**📍 Station 2: Magnetic Mystery!**

**Focus:** Magnet Testing & Simple Problem Solving
**NGSS Standard:** **3-PS2-4**

### **Goal**:

Test different materials to see if they are magnetic, and then design a creative tool, gadget, or solution that uses magnets to solve a problem!

**Materials needed:**

 **Magnets** (bar or disc magnets work well)

 A tray of test items:

* Paper clip
* Coin
* Aluminum foil
* String
* Eraser
* Metal key
* LEGO brick

 **Magnet Test Chart**

 Paper & pencil (for sketching or design brainstorming)

**Student Directions:**

#### Step 1: Test the Items

1. Pick up the **magnet** and gently touch it to each item.
2. **Does the item stick to the magnet?** Try both sides!
3. Write **“Yes”** if the item is magnetic and **“No”** if it isn’t.

Use a chart like this:

| **Test Item** | **Magnetic? (Yes/No)** |
| --- | --- |
| Paper Clip |  |
| Coin |  |
| Foil |  |
| String |  |
| Eraser |  |
| Key |  |
| LEGO Brick |  |

#### 💡 Step 2: Think Like an Inventor!

Now that you know which items are magnetic, try solving a design challenge:

🎯 **Design Task:**
Can you **create or imagine something useful that uses a magnet** to make life easier, safer, or more fun? (Think: secret locker, magnetic toy, cabinet lock, a trapdoor, floating train, etc.)

#### ✏️ Step 3: Sketch or Describe Your Idea

On the back of your worksheet or below, **draw a simple design** that uses a magnet to solve a problem. Label the parts and describe what it does.

**Design Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

🧠 **What problem does it solve?**
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

🎨 **Sketch your idea here (or describe it if you prefer):**
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### ✅ Reflection Questions:

* Why do some materials stick to magnets but others don’t?
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* What was the most surprising material that did (or didn’t) stick?
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* How could you improve or test your magnet-powered design further?
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### 📍 Station 2: **Magnetic Mystery!**

**Focus:** Magnet Testing & Simple Problem Solving
**NGSS Standard:** **3-PS2-4** – Define a simple design problem that can be solved by applying scientific ideas about magnets.

### ✅ **ITEEA STEL Standards – Elementary School Level**

**STEL 1A** – Technological products and systems are created by designers.
→ Students act as inventors, brainstorming magnetic solutions to real-world challenges.

**STEL 3A** – Use measurement tools and techniques to gather data.
→ Students use magnets as investigation tools and gather simple yes/no data based on observable properties.

**STEL 4A** – Materials have properties that help determine how they are used.
→ Learners explore and classify materials based on magnetic properties and infer which materials are suitable for magnetic tools or gadgets.

**STEL 8A** – Design involves identifying a problem and creating a solution.
→ Through drawing or describing magnet-powered inventions, students follow an early-stage design process.

**STEL 11A** – Describe and explain how information is collected and used to inform decisions.
→ Students use testing results to inform and guide their invention or design ideas.

### ✅ **Common Core Math Standards – Elementary (Grades 2–3)**

**CCSS.MATH.CONTENT.2.MD.D.10** – Draw a picture graph and a bar graph to represent a data set with up to four categories.
→ Optional: Students could graph which test items were magnetic vs. not magnetic.

**CCSS.MATH.PRACTICE.MP2** – Reason abstractly and quantitatively.
→ Students use reasoning when deciding which materials will work best in their magnetic designs.

**CCSS.MATH.PRACTICE.MP5** – Use appropriate tools strategically.
→ Students choose and use the magnet to test materials with purpose.

**CCSS.MATH.PRACTICE.MP6** – Attend to precision.
→ Students carefully test and record accurate observations of material properties.

### ✅ Summary:

This creative, hands-on activity integrates science, engineering, and design thinking. Students classify materials based on magnetic properties and apply what they learn to invent something useful. It aligns with **NGSS 3-PS2-4**, supports **ITEEA STEL standards** through material analysis and design, and connects to **Common Core Math** by encouraging reasoning, comparison, and data recording.