

## California Content Standards — Grade 5

### Physical Sciences

1. Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept:
- 1b. Students know all matter is made of atoms, which may combine to form molecules.

### Hands on Activity with Math Link

Grade 5 Mathematics Content Standard : *MG 2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).*

#### **Objective:**

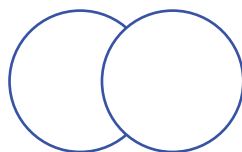
Understand that all matter is made of atoms, which may combine to form molecules.

#### **Materials:**

- Coloring pens.

#### **Directions:**

Color and label the diagram so that it represents Oxygen



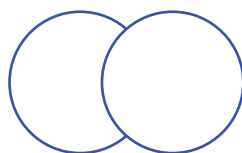
Can you think of another way to draw Oxygen using a bond?



What does “diatomic molecule” mean?

**Answer; It means two like atoms are stuck together.**

Color and label the diagram so that it represents Nitrogen.



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1b. Students know all matter is made of atoms, which may combine to form molecules.

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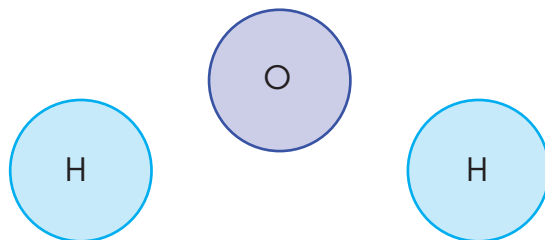
Is this a diatomic molecule, why or why not?

Answer; Yes, because two atoms of nitrogen are stuck together.

Why is nitrogen very important to us?

Answer; The air we breathe is mostly nitrogen

Now draw a diagram to represent water.



What is different about the way the atoms in a water molecule are arranged?

Answer; Not diatomic, as oxygen combined with hydrogen

Is the color we use important for each representation of atoms? Why or why not?

Answer; No, we do not really know the colors of atoms

Create a diagram of the water molecule of your own. Draw a line between the hydrogen and oxygen atoms. Measure and write in the angles.

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### Hands on Activity with Math Link - Strategic Level

Grade 5 Mathematics Content Standard : *MG 2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).*

#### **Objective:**

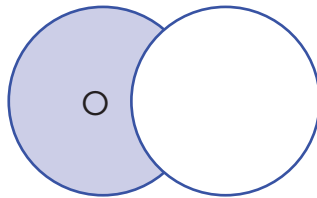
Understand that all matter is made of atoms, which may combine to form molecules.

#### **Materials:**

- Coloring pens.

#### **Directions:**

Color and label the diagram so that it represents Oxygen. The first part is done for you.



Here is another way to draw Oxygen using a bond. Label the diagram.



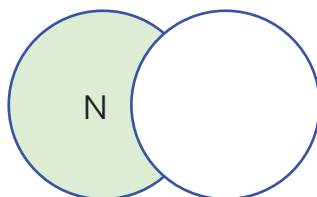
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1b. Students know all matter is made of atoms, which may combine to form molecules.

## Hands on Activity with Math Link - Strategic Level

Grade 5 Mathematics Content Standard : *MG 2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).*

Do you remember that a “diatomic molecule” means two like atoms are stuck together? Color and label the diagram so that it represents Nitrogen. The first part is done for you.



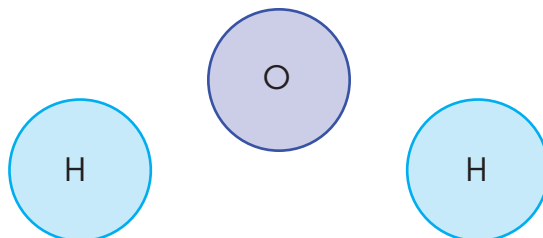
Is this a diatomic molecule, why or why not?

*Answer; Yes because two atoms of nitrogen are stuck together.*

Why is nitrogen very important to us?

*Answer; The air we breathe is mostly nitrogen*

Here is a diagram to represent water. What is different about the way the atoms in a water molecule are arranged?



*Answer; Not diatomic, as oxygen combined with hydrogen*

## California Content Standards — Grade 5

1b. Students know all matter is made of atoms, which may combine to form molecules.

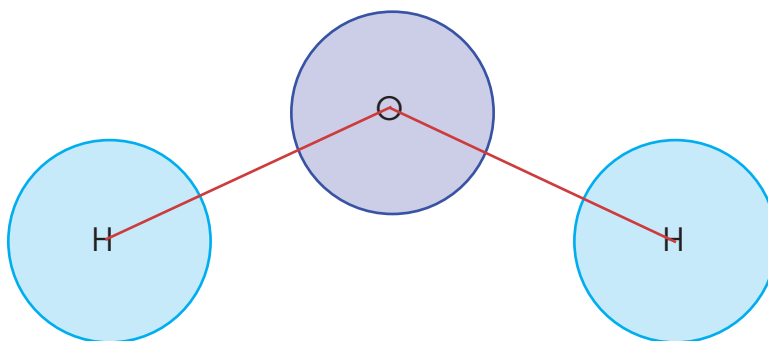
**Hands on Activity with Math Link - Strategic Level**

Grade 5 Mathematics Content Standard : *MG 2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).*

Is the color we use important for each representation of atoms? Why or why not?

Answer; No, we do not really know the colors of atoms

Here is a geometric diagram of water, labeled. Draw a line between the hydrogen and oxygen atoms. Measure and write in the angle.



Answer; Example - 127 degrees

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### Hands on Activity with Math Link - Advanced Level

Grade 5 Mathematics Content Standard : *MG 2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).*

#### **Objective:**

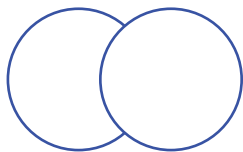
Understand that all matter is made of atoms, which may combine to form molecules.

#### **Materials:**

- Coloring pens.

#### **Directions:**

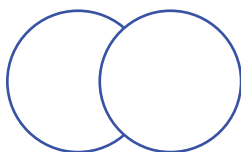
Draw two different representations of Oxygen



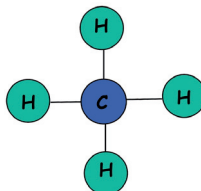
What does "diatomic molecule" mean?

*Answer; It means two like atoms are stuck together.*

Draw a diagram to represent Nitrogen.



Draw a diagram of methane. Label it.



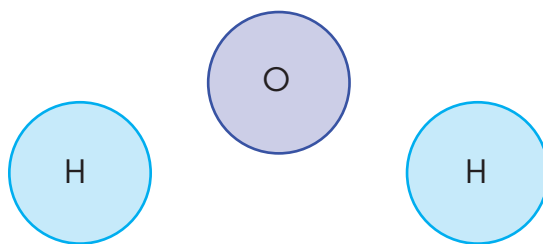
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1b. Students know all matter is made of atoms, which may combine to form molecules.

## Hands on Activity with Math Link - Advanced Level

Grade 5 Mathematics Content Standard : *MG 2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).*

Now draw a diagram to represent water.



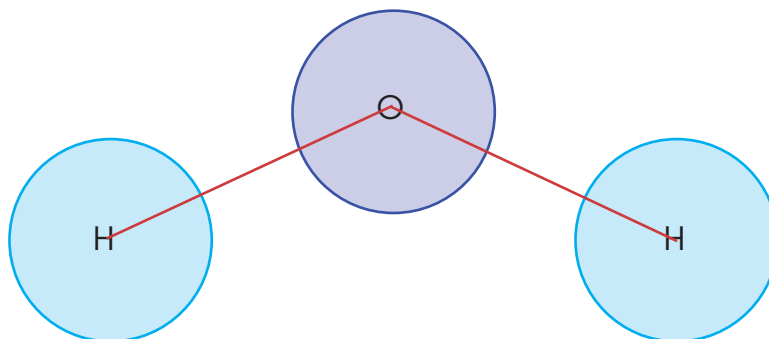
What is different about the way the atoms in a water molecule are arranged?

Answer; not diatomic, as oxygen combined with hydrogen

Is the color we use important for each representation of atoms? Why or why not?

Answer; no, we do not really know the colors of atoms

Create a diagram of the water molecule of your own. Draw a line between the hydrogen and oxygen atoms. Measure and write in the angles.



Answer; Example - 127 degrees

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### Hands on Activity Self Assessment

#### ***Questions about how all matter is made of atoms, which may combine to form molecules.***

Did you enjoy learning about how all matter is made of atoms, which may combine to form molecules?

- Yes
- No
- A little

Did you find it hard to understand?

- Yes
- No
- A little

Which part about *all matter, atoms, and molecules* do you need help with?

Write a sentence here to explain the area you do not understand.

Student answers will vary

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1b. Students know all matter is made of atoms, which may combine to form molecules.

## Hands on Activity Self Assessment

Answer the following focus questions;

What is a chemical compound?

Answer; when two or more elements combine chemically.

What is a chemical reaction?

Answer; a change that happens when substances combine to form new substances

What is mass?

Answer; it is the amount of matter in something.

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### Hands on Activity with Literacy Connection

Grade 5 ELA Content Standard : *Written and Oral English Language Conventions 1.5 Spell roots, suffixes, prefixes, contractions, and syllable constructions correctly.*

You have been learning about atoms. Use the words below to fill in the gaps in the sentences.

**Atoms** are the smallest particle of an element.

Some molecules are only made up of **two** atoms.

A **bond** is something that holds two atoms together.

Two diatomic molecules are nitrogen and **oxygen**.

Water is made up of **hydrogen** and oxygen.

Oxygen

Bond

Atoms

Hydrogen

Two

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### Hands on Activity with Literacy Connection - Strategic Level

Grade 5 ELA Content Standard : *Written and Oral English Language Conventions 1.5 Spell roots, suffixes, prefixes, contractions, and syllable constructions correctly.*

For each of the following words circle the one that has been spelt correctly.

Attom

Atoom

Atom

Molecule

Molcule

Mulecule

Oxygin

Oxygen

Oxgen

Hydrogen

Hidrogin

Hedrogin

Carbin

Karbon

Carbon

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### Hands on Activity with Literacy Connection - Advanced Level

Grade 5 ELA Content Standard : *Reading 2.1 Understand how text features (e.g., format, graphics, sequence, diagrams, illustrations, charts, maps) make information accessible and usable.*

If Methane has the chemical formula  $\text{CH}_4$ , what is it likely to look like if drawn out as a diagram?

Draw it here.

