Activities and the TEKS

Classroom Contributions by UTEP Student Interns

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Fireproof Balloon Experiment - Lizette Chavez

Science Grade 4 - TEKS

Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:

(A) Plan and implement descriptive investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;

(B) Collect information by observing and measuring;

(C) Analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

(D) Communicate valid conclusions.

Goal of the Activity:

Balloons are rather fragile things. You know that they must be kept away from sharp objects. The also need to be kept away from flames. A fire can weaken the rubber and cause it to burst. However, in this experiment you will find out how you can hold a balloon directly in a flame without breaking the balloon.

For this experiment you will need:

- two round balloons, not inflated
- several matches
- water

Step by step instructions:

Inflate one of the balloons and tie it closed. Place 60 milliliters (¼ cup) of water in the other balloon, and then inflate it and tie it shut.

Light a match and hold it under the first balloon. Allow the flame to touch the balloon. What happens? The balloon breaks, perhaps even before the flame touches it.

Light another match. Hold it directly under the water in the second balloon. Allow the flame to touch the balloon. What happens with this balloon? The balloon doesn't break. You may even see a black patch of soot form on the outside of the balloon above the flame.

How would I implement this activity in my classroom?

I would gather all my students around in a big circle. I would be in the middle of the circle and have them participate with me by having them follow with me the step by step process and let them participate.

What Gives A Bounce? - Laura Zuniga

Grade Level: 6

TEKS: 112.22(7) Science concepts. (A) (B).

Here's how it's done!

Steps: 1st gob

1. Add I teaspoon powdered borax to ½ cup water. Stir until the borax stops dissolving (there will still be borax at the bottom of the container).
2. Place 2 tablespoons of glue in a clean cup. Wash the measuring spoon right away.
3. Add a drop of food coloring and stir. Add two teaspoons of borax solution to the glue and stir.
4. Set the goop aside until the next two gobs are done.

2nd gob

5. Pour two tablespoons o9f glue into a clean cup.
6. Slowly pour one tablespoon of liquid starch into the glue.
7. When the mixture looks like it is the consistency of chewing gum, lift the glue out of the starch and knead it with your hands. The mixture may begin to fall apart, so if it is sticky, add a little bit more starch. If it is stringy, add a little bit more glue, if it is too runny add a tiny pinch of salt.
8. Knead until you can form a ball.
9. Add a drop of another color food coloring and work it in the mixture.

My goal for this activity was engage the students in experimenting with mixing liquids and solids to make two types of semi-solids.

The objective of this activity is to allow students the opportunity to learn that substances have physical and chemical properties.

My instructional method for this activity was definitely collaborative work. The students will be able to make observations and record their findings. In this setting the students will be able to make predictions about the outcome of their mixtures. In this activity the teacher will be able to informally asses students as she observes the comments made by the students about the changes in physical properties in the mixtures of the compounds.

The concepts that this activity address are the classification of substances by their physical and chemical properties.

The Hammer That Defies Gravity - Manuel Gutierrez

Grade Level: 8th

Objective: Students will demonstrate the use of their powers of observation and critical thinking to discover how an object's center of gravity affects its balance.

TEKS: 112.24b (3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:

(A) Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.

Materials:

1. A hammer with a wooden handle and a metal head.
2. A wooden ruler or stick of the same approximate size of a ruler.
3. A 1-foot piece of string or very light wire.

Step by step Instructions:

1. Make a loop in the string or light wire about 4" (10 cm) in diameter.
2. Slip the loop of string or wire around the ruler and the hammer handle.
3. Let the end of the hammer handle press against the ruler. If you have problems with the string or wire slipping up the hammer handle, file a small notch in the handle.
4. Hang the entire system from the edge of a table. The hammer will seemingly defy gravity and should hang and not fall.

How Would I Implement This Activity in my classroom?

The way I would implement this activity in my classroom is I would have the hammer system set up where the students can see it come into the classroom. Then I would have each student write down what they think is making the hammer not fall.

Test My Density - Claudia Salgado

Lesson Plan
Grade: 6^{th} grade
Content Area: Science

TEKS:
(2) Scientific processes. The student uses scientific inquiry methods during field laboratory investigations. The student is expected to:
(B) collect data by observing and measuring;
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
(D) communicate valid conclusions.

(4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:
(A) collect, analyze, and record information using tools including beakers, Petri dishes, meter sticks, graduated cylinders, weather instruments, timing devices, hot plates, test tubes, safety goggles, spring scales, magnets, balances, microscopes, telescopes, thermometers, calculators, filed equipment, compasses, computers, and computer probes.

Topic
Density "Relative densities of solids and liquids"

Objective
Classify liquids and solids based on their densities based on how they arrange themselves when combined.

Integrated Process
Observing
Collecting and recording data
Interpreting Data
Generalizing

Materials
Test tubes or vial- 4small and one large
Corn syrup
Glycerin
Piece of wood or cork
Piece of pink eraser (Pink Pearl)
Food coloring, optional
Corn oil
Water
Piece of art gum eraser

Piece of steel alloy
Graduated cylinder

Background Information
Students are often confused when working with the concept of density. Density is a mass to volume ratio. This activity involves the observation of the relative densities of some solids and liquids. The observation of the layering of liquids should help reinforce the concept of density. Further reinforcement occurs as solids are added to the liquid layers and students are asked to compare the densities of the solids to the liquids.

Management
1) The liquids should be in four containers marked A,B,C and D. There should be the same amount of liquid in each container. (2 oz will be a good amount)
2) Students are to determine what substance is in each container.
3) Food coloring should be added to the water to make a distinction between water and glycerin.
4) Be sure that the liquids from all four small test tubes and the solids can easily be contained in the large test tube.
5) Be sure that the pieces of solid are small enough that they can fit into the test tube easily and can pass each other no matter what order the students choose to drop them into the test tube.

Procedure
1) Divide the class into groups of four to six students
2) Have the students pour 2 ounces of liquid A into the first container. Do the same for liquid B,C, and D.
3) Allow students to smell and touch the liquids to determine what they are. A list with the four liquids will be given to each group and they are to label each container based on their findings. Have them record their results on the activity sheet.
4) Students are to predict what will happen to the liquids if they are to be poured into one container. Have them write down their predictions on the activity sheet.
5) Distribute a large test tube to each group. Direct the students to pour each liquid in the largest test tube. Liquids can be poured in any order.
6) Ask the students to determine which solid is to be No. 1, No. 2, etc. Have them list the numbers and the solids on the activity sheet. Direct them to drop the solids into the liquids in varied orders and record their observations.

Discussion
1) What was the volume of each of the liquids? (2 oz) If all of them had the same volume, why are they layered? (They have different masses.)
2) Does it make a difference which of the solids is poured first into the container? Does it make a difference which of the solids is dropped in first?
3) Where your predictions about how the liquids will layer correct?
4) What other liquids will you like to test?.....what solids?

Extensions
Select other liquids and find their relative densities

Overview
What weights more a box full of crayons or the same box full of popcorn? Why does a box full of crayons weigh more than the same box full of popcorn if they occupy the same space? It is all a matter of density. Density is a measure of the “compactness” of a material. It is a comparison of the heaviness or lightness of the same volume of materials. If all liquids have similar characteristics, do you think they have the same density?

Liquids
Water
Corn Oil
Glycerin
Corn Syrup

Solids
Piece of art gum eraser
Piece of cork
Piece of steel alloy
Piece of pink eraser

Instructions
1) Label the containers or test tubes A, B, C, and D.
2) Pour 2 oz of liquid A into the A container. Follow the same steps for the rest of the liquids.
3) Try to determine what each liquid is and record the name of each liquid on the activity sheet.
4) Predict on what will happen if all four liquids are to be poured into one container. Record your predictions on the activity sheet.
5) Pour each liquid (one at a time) into the big container in any order you want. Record your observations.
6) Drop the solids (one at a time) into the container with the liquids.
   Allow them to come to rest. Compare the solids to the liquids by completing the statements on your activity sheet.

Test My Density Activity Sheet

Liquids

A ______________________________ B______________________________

C_______________________________ D______________________________

Prediction
What will happen if all four liquids are to be poured into one container?

____
____
____
____
____
____

What happened to the liquids as you poured them into the container? Record your observations.

____
____
____
____
____
____

Solids

1_________________________ 2______________________________

3_________________________ 4______________________________

Statements

The density of solid #1 is greater than _________________ and less than_____________.

The density of solid #2 is greater than _________________ and less than_____________.

The density of solid #3 is greater than _________________ and less than_____________.

The density of solid #4 is greater than _________________ and less than_____________.

Draw and label the solids and liquids after you have poured them onto the container.

Solids Liquids

How Do You Prove Air Is Matter? - Myriam Vargas

Objective

The student will be able to demonstrate that the air has weight. Therefore, air has mass. As a result, *air is matter*.

TEKS

112.6. Science, Grade 4.

(A) Introduction

(6) Investigations are used to learn about the natural world.

b) Knowledge and skills

(4.1) Scientific processes. (4.2) Scientific processes (4.7) Science concepts:

(A) Observe and record changes in the states of matter caused by the addition or reduction of heat; and

(B) Conduct tests, compare data, and draw conclusions about physical properties of matter including states of matter, conduction, density, and buoyancy.

Activity

Matter is anything that has mass and takes up space. So, in order to prove that air is matter, we need to prove that air has mass and takes up space. How we are going to do this? We need to make a balance with two balloons in order to weight the air.

Procedure

1. Go ahead and inflate the balloons with air. The balloons get larger as you put air into them. By doing this you will see and prove that the only way that air could make them get larger is if air takes up space, so half of our proof is complete.
2. Tie the balloons closed so that they stay inflated.
3. We can show that the air in the balloon has mass by building a balance.
4. Take some of the string and tie one end to the middle of the ruler. With the help of a partner, make sure that the ruler is free to move around.
5. Tie a section of string to each balloon. On one balloon, make an "X" with two pieces of tape.
6. Take the balloons and tie each one on each end of the ruler. Balance the ruler by repositioning the balloons, if necessary.
7. So, at the moment, you should have two balloons hanging from a ruler, one from each end. If one of the balloons changes mass, we will be able to tell because the ruler will 'tilt' towards the more massive object. So, all you need to do is to let the air out of one of the balloons.
8. Take the needle and CAREFULLY poke a hole in the center of the "X". You don't want to pop the balloon - you just want to make a hole so that the air will leak out. Hopefully, the tape will keep the balloon together.

Lesson Plan: Newton's Third Law Of Motion - Luz Pedroza

6th Grade Level

Purpose of the Lesson:

To arrive at and be able to communicate Newton's Third Law of Motion and make real-life connections and applications. The learner will arrive/make-up a rule for the motion observed when an object is acted upon by the force of another object - Newton's Third Law of Motion : for every action (force) there is an equal and opposite reaction (force).

Aims/Objectives:

The learner will analyze and interpret information to construct reasonable explanations from direct and indirect evidence. (TEKS 6.2 C)

The learner will identify and describe the changes in position, direction of motion and speed of an object when acted upon by a force. (TEKS 6.6 A)

Scaffolding:

The learner will understand Newton's Third Law of Motion by observing the direction of travel of an air-filled balloon when it is released. In order for the learners to have a clear depiction of Newton's Third Law of Motion, the air-filled balloon will be taped to a straw. A piece of string whose ends are tied to the backs of the chairs is threaded through said straw. The learner will release the air-filled balloon and observe what happens. The learner will determine the direction in which the air escaped and the direction in which the balloon traveled. This will provide the learner with an introduction to Newton's Third Law of Motion and thus the lesson.

Touch on Community/Student Interest and Rationale:

The subject of the lesson ties to the community and students' interest because Newton's Third Law of Motion is visible and governs and affects the universe and therefore the earth in which we live. For example, Newton's Third Law of Motion is evident in nature, the propulsion of a fish through water, the flying motion of birds, and in everyday life, the motion of the car when we are coming to school and even when sitting on a chair.

Materials:

- ✓ String (approx. 10 feet long per demonstration/experiment)
- ✓ Chairs (Two per demonstration/experiment)
- ✓ Drinking Straws (One per demonstration/experiment)
- ✓ Balloon (One per demonstration/experiment)
- ✓ Tape
- ✓ Rulers (Two per demonstration/experiment)
- ✓ Assortment of coins (At least 6 having the same denomination per demonstration/experiment)
- ✓ Table with smooth surface (One per demonstration/experiment)

Lesson Procedure:

Guided Practice

- ❖ The teacher will engage the learners' interest by having the learner perform the balloon activity.
- ❖ The teacher will guide the learners through the activity (materials i.e. string, drinking straw, balloon, tape have been gathered and distributed prior to class):
  1. The learners will thread a piece of string through a drinking straw.
  2. The learners will tie each end of the string to two chairs, making sure that the string is tight and does not sag.
  3. The learners will blow up the balloon and pinch the opening closed in order to prevent the air from escaping (the balloon remains closed until the end of step five.
  4. The learners will hold the balloon against the straw on the string. The straw is taped to the balloon from the front to the back.
  5. The learners will slide the balloon to one end of the string and then release the balloon.
- ❖ The teacher will inquire from the learners what happened when the balloon was released.
- ❖ The teacher will inquire the direction in which the air escaped.

- The teacher will inquire the direction in which the balloon traveled.

Independent Practice (Collaborative Groups)

- The learners will gather materials needed for the Coin Flick activity (i.e. rulers, coins, tape).
- The learners will secure the rulers to the table with tape in a parallel position to each other providing that there is enough space for the coins in between the rulers.
- The learners will lay five identical coins in line between the two rulers, making sure that each coin touches the next. Coins should be about one inch from one end of the rulers.
- The learners will place another identical coin at the entrance to the gap between the rulers.
- The learners will flick the coin toward the center of the coins between the rulers. The learners will observe the coins move, but the end result is that the coin on the other end flies off. (In theory, the row of coins should not move when hit, but in practice this is not so. The learners may hold down one of the coins as long as it is not the coin on the end, thus noticing that the coin on the end flies off as before - - the force is still passed on).
- The learners will repeat the experiment, flicking the coin harder or softer observing the result.
- The learners will flick two identical coins against the row to see what happens. (Two coins fly off the other end – thus no matter how many identical coins are flicked, the number of coins flying off will be the same).

If Learners Finish Early:

The learners will experiment with coins of different weights. (If a heavy coin is flicked against a row of identical coins which has a light coin at the end, the coin at the end flies off very quickly, followed by one of the heavier coins.)

Closure:

To end the lesson the teacher will reiterate the information and concepts observed by having the students report their findings, observations and therefore their understanding of the scientific concept under study. The teacher will then have the learners make real-life connections and applications. For example, Newton's Third Law of Motion as evidenced by nature, i.e. the propulsion of a fish through water. The learners will be asked to find other examples of Newton's Third Law of Motion around them. In addition, in order to check for understanding the learners will be required to answer and provide an explanation to the following question:

> While on your way to school, an unfortunate bug strikes the windshield of the school bus. Obviously, this is a case of Newton's Third Law of Motion. The bug hit the bus and the windshield hit the bug. Which of the forces is greater: the force on the bug or the force on the bus?

Assessment:

The learners will be assessed based on the rule and rationale that the learners arrived at/made-up. The learners will be assessed on the learners' ability to communicate how Newton's Third Law of Motion affects the coins and the dynamics that take place when the coin is flicked. The learner should be able to state that to every action there must be a reaction. The learner should realize that when the coin is flicked, it hits the first one (action) and that coin then tries to move away from the first one (reaction). The coin however cannot move because it is prevented by the next coin in line. The force of the impact is passed on to the next coin in line. At this point there is nothing preventing the last coin from moving resulting in this coin flying off.

A Spoon-Powered Catapult – Enrique Mejia

Grade: 7th

TEKS: 112.23 Science

(6) Science concepts (A & B)

This catapult was made as a school project by Steven King. (No, not the storywriter- another Steven King.) I made a few adjustments such as a wooden box and a more secure way to fasten the spoon, but, besides that, everything is about the same.

Supplies Needed

1. Strong box
2. Plastic spoon
3. Rubber band
4. Tape and/or scissors

Instructions

1. Tape the spoon on one end of the box so that the indented part on the part you eat out of is facing toward the box.
2. Tape one end of the rubber band to the spoon, being certain not to cut the rubber band in half.
3. Tape or staple the other end of the rubber band to side of the box the indention on the spoon is facing.
4. Push a stick, nail, etc. into the box right next to the spoon.

Operation

1. Put your middle and index finger on either sides of the spoon while placing your thumb on the thin part of the spoon.
2. Pull back, load, and release!

Rest And Motion - Melissa Sandate

Goal:
Students should be able to understand Newton's First Law of Motion and they are to be able to apply it to almost everything.

TEKS :
(6B) The student is expected to demonstrate that an object will remain at rest or move at a constant speed and in a straight line if it is not being subjected to an unbalanced force.
Materials:

- 1 toy car (sedan type)
- dime
- eraser (rectangular)
- binder
- stack of books

Steps:

1. Ask a familiar question. What happens to your body when in a moving car and then the brakes are applied?
2. Introduce definition of Newton’s First Law of Motion
3. Place the car on the table or flat surface *
4. Flick the car *
5. Place the dime on top of the roof of the car and flick the car gently *
6. Place the binders thick end on top of a stack of books, so that the binder is at an angle.
7. Put the car, with a dime on its roof, on top of the binder.
8. Put the eraser at the bottom of the binder aligned with the car.
9. Let the car go *

* Students will make predictions on what will happen next

This activity is done by the teacher in front of the class, as well as at the beginning of class. The teacher will use Socratic questioning when demonstrating this activity, especially in the areas that have asterisks (*) to see if the students understand the concept. After this activity the teacher can apply other events in which the first law of motion applies. As an assessment the teacher can have the students demonstrate their own activity pertaining to the first law of motion.

Iron For Breakfast – Eddie Acosta

Grade: **7th, Science**

TEKS: **7.2A, B, C, D**

Materials:

Magnet	Warm water
2 types of breakfast cereals	2 sealable plastic bags
White Towel	3 plastic containers

Procedure

1. Read the nutrition facts listed on the packages of the cereals that will be tested. Record the percentage of iron listed for each cereal.

2. Place each cereal in a plastic bag and crush until cereal becomes a fine powder.

3. Pour each cereal into a plastic container. Then add warm water to the mixture until the water is a few centimeters above the cereal.

4. Stir with the magnet for three to five minutes.

5. Rinse the magnet gently in water and wipe with a white towel.

Questions

1. Describe the material on the white towel.

2. Which cereal had more of this material?

3. Why would this be added to cereal?

4. What role does iron play in the human body?

Manipulating Friction through Hovercraft - Diana Hurtado

Grade: 7th grade

TEKS:
(6) Science concepts. The student knows that there is a relationship between force and motion. The student is expected to:

(A) demonstrate basic relationships between force and motion;

(B) demonstrate that an object will remain at rest or move at a constant speed and in a straight line if it is not being subjected to an unbalanced force;

Objective: students will engage and manipulate friction by constructing a Hovercraft. Students will predict outcomes from activities and make inference to how the Hovercraft effect works. Students will determine the ideal characteristics of their Hovercraft in order to maximize the distance traveled by it. Students will determine how real Hovercrafts can lower friction and sustain great amounts of weight.

Introduction:

- Teacher will inflate a balloon and without tying it and let it loose.
- Pose question: What made the balloon fly?
- Pose question: What happened to the air inside the balloon?
- Pose question: How can this principle be applied to reduce friction?

Activity:

- Students will engage in creating a Hovercraft using the standard supplies/materials.
- Students will determine the characteristics that allowed the original Hovercraft travel farthest.
- Students will explain the Hovercraft effect using as reference past experiences, evidence from the activity and deductive skills.
- Students will propose an ideal Hovercraft model that will minimize friction and maximize the distance. Students will propose modifications/characteristics (size, shape, and amount of air) to the materials needed in order to achieve goal.
- After prediction, students will create modified Hovercraft and determine whether predictions are correct.
- Students will make inference about how Hovercrafts can sustain great amounts of weight.
- Students will engage in extension activity and compare outcomes of two Hovercrafts.

Extension:

- Students will create a “funnel Hovercraft” an compare outcomes between such and “cardboard Hovercraft”. Students will determine reasons for outcomes.

Assessment:

- Students' knowledge/misconceptions will be assessed through questioning during the entire activity. Students will express their acquired knowledge by reasoning and outcome of modified Hovercraft.

TO MAKE YOUR HOVERCRAFT

MATERIALS:
9 cm. Cardboard square
Thread Spool
Glue
9 " Balloon
Scissors
Fishing Weights
Tape
Ruler
Pencil

PROCEDURE:

Using the scissors punch a hole in the cardboard. Make sure you punch the hole in the center of the cardboard. The hole should be the same size as the hole in the spool.
Glue the spool to the cardboard on top of the hole. Make sure you glue it real good. Make sure the holes line up. Make sure you use enough glue to assure that no air can escape between the spool and the piece of cardboard.
Cover the top of the spool with a circle of paper - glue it to the spool and wait until the glue is good and dry.
Punch a hole in the middle of the paper cover where the hole of the spool is. Now your hole should run through the paper, spool, and cardboard without any obstructions (watch for too much glue).
Place a piece of tape in a smooth surface. This will be your starting line.
Align your cardboard (with the spool) at the starting line.
Give the cardboard and spool a little push with you hand.
Using the ruler measure the distance between the starting line and your cardboard. Record such distance in the table below.
Blow up the balloon and twist the end to keep the air from escaping. Stretch the balloon over the top of the spool.
Set the hovercraft on the starting line. Let go of the balloon and give it a little push. Allow for all the air to come out completely and measure the distance. Record distance in table.
Predict: What will happen as you add a fishing weight to the Hovercraft?
____
Try it- Tape a fishing weight to the cardboard square. Blow up the balloon and twist the end to keep the air from escaping. Stretch the balloon over the top of the spool. Set the hovercraft on the starting line. Let go of the balloon and give it a little push. Allow for all the air to come out completely and measure the distance. Record distance in table.

Cardboard and spool (no balloon)	Distance:
Cardboard and spool with balloon	Distance:
Hovercraft plus weight	Distance:

CONCLUSIONS:

Which Hovercraft was able to travel the farthest/ fastest?

Why do you think that is?

What is the effect on the distance of the air coming out of the balloon?

Why do you think that is?

What happened as you increased the weight of the Hovercraft? Did it affect your distance results?

Why do you think that happened?

Which conditions/characteristics do you think will be the ideal for a Hovercraft (size of cardboard, balloon, holes, etc)?

EXTENTION:

Using the additional materials, modify your hovercraft in order to find a model that will maximize the distance traveled.

Record your findings:

Cardboard shape	**Cardboard size**	**Balloon size**	**Distance traveled**

How do you think the Hovercraft principle can be benefit our world and us?

Toys and Gravity – Christine Duran

Purpose:

Forces cause every change in motion we can see around us. The purpose of this activity is to analyze motion using Newton's first and second laws.

Objectives:

6.3 Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.
6.6 Science concepts. The student knows that there is a relationship between force and motion. The student is expected to:
(A) identify and describe the changes in position, direction of motion, and speed of an object when acted upon by force.

Scaffolding:

Students will predict where the ball will hit the paddle when the ball is pulled away from the paddle horizontally as far as the elastic will stretch and then released. After several trials students will change the angle of the release and predict where the ball will hit the paddle. The goal is to determine the angle that the ball should be released from in order for it to hit the center of the paddle.

Student Interest and Real Life Connections:

Students will gain an understanding of the physical concepts of acceleration and gravity and the affects they have on the motion of a baseball (fly ball) and shooting a basketball.

Materials:

Paddleball toy.

Procedure:

1. Hold the paddle in one hand and the ball in the other hand.
2. Pull the ball straight out horizontally from the paddle as far as your outstretched arms or the elastic will allow.
3. Release the ball.
4. Observe the path of the returning ball.
5. Again, pull the ball straight out from the paddle as far as your outstretched arms or the elastic will allow. Raise the ball about 1 foot (30 cm) from its horizontal position.

6. Release the ball and observe the path.
7. Continue to change the position of the ball until its returning path directs it to the center of the paddle.

*The paddle can be taped to the wall, partially covered with black paper and the ball dipped in flour. A white spot will mark the point of the returning ball.

Results:

The returning ball often misses the center of the paddle when it is stretched straight out from the paddle. Holding the ball at a height higher than the top of the paddle results in the ball striking the center of the paddle.

Why?

The string pulls the ball toward the paddle, but **gravity** pulls the ball straight down. These two forces cause the ball to continue to fall and at the same time move toward the paddle. The result is that the ball moves in a curved path that arches downward. When pulled straight out, the ball's curved path brings it lower than the paddle's handle. The raised ball still moves in a curved path that arches downward, but the new path ends in the center of the paddle.

Guided Practice:

The teacher will activate schema by asking questions about gravity and the direction of motion when a force is applied. Teacher will present questions and students will make predictions of the path of the ball.

Independent Practice:

Students will work in pairs to practice the activity and record their observations.

Closure:

Teacher will bring students together in large group to discuss observations. Discussion will clarify any misconceptions. Connections to real life situations will be discussed.

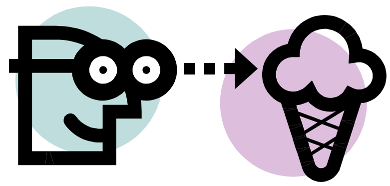
Assessment:

Informal assessment will be conducted as teacher circulates to the pairs of students and listens to students' comments and discussions and asks questions.

Extension Explorations:

Teacher provides other toys such as a Slinky, basketball hoop and ball, yo-yo, ball and jacks, flip-cup and asks students to think about the effects of gravity on these objects. Teacher asks students how these objects would behave in space. For more information and results of actual experiments conducted in space teachers can visit: http://quest.nasa.gov/space/teachers/liftoff/toys2.html.

“Ice Cream! You Scream! We All Scream! For Ice Cream!” – Isabel Ramirez



Objective: TEKS 8th grade (10C), Science concepts. The student knows that complex interactions occur between matter and energy. The student is expected to identify and demonstrate that loss or gain of heat energy occurs during exothermic and endothermic chemical reactions.

Materials:

- Gallon size zip lock bags
- Pint size zip lock bag
- Measuring spoons, tbsp and tsp
- Rock salt
- Sugar
- Vanilla flavor
- Chocolate syrup
- Crushed ice
- Whole milk
- Towels

Procedures:

1. Put one tablespoon of sugar in the 1pint bag.
2. Add either ¼ teaspoon of vanilla or tablespoons of chocolate syrup to small bag.
3. Add ½ cup of whole milk to the small bag.
4. Carefully seal the small bag.
5. Fill the large bag (1 gallon) half full of crushed ice.
6. Add ¼ cups of salt to the large bag.
7. Place the small (sealed) bag in the large bag, on the ice and salt.
8. Shake the large bag until the contents in the small bag is ice cream.
9. Remove the small bag; carefully wipe off the top to remove any salt.
10. Open the small bag and enjoy the ice cream.

Brief Description: “When a substance undergoes a physical change, the size, shape or state of matter changes. However, no new substance is formed. During some physical changes, energy is released into the surroundings. These reactions are called exothermic reactions. The containers of exothermic reactions will feel hot. On the other hand, some reactions absorb energy from their surroundings. These are called endothermic reactions and the container the reaction takes place in will feel cool. One example of an endothermic physical change is the melting of ice. As it melts, it absorbs heat from its surroundings, which makes the reaction feel cold. Making ice cream readily uses this concept. In order to make ice cream, the edible ingredients are mixed in a bag that is surrounded by ice and rock salt. The salt melts the ice, an endothermic process. This removes heat from the edible ingredients, freezing them."

Electric Gelatin - Teresa Barraza

TEK 5.8 Science concepts. The student knows that energy occurs in many forms. The student is expected to

(A) differentiate among forms of energy including light, heat, electrical, and solar energy.

Material needed

- Balloons
- Unflavored gelatin powder
- Paper plates
- Your hair or a wool sweater

Instructions:

1. Pour unflavored gelatin powder on the paper plate
2. Blow up a balloon and tie the opening shut
3. Rub the balloon on your hair or on the wool sweater for 10 seconds
4. Hold the charged area of the balloon (the part that you rubbed with your hair) and inch above the gelatin powder. Don't let the balloon touch the gelatin.
5. What happens?
6. Slowly raise the balloon. Now what happens?

The goal of this activity is for students to explore the concepts of static electricity. As an instructional method I would use the Socratic Method to get the students involved and to get them thinking about static electricity. Then I would put them to work in cooperative groups to perform this activity, so that they can share their observations and learn from each other. I would informally assess them by observing how they are working and by asking them questions.

Sinking and Floating - Jeanette Ybarra

Objective: Students will develop an understanding of sinking and floating. This experiment will serve as an introduction to the exploration of density of solids and liquids. The experiment is an attempt to encourage student skills in experimental design, testing simple hypotheses, and grouping objects by common characteristics.

TEKS:

(5.1) **Scientific processes.** The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.
The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
(5.2) **Scientific processes.** The student uses scientific methods during field and laboratory investigations.
(B) collect information by observing and measuring;
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
(E) construct simple graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information.

Context

This activity provides an opportunity for students in Grades 3-5 to develop experimental design skills in the context of a familiar event (floating and sinking) while furthering their understanding of the concepts of density and buoyancy.

"They should be encouraged to observe more and more carefully, measure things with increasing accuracy (where the nature of the investigations involves measurement), record data clearly in logs and journals, and communicate their results in charts and simple graphs as well as in prose. Time should be provided to let students run enough trials to be confident of their results. Investigations should often be followed up with presentations to the entire class to emphasize the importance of clear communication in science.

Students will first classify a group of common objects by a characteristic of their own choosing. Then they will reclassify the same group of objects by their predictions about whether each item will float or sink in water. As a group, they will design an experiment to test their predictions (hypotheses). Although students may be unable to develop a well-controlled experimental protocol, they will work to develop a consistent sequence of steps by which they test each item and record their data

Be sure to provide groups with feedback on their protocol and data tables before data is collected. After groups carry out their experiment, record their results, and do a preliminary analysis of their data, they should be allowed to revise their experimental procedure and repeat the experiment, if desired. Finally, students will use a variety of resources to explore how terms such as "buoyancy" and "density" are used to explain the phenomena they have observed.

Planning Ahead

Materials:

bucket or bowl of water about ½ full for each student group

at least six 3" x 5" cards per group. Each card should have a hole punched in the upper left hand corner

6-inch piece of yarn or string for each student group

at least 15 items for each group, made of a variety of materials, such as wood, metal, plastic, and paper. Possibilities include: paper clips, toothpicks, soda bottle caps, marbles, plastic beads and cubes, sponge pieces, pencils, pieces of aluminum foil and paper, small balls, erasers, pieces of Styrofoam, and plastic eating utensils

bowl of water half full of water for the teacher demonstration

paper clips to use for the teacher demonstration

Sink It student sheet

Motivation

Student groups (2-3 students each) will first brainstorm to develop 2-3 characteristics by which a group of common objects could be classified (e.g., color, weight, size, shape, composition, "bendability," etc.). They will try out their classification scheme on a set of common objects (those listed in Planning Ahead).

This should be a quick, fun activity to get students thinking about the properties of the materials (plastic, metals, glass, rubber, wood, etc.). Students can share their classification scheme with the class either through a group discussion, through writings or drawings.

Development

This activity uses a phenomenon that is already familiar to most students to help them think about how and why some items float and others sink, and to help them gain skills in gathering data in systematic ways, using a consistent experimental method. These skills can be applied for other inquiry-based activities, as well.

Do not provide definitions and explanations for terms such as "buoyancy" and "density" before the hands-on activity. Rather, allow students to explore the phenomenon first; then these terms become tools to help explain what they have already observed.

Begin by discussing the different ways that students separated their pile of materials into two groups in the introductory activity. Point out that different objects can be described by a number of characteristics, including the type of material from which they are made, their size, their shape, their color, and their weight. Some objects can be characterized by their purpose; for example, buttons and paper clips are both designed to hold things together.

Follow this by discussing another characteristic that students may not have considered - whether the objects will float or sink in water. As a group, generate a list of descriptive words for objects that float and one for objects that sink. Using the list allow the class to predict whether several demonstration objects (apple, potato, paper clip or penny, and wood piece) will float or sink.

Students may have said that objects that are "heavy" will sink while those that are "light" will float. A pan balance can be used to compare, for example, a paper clip and an apple. Students may predict that, because the apple is heavier, it should sink. Demonstrate that the apple floats and the paperclip sinks. You can show several discrepant events of this type to both generate student interest and point out that there is something more to floating and sinking than just weight. Tell students that you will be exploring this idea further in this activity.

Students should continue to work in their original groups of 2-3. Each group should re-sort their pile of objects based on their predictions about whether each object will float or sink.

Distribute the data table Sink It. Students should prepare the data table by writing the name of each object on the table in the first column, with their prediction about whether the object will float or sink in the second column.

Then, using the 3" x 5" cards, they should write a procedure for testing each object, writing one step on each card. If preferred, students can use diagrams. Each card should be numbered in order of the steps. Steps should include the recording of data and preparation of the testing tank (bucket) for the next experiment. Students should do a "dry" run, following the steps exactly as they are written, then modify their procedure, if needed.

When the students have a procedure developed, review the steps and make suggestions for steps that have been omitted or need to be edited. The object is to guide students to develop a fairly detailed procedure for this experiment. This will help build skills for future, multi-step controlled experiments.

Guiding questions could include:

How full will your bucket be for each object tested? Do you need a certain amount of water to be able to fairly test whether something floats? Should it be the same amount of water for each item?

How will you place the object in the bucket? Will you drop it in? If so, from what height? Will you place it halfway down into the water and then let it go? Will you place it on the bottom of the bucket and then let it go? Will you put the object in the bucket and then add water?

How will you define floating? Is anything off of the bottom floating? Does the item have to rise all the way to the top of the water?

Once their procedure has been approved, students should put the cards in order, run the string through the holes, and tie it loosely. Students can begin their data collection, testing one item at a time, using the steps written on the flip-stack of cards. The cards should guide the procedure. For purposes of cooperative grouping, one student can serve as the card reader, a second as the equipment handler, and a third as the recorder.

After the initial data has been collected, students in the group should confer to decide whether any items should be re-tested. Some items may seem to float, then sink as they become wet. Others may have densities similar to water and may float in the middle of the bucket rather than on top of the water. Students should retest these items and should add written comments about them on the data table in the "Notes" column.

Students should analyze their data by which of their predictions (hypotheses) were confirmed and which were proven incorrect. They may or may not be able to draw conclusions about why objects did and did not float.

Further explorations of density - comparing volume and weights - will certainly help students expand their understanding of this concept. However, student groups should be able to draw some conclusions about the types of materials that float and those that sink (e.g., metals, materials that feel "light," etc.). Students may need to run additional trials with other materials to further test their conclusions.

Assessment

Students should present their findings to the class as a poster or an oral presentation. They should include reading their step-by-step procedure, show the items that did and did not float, and tell what conclusions they drew about what types of items do and do not float in water.

After all groups have presented their findings, lead a discussion on two topics. The first is whether results among the groups were consistent ("Did the marble sink for everyone? How about the plastic beads? The aluminum foil?") Where there are differences in their findings, ask students to speculate why this could be? How could they explore this further? Did the difference have to do with different procedures?

Then lead the discussion into drawing conclusions about how we describe objects that float or sink. Refer back to the words the students originally used to describe items that float or sink. Ask the students to look for commonalities among the items that float and those that sink. Which descriptive words would they change? Are there words they would add?

This is an appropriate time to introduce vocabulary. Students have a concept in mind - objects that float - that can be described by a new word, "buoyant." The concept of density can also be introduced at this time; a good visual demonstration is the buoyancy of a golf ball and a ping-pong ball. They have similar volumes but one is much heavier, therefore, more dense. The concept of density can be further explored, as described in the Extensions below.

Extensions

Students can hypothesize whether the type of liquid makes a difference in this experiment. They can explore hot versus cold water, salt water, soapy water vegetable oil, or corn syrup.

Diffusion and Osmosis Lab Activity - Chris Candelas

Goal: Students will understand the process of *diffusion* and *osmosis* through hands on activities, observations and data collection with 90% accuracy.

Objective: Students will observe the selective passing of materials into and out of a membrane, and observe the types of materials that are and are not passed through. Students will also construct data collection tables and compare and contrast collected data.

TEKS Objectives: **7 (2)** (a),(b), (c), (d), (e) The student uses scientific inquiry methods during field and laboratory investigations.
7 (5) (a) The student knows that an equilibrium of a system may change
7 (7) (b) The student knows that substances have physical and chemical properties (involves the periodic table)

Specific content area and concepts (TEKS): "Physical and chemical properties" (diffusion and osmosis); concepts: Lab safety, scientific process, metric measuring, observing, collecting data (comparing and contrasting data), working in groups and group management, constructing graphs etc.

Introduction:
This activity is really based on the process of osmosis which can certainly be misunderstood for the process of diffusion. This is truly a hands on activity which will engage students to predict and ask leading questions. Using eggs in this activity helps students view right before there eyes the changes of "Physical and chemical properties" occurring within an egg which could represent a number of things, in this case the egg represents a cell. The cool thing about this activity is that a teacher is able to integrate various concepts and contents for instance: in this activity physical science and biology work hand in hand to get the meaning across about osmosis.

Instructional Methods:
Teacher will launch lesson by speaking to the entire class on the topic of osmosis and give descriptions of the step-by-step process that occurs during osmosis. The teacher will also give real life examples that students may be aware of that resemble the process of osmosis. Then when students have some knowledge of the term and terms that are necessary to help them understand osmosis, the teacher will then introduce and launch the lab activity on osmosis. Students will be placed in groups and be assigned specific jobs and be responsible for collecting different data information throughout the entire lab experience. At the end of the lab activity each group will present their data and share various experiences they had throughout the osmosis lab.

Materials:
1. one chicken egg
2. measuring cup (reading milliliters)
3. one glass jar
4. 300 mL of 5 % acetic acid solution (vinegar)

5. 300 mL of 50 % glucose solution (karo syrup)
6. 300 mL of distilled water
7. ruler
8. about 30 cm of string
9. balance scale

Procedure:

1. Measure length and circumference of egg using string and ruler.
2. Measure mass of egg using a balance scale.
3. Measure 300ml of acetic acid solution with measuring cup
4. Pour into jar.
5. Cover jar with lid.
6. Store egg for one day in a cool and dry place.
7. On the next day take out egg and repeat steps 1-2
8. Then repeat steps 3-8 for glucose solution.
9. On the following day take out the egg and repeat steps 1-2.
10. Then repeat steps 3-8 for distilled water.

What Causes Clouds and Precipitation? - Sandra Aguirre

Objective from TEKS:
§112.6. Science, Grade 4.

(a) Introduction.

> (5) A system is a collection of cycles, structures, and processes that interact. Students should understand a whole in terms of its components and how these components relate to each other and to the whole. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems and can be observed and measured as patterns. These patterns help to predict what will happen next and can change over time.

(4.4) **Scientific processes.** The student knows how to use a variety of tools and methods to conduct science inquiry.

Goal of Activity

This experiment is most effective after the water cycle has been reviewed in science class. When working with fourth grade students, it is important to use visual aids to help them understand various difficult concepts such as the condensation and precipitation involved in cloud formation. The following will describe an effective demonstration of cloud formation and its role in the water cycle. The "**hook"** of this lesson would be to take students outside and observe the sky. They can brainstorm as to what causes clouds and predicting weather.

Activity: Simulation of Cloud Formation

Materials: Clear glass, Hot water, Ice in small plastic bags, Matches, Flashlight

First, fill a glass until it is about ¼ full with hot water. Light one or two matches together and drop them into the glass. Immediately, cover the glass with the ice bags. Now observe how water droplets evaporate and use the warm air from the match to condense. When the evaporated water hits the cold surface, it begins to form a cloud. Shine the flashlight in the glass for a clearer picture of the effect.

Extension/Follow-up Questions:

What did you see in the jar/glass?

How did the warm water effect the cloud formation? (it caused the water to evaporate and warmed the air, causing it to rise)

What did the ice cubes do to help the clouds form? (cooled the air and it made the water vapor condense)

What role did the match and its smoke play in the cloud formation? (gave the water something to condense and grab on to)

What is a cloud made of? (small water droplets)

Instructional Methods

Fourth grade covers various cycles, in which the water cycle is included. Cloud formation is often the most confusing portion of the water cycle. Beginning with observing clouds outside, brainstorming and Socratic questioning, students get "hooked" and are eager to learn more. Forming clouds in class allows for students to visualize condensation and evaporation. They can then easily understand why the clouds would then get heavy and release precipitation.

A demonstration such as this would allow for students to work in groups and try the experiments on their own. Students could be given exact measurements on water and ice components, allowing them to practice the measuring necessary for TAKS testing. The writing of their observations and results would also help them practice for TAKS testing. Research via the internet would allow for students to incorporate technology. Most importantly, witnessing the actual development of clouds is not likely something students will forget. The results will be a class that truly comprehends the terminology of evaporation and condensation because they have witnessed it for themselves.

Light up My Face - Alma Rivera

The objective of this activity is to teach students how light is reflected and/or refracted on surfaces and will be given vocabulary that will help them identify the steps in the activity they will be doing.

The goal for the activity will be 80 percent success of the class will learn and explain the concepts. The TEKS for this lesson plan is: Science 8(B) identifies and demonstrates everyday examples of how light is reflected, such as from tinted windows, and refracted, such as in cameras, telescopes, and eyeglasses.

As the teacher, I would first begin the lesson by pairing students with a partner, giving each group a flashlight, meter stick or measuring tape, and a mirror. After all materials have been distributed, then I would begin placing the paired students about 3 or 4 meters apart and place a mirror between them. After all the groups are placed and are ready to begin, I would give them the objective. What they need to do is: the student with the flashlight needs to raise the flashlight at nose length and be able to point the light directly to the mirror and try to reflect the light to the other student in front of him by aiming at his face. If at the first try the light doesn't hit the student's face, then the student with the flashlight has to move either back or forward in order for the light to reflect on the other student's face. If the group accomplished the task, then they have to use the measuring stick or tape and record the distance between the students from which the light did reflect to the other student. In order for them to proceed to the next activity, I first ask questions of what was going on when they were doing the activity (those questions are below). This would give me the assessment I would use in order to see if the students understand the concepts of the activity. For the second activity, it would be preferable if the students are paired up with someone of a different height. In the second part of the activity, the student with the flashlight has to kneel down and do the same activity as the first, try to reflect the light on the other student's face and measure the distance between them.

I feel that this would be a good activity that can be used for an introduction or for then end of the lesson. Here are some questions that can be asked for assessing during the activity:1.) What is the name of the ray of light that is beaming down to the mirror?,
2.) What is the name of the line that is perpendicular to the surface?, 3.) What is the name of the ray of light that leaves the surface?, 4.) What are the names of the angles that are between the rays?

Acids and Bases - Rebecca Wyatt

Goal: To give 6th grade students a strong understanding of the chemical compounds of acids and bases through the use of hands-on experimentation.

Objective: Students will learn how to determine the acidity of chemicals

Instructional Method: This activity would best be taught through the use of constructivist methods. In the activity students should be guided through the steps; however, they should be allowed to discover and construct the physical science concepts on their own.
Using the red cabbage juice strips to determine the acidity of different household products, allows them to use experimentation through a hands-on approach to develop an understanding of the concepts.
The activity would take about a week to complete. The first day of the activity the students would make the red cabbage ph indicator strips. Once the strips are done and ready for testing, the students could then begin gathering different household chemicals to test. When the activity has been completed, students could then take home the indicator strips they have made, and test some chemicals at home. They could then share there findings with the class.

TEKS:
(6.1) scientific processes. The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations

(6.2) Scientific processes. The student uses scientific inquiry methods during field andlaboratory investigations. The student is expected to:
(B) collect data by observing and measuring

(6.7) Science concepts. The student knows that substances have physical and chemical properties. The student is expected to:
(B) classify substances by their physical and chemical properties

Instructions:
1) Use a mini-lesson to briefly introduce the concept of using litmus paper to determine acidy of a chemical.
2) Make litmus paper using red cabbage juice (Boil red cabbages for 30 minutes, then soak the white porous paper in the red cabbage water).
3) Cut the homemade litmus paper into thin strips.
4) Dip the strips into different household chemicals.
5) If the strip turns pink, the chemical is an acid. If the strip turns green, it is a base
6) Use a ph table to determine what the acidy of the chemical is.

Potential and Kinetic Energy - Yolanda Lazcano

5^{th} Grade Level

Purpose of the Lesson:

To investigate and be able to distinguish the relationship between potential and kinetic energy.

Aims/Objectives:

Students will see how potential energy can be changed into kinetic energy and how kinetic energy can be used to do work.

TEKS:

5.8 Science concepts. The student knows that energy occurs in many forms. The student is expected to:

(A) differentiate among forms of energy including light, heat, electrical, and solar energy;

5.2 Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:

(A) plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;

(B) collect information by observing and measuring;

(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

(D) communicate valid conclusions; and

(E) construct simple graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information.

Materials:

1. paper cup
2. different sizes marbles

3. scissors
4. blank sheet of paper
5. 2 plastic metric rulers with groove
6. 4 identical textbooks

Activating schema:

To activate prior knowledge, and to make real world connections, I will ask students about their experiences on a playground slide. How would speeds compare on different height slides? What if there was a ball at the bottom of the slide, what would happen to the ball if when they went down the slide their feet hit the ball? Then I will divide students into groups of four making sure each one of them has an assigned part of the activity. in charge of releasing the marble from the top of the ramp

Procedure:

1. Have students make a chart used to record their measurements and predictions.
2. Cut a rectangle 4cm. and 5cm. tall from the top of the paper cup.
3. Place the cup upside-down on the paper near the edge. The rectangle opening should face the edge. Make a mark on the paper along the outside of the cup on the side opposite the opening.
4. Place the end of ruler into the opening as far as it will go. Place a textbook about 1cm. under the other edge of the ruler to form a ramp.
5. Measure the height of the ramp by measuring the height of the textbook.
6. Hold the marble at the top of the groove in the ruler. Release the marble from the top of the ruler and observe what happens to the cup.
7. Make a mark on the paper around the outside edge of the cup. Remove the cup and measure the distance from the new mark made before. Collect data by recording measurement. Return the cup and ruler to their original positions.
8. Place another textbook on top of the first textbook. Repeat steps 5-7 using three, then four textbooks.

Assessment:

The students will be assessed based on how they follow instructions, observe and measure the distance the marble moves the cup. They should also be able to collect and interpret data and make inferences about the potential and kinetic energy of the marble and the amount of work done by the marble. As a result of this lab experiment the students should be able to distinguish the relationship between kinetic and potential energy.

Extensions:

We can go back and find what effect would the mass of the marble have on the distance the cup moves? This can be done by trying the experiment with different sizes of marbles. Here we can add the use of a scale. We would weigh each marble and then go through the procedure. Then at the end we would compare the results with the different marbles.

Density of a Liquid - Susana Reyes

Students will have a visual understanding of density in a liquid. The demonstration will be an extension of the different states of matter. It also follows the introduction of terminology on measurements and how they are used. Assess the understanding of graphs.

Objectives:

2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
(E) construct simple graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information
(7) Science concepts. The student knows that matter has physical properties. The student is expected to:
(B) demonstrate that some mixtures maintain the physical properties of their ingredients;

Materials Needed

- A long glass
- A graduated cylinder
- 30 ml. of water
- 30 ml. of vegetable oil
- 30 ml. of corn syrup
- 30 ml. of isopropyl alcohol
- food coloring

Procedure

1. Measure each liquid individually and pour it into the glass one at a time.
2. First do the water.
3. Then do the vegetable oil.
4. Follow with the isopropyl alcohol.
5. Finally, do the corn syrup.
6. Allow the liquids to settle.

The teacher will first review the prior information on measurement and tools, which will be followed by the explanation of density of a liquid. Finally, the teacher will model the procedure of the experiment. Before and after the students will graph their hypothesis and their conclusion.

Weathering and Erosion - Sonia Zepeda

Introduction:
In a fifth grade science class, the unit being taught includes the cycles: life cycle, rock cycle, nitrogen and carbon cycle, and the water cycle. This unit can be explained in any order, after all these are all cycles. Students will learn vocabulary, concepts, and model activities to better understand the material being taught.

In this lesson, students will work hands on with an activity that requires your hands getting dirty. In lab groups of two or four, students will attempt to make a model displaying some of the Earth's physical land forms. This will better explain why land features are the way they are. Good examples would include: rivers, valleys, and deltas.

TEKS: Students in grade five will learn the effect of weathering on landforms. They will also learn about a system of a collection of cycles, structures, and processes. Investigations will be used to learn about the natural world.

(5.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions.

(A) analyze, review, and critique scientific explanations, including hypothesis and theories, as to their strengths and weaknesses using scientific evidence and information;

(C) represent the natural world using models and identify their limitations

(5.5) Scientific concepts. The student knows that a system is a collection of cycles, structures, and processes that interact. The student is expected to:

(A) describe some cycles, structures, and processes that are found in a simple system;

(B) describe some interactions that occur in a simple system.

(5.6) Science concepts. The student knows that some change occurs in cycles. The student is expected to:

(A) identify events and describe changes that occur on a regular basis such as daily, weekly, lunar, and seasonal cycles;

(B) identify the significance of the water, carbon, and nitrogen cycles.

(5.11) Science concepts. The student knows that certain past events affect past and future events. The student is expected to:

(A) identify and observe actions that require time for the changes to be measurable, including growth, erosion, dissolving, weathering, and flow.

(5.12) Science concepts. The student knows that the natural world includes Earth materials and objects in the sky. The student is expected to:

(A) interpret how land forms are the result of a combination of constructive and destructive forces such as deposition of sediment and weathering;

(C) identify the physical characteristics of the Earth and compare them to the physical characteristics of the moon.

Materials:

Aluminum pan
2 cups gravel
2 cups rock pebbles
8 cups sand or dirt
Ruler
Cup with a whole on the bottom
5 cups of water
Toothpicks
Scissors
Paper and pencil

Good starters!

Ever wondered how rivers and streams form?
Why do valleys have a V shape?
How do mountains make their shape?

Before:

Allow a change in partners to occur before lab time. You can group students by certain examples they may have in common, such as month of birthday, method of transportation to school, or a science concept, such as who likes rainy, sunny, windy, snowy days; seasons they like most, or were born in etc. You can group students by two's or four's. Students should be assigned tasks such as, recorder, supplies clerk, presenter, and time keeper. Once assignments have been given out students can begin collecting and measuring materials, as well as follow instructions to make their model.

Before giving instructions of how to begin the process of weathering and erosion, explain to students how the materials being used will represent certain landforms seen in everyday life, and how these changes they will witness occur at a very much slower rate: thousands of years. Have the class list causes of weathering and erosion. Make sure they mention the sun, wind, rain, and man. These are all reasons for weathering and erosion. Once students know the difference between weathering and erosion, and how it is caused, students will better understand how each contributes to the shaping of land features.

Instructions:

1. Once students have materials they will pour sand, gravel, and rocks into the aluminum pan.

2. Mix all three together with hands and move all the material over to one side of the pan.
3. Place the ruler over the side of the pan where the sand was placed. The ruler will be supported by the sides of the pan.
4. Make a small hole on the bottom of a paper or Styrofoam cup and place it between the edge of the pan and the ruler. This means the ruler will be sideways, close to the pan about one inch.
5. Begin pouring water in the cup until the water has run out.

Observations:

Students will observe as the trickle of water begins to wet the dirt mixture and allow a flow of water to surpass over to the empty side. The water will cause the mixture to move, sink in, and dissolve towards the opposite direction. Students should record the changes by drawing what the pan looked like before the pouring of the water and after the pouring of the water. As the mixture and water finish their movements, students will be given a handout with drawings, as well as definitions to certain landforms they can compare to their model.

Assessment:

Students will color their drawing observations.
Students will identify certain landforms that compare to the handout.
Students will label certain landforms identified in their model.
Last, students will be given the chance to observe the other group's models.

Extensions:

Activities: Erosion-Sugar cubes and water (dissolving)
Water cycle-greenhouse
Rock cycle- game (similar to Life)
Resources Home Survey- to identify the use of electricity, water, and gas.

Water Cycle, Nitrogen and Carbon Cycle, and Life Cycle (plant and animal)

“Denser or Heavier?” - Tony Dobson

This physical science activity will be conducted in a fifth grade class. The ***TEKS*** that this activity will involve are as listed:

#112.7.Science, Grade 5.

(a) Introduction.

(4) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(**5.2**) **Scientific processes.** The student uses scientific methods during field and laboratory investigations.

The student is expected to:

(A) plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;

(B) collect information by observing and measuring;

(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

(D) communicate valid conclusions; and

(E) ... organize, examine, and evaluate information.

(**5.7**) **Science concepts.** The student knows that matter has physical properties.

The student is expected to:

(A) classify matter based on its physical properties including… physical state….

(B) Demonstrate that some mixtures maintain the physical properties of their ingredients;

(C) Identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving a bicarbonate in water; and

(D) Observe and measure characteristic properties of substances that remain constant such as boiling points and melting points.

The activity:

In this activity, we will be conducting an experiment using solids, liquids, and gases. My questions to you are, 'What will happen if we drop popcorn kernels, raisins, or seeds into plain or carbonated water?" "Can we make something that sinks float?" "What is carbon dioxide?" "Can we make a raisin float?" The instructions (procedures) are as follows:

1. Divide into groups and assign roles.
2. Have a whole class discussion of the question, "What will happen if we drop corn, raisins, or these seeds into plain or carbonated water?" Share predictions.
3. Pour water into jars, no more than 250 ml.
4. Drop several corn kernels into the water and observe what happens. Record. Leave corn in jar.
5. Break a seltzer tablet into small pieces and add one piece at a time, noting the reaction after each addition. Observe what happens and record. Leave corn in jar.
6. Repeat with raisins and then seeds.

Here are exploration extensions that will engage the students into making real world connections from the experiment.

1. Repeat with other seeds and natural objects. Be sure to have students predict each time.
2. Try it with a paper clip. Guide students to understand that the paper clip sinks because it is denser than the water, even with the carbon dioxide bubbles on it.
3. Have students challenge one another with untried objects.

To Float or Not To Float - Sylvia Amor

Goal
What is buoyancy? It's the force of water pushing up on something. Sometimes it's enough to make things float, sometimes not. How does it work?

Equipment:
1.bucket
2.water source to fill up bucket (back yard hose will be fine)
3.air tight jar, not small, but small enough to fit in bucket a bunch of rocks, different sizes, but small enough to fit in the jar at the same time
4.swimsuit (optional: if it's summer, you might have more fun with this if you are in one)

Safety:
1. Don't drink the water - the bucket and rocks will make it dirty.
2. Don't get your mom or dad wet without asking first!
How to do the experiment:
1. Go outside and fill up the bucket with water.
2. Put the rocks, one at a time, in the water. (We put them in one at a time because we are polite, and also because it is important to keep all the water inside the bucket.) Do they float?
3. Take the empty jar, close the lid tightly and put it in the water. Does it float? If it doesn't, get another jar... Empty jars are supposed to float.
4. Take the rocks out of the water. Put the smallest one in the jar. Close the lid and put the jar back in the bucket. Does it still float?
5. One rock at a time, add more of the rocks to the jar. Each time you add one more rock, put the lid back on and see if the jar still floats.
If you can fill the jar with enough rocks, you will eventually be able to make it sink. Why? Why do rocks float when they are in the jar, but sink if they are not?

Explanation:
Everything in or on water pushes some water aside, even if just a little bit. This is called displacement.
The smallest rock sank, didn't it? When it did, it had to displace some water to make room. The water level went up a little when this happened.
If we could weigh the little rock and the amount of displaced water, we would see that the rock weighs more than the water, since it sank right to the bottom of the bucket!
Next, let’s say we weighed our jar with the smallest rock inside and the amount of water IT displaced. Our jar with the little rock floated, didn't it? On our scale, it would weigh THE SAME as the water it displaced. If we kept weighing our jar with more rocks, and the water it displaced each time, we would see that the jar displaces more and more water.
The heavier the jar gets, the more water it displaces, but as long as the two weights are the same, the jar will still float. At some point, the jar begins to be heavier than the water it displaces, and this is when it finally begins to sink.

When you made the jar heavy enough sink, were you able to see the water level in the bucket rise?

Science, Grade 4.

Investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:

- Analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

Science concepts. The student knows that matter has physical properties. The student is expected to:

- Conduct tests, compare data, and draw conclusions about physical properties of matter including states of matter, conduction, density, and buoyancy.

In this project the teacher will first demonstrate the project and passes out handouts. During the demonstration, the teacher will ask questions of what the students will predict will happen. Then the students will continue after the first step. This project will be an extension to volume and mass.

Water Density - Laura Soto

TEKS: 7th grade Science-112.23 7(a) (4); (2) (B); (2) (C); (2) (d)

INTRODUCTION: Start off by asking students this Question- "Did you know that you can make water denser?

MATERIALS NEEDED: Clear straws; clay; salt; blue, red, & yellow food coloring; dropper; & 3 plastic cups filled with water

INSTRUCTIONS:
1.) Add a few drops of blue food coloring to one of the cups filled with water. Add red to the other cup and yellow to the third cup.
2.) Then add different amounts of salt to each cup. Add lots of salt to one color, a medium amount to another color, and very little to the third color.
3.) Using clay, make a base for the straw. Stick the straw into the clay to keep it standing straight.
4.) Now, put drops of the different colored water into the straw. Record what happened.
5.) The different colors float on top of each other in the straw. This is because the more salt that there is in each solution of water, the denser it is. Density is one thing that makes things float. So, the color that floats at the top of the straw is one that is least dense.

QUESTIONS TO EXPAND ON:
1.) What would happen if we added different amount of sugar instead of salt?
2.)What other ingredients do you think you could add to the water to distinguish density?
3.) What other liquids could you substitute instead of water and how do you think it would make a difference?

Reaction in a Zip Bag - Melissa Lozano

Lesson Idea from:
FOSS (Full Option Science System) Mixtures and Solutions, Investigation 4: Fizz Quiz (p. 22)

Purpose: To allow students to gain hands on experience with chemical reactions and the amount of gas produced in a closed system. Students will witness how a reactant is produced and will be capable of evaluating and synthesizing information attained. TEKS §112.7 (a) (b) (1) (2) (3) (4) (7).

Materials for the teacher:

1 Large zip bag	1 small zip bag
One can of soda	

Materials per group:

2 Small zip bags	
1 Syringe	Calcium Chloride
1 Container of water	Baking-Soda
Safety goggles	Citric-Acid
5 ml spoon	Little Scientist Journal hand out

Hook: Take a soda can and furiously shake it. Put inside the large zip bag and seal it. Allow students to see what happens when you open the can inside the zip bag.

Preliminary Discussion: Permit students to ascertain why the can exploded. Ask students what their concept of chemistry is. Then ask if they believe that the process that took place in the can while being shaken had anything to do with chemistry.

Procedure:

1. Place students in groups of three. Each group should have all the materials

2. The student will get one leveled spoon of calcium chloride and one leveled spoon of baking soda and drop into the small zip bag.

3. The student will then zip the bag closed leaving an opening about the size of the syringe. (The student should push all the air out of the bag in the process)

4. The student will get 50 ml of water with the syringe and quickly add it to the zip bag and close it.

5. All students observe as the group members take turns holding and gently shaking the bag.

Socratically assess students' ability to decipher what is occurring. Ask students questions such as:

- *What happened to the bag?*
- *What made the bag inflate?*
- *Where did the gas come from?*
- *How does the volume of gas compare to the volume of chemicals you put into the bags?*

6. Now the student will conduct the same experiment as in steps 2-5 utilizing citric-acid and baking soda.

Ask students how this experiment differed from the previous one.

7. Now the teacher will demonstrate adding one level spoon of all three of the materials into a zip bag: calcium-chloride, baking-soda, & citric-acid.

Ask students how they think the bag will react now.

Discussion:

Introduce the concept of a reactant. Reactants are two chemicals that when put together form a reaction. In order to retrieve background knowledge, talk about what happened with the can that was shook. When furiously mixing the carbonated water, corn syrup, citric acid, sodium citrate and sodium benzoate in the can, it produces a gas that creates an explosion upon releasing the tension.

Ask students who we know that a gas was formed in the experiment. Discuss the idea that gas in tangible in the form of bubbles yet breaks free of the liquid and disperses into the air.

Discuss how it was possible to determine which reactant produced more gas.

Finally, ask the initial question whether the process that took place in the can had anything to do with chemistry and why.

By having students make the connection that chemistry is all around us and that we are exposed to it on a daily basis will prompt awareness and will allow students to later build upon the knowledge obtained.

Baeza Rocket

Lesson Idea from: Isaac Baeza (Clinical Faculty)

Purpose: To give students an opportunity to bridge the gap between chemical reactions and physical science concepts. TEKS §112.7 (b) (1)(2)(3)(4)(7)(8).

Materials:

Several Alka Seltzer tablets	1 small rubber band
1 film	1 large class of water
1 Hot Wheels toy car	1 nail
Little Scientist Journal hand out	

Procedure:

1. Secure the film canister to the top of the toy car with the rubber band.
2. Poke a hole in the cap of the film canister using the nail.
3. Break 4 Alka Seltzer tablets and drop into film canister.
4. Fill ¼ of the film canister with water and cover with cap immediately.
5. Place car on the floor and let go.
6. Measure the distance traveled with 4 Alka Seltzers.
7. Repeat procedure with 5 Alka Seltzer's and record results. Then with 6 tablets and so on.

Conclusion:

The chemicals in the tablet are energy at rest (potential energy). It is not until you mix the chemicals with a solvent, water, that the chemicals now become kinetic energy, thus propelling the vehicle.

Physical Science Concepts at work: opposite and equal reaction, motion, potential and kinetic energy.

Discussion:

After trying both experiments, students will have a better understanding of chemical reactions and how they can be utilized in the real world. Socratically ask students: How can this concept be applied to the real world? Where do you see such concepts being used?

Little Scientist Journal

Reaction in a Zip Bag

1. What do you know about:

- Citric Acid - ____
- Baking Soda - ____
- Calcium Chloride - _______________________________________

2. What do you predict will happen when you add water to the bag that contains citric acid and baking soda?

____

____

3. Was your prediction correct? Why or why not? What actually happened?

____

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4. What do you predict will happen when you add water to the bag that contains calcium chloride and baking soda?

____

____

5. Was your prediction correct? Why or why not? What actually happened?

____

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____

6. What do you predict will happen when you add water to the bag that contains citric acid, calcium chloride and baking soda?

7. Was your prediction correct? Why or why not? What actually happened?

8. Why do you think the zip bag inflated each time?

Baeza Rocket

1. What do you predict will happen when 4 Alka Seltzer are added to the film canister? Why?

2. Was your prediction correct? Why or why not? What actually happened?

3. What physical science concepts are at work here? How do you know?

4. Where else have you seen these types of concepts at work?

Executing this project in the classroom will provide students the ability to understand how chemical reactions occur and how we use them. In order to best use this activity in the classroom, the instructor should be extremely prepared and ready for any unexpected outcomes to occur. If the instructor actually performs the experiment before hand, he/she may be more insightful to expected and unexpected outcomes.

When preparing for the first part of the experiment, it is best to have the materials already out and ready on the table. Have the materials that each group of students will need put inside a bin so that it may be easy for students to obtain them. For the next experiment, it would be best to introduce it the next day so that students will have the opportunity to absorb the concepts before moving on. Again however, having materials set to go will alleviate any wasted time and will allow for more instruction time.

It is best to be thoughtful about proceeding to introduce the lesson. Mentally run through key element in the lesson so that you won't forget to discuss them. An index card with these key concepts can assist you as you begin the lesson. After an introduction has been established, students will then proceed to take on the project as a group.

An appropriate method that should be initiated by the instructor is to walk around from group to group to assess and scaffold learning. Students will appreciate the freedom you give them while providing them assistance and reassurance while conducting the experiments.

After actually teaching these experiments in the classroom, I realize that my students really enjoyed having a hands on experience with chemical elements. They displayed a desire to learn and do more. They began asking questions such as, "what if we did this?" and, "we should try doing that…" I enjoyed seeing them so engaged and took pleasure in seeing learning at its best.

Fun with Density – Oscar Mendez

TEKS
§§112.22. Science, Grade 6.

(b) Knowledge and skills.
(2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;
(B) collect data by observing and measuring;
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
(D) communicate valid conclusions; and

Introduction

Have you every wondered why some liquids or solids float. This lesson will introduce students to density, mass and volume. It will show density as both a property of solids and liquids. Density is a physical property of matter, as each element and compound has its own unique density. Density can be defined as the measure of the relative "heaviness" of objects with a constant volume. For example: A rock is obviously denser than a crumpled piece of paper of the same size.

Objectives

1. Students will be able to define density, mass, and volume.
2. Students will be able to use their knowledge of density to layer different colors of water in a straw
3. Students will be able to explain why liquids float or sink.

Materials

small aquarium or clear bowl
water
two cans of Coke or Pepsi (diet and regular) food coloring (red, green, and blue)
clear straws
clear plastic cups
sugar cubes
stirring rods or spoon

Fun with Density Data Sheet

Procedure

Focus Phase:

Fill a fish tank or clear bowl with water. Ask students to predict whether both (diet and regular) cans of soda will sink or float and why. Students write their predictions and explanations on a data sheet (see Materials). After predictions have been made, place both cans in the water one at a time. Have the students record the results on their data sheet. Ask students for their ideas about what happened. Write students' ideas on the board.

Challenge Phase:

Each student will receive four cups. Three of the cups will contain one cup of water with either red, green, or blue colored water. One cup will just be an empty waste cup. Students will put the following amount of sugar cubes in each cup:

the green colored water will contain 5 sugar cubes
the red colored water will contain 3 sugar cubes the
blue colored water will not have sugar cubes

Students will stir their mixtures until the sugar dissolves completely. Give each student a straw. Inform students, "The goal of this activity is to layer your colored water in the straw." (Demonstrate what is meant by layering using other colors of water -- different colors than what the students have.)

"What order will the colors layer in your straw? Why?" Students will record their predictions and explanations individually. Students begin the activity by placing their clear straws in the cups of colored water. They will use their thumb to get the colors to layer. The goal is to get the water to layer in the straw. (It should layer blue, red, and green *from* top to bottom.) Students will write down the order in which the colors layered and why they think they layered in this way.

Concept Introduction Phase:

Ask students to share their results *from* the focus phase and challenge phase. Write the results on the board.

.*Cans:* "Why did one sink and one float?
Straws: "Did your solutions layer? In what order? Why did they layer?"

."Are there any similarities between the two experiments?" Students should make the connection that the amount of mass in the heavier of the two liquids affects the density, and it sinks below the substance containing less mass. The density of the regular soda is heavier than the diet soda because it contains more sugar. The density of the red liquid is heavier because it has the most sugar. Discuss the concept of density and the relationship between mass and volume. The amount of mass in an object makes it denser.

Concept Application {Reinforcer}:
In order to reinforce students' understanding, ask the following questions: "In this activity did you notice that the colors mixed to create a brownish liquid? If so, why did they mix in this way instead of forming distinct layers? What did you do differently to get the colors to layer?"

Assessment

Collect the students' data sheet ensures that they accurately communicated that liquids with greater density will sink below liquids that are less dense.

Name: Date:

Fun with Density Data Sheet

1. Sink or float? What will happen when a can of soda and a can of diet soda are placed in the aquarium? Why do you think this will happen? Write your prediction and explanation in the space below.

2. Now record what you have seen happen with the two cans of soda. Why did this happen? Record your ideas below.

3. Predict in what order the colored liquids will layer in your straw. Why do you think they will layer in this order? Write your answers below.

4. Now that you have completed the activity, write down in what order the colors layered. Were your predictions accurate? Why did the colored liquids layer in this order? Write your answers below.

5. What is the relationship between the two experiments (sodas and straws)? Why did one soda sink and one float? How does this relate to the way the liquids layered in your straw? Write your answer below.

Electro-Detector: Detecting Charged Objects - Sulema Ortiz-Monreal

GRADE LEVEL: 5th grade

Subject: Science

OVERVIEW: This lesson introduces the concept of electrical conduction and the effects on an electroscope. The students should construct and use a simple electroscope and use the device to discover how charges affect an electroscope.

OBJECTIVE: Students will be able to

- Build an electroscope;
- Define the function of an electroscope;
- Describe the motion of charges inside an electroscope when near the charge object.

TEKS:
Science concepts. The student knows that matter has physical properties. The student is expected to:
(A) Classify matter based on its physical properties including magnetism, physical state, and the ability to conduct or insulate heat, and electricity.
(8) Science concepts. The student knows that energy occurs in many forms. The student is expected to:
(A) Differentiate among forms of energy (electrical).
(C) Demonstrate that electricity can flow in a circuit and can produce magnetic effects.

MATERIALS NEEDED:

- Small Jar w/Lid
- Balloon
- Nail
- Clothes (wool, or polyester)
- Aluminum Foil
- Copper Wire
- Comb
- Scissors
- Clay

PROCEDURES: Experiment with Balloon
1. Find a lid that will fit the jar. With a nail, make a small hole through the center of the lid from top to bottom.
2. Push a 6-inch piece of copper wire through the hole. Leave about 1 inch of wire above the top of the lid.
3. Seal the top and the bottom of the hole with clay. Make sure that no air enters the jar.

4. Bend the wire coming from the bottom of the lid into a hook. Make an L- shape with the wire.
5. Cut a piece of aluminum foil into a strip 1 long and ¼ inch wide. Fold the strip in half, and hang it on the L-shape wire. Make sure the sides of the aluminum foil are not each other, but also are not too far apart.
6. Make sure the aluminum foil and the hook do not touch the sides or bottom of the jar.
7. Roll up another piece of aluminum foil into a ball and the copper wire sticking out of the lid. Make sure it is placed firmly.

PROCEDURES: Experiment with Comb
1. Turn a balloon or a comb into a charged object by rubbing it on your clothes.
2. Bring the charged object near (Do not touch) the foil ball at the top of the electroscope. Watch what happens.

OBSERVATION: Did the foil strips come closer together or farther apart? If you hold an object with a charge near the foil ball, the object will draw the opposite charge through the wire from the foil strip. The two sides of the strip will then have the same charge and repel each other.

THE HOOK:

How do you charge an item?
How do you know the item is charged?
How can you determine the charge?

WHAT YOU'LL LEARN: You can make a device that detects electrical charges.
Electroscope: a simple instrument for detecting the presence of static electricity.
Electroscopes are also used for measuring the quantity of charge.

REAL WORLD USES:
1. Electroscopes are still used to measure radiation.
2. You come inside from the cold, pull off your hat and......BOING!!! All your hair stands on end.
3. If you walk across a carpet, electrons move from the rug to you. Now you have extra electrons. Touch a door knob and ZAP! The electrons move from you to the knob. You get a shock.
4. Electrostatic can be very harmful to computers.

Tiny Bubbles in My Hard Water? - Annalletta Mora

Materials: 2 tablespoons of Epson Salt, 8 cups of distilled water, 3 teaspoons of dawn dishwashing detergent, two tablespoons of Cascade dishwasher detergent, stop watch, and 4 plastic two liter bottle containers labeled hard water with dawn, soft water with dawn, soft water with cascade, and just soft water.

Steps:
1. Pour two cups of distilled in each of the plastic containers.
2. Pour the 2 tablespoons of Epson Salt and 1 teaspoon of Dawn in the plastic container labeled hard water with dawn,
3. Pour the 1 teaspoon of Dawn in the plastic container labeled soft water with dawn,
4. Pour the two tablespoons of Cascade dishwasher detergent in plastic container labeled soft water with cascade,
5. Leave the soft water container without anything in the water,
6. Shake each container for 20 seconds and have students record their findings on a sheet of paper,
7. Explain that the bottle with the cascade did not bubble that much, because it is chemically formulated not to bubble,
8. Explain that the hard water (Epson Salt) did not bubble as much as the soft water, because soap bubbles are harder water, then soft,
9. The bottle with the soft water only did not last at all, because there was no soap to help the bubbles form, and
10. The soft water with Dawn had the best bubble, because soap works the best in soft water.

TEKS: Fifth Grade Science "Mixtures"

Build Your Own ACV (Air-Cushion Vehicle/Hovercraft) - Debbie Long

Grade Level: 7
Time: 45 minutes
Materials: Cardboard Square (4”x4”)
Thread Spool
Balloon
Paper
Glue
Scissors
Pencils, round (several)
Small Action Figure (optional)
2 Books
String
Elastic Band

TEKS: 7.2A Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:

7.2C Plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;

7.6A Science concepts. The student knows that there is a relationship between force and motion. The student is expected to:

7.6B demonstrate that an object will remain at rest or move at a constant speed and in a straight line if it is not being subjected to an unbalanced force

Activating Prior Knowledge:
This brief activity could follow a unit on force, mass and acceleration.
Prior to introducing lesson, stack 2 books on a table and tie a string around the bottom book. Attach a long elastic band to the string. Move the stack of books a short distance by pulling the elastic band. Have students observe how much the band stretches. Now put several round pencils beneath the books, and have students again observe how much the band stretches. Allow students to discuss what they think is happening in both situations. Some sample questions you may want to pose to students throughout activity:
“What happens if you push a stack of books across the table and then stop pushing?”
“Will it keep moving?”
“Why does the book stop sliding after you push it?”
“In which direction is the force acting upon the books?”

Discuss: Friction and the different types of frictions (sliding, rolling, and fluid). Explain to students that as the book slides, the force of friction causes it to slow and eventually stop. Friction acts in the opposite direction of the motion of the books. The force of friction depends on the types of surfaces involved and the force with which they rub against each other.

Examples of friction you may want to discuss with students:

- A car is able to move, because there is friction between its tires and the road. Friction allows your car to accelerate, stop, and change direction. When it rains or snows, friction is reduced and causes us to slide.
- You can walk and move forward, because there is friction between your feet and the floor.
- If you rub your hands together lightly you have very little friction, but try pushing them together and then try rubbing them-more friction, right?

Ask students if they can think of anything we use that reduces friction. Examples of possible responses:

- A mouse and mouse pad
- Air hockey
- Roller skates/Ice skates
- Sleds/toboggans

Tell students they will be creating their own hovercraft or ACV. Explain that an ACV is a vehicle that travels on a layer of compressed air just above a surface (land or water). Students may be place in groups of 4 for the hovercraft activity.

ACV Model

Procedure:

1.Prior to passing out cardboard, punch a hole in the center of each square. The hole should be the same size as the hole in the spool.
2. Glue the spool to the cardboard on top of the hole. Be sure to carefully line up the holes. Use enough glue so that no air can escape between the spool and the cardboard.
3.Cover the top of the spool with a circle of paper and allow the glue to dry.
4.Punch a hole in the middle of the paper cover where the hole of the spool is. You should have a hole that runs through the paper, spool, and cardboard without any obstructions (watch for too much glue)
5.Blow up the balloon and twist the end to keep the air from escaping. Stretch the balloon over the top of the spool.
6.Put your Galaxy Warrior in a seatbelt!
7.Set your hovercraft on a level table. Let go of the balloon.
8.Give your ACV a few gentle pushes.

Discuss with students:

The compressed air acts as an invisible cushion that removes nearly all the friction between the surface and the ACV. Some ACVs carry passengers, vehicles, and freight, and can travel up to 80 mph. They will be using air to reduce the friction that would have existed if the ACV were resting directly on the table. When the friction is decreased, their ACV will scoot across the table.

Extension: This would be a good introduction to a unit on gravity.

Assessment:
•Question and answer sessions throughout both activities
•Students ability to follow instructions
•ACV Model

References:
www.springhurst.org/students/hovercraft.htm
Science Explorer Grade 7, Prentice Hall
www.spartechsoftware.com/reeko/Experiments/ExpHoverCraft.htm

Instructional Methods:

•Activate prior knowledge of force and motion.
•Engage students with a warm-up activity. Allow students to analyze, interpret, and make inferences about what is happening between the stack of books and the table
•Make connections between the current lesson on friction and previous lesson on force and motion
•Challenge students to think of other types of devices that involve the reduction of friction (ice skates, air hockey, sleds, etc.)
•Place students in groups and facilitate building of the ACV model
•Asses understanding of concepts throughout both activities

Electric Gelatin – Teresa Barraza

TEK 5.8 Science concepts. The student knows that energy occurs in many forms. The student is expected to

(A) differentiate among forms of energy including light, heat, electrical, and solar energy.

Material needed

- Balloons
- Unflavored gelatin powder
- Paper plates
- Your hair or a wool sweater

Instructions:

7. Pour unflavored gelatin powder on the paper plate
8. Blow up a balloon and tie the opening shut
9. Rub the balloon on your hair or on the wool sweater for 10 seconds
10. Hold the charged area of the balloon (the part that you rubbed with your hair) and inch above the gelatin powder. Don't let the balloon touch the gelatin.
11. What happens?
12. Slowly raise the balloon. Now what happens?

The goal of this activity is for students to explore the concepts of static electricity. As an instructional method I would use the Socratic Method to get the students involved and to get them thinking about static electricity. Then I would put them to work in cooperative groups to perform this activity, so that they can share their observations and learn from each other. I would informally assess them by observing how they are working and by asking them questions.