction force is…
   a. The force the glove exerts on the ball
   b. The player's grip on the glove
   c. The friction of the ground on the player's shoes

_____

4. A player hits a ball with a bat. The action force is the impact of the bat against the ball. The reaction force is…
   a. The grip of the player's hands on the ball
   b. The air resistance on the ball
   c. The force of the ball against the bat

_____

5. A baseball player bats a ball with a force of 1,000 N. The ball exerts a reaction force against the bat of…
   a. Less than 1,000 N
   b. More than 1,000 N
   c. 1,000 N

_____

6. A person is attracted toward the center of the Earth by a 500 N gravitational force. The force that the Earth is attracted toward the person is…
   a. 500 N
   b. Much less than 500 N
   c. Much more than 500 N

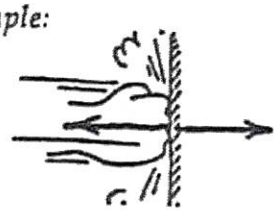
_____

Newton's Third Law of Motion

Action and Reaction Pairs

1. In the example below, the action-reaction pair is shown by the arrows (vectors), and the action-reaction described in words. In (*a*) through (*g*) draw the other arrow (vector) and state the reaction to the given action. Then make up your own example.

Example:

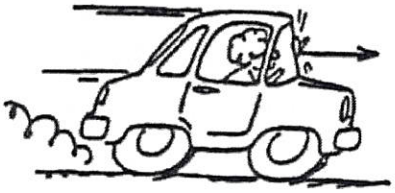


Fist hits wall.

Wall hits fist.

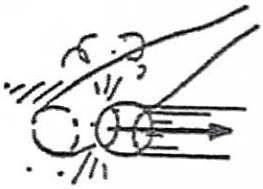
Head bumps ball.

(*a*)_____



Windshield hits bug.

(*b*)_____



Bat hits ball.

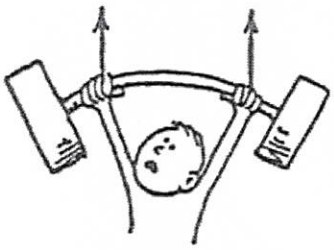
(*c*)_____

Hand touches nose.

(*d*)_____

Hand pulls on flower.

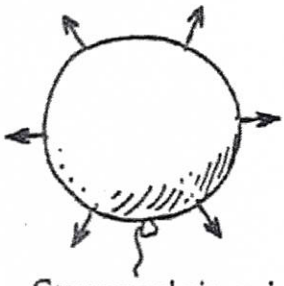
(*e*)_____



Athlete pushes bar upward.

(*f*)_____

_____



Compressed air pushes balloon surface outward.

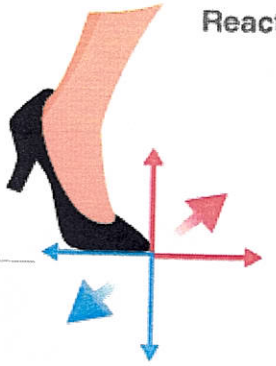
(*g*)_____

_____

Reactio

Action

Foot pushes



(h)_____

_____