Lesson: Balloon Rocket Science	Name:
Teacher:	Date:

Balloon Rocket Science

Florida State Standard: SC.6.P.13.3 – Investigate and explain that Newton's Third Law of Motion states that forces act in pairs and for every action, there is an equal and opposite reaction.
Florida State Benchmark: SC.6.P.13.3 – Investigate and explain that forces cause objects to move or change their motion.
NGSS Performance Expectation: MS-PS2-2 – Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

Objective: Conduct the balloon rocket experiment to demonstrate Newton's Third Law of Motion, observe the motion of the balloon, and explain how action and reaction forces result in motion.

Materials:

- 1 balloon (any size)
- 1 long piece of string (3–5 meters)
- 1 plastic straw
- Tape (scotch or masking tape)
- 2 chairs (or other sturdy objects to tie the string to)
- Stopwatch (optional)
- Ruler or measuring tape (optional)

Safety Precautions:

- Handle balloons gently; they may burst if overinflated.
- Do not stand directly in front of the balloon during release.
- Ensure the string is secured to stable objects to prevent accidents.
- Always follow teacher supervision and instructions.

Procedures

1. Set Up the String

Tie one end of the string to the back of a chair and feed the straw onto the string. Tie the other end to a second chair, making sure the string is taut.

Check for Understanding:

1. Why do you need to make the string taut?

2. Inflate the Balloon

Inflate the balloon without tying it off. Hold the open end of the balloon shut.

Check for Understanding:

2. What potential energy is stored in the inflated balloon?

3. Attach the Balloon to the Straw

Tape the inflated balloon to the straw. Make sure the balloon is parallel to the string and the open end is facing away from the direction it will travel.

Check for Understanding:

3. Why should the balloon be aligned parallel to the string?

4. Launch the Rocket

Release the balloon and observe how it moves along the string as air escapes.

Observation Questions:

4. Describe how the balloon moves.

5. What does the motion of the balloon demonstrate about action and reaction forces?

6. How might the amount of air in the balloon affect its motion?

5. Record Observations
Measure the distance traveled by the balloon and the time it takes (if using a stopwatch).

Critical Thinking Questions:
7. How could you make the balloon travel farther or faster?

8. Can you think of a real-world example of Newton's Third Law that works like this experiment?

Clean-Up:

- Deflate any remaining balloons and dispose of them properly.
- Unhook the string from the chairs and clear the area of tape or materials used.
- Return all materials to their proper places.

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