Learning Target S8P3.b I can construct an explanation using Newton's 3rd Law of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.

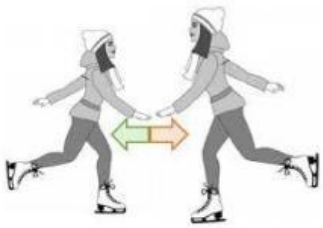
Newton's 3rd Law of Motion Balanced vs. Unbalanced Forces Interactive Activity

Section 1: Understanding Newton's Third Law of Motion

1. **Definition:** Write the statement of Newton's Third Law of Motion in your own words: _____
   _____
   _____

2. **Key Concept:** Newton's 3rd Law states: *For every action, there is an equal and opposite reaction.*

Diagram: Below is a diagram of two ice skaters pushing against each other:



Question: What happens to each skater after they push off? Explain in terms of Newton's Third Law. ___
_____
_____
_____

Section 2: Balanced vs. Unbalanced Forces

Definition:

- **Balanced Forces:** Forces that are equal in size and opposite in direction, causing no change in motion.
- **Unbalanced Forces:** Forces that are not equal, causing a change in motion (acceleration).

Activity: Identify if the forces in the scenarios below are balanced or unbalanced:

Scenario 1: A book resting on a table.

- Forces: Gravity pulls the book downward, and the table pushes it upward.
- Are the forces balanced or unbalanced? _____

Scenario 2: A soccer ball is kicked and starts rolling across the field.

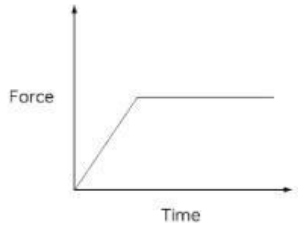
- Forces: The kick applies force, and friction resists the motion.
- Are the forces balanced or unbalanced? _____

Created By: Chivas & Jordan Spivey

Learning Target S8P3.b I can construct an explanation using Newton's 3rd Law of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.

Section 3: Graphical Analysis

Graph 1: Below is a force-time graph for a tug-of-war game:

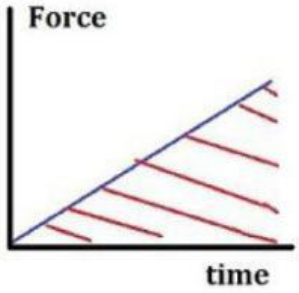


- **Question:** Is the tug-of-war balanced or unbalanced? Explain your reasoning. _____

_____

_____

Graph 2: Below is a force-time graph for a car accelerating:



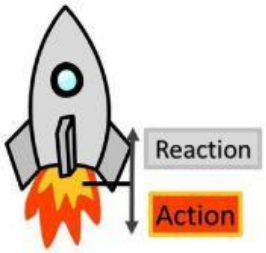
- **Question:** How do the forces change over time? What type of motion would the car experience?

_____

_____

Section 4: Real-World Applications

1. **Rocket Launch:**



   - **Question:** Describe the action and reaction forces involved in the launch: _____

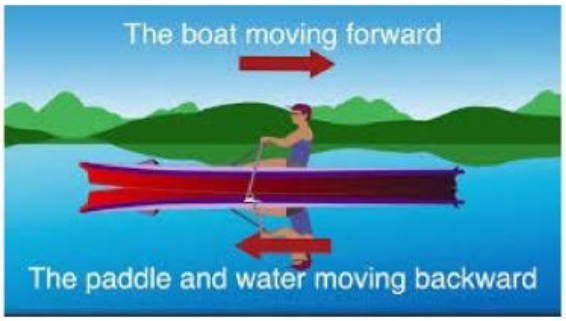
_____

_____

_____

Learning Target S8P3.b I can construct an explanation using Newton's 3rd Law of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.

- **Rowing a Boat:**



- **Question:** How does Newton's Third Law apply to rowing?

Section 5: Problem Solving

1. A 50 kg skater pushes off a wall with a force of 200 N. According to Newton's Third Law:
   - What force does the wall exert on the skater? _____
   - In which direction does the skater move? _____
2. Two teams are playing tug-of-war. Team A exerts a force of 500 N to the right, and Team B exerts a force of 450 N to the left.
   - What is the net force? _____
   - Which team will win? _____
   - By how much and what direction? _____

Section 6: Reflection

1. Provide an example from your daily life that demonstrates Newton's Third Law. Explain the action and reaction forces: _____
   _____
   _____
   _____
2. Why is it important to understand the difference between balanced and unbalanced forces? ___
   _____
   _____
   _____