Science/Ciencia

Roanoke City
PUBLIC SCHOOLS

Teacher Contact Information:
Información de contacto del profesor:

Family Learning Resources: Remote Learning Edition

Recursos de Aprendizaje Familiar: Edición de Aprendizaje Remoto

Physical Science/Ciencias Físicas

Family Learning Resources: Remote Learning Edition

Roanoke City Public Schools

Winter 2026 - 5 Days of Resources

Content Areas Included

- English Language Arts
- Mathematics
- Science
- Social Studies

Objective

This document will provide families with remote learning resources in the four core content areas for the anticipated extended closure of schools due to inclement weather.

Recommendations for Usage

- These necessary materials focus on reinforcing previously learned concepts - no new materials are covered.
- Students should be able to complete with minimal adult assistance. However, discussing the purpose and understandings from resources can help establish a deeper connection to the materials.
- Students are encouraged to write down questions that they might have about the materials so that they may be discussed with teachers.
- In addition to the completion of these materials, RCPS recommends that students take time to read - either independently or with others.

Questions & Follow Up Notes

Please do not hesitate to reach out to your student's teachers with any questions. These resources are designed to support remote learning during school closures and help minimize disruptions to instruction. **Students should bring this booklet with them when they return to school.**

_____

_____

_____

Recursos de Aprendizaje Familiar: Aprendizaje Remoto

Roanoke City
PUBLIC SCHOOLS

Invierno 2026 – 5 días de recursos

Áreas de contenido

- Lenguaje (Inglés)
- Matemáticas
- Ciencias
- Estudios Sociales

Objetivo

Este documento ofrece a las familias recursos de aprendizaje remoto en las cuatro áreas académicas principales, pensados para apoyar la continuidad educativa durante cierres escolares prolongados debido a las inclemencias del tiempo.

Recomendaciones de Uso

- Estos materiales necesarios se centran en reforzar conceptos aprendidos previamente - no se cubre material nuevo.
- Los estudiantes deberían poder completar las actividades con una asistencia mínima de un adulto. Sin embargo, conversar sobre el propósito y los aprendizajes de los recursos puede ayudar a establecer una conexión más profunda con el material.
- Se anima a los estudiantes a escribir las preguntas que puedan tener sobre los materiales para que puedan ser comentadas con los maestros.
- Además de completar estos materiales, RCPS recomienda que los estudiantes dediquen tiempo a la lectura, ya sea de manera independiente o con otras personas.

Preguntas y notas de seguimiento

Por favor, no dude en comunicarse con los maestros de su estudiante si tiene alguna pregunta. Estos recursos están diseñados para apoyar el aprendizaje remoto durante los cierres escolares y ayudar a minimizar las interrupciones en la instrucción. **Los estudiantes deben traer este folleto cuando regresen a la escuela.**

MEASURING

- **Graduated cylinders** and **beakers** are used to measure volume (liters, mL).
- A **triple beam balance or balance** is used to measure mass (grams).
  - A small paper clip is about 1 gram.
- A **thermometer** (˚C) is used to measure temperature.
- **Density** is the amount of mass in a given volume.
- Metric conversions can be completed using the metric stair case.

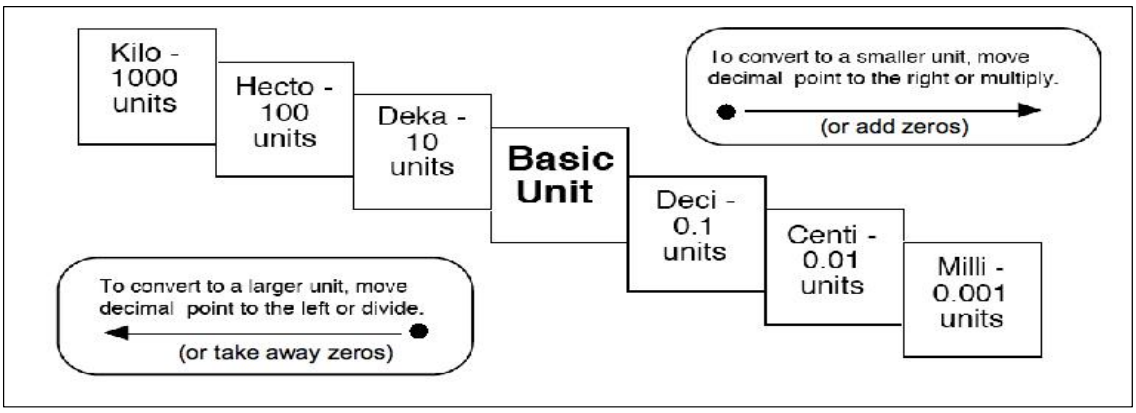
$$density = \frac{mass}{volume}$$

or, in short form:

$$d = \frac{m}{v}$$

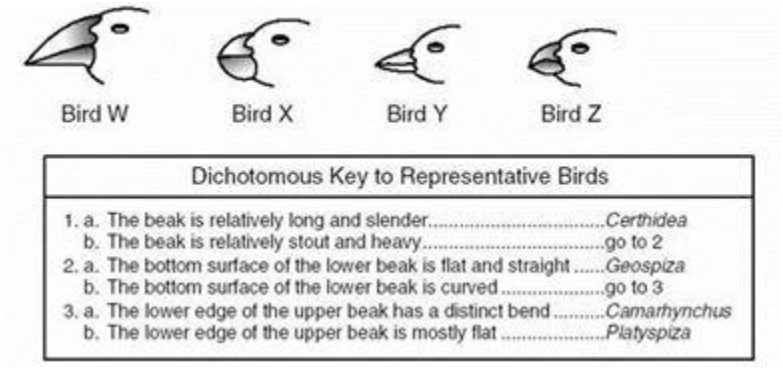
***Mass** – the amount of matter in a substance

* **Weight** – a measure of force due to gravity acting on a mass



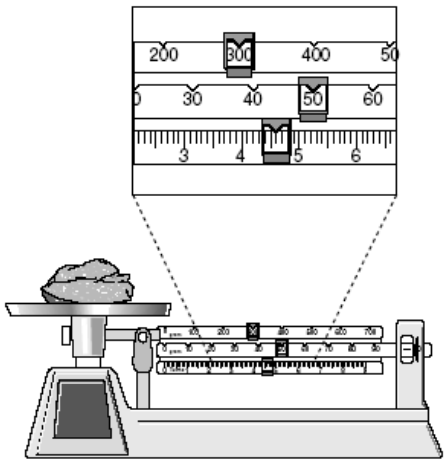
Nature of Science Practice (6.1, LS.1, & PS.1)

1. Identify the name of Bird W using the dichotomous key.



Dichotomous Key to Representative Birds

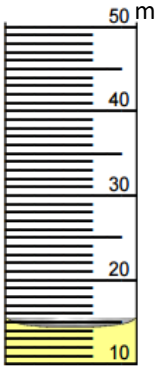
1. a. The beak is relatively long and slender ..... *Certhidea*
   b. The beak is relatively stout and heavy ..... go to 2
2. a. The bottom surface of the lower beak is flat and straight ..... *Geospiza*
   b. The bottom surface of the lower beak is curved ..... go to 3
3. a. The lower edge of the upper beak has a distinct bend ..... *Camarhynchus*
   b. The lower edge of the upper beak is mostly flat ..... *Platyspiza*



2. What is the mass of the rock?

3.

A

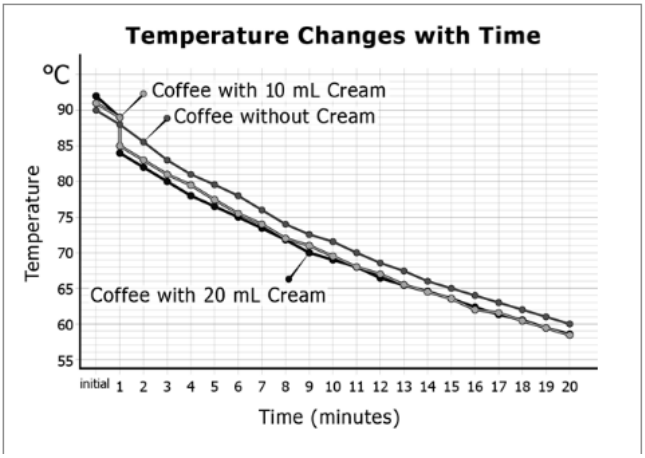


B

What is the volume in the graduated cylinder marked A?

What is the volume in the graduated cylinder marked B?

4.



a. **Identify the independent variable for this graph.**
_____

b. **What is the dependent variable for this experiment? _____**

c. **What should be held constant?**
_____

d. **What is the control?**
_____

5. ***Identify the <u>Independent</u> Variable, Dependent Variable and <u>2 Controls</u> in each Experiment.***

a. Students of different ages were given the same puzzle to assemble, and the puzzle assembly time was measured.

Independent Variable -
Dependent Variable -
Control #1 -
Control #2 –

b. Two groups of students, were tested to compare their speed working math problems. Each group was given the same problems. One group used calculators and the other group computed without calculators.

Independent Variable -
Dependent Variable -
Control #1 -
Control #2 – -

c. A study was done to find if different tire treads affect the braking distance of a bike.

Independent Variable -
Dependent Variable -
Control #1 -
Control #2 –

d. A study was attempted to find if the length of the string in a string telephone affected its sound clarity.

Independent Variable -
Dependent Variable -
Control #1 -
Control #2 –

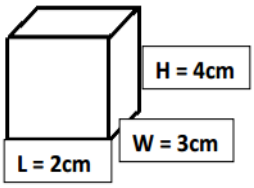
6. 

a. The mass of an object is 40g and the volume is 20mL. What is the density of the object? (SHOW WORK!)

b. The mass of an object is 150g and the volume is 45mL. What is the density of the object? (SHOW WORK!)

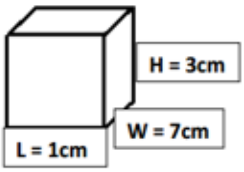
c. Determine the density of the objects. (SHOW WORK!)

Mass = 48g



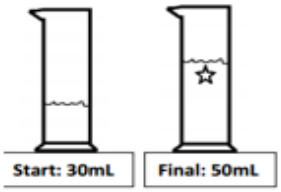
- What is the Volume? _____
- What is the Density? _____

Mass = 63g



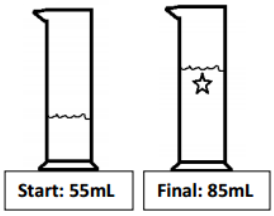
- What is the Volume? _____
- What is the Density? _____

Mass = 10g



- What is the Volume? _____
- What is the Density? _____

Mass = 10g



- What is the Volume? _____
- What is the Density? _____

7. Write the following numbers using proper scientific notation.

a 400 = _____

b 60,000 = _____

c 750,000 = _____

d 0.005 = _____

e 0.0034 = _____

f 0.06457 = _____

g 3×10^{2} = _____

h 7×10^{4} = _____

i 2.4×10^{3} = _____

j 6×10^{-3} = _____

k 900×10^{-2} = _____

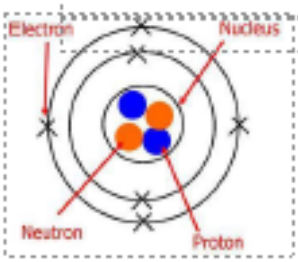
l 4×10^{-6} = _____

8. Draw and label the metric staircase (or line).

Match word to definition

1. Independent variable	**A.** The normal group, the group without the Independent Variable
2. Dependent variable	**B.** what stays the same
3. Control Group	**C.** what the scientist changes
4. Constant	D. What the scientist measures or observes
5. Quantitative Data	E. What I do to test my hypothesis
6. Qualitative Data	F. Something that I see, smell, taste, hear or feel. A fact.
7. Hypothesis	G. The answer to my question. What I Infer at the end of my experiment based on my observations.
8. Observation	H. An informed guess about what will happen in an experiment.
9. Conclusion	I. Observations that have numbers in them
10. Experiment	J. Observations that are descriptions without numbers

ADDITIONAL NOTES



ATOMIC STRUCTURE

- **Proton** – has a positive charge; located in the nucleus of an atom
- **Neutron** – has a neutral charge; located in the nucleus of an atom
- **Electron** – has a negative charge; located in the shells (cloud) of an atom
- Protons and neutrons account for most of the mass of an atom.
- The nucleus of an atom has an overall **positive** charge.
- An atom has an overall **neutral** charge.

Identify each of the following PURE SUBSTANCES as either an **element** or a **compound**. The formula for each pure substance has been provided in the brackets.

a) oxygen (O_2) _____

b) hydrogen peroxide (H_2O_2) _____

c) platinum (Pt) _____

d) methane (CH_4) _____

e) nitrogen (N_2) _____

f) sodium chloride (NaCl) _____

g) sodium (Na) _____

h) aluminum (Al) _____

i) glucose ($C_6H_{12}O_6$) _____

j) ammonia (NH_3) _____

k) chlorine (Cl) _____

l) hydrogen (H_2) _____

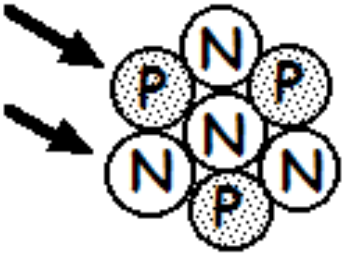
m) carbon dioxide (CO_2) _____

n) mercury (Hg) _____

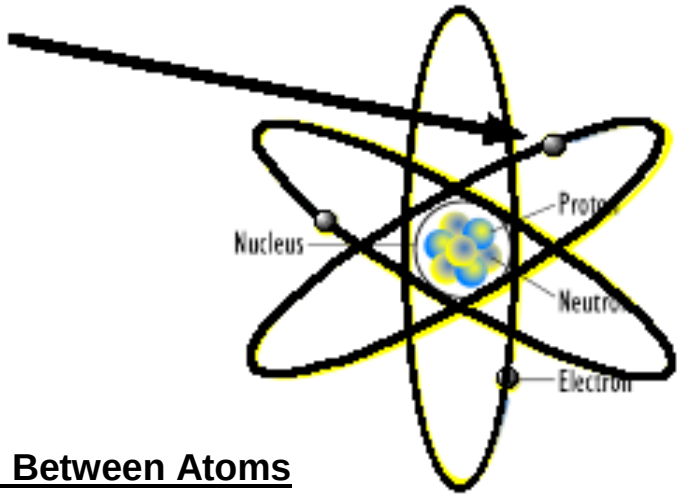
o) propane (C_3H_8) _____

p) benzene (C_6H_6) _____

A. Electron B. Neutron C. Proton

____ 19. 

____ 21.

____ 20. 

Distinguishing Between Atoms

21. The _____ **number** of an element is the number of **protons** in its nucleus.

22. Do **all Carbon atoms** have an **atomic number** of **6**? _____

23. Can, say, a **Nitrogen** atom have an atomic number of **6** also? _____

24. _____ **number** of an element = the number of **protons <u>and</u> neutrons** in its nucleus.

25. Do **all Carbon atoms** have a **mass number** of **12**? _____

26. For a **neutral atom**, the number of _____ is **also** equal to the atomic number.

27. Uranium's **mass number** is **238**. Its **atomic number** is **92**. How many **neutrons** does **Uranium-238** contain? _____

28. Use the **atomic symbol** at the right to answer these questions:

$^{197}_{79}\mathbf{Au}$

a) Which **element** is this? _____

b) What is the **mass** number? _____

c) What is the **atomic** number? _____

d) Number of **protons**? _____ e) Number of **neutrons**? _____

Counting Atoms

2 H_2O

_____ molecules of H_2O
_____ H (hydrogen)
_____ O (oxygen)

3 Na_2SO_4

_____ molecules of Na_2SO4
_____ Na (sodium)
_____ S (sulphur)
_____ O (oxygen)

4 $Pb(NO_3)_2$

_____ molecules of $Pb(NO_3)_2$
_____ Pb (Lead)
_____ N (nitrogen)
_____ O (oxygen)

K_2CO_3

Type of Atom	# of Atoms
_____	_____
_____	_____
_____	_____
Total	_____

$Ba_3(PO_4)_2$

Type of Atom	# of Atoms
_____	_____
_____	_____
_____	_____
Total	_____

Na_2CrO_4

Type of Atom	# of Atoms
_____	_____
_____	_____
_____	_____
Total	_____

3 $CaCl_2$

Type of Atom	# of Atoms
_____	_____
_____	_____
Total	_____

$NH_4C_2H_3O_2$

Type of Atom	# of Atoms
_____	_____
_____	_____
_____	_____
_____	_____
Total	_____

4 $Al_2(CO_3)_3$

Type of Atom	# of Atoms
_____	_____
_____	_____
_____	_____
Total	_____

Additional Notes:

6. Water is able to dissolve many substances and is commonly known as the _____.
   - A Universal element
   - B Universal compound
   - C Universal solvent
   - D Universal solute

7. Which substance will not dissolve in water?
   - A Sugar
   - B Salt
   - C Bleach
   - D Oil

8. How many atoms of oxygen does a molecule of water contain?
   - A 1
   - B 0
   - C 3
   - D 2

9. Which statement explains why water molecules stick together?
   - A Both sides are positive
   - B One side has a positive charge and the other side has a negative charge
   - C Both sides are negative
   - D One side has a negative charge and the other side has a neutral charge

10. The tightness across the surface of water that is caused by polar molecules pulling on each other is called _____.
    - A Condensation
    - B Capillary action
    - C Universal solvent
    - D Surface tension

12. What is an example of condensation?
    - A Hair drying after swimming
    - B Clothes drying on a clothesline
    - C Breathing on a window
    - D A hot day decreasing the amount of water in a swimming pool

14. The process of gas changing into a liquid is _____
    - A Precipitation
    - B Evaporation
    - C Condensation
    - D Melting

15. What is the freezing point of water in degrees Fahrenheit?
    - A 32°
    - B 0°
    - C 100°
    - D 212°

16. What is not a property of water?
    - A Water sinks when it freezes
    - B Water has a high temperature range in its liquid state
    - C Water floats when it freezes
    - D Water has a high surface tension

17. What causes dew to form in the morning?
    - A Condensation
    - B Evaporation
    - C Transpiration
    - D Precipitation

18. What are the 3 states of water?
    - A Solid, solution, gas
    - B Solid, liquid, gas
    - C Solid, solute, solvent
    - D Gas, solute, solvent

19. What is solid water called?
    - A Ice
    - B Water
    - C Fog
    - D Water Vapor

20. What is a mixture that is evenly mixed throughout?
    - A Solution
    - B Solvent
    - C Solute
    - D compound

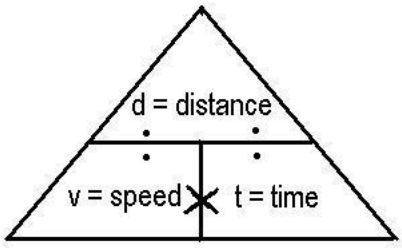
Speed, Velocity, & Acceleration Practice

SHOW WORK!

Distance = Speed x Time

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$



$$\text{Acceleration} = \frac{\text{Change in velocity}}{\text{Change in Time}}$$

1. If Chris throws the baseball 60 meters in 4 seconds, what is the average speed of the football?

2. An airplane travels 4000m in 16 seconds on a heading of 35^{o}W. What is its velocity?

3. A bicycle is heading North. It goes 5000m in 500s. What is its velocity?

4. If Justin races his Chevy Camaro South down I-81S for 2560m in 60s, what is his velocity?

5. An ice cream truck is going 25m/s to the East. It accelerates to 40m/s in the same direction over 3s. What is the acceleration?

6. A soccer player is running upfield at 10m/s and comes to a stop in 3s facing the same direction. What is his acceleration?

7. If the speedometer of your car reads a constant speed of 40km/hr, can you say the car has constant velocity? Explain your answer.

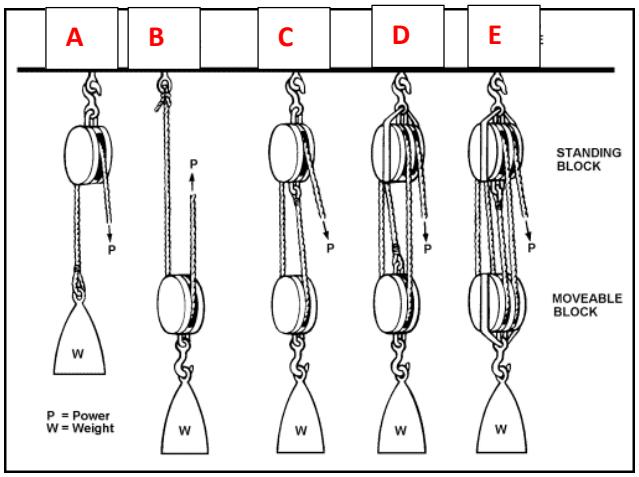
SIMPLE MACHINE PRACTICE

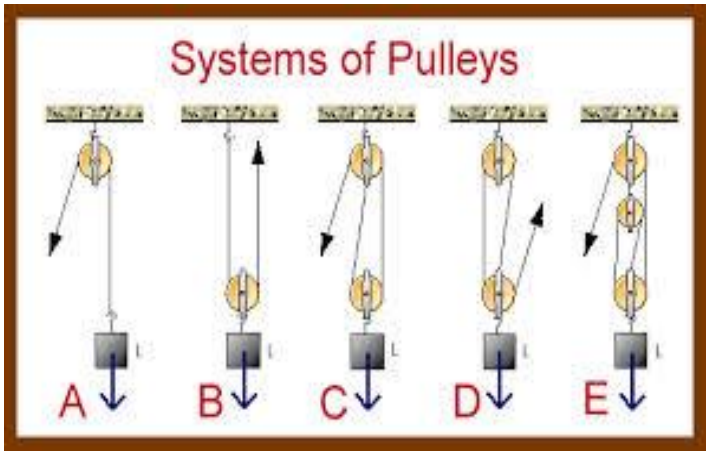
1. Match the simple machine with its correct definition.

Simple Machines	Answer
Lever =	
Inclined plane =	
Wedge =	
Screw =	
Wheel and axle =	
Pulley =	

Definitions
1. Something that reduces the friction of moving something.
2. Something that can hold things together or lift an object.
3. A ramp.
4. Something that uses a rope and can change the direction of a force
5. Something similar to a see-saw that can lift an object.
6. Something that can split an object apart.

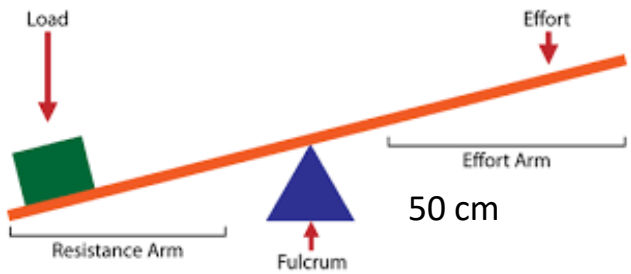
2. Calculate the mechanical advantage (MA) of the following pulley systems.





_____ _____ _____ ____ _____ _____ _____ _____ _____ _____

3. Calculate the mechanical advantage of the following levers.



50 cm

50 cm