



Lesson Plan: Elements, Mixtures, and Compounds

Grade Level: 5

Subject: Physical Science

Duration: 45–60

NGSS 5-PS1-1: Develop a model to describe that matter is made of particles too small to be seen.

Learning Objectives

By the end of this lesson, students will be able to:

- **Identify** the basic parts of an atom, including protons, neutrons, and electrons.
- **Differentiate** between elements, compounds, and mixtures.
- **Use** the Periodic Table to find information about elements, such as atomic number and



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properties.

Materials Needed: (all links are included in this PDF)

- Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-5-elements-mixtures-and-compounds.pdf>)
- Activity Lesson (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-5-elements-mixtures-and-compounds-4.pdf>)



- Practice Worksheet 0 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-elements-mixtures-and-compounds-0.pdf>)
- Practice Worksheet 1 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-elements-mixtures-and-compounds-1.pdf>)
- Vocabulary Set 1 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-5-elements-mixtures-and-compounds-1.pdf>)

Lesson Procedure

Step 1: Introduction (5 minutes)

- Hook students by asking: 'What do you think is the smallest building block of everything around us?'
- Show the atom diagram from the Study Guide to introduce protons, neutrons, and electrons. (<https://newpathworksheets.com/api/guide/study-guide-science-grade-5-elements-mixtures-and-compounds-1.pdf>)



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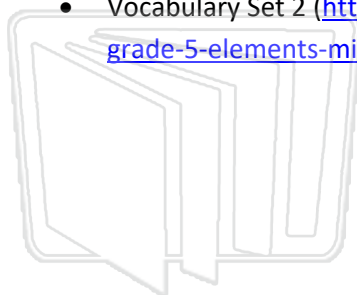
Step 4: Independent Practice (15 minutes)

- Have students complete Practice Worksheet 0 to review the structure of an atom and how to read the Periodic Table. (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-elements-mixtures-and-compounds-0.pdf>)
- Assign Vocabulary Set 1 to reinforce definitions of key terms. (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-5-elements-mixtures-and-compounds-1.pdf>)

Step 5: Assessment (10 minutes)



- Practice Worksheet 2 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-elements-mixtures-and-compounds-2.pdf>)
- Practice Worksheet 3 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-5-elements-mixtures-and-compounds-3.pdf>)
- Vocabulary Set 1 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-5-elements-mixtures-and-compounds-1.pdf>)
- Vocabulary Set 2 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-5-elements-mixtures-and-compounds-2.pdf>)



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NEW PATH LEARNING

ELEMENTS, MIXTURES, AND COMPOUNDS

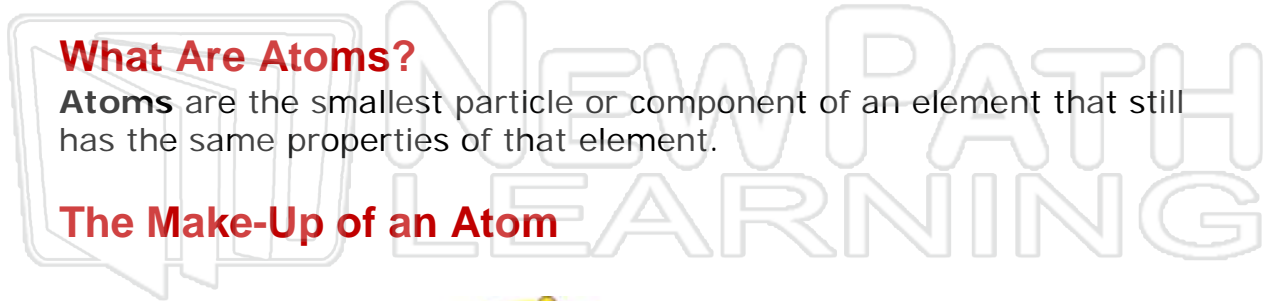
What Are Elements?

Elements are a basic (simple) kind of matter. They can't be broken down into simpler parts and still keep their properties because they are in the simplest form.

What Are Atoms?

Atoms are the smallest particle or component of an element that still has the same properties of that element.

The Make-Up of an Atom



The illustration shows a group of diverse children standing on a green grassy field. Above them are four thought bubbles containing various educational icons: a 3D cube, a microscope, a protractor, a globe, a balance scale, a red flask, a pie chart, an atom symbol, a bar graph, and a math sign with symbols for multiplication, addition, subtraction, and division. The word 'ABC' is also visible in one of the bubbles.

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Lesson Checkpoint: How is an atom identified?



How Are Elements Grouped?

The **Periodic Table** groups elements in an organized fashion. Each box on the periodic table represents one element. Each element has its own unique symbol.



1	2											13	14	15	16	17	18
1 H Hydrogen																	2 He Helium
3 Li Lithium	4 Be Beryllium											5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon
11 Na Sodium	12 Mg Magnesium											13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon
55 Cs Cesium	56 Ba Barium	57 La Lanthanum	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon
87 Fr Francium	88 Ra Radium	89 Ac Actinium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110 Ds Darmstadtium	111 Nh Nihonium	112 Fl Flerovium						



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What's in the Box?

Each element has its own box on the Periodic Table. Each box contains the element's name, symbol, atomic number, and atomic mass.



8
O
Oxygen
15.999

Top number is the atomic number. Every element has its own personal atomic number. The atomic number tells how many protons that element contains.

No two elements have the same number of protons. Oxygen = 8 protons



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Compounds

A **compound** is a molecule that contains two or more different elements. For example, water is made of hydrogen and oxygen atoms, and carbon dioxide is made of carbon and oxygen atoms.



H_2O = two hydrogen atoms and one oxygen atom = water

$1CO_2$ = one carbon atom and 2 oxygen atoms = carbon dioxide



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not dissolved.

Solutes, Solvents, and Solubility (try and say that five times fast)

A **solute** is the substance that is dissolved in the solvent. The **solvent** is what dissolves another substance.

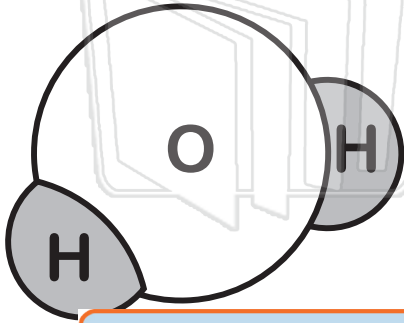
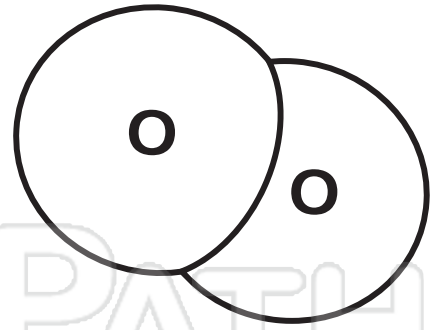
Solubility refers to the ability of one substance to dissolve into another substance.

Lesson Checkpoint: Describe a solute and a solvent.



Name _____ Class _____ Date _____

A **molecule** is the smallest unit of a substance formed when two or more atoms join together chemically. Many substances occur in nature as molecules and not as single atoms. Examples include oxygen (O_2) and nitrogen (N_2) molecules.



A **compound** is a substance that contains two or more **different elements** chemically joined together. Water is an example of a compound (H_2O).

A mix
bond
sepa



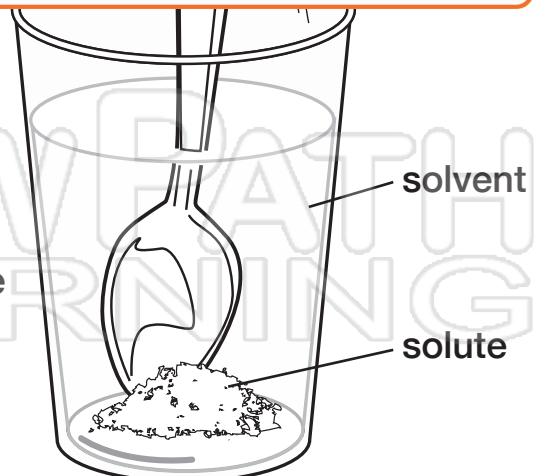
o not
an be

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The mixture can easily
be separated.

A **solution** is a type of **mixture**. Salt dissolved in water is one example – the salt is the **solute** and the water is the **solvent**.





Name _____ Class _____ Date _____

Answer Key

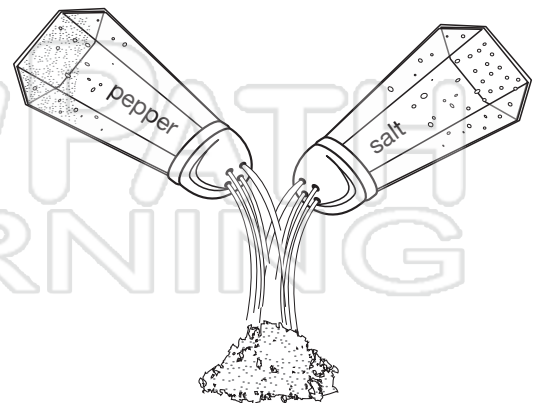
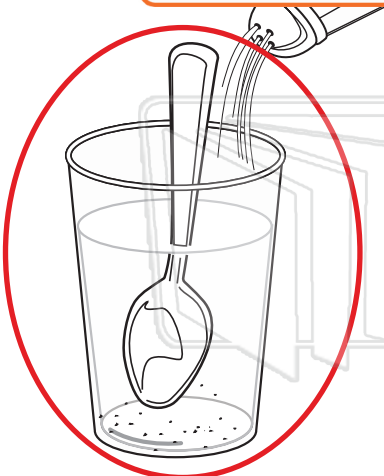
A mixture is the **combination of two or more** different substances that do not bond to form a compound. The substances are only physically combined and can be separated.

A solution is a **type of mixture**. Salt dissolved in water is one example – the **salt** is the solute and the **water** is the solvent.



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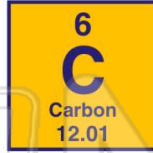




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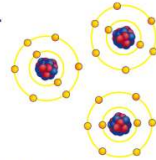
1 Which statement is true of an **element**?

- A It is complex.
- B It can be broken down.
- C It only has one proton.
- D It cannot be broken down into simpler substances.



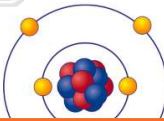
2 An **atom** is the **smallest particle of an element** that _____.

- A can change into any molecule
- B has no properties of the original element
- C has different properties of that element
- D has the same properties of that element



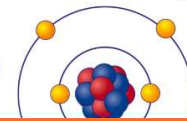
3 All atoms have a **nucleus**. What does the **nucleus** of an atom contain?

- A neutrons only
- B protons and neutrons
- C protons and electrons



4 **Neutrons** have no electrical charge and **protons** have _____.

- A a positive charge
- B a negative charge
- C a neutral charge



5



PREVIEW

7

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SOLIDS

Fr Ra Ac Rf Db Sg Bh Hs Mt Uu Ouu Ouu

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

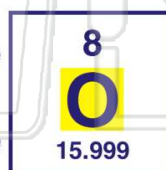
more than one element

Calcium
40.08

9

What is **highlighted** on the box below?

- A the element's mass
- B the element's unique number
- C the element's name
- D the element's unique symbol



10

The **18 vertical columns** of the periodic table are called _____.

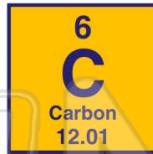
- A groups or families
- B properties
- C periods
- D elements



Name _____ Class _____ Date _____

1 Which statement is true of an **element**?

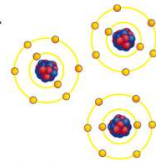
- A It is complex.
- B It can be broken down.
- C It only has one proton.
- D It cannot be broken down into simpler substances.



D

2 An **atom** is the **smallest particle of an element** that _____.

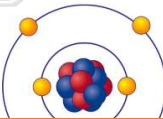
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D

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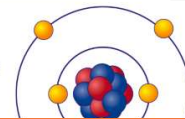
- A neutrons only
- B protons and neutrons
- C protons and electrons



B

4 **Neutrons** have no electrical charge and **protons** have _____.

- A a positive charge
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A

5



D

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A

SOLIDS

Fr Ra Ac Rf Db Sg Bh Hs Mt UuUuUuUu

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

more than one element

Calcium
40.08

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What is **highlighted** on the box below?

- A the element's mass
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- D the element's unique symbol



D

10

The **18 vertical columns** of the periodic table are called _____.

- A groups or families
- B properties
- C periods
- D elements

A



Name _____ Class _____ Date _____

1 Elements that belong in the **same family** are **identical**.

True or false?

- A true
- B false

10
28
Ni Nickel
46
Pd Palladium
78
Pt Platinum
110
Uun Ununnilium

2 The **horizontal rows** of the periodic table are known as **periods**. Which is true of elements in a **period**?

- A They have many characteristics in common.
- B They do not have similar characteristics.
- C They are all the same element.
- D They have similar characteristics.

3 The elements' **atomic sizes decrease** from left to right across a period on the periodic table. **From left to right, the atomic masses _____.**

- A increase

4 What **information** about an element does **each box on a periodic table** contain?

- A abbreviation, atomic mass, charges of electrons
- B name and number of electrons

29
Cu
Copper
63.546



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D N

Nitrogen
14.007

- C calcium
- D chlorine

12.01

9 Below the name is the element's atomic mass. **What is the approximate atomic mass of oxygen?**

- A 18
- B 6
- C 8
- D 16

8
O
Oxygen
15.999

10 What is the **atomic mass of nickel**?

- A 58.71
- B 58.28
- C 28
- D 71

28
Ni
Nickle
58.71



Name _____ Class _____ Date _____

1 Elements that belong in the **same family** are **identical**.

True or false?

- A true
- B false

(B)

2 The **horizontal rows** of the periodic table are known as **periods**. Which is true of elements in a **period**?

- A They have many characteristics in common.
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(B)

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(A)

4 What **information** about an element does **each box on a periodic table** contain?

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29
Cu
Copper
63.546

(D)

5



(C)

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(A)

D N

Nitrogen
14.007

- C calcium
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12.01

9

Below the name is the element's atomic mass. **What is the approximate atomic mass of oxygen?**

- A 18
- B 6
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O
Oxygen
15.999

(D)

10

What is the **atomic mass of nickel**?

- A 58.71
- B 58.28
- C 28
- D 71

28
Ni
Nickle
58.71

(A)



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

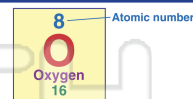
Periodic table
Element

Neutron
Compound

Mixture
Molecule

Atomic number
Colloid

1. _____ - the total number of protons contained in an atom



2. _____ - a mixture in which very small particles of one substance are dispersed evenly throughout another substance; a type of mixture in which a solute is not totally dissolved



3. _____
element



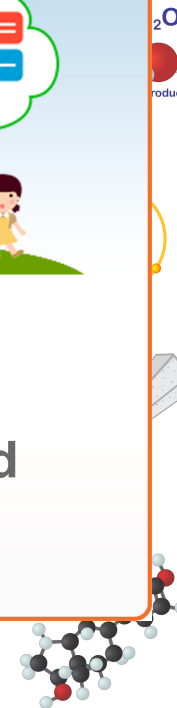
4. _____
broken by a chemical reaction

5. _____
substance
physical change

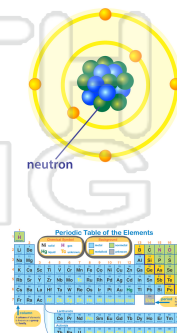
6. _____
more than one
two atoms

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7. _____
of an atom



8. _____ - the table where scientists place and organize more than 100 different elements; a chart that groups elements in an organized fashion





Name _____ Class _____ Date _____

Match each of the following terms to its definition:

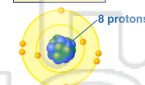
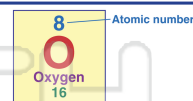
Periodic table
Element

Neutron
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Mixture
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Colloid

1. **atomic number** - the total number of protons contained in an atom



2. **colloid** - a mixture in which very small particles of one substance are dispersed evenly throughout another substance; a type of mixture in which a solute is not totally dissolved



3. **com**
are ch



4. **ele**
down;
chemi

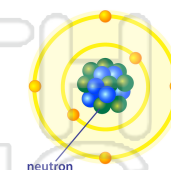
5. **mix**
substa
physic

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6. **mo**
atoms
atoms

7. **neutron** - a neutrally charged particle with mass in the nucleus of an atom



8. **periodic table** - the table where scientists place and organize more than 100 different elements; a chart that groups elements in an organized fashion

Periodic Table of the Elements