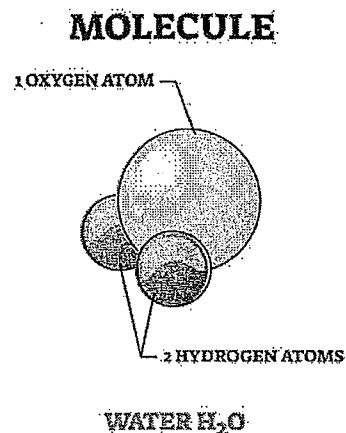
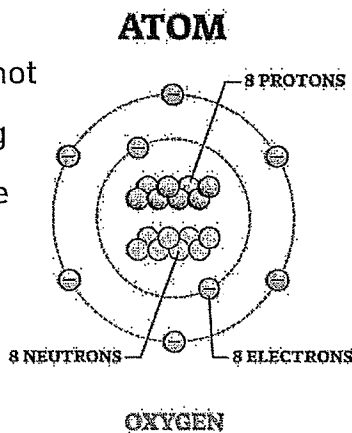


# Atoms, Molecules and Pure Substances

## Atoms vs Molecules

Atoms are the smallest particles. They cannot be divided further, and they are the building blocks of matter. **Elements** are either single atoms or two or more of the same type of atoms bonded together. For example, hydrogen is an element that is made of two hydrogen atoms.

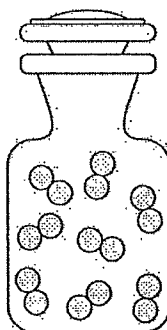


A **molecule** is a group of atoms bonded together. Therefore, hydrogen is a molecule because it is made of two hydrogen atoms. In fact, hydrogen is the smallest molecule!

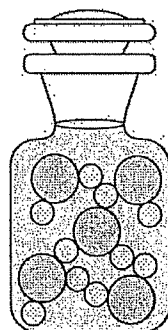
A compound is a molecule as well because compounds have more than two atoms bonded together. However, the key difference between an element and a compound is that **compounds** are made of two or

more different elements that are combined. Water is a compound because it is made of two different elements (hydrogen and oxygen) that are bonded together. Water has two hydrogen atoms combined with one oxygen atom.

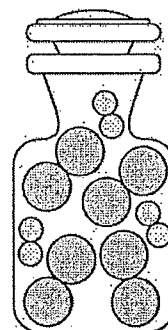
## Elements, Compounds and Mixtures



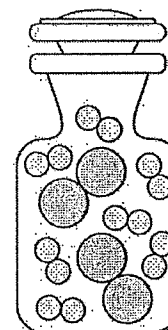
An Element  
(Hydrogen)



A Compound  
(Water)



A Mixture  
(Hydrogen & Oxygen)



A Mixture  
(Hydrogen & Oxygen)

## Pure Substances

All matter is either a pure substance

or a mixture. A **pure substance** is made of just one element or one compound, while a **mixture** has more than one element or compound. Hydrogen is a molecule that is a pure substance because it is made of just one element. Water is a pure substance because it is made of just one compound. Other examples of pure substances are sugar, table salt, baking soda, aluminum and gold.

Name: \_\_\_\_\_

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Curriculum Connection  
B.1, B.2, B.3

# Atoms, Molecules and Pure Substances

**Define**

What do the terms below mean? Give an example of each

	Definitions	Example
Atom		
Molecule		
Element		
Compound		
Pure Substance		
Mixture		

**Draw**

Draw a diagram of each of the terms below

Atom	Molecule	Element	Compound	Pure Substance	Mixture

# What are Atoms?

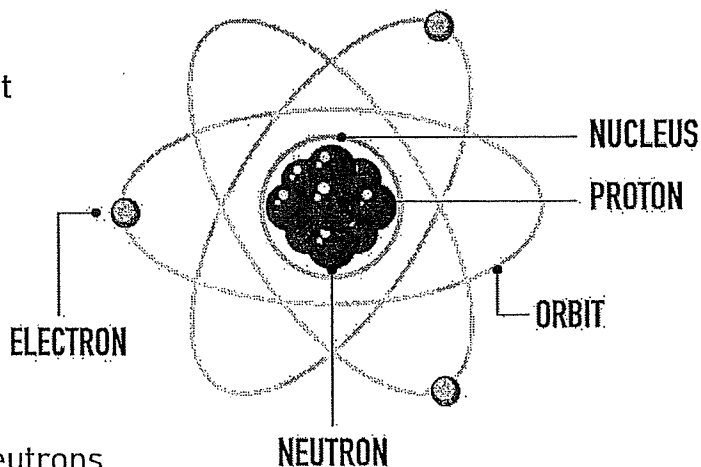
## What are Atoms?

Atoms are the basic building blocks of all matter. Everything around us, including the air we breathe, the food we eat, and the clothes we wear, is made up of atoms.

Atoms are very small particles that are too small to see with the naked eye. They are so small that it takes billions of them to make up just a tiny grain of sand. Despite their small size, atoms are very important because they determine the properties of the materials they make up.

Each atom is made up of three types of subatomic particles: protons, neutrons, and electrons.

## ATOM STRUCTURE



### Protons

Protons are found in the center of the atom, in a region called the nucleus. They are positive charges, which means that they have a positive electrical charge. The number of protons in the nucleus of an atom determines what element the atom is. For example, if an atom has six protons in its nucleus, it is a carbon atom. If it has eight protons, it is an oxygen atom.

### Neutrons

Neutrons are also found in the nucleus of an atom. They have no electrical charge, which means that they are neutral. The number of neutrons in an atom can vary, but the number of protons is always the same for a given element.

### Electrons

Electrons are much smaller than protons and are found orbiting the nucleus. They have a negative electrical charge, which means that they have the opposite charge as protons. Electrons are very important because they determine the chemical properties of atoms and how they can react with other atoms.

### What is the Nucleus?

The nucleus of an atom is the central region of the atom that contains protons and neutrons. It is located in the center of the atom and is surrounded by a cloud of electrons orbiting the nucleus.

Name: \_\_\_\_\_

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Curriculum Connection  
B.1

# What are Atoms?

## Questions

Answer the questions below using evidence from the text

1) What three subatomic particles do atoms have?

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---

2) What is the nucleus of an atom?

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## Define

What do each of the subatomic particles do?

<b>Protons</b>	
<b>Neutrons</b>	
<b>Electrons</b>	

## True or False

Circle whether the statement is true or false

1) Electrons are positively charged	True	False
2) Protons have a positive charge	True	False
3) Oxygen atoms always have 8 protons	True	False
4) Carbon atoms always have the same number of neutrons	True	False
5) Electrons are located in the nucleus	True	False