



## NOTEBOOK SPRING LAUNCHER

### SCIENCE SAFETY

PLEASE follow these safety precautions when doing any science experiment.

- **ALWAYS** have an adult present.
- **ALWAYS** wear the correct safety gear while doing any experiment.
- **NEVER** eat or drink anything when performing any experiment.
- **REMEMBER** experiments may require marbles, small balls, balloons, and other small parts. Those objects could become a **CHOKING HAZARD**. Adults are to perform those experiments using these objects. Any child can choke or suffocate on uninflated or broken balloons. Keep uninflated or broken balloons away from children.

### INGREDIENTS

- Plastic Spiral Notebook
- Dowel Rod
- Ruler

### INSTRUCTIONS

**STEP 1:** Remove the paper from the plastic spiral notebook spring.

**STEP 2:** Hold the dowel rod by placing your thumb and index finger at one end of the dowel rod. Slide the plastic spiral notebook spring onto the other end of the dowel rod.

**STEP 3:** Using your hand, barely compress the plastic spiral notebook spring against your thumb and index finger. Release the plastic spiral notebook spring and observe. Using the ruler, determine how far the plastic spiral notebook spring launched. Use this evidence to construct an explanation relating the speed of the plastic spiral notebook spring to the energy of the plastic spiral notebook spring.

**STEP 4:** Using your hand, completely compress the plastic spiral notebook spring against your thumb and index finger. Release the plastic spiral notebook spring and observe. Using the ruler, determine how far the plastic spiral notebook spring launched. Use this evidence to construct an explanation relating the speed of the plastic spiral notebook spring to the energy of the plastic spiral notebook spring. Compare the effects of the different directions of the pushes and pulls on the motion of the plastic spiral notebook spring. Provide evidence that a pattern can be used to predict future motion of the plastic spiral notebook spring.

### EXPLANATION

When the plastic spiral notebook spring is compressed, energy is stored. Potential energy is stored energy. When the compressed spiral notebook spring is released, potential energy is transformed or changed to kinetic energy, and launches across the room. Kinetic energy is energy of motion.



### SCIENCE BACKGROUND

A force is a push or a pull. Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the direction of its motion and can start or stop it. The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. Energy is the ability to do work. The faster a given object is moving, the more energy it possesses. Energy cannot be created or destroyed, but it can be transformed or changed from one form to another. Potential energy is stored energy. Kinetic energy is energy of motion.

### I CAN STATEMENTS

- ✓ I can plan and conduct an investigation to compare the effects of different directions of pushes and pulls on the motion of an object.
- ✓ I can make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
- ✓ I can use evidence to construct an explanation relating the speed of an object to the energy of the object.

### NEXT GENERATION SCIENCE STANDARDS CONNECTION

**K** – Forces and Interactions: Pushes and Pulls | Cause and Effect

**3** – Forces and Interactions | Patterns

**4** – Energy | Cause and Effect | Energy and Matter