Newton's Third Law – Worksheet

1. Key Idea

Newton's Third Law says:
"For every action, there is an equal and opposite reaction."

This means:

- Forces always come in pairs
- The forces are equal in size
- They act in opposite directions
- They act on two different objects

2. Examples

- A. Book on a Table
  - The book pushes down on the table.
  - The table pushes up on the book.
- B. Person Walking
  - Your foot pushes backward on the ground.
  - The ground pushes you forward.
- C. Rocket Launch
  - The rocket pushes gas downward.
  - The gas pushes the rocket upward.
- D. Ball Hitting a Wall
  - The ball pushes on the wall.
  - The wall pushes back on the ball.

3. Fill-in-the-Blanks

1. Every action has an _____ and _____ reaction.

2. Action and reaction forces are _____ in size.

3. Action and reaction forces act on _____ objects.

4. When you walk, your foot pushes _____ on the ground.

5. The ground pushes you _____ so you can move.

4. Match the Action–Reaction Pairs

A ball hits the wall — The wall pushes back on the ball

A swimmer pushes water backward — Water pushes the swimmer forward

A chair pushes up on you — You push down on the chair

5. Short Questions

1. Why do you move forward when you push backward on the ground

2. When a rocket pushes gas down, what force makes it go up

3. Why don't action and reaction forces cancel each other out

6. Challenge Question

A boy jumps off a small boat.

- What force does the boy apply to the boat

- What force does the boat apply to the boy

- Why does the boat move backward

ANSWER KEY

Fill-in-the-Blanks Answers:

1. equal, opposite

2. equal

3. two different

4. backward

5. forward

Match the Pairs Answers:

A ball hits the wall — The wall pushes back on the ball

A swimmer pushes water backward — Water pushes the swimmer forward

A chair pushes up on you — You push down on the chair

Short Questions – Detailed Answers:

1. You move forward because the ground pushes you forward with an equal and opposite force when you push backward.

2. The gas pushes the rocket upward with an equal and opposite force.

3. They do not cancel because they act on different objects.

Challenge Question – Detailed Answer:

The boy pushes the boat backward.

The boat pushes the boy forward.

The boat moves backward because the boy's push is the action force, and the boat reacts by moving in the opposite direction.