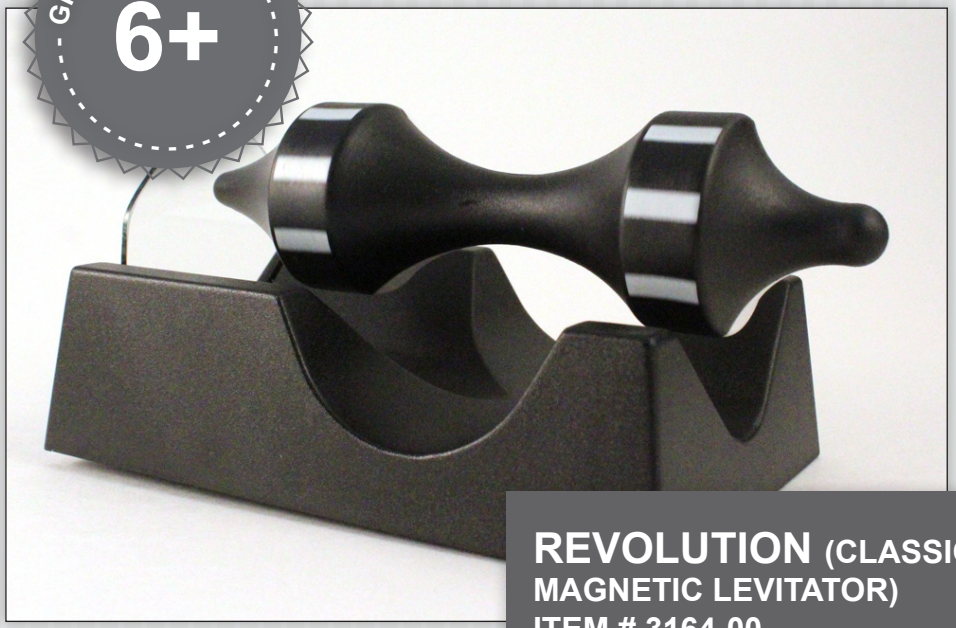
TEACHERS GUIDE

GRADE LEVEL 6+



REVOLUTION (CLASSIC MAGNETIC LEVITATOR)
ITEM # 3164-00

ENERGY - MAGNETISM

This fascinating anti-gravity demonstration works on the principle of repelling magnets and is ideal for discussing magnet levitation and frictional force experiments. With a simple twist of the fingers the axle spins horizontally in a state of near perpetual motion for up to 20 minutes. Black and white reflecting strips on axle allow students to observe the patterns created by the alternating colors and to measure rotation speed using a stroboscope (not included).

- Approximate product size: 2-1/2” x 5” x 3” deep.
- Batteries are not required.

Materials

- Two large strong magnets
- Video on Maglev Trains
- Optional: Bicycle

Suggestion: https://www.youtube.com/watch?v=iaElPV0FWJ0

Goals & Objectives

Students will:

- review the properties of magnets.
- understand the property of magnetic levitation.

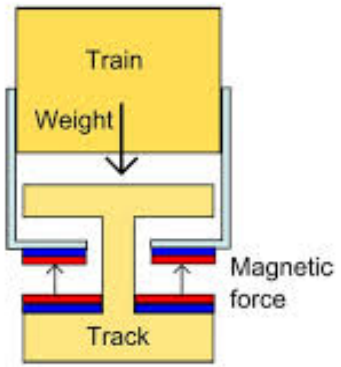
Discussion

Optional Study and Discussion

1. Discuss the differences between the Maglev Trains and this Magnetic Levitator.
   - Maglev Trains use electromagnetism whereas the Magnetic Levitator has no power or batteries. In the Maglev trains the electricity CREATES the magnet. In the Levitator, the magnet acts alone and independent of batteries or electricity.
2. Research super conductors.
3. **Critical Thinking:** What could you create using the principle of magnetic levitation? What are some practical applications for magnetic levitation?

Activities

1. Review the properties of magnets. Using two strong magnets, review the principle that opposite poles attract and like poles repel. Demonstrate for students. If time and resources allow, let students experiment themselves with the magnets.
2. Introduce the property of magnetic levitation. Write the words “magnetic levitation” on the board. Begin by showing students a video on “maglev trains.”
   - You may use video from **materials** section or find a video on the science behind Maglev Trains on the internet or at your local library.



The video explains that trains are built using the principle of magnetic levitation. Note that the train is “floating” on the track and because there is no “friction” the train can go super fast.

3. Optional Demonstration: Using the bicycle, lift the front tire up off the ground and spin the tire. The tire slows because of friction. If there were no friction, the tire would continue spinning for a lot longer. Record the length of time the bicycle tire spins.
4. Introduce the magnetic levitator to the class. Show the bar and the stand separate. Ask students to pair together and predict what will happen if you place the bar on top of the stand. Place the bar on the stand and spin. It will continue spinning because there is no friction except for air. Record the length of time the levitator spins. Spin it the opposite way. Put a pen underneath the spinning bar to show that it doesn’t change the properties of magnetic levitation.

Note

It is always best to DO an experiment ahead of time to be able to best present it to the class.