**Station Outlines**

**Title of station:** Magnetism

**Station Big Idea:** Scientists can measure forces

**Materials at station:**

* 4 round magnets
* Paper clips
* Small washers
* 2”x2” squares of tagboard

**Poster:**

* **Images:** select several images of magnets at work
* **Text:** Magnets have measurable forces. How can you measure these forces using the materials at the station? Remember to document evidence of your work.

**Grade range**: 3-5

**To the teacher:** There are multiple strategies students can follow at this station. They can see how long a string of paper clips one magnet can hold. They can try two magnets. Does that double the paper clips? They can try barriers between the magnet and the paper clip. How many tagboard squares does it take before the distance is too much for the magnetic force to hold up a paper clip. Push for multiple strategies and documentation of their evidence

**Safety and management:** These small magnets are tempting to be pocketed. We have had some luck with a square of steel divided into four quadrants. When leaving the station, students need to put on magnet in each quadrant.

**DCI:**

**PS2.B: Types of Interactions**

* Objects in contact exert forces on each other. (3-PS2-1)
* Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3),(3-PS2-4)

**CCC:**

**Patterns**

* Patterns of change can be used to make predictions. (3-PS2-2)

**Cause and Effect**

* Cause and effect relationships are routinely identified. (3-PS2-1)
* Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)

**SEP:**

* Asking Questions and Defining Problems
* Planning and Carrying Out Investigations

**Title of station**: Pendulum Motion

**Station Big Idea:** Objects in motion follow predictable patterns

**Materials at station:**

* Anchor point 16”-24” above the golf tee pad on the table top
* Golf ball with screw eye and string long enough to be ½” above the golf tee pad
* Golf tee pad: 16” x 16” ½” plywood with ⅜” holes drilled ⅛” deep at each intersection of a 1.5” grid
* Golf tees to be placed upside down in each hole.

**Poster:**

* Images: Clock, swingset. Look for several others that would capture attention.
* Text: Try swinging the ball. Observe. What do you notice? Put up the golf tees. Try it again. Observe. What do you notice? Remember to document evidence of your work.

**Grade range:** 1-4

**To the teacher:** Students get a chance to observe carefully through this station. They can put up all the golf tees to see the full path the pendulum takes, or set up one and use their knowledge to knock it down. Remember the importance of a focus on documenting evidence.

**Safety and management:** Be alert to the potential misuse of the pointed end of the tees.

**DCI: PS2-A Forces and Motion:** The patterns of an object’s motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it.

**CCC: Patterns:** Patterns of change can be used to make predictions. (3-PS2-2)

**SEP:**

* Asking Questions and Defining Problems
* Planning and Carrying Out Investigations

**Title of station**: Mealworms

**Station Big Idea:** All living things have structures that help them live.

**Materials at station:**

* Mealworm colony in a plastic tub
* Hand lens
* Spoon
* 9”x12” sheet of construction paper

**Poster:**

* Images: Selected images of mealworms at each stage of its life cycle
* Text: All plants and animals have body parts that help them live in their world. Examine this colony of mealworms. What do you notice? What do you wonder about? Document evidence of what you find.

**Grade range:** K-3

**To the teacher:** Students are naturally interested in living things. Mealworms provide an easy-to-care for, engaging classroom animal. Within the colony should be models of each of the life cycle stages of a mealworm: egg (Likely too small to see) - larvae - pupae - adult. Be alert to helping students see each of these stages as the same organism.

**Safety and management:** This is a good time to raise the ethics of working with living things. Students should use hand sanitizer after working at this station.

**DCI: LS1.A: Structure and Function**: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.

**CCC: Structure and Function:** The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

**SEP: Analyzing and Interpreting Data:** Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)

**Title of station:** Turtles

**Station Big Idea:** The wide diversity of life

**Materials at station:**

* Aquarium (at least 29 gallons) for turtle
* Terrarium (at least 40 gallons) for tortoise

**Poster:**

* **Images**: Include images of turtles in their natural environment
* **Text**: Turtles are fascinating animals. Observe closely their behaviors and responses to their environment.

**Grade range**: K-6

**To the teacher:** Turtles and tortoises are fascinating animals for students to observe. Have space prepared for students to take them out crawl around on the floor. With proper planning, students love to be brought into their care.

**Safety and management:** Despite their inherent interest, turtles and tortoises, they are labor intensive to keep healthy and clean. Safety precautions must be taken with students using antiseptic lotion after handling.

**DCI: LS1.A: Structure and Function**: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.

**CCC: Structure and Function:** The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

**SEP: Analyzing and Interpreting Data:** Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)

**Title of station:** Classification

**Station Big Idea:** Scientists group objects by common characteristics.

**Materials at station:**

* Objects to sort - buttons, toy animals, attribute blocks, rocks, leaves, letters, words, fabric, etc. Some collections can be brought together for richer sorting.
* Hand lenses
* Sorting mats

**Poster:**

* Images: Any variety of piles of objects.
* Text: Scientists sort things to help them understand. Then they sort them again in new way. How can you sort these objects? How many ways can you sort them? Document your findings.

**Grade range**: K-3

To the teacher: We vary the collection, but this station continues to draw children’s interest. It is a great place to probe their thinking. Why did they sort that way? What other ways can you sort them?

**Safety and management:** Be mindful of small objects. This is a center that can draw in parents offering some of their collections for sorting.

**DCI: PS1.A: Structure and Properties of Matter:** Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1)

**CCC: Patterns:** Patterns in the natural and human designed world can be observed. (2-PS1-1)

**SEP:** Construct an argument with evidence to support a claim. (2-PS1-4)

**Title of station:** Marble roll

**Station Big Idea:** Gravity provides the force for the marble to get from the top to the bottom. Engineers can use that force to create interesting movements as the marble travels down.

**Materials at station:**

* A collection of wooden blocks in all shapes and size, boards, ramps, etc.

**Poster:**

* Images: Roller coasters
* Text: What can you learn as the marble travels from top to bottom?

**Grade range:** K-5

**To the teacher:** This exploration of motion offers broad opportunities for learning. Pay attention to what the students are trying to do. When appropriate offer a clarification of what they are trying to do and a gentle nudge helping them with an investigative plan.

**Safety and management:** This can provide excitement and movement. Be mindful of keeping their investigations under control.

**Note:** There are multiple formats to use to build a marble roll station. Another favorite is to use a pegboard wall with pegs and foam pipe insulation. This allows limitless possibilities and is a bit more contained.

We have also set up a sheet metal covered wall and used magnetic marble runs.

**DCI: PS2-A Forces and Motion:** The patterns of an object’s motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it.

**CCC: Cause and Effect**

* Cause and effect relationships are routinely identified. (3-PS2-1)
* Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)

**SEP:**

* Asking Questions and Defining Problems
* Planning and Carrying Out Investigations