

Force, Motion, Energy and Matter

ASOL:

SFME 1: The student will investigate and understand that magnets have an effect on some materials, make some things move without touching them, and have useful applications. Key concepts include:

- a) attraction/nonattraction, push/pull, attract/repel, and metal/nonmetal.

Sample Activity:

Given magnets of varied sizes and shapes, the student will investigate a variety of teacher selected materials in the classroom and throughout the school. The student will discover which items the magnets will attract. Divide the students up in pairs (a general education peer would be ideal). Give each pair a magnet and a digital camera. Have the students take pictures of three to five items on which the magnet is attracted. Upon completion of this activity. Have the students place pictures on a chart, in a book or scan into the computer. Repeat this process for each property of the magnets. It may be beneficial to demonstrate the properties first. Following the completion of all of the properties, the student will complete a chart of materials through sorting the pictures by attributes (pushed/pulled, attracted/repelled, attracted/not-attracted from/to magnets).

Materials Needed:

- Different kinds of magnets: different sizes and shapes.
- Objects which will attract, push or pull, or are metal or non metal.
- Digital camera.
- Poster paper or computer.

Instructional Setting(s):

- School wide activities.

Community Connections and/or Peer Interaction:

- With a general education peer the student will find ways magnets help people within the school environment.

Functional Activity/Routine:

- Have students hang posters or signs from walls, doors or filing cabinets using magnets.
- Students could make labels for storage cabinets and use magnets to hang labels on the cabinets.

Strategies to Collect Evidence:

- Photos with captions that show the students end product of sorted materials by attributes (pushed/pulled, attracted/repelled, attracted/not-attracted from/to magnets).
- Video of the student sorting materials by attributes (pushed/pulled, attracted/repelled, attracted/not-attracted from/to magnets).

- Work product of the pictures of the objects sorted into right category.

Specific Options for Differentiating this Activity:

- **Size and scope of activity:** Reduce the number of choices or/and create a book that shows the results of the students investigations.
- **Support:** Using a general education peer partners; vary the size and weight of the magnet; use a bingo chip wand for better grasp.
- **Assistive Technology:** Scan pictures to create a computer activity reinforcing magnets.
- **Multi-Sensory:** Use magnet blocks or other magnetic toy or sculpture to create original designs.

Force, Motion, Energy and Matter

ASOL:

SFME 2: The student will investigate and understand that moving objects exhibit different kinds of motion. Key concepts include:

- c) pushes or pulls can change the movement of an object.

Sample Activity:

Given an age-appropriate model cars such as Soapbox Derby Car, matchbox, NASCAR, have student participate in an experiment to discover how pushes and pulls can change the movement of the car. Attach the rope/string to the front of the car. Tape off the perimeter of the car. Have student push the car forward and pull the car backward over the tape lines. Discuss what causes the car to move forward and backward. Take pictures of student moving the car forward and back. At the conclusion have student sort picture on a T chart under the correct heading.

Materials Needed:

- Age-appropriate model cars - Soapbox Derby Car, matchbox, or NASCAR.
- Rope or strings.
- Tape.

Instructional Setting(s):

- Classroom, hallway with general education peers.

Community Connections and/or Peer Interaction:

- With a general education peer the student will find objects within the school environment that are pushed or pulled.

Functional Activity/Routine:

- Have students use items within the school environment that help people complete task through the use of “pushing” and “pulling.” e.g. vacuuming, dusting, sweeping, mopping.

Strategies to Collect Evidence:

- Photos with captions that show the student pushing/pulling the car.
- Worksheet that documents the results of the student’s experimentation.

Specific Options for Differentiating this Activity:

- **Size and scope of activity:** Create a book that shows the results of the students investigations in the school of objects that can be pushed or pulled.
- **Support:** Using non-disabled peer partners.
- **Assistive Technology:** Use Boardmaker symbols showing push and pull. Augmentative communication device to answer “yes”/”no” question with peer throughout the school environment.

Force, Motion, Energy and Matter

ASOL:

S-FME 4: The student will investigate and understand simple machines and their uses. Key concepts include:

a) types of simple machines (lever, screw, pulley, wheel and axle, inclined plane, and wedge).

Sample Activity:

This activity addresses the concepts that different kinds of simple machines exist and do different jobs. The students will collect digital photographs of simple machines. They will utilize the photos while creating a graphing page for counting simple machines in the school environment. The students will graph the number of simple machines they find within the school environment. Peers will keep track of specific simple machines found. They will discuss the results in the classroom.

Materials Needed:

- Scavenger Hunt:
- Graph of simple machine

Instructional Setting(s):

- Classrooms, cafeteria, office, hallways with general education peers.

Community Connections and/or Peer Interaction:

- With a general education peer the student will find objects within the school environment that are simple machines.

Functional Activity/Routine:

- Following an instructional lesson with actual examples of simple machines, having the students will find, use, and identify simple machines within the school environment.
- Have the students attempt to perform an activity without the use of a simple machine. (For example, tear paper instead of using scissors; lift an object instead of having a lever.)
- Have the students recognize how simple machines can make work easier.

Strategies to Collect Evidence:

- Work sample (graph) and peer interview discussing the process of finding simple machines in the school environment.

Specific Options for Differentiating this Activity:

- **Size and scope of activity:** Limit the number of simple machines that a specific student is required to find. Make an example of a simple machine with a general education peer. Create a book that shows the results of the students investigations with labeled photos of simple machines in the school or found in magazines.
- **Support:** Using a general education peer partners; Use adapted tools if necessary
- **Assistive Technology:** .Use students augmentative communication device, computer games.
- **Multi-Sensory:** Utilization of real-life examples of simple machines.

Force, Motion, Energy and Matter

ASOL:

S-M 2: The student will investigate and understand that water flows and has properties that can be observed and tested. Key concepts include:

- a) Water occurs in different states (solid, liquid, gas).

Sample Activity:

During a small group activity, the student will follow picture paired with words directions to experience water in different states. First, the student will mix a pack of flavored drink mix with water and when asked, the student will identify this state as “liquid/water.” The student will then pour the water into an ice cube tray and place it in the freezer. While the flavored water is freezing, the student will add two tablespoons of salt to two cups of water and boil it. As the water boils, and steam arises, the teacher will hold a mirror or non-porous surface over the water so the student can touch and draw on the condensation collected. When asked, the student will label this state “gas/steam.” When all the water has evaporated and the pot has cooled, the student will touch and feel the salt residue that was left when all the water boiled away. Later, the student will retrieve the frozen cubes in solid state, label this phase as “solid/ice” and then eat the frozen product.

Materials Needed:

- Water
- Pitcher
- Ice cube trays
- Popsicle sticks (this is optional, and something the teacher could place into the cubes when they are in mid-frozen state)
- Pot
- Salt
- Mirror or non-porous surface
- Napkins
- Flavored drink mix
- Heating source
- Visual direction cards for the activity

Instructional Setting(s):

- Classroom or instructional space with heating source.

Community Connections and/or Peer Interaction:

- Visit cafeteria, neighborhood restaurant, or hot beverage vendor that sells liquids in solid or liquid state.
- Purchase ice novelty treats when in the community.
- Small group learning could take place with non-disabled peers.
- Invite other classes and general education peers to share in enjoying water in various states, (popsicles, hot drinks, cold drinks).
- Hold a special event, such as “Wonderful Wet Wednesday” and invite general education peers to enjoy water activities.

Functional Activity/Routine:

- Identify uses of water in different states throughout the student's day, including: steam in the bathroom, water in the shower or bath, ice in a drink, ice for first aid.
- Identify different states of water in food preparation.

Strategies to Collect Evidence:

- Videotape the student completing the picture instructions and identifying the different states of water displayed.
- Work sample of a chart/collage separating the three states of water.
- Interview with a non-disabled peer or support staff that observed the student completing the picture instructions and identifying the different states of water displayed.

Specific Options for Differentiating this Activity:

- **Size and scope of activity:** Reduce or expand the activity, for example, the student would complete the activity for only two states of water, or expand the activity to include identifying states of water in nature.
- **Assistive Technology:** Use a whistling tea kettle to signal when the water is boiling: Use computer software to generate and present the picture instructions. Use voice output devices to give auditory message associated with picture symbol. Scan digital photos or use photos and have student sort pictures into categories of solid, liquid or gas.

Force, Motion, Energy and Matter

ASOL:

S-M3: The student will investigate and understand how different common materials interact with water. Key concepts include:

- b) some common solids will dissolve in water, but others will not.

Sample Activity:

During a small group activity, the teacher demonstrates the concept of dissolving by modeling. First the teacher will pour salt in water and stir. The teacher asks students to predict if paperclips will dissolve and then places their responses on the chart. Then stir paper clips to show that they do not dissolve. Place the paper clip graphic under “No.” The students select a cup that contains one of the following substances: sugar, powdered laundry detergent, sand, and rocks. Each student can feel their substance and predict if the substance will dissolve, and place their prediction on the dissolving Yes/No chart. Students will add water to their cups and stir and record the outcome on the Yes/No chart. The students will create an individual chart where they place picture cards of all objects into the correct outcome column.

Materials Needed:

- Powdered laundry detergent
- Sugar
- Sand
- Rocks
- Clear plastic cups
- Spoons
- Materials to make a class and individual charts
- Picture symbols for charts
- Paperclips

Instructional Setting(s):

- Classroom or Outside.

Community Connections and/or Peer Interaction:

- Gather items needed for the experiment such as rocks or sand.
- Guest speaker such as gardener, geologist, or civil engineer that can discuss the impact of substances that do and do not dissolve.
- Have each child paired with a non-disabled peer to complete the activity.
- Students could pair with a non-disabled peer to collect samples in nature.

Functional Activity/Routine:

- Helping do laundry at home. Using water and other substances to make recipes.

Strategies to Collect Evidence:

- Completed student chart with editor’s notes.
- Videotape the student contributing to the activity.

Specific Options for Differentiating this Activity:

- **Size and scope of activity:** Reduce or increase the number of objects tested, eliminate or expand the prediction component.
- **Support:** Assist student as needed with physical tasks.
- **Multi-Sensory:** Create a graph using the actual objects tested that students can touch and feel.