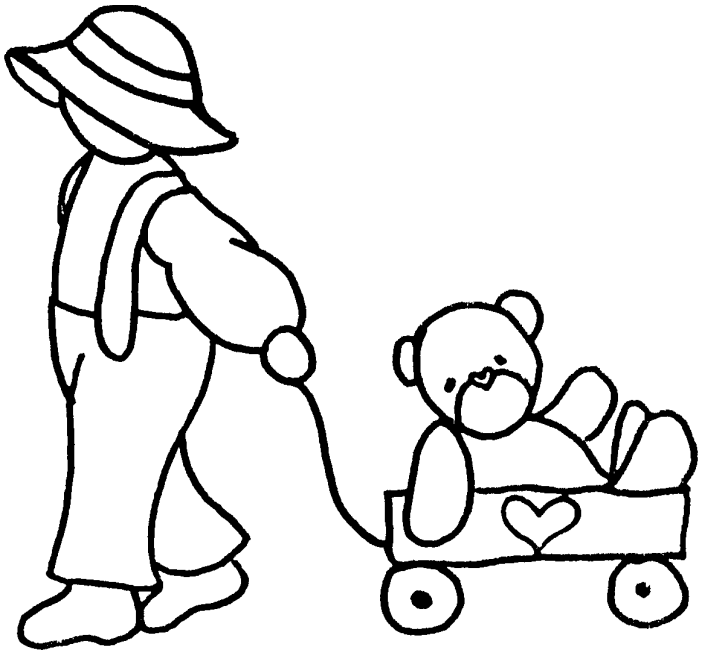
Applied Science

Our Technological World

THIRD GRADE

SCIENCE AND MATH



3 WEEKS
LESSON PLANS AND
ACTIVITIES

APPLIED SCIENCE
OVERVIEW OF THIRD GRADE

SCIENCE AND MATH

WEEK 1.
PRE: *Comparing objects mathematically.*
LAB: *Predicting and measuring objects.*
POST: *Comparing and contrasting objects.*
WEEK 2.
PRE: *Discovering lab equipment.*
LAB: *Measuring volume using a graduated cylinder.*
POST: *Comparing volume, mass, and weight.*
WEEK 3.
PRE: *Investigating a "new" discovery.*
LAB: *Experimenting with peanuts.*
POST: *Comparing inventors and scientists.*

PHYSICS

WEEK 4.
PRE: *Exploring magnetism.*
LAB: *Discovering magnetic force.*
POST: *Comparing objects that are magnetic and non-magnetic.*
WEEK 5.
PRE: *Comparing static and current electricity.*
LAB: *Exploring the origin of static electricity.*
POST: *Investigating lightning.*

TECHNOLOGY

WEEK 6.
PRE: *Exploring DC and AC current.*
LAB: *Comparing series and parallel circuits.*
POST: *Discovering how machines operate using electricity.*
WEEK 7.
PRE: *Investigating how you pay your energy bill.*
LAB: *Exploring small appliances.*
POST: *Evaluating electrical safety.*

BUILT ENVIRONMENT

WEEK 8.
PRE: *Comparing different modes of transportation.*
LAB: *Designing a train route to service a community.*
POST: *Investigating different types of trains.*

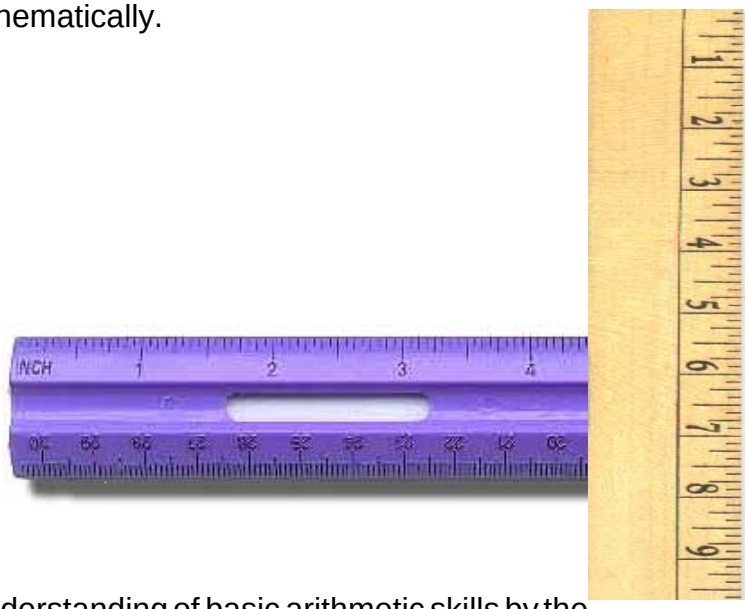
APPLIED SCIENCES - SCIENCE AND MATH (3A)

PRE LAB

Student measure length and width of two-dimensional objects.

OBJECTIVE:

1. Comparing objects mathematically.
2. Measuring objects.



VOCABULARY:

geometry
mathematics
metric

MATERIALS:

metric rulers
worksheet

BACKGROUND:

Students should have an understanding of basic arithmetic skills by the third grade. However, much of their understanding of arithmetic is how to manipulate numbers and find answers. Many students find this boring and tedious and develop a dislike for mathematics. Mathematics is a diverse topic that has fascinated humans for a long time. Importantly, mathematics is useful to scientists, business, painters, builders, and economist to name of few.

Math provides a greater ability to describe objects. If a student has a good knowledge of geometry, they are able to describe what they see. Geometry can be divided into linear geometry which describes 1 or 2 dimensional objects, and solid geometry which describes three-dimensional objects. Many subjects in science require this qualitative ability to describe things. Without the ability to measure or see shapes, a student will not be able to further their investigations.

In this activity, students describe and measure the length of 2 dimensional shapes. In the lab, students will be asked to describe different objects. It is difficult for students to describe shapes and to estimate length without prior practice. Students will use the worksheet to help them develop measurement skills and shape recognition.

PROCEDURE:

1. Discuss the differences between 2 dimensional and 3 dimensional objects. Some shapes such as diamonds or hearts can be both 3 dimensional or 2 dimensional. Ask the students to describe shapes in the room and estimate linear measurements.

2. Describe length of an object as the longest measurement, width as the shortest. It doesn't matter which way you turn the object, the measurements are constant. There are some exceptions to this, especially with objects you cannot move. Vertical blinds for a window are one exception; the width is always parallel to the floor and the length is perpendicular to the floor.

3. Distribute the worksheets and metric rulers to the students. Tell the students that they will be measuring objects using the metric system. They will measure the objects in centimeters. Using centimeters is much easier to measure objects and helps students understand decimals and percentage. For instance, if an object is 1 cm and 5 mm in length, the student writes 1.5 cm. 1 is the number of cm (before the decimal) and 5 is the number of mm (after the decimal). There is no conversion in metric because it is base 10 already. Make sure the students know the difference between cm and mm "ticks" on the ruler. Do not make student “convert” from the English to metric. They need to get an feeling for the metric with a conversion factor.

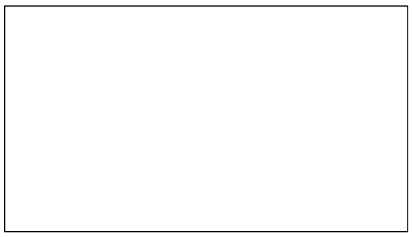
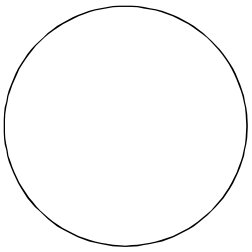
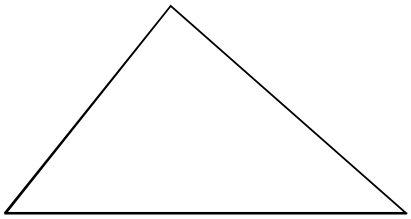
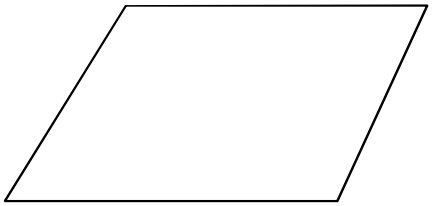
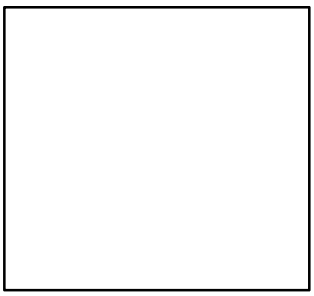
4. Model how to do the first object. On the board write down the width, length, and shape of the object. Work this problem with the students. Show the students where to record their answers.

5. Allow students time to complete the worksheet on their own or with a partner. Monitor them as they work.

6. After the students have finished measuring all the objects, orally review their results. Give them the names of the shapes if they did not get them correct. Remember there is margin of error when measuring, so allow them a little leeway.

APPLIED SCIENCES - SCIENCE AND MATH (3A) PRE

MATERIALS: metric ruler
DIRECTIONS: Measure the items listed in centimeters and millimeters and describe their shapes in the space provided.

LENGTH WIDTH SHAPE	1. 
DIAMETER SHAPE	2. 
LENGTH HEIGHT SHAPE	3. 
LENGTH HEIGHT SHAPE	4. 
LENGTH WIDTH SHAPE	5. 

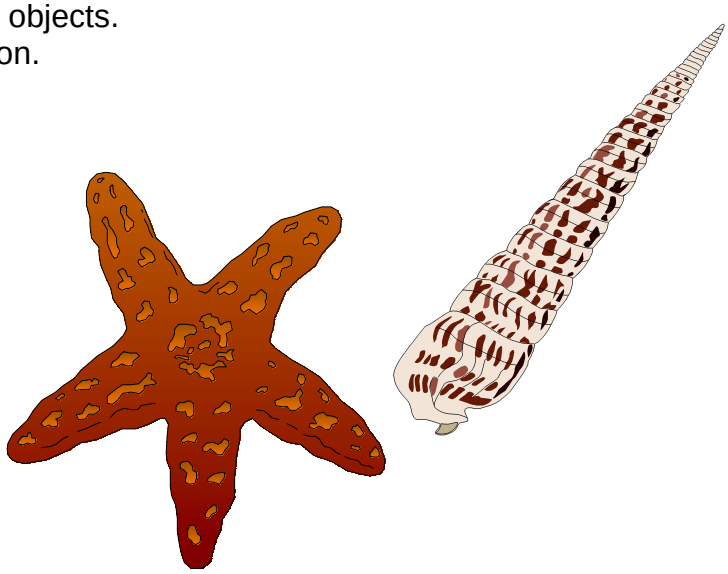
APPLIED SCIENCES - SCIENCE AND MATH (3A)

LAB

Students measure natural objects.

OBJECTIVE:

1. Predicting and measuring objects.
2. Exploring shape recognition.



VOCABULARY:

cubic
rectangle
rhombohedral
round
sphere
square

MATERIALS:

lab sheet
Science and Math (3A)
rulers

BACKGROUND:

Real objects aren't always a perfect shape. In order to describe such objects, one must be able to make a "close approximation." Sometimes the endings -ish or -like can help distinguish a perfect shape from a not-so-perfect shape. For example, a roundish object or a square-like shape.

In this lab, students will look at different objects. They will describe their shape and color. Students will predict and record the measurements of objects before they measure them. The metric system is recommended because it is easier to measure a fractional part of the object. Even if students have not learned about decimal points, it is easy to say centimeters before the decimal, millimeters after the decimal. The English system is difficult to convert because the decimal system basically converts the English system to metric. Using metric to start with avoids the use of conversion.

PROCEDURE:

1. Pass out the objects. Tell students that they need to describe the shape and color(s) of each object. Model how to do this with one student's object. After recording the shape and color, they need to predict the object's dimensions. In most cases they need to only guess at it's length and width. Occasionally they also need to mention it's height.

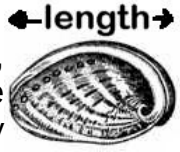
Remind them that their guesses will not be held against them if they are wrong. The more they practice measuring the better their guessing will become.

Reinforce the difference between length, width, and heigh. Demonstrate how to measure an irregular object like the abalone shell. Length is the longest length and width the shortest.

2. After they have predicted the dimensions they can use a metric ruler to measure the object. Ask them to record their measurements in the spaces provided and compare it with their prediction.

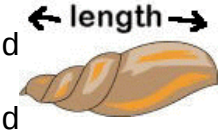
3. The information below will help you with each of the items.

CUBE WITH MAGNIFYING LENS: Students should predict the length, width, and height. As an extension, you might want students to describe the magnification, which is approximately 2 times. Students can find the magnification by putting a line on a piece of paper. Next, put the magnifier over the line and draw the apparent height they see and then compare.



ABALONE SHELL: Students should count the number of holes, length, and color on one side and the other side. The holes are used by the abalone as a way to get water through its body. Remember abalone only have one shell.

SCALLOP: Students should measure the length and width and describe the shape. Remember that the length is the direction in which it is the longest. The width is the other direction, and the "fattest" portion of the width, is the actual number.



SNAIL: Students should measure the length and width, and describe the color. The geometry of the snail is "spiral."

SEA URCHIN SPINE: Students should measure the width and length of this sea urchin spine, which was attached to a sea urchin when it was alive. The spines would radiate from the sea urchin body, and helps the sea urchin move. Many times people use the spines in necklaces.

FLOWER CORAL: Students should measure the width and length and describe the color. This specimen represents on coral individual. The living animal had tentacles that trap particles in the water from which it finds food.

LEAF: Students should describe the length and width and describe color. You may want to replace this with a real leaf. If possible, use real leaves so students can also describe the veins.

ANIMAL SHAPE: Describe the shape and measure length and width. Have students describe without mentioning the name of the animal. This is difficult.

APPLIED SCIENCE - SCIENCE AND MATH (3A)

PROBLEM: Is it easy to predict the dimensions of natural objects?
PREDICTION: _____
PROCEDURE: Look at the objects. Describe and record the dimensions you think the objects are. Record them in the box. Then measure the object and see how close you were!

	DESCRIBE SHAPE	PREDICT DIMENSIONS	ACTUAL DIMENSIONS
CUBE			
ABALONE			
CALCITE			
SCALLOP			
SNAIL			
SEA URCHIN			
FLOWER CORAL			
LEAF			
ANIMAL			

CONCLUSION: Were you able to predict the measurements of the objects easily?
_____

APPLIED SCIENCE - SCIENCE AND MATH (3A)

POST LAB

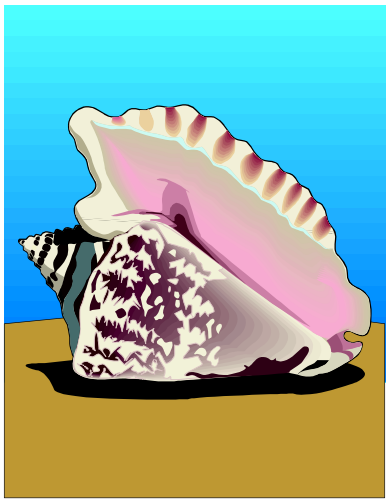
Students compare a clam and a snail.

OBJECTIVE:

1. Comparing and contrasting objects.
2. Investigating how to compare objects systematically.

VOCABULARY:

characteristics
shape
shell
spiral



Gastropods are spiral.

MATERIALS:

worksheet
snail
clam

BACKGROUND:

Nature for some reason likes symmetry. Many organisms display a beautiful pattern in their group. Early philosophers would write about why nature is so consistent. For instance, to the left is a picture of fuchsia, which grows in multiples of four. So even a plant, knows its time tables! We call this 4-part symmetry.

Other organisms have bilateral symmetry, which is a mirror image of one side. Bilateral symmetry is characteristic of many animals, including insects, fishes, amphibians, reptiles, birds, mammals, and many crustaceans.

Some organisms have a 5-part or pentagonal symmetry. Echinoderms including sand dollars, sea urchins, and sea stars have this “star” symmetry.

Other organisms have no symmetry or asymmetrical. Spiral symmetry, like a snail, is asymmetrical. A circle has radial symmetry, which is no matter how you cut it through the center, one side will look like the other.

PROCEDURE:

1. Pass out the student worksheets. Ask the students to look at the shells and then describe the differences orally. Many will find it difficult. Record their responses on the

board.

2. Instruct students to begin working on the exercise. Give students guidelines to help them compare objects. First ask students to compare: color, length, width, lines, and shape.

3. Color is dependant on the real clam or snail you give them. You may want to use real objects for the entire exercise. Their answers will differ depending on the color of their sample.

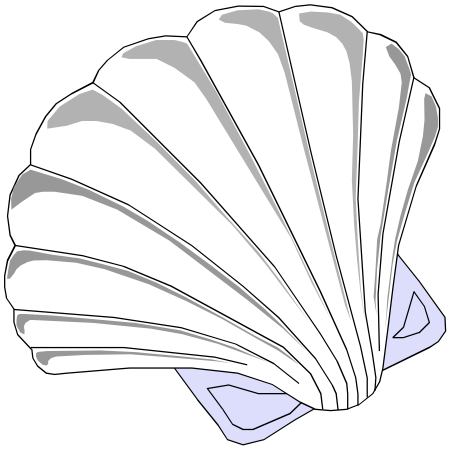
4. The shape of these two objects can be divided into two groups: bilateral and spiral. Bilateral objects can be split in two leaving two objects that mirror each other. A spiral object cannot be divided into any parts that look like the other side (asymmetrical).

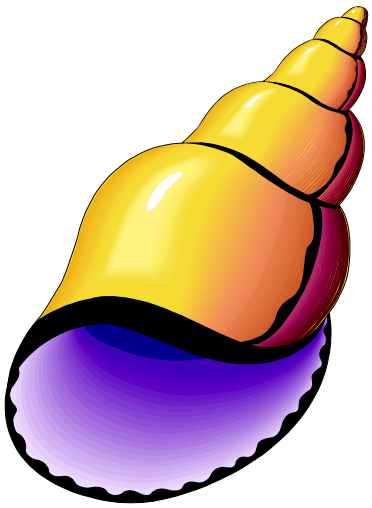
5. Review their charts when finished. Use the following chart as a guideline. Discuss the similarities and differences.

	CLAM	**SNAIL**
length	5.5 cm	7.5 cm
width	6.3 cm	4 cm
lines	across, up and down	up and down
color	depends on sample	depends on sample
shape	bilateral	spiral

APPLIED SCIENCE - SCIENCE AND MATH (3A) POST

LOOK AT THE PICTURES BELOW. FILL IN THE APPROPRIATE INFORMATION ON THE DATA CHART. (USE A REAL CLAM AND SNAIL TO DESCRIBE THE COLOR.)





	CLAM	SNAIL
length		
width		
lines		
color		
shape		

APPLIED SCIENCE - SCIENCE AND MATH (3B)

PRE LAB

Students determine the function of laboratory equipment.

OBJECTIVES:

1. Discovering laboratory equipment.
2. Comparing the functions of different lab equipment.

VOCABULARY:

balance
beaker
graduated cylinder
ruler

MATERIALS:

worksheet
beakers
graduated cylinders
ruler
balance

BACKGROUND:

Laboratory equipment can be very complicated because many pieces were designed for certain functions. In many cases, scientists or inventors have to develop their own "tools" in order to complete an experiment.

Depending on the science will determine the equipment needed. For instance, microscopes are very important to scientists who study protozoa or other small organisms. A geologist needs a hand lense and a hammer to break rocks. A physicist needs electronic equipment depending on the exact field of investigation.

Some equipment like glassware is usually standard including beakers and graduated cylinders. Equipment that measures weight or size is also important in most labs. It is important for young students to become familiar with some of the basic tools of science.

PROCEDURE:

1. In this exercise, students will look at the different science equipment you put out at stations. You can identify the piece of equipment by putting a name tag in front of each piece. If you don't have enough equipment, you might want to use pictures.

2. Students should try to figure out the function of each of the items before you discuss the function.

3. Use the worksheet to see if students can predict what the items are used for. Have students list the piece of equipment and then predict its use. Below are some examples you can use.

BEAKER: Used to measure and pour liquids. Have students notice the "beak" which helps liquids pour easily and accurately.

GRADUATED CYLINDERS: Used to measure liquids. Have students notice that they come in many different sizes. Graduated cylinders also have beaks to help pour easily.

RULER: Can be used to measure length in a linear direction.

BALANCE: Can measure the mass of an object by using mass weights. Can also measure one object against another.

THERMOMETER: Measures the temperature.

LITER: Measures volume.

APPLIED SCIENCE - SCIENCE AND MATH (3B)

TYPE OF EQUIPMENT	PREDICT PURPOSE

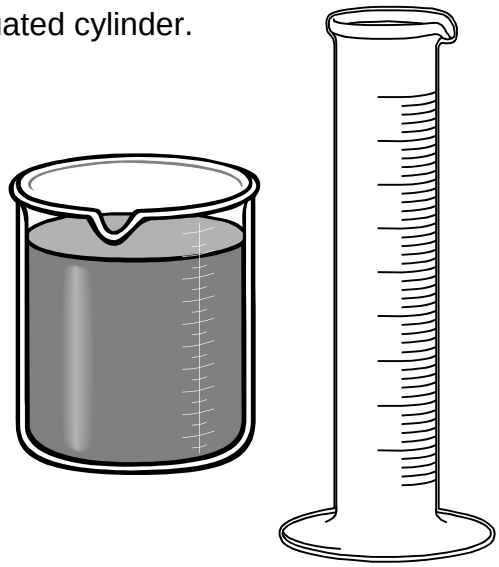
APPLIED SCIENCE - SCIENCE AND MATH (3B)

LAB

Students learn to measure liquids in a graduated cylinder.

OBJECTIVE:

1. Measuring volume using a graduated cylinder.
2. Recording volume.



VOCABULARY:

graduated cylinder
measure
volume

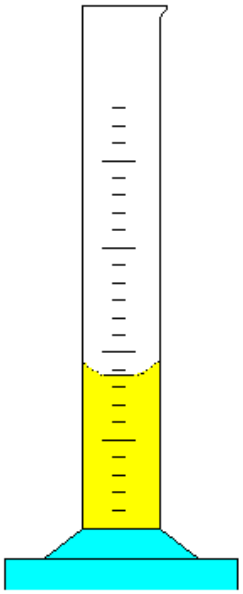
MATERIALS:

25 ml graduated cylinders
10 ml graduated cylinders
beakers
metric spoons
meat trays to catch spills
salt, vegetable oil, food coloring, rubbing alcohol

BACKGROUND:

Measuring liquid is difficult for students. Practice makes students more proficient, but not experts. It takes experience and skill to measure when using a graduated cylinder.

Discuss the divisions of measurement on your graduated cylinder. A graduated cylinder measures in milliliters, which is a measure of volume. The English system equivalent is pints, quarts, and gallons. It is much easier to measure in milliliters, because it is already divided into the decimal system for you. Just as students measured using metric with the left side of the decimal point centimeters and the right millimeters, the same is true for metric volume.



Measuring with a graduated cylinder is complicated somewhat by a *meniscus.* A meniscus is the curvature of the surface of the water. Water "sticks" to the walls of the graduated cylinder, but only on the sides and not the middle. When students look at the surface, the water level is not straight. Measurement should be at the lowest point (see figure to the right). Students need to read the meniscus at eye level in order to get an accurate reading. Students should place the graduated cylinder on the table and then lower their heads to be able to read the meniscus at eye level.

PROCEDURE:

1. Explain to students that learning to measure volumes takes practice. Today they will practice measuring different liquids. They will use a container called a graduated cylinder to measure liquids. Graduated cylinders have numbers on the side that help you determine the volume. Volume is measured in units called liters or fractions of liters called milliliters (ml). Students need to follow the directions on the lab sheet carefully. Remind them that you will be checking how they measure as you move about the room.

2. On the board show students a drawing of a graduated cylinder with a meniscus. Demonstrate where you would take the measurement. Ask them to work over the dish provided to make clean-up easier. Styrofoam meat trays work well for this.

3. Show students the beaks on both the graduated cylinder and the beaker. Tell them that they should use the beak to pour from.

4. Distribute the lab sheets. Ask students to complete the prediction and then to follow the directions on the lab sheet. It is difficult for students to measure because they are usually not patient. It is important for them to keep trying.

5. When the lab is completed, ask the students to answer the conclusion.

6. Students should notice that the addition of salt does not effect the volume of the water. This is because as the salt dissolves, its molecules fill in the free spaces between the water molecules. The volume would change if enough salt was added to saturate the water. Be sure to use soapy water to clean the glassware containing oil.

APPLIED SCIENCE - SCIENCE AND MATH (3B)

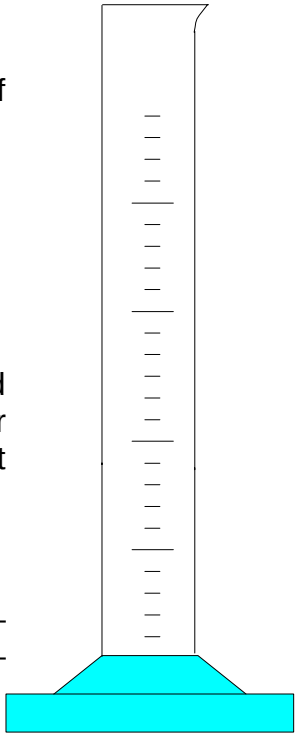
PROBLEM: How can you measure liquid volume?

PREDICTION:_____

PROCEDURE:

MATERIALS: graduated cylinder, food coloring, alcohol, vegetable oil

1. In your large graduated cylinder, measure 20 ml of water from a beaker. In the smaller graduated cylinder pour 9 ml of water. Have your teacher check your level. Draw what you see. The dip the water makes is called a meniscus. To measure the liquid read the lowest point of the water.



2. Put 15 ml of water in your 25 ml graduated cylinder. Add 1 ml of salt to the test tube. What is the volume of the graduated cylinder?

_____

Add another 1 ml of salt. Does the volume change?

_____

3. Put 10 ml of water in a graduated cylinder. In another graduated cylinder (25 ml one) put 10 ml of vegetable oil. Slowly pour the water into the vegetable oil. How much liquid do you have? Describe what you see?

_____

_____

4. Slowly pour the contents of #3 into a beaker or clear cup. Measure 10 ml of alcohol. Put 2 drops of red food coloring in it. Slowly pour the liquid into the beaker or plastic cup. Describe what happens?

_____

_____

CONCLUSIONS:

If you had a test tube filled with water, how could you measure it's volume?

_____

What is the unit of measurement for volume? _____

APPLIED SCIENCE - SCIENCE AND MATH (3B)

POST LAB

Students look at instruments that measures mass and weight.

OBJECTIVE:

1. Comparing volume, mass, and weight.
2. Investigating different methods of measuring.

VOCABULARY:

mass
volume
weight

MATERIALS:

balance (bucket)
spring balance
liter boxes
bath scale
graduated cylinders

BACKGROUND:

Mass is the quantity of matter in a body. More specifically, it is the measurement of the inertia or sluggishness that a body, in the absence of friction, exhibits in response to any effort made to start it, stop it, or change in any way from its original state of motion. Two items that have the same dimensions could have different masses, and two different sized objects could have similar mass. Mass does not change, no matter if you are in space or on Earth. Mass is a measure of the matter within a body. Mass is measured in kilograms and grams (metric) and slugs (English).

Weight is the force of gravitational attraction on a body as observed on the rotating Earth or similar situation. Weight on Earth and weight on the Moon of the same object, is different. The English system is measured in ounces and pounds and the metric is measured in newtons and dynes.

Although the difference between mass and weight is real, on Earth mass and weight are very similar. Many books do not distinguish the difference. This activity introduces the two words, mass and weight, and acknowledges they are somehow different. This helps students in future labs.

Balance

Volume is the quantity of space a body occupies measured in liters and milliliters in the metric system and ounces and pounds in the English system. The same volume of two different substances, may have different weight and mass.

Students in the third grade just have to understand that weight and mass are similar but not the same. Mathematical formulas can be used to distinguish the two easier, but not until a later grade!

Spring scales

PROCEDURE:

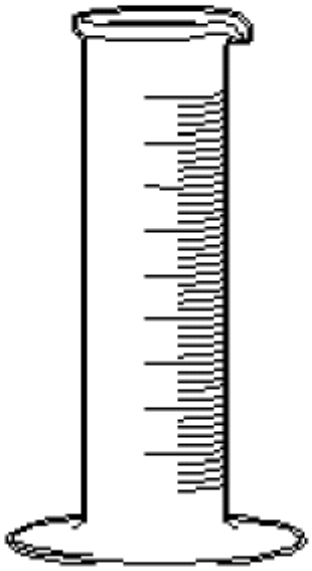
1. Go over the difference between volume, mass, and weight. Emphasize that on Earth the two measurements are similar, but in space the differences are very important. For instance you will weigh much less on the Moon than on Earth, but your mass is still the same. Gravity influences weigh, so the larger the body like Jupiter, the more you will weigh. It is not important if children remember this, as much as you begin their understanding of the difference.

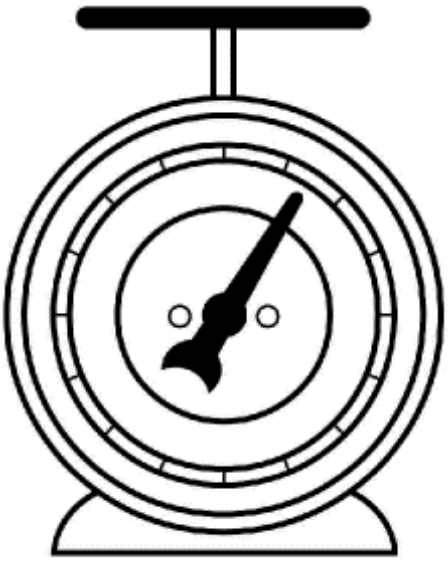
2. If you have different scales and balances you should demonstrate mass, volume and weight. A balance measures mass. A bath scale measures weight. Liter boxes or graduated cylinders measure volume. Go over this several times. It is not easy to understand, but very important in later labs. Have the students measure different things on the balance so they become familiar with using the balance.

3. You may want to use the worksheet and have students identify which of the instruments are used to measure volume, weight, and mass. The graduated cylinder measures volume, the rest of the scales (spring, balance, and scale) are used to measure weight and mass depending on the type of scale used.

WHAT INSTRUMENTS DO YOU NEED TO FIND THE MASS, WEIGHT, AND VOLUME OF AN OBJECT?

Identify each of the instruments. Remember Mass = amount of matter; Weight = pull of large body by gravity; Volume = space taken up by an object.





APPLIED SCIENCE - SCIENCE AND MATH (3C)

PRE LAB

Students research different inventors and scientists.

OBJECTIVES:

1. Investigating a "new" discovery.
2. Exploring how a discovery becomes part of technology.

VOCABULARY:

discovery
equipment
invention
research
scientific method
technology

MATERIALS:

books from school library
Internet
Invention by Lionel Bender (Knopf)

BACKGROUND:

An inventor's success depends upon the conditions and demands of a society as well as the available technological machines that assist in the development. Technical advances in one field are usually dependent upon technological progress in another. For instance, James Watt the inventor of the steam engine, was in the right society at the right time. In the early 1700's the Russian Polzunov, and in the 1600's an Italian, Giovani Bianca, designed a steam turbine. However, they were not in a society where skilled labor could apply the invention.

James Watt

Most scientists work in an intellectual framework (paradigm) where they think and produce. When a few scientists go outside the paradigm or the dogma of the day, it is referred to as scientific revolution. Scientists, as are most people, are reluctant to destroy a familiar framework. Sometimes science becomes stale because of this.

Discovery is sometimes hampered by too much structure in science. The "scientific method" of Francis Bacon in the 17th century of

experimentation, observation, and generalization is really not how science works. By the mid-20th century people realized there was no one scientific method, but many different methods applicable to different sciences and to different problems within them.

Creativity of observations and searching for answers where no one looks is key to excitement in science.

Science is interdisciplinary with far reaching conclusions. Science is many things to many people. Looking at science from a historical perspective, notice that most of the modern technology has been "discovered" within the last 100 years, one discovery leads to another. The next few labs will focus on the need for some inventions and how technology has changed our lives.

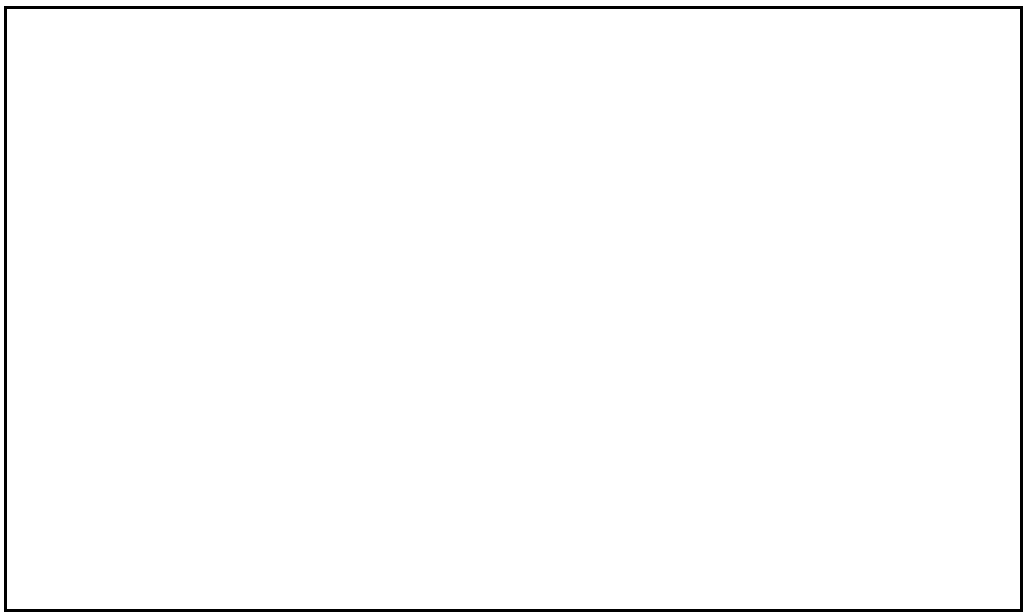
PROCEDURE:

1. Have students do a library or internet search on a scientific breakthrough that interests them. Use books like the recommended *Inventions.*

2. Have students write a short essay on "A Technology that changed the World." Use the enclosed sheet to help guide students. Students should draw their technology in the box. Topics for students to research include telephone, cinema, car, light bulb, bicycle, or any other technology.

APPLIED SCIENCE - SCIENCE AND MATH (3C) PRE

A TECHNOLOGY THAT CHANGED THE WORLD



APPLIED SCIENCE - SCIENCE AND MATH (3C)

LAB

Students experiment with peanuts.

OBJECTIVES:

1. Experimenting with peanuts.
2. Investigating the history of peanut products.

VOCABULARY:

discovery
inventor
researcher

MATERIALS:

peanuts
peanut butter (different brands)
crackers
paper clips

BACKGROUND:

After the Civil War, the United States went through many changes. The importance of the South declined because cotton was no longer king. The southern farmers planted cotton year after year, and it depleted the soil. When the slaves became free, many turned to farming since this was a profession they knew something about. However, they followed the practices of their former bosses, which continued to deplete the soil. Many faced disaster and this became a growing concern.

Peanut plant

George Washington Carver, an American, was a chemist, agricultural scientist, and inventor. He realized that southern farmers should diversify their crops by planting soil enriching peanuts and sweet potatoes instead of soil exhausting cotton. He campaigned very hard to get farmers to change their ways, but he then created another problem. What do you do with peanuts and sweet potatoes with a very limited market. So George Washington Carver, turned to his inventive side. He created over 300 products that could be used by both peanuts and sweet potatoes. Peanuts were used for cheese, milk, coffee, flour, ink, dyes, soap, wood stain, and insulating board. Sweet potatoes were used for flour, vinegar, molasses, and rubber.

Peanuts are high in protein and contain a high

percentage of oil. The ability to break down into a smooth mixture makes peanuts ideal for a sandwich spread. It would be hard for children to live in the United States without peanut butter and jelly sandwiches. George Washington Carver's inventions changed the eating habits of most Americans.

PROCEDURE:

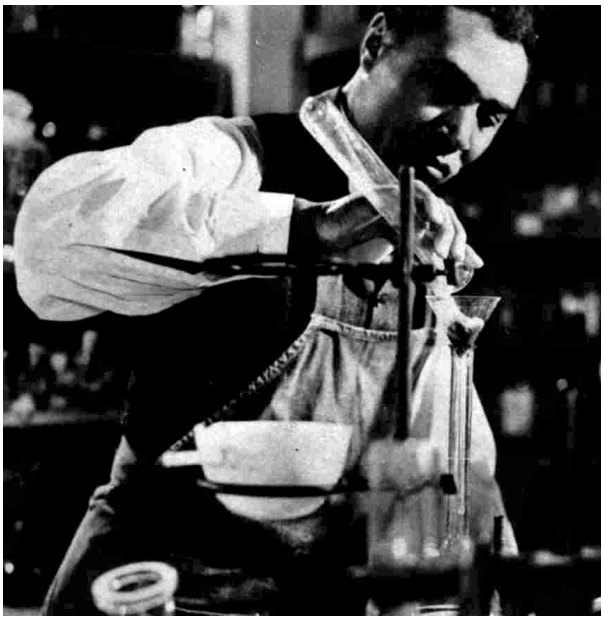
1. In this lab, students will learn some of the properties of peanuts George Washington Carver had to investigate before he "invented" new products. First, ask students if anyone is allergic to peanuts. These children should be excused from eating any peanut products.

2. Following the lab sheet, burn the peanut first. This may be done as a demonstration if parent help is not available. Students love to burn the peanuts, but many need supervision with matches. The peanut will be a mini torch.

3. Use a stretched out paper clip or a meat skewer to pierce the peanut on one end and then light it. The longer the handle of the torch the better. It may be wise to have students do this over a pail of water. The torch will last for a minute or so, this is because there is a lot of oil in a peanut.

4. Give the students several peanuts and have them look at the properties of the shell and peanut. The shell was used as insulating material at one time. See what the students think can be made from a peanut. Make them use their imaginations.

5. Have a taste test of two or three peanut butter brands. See if the students can tell the difference between brands. This a great lab for a snack!



George Washington Carver

APPLIED SCIENCE - SCIENCE AND MATH (3C)

PROBLEM: How can you develop products from peanuts?

PREDICTION: _____
_____

PROCEDURE:

MATERIALS: peanuts, peanut butter (different brands)

DEMONSTRATION: (WATCH YOUR TEACHER CAREFULLY...DO NOT REPEAT THIS EXPERIMENT AT HOME) Watch and answer the questions below.

1. Burning a peanut.
   Describe what happens when your teacher ignites a peanut?

_____

   Why does the peanut burn so easily? _____

   What makes peanuts a good product to work with?

_____

2. Shell several peanuts. Describe or draw what you get?

_____

3. Look at other peanut products. (Your teacher will give instructions.)

_____
_____

CONCLUSIONS:

Can you think of any products that can be made from a peanut?

_____

_____

How would you experiment to find out if the products would be useful?

_____

APPLIED SCIENCE - SCIENCE AND MATH (3C)

POST

Students research the people behind inventions and science.

OBJECTIVES:

1. Comparing scientists and their discoveries.
2. Comparing inventors and their inventions.

VOCABULARY:

discovery
invention
inventor
scientist

MATERIALS:

(optional books)
Famous Scientists by B.J. Townsley
What's the Big Idea, Ben Franklin by J. Fritz
Story of George Washington Carver by Moore
Internet

BACKGROUND:

The distinction between a discovery and invention is not always clear. Scientists merely document what is already functioning in nature. The inventor creates a device or techniques or machine that has never existed before. Many times a scientist and inventor are one in the same person. For instance, George Washington Carver discovered that lack of nitrates in the soil were ruining the cotton crop, and that planting peanuts would restore the land. He then invented many ways to use peanuts.

Invention and discovery seem to be a human trait. All cultures and both sexes have contributed to humankind. Tool making was probably the first invention in the territories of Africa and Asia. Modern historians feel that Asia was far ahead of the Europeans in engineering, optics, acoustics and many other disciplines. The Europeans, however, were more world-wide explorers and brought back inventions they found in Asia to their homeland. Cultural influences, including religion and wealth of the society, also influenced scientific thought and invention.

Students should become aware that all societies contributed to what is known today. Without information built up over the years, all societies would have to start from the beginning. The world is always changing because of the advances of science and technology.

Our country is very diverse and this diversity can add to our strength. Encourage students to find out the advances of their particular culture by investigating. If children are not familiar with their ancestry, they can investigate American contributions from Native

American to early and present day Americans.

PROCEDURE:

1. There are many inventors throughout the history of the world. The library and encyclopedias are recommended to obtain information. This can be an extension of the PRE LAB that looked at specific technology.

2. Give students the worksheet and have them write a paragraph on their favorite scientist or inventor. In the paragraph they should say “why” the person is their favorite. Have them draw the person, using the cartoon as a template.

APPLIED SCIENCE - SCIENCE AND MATH (3C)

MY FAVORITE SCIENTIST OR INVENTOR IS