Sixth Grade Science
Atoms, Molecules, Elements, and Compounds Lab Book

Mr. Hoynes

Rm. 211

Mastery Checklist:

Skill to be mastered:	Mastered?
I can define matter, substance, atom, elements, compounds, mixture, and molecules.	
I can explain how atoms are the basic particle from which all elements are made.	
I can explain that there is empty space between the atoms that make up a substance.	
I can explain that each atom takes up space, has mass and is in constant motion.	
I can explain that an element is a pure substance that cannot be broken down by chemical or physical means.	
I can explain how all substances are composed of one or more elements.	
I can explain how each element and compound has properties, which are independent of the amount of the sample.	
I can explain how a compound has its own unique composition of elements and atoms.	
I can explain that both elements and compounds can form molecules.	
I can make models of atoms, molecules, and compounds.	

How Small Can You Go?

In the activity below, you will attempt to separate a large droplet of water into as many smaller droplets as possible. The goal is to create the smallest droplet possible.

Activity

Problem: How small can you make a water droplet?

Materials:

- Water dropper
- 1 piece of wax paper for each group
- Popsicle stick

Procedure:

1. Use a dropper bottle and place 4 or 5 drops of water together on the wax paper to make a drop about the size of a dime.
2. Use a Popsicle stick to slowly move the drop around the wax paper. Try using your stick to separate your drop into two.
3. Continue to divide the drops into smaller and smaller drops until they cannot be made any smaller.

What did you observe?

1. When you tried to split your drop, did the drop separate easily?

The water drop "tried" to stay together. You could drag it around the wax paper with the popsicle stick.

2. Make a drawing of your results.

Answers will vary.

3. Approximately how many droplets did you create?

   Most students were able to create over 100 droplets of water from their small water drop.

4. What is the approximate size of your smallest droplet?

   Less than 1 millimeter.

5. Do you think it is possible to create even smaller droplets of water?

   Sharper tools not made of wood. A way to increase magnification so you can see the smaller drops.

6. What would you call the smallest droplet of water?

   A molecule of water.

7. If you were to break down a molecule of water (H_2O), what would you have?

   Two hydrogen atoms and one oxygen atom.

Elements and Atoms

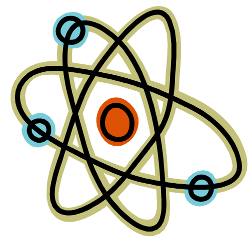
A. Describing Matter

1. Matter is anything that has **mass** and **volume**.
2. Mass is the amount of **matter** in an object.
3. A substance is a single kind of matter that is **pure**, meaning it always has a specific makeup and a specific set of properties.
   a. All particles of a pure substance have nearly **identical** masses.
   b. Particles of different substances usually have **different** masses, depending on their atomic composition.

B. Elements

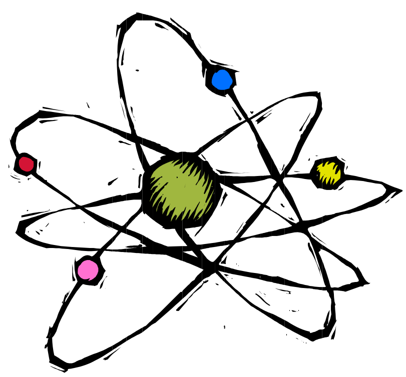
1. An element is a **pure** substance that cannot be broken down into **simpler** substances.
   a. There are approximately **90** different **naturally** occurring elements that have been identified.
   b. There are additional elements that were made in a **laboratory**, but these elements are not stable.
2. All substances are composed of one or more **element**.

3. Elements are often called the **building blocks** of matter because all matter is composed of one element or a **combination** of two or more elements.
4. Elements are a class of substances composed of a single kind of **atom**.
   - Examples: aluminum, copper, lead, **oxygen**, chlorine, neon, and helium.



C. Atoms

1. An atom is the basic, **smallest particle** from which all elements are made.
2. All matter is made up of atoms, which are **particles** that are too **small** to be seen, even with a light microscope.
3. Each atom takes up **space**, has **mass** and is in constant **motion**.
4. All **atoms** of any one **element** are alike, but are different from atoms of other elements.
5. There is **empty** space between the atoms that make up a **substance**.



Trying to Create a Life Sized Model of an Atom

The Phantom wants to create life sized models of atoms, and he wants your help! Help the Phantom investigate the world of the very small by cutting a 28 cm strip of paper in half as many times as you can. If you can cut the strip of paper in half 31 times you will end up with a piece of paper the size of an atom!

Procedure

1. Take your strip of paper and cut it into equal halves.
2. Cut one of the remaining pieces of paper into equal halves.
3. Continue to cut the strip into equal halves as many times as you can.
4. Make all cuts parallel to the first one. When the width gets longer than the length, you may cut off the excess, but that does not count as a cut.

How far did you get? Here are some comparisons to think about.

Cut Number	Size (Metric)	Size (Inches)	Comparison
1	14.0 cm	5.5"	Child's hand, pockets
2	7.0 cm	2.75"	Fingers, ears, toes
3	3.5 cm	1.38"	Watch, mushroom, eye
4	1.75 cm	.69"	Keyboard keys, rings, insects
6	.44 cm	.17"	Poppy seeds
8	1 mm	.04"	Thread. Congratulations if you're still in!
10	.25 mm	.01"	Still cutting? Most have quit by now
12	.06 mm	.002"	Microscopic range, human hair
14	.015 mm	.006"	Width of paper, microchip components
18	1 micron	.0004"	Water purification openings, bacteria
19	.5 micron	.000018"	Visible light waves
24	.015 micron	.0000006"	Electron microscope range, membranes
31	.0001 micron	.0000000045"	The size of an Atom!

Now what?

Is there anything smaller? Yes, the size of an atom nucleus would take about 41 cuts! Scientists use advanced technology to explore the world of electrons and quarks that are at least 9,000 times smaller than a nucleus.

We cannot see anything smaller than an atom with our eyes, even with the electron microscope. Physicists study much smaller things without seeing them directly.

Is there an end to the quest for the smallest and most basic elements in our world? The search began with the Greeks and continues as scientists search for the Building Blocks of the universe. These things are far beyond the range of sensory perception but not beyond the range of human understanding.

Drawings will vary. Answers on questions on page 9 should all be the same

Microviewer Activity – The Elements

DIRECTIONS: Observe the slides in the microviewer. Read the information that goes with the picture. Draw & color each of the elements you see. List two properties (other than color) of that element under the picture. Use a pencil for your diagrams.

Begin by defining ELEMENT :

An element is a pure substance that cannot be broken down into simpler substances.

1. Carbon	2. Copper

3. Gold	4. Silver
5. Sulfur	6. Mercury

7. Platinum	8. Lead

1. What similarities do you see between these 8 elements?

   These 8 elements are similar because they are all pure substances that cannot be broken down into anything simpler.

2. What differences do you see between these 8 elements?

   The elements all have different properties from each other.

3. Why are they all different? Explain your answer.

   All elements are different because they are made up of a different type of atom.

Answers Will Vary: A Search Through the Periodic Table

Use the periodic table of elements provided to complete the activity.

1. Of the first 103 elements, how many have just one letter in their symbols? ___________
2. How many have two letter symbols? ________________________
3. Name some elements that have a one letter symbol that is also the first letter of the word.

   ____________________ ____________________ ____________________

   ____________________ ____________________ ____________________

   ____________________ ____________________ ____________________

4. Name some elements that have two letter symbols that are the first letters of the word.

   ____________________ ____________________ ____________________

   ____________________ ____________________ ____________________

   ____________________ ____________________ ____________________

5. Name some elements that have a symbol that is entirely different from the spelling of the word.

   ____________________ ____________________ ____________________

   ____________________ ____________________ ____________________

   ____________________ ____________________ ____________________

6. Name some elements named after people.

   ____________________ ____________________ ____________________

7. Name some elements named after planets.

   ____________________ ____________________ ____________________

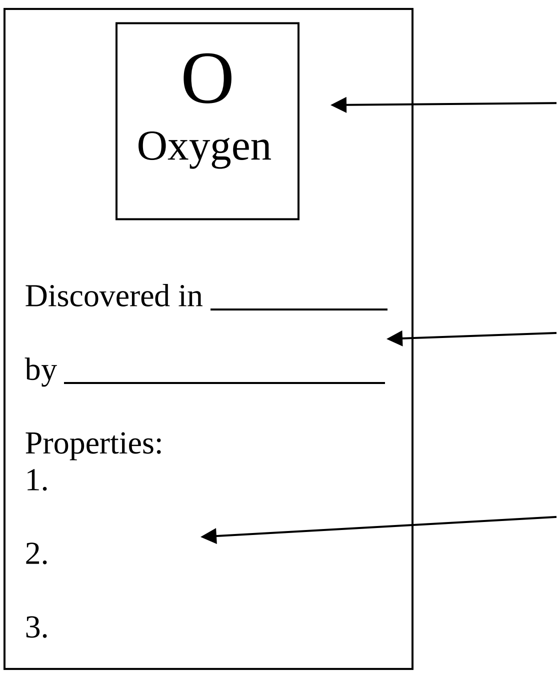
8. Name some elements named after a city, a state, a country, or university.

   ____________________ ____________________ ____________________

Element Trading Cards

For this project you will need to use the Internet to research the elements in the Periodic Table. You must choose 4 elements to research. Each card must include:

- Periodic Table abbreviation
- Discovery information (Person and date)
- Important Uses – at least 3!
- Draw and label a picture that illustrate one use for your elements



Chemical symbol and element name in the square.

Research your element to find out who discovered or named your element and give the year.

Provide at least 3 uses for your elements.

Provide a picture on the back of the trading card that illustrates uses for your element. Describe the use below the illustration.

Students completed this on notecards to be turned in for a grade!

Discovered in ____________

by ________________________________

Properties:

1.

2.

3.

Discovered in ____________

by ________________________________

Properties:

1.

2.

3.

Discovered in ____________

by ________________________________

Properties:

1.

2.

3.

Discovered in ____________

by ______________________

Properties:

1.

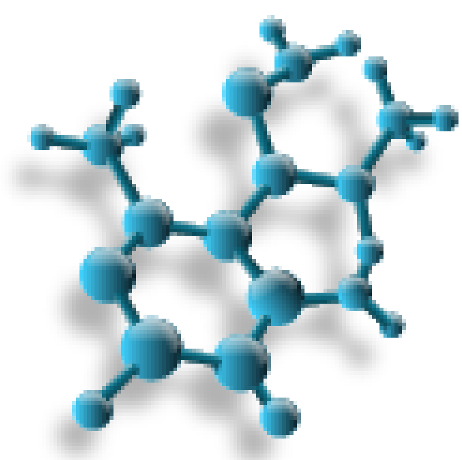
2.

3.

D. **Molecules**

1. Molecules are the **combination** of two or more atoms that are **joined** together chemically.
   a. A molecule of water consists of an **oxygen** atom chemically bonded to two **hydrogen** atoms.

   b. Two atoms of the **same** element can also combine to form a **molecule**. Oxygen molecules consist of **2** oxygen atoms.
2. Both **elements** and compounds can form molecules.
3. Molecules and atoms may join **together** in large three dimensional networks.

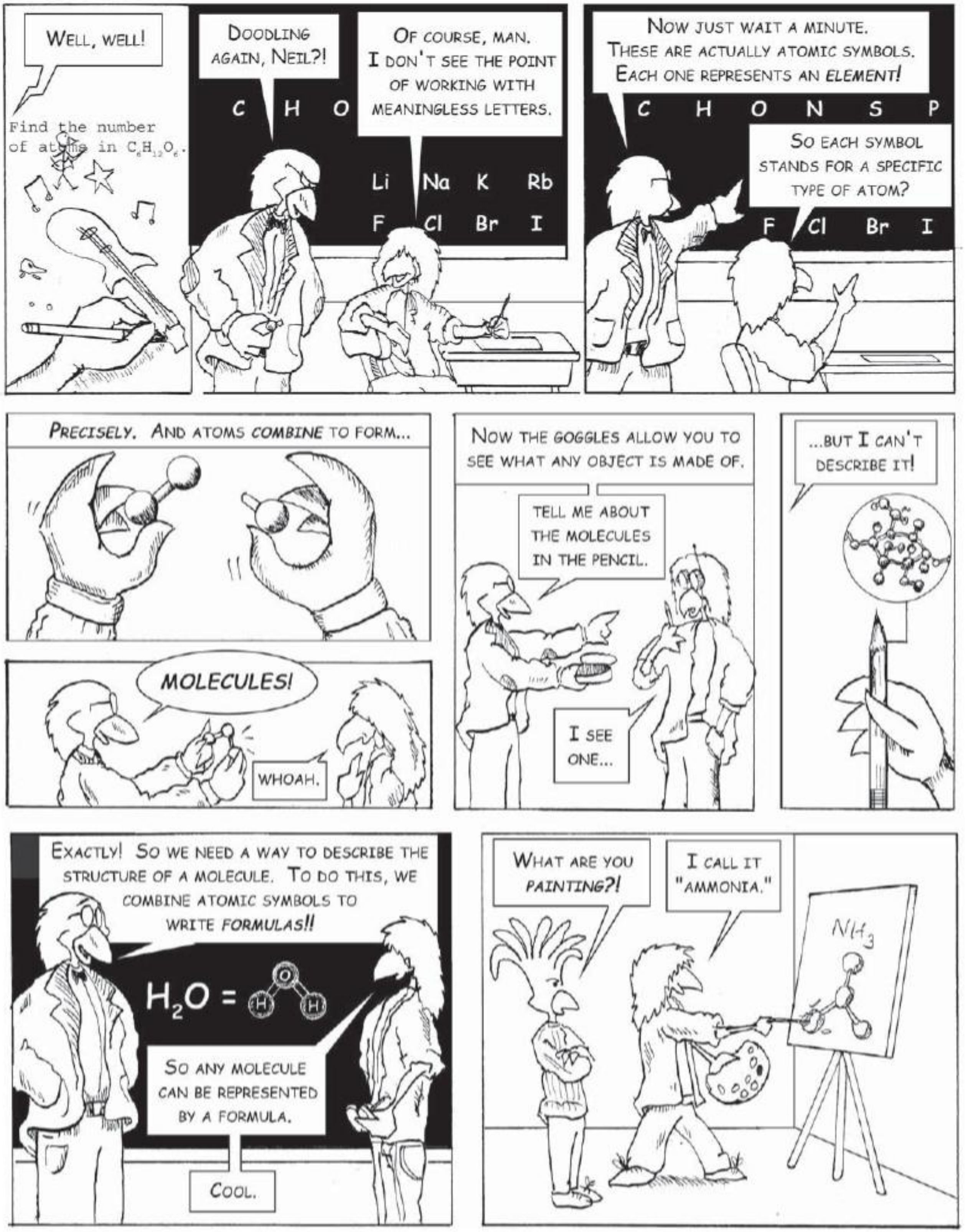


DR. BIRDLEY INVESTIGATES

SYMBOLS & FORMULAS

NAME:____________________

CLASS:__________ DATE:__________

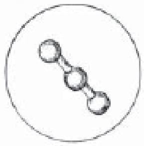


Dr. Birdley Investigates

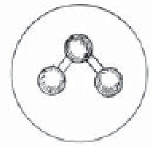
Symbols & Formulas

Name:________________________

Class:____________ Date:____________



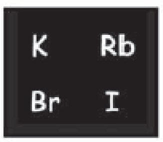
Study Questions



Directions: Answer the following questions to the best of your ability.

1. What is Neil's opinion about the language of chemistry at the beginning of the comic?

   Neil thinks it is boring and meaningless.

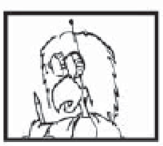


2. Explain the importance of the symbols that Dr. Birdley points to.

   Each symbol represents an element.

3. How do atoms relate to molecules? How does Dr. Birdley illustrate this point?

   Molecules are made up of atoms. He illustrates this by making a model of a molecule.



4. Explain how the goggles help Neil understand the importance of molecules.

   He can see the molecules that make up an object.

5. What do formulas tell us about molecules?

   Formulas tell us the type of elements and amount of atoms in a molecule.

DR. BIRDLEY INVESTIGATES — THE LANGUAGE OF CHEMISTRY

NAME:____________________

CLASS:__________ DATE:__________

Background: Neil Discusses Symbols & Formulas

Whoa! What a day. There I was, just doodling in chemistry class. Then, Dr. Birdley showed me that chemistry is actually interesting and relevant to real life. Who knew that my pencil was made of molecules?!

Those weird letters are actually symbols for elements...which are specific types of atoms. Elements, which are all found on the periodic table, are the simplest forms of matter. Atoms are the smallest units of matter.

Atoms combine to form molecules, which can be represented by formulas. Got it? Wait, I should really make some sort of diagram. How about this:

Each symbol stands for an element!

Molecules are made of atoms that are bonded together.

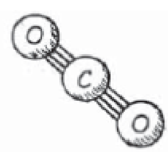
Each formula represents a molecule!

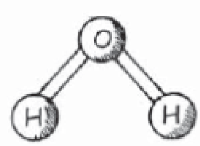
O = Oxygen

N = Nitrogen

C = Carbon

H = Hydrogen





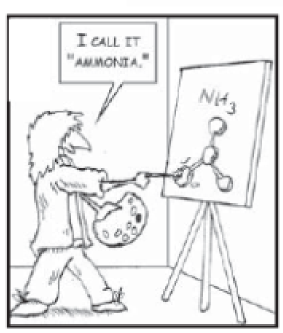
H_2O = Water

CO_2 = Carbon Dioxide

NH_3 = Ammonia

CH_4 = Methane

Each element is a specific type of atom.



Each compound contains one specific type of molecule.

How are atoms and molecules related?

Atoms combine to form molecules.

Chemical Compounds

All chemicals can be classified either as elements or as compounds. In chemical reactions, elements may combine to form compounds. For example, when carbon burns it combines with oxygen in the air to form carbon dioxide, a compound.

Use the periodic table to help you identify the elements in the compounds listed below. For example, a molecule of sulfuric acid, H_2SO_4, contains two atoms of hydrogen, one atom of sulfur, and four atoms of oxygen. When no number appears next to an element, the molecule is assumed to contain one atom.

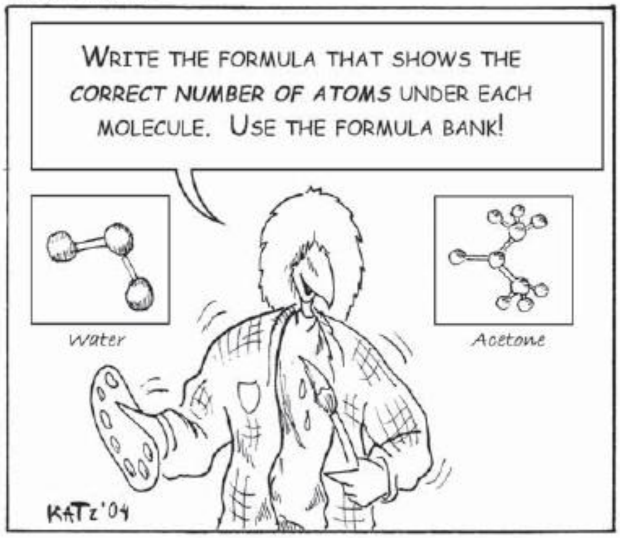
1. $NaCl$ **Sodium Chlorine**
2. $NaHCO_3$ **Sodium** **Hydrogen** **Carbon** **Oxygen**
3. Fe_2O_3 **Iron** **Oxygen**
4. H_2S **Hydrogen** **Sulfur**
5. $C_{12}H_{22}O_{11}$ **Carbon** **Hydrogen** **Oxygen**
6. $CaCO_3$ **Calcium** **Carbon** **Oxygen**
7. NH_3 **Nitrogen** **Hydrogen**
8. $KMnO_4$ **Potassium** **Manganese** **Oxygen**
9. CCl_4 **Carbon** **Chlorine**
10. $AgNO_3$ **Silver** **Nitrogen** **Oxygen**
11. $PbSO_4$ **Lead** **Sulfur** **Oxygen**
12. $CoCl_2$ **Cobalt** **Chlorine**

DR. BIRDLEY INVESTIGATES

MOLECULES & FORMULAS

NAME:____________________

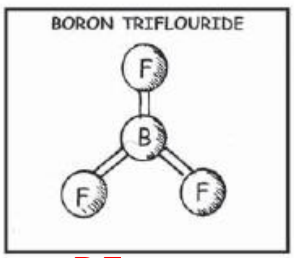
CLASS:__________ DATE:__________



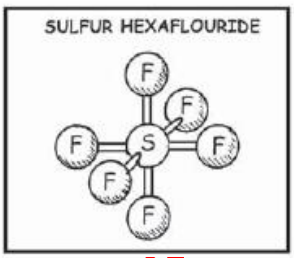
FORMULA BANK

CH_4	CO_2	BF_3	$C_2H_2Br_2$
H_20	SF_6	CH_2O	C_4H_{10}
H_2SO_4	CH_4O	C_2H_6	C_6H_6
H_3PO_4	$C_2H_4O_2$	C_3H_6O	NH_3

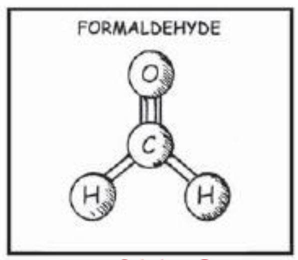
NOTE: FOUR FORMULAS ARE NOT USED!



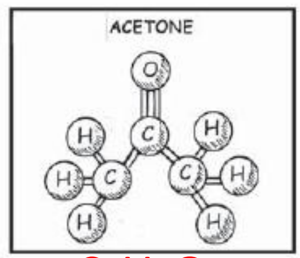
1. BF_3



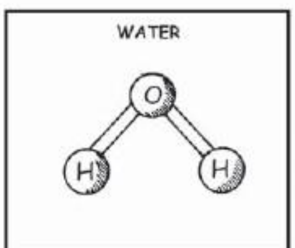
2. SF_6



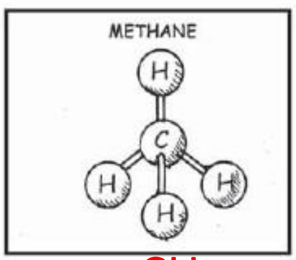
3. CH_2O



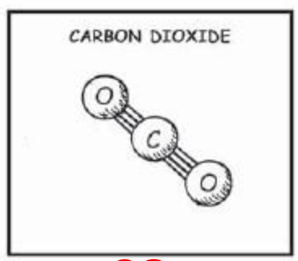
4. C_3H_6O



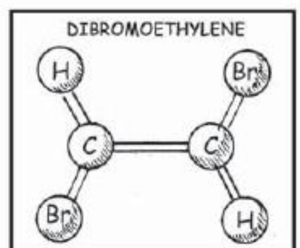
5. H_20



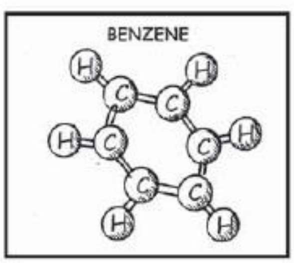
6. CH_4



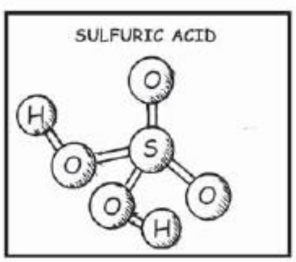
7. CO_2



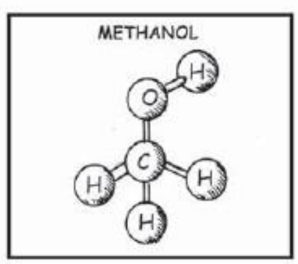
8. $C_2H_2Br_2$



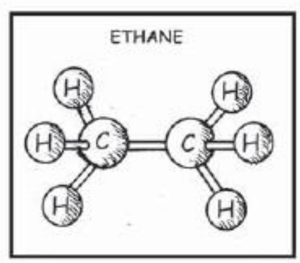
9. C_6H_6



10. H_2SO_4



11. CH_40



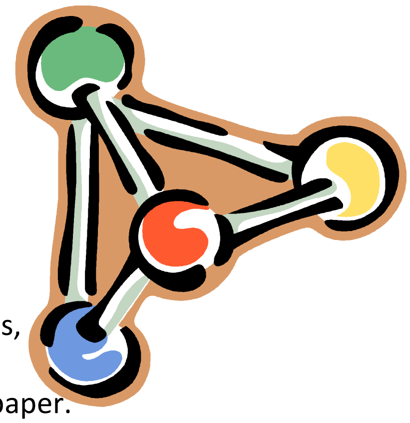
12. C_2H_6

Name ____

Gumdrop Molecules

Purpose:

- Construct models of molecules with the accurate ratios of their component elements.
- Compare the elements contained in common molecules by completing the drawings.



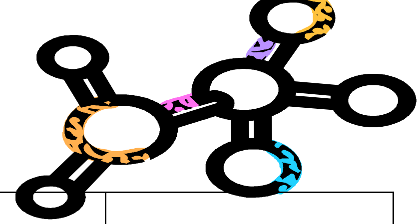
Materials: gumdrops
Toothpicks
Wax paper
Colored pencils/crayons/markers

1. Complete the table shown below.
2. Add the columns to find the total number of atoms.
3. Gather the correct number of gumdrops to be the atoms, using the color given for each element.
4. Using toothpicks, assemble the five molecules on wax paper.
5. When all models are complete, draw them in the appropriate space on the back of the paper.

Data/Observations:

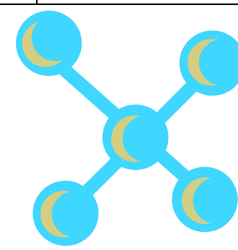
	Chemical Formula	**Number of Atoms of Elements in the Molecules**				
		Oxygen	Hydrogen	Carbon	Fluorine	Lithium
Oxygen	O_2					
Water	H_2O					
Carbon Dioxide	CO_2					
Carbon Tetrafluoride	CF_4					
Lithium Fluoride	LiF					
Total Number of Atoms						

Data: Draw and color the gumdrop molecule models below



O_2	H_2O	CO_2	CF_4	LiF

Analysis/Conclusions



1. Are there similarities between any of the two models?

____

____

____

2. How are molecules different from elements?

____

____

____

3. How are molecules related to elements?

____

____

____

4. How are molecules related to atoms?

____

____

____

E. Compounds

1. Pure substance made of two or more ___________________________ that are combined chemically in a specific _________________________.
2. When elements are chemically combined, they form compounds having _________________________ that are _______________________ from those of the uncombined elements.
    a. The elements oxygen and hydrogen are _______________ and carbon is __________________ like charcoal. But when these elements form a compound they form _________________________ which does not resemble any of those elements.
    b. Table salt, made of sodium and chlorine, has the same __________________________ and properties no matter where it comes from – ______________________ or a salt mine.
3. Each compound has its own unique, unchanging _______________________of type and number of elements and atoms.
    - ___________________________ from underground mines or from seawater is always 39.3% sodium and 60.7% chlorine.

F. Mixtures

1. Elements and compounds are pure substances, but most materials are not.

2. A mixture is made up of 2 or more ________________________ – elements, compounds, or both - that are together in the same place but are not chemically __________________________.

3. Two differences between compounds and mixtures.

   a. Each substance in a mixture keeps its __________________ properties.

   b. Parts of a ____________________ are not combined in a set ratio.

4. Samples of soil from different places probably won't contain the _____________ amounts of sand, clay, and water.

Compounds	Molecules

BrainPOP Compounds and Mixtures

Watch the BrainPOP movie on Compounds and Mixtures and complete the following:
Circle the correct answer for each of the following:

1. Mixing brownie batter: Chemical or Physical change

2. Compounds: Chemical change or Physical Change

3. Mixtures: Chemical change or Physical Change

Read each statement and complete the following:

4. Compounds atoms of ________ or more ___________ bond in a ___________ reaction.

5. Compounds don't always look like their original ________________ .

6. Salt is a _______________ made from green ____________ gas and a silvery _______ called __________________.

7. Reactions that make up a compound are _______________ to undo.

8. When two or more compounds or elements are blended without combining _____________, you have a ________________.

9. Each substance in a mixture keeps its own _________________________.

10. Mixtures can be separated using either __________________ or _________________ means.

11. Solids, liquids, and gases can all be blended into _________________________ or ___________________________ mixtures.

12. Salt crystals dissolved in water are a _______________________ mixture.

13. You can't see the __________ ________________________.

14. The mixture is pretty _______________________ throughout the bottle.

15. Salad dressing is a ______________________ mixture; the parts do not combine completely or uniformly.

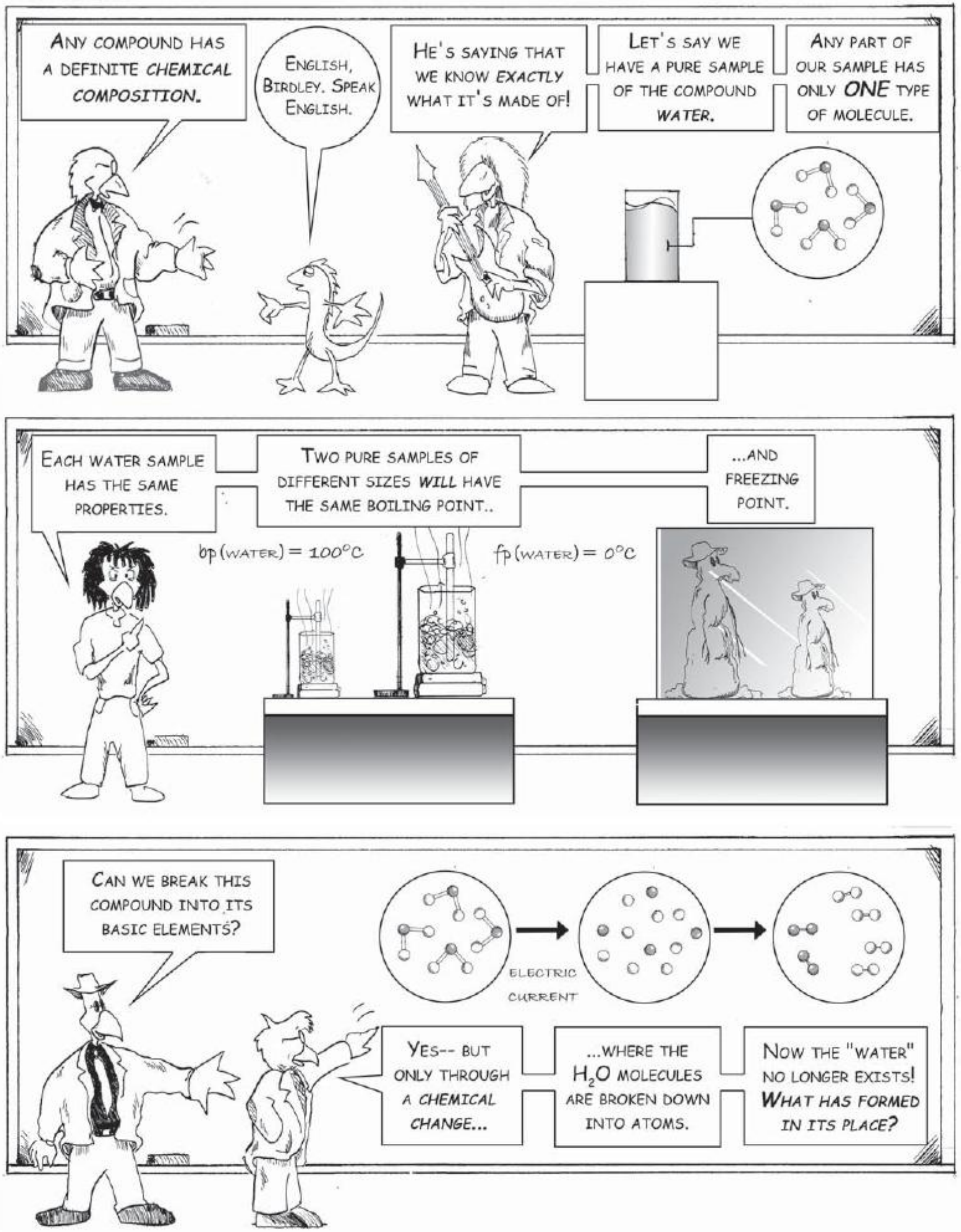
16. You can ____________ the different ingredients in salad dressing.

DR. BIRDLEY INVESTIGATES

COMPOUND COOLNESS

NAME:____________________

CLASS:_____ DATE:____________



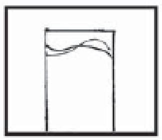
DR. BIRDLEY INVESTIGATES

COMPOUND COOLNESS

Name:______________________
Class:__________Date:________

STUDY QUESTIONS

Directions: Read the related cartoon and answer the following questions.



1. Explain the meaning of the statement, "Every compound has a definite chemical composition."

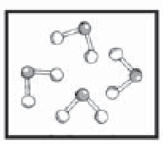
____

____

2. What are two physical properties that do not depend on size? What do they depend on?

____

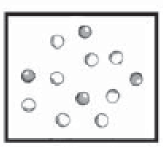
____



3. How can a compound such as water be broken down into its basic elements?

____

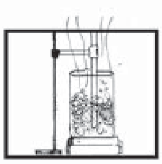
____



4. What happens to the bonds between atoms during a chemical reaction? What is the result of this process?

____

____



5. How are compounds different from elements?

____

____

Dr. Birdley Investigates

Nano-Goggles

Name: ____________________

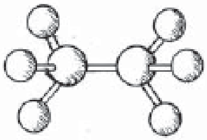
Class: __________ Date: __________

Dr. Birdley Investigates

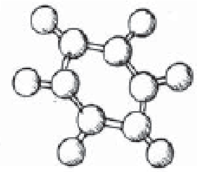
NANO-GOGGLES

NAME:______________________

CLASS:__________ DATE:__________



STUDY QUESTIONS



Directions: Answer the following questions to the best of your ability.

1. Describe the powers that Dr. Birdley's goggles have.

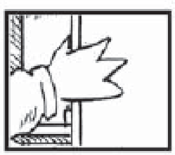
____

____

2. How does Dr. Birdley demonstrate these powers to Dean Owelle?

____

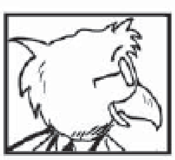
____



3. In the lab cabinet, which substance (A, B, C, or D) is a compound? How is it different from the other three mixtures?

____

____



4. What do you think makes compounds "pure" and mixtures "impure"?

____

____

5. How could Birdley's goggles be used in a science-related job? (Building houses, designing cars, creating medications...pick your favorite.)

____

____

Compound and Mixture Lab

Problem: How can you identify compounds and mixtures?
Research: Write the definition of compound and mixture.

Compound: ____

____

____

Mixture: ____

____

____

Procedure:

1. Examine the contents of the bag at each station.
2. Record a description of the bag's contents in the data table below.
3. Based on your research about the definition of compounds and mixtures, record whether you think each bag is a compound or mixture.
4. Lastly, defend your choice for each item.

Data Table

Bag Number	Description of Contents	Mixture or Compound?	Defense
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Name ____

Directions: Use your data from the lab and information in your notes to answer the following questions.

1. What is a way to distinguish a compound from a mixture?

2. What are three mixtures you see on a daily basis?

3. What are three compounds you can find in the classroom?

4. How do compound affect our daily lives?

5. Write a brief conclusion that states at least three differences about compounds and mixtures.

Vocabulary Cut and Paste

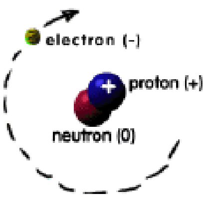
Place the definition next to the correct vocabulary word. Glue the definition into the correct box after your work is checked by the teacher.

Matter	
Atoms	
Molecules	
Compound	
Mixture	

No chemical change

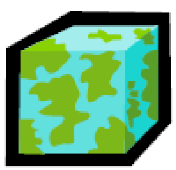
Each keeps its own properties

Can be separated

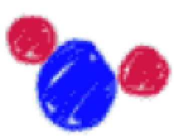


The building blocks of matter.

Made up of protons, electrons, and neutrons.



Anything that has a mass and a volume.



A molecule that has two or more *different* elements bonded together.

Example: H and O = H_2O

Two or more atoms are joined together chemically. Elements can be different *or* the same.

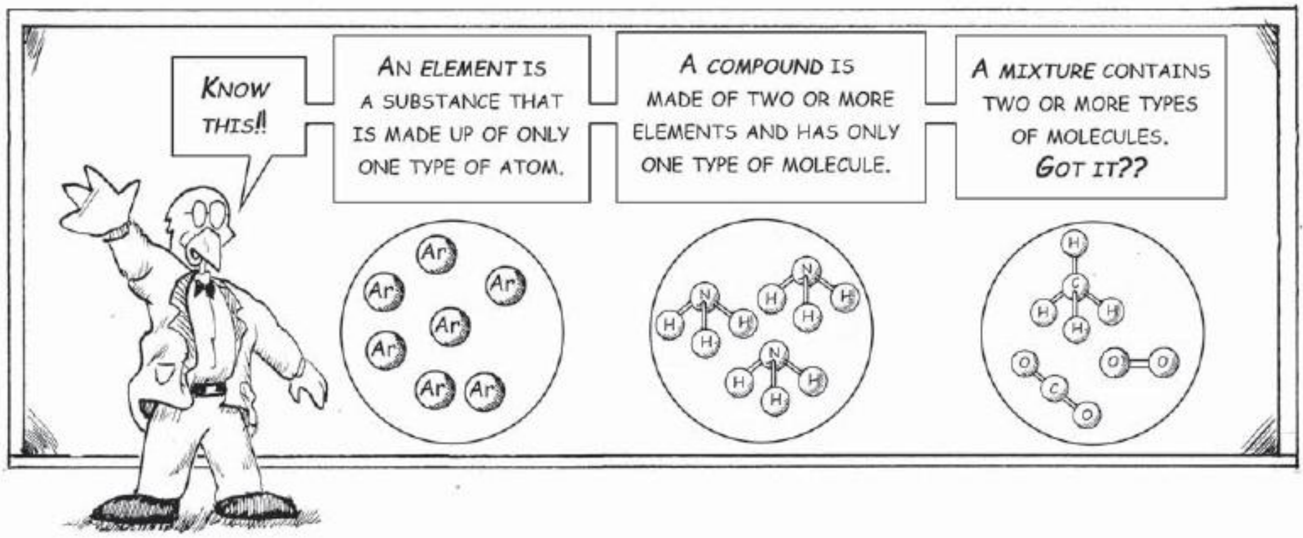
Example: O + O = O_2

NAME:______________________

CLASS:__________ DATE:__________

MINI-COMIC: COMPOSITION OF MATTER

Directions: Review the panel in the space below and answer the questions that follow.



1. What is the difference between a compound and an element?

2. What is the difference between a compound and a mixture?

3. Can mixtures be represented by formulas? Why or why not?

4. Is the mixture shown a solid, liquid, or gas? How do you know?

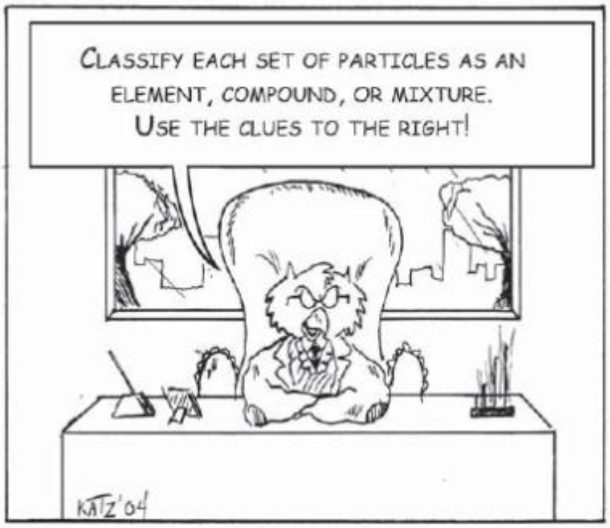
5. List all the elements shown in the mini-comic above.

Dr. Birdley Investigates

Element, Compound, or Mixture?

Name:______________________

Class:__________ Date:__________



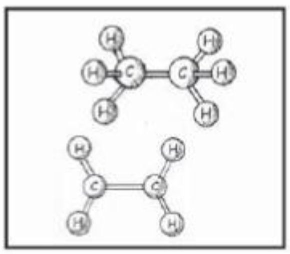
CLUES

AN ELEMENT CONTAINS ONLY ONE TYPE OF ATOM.

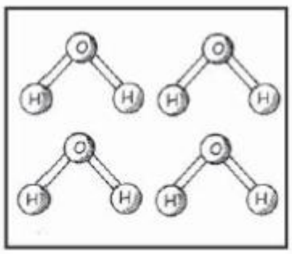
A COMPOUND CONTAINS ONE TYPE OF MOLECULE. THIS MOLECULE HAS TWO OR MORE TYPES OF ATOMS.

A MIXTURE CONTAINS:

- TWO OR MORE TYPES OF MOLECULES, OR
- ONE TYPE OF MOLECULE AND ANOTHER SEPARATE TYPE OF ATOM.



1.________________



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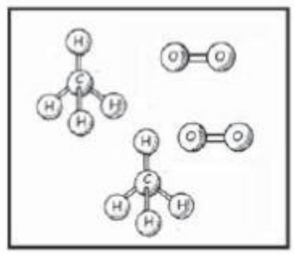

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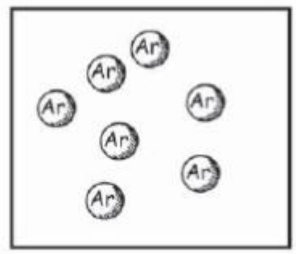

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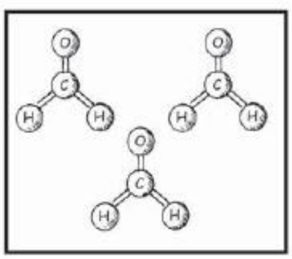

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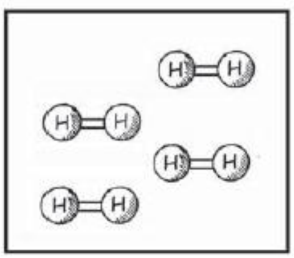

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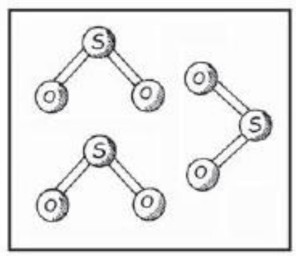

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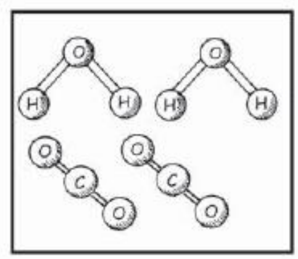

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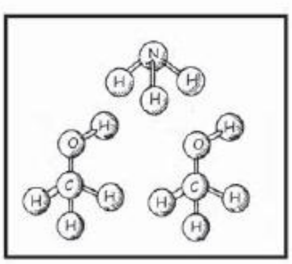

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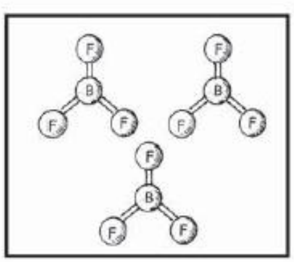

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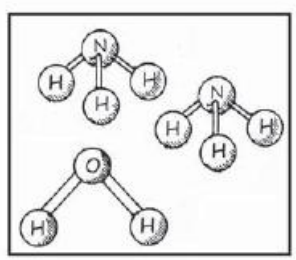

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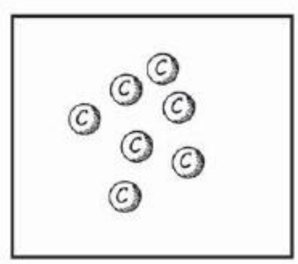

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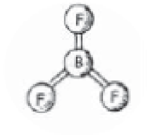
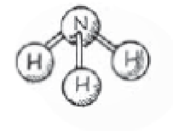
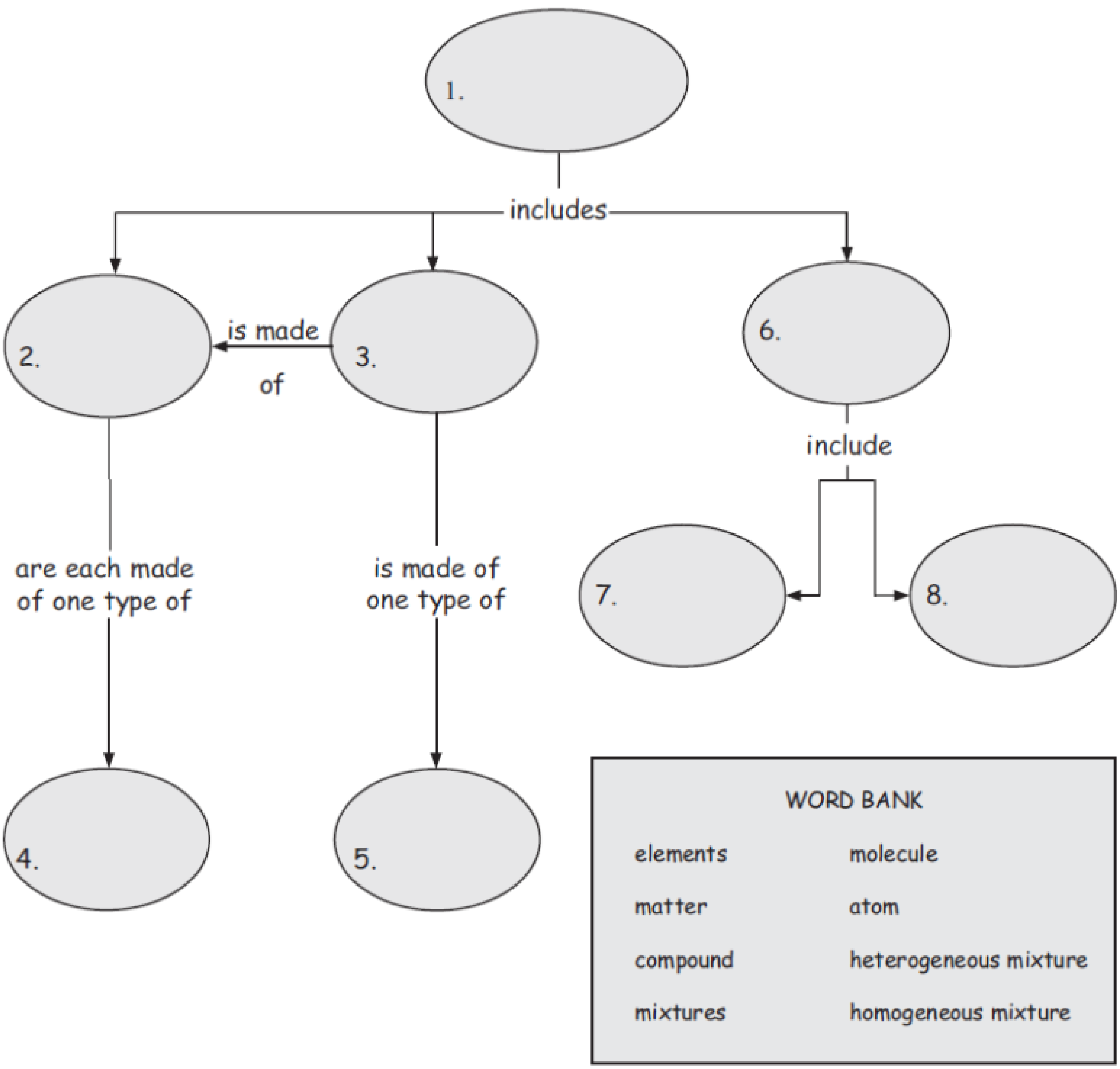


Concept Map: Matter



Fill in the bubbles with the words from the word bank. Use the Mini-Comic, Source Cartoons, and related background section from this chapter as source material.



Breaking Down Compounds and Mixtures

COMPOUND - a pure substance made of two or more elements that are combined chemically in a specific ratio.

A pure substance		
made of two or more elements		
combined chemically		
in a specific ratio.		

MIXTURE - made of two or more substances – elements, compound, or both – that are together in the same place but are not chemically combined.

Made of two or more substances		
that are together in the same place		
but not chemically combined		

Compound Vs. Mixture - Complete the table below to help you remember the differences between compounds and mixtures.

Compound	Vs.	Mixture
	What's it made of?	
	Type of Change	
	Properties	
	How Much?	
	Molecules	
	Draw a Picture	

Use the choices below to complete the compound and mixture chart above.

Two or more elements	Physical Change	Set ratio of atoms and elements	Different properties from the original substances	No set ratio of substances
One type of molecule	Two or more substances	Properties of the original substances do not change	Chemical Change	Two or more molecules or one type of molecule and one separate type of atom

Name ____

The Space in Matter

Purpose

- Explain how it is known that most of a compound is empty space.

Materials

- Distilled water
- Salt
- Rubbing alcohol
- Two 100 mL graduated cylinders
- Balance or scale

Procedure Trial A

1. Using a graduated cylinder, carefully measure 50 mL of water.
2. In the second graduated cylinder, measure 50 mL of rubbing alcohol.
3. Predict what the volume would be if the water and rubbing alcohol were mixed together. Write out your reasoning in the space provided.
4. Carefully pour all of the alcohol from the second graduated cylinder into the water.
5. Measure the volume of the two materials that are mixed together and record it.
6. Find the difference between the expected answer and the actual final measurement of the volume. Explain the results in the space below.

Data/Results Trial A

Volume of Water	Volume of Alcohol	Predicted Volume of Combination	Actual Volume

Explain why you expect the predicted volume of the combination of water and rubbing alcohol:

Actual volume: ___________________mL

Difference between the expected volume and actual volume: ________________mL

Procedure Trial B

1. Using a graduated cylinder, carefully measure exactly 50 mL of water.
2. Using a balance, measure exactly 50 g of salt.
3. Pour the salt into a dry, clean graduated cylinder.
4. Record the volume of the 50 g salt.
5. Predict what the volume would be if the water and salt were mixed together. Write out your reasoning in the space provided.
6. Pour the salt into the water in the first graduated. Dissolve the salt as completely as possible.
7. Measure the volume of the two materials that are mixed together and record it.
8. Find the difference between the expected answer and the actual final measurement of the volume. Explain the results in the space below.

Data/Results Trial B

Volume of Water	Volume of Salt	Predicted Volume of Combination	Actual Volume

Explain why you expect the predicted volume of the combination of water and rubbing alcohol:

Actual volume: ___________________mL

Difference between the expected volume and actual volume: ________________mL

Conclusion/Analysis

1. Were the actual volumes simply a matter of adding the two volumes together?

   ____

2. What was responsible for the difference between the predicted volume and the actual volume? ____

   ____

   ____

3. What does this say about compounds?

   ____

   ____

   ____