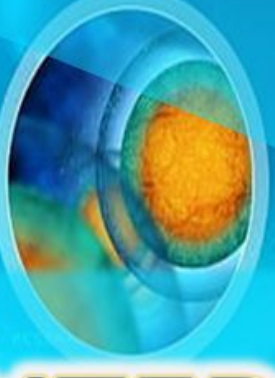
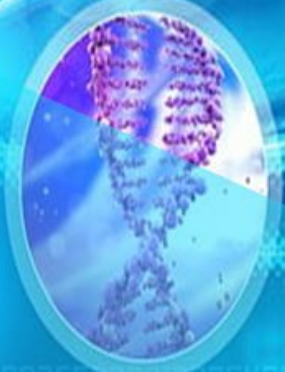
ACTIVITY GUIDE



SECONDARY LITERACY INFUSED SCIENCE CURRICULUM

GRADE 7



NATIONAL LITERACY DEPARTMENT

MINISTRY OF EDUCATION
M.O.E
GUYANA

Note to the Teacher

The Literacy Infused Curriculum-Activity Guide, is a document crafted by the Ministry of Education- National Literacy Department in collaboration with the Peace Corp Guyana. This document provides guidance for Science teachers on activities and how the literacy skills can be developed using subject specific content and concept related activities.

The use of this guide allows teachers to present lessons that are student centred and addresses immediate literacy development needs. It is advised that this activity guide be used as a support to Consolidated Curriculum. Woven into the activities are the essential literacy skills that are needed by learners to become functionally literate.

This guide is in-keeping with the Ministry of Education's Objective to ensure that every possible opportunity is explored and made available to learners, so that they can achieve expected educational outcomes. The Infused Curriculum activities, provides opportunity for Reading, Vocabulary development, Critical Thinking and development of Writing Skills. Learners will be able to understand concepts and content better while completing activities geared to their level.

Content

Pre-Unit Activity to address spelling/comprehension of words

(Have students complete this activity before each unit using textbooks or handouts being used for the lessons – keep a journal of the work for future review). Do the individual or group activity as below. Possibly switch it up with each unit or do both.

Individual Activity

1. Read the text and think about the overall meaning. Ask yourself the following questions:
   a. What does the teacher want me to understand?
   b. What are the main points of this topic?
   ** Have a group discussion with the students to see how they answer these questions, to determine if they understand the concepts behind the work being presented to them**

2. Identify the words that are unfamiliar to you. Write down at least three of those words and write the definition of these words. Practise writing these words using the following format:

COPY	TRACE	RECALL
Look at the word and copy it down on the paper. Example: Science	Spell out the word with one letter missing each time – use a piece of paper to cover the previous word. Fill in the missing letter. Example: Science Scienc_ Scien_ _ Scie_ _ _ Sci_ _ _ _ Sc _ _ _ _ _ S _ _ _ _ _ _ _ _ _ _ _ _ _	Try to remember how to spell the word on its own. Read the word then fold over the copy and trace columns and try to write the word from memory.

Keep a word journal with all of these words, so that you can review the words when you need to and at the end of the school year you will get to see how many new words you learned!
Additional activity - Compare your words with your classmates' words and see if there are other words you can learn!

** Group Activity**

1. Have the teacher ask the class which words they do not know/understand.
2. The teacher writes the words down on the board.
3. The students break up into groups and the teacher divides the unknown words evenly amongst the groups. The groups look up the definitions to present the words to the class.
4. Presentation consists of:

1. Word with definition. The student will present and the teacher will write what the student says on the board. The rest of the students will write down the word and the definition of the word to add to their word list. They will then complete the trace, copy, recall activity later.
2. Example, including visual aid if needed/possible. If using a text book – have students share where in the textbook or handouts they can find an example of the word.
3. How the student(s) think about and share how they may use this word in their work.

Example:

1. Beaker - a lipped cylindrical glass container for laboratory use.
2. 
3. I will use a beaker in class to measure liquids.

5. Have students keep a word journal. They will use the same notebook each time to continue a list of words they learned in each class. They can then go back and review the words they learned at any time.

UNIT 1: HOW A SCIENTIST WORKS

1. Complete Pre-Unit activity
2. Word Search:
    1. Spelling: Find the equipment in the word search below.
    2. Understanding: Pick two pieces of equipment and explain how you might use these two pieces of equipment together. Example: I would use the wire brush to clean the test tubes.

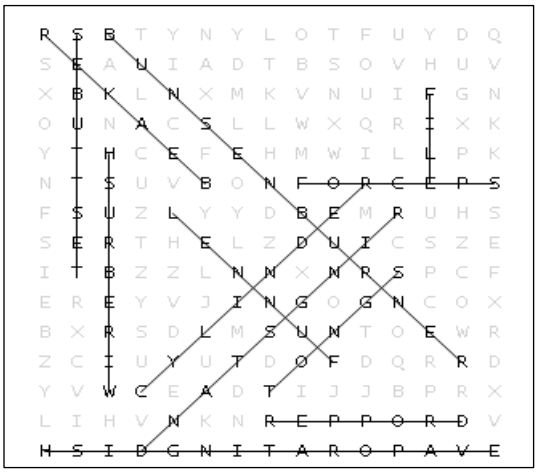
R	S	B	T	Y	N	Y	L	O	T	F	U	Y	D	Q
S	E	A	U	I	A	D	T	B	S	O	V	H	U	V
X	B	K	L	N	X	M	K	V	N	U	I	F	G	N
O	U	N	A	C	S	L	L	W	X	Q	R	I	X	K
Y	T	H	C	E	F	E	H	M	W	I	L	L	P	K
N	T	S	U	V	B	O	N	F	O	R	C	E	P	S
F	S	U	Z	L	Y	Y	D	B	E	M	R	U	H	S
S	E	R	T	H	E	L	Z	D	U	I	C	S	Z	E
I	T	B	Z	Z	L	N	N	X	N	R	S	P	C	F
E	R	E	Y	V	J	I	N	G	O	G	N	C	O	X
B	X	R	S	D	L	M	S	U	N	T	O	E	W	R
Z	C	I	U	Y	U	T	D	O	F	D	Q	R	R	D
Y	V	W	C	E	A	D	T	I	J	J	B	P	R	X
L	I	H	V	N	K	N	R	E	P	P	O	R	D	V
H	S	I	D	G	N	I	T	A	R	O	P	A	V	E

List of words to find

Beaker	Wire Brush
Cylinder	Forceps
Bunsen burner	File
Ring Stand	Dropper
Evaporating Dish	Funnel
Test Tubes	Tongs

Solution to puzzle:

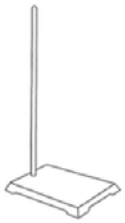
Solution to the puzzle:



3. Identify the equipment you found above. Enter the letter of the picture that shows you the piece of equipment.

Beaker ___
Wire Brush ___
Graduated Cylinder ___
Forceps ____
Bunsen Burner ___
File ___
Ring Stand ___
Dropper ___
Evaporating Dish ___
Funnel ___
Test Tubes ___
Tongs ___

A.  B.  C.  D.  E.  F. 

G.  H.  I.  J.  K.  L. 

UNIT 2: MEASURING IN SCIENCE

For each unit of measurement have students complete a Frayer model card.

Examples:

Definition

To compare a quantity to a defined unit quantity in a multiplicative sense

Charateristics

Need a defined unit quantity

Often uses a measuring tool, such a ruler, scale or measuring jug

Measure
(A quantity)

Examples

Measuring a length using centimeters

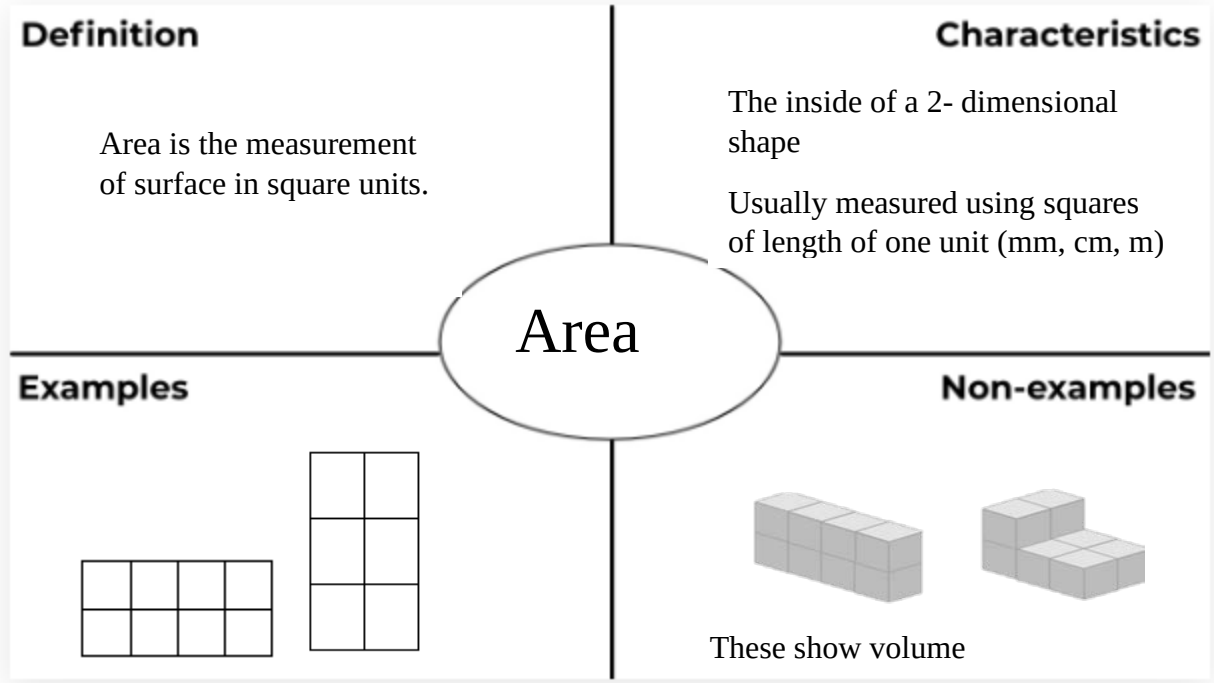
Measuring mass using Kilograms

Measuring area using centimetre squares

Non-examples

Counting the number of people in a classroom

Counting the number of sweets in a packet



1. Complete Pre-Unit Activity and Frayer cards
2. Individual Measurements

To introduce students to measurements:
Introduce the base units for mass, volume and length: gram, Litre, and metre. Discuss how the prefixes can be added to the base units: kilo, centi, and milli. Have students list all the combinations that are possible and go over what each one means – ex. Kilogram, centimetre, etc. Practise writing and using the abbreviations. For example centi + meter = centimetre (cm).

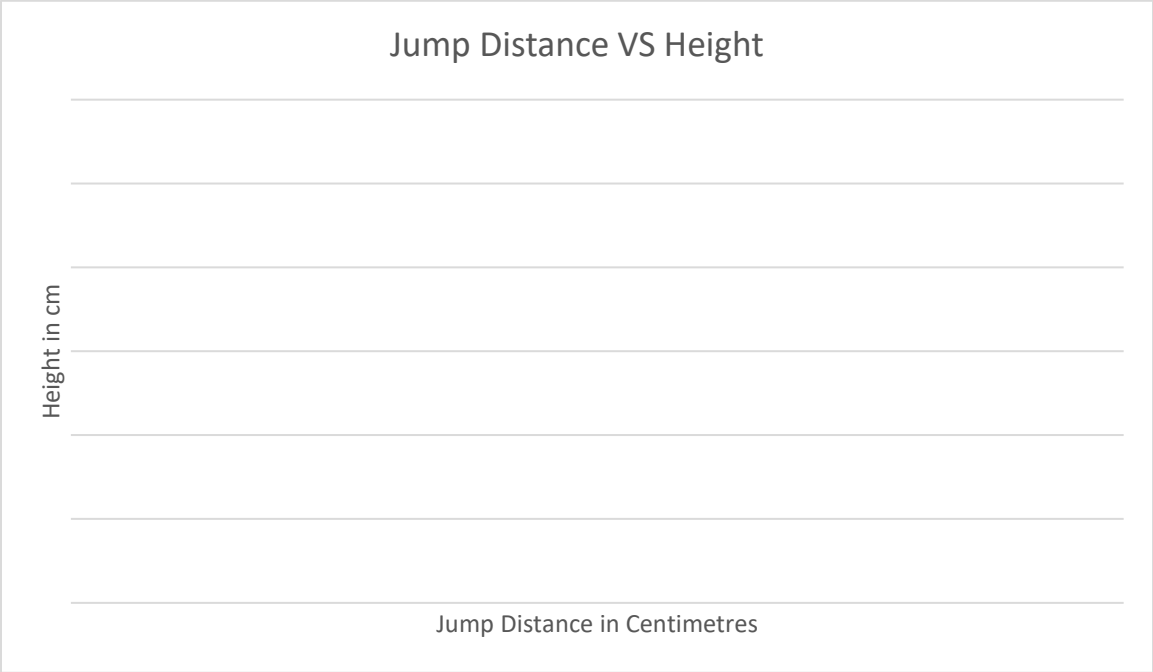
A. Length/Height
   Individual activity
   - Defining and comparing length:
     1. Determine how many millimetres in a centimetre, centimetres in a metre and metres in a kilometer.
     2. Which one is bigger: 1 centimetre or 8 millimetres?
        170 centimeters or 1.5 metre? 750 metres or 1 kilometre?
   - Take a piece of paper and outline your bare foot on a piece of paper. Measure your foot and document the measurement in millimetres and centimetres. Compare with your classmates to see who has the biggest foot. Estimate the length of 2 other objects in your classroom – chalkboard erasers, pencils, etc based on your foot size. Write down your measurements, then take real estimates of those objects, How close were you?

Group Activity
Get a tape measure and some tape (alternative small object to be left on the ground as a marker).

1. Either lay the tape measure out as long as it will go or draw a line with the tape measure on the ground that is at least 100 centimeters long. You should mark a starting line at one end of the line.

Start

2. Measure how tall each student in the group is. The student should write that number down on a piece of paper.
3. Have students guess who they think will jump the farthest and ask them why. Each student will then jump, starting at the start line. The shortest student will jump first, then go in order of height. The student will put a piece of tape or other marker on the ground where they land and then measure how far they jumped. They will write this down next to their height on their piece of paper.
4. After everyone has jumped, they will compare how far each student jumped. They will then make a graph comparing how far everyone jumped against how tall people are to see if height and jump distance correlate. Ask students to define correlate before having them draw the tables.



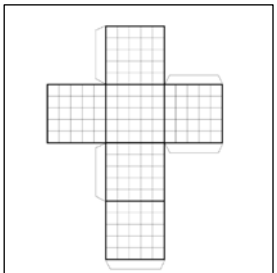
B. Mass
   - Defining and comparing mass:
     1. Determine how many milligrams in a gram, grams in a kilogram.
     2. Which one is heavier; 100 milligrams or ½ gram?

   Activity: Understating tools for measuring mass
   - triple beam balance
   - electronic
   - lever
   - spring

   Have students create cards with:
   1. the name of the tool
   2. how the tool works
   3. n example of what they would measure using the tool

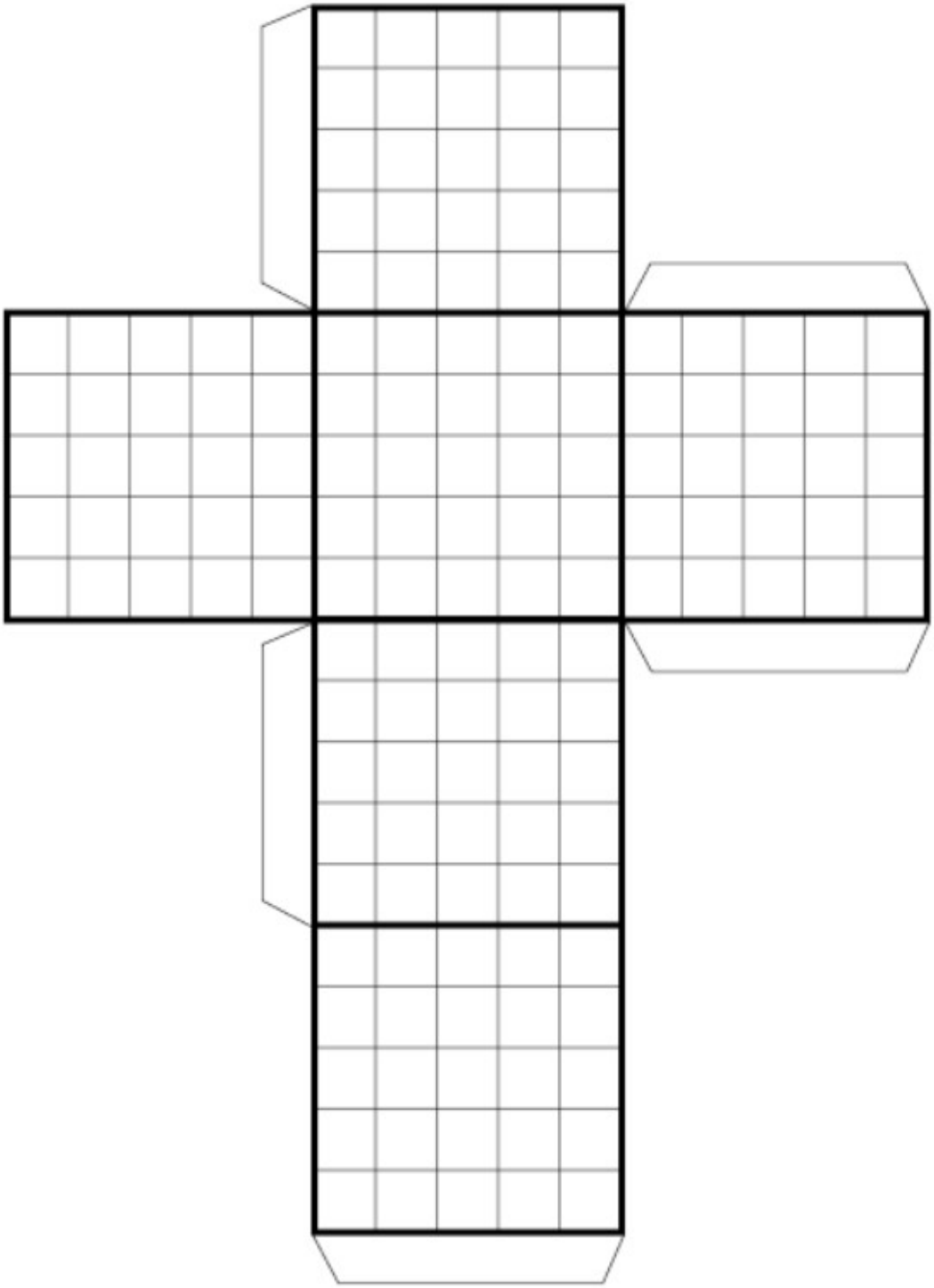
C. Area – Have students complete the Area vs Volume worksheet. They will need scissors to cut out the object after measuring the area in order to determine the volume.

D. Volume of Solids
   Combined with the Area activity, learn the two by comparison.



Activity: Area vs Volume

Have students measure this object without the tabs to determine area, then cut it out and let them determine the volume. Have them explain the difference.



E. Volume of Liquids
   - Review activity titled “Reading graduated cylinders” – handout in Volume folder. Students will review the information on the introduction slides and then answer the question on the last pages regarding determining volume.

Graduated Cylinder

- Used to find the volume of liquids
- Milliliters (mL)
- Come in many different sizes

Presentation created by: Sarah Derr 2014

Reading a Graduated Cylinder

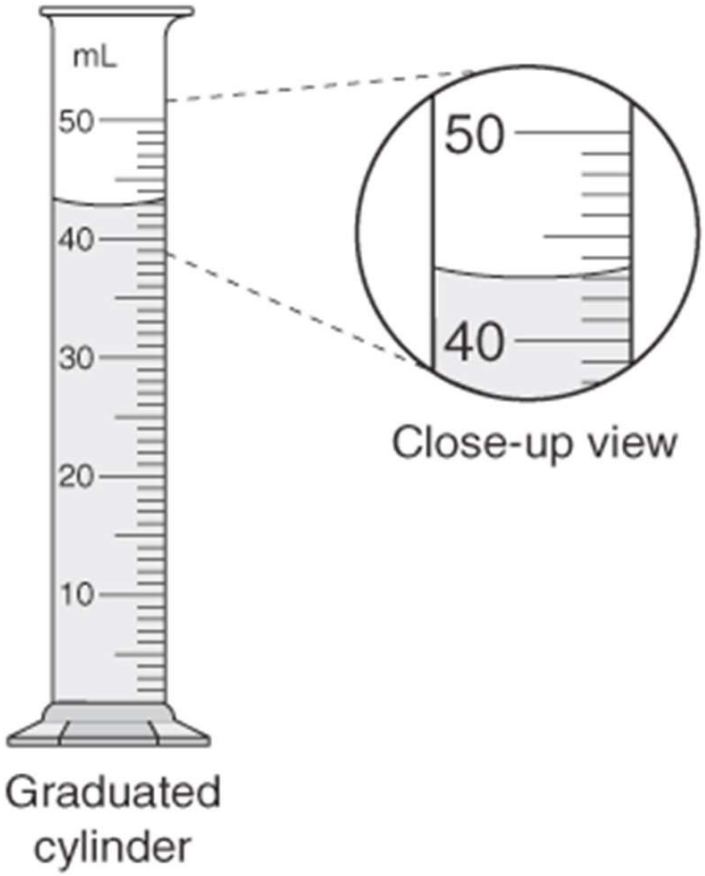
- Place on flat surface like table or countertop.
- Eyes should be level with liquid.
- Liquid curves downward. This is called the meniscus.
- Read the volume at the lowest point of the meniscus.

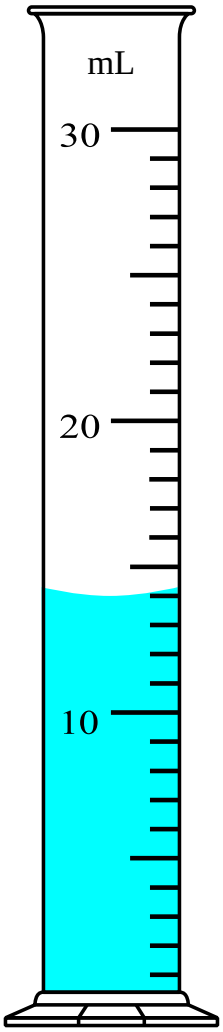
How is it Divided?

- All graduated cylinders are divided using a different scale.

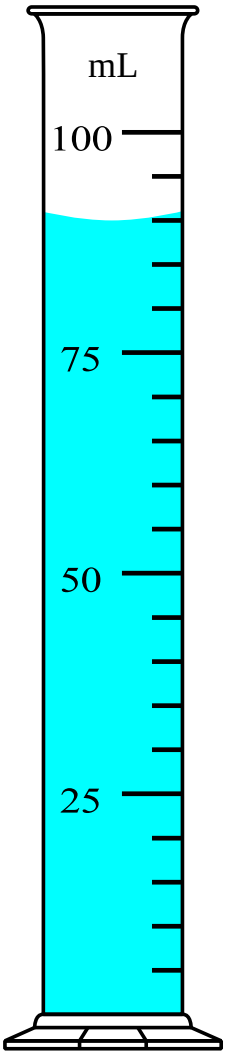
- Marks between numbers represent numbers between those numbers. This is called scale.

- Determine the scale before attempting to measure.

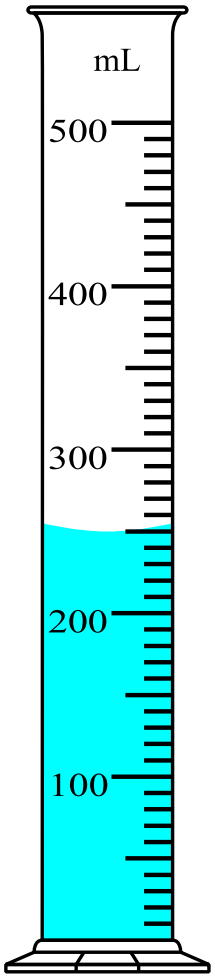




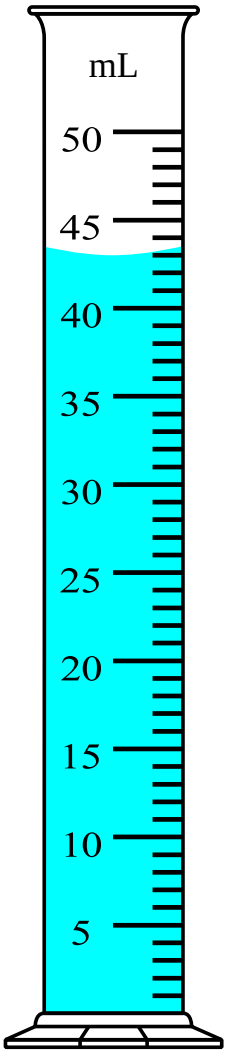
- Scale: 1
- Volume: 14 mL



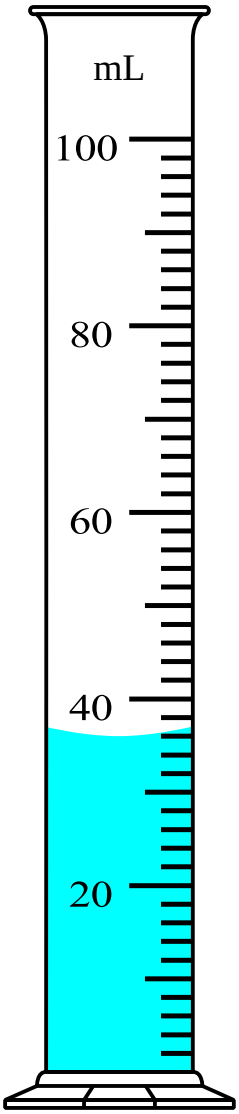
- Scale: 5
- Volume: 90 mL



- Scale: 10
- Volume: 250 mL



- Scale: 1
- Volume: 43 mL



- Scale: 2
- Volume: 36 mL

F. Temperature – Crossword puzzle

<u>Words and definitions below- Crossword puzzle attached</u>

Bulb The _____ in a thermometer is filled with mercury

Quick Silver: this is the name often used for mercury in Guyana

Stem magnified glass that makes up the outside jacket of the thermometer

Mercury: substance in the bulb of a thermometer

Capillary Tube: the space inside the stem where mercury can be seen rising

Kelvin: the Standard International (SI) unit of thermodynamic temperature

Celsius: The unit used to measure temperature

Boiling Point What it is called when water reached 100 degrees Celsius

Melting Point What it is called when water reaches 0 degrees Celsius

Human The average temperature of the _____body is 37 degrees Celsius

Answers to reading a graduated cylinder:

Scale 1. 14ml

Scale 5. 90 ml

Scale 10. 250 ml

Scale 1. 43 ml

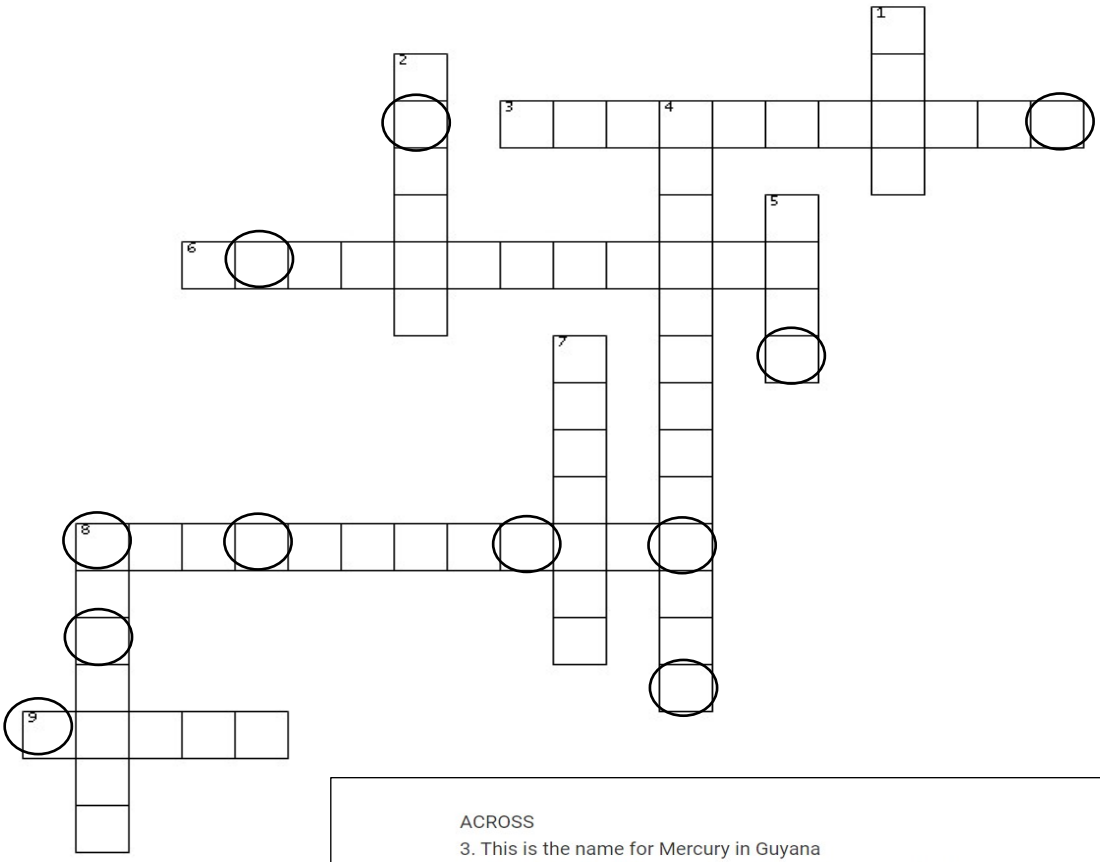
Scale 2. 36 ml

Resource: https://www.teacherspayteachers.com/Product/Reading-a-Graduated-Cylinder-Lesson-Presentation-1314256?st=d7b313928c299087fc6efea98b627e9b

What are we measuring?

Step 1: Complete the crossword puzzle.

Step 2: Copy the letters in the circled boxes and unscramble them to find the answer to the puzzle



ACROSS

3. This is the name for Mercury in Guyana
6. What it is called when water reaches 100 degrees Celsius
8. What it is called when water reached 0 degrees Celsius
9. The average temperature of the _____body is 37 degrees Celsius

DOWN

1. The _____ in a thermometer is filled with mercury
2. the Standard International (SI) unit of thermodynamic temperature
4. The space inside the stem where mercury can be seen rising
5. Magnified glass that makes up the outside jacket of the thermometer
7. The unit of measure used in Guyana to measure temperature
8. Substance in the bulb of a thermometer

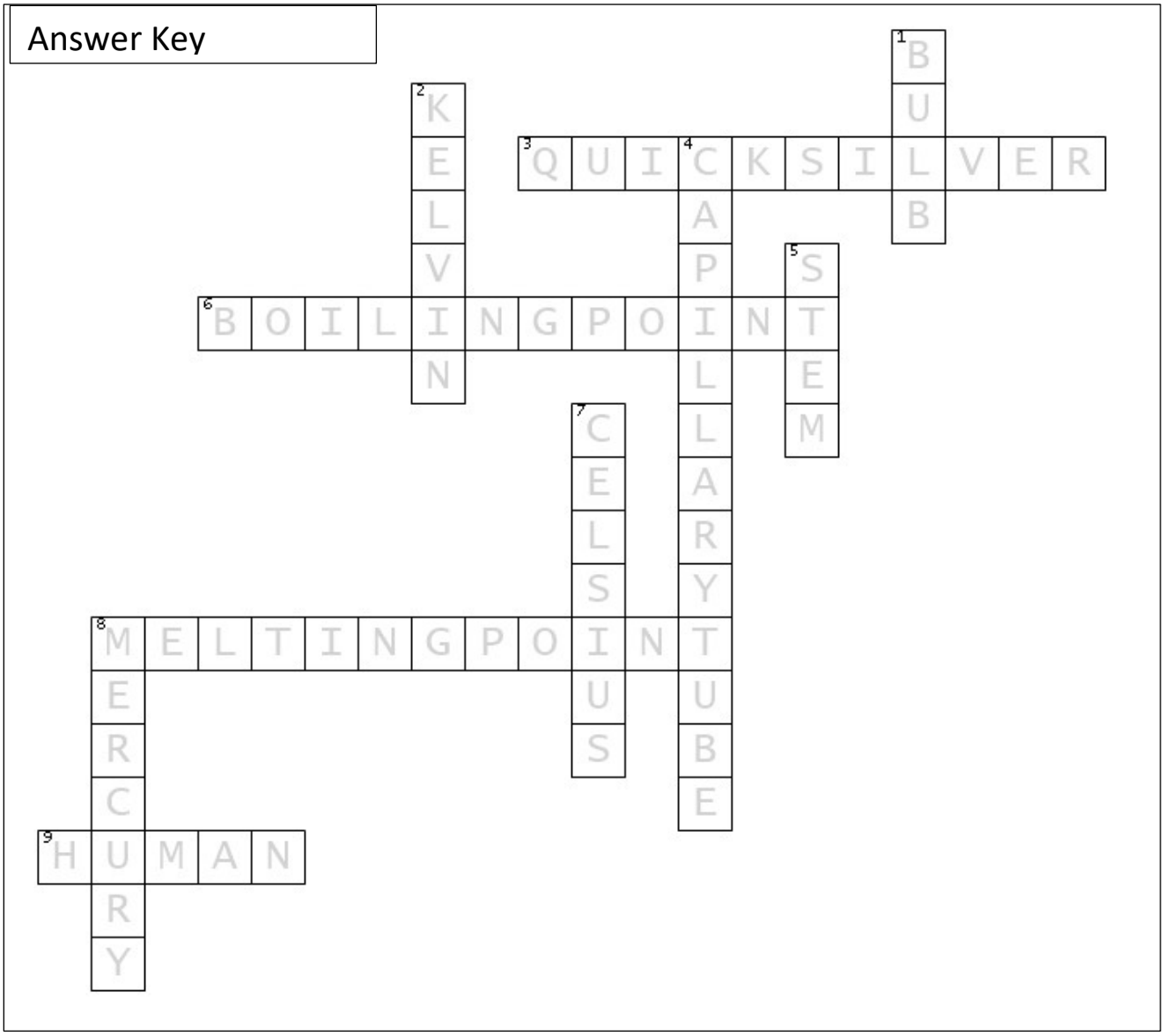
Use the clues to fill in the words above.

Words can go across or down.
Letters are shared when the words intersect.

Enter letters below:

__ __ __ __ __ __ __ __ __ __ __ __ = _____

Answer Key



UNIT 3: LIFE

1. Pre-Unit Activity
2. A. Characteristics of living organisms
   Activity: Complete the following table.
   1. Using your book define the Life Processes
   2. Pick an organism and describe the process for your example.

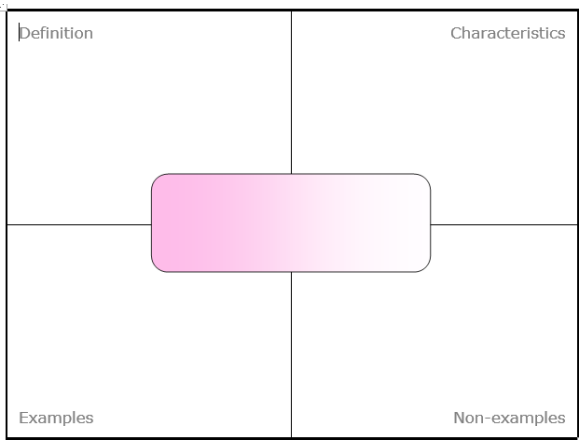
Life Process	**Explanation**	**Example**
Movement		
Respiration		
Sensitivity		
Growth		
Reproduction		
Excretion		
Nutrition		

**Group Activity Option:

1. The teacher selects either enough organisms for each student in the class to review one, or enough for a set group of students to review one. The list is presented to students/groups and students/groups are either assigned an organism, or choose one.
2. The student or group define the processes by reviewing the book and completing the examples. If in groups, they can divide up the work.
3. The student or the group presents their organism to the class and students document information in their journal.

A. Looking at organisms in our environment

Have the students exchange a copy of the "Life Process" activity they did for the "Characteristics of Living" above and do a Frayer model card for the organism that their fellow student did the life process activity for.



For the categories, have the students do four of the categories from the life process activity, such as movement, respiration, sensitivity and growth.

Then copy the cards and share them with the other students so that everyone gets to learn about all of the organisms.

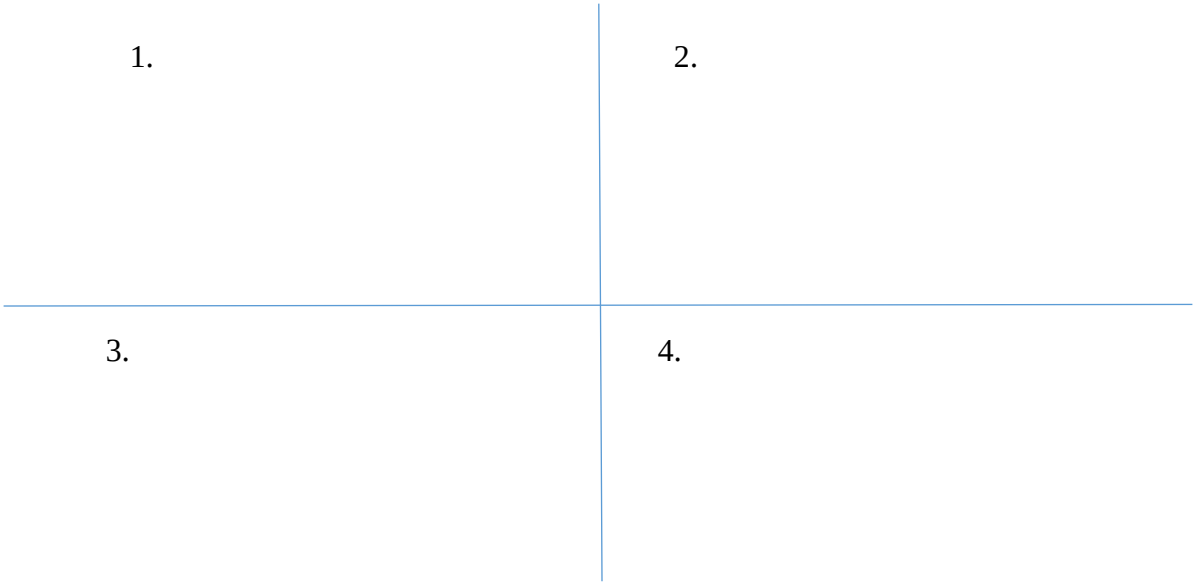
The teacher then collects all of the cards and creates a master list of completed cards.
Additionally, the teacher could make photocopies of all of the cards but remove the word in the middle of the card. The teacher then makes packets of the cards for each of the students, with a list of the organisms and the students have to determine what the word in the middle is.

B. Grouping organisms according to their structure
   Provide the students with the Handout "5 ways Monocots and Dicots are different". Have each student complete the handout accompanying this.

C. Collecting storing and classifying organisms
   Use a planning diagram, when preparing for storing and classifying an organism.

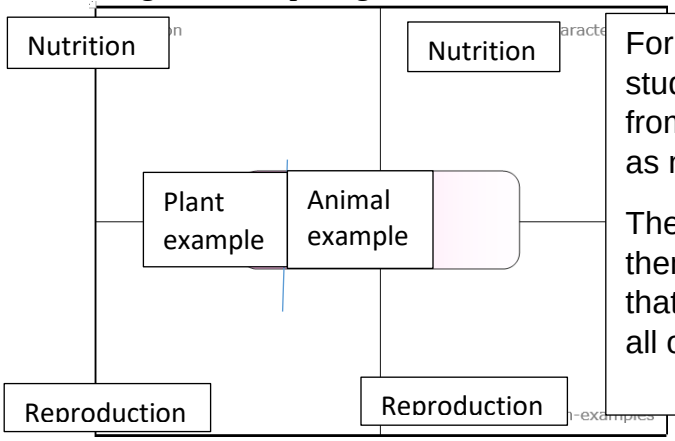
   1. Draw a picture to represent the process, and annotate it.
   2. Write a list of the key words and relationships relevant to the process. If any of these aren't in the picture I add them
   3. Write bullet point notes to *describe* the process (using the drawing as a reminder and ticking off key words as I go along)
   4. Write bullet points to provide the *explanation* (again, using the drawing and key words).

   Example of the layout : Each section is filled with the work as detailed above.



D. Classification of organisms

Have students complete a kind of Frayer cards related to the classification of organisms. Instead of four categories though, have them split the middle box in half and put plant on side and animal on the other and have the same categories, comparing the two.



For the categories, have the students do four of the categories from the life process activity, such as nutrition and reproduction.

Then copy the cards and share them with the other students so that everyone gets to learn about all of the organisms.

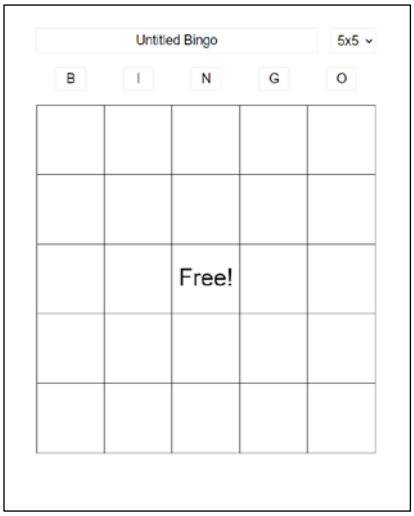
UNIT 4: MIXING AND SEPARATING

1. Pre- Unit Activity
2. A. Solutions
   B. Separating Techniques

-Create a bingo game by putting the definitions of the words on the cards and the students have to complete the card by writing in the word.

Example in box 1: You could write _____ is a liquid mixture in which the minor component (the solute) is uniformly distributed within the major component (the solvent). Then the student has to write in the word "Solution"
Then in Box 2, you could write _____ is the minor component in a solution, dissolved in the solvent.
And so on, using the words you want them to know. This way they practise writing the word and have to know the definition.
The first one to get Bingo wins a prize.

This website will allow you to make Bingo cards - https://bingobaker.com/



UNIT 5: PROPERTIES AND CHANGE

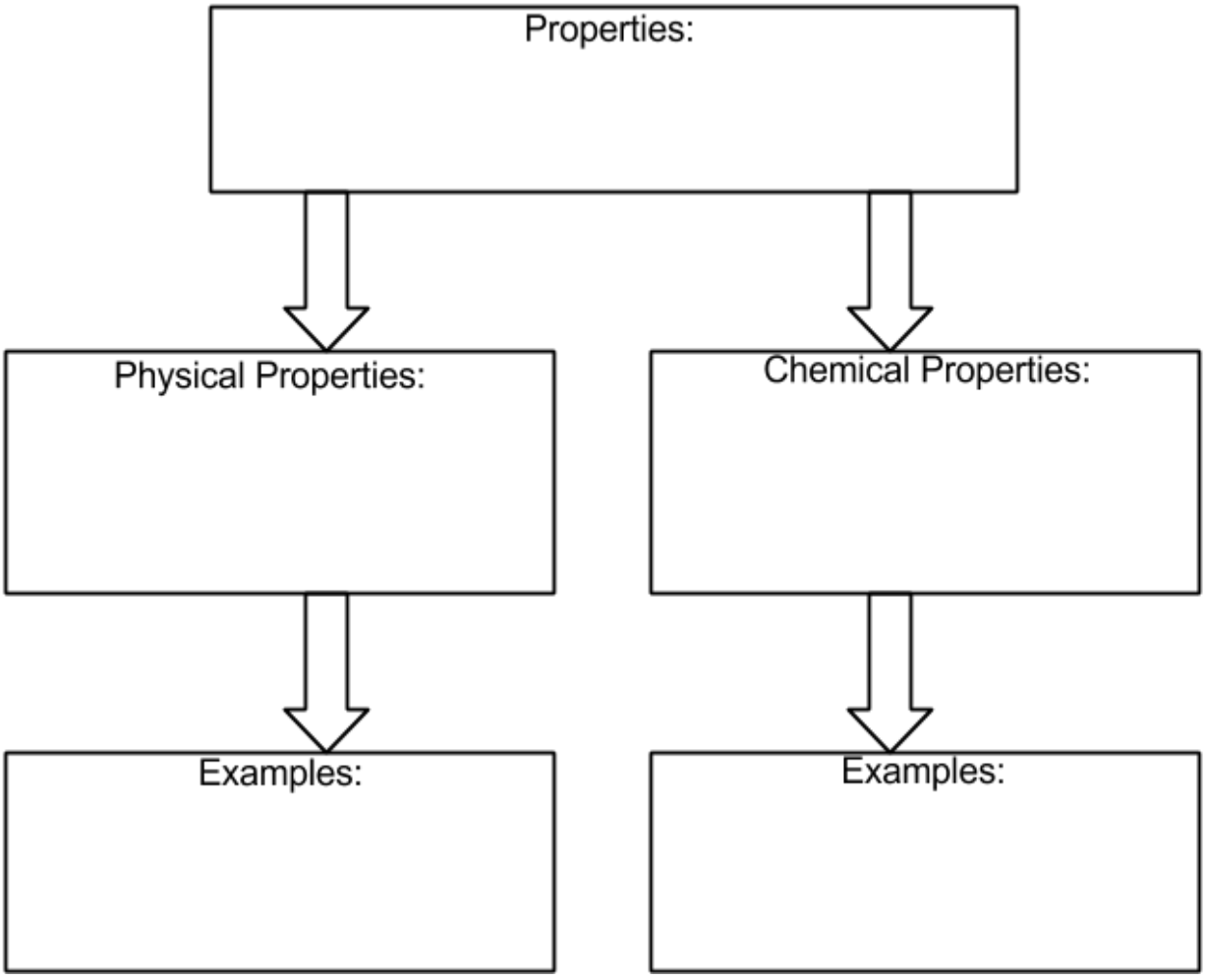
1. Pre- Unit Activity
2. A. Physical Properties
   B. Chemical Properties
   C. Physical Changes
   D. Chemical Changes

Use the physical vs chemical properties handout to have students practise reading and writing the words related to this topic and to think about what they mean.

Physical vs. Chemical Properties Notes

Name:_____ Date:_____/_____/____

Practice: Determine one physical property and one chemical property of each item shown below.



Book:

Physical Property:

Chemical Property:

Ice Cubes:

Physical Property:

Chemical Property:

Physical Vs. Chemical Properties Practice

Read each sentence and decide whether the sentence is describing a physical property or chemical property.

1. Construction paper is bendable. _____
2. The book is flammable. _____
3. The window is transparent. _____
4. The glass cup can break if someone drops it. _____
5. Gasoline is explosive and must be stored away from fire. _____
6. Water will boil and become a gas at 100° Celsius. _____
7. A metal called sodium will explode if placed in water. _____

Extension:

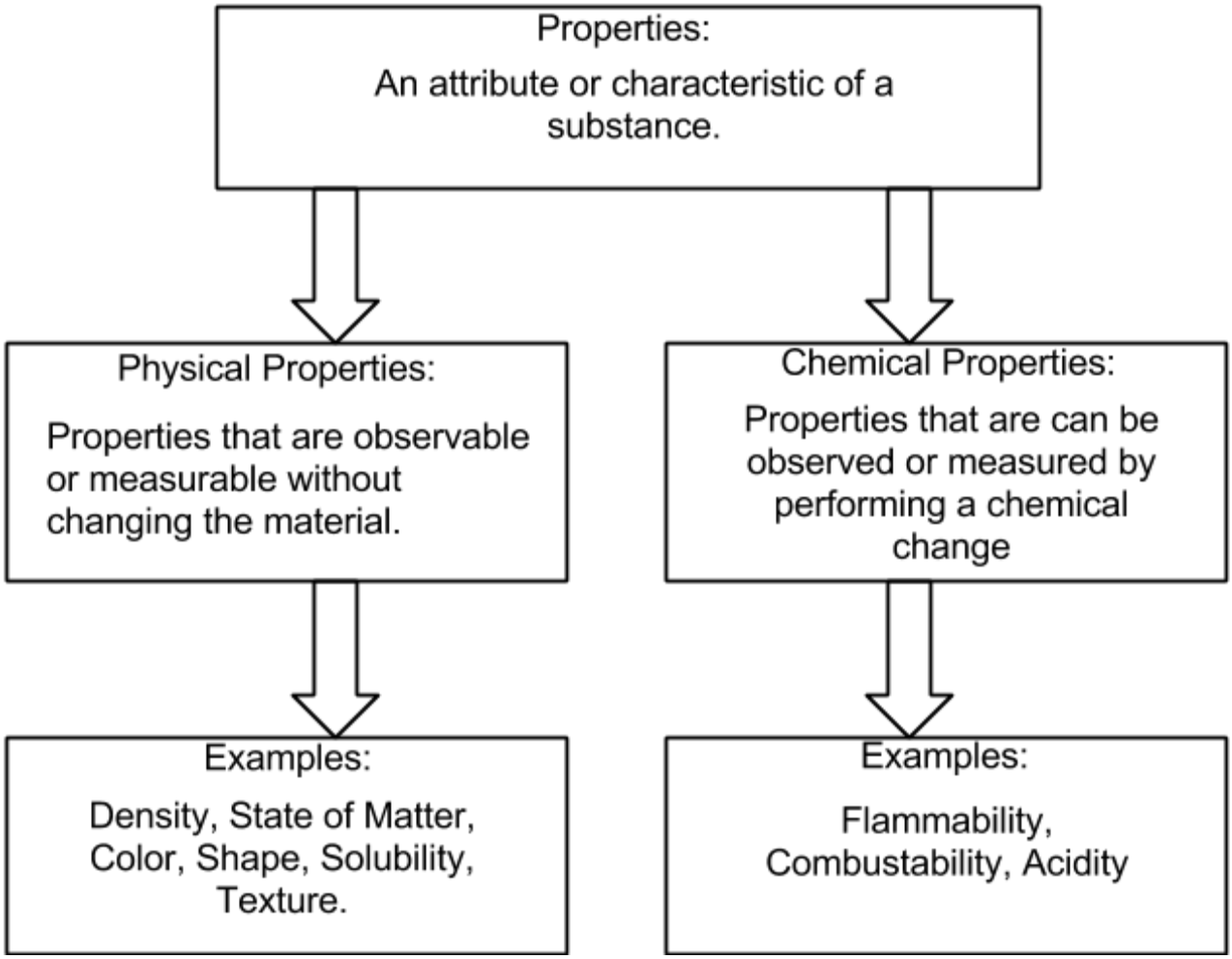
1. Write a sentence that describes a chemical property of a candle.

---

2. Write a sentence that describes a physical property of a candle.

_____

Answer Key


Properties:
An attribute or characteristic of a substance.
Physical Properties:
Properties that are observable or measurable without changing the material.
Chemical Properties:
Properties that are can be observed or measured by performing a chemical change
Examples:
Density, State of Matter, Color, Shape, Solubility, Texture.
Examples:
Flammability, Combustability, Acidity

Book:

Physical Property: Blue, Rectangular.

Chemical Property: Flammable

Ice Cubes:

Physical Property: Smooth, Solid
Chemical Property: Not Flammable, pH of 7

Physical Vs. Chemical Properties Practice

Read each sentence and decide whether the sentence is describing a physical property or a chemical property.

8. Construction paper is bendable. ___Physical property_____

9. The book is flammable. _____Chemical property_____

10. The window is transparent. _____Physical property_____

11. The glass cup can break if someone drops it. _____Physical property_____

12. Gasoline is explosive and must be stored away from fire. ___Chemical property

13. Water will boil and become a gas at 100° Celsius. _____Physical property_

14. A metal called sodium will explode if placed in water. _____Chemical property__

Extension:

3. Write a sentence that describes a chemical property of a candle.

The wick of a candle is flammable.

4. Write a sentence that describes a physical property of a candle.

The wax of a candle feels smooth.

UNIT 6: ENERGY AND MATTER

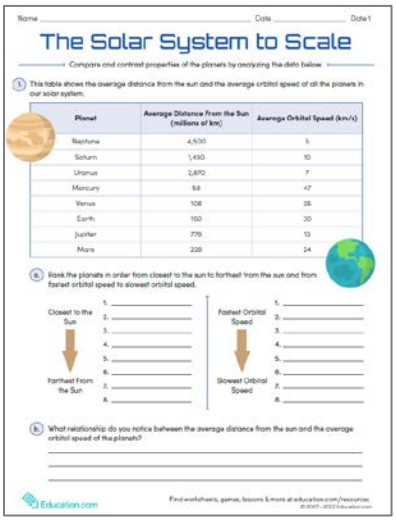
1. Pre- Unit Activity
2. Have students prepare using energy and force vocabulary cards from handout.
3. A. Types of energy
   Have students develop scenarios that explain potential versus kinetic energy. Have them write the scenarios as stories and then collate all of the stories into a book.
   B. Sources of energy
   Have students review each other's stories and answer the following questions. What is the source of energy in this story? What are other sources of energy? What sources of energy have you used today?
   C. Inter conversions of common forms of energy
   Have the students pick one of the sources of energy they wrote about in Exercise B. above and write step by step the conversion of that energy from one form to another. The relationship between energy and force
   Have the students continue to review the stories and explain what part of the actions of the story represent force and which represent energy. If they are not able to identify any, ask them to add to the story in a way that illustrates the difference between the two while keeping in the theme of the story.
   D. Conservation of energy
   E. Conservation of mass
   F. Conduction of electricity
   G. What is matter
   H. Changes of state
   Have students complete the "Changes in Matter" handout
   I. Effects of heat on the states of matter
   J. Diffusion of matter

UNIT 7: OUR SOLAR SYSTEM

1. Pre- Unit Activity
2. A. The solar system

----------Handouts shown in the pages that follow----------

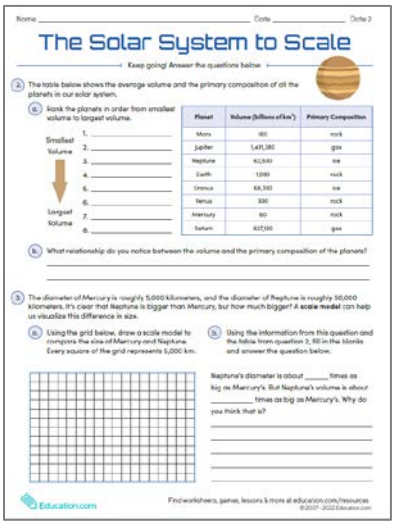
See worksheet titled “Solar System to Scale”



The Solar System to Scale

Compare and contrast properties of the planets by analyzing the data below.

Planet	Average Distance From the Sun (millions of km)	Average Orbital Speed (km/s)
Neptune	4,500	5
Saturn	1,430	10
Uranus	2,870	7
Mercury	58	47
Venus	108	35
Earth	150	30
Jupiter	778	13
Mars	228	24



The Solar System to Scale

Keep going! Answer the questions below.

Planet	Volume (billions of km³)	Primary Composition
Mars	160	rock
Jupiter	1,431,280	gas
Neptune	62,540	ice
Earth	1,090	rock
Uranus	68,330	ice
Venus	930	rock
Mercury	60	rock
Saturn	827,130	gas

B. Seasons of the earth

Reading Comprehension Activity, See “Seasons” handouts

Seasons

Science Literacy Article

The mention of seasons tends to bring out vivid thoughts for most people. You might think of relaxing on the beach in the summer or playing in the snow in the winter. Seasons are the four divisions of the year (i.e. winter, spring, summer, and autumn). Seasons occur because the Earth revolves around the Sun once every 365 days. The Earth is also tilted on its axis (an imaginary line that runs through both poles) at an angle of 23.5 degrees. This revolution and tilt allows the Earth to experience particular weather patterns and amounts of daylight hours at different places on Earth at the same time.

The equator is an imaginary line that divides the Earth into two equal halves, or hemispheres. The northern hemisphere is located to the north of the equator and the southern hemisphere is located to the south of the equator. Since the Earth is tilted on its axis, the northern and southern hemispheres always experience opposite seasons. For example, if the northern hemisphere is experiencing summer, then the southern hemisphere is experiencing winter.

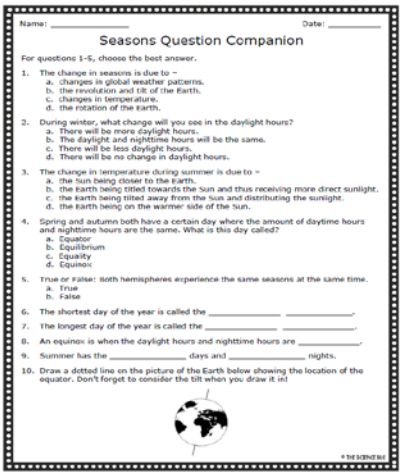
Winter is the coldest season of the year. This is because the hemisphere experiencing winter is tilted away from the Sun and receives less direct sunlight. During winter, these areas will also observe shorter days and longer nights. The shortest day of the year with the least amount of sunlight is referred to as the winter solstice. A winter solstice occurs when the Sun reaches its lowest point in the sky at noon. The winter solstice generally occurs around December 21 – 22 in the northern hemisphere.

During spring, the weather becomes warmer and plants begin to grow again. The hemisphere experiencing spring is not tilted toward or away from the Sun. Therefore, these areas will observe amounts of daylight hours and nighttime hours that are fairly equal. An equinox occurs when the Sun crosses the plane of the equator and it is marked by nearly equal amounts of day and night (12 hours of each). During spring, this day is known as the vernal equinox. The vernal equinox occurs around March 20 – 21 in the northern hemisphere.

Summer is the warmest season of the year. This is because the hemisphere experiencing summer is tilted toward the Sun and receives more direct sunlight. During summer, these areas will also observe longer days and shorter nights. The longest day of the year with the most amount of sunlight is referred to as the summer solstice. A summer solstice occurs when the Sun reaches its highest point in the sky at noon. The summer solstice generally occurs around June 21 – 22 in the northern hemisphere.

During autumn, the weather becomes cooler and leaves begin to fall from trees and plants. The hemisphere experiencing autumn is not tilted toward or away from the Sun. Therefore, these areas will observe amounts of daylight hours and nighttime hours that are fairly equal. An equinox occurs once again when the Sun crosses the plane of the equator and it is marked by nearly equal amounts of day and night (12 hours of each). During autumn, this day is known as the autumnal equinox. The autumnal equinox occurs around September 22 – 23 in the northern hemisphere.

As you have read, there are four seasons that occur on Earth, each with specific characteristics. As the Earth continues its revolution around the Sun on its tilted axis, each season lasts for only a few months before transitioning into the next one. Without this crucial revolution and tilt, seasons as we know them would be completely different and might not even exist at all!



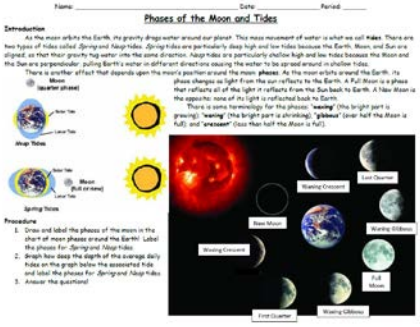
Seasons Question Companion

For questions 1-5, choose the best answer.

1. The change in seasons is due to –
   a. changes in global weather patterns.
   b. the revolution and tilt of the Earth.
   c. changes in temperature.
   d. the rotation of the Earth.
2. During winter, what change will you see in the daylight hours?
   a. There will be more daylight hours.
   b. The daylight and nighttime hours will be the same.
   c. There will be less daylight hours.
   d. There will be no change in daylight hours.
3. The change in temperature during summer is due to –
   a. the Sun being closer to the Earth.
   b. the Earth being tilted towards the Sun and thus receiving more direct sunlight.
   c. the Earth being tilted away from the Sun and distributing the sunlight.
   d. the Earth being on the warmer side of the Sun.
4. Spring and autumn both have a certain day where the amount of daytime hours and nighttime hours are the same. What is this day called?
   a. Equator
   b. Equilibrium
   c. Equality
   d. Equinox
5. True or False: Both hemispheres experience the same seasons at the same time.
   a. True
   b. False
6. The shortest day of the year is called the _____ _____.
7. The longest day of the year is called the _____ _____.
8. An equinox is when the daylight hours and nighttime hours are _____.
9. Summer has the _____ days and _____ nights.
10. Draw a dotted line on the picture of the Earth below showing the location of the equator. Don't forget to consider the tilt when you draw it in!

C. Moon phases and tides

Reading Comprehension Activity, See “Moon and Tides”



Phases of the Moon and Tides

Introduction

As the moon orbits the Earth, its gravity drags water around our planet. This mass movement of water is what we call **tides**. There are two types of tides called *Spring* and *Neap* tides. *Spring* tides are particularly deep high and low tides because the Earth, Moon, and Sun are aligned, so that their gravity tug water into the same direction. *Neap* tides are particularly shallow high and low tides because the Moon and the Sun are perpendicular, pulling Earth's water in different directions causing the water to be spread around in shallow tides.

There is another effect that depends upon the moon's position around the moon: **phases**. As the moon orbits around the Earth, its phase changes as light from the sun reflects to the Earth. A Full Moon is a phase that reflects all of the light it reflects from the Sun back to Earth. A New Moon is the opposite: none of its light is reflected back to Earth.

There is some terminology for the phases: '**waxing**' (the bright part is growing), '**waning**' (the bright part is shrinking), '**gibbous**' (over half the Moon is full), and '**crescent**' (less than half the Moon is full).

Procedure

1. Draw and label the phases of the moon in the chart of moon phases around the Earth. Label the phases for *Spring* and *Neap* tides.
2. Graph how deep the depth of the average daily tides on the graph below the associated tide and label the phases for *Spring* and *Neap* tides.
3. Answer the questions!

Name _____ Date _____ Date 1

The Solar System to Scale

Compare and contrast properties of the planets by analyzing the data below.

1. This table shows the average distance from the sun and the average orbital speed of all the planets in our solar system.

Planet	Average Distance From the Sun (millions of km)	Average Orbital Speed (km/s)
Neptune	4,500	5
Saturn	1,430	10
Uranus	2,870	7
Mercury	58	47
Venus	108	35
Earth	150	30
Jupiter	778	13
Mars	228	24

a. Rank the planets in order from closest to the sun to farthest from the sun and from fastest orbital speed to slowest orbital speed.

Closest to the Sun

Farthest From the Sun

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Fastest Orbital Speed

Slowest Orbital Speed

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

b. What relationship do you notice between the average distance from the sun and the average orbital speed of the planets?

_____

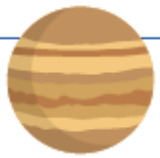
_____

_____

Name _____ Date _____ Date 2

The Solar System to Scale

Keep going! Answer the questions below.



2. The table below shows the average volume and the primary composition of all the planets in our solar system.

a. Rank the planets in order from smallest volume to largest volume.

Smallest Volume

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Largest Volume

Planet	Volume (billions of km³)	Primary Composition
Mars	160	rock
Jupiter	1,431,280	gas
Neptune	62,530	ice
Earth	1,090	rock
Uranus	68,330	ice
Venus	930	rock
Mercury	60	rock
Saturn	827,130	gas

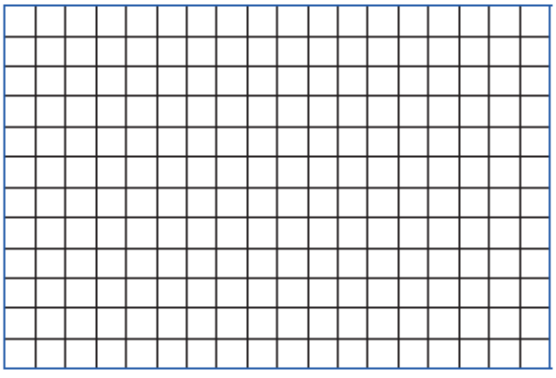
b. What relationship do you notice between the volume and the primary composition of the planets?

_____

_____

3. The diameter of Mercury is roughly 5,000 kilometers, and the diameter of Neptune is roughly 50,000 kilometers. It's clear that Neptune is bigger than Mercury, but how much bigger? A **scale model** can help us visualize this difference in size.

a. Using the grid below, draw a scale model to compare the size of Mercury and Neptune. Every square of the grid represents 5,000 km.



b. Using the information from this question and the table from question 2, fill in the blanks and answer the question below.

Neptune's diameter is about _____ times as big as Mercury's. But Neptune's volume is about _____ times as big as Mercury's. Why do you think that is?

_____

_____

_____

_____

_____

Name: _____ Date: _____

Seasons

Science Literacy Article

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Name: _____ Date: _____ Period: _____

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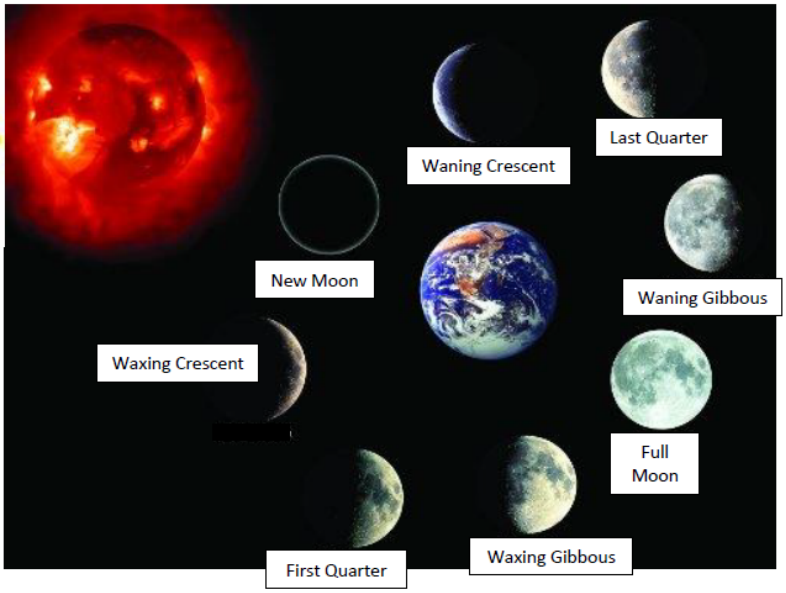

Procedure

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