



## MAGNETIC MONEY

### 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 while doing 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

- Neodymium Magnet
- United States Dollar Bill

### INSTRUCTIONS

**STEP 1:** Hold the dollar bill so it hangs freely from your fingers. What will happen when you bring the neodymium magnet close to the dollar bill?

**STEP 2:** Look for a location on the dollar bill, which has a lot of ink, bring the neodymium magnet close to the dollar bill, and observe. What happens? Apply what you know to help a cashier create a way to determine if a dollar bill is counterfeit.

### EXPLANATION

To prevent counterfeiting dollar bills in the United States are printed with magnetic ink, which causes the dollar bill to attract to the neodymium magnet. Neodymium magnets are strong magnets made of neodymium.



### SCIENCE BACKGROUND

A force is a push or pull, which can cause an object to be in motion. Pushes and pulls can have different strengths and directions. Motion is a change in position. Objects in contact exert forces on each other. Magnetic forces do not require that the objects be in contact. A magnet is an object, which attracts to iron. Magnetism, an invisible force, is created by a magnet's north and south poles. Opposite poles attract, while same poles repel. The size of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. Earth acts like a gigantic magnet. A compass always points toward Earth's magnetic north pole.

### I CAN STATEMENT

- ✓ Ask questions to determine cause and effect relationships of magnetic interactions between two objects not in contact with each other.
- ✓ Define a simple design problem that can be solved by applying scientific ideas about magnets.

### NEXT GENERATION SCIENCE STANDARDS CONNECTION

3 – Forces and Interactions | Cause and Effect | Interdependence of Science, Engineering, and Technology