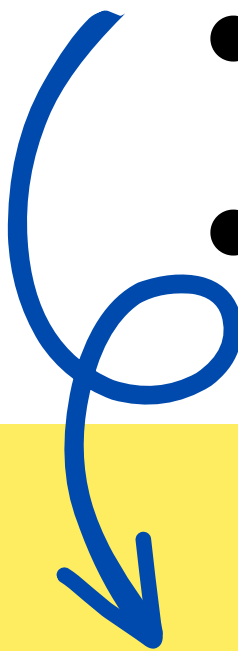


Complete Newton's 3rd Law Bundle

- **Lesson**
- **Worksheets**
- **Activities**
- **Assessment**

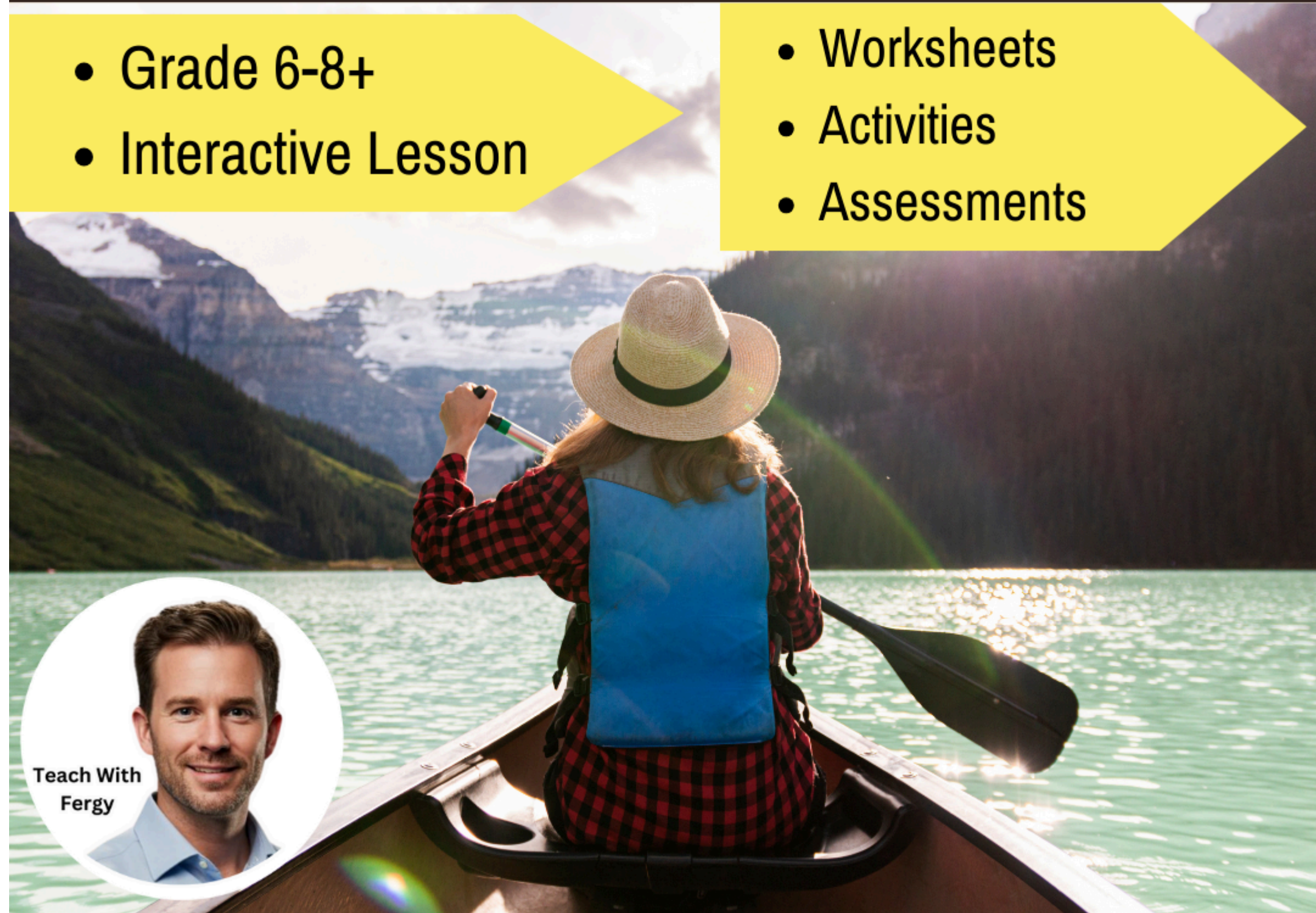


SCROLL
to take a look inside!

Newton's 3rd Law of Motion: Lesson, Worksheet, & Activities Bundle

- Grade 6-8+
- Interactive Lesson

- Worksheets
- Activities
- Assessments



1 Fully Editable & Engaging Lesson and Worksheets

Videos embedded directly in your lesson



6-Part Worksheet with Answer Key



Newton's Third Law of Motion — Worksheet
Name: _____ Date: _____

What is Newton's Third Law of Motion? What does "action and reaction force pairs" mean in different situations?

Part 1 — Vocabulary (Match the term to the definition)
A. Action Force
B. Reaction Force
C. Pair Forces
D. Momentum
1. _____
2. _____
3. _____
4. _____

Part 2 — Write True or False
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Part 3 — Multiple-Choice Questions
1. Explain Newton's Third Law of Motion.

Part 4 — Application Problems
1. A student pushes backward on a skateboard with a force of 40 N. What is the size and direction of the reaction force?

2. When a person steps off a small boat, they move forward, but the boat moves backward. Explain this using Newton's Third Law.

3. A hammer hits a nail with a force of 200 N. What force does the nail exert on the hammer?

Part 5 — Challenge Question
A 60-kg astronaut floating in space pushes a 10-kg satellite away from them with a force of 30 N. What happens to both objects, and why? (Think about direction and how action-reaction forces act on *different* masses.)

2. Write your answer.

3. Draw a diagram.

Part 6 — Multiple-Choice Questions
1. Newton's Third Law states:
A. Objects at rest stay at rest
B. $F = m \times a$
C. For every action, there is an equal and opposite reaction
D. Force depends on mass

2. Which situation BEST shows Newton's Third Law?
A. A ball speeding up on a ramp
B. A book sliding across a desk
C. A rocket launching upward
D. A car slowing down

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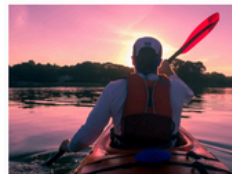
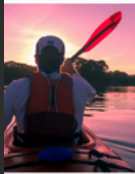
 **Application**

- A rocket pushes fuel backward, and the fuel pushes the rocket forward



 **Application**

- A rocket pushes fuel backward, and the fuel pushes the rocket forward
- This works even in space with no air
- _____



Relationship Between Kinetic Energy Mass and Speed — Student Lesson Outline

Energy
What is energy?

Example: If a bowling ball is moving, it has energy. If it collides with bowling pins, it will knock them over because it has energy.

Kinetic Energy

Kinetic Energy and Mass

- Usually, heavier objects have more mass
- Which would be more massive?

Kinetic Energy and Mass

Which ball would be harder to catch if thrown at the same speed, the bowling ball or beach ball? Why?

Kinetic Energy and Mass

Since the bowling ball has more mass, _____

Kinetic Energy and Speed

The amount of kinetic energy an object has also _____

Kinetic Energy and Speed

If you roll the grey ball at 1 m/s and the blue ball at 5 m/s and they have the same mass, which will have more energy? How do you know?

Kinetic Energy and Speed

If you want to see why energy changes with an increase in mass and speed, have a look at the equation below.
Note: You do not need to memorize or use the equation.

$$\text{Kinetic Energy} = \frac{1}{2} mv^2$$

Kinetic energy is equal to $\frac{1}{2}$ multiplied by the mass multiplied by the speed (v). If you increase the mass or speed, you increase the kinetic energy.



Student Notes

Student & Teacher Versions



Engaging Activities & Worksheets

THREE Activities in One!

Basic 22-Term Word Search



Word Scramble and Define Activity



Case Study

Newton's 3rd Law: How Rockets Accelerate in Space



Build your students' scientific literacy, apply science to real-world issues, and stay prepared with a no-prep reading.

FULLY EDITABLE AND READY-TO-GO INVESTIGATION

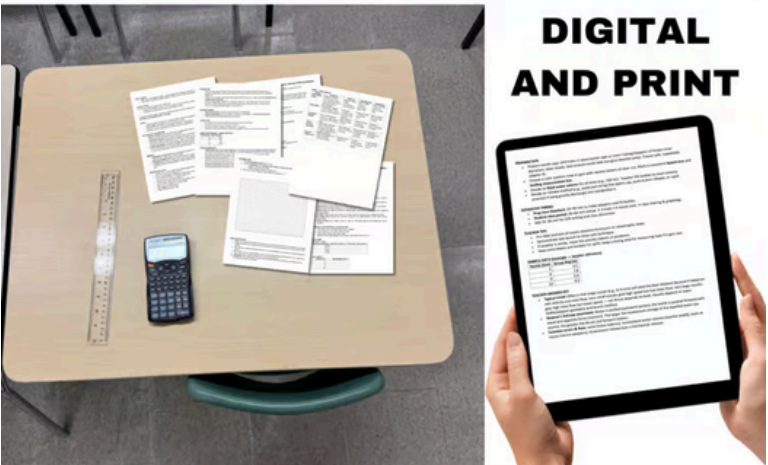
Reading & Questions



Answer Key



DIGITAL AND PRINT



GREAT FOR TEACHING THE SCIENTIFIC METHOD

- ✓
- ✓
- ✓
- ✓
- ✓
- ✓
- ✓
- ✓
- ✓

Newton's Third Law of Motion Lesson

Newton's 3rd Law Case Study - How Rockets Accelerate in Space

Newton's 3rd Law Case Study - Why You Don't Jump off Boats

Newton 3rd Law STEM Investigation - Thrust vs Nozzle Size

Newton's Laws of Motion Word Search and Scramble Activity

Newton's 3 Laws Identification Worksheet

Newton's 3rd Law Worksheet

Newtons Third Law and Colliding Objects Activity

NO PREP

Just Download and Teach



Application

- A rocket pushes fuel backward, and the fuel pushes the rocket forward



Newton's 3rd Law of Motion Lesson Bundle

- Teaching Timeline
- Grade 6-8+
- Lessons
- Worksheets
- Activity
- Assessments

Teach With Fergy

Newton's Third Law and Colliding Objects Activity

MS-PS2-1 Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

Newton's third law states that for every action there is an equal and opposite reaction. If you push on the ground, it pushes back at you. If you kick a soccer ball, the ball pushes back on you. Explain and answer the questions for the following 3 situations below to the best of your ability. Once you are done, read the short explanation on page 2 and then use the information to alter your answer if needed.

1. Rocket lifting off the ground.
2. A bowling ball colliding with a bowling pin.
3. A child jumping off the ground outside.

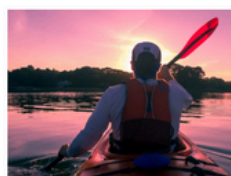
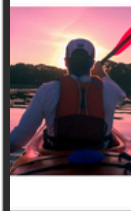
DIGITAL AND PRINT

GREAT FOR TEACHING THE SCIENTIFIC METHOD



Application

- A rocket pushes fuel backward, and the fuel pushes the rocket forward
- This works even in space with no air
- _____



Reading & Questions

Why You Don't Jump off Boats — Understanding Newton's 3rd Law

On a warm, sunny morning, brothers Ethan and Miguel paddled their small boat to the middle of Blue Pine Lake. The water was calm, the air was cool, and they spent hours fishing, talking, and drifting under the sun. When the afternoon clouds began to roll in, they decided it was time to head back to shore. But instead of paddling the whole way, Ethan suggested they jump in and swim the last stretch.

Their boat wasn't tied to anything and floated freely on the water. Ethan stood up first, carefully balancing himself on the slightly wobbly surface. "Let's jump together!" he said. Miguel nodded and moved beside him. On the count of three, the brothers bent their knees, leaned forward, and pushed off with their legs. The moment both brothers jumped, the boat shot backward—much farther than either of them expected.

Ethan and Miguel splashed into the lake, resurfacing with a burst of laughter. But when they turned around, their laughter disappeared. The little boat had drifted several meters away. Neither of them had thought to hold onto the rope attached to the boat, and now it was gliding steadily away in the opposite direction.

Miguel gasped. "Great... now we have to chase it."

As they swam toward it, Ethan realized exactly what had happened. Their science teacher had talked about this during their unit on forces: Newton's Third Law. Every action has an equal and opposite reaction.

When Ethan and Miguel jumped, they both pushed backward on the boat with their legs. That backward push was the action force. At the same time, the boat pushed them forward with an equal and opposite reaction force, launching them into the water.

Because both brothers jumped at the same time, the total force pushing backward on the boat was much larger than normal. And since the boat had far less mass than the two of them combined, it accelerated backward quickly. A larger force acting on a smaller mass creates a much larger acceleration. If they had been on a heavier boat—or if only one brother had jumped—the movement would have been much smaller. But two strong pushes at once created a powerful reaction, sending the boat gliding away dramatically.

After a short swim, the brothers reached the boat, climbed back in, and laughed about the little lesson they had just experienced. Their jump had perfectly demonstrated Newton's Third Law.

Case Study Questions:

1. Why did the boat move so far backward when the brothers jumped forward? The boat moved backward because both brothers pushed on it as they jumped, causing a large opposite force that accelerated the boat away.
2. What was the action force in this situation? The action force was Ethan and Miguel pushing backward on the boat with their legs.
3. What was the reaction force in this situation? The reaction force was the boat pushing the brothers forward into the water.
4. Why did the boat accelerate more than the brothers expected? The boat had much less mass than the two brothers combined, so the same force caused greater acceleration.
5. How does this scenario demonstrate Newton's Third Law? It demonstrates that every action force has an equal and opposite reaction force, causing opposite movements of the brothers and the boat.

Answer Key

NEWTON 3RD LAW OF MOTION STEM INVESTIGATION

Water Bottle Jet - Thrust vs Nozzle Size - Newton 3rd Law STEM Investigation

Driving Question: How does nozzle diameter affect how far a water jet bottle will travel?

PURPOSE / OVERVIEW
Students build a simple water jet rocket (a partially filled plastic bottle) and vary only the nozzle opening size to measure how nozzle diameter changes thrust and therefore how far the bottle travels. Through repeated launches, controlled tests, data recording, class averaging, graphing, and a CER, students connect action-reaction forces and fluid momentum to real motion.

LEARNING TARGETS

- Plan and carry out a controlled investigation with repeated trials.
- Measure travel distance and complete averages.
- Graph class averages to compare thrust performance by nozzle size.
- Write a CER explaining the relationship between nozzle size, thrust, and motion using Newton's 3rd Law.

PREPARATION
Option 1 — Drill Holes in Spare Bottle Caps (Easiest & Most Consistent)
Materials:

- Extra plastic bottle caps (same brand + same fit)
- Drill + drill bits (3 mm, 6 mm, 9 mm, 12 mm)
- Hot glue or wax to seal

How to make them:

1. Drill a centered hole using each drill bit size.
2. Label each cap (e.g., "3 mm," "6 mm," "9 mm," "12 mm").
3. If the hole has rough edges, smooth with sandpaper.
4. Optional: Glue a short straw piece into the hole to keep the jet direction straight.

Option 2 — Use Rubber Stoppers with Pre-Drilled Holes
Materials:

- Rubber stoppers (3/8", 1/2" with 1 hole)
- Hot glue or wax to seal

How to make them:

1. Insert stopper into bottle mouth (fit tightly).
2. Swap stopper to change nozzle diameter.

The bottle is placed in the launch cradle then released. How the bottle stays in the cradle is determined by the launch cradle.

How to use the launch cradle:

- The launch cradle is made of cardboard and is shaped like a 'U' with a small notch at the bottom.
- The bottle is placed in the launch cradle and the launch cradle is held in place by a rubber band.
- The launch cradle is then released, and the bottle is launched into the air.



THRUST VS NOZZLE SIZE

Newton's 3 Laws Identification Worksheet

NGSS MS-PS2-1 and PS2-2

Students analyze 10 different real-life situations and determine which of Newton's 3 Laws can be used to explain what is happening.

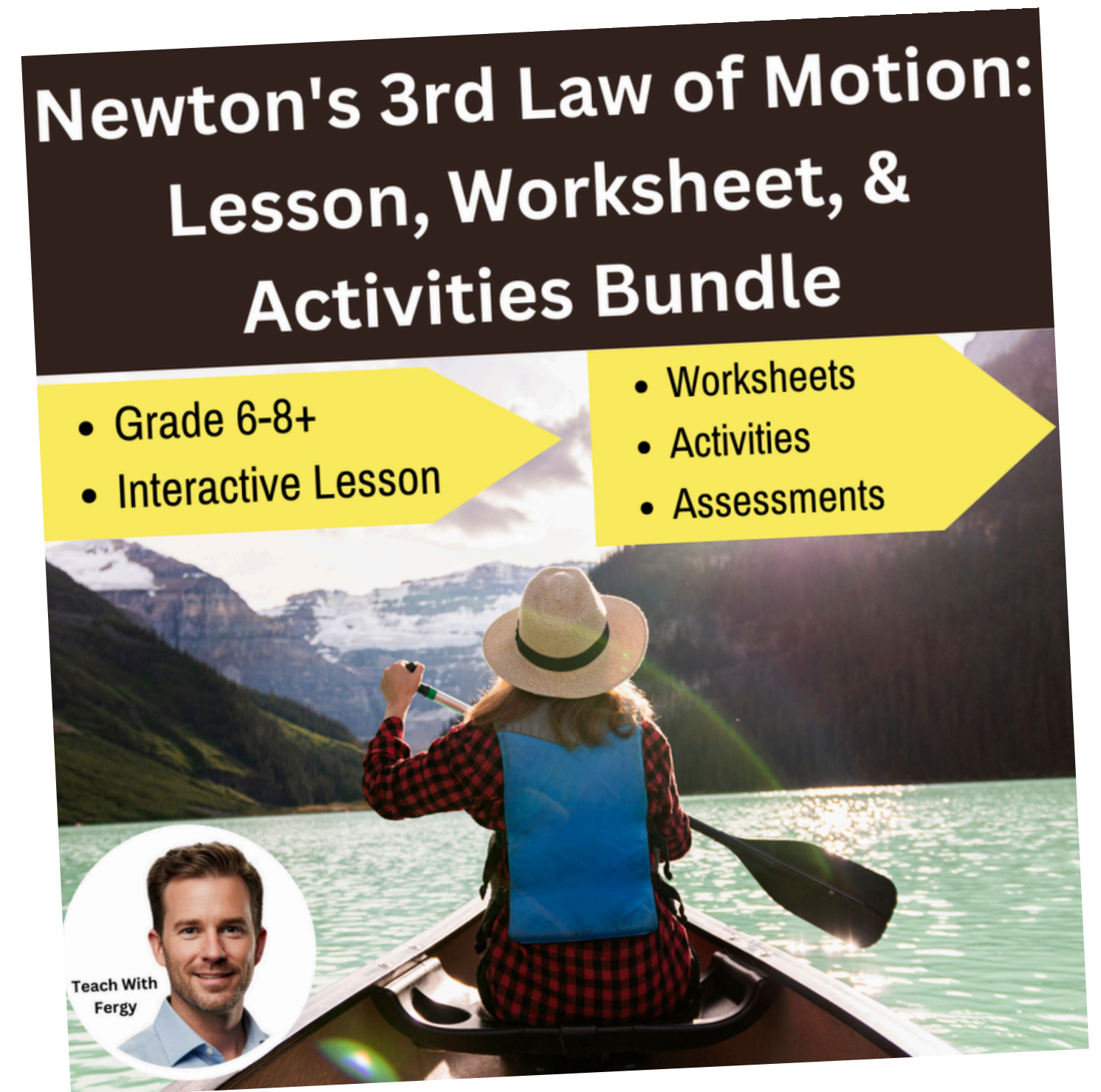


NGSS MS-PS2-1 and PS2-2



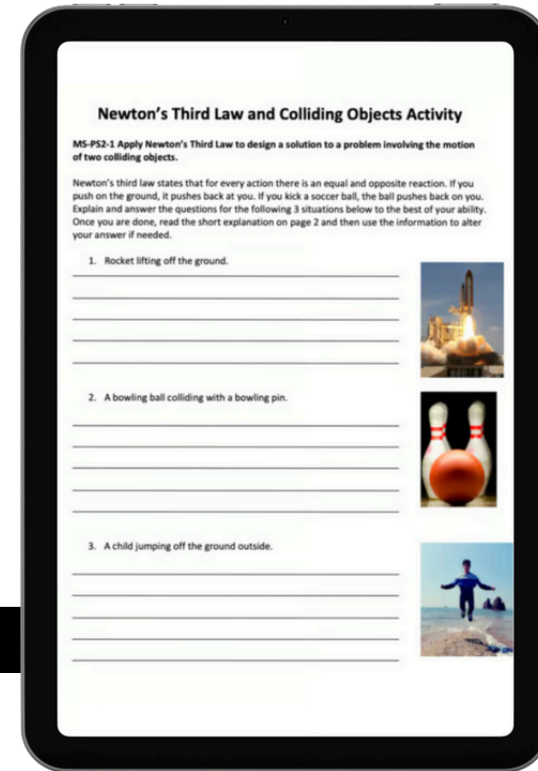
BY THE END OF THIS BUNDLE, STUDENTS WILL UNDERSTAND

- Forces & Net Force
- Net, Balanced, and Unbalanced forces
- Action and Reaction Forces
- For every action there is an equal and opposite reaction
- Using Labs to Explore Newton's 3rd Law
- Observing how force affects its motion
- Application & Problem Solving



Editable and Interactive

Office, Google,
and PDF Versions
Fully Editable



Hands-on and
Interactive Activities

Engaging and Colorful Lesson

