

# Discover Magnets

Explore how magnets work, and their connection to the aurora!



UAF photo by Todd Paris.

The Earth is a giant magnet. Energy from the Sun combines with the Earth's magnetic field and atmosphere to produce the aurora!

## Materials Needed:

Magnet, paper clips. *Optional:* Small container with a lid.



**Caution:** Closely supervise children during this activity. Recommended for children ages 3 and older. Magnets and paper clips are choking hazards, and can be dangerous if swallowed.

## Instructions:

Let your child(ren) explore the interactions between the magnet and paper clips. Try different experiments and see what happens!

**Hint:** For young children, place the magnet inside a container with a lid so they cannot access the magnet directly, but can still explore its effects on the paperclips. This is helpful, but not a substitute for close supervision.

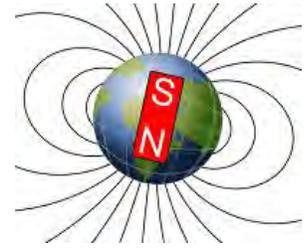
## Challenges to Try:

- How many paper clips can you lift with the magnet at one time?
- Can you use the magnet to line up the paper clips in a row?
- Can the magnet pick up paper clips through an object? (Examples: your hand, a piece of paper, a small toy)
- Can you find other objects that are attracted to the magnet?
- Can you use the magnet to create a paper clip sculpture?
- Explore what happens when you have two magnets!



# The Magnetic Earth and Sun

The Earth is a giant magnet! Just like smaller magnets, it has North and South Poles. Invisible lines of magnetic energy connect the poles through the Earth's atmosphere.



Right: Earth's magnetic field. *Image: Wikimedia Commons.*

The Sun produces an incredible amount of energy. It emits this energy as charged particles that travel across the solar system, called the *solar wind*. The Earth's magnetic field protects us from the solar wind by deflecting most of it back into space. But some particles get caught in Earth's magnetic field, and follow the magnetic field lines toward the North and South Poles. The particles crash into gases in the atmosphere, creating the colorful lights of the aurora.

In Alaska and other northern regions, we enjoy watching these northern lights when the sky is dark.



*Image: Pikist.com*



*Auroral oval around the North Pole. Image: NASA.*

The Sun is an even larger magnet! Scientists are still learning about how magnetic energy travels around the Sun and how it affects the Earth.

**See a model of the magnetic Sun:**

[www.nasa.gov/feature/goddard/2016/understanding-the-magnetic-sun](http://www.nasa.gov/feature/goddard/2016/understanding-the-magnetic-sun)