Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour:\_\_\_\_

**Newton’s 3rd Law of Motion**

**Newton’s 3rd Law:**

Example: When you push on a wall, the wall pushes back on your with a force equal in strength to the force you exerted but opposite in direction.

* According to Newton’s third law of motion: forces always act in \_\_\_\_\_\_\_\_\_\_\_\_ but \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_
* The forces exerted by two objects on each other are often called an \_\_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_ force pair
* Action and reaction pairs don’t \_\_\_\_\_\_\_\_\_\_\_ because they act on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ objects

**Examples:**

1. Jumping – when you jump \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ on the ground
   1. The \_\_\_\_\_\_\_\_\_\_\_\_ then \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ on you. This is the upward force that pushes you into the air
2. Birds Flying – when a bird flies, its \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ direction
   1. This pushes air back downward and backward
   2. By Newton’s third law, the \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ back on the bird in the opposite directions \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. This force keeps the bird in the air and propels it forward

**Your Turn Examples:**

1. A fish’s fin pushing water backward
   1. Action:
   2. Reaction:
2. A butterfly’s wings push air downwards
   1. Action:
   2. Reaction:
3. A car hits a cement wall
   1. Action:
   2. Reaction:
4. Tires on a car push the road backwards
   1. Action:
   2. Reaction:

**Newton’s Laws of Motion Review**

**Directions: Analyze the scenarios and decide which of Newton’s Laws applies to each one. Explain how the law relates to the scenario.**

1. You step on the edge of a skateboard. The skateboard flies off in one direction and you topple over in the opposite direction.

Law: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Explanation:

2. A 250-pound fullback collides head-on with a 150-pound defensive back. The defensive back is driven backwards by the impact and the fullback continues toward the goal line.

Law: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Explanation:

3. Your notebook is lying on the dashboard of the car. As the car goes around the corner, the notebook goes out the open passenger side window.

Law: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Explanation:

4. You are in a car and are not wearing a seatbelt. The driver slams on the brakes. You go through the windshield.

Law: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Explanation:

5. Two people on in-line skates push against each other and move off in opposite directions.

Law: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Explanation:

6. You are standing on a city bus because there are no seats available. The bus starts up and suddenly you topple backwards.

Law: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Explanation: