



Education Component - Water Works (Science)

Science Pre-K Standard/IEKS

Pre-K Standard VII.A.2: Child investigates and describes position and motion of objects.

Kinder: (6) Force, motion, and energy. The student knows that energy, force, and motion are related and are a part of their everyday life. The student is expected to:

(C) observe and describe the location of an object in relation to another such as above, below, behind, in front of, and beside; and

(D) observe and describe the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow.

1st: (6) Force, motion, and energy. The student knows that force, motion, and energy are related and are a part of everyday life. The student is expected to:

(C) describe the change in the location of an object such as closer to, nearer to, and farther from; and

(D) demonstrate and record the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow.

2nd: (6) Force, motion, and energy. The student knows that forces cause change and energy exists in many forms. The student is expected to:

(C) trace the changes in the position of an object over time such as a cup rolling on the floor and a car rolling down a ramp; and

(D) compare patterns of movement of objects such as sliding, rolling, and spinning

3rd:(6) Force, motion, and energy. The student knows that forces cause change and that energy exists in many forms. The student is expected to:

(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons.

4th:(6) Force, motion, and energy. The student knows that energy exists in many forms and can be observed in cycles, patterns, and systems.

(D) design an experiment to test the effect of force on an object such as a push or a pull, gravity, friction, or magnetism.

5th:(6) Force, motion, and energy. The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:

(D) design an experiment that tests the effect of force on an object.

TAKS-Ait Essence Statement: Recognizes that forces can cause changes in the motion of the object.

6th:(8) Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to:

(B) identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces;

7th:(7) Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. The student is expected to:

(C) demonstrate and illustrate forces that affect motion in everyday life such as emergence of seedlings, turgor pressure, and geotropism.

8th: (6) Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. The student is expected to:

(A) demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion;

TAKS-Ait Essence Statement: Recognizes that forces can cause changes in the motion of an object.

9th: No force and motion standard at this grade level.

10th: (5) Integrated Physics and Chemistry. The student knows concepts of force and motion evident in everyday life. The student is expected to:

(A) calculate speed, momentum, acceleration, work, and power in systems such as in the human body, moving toys, and machines.

TAKS-Ait Essence Statement: Recognizes that relationships between force and motion can be applied to everyday experiences.

11th: (5) Integrated Physics and Chemistry. The student knows concepts of force and motion evident in everyday life. The student is expected to:

(A) calculate speed, momentum, acceleration, work, and power in systems such as in the human body, moving toys, and machines;

(D) investigate and demonstrate [mechanical advantage and] efficiency of various machines such as levers, motors, wheels and axles, pulleys, and ramps.

TAKS-Ait Essence Statement: Recognizes that relationships between force and motion can be applied to everyday experiences.

Science

Objective: While visiting the Water Works area at Morgan's Wonderland, the student will be able to describe the motion of objects being placed in water and observe the direction of the flow of water using instruments within Water Works area.

Engagement: Before visiting the Water Works area at Morgan's Wonderland, have the class brainstorm words they think of when they hear the words motion and/or movement. Create a concept web on the board using all of the words the

students brainstormed. Explain to the students that they are going to participate in an activity involving movement and the words from the concept web. Have students line up in classroom. Have students walk in a straight line and ask, "What direction did you walk?" Possible answers could be: forward, straight, across the room, etc. Have some students stand in the way of this line moving forward so the line will now have to walk around the "obstacle". Now have students describe the path the students walked. Possible answers could be: around, to the right/left. Create several more paths filled with "obstacles" and have class describe the paths they took.

Explain to students that at the Water Works area today they will see water that is in motion. They will use observation skills to detect a variety of objects in motion.

Accommodations: Give picture or word cards to students that have words or pictures describing motion.

Exploration: Once at the Water Works area, encourage the students to explore and interact with all sections of the water area. Gather students around the section of the water area that encompasses the boards that can be moved to change the flow of water. Ask students to describe the motion of the water and then have different students take turns moving the boards around. Ask what difference they see in the motion of the water. After a few students have changed the flow of water, introduce different objects that float. Ask what will happen when different objects are put in the water (examples could be small rubber duck, toy boat, ball, etc.). Have students observe all the objects put in the water while different students are moving the boards to change the flow of the water. Allow students to move to the area where they can use instruments to move and squirt the water. Have students compare and contrast the difference in the motion of this water compared to the area where they moved boards and floated objects.

Accommodation: Using hand over hand if necessary/ have student take turns moving boards within the water area. Using the same pictures used in engagement/ ask student if any of these words or pictures can be used to describe the motion of the water.

Explanation: Have students get into cooperative learning groups and provide each group with construction paper or large writing paper and pencils. Have each group draw the direction of motion for each of the objects placed within the water. Have them use descriptive words under each drawing to describe movement (straight, zigzag, forward, round and round, up/down, rolling, spinning, etc.)

Accommodation: Provide assistance so student can actively participate in group discussion. The student can use the actual pictures they have been using during engagement and exploration.

Extension: Once back in the classroom, create another concept web on the board. Have students brainstorm words they now know are associated with motion. Have students get in cooperative groups and assign each group an object or instrument that was used in the water area (rubber duck, ball, fixed moving and squirting instruments, etc.) Have students choose one of the following: draw a picture, act out, or create a 3D model that demonstrates the directional flow of their object in the water.

Accommodation: Give student a new set of word or picture cards with descriptive words that would describe the direction of motion objects took in the water area. Make sure student has access to materials so they can participate in group activity.

Evaluation: The student will have mastered the objective if they are able to describe the motion of objects.