



MAKING A MAGNETIC LEVITATION DEVICE

— WITH RING MAGNETS —

You will build a simple magnetic levitation (maglev) device using ring magnets. Like poles repel, creating a magnetic force that can make one magnet float above another.



GOAL

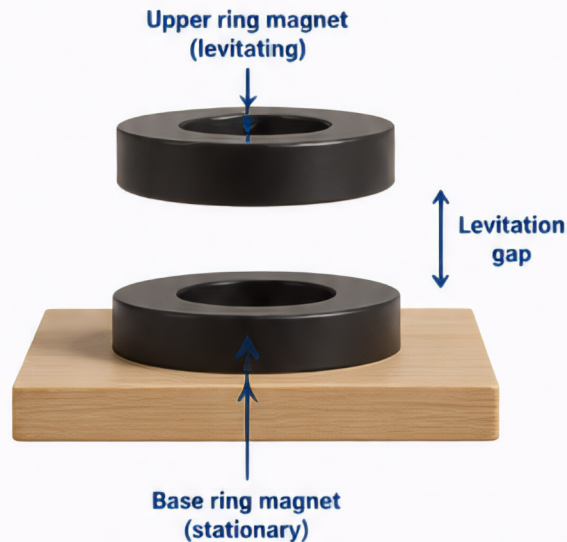
Build a device that uses magnetic repulsion to levitate (float) a ring magnet above another magnet.



SCIENCE IDEA

Magnets have two poles: North (N) and South (S). When like poles face each other, they repel. The repulsive force can push one magnet upward against gravity, causing it to levitate.

Key Concept: Magnetic force can balance the force of gravity.



MATERIALS

- 2 ring magnets (same size)
(Recommended: outer diameter 1.5–2 in / 38–50 mm)
- Wooden base (at least 4 in / 10 cm square)
- Hot glue or strong glue
- Ruler or tape measure
- Safety gloves (optional)
- Soft cloth or felt (to protect surfaces)



SAFETY

- Ring magnets are strong and can snap together. Keep fingers clear to avoid pinching.
- Keep magnets away from electronics, credit cards, and pacemakers.
- Work on a clear, flat surface.



PROCEDURE

- 1 Place one ring magnet flat on the table.
- 2 Hold the second ring magnet above the first.
- 3 Slowly rotate (flip) the upper magnet while lowering it. You will feel strong repulsion when like poles face each other. Stop when the upper magnet levitates.
- 4 Measure and record the levitation gap (distance between magnets).
- 5 Glue the bottom magnet to the center of the wooden base.
- 6 Let the glue dry completely.
- 7 Carefully place the upper magnet above the base magnet and find the levitation point again.
- 8 Test stability by gently moving your hand or the base. Try different sizes or stronger/weaker magnets.



OBSERVATIONS

1. What is the levitation gap (in mm or inches)? _____
2. How stable is the levitating magnet?
☐ Very stable ☐ Somewhat stable ☐ Not stable
3. What happens if you tilt the base?

4. What other variables did you try? _____



THINK & DISCUSS

1. Why do the magnets repel when like poles face each other?

2. What factors affect the height (gap) at which the magnet levitates?

3. How could you make the levitation more stable?

4. What are some real-world uses of magnetic levitation?



CHALLENGE!

Try using stronger magnets or different sizes of ring magnets. Can you increase the levitation height while keeping it stable?

