

Levers Background Information and Activity Sheet for Students 1.3d

Student Name: _____

Action-Reaction (ICP.4.4)

Question for Analysis

How does force affect the interactions of object in motion? (ICP.3.7)

Key Concepts

- **Action** – the force acting in one direction
- **Force** – any interaction that, when unopposed, will change the motion of an object $F = ma$
- **Interaction** – reciprocal action or influence
- **Newton’s 1st Law of Motion** – An object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force.
- **Newton’s 3rd Law of Motion** – For every action, there is an equal and opposite reaction.
- **Reaction** – the force acting in the opposite direction.

Background

Because forces always come in pairs identifying and describing action-reaction force pairs is a simple matter of identifying the two interacting objects and describing the direction of the action and reaction.

In the example below, the action-reaction pair is shown by the arrows (vectors), and described in words.



Fist hits wall

Wall hits fist

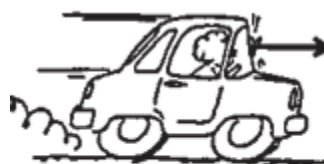
Practice Problems

1. In (a) through (g) draw the other arrow (vector) and state the reaction to the given action. Then make up your own example in (h).



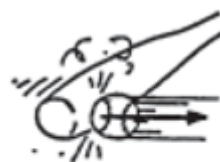
Head bumps ball

a. _____



Windshield hits bug

b. _____



Bat hits ball

c. _____



Hand touches nose

d. _____



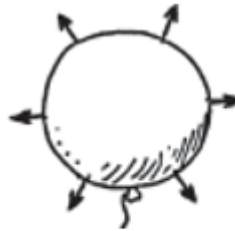
Athlete pushes bar upward

f. _____



Hand pulls on flower

e. _____



Compressed air pushes balloon surface outward

g. _____

h. _____

2. Consider the interaction depicted below between foot A, ball B, and foot C. The three objects interact simultaneously (at the same time). Identify the two pairs of action-reaction forces. Use the notation "foot A", "foot C", and "ball B" in your statements.

