Applied Science

Our Technological World

THIRD GRADE

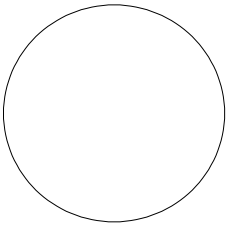
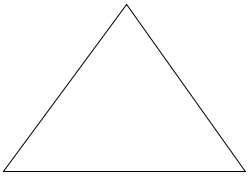
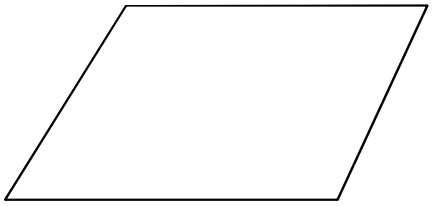
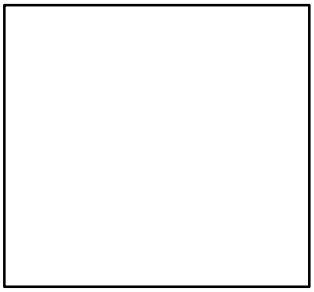
WORKBOOK

students _____

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 SCIENCE - SCIENCE AND MATH (3A)

PROBLEM: Is it easy to predict the dimensions of natural objects?

PREDICTION: _____

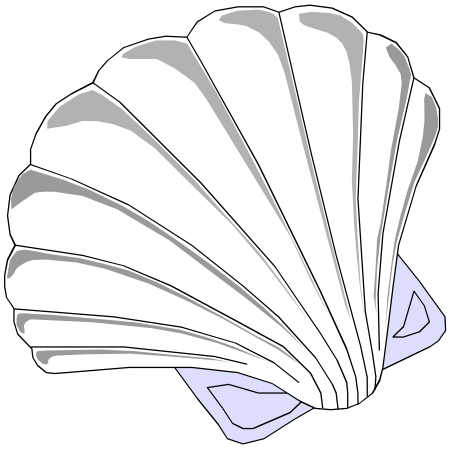
PROCEDURE: Look at the objects. Describe and record the dimensions you think the objects are. Record them in the box. Then measure the object and see how close you were!

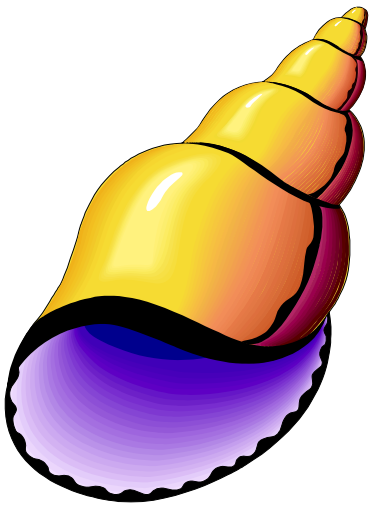
	DESCRIBE SHAPE	PREDICT DIMENSIONS	ACTUAL DIMENSIONS
CUBE			
ABALONE			
CALCITE			
SCALLOP			
SNAIL			
SEA URCHIN			
FLOWER CORAL			
LEAF			
ANIMAL			

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

_____

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		

TYPE OF EQUIPMENT	PREDICT PURPOSE

APPLIED SCIENCE - SCIENCE AND MATH (3B)

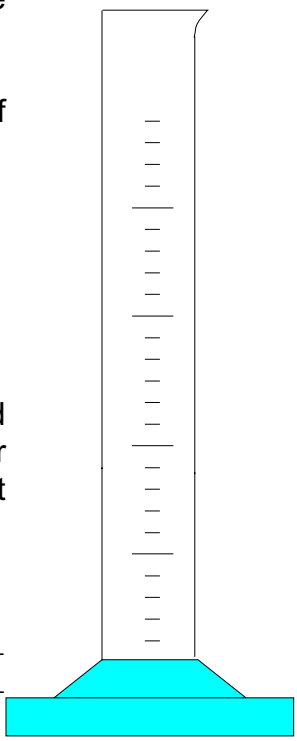
PROBLEM: How can you measure liquid volume?

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:

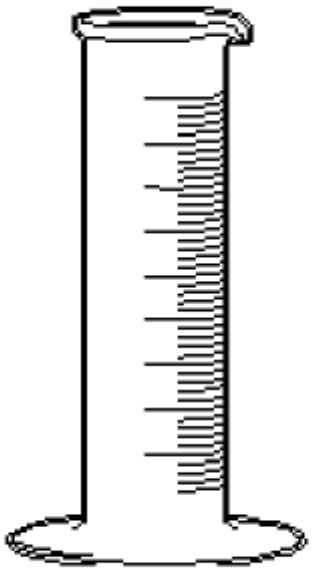
If you had a test tube filled with water, how could you measure it's volume?

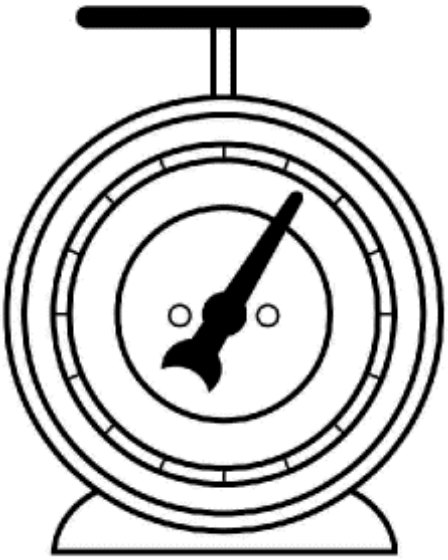
_____

What is the unit of measurement for volume? _____

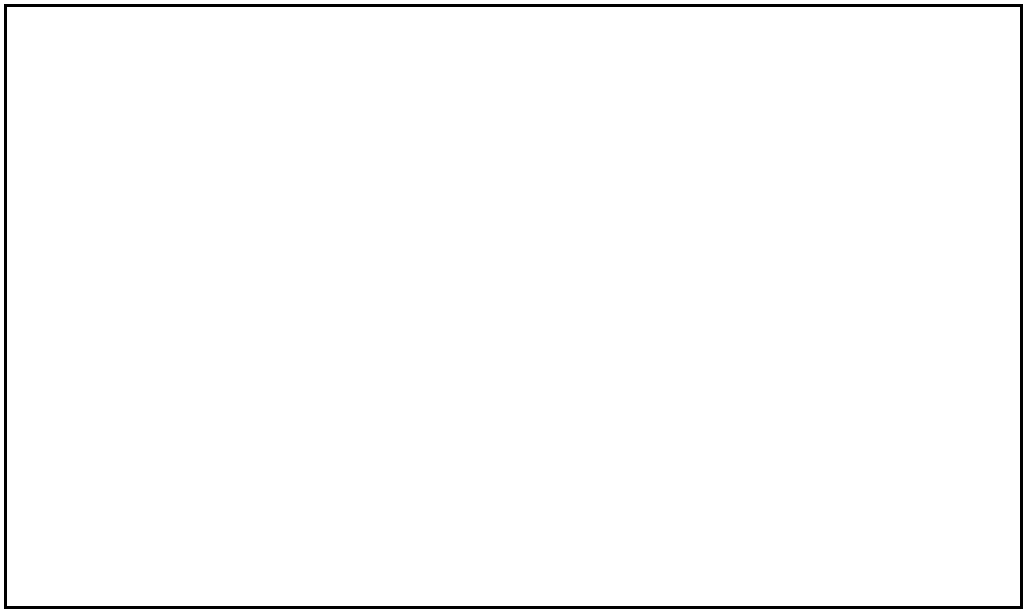
WHAT INSTRUMENTS DO YOU NEED TO FIND THE MASS, WEIGHT, AND VOLUME OF AN OBJECT?

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





A TECHNOLOGY THAT CHANGED THE WORLD



_____

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.)

_____
_____

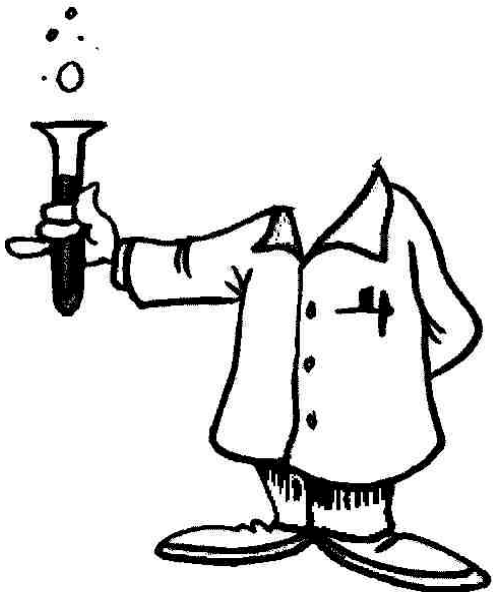
CONCLUSIONS:

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?

MY FAVORITE SCIENTIST OR INVENTOR IS



APPLIED SCIENCE - PHYSICS (3A)

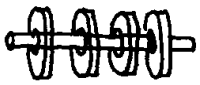
PROBLEM: How can you find the north and south pole of a magnet?

PREDICTION: _____

_____

PROCEDURE: Go to 4 different stations and complete the assignment. Listen to your teacher give instructions.
Station #1. Put a sheet of paper over the bar magnet. Sprinkle iron filings. Draw what happens. Be careful not to put the iron filings on the magnet.

Station #2. There are 4 ring magnets. Experiment with them and arrange them so they "float." See diagram. Explain why this occurs.



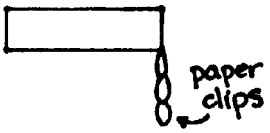
_____

_____

Station #3. There are 2 magnets with iron files all over them. Draw what happens when you slowly pull them apart. What causes this? Next try to take 1 magnet and slowly turn it to the opposite face. What happens?_____

_____

_____



Station #4.
How many paper clips can you pick up?

_____

How many paper clips can you line up (see diagram)?

_____

CONCLUSIONS: How were you able to distinguish north and south?

_____

_____

_____

APPLIED SCIENCE - PHYSICS (3B)

PROBLEM: Where does static electricity occur?

PREDICTION:_____

EXPERIMENT 1.

1. Hold a plastic comb over confetti without rubbing the comb. What happens?

_____

2. Rub a plastic comb with a piece of cloth. Hold the comb over a small pile of confetti. Did the comb "attract" or "repel" the confetti?

_____

3. Rub the plastic rods, put it on the confetti? What happens?

_____

EXPERIMENT 2.

1. Blow up a balloon. Without rubbing it, try and put the balloon on the wall. Does it work?

YES NO

2. Blow up two balloons. Using a piece of cloth, both partners simultaneously rub their own balloon; one for 15 seconds and the other for 30 seconds. Quickly place both balloons on the wall and time how long each one stays up.

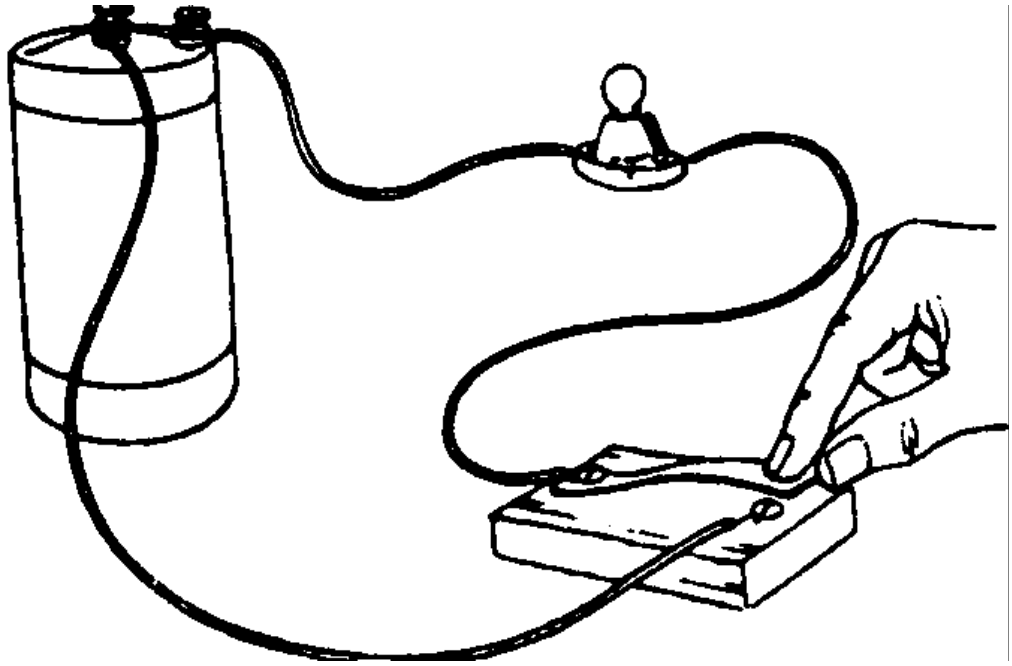
Which balloon stayed up the longest?_____
Why?_____

EXPERIMENT 3.

1. Rub a balloon to produce static electricity. Place one end of a fluorescent tube to the balloon. Describe what happens.

_____
_____
_____

CONCLUSION: How can you create static electricity?_____
_____
_____



LABEL THE DIRECTION OF THE CURRENT WHEN A COMPLETE CIRCUIT IS MADE. USE ARROWS, LABEL ONE OF THE ELECTRODES + AND ONE -. LABEL BATTERY, SWITCH, LIGHT

1. WHICH WAY DOES THE CURRENT FLOW?

_____
_____

2. WHAT DOES IT MEAN TO HAVE THE SWITCH “CLOSED?”

_____
_____

3. WHAT IS AN ELECTRIC CIRCUIT? DO YOU NEED A BATTERY OR CAN YOU USE SOMETHING ELSE?

_____
_____

APPLIED SCIENCE - TECHNOLOGY (3A)

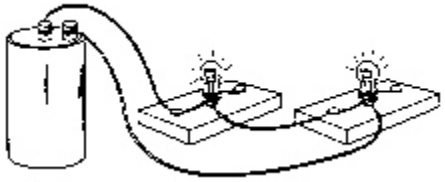
PROBLEM: What is the difference between a parallel and series circuit?

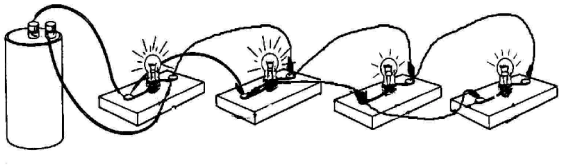
PREDICTION:_____

PROCEDURE:

Follow the diagrams below and compare a series circuit with a parallel circuit. Then use your classmates and an alien ball to make your human series and parallel circuit. The electrons flow through the surface of your body, so in fact you act as a wire.

SERIES PARALLEL





1. How many paths of current does the series circuit have? _____

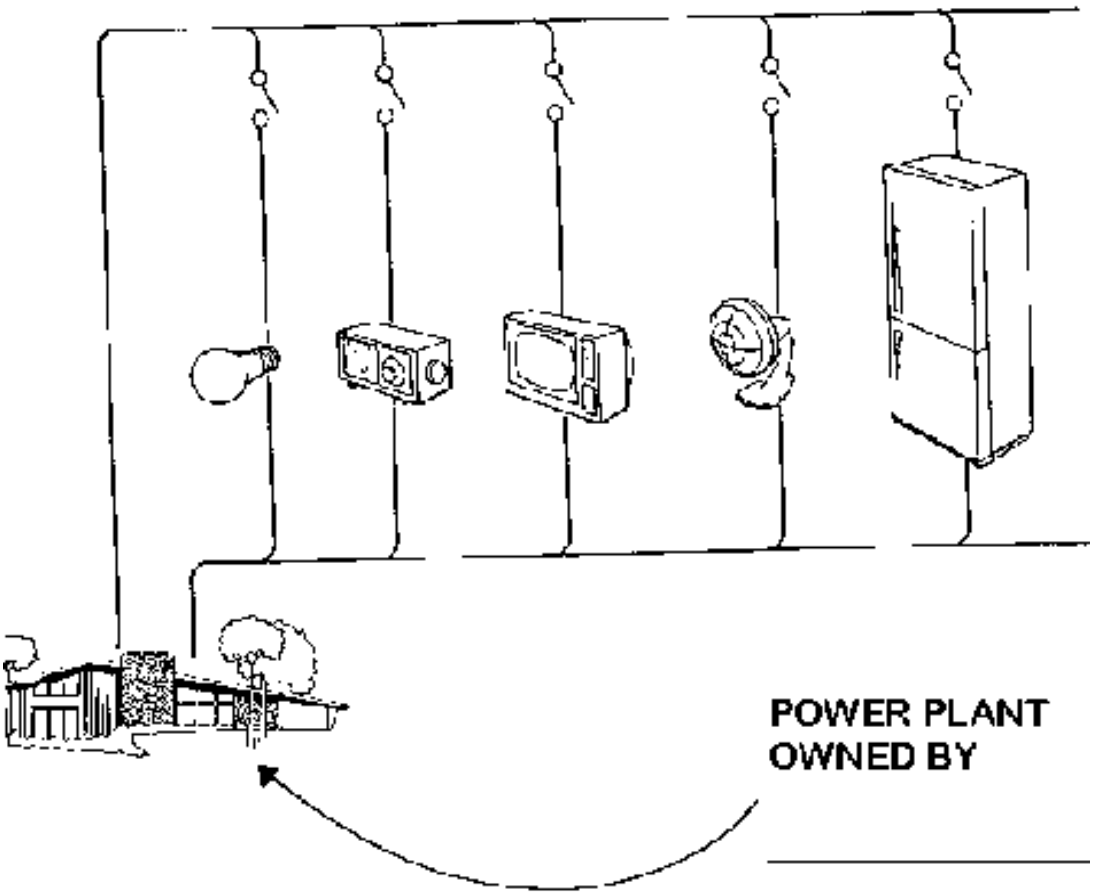
2. How many paths of current does the parallel circuit have? _____

Draw how you made your series and parallel circuit with your classmate. Use stick figures to represent students.

CONCLUSIONS: Explain the difference between series and parallel? Which one do you think is used in our society? Explain.

_____

HOW ELECTRICITY TRAVELS TO A POWER PLANT TO YOUR HOUSE



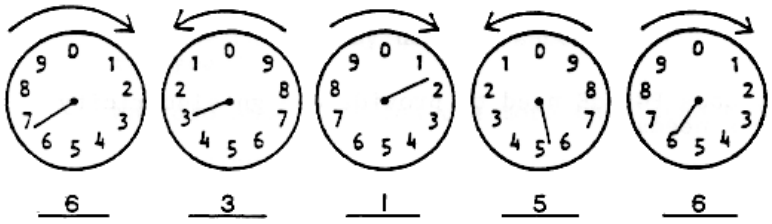
ITEM USED IN HOUSE OR OUTSIDE	DOES IT USE ELECTRICITY OR GAS?
OVEN	
REFRIGERATOR	
WATER HEATER	
HEAT IN THE HOUSE	
AIR CONDITIONER	
WASHING MACHINE	
DRYER	

APPLIED SCIENCE - TECHNOLOGY (3B) PRE

Meter cards

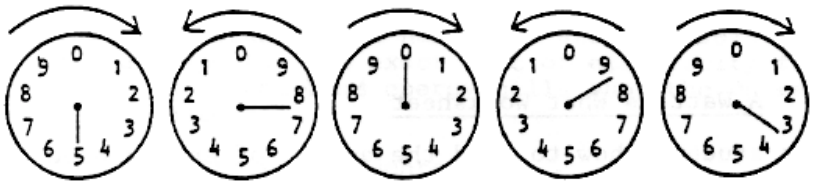
Exercise 1.

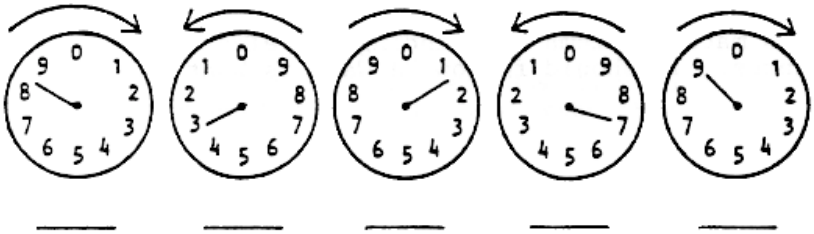
Record the position of the arrow below each dial. If the arrow lies between two numbers, record the smaller number. You read the total kilowatts by reading the numbers you have written from left to right. Example:



6 3 1 5 6

The meter dials above read: 63156





Kilowatt-hours = kwh

The unit of energy you are recording is in _____

Make a meter card. Follow directions from your teacher. It should look like this when you are finished.

APPLIED SCIENCE - TECHNOLOGY (3B)

PROBLEM: How can we measure electricity?

PREDICTION:_____

PROCEDURE:

MATERIALS: small appliances

EXERCISE 1.

Appliances are labeled with the amount of watts they use. Look on the back or on the bottom at each of the prepared stations. Not all labels are in watts, some are in volts and amps. Volts and amps are related to watts: watts = volts x amps. Record either the watt or volts/amps in the space below.

appliance	watts	volts	ampere

Which appliance uses the most electricity? _____

CONCLUSIONS: How do you measure electricity?

_____

ELECTRICAL SAFETY

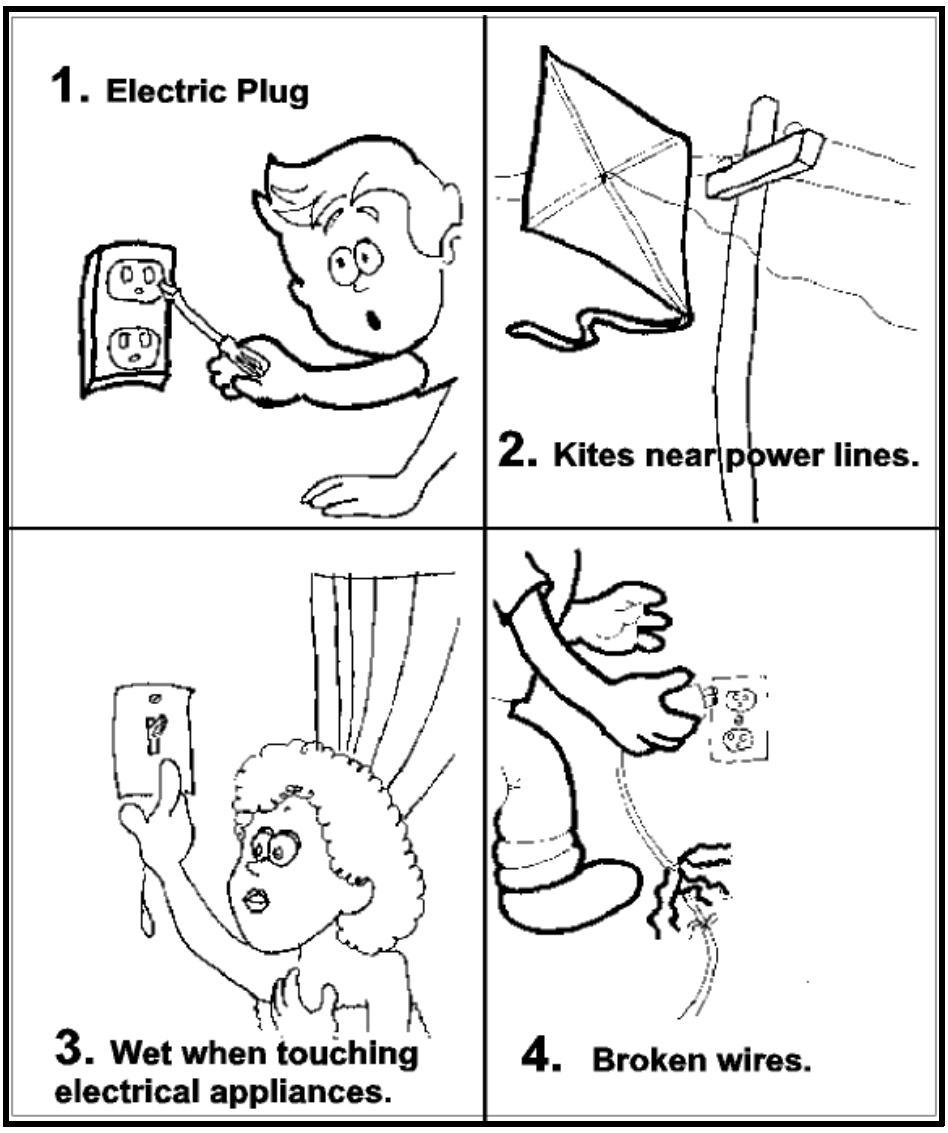
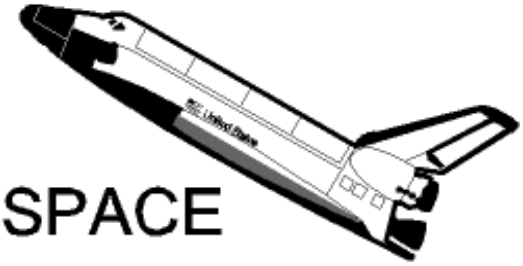


DIAGRAM #	IS IT SAFE	IF IT IS NOT SAFE, WHAT CAN YOU DO?

WATER

LAND

AIR



SPACE

APPLIED SCIENCE - BUILT ENVIRONMENT (3)

PROBLEM: Can you design a railway system that can service a community?

PREDICTION: _____

PROCEDURE:

MATERIALS: train set

Look at the train set that is set up. When it is your turn as the engineer, think about the following questions. Then return to your seat and answer them.

1.Describe the design of the tracks? _____

2. Name the parts of the train?_____
_____

3. If the curves of the track are not designed correctly, what will happen and why?
_____
_____

BELOW IS THE COMMUNITY OF NORTH CITY, THEY WANT TO PUT A RAILWAY THROUGH THEIR COMMUNITY TO HELP SERVICE THE BIG FACTORIES. DESIGN A SYSTEM FOR THE TRACKS. (Remember, you can make tunnels, bridges, whatever you feel can be made.)

CONCLUSION:_____
_____

TRAVELING BY TRAIN