



What Do Magnets Attract?

Boys and Girls Club After School Science
NSF Center for Chemical Innovation
Chemistry at the Space Time Limit (CaSTL)
<https://www.castl.uci.edu/>

Lesson Objective: Children will begin to explore the forces of magnets while in cooperative groups and by making observations and talking to their partners. They will predict what materials might be attracted to magnets

Materials Used: Large magnets, class-sized chart paper for recording student responses

Student Talk Strategies: *Report to a Partner, Revoicing*

Classroom Management: CHAMPs

Conversation: Children may talk with inside voice to their partners only. **Help:** If children need help, one of the group will raise a hand to let the teacher know. **Activity:** Children will use manipulatives, make observations, and draw the materials and forces. **Movement:** Children will stay at their place. **Participation:** All children in the group are expected to take turns and handle the manipulatives.

Funding and Credits:

This project was funded by the National Science Foundation Centers for Chemical Innovation award #1414466 and #0802913 to V. Ara Apkarian, Ph.D. at the University of California, Irvine, Department of Chemistry. This lesson was written by Therese B. Shanahan, Ed.D., University of California, Irvine, School of Education and Cal Teach.

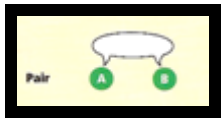
ENGAGE: <i>Connect to Prior Knowledge and Experience, Create Emotionally Safe Learning Environment, Preview New Vocabulary</i>		
		Estimated time: 15 minutes
Teacher's Role	Teacher Questions	Children's Role
1. Teacher reviews students' prior knowledge of forces from previous lessons. Teacher scribes students' answers on a class-sized chart. 2. Teacher tells students that there is another force that they	1. What is a force? How do forces work? What are examples/demonstrations of forces? Can you name some forces?	1. Students report out to the whole class.

will observe today. It's called Magnetic Force.		
EXPLORE: <i>Hands-On Learning, Contextualize Language, Use of Scaffolding (Graphic Organizers, Thinking Maps, Cooperative Learning), Use of Multiple Intelligences, Check for Understanding</i> Estimated time: 15 minutes		
Teacher's Role	Teacher Questions	Children's Role
1. Teacher gives students a new magnet and asks them, in pairs, to first predict and then to investigate different objects around the room that are attracted to the magnet.	1 Report to a partner: Ask your elbow partner, "What do you think will be attracted to the magnet?" "Why do you think that?"	1. Children respond individually by talking to an elbow partner (Report to a Partner). Naïve conception: Some children think that all metals are attracted to magnets.
EXPLAIN: <i>Listening, Speaking, Reading, and Writing to Communicate Conceptual Understanding</i> Estimated time: 5 minutes		
Teacher's Role	Teacher Questions	Children's Role
1. Teacher has pairs report out. Teacher records findings in a T-chart, using drawings and words (attracted/not attracted). 2. Teacher listens to groups' reports and repeats or Revoices (one of the five productive talk moves) what they say to be sure that the class is noticing patterns and the learning is addressing the standards.	1. Each group will now tell us what they observed. What did you find around the room that was attracted to the magnet? Was your prediction correct?	1. Children in their groups tell the whole class what they observed.
EVALUATE: <i>Thinking Maps, Summarize Lesson and Review Vocabulary, Variety of Assessment Tools, Games to Show Understanding</i> Estimated time: 5 minutes		
Teacher's Role	Teacher Questions	Children's Role
1. Teacher finds objects in the room that the children did not investigate and asks the students if the objects will be attracted to the magnet. Teacher takes a vote. Then,	1. Teacher asks each student to ask their partner, "Do you think this ____ will be attracted to the magnet?" Each student must respond.	1. Children decide whether the object will be attracted. They vote.

the teacher performs the demonstration.	<p>Was the object attracted to the magnet?</p> <p>How are the objects that are attracted to the magnet similar?</p> <p>How are the objects that are not attracted to the magnet similar?</p>	<p>Students observe and reflect on their prediction.</p> <p><i>“The ones that attract the magnet are all metal.”</i></p> <p><i>“The ones that do not attract the magnet are made of wood or paper.”</i></p>
<p>EXTEND: Group Projects, Plays, Murals, Songs, Connections to Real World, Connections to Other Curricular Areas</p> <p style="text-align: right;">Estimated time: 5 minutes</p>		
Teacher’s Role	Teacher Questions	Children’s Role
1. Teacher asks students to explore objects outside, at home, and around the Club that are attracted to magnets.	1. What do you think you’ll find at home? Where do you have some magnets at home?	1. Students begin to think about places and times they’ve seen magnets (in use) in other places.

Student Talk Strategies

Adapted from *Avenues* (2007). Hampton Brown.

Design	Description	Benefits and Purposes
<p>Report to a partner</p> 	<ul style="list-style-type: none"> • Each student reports his/her own answer to a peer. • The students listen to their partner’s response. (“Turn to a partner on your left.” “Now turn to a partner on your right” etc.) 	<ul style="list-style-type: none"> • This allows students to talk to different students in the class and gives each student an opportunity to share and listen to various answers and language structures. • Talking one-on-one with a variety of partners gives risk free fluency practice. • Students practice speaking and listening.

Magnet T-Chart

Did Attract	Did Not Attract