

# Magnetic Salad

## Teacher's Guide

---

### The Initial View (Introducing the Activity)

The bag must be completely sealed to keep you from having to clean oily iron filings off a magnet. You could substitute plastic wrap for the bag. You may want to discard the oil and filings, since the filings won't clean easily. The best alternative is to keep the jars with their iron filings in them from year to year. Just replace any oil or iron filings which might get spilled. *Remind the students to keep the iron filings from direct contact with the magnet.*

### Take a Deeper View! (More Science)

**Magnetism** is now thought to be the result of **Forces** produced between **Electric Charges** in motion. The **Electrons** of certain **Metals** which are permanently magnetic are arranged in a certain manner which produce their **Magnetic Properties**. They're spinning or **Rotating** like little tiny planets on their **Axis** *while* they are **Orbiting** or **Revolving** around the **Nucleus**. Together this spinning and orbiting creates the magnetism we have all played with! Running an **Electric Current** through a wire or **Conductor** wrapped around certain metals will produce a temporary magnetism called **Electromagnetism**. Your car's electric door locks take advantage of this electromagnetism. By reversing the current using the door lock switch, you can reverse the **North** and **South Poles** of the temporary door lock magnets. This **Attraction** and **Repulsion** is heard with an audible "thunk" as the doors lock or unlock!

### More and Bigger Views! (Additional Classroom Ideas)

1. Try different shapes of magnets to view their magnetic fields. If the magnets are smaller or larger, you may have to adjust the **Volume** of the container's oil.
2. Observe a **Compass** arrow (also a magnet) to see how it lines up with Earth's magnetic field! Research how a compass helps find directions and **Navigate** around the Earth.
3. Charles Coulomb is an important scientist in electricity/magnetism. Research him!
4. Metals attracted by a magnet are said to be **Ferromagnetic**. These include iron, steel nickel, and **Alloys** of these metals. (Alloys are mixtures of metals.) Identify some other metals or alloys which show ferromagnetism. How are these metals made into magnets?
5. Research other ways electromagnets are used, especially in how electromagnetism makes *all* **Electric Motors** work!! Get an electric motor kit and have the more mechanically oriented kids assemble it! Go on a "Motor Hunt"! How many motors are at home?
6. The name magnet refers to an area of Turkey called Magnesia by ancient Greeks. The **Ore** (any material **Mined** from the Earth for a useful purpose) of iron which was magnetic was called **Magnetite**. Ancient sailors called these pieces of rock **Lodestones**, or "leading stones". Find out more about these ancient magnets and their uses!
7. Heating a magnet beyond a specific temperature called the **Curie Point** makes it lose its magnetic properties. Each magnet has its own Curie point. Look up some Curie points.
8. The **Like Poles** of a magnet will **Repel**, **Unlike Poles** will **Attract**. This means a compass needle's "North" pole is a "north seeking" pole, a south pole of a tiny magnet!
9. Put two magnets in bags, arrange their poles alike and unlike in the oil. Observe.
10. How does magnetism help some birds navigate while they're **Migrating**?

### Answers

1. (the Earth's magnetic field)