McClelland – 8th SCIENCE Distance Learning 2020 Student Name:_____ Per#___

**WEEK #1** **NOTE:** You may choose to complete this assignment on MobyMax using a cell phone.

**DAY #1 - DIRECTIONS: Read each passage and complete the activities after each.**

*All matter is made of one or more basic materials combined together. Scientists have identified around 100 basic types of matter, called **elements**. Matter can be made up of a single element or a combination of many different elements. Each particle of a particular element cannot be broken down into simpler substances by ordinary physical or chemical processes. Some examples of elements that you might recognize are oxygen, carbon, helium, mercury, copper, and gold. A bar of gold is made up of pure gold. Because gold is its own element, a gold bar is only made of one element.*

*Scientists have identified over 100 elements in nature and have made even more in laboratories. On Earth, elements can exist in all states of matter. Some elements, such as copper and gold, are typically found in a solid state. Mercury is an element that is found on Earth as a liquid. Elements like oxygen and helium are found as gases.*

*Copper, gold, mercury, helium, and oxygen are single elements. However, single elements can combine to create new substances. Different combinations of elements help create all of the matter in the universe.*

Elements are the _____ materials that make up _____ in the universe. They _____ be broken down into simpler substances by ordinary physical or chemical processes.

Name 3 items that are made up of elements:

1. _____ 2. _____ 3._____

Which of the following statements are true about the gold bars?

- ☐ The gold bars are made up of one element: copper.
- ☐ The gold bars are made up of many elements.
- ☐ The gold bars are made up of one element: gold.
- ☐ The gold bars are not made up of any elements.

You cut a bar of pure gold into smaller and smaller pieces. Will this action change the element that makes up the bar? Explain your answer.

_____

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There are only about 118 known elements. How is it possible that all matter in the universe is made up of just over 100 elements? Explain your answer.

_____

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Add two more examples for each form of matter:

| SOLID | LIQUID | GAS |
|---|---|---|
| Copper in a penny | Mercury in a thermometer | Helium in a balloon |
| | | |
| | | |
| | | |

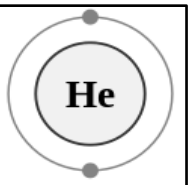
Water is necessary for life. It covers 3/4 of our planet. However, water is not an element. How can this be true?

- Water is made of something other than elements.
- Water is made from a combination of elements.
- Water is not actually matter.

**DAY #2 - DIRECTIONS: Read each passage and complete the activities after each.**

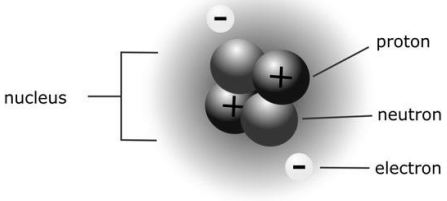
*Just as all matter is made up of different combinations of elements, each pure element is made up of smaller building blocks called atoms. An **atom** is the smallest particle of an element that still has the properties of that element. Properties determine how an element will change under certain conditions. Different elements are made of different atoms. For example, all silver atoms are the same. However, a silver atom is very different from a hydrogen atom.*

This is a drawing of a helium atom. These are some of the characteristics of helium atoms: they do not easily bond, or join together with, other atoms; they do not light on fire.




This balloon is filled with helium. Which of the following are true about the helium gas inside the balloon?

*Atoms are also made up of smaller pieces. All atoms have three different kinds of particles with different electrical charges.*

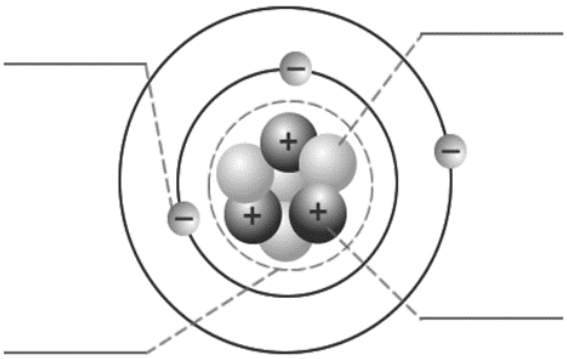



*An atom is identified by the number of protons within its nucleus. Atoms of different elements have different numbers of protons. This atom is a helium atom.*

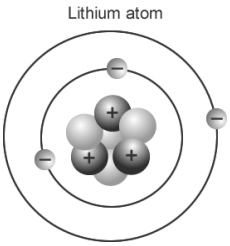
Mark all statements that are true about a helium atom:

- It will form many bonds if it meets other substances.
- It will light on fire very easily.
- It will not form bonds if it meets another substance.
- It will not light on fire.

The _____ is the center of the atom. It contains protons and _____. Protons have a _____ charge. Neutrons have a _____ charge. Electrons move in the space _____ the nucleus. They have a _____ charge.



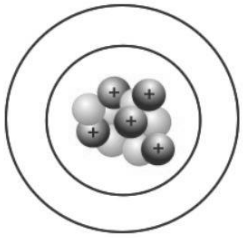
Label the parts of the atom using these terms:
NUCLEUS
NEUTRON
ELECTRON
PROTON



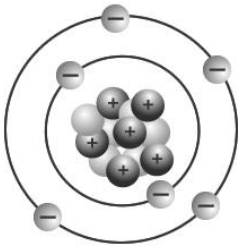

Based on this diagram, which of the following is true about the lithium atom?

- All lithium atoms always have only three neutrons.
- All lithium atoms always have only three protons.
- All lithium atoms always have only three electrons.

*This boron atom is missing its electrons. Create a boron atom with a neutral charge by adding the correct number of electrons into the space surrounding the nucleus.*



*This is a carbon atom. It has six protons, six neutrons, and six electrons.*



Which of the following are true about a carbon atom's electrons?

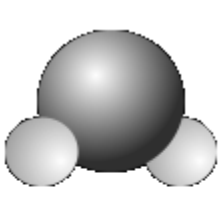
- They can leave the atom
- More electrons can join the atom
- They can help atoms join together
- They do not change

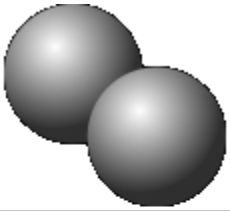
An atom is the _____ particle of an element that has _____ the element. Atoms of different levels will be _____ of each other. Atoms of the same element will be _____ of each other.

**DAY #3 - DIRECTIONS: Read each passage and complete the activities after each.**

*Typically, matter is the result of a combination of atoms. Atoms combine, or bond, using their electrons. When atoms from two or more different elements bond, they form a compound. Most of the matter in the universe is a compound, and each compound has its own properties. For example, water is a liquid and table salt is a solid crystal.*

*A molecule describes a combination of atoms that cannot be broken apart while still retaining the same properties as the larger substance that it is a part of. Many compounds are also considered molecules. For example, water is a chemical compound because it results from bonds between atoms from two different elements: hydrogen and oxygen. Water is considered a molecule because the moment one of the bonds between a hydrogen and an oxygen atom are broken, water's properties will change. However, oxygen is not a compound because it is formed by two atoms of the same element.*

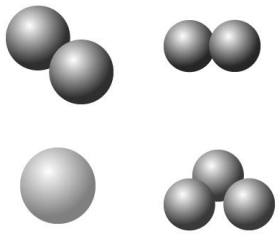


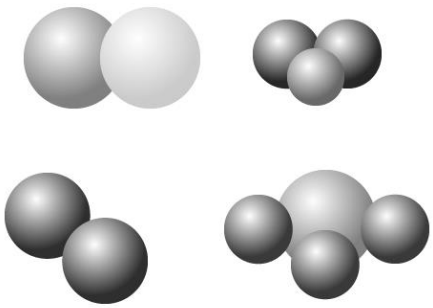


| | Water | Oxygen |
|---|---|---|
| Number of Elements | Two | One |
| Compound? | Yes | No |
| Molecule? | Yes | Yes |

*The properties of a compound can be very different from properties of each individual atom in the compound. For example, on Earth, hydrogen atoms make up a gas, and oxygen atoms make up a gas. But when two hydrogen atoms and one oxygen atom join together to make water, the resulting compound is a liquid.*

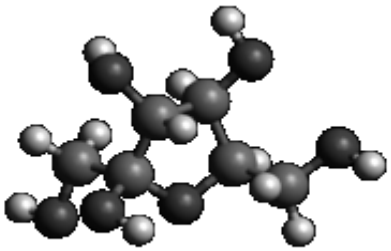
Each sphere represents a different kind of atom. Which of these models show molecules? CIRCLE the images of the atoms:





Each differently shaded sphere represents a different kind of atom. Which of these models show compounds? CIRCLE the images of the compounds

This structure shows how atoms make up sugar. The different colors represent different types of atoms. Is sugar an element, just a molecule, or a molecule *and* a compound? How do you know?



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Sugar is made of carbon, hydrogen, and oxygen. Like all compounds, the compound of sugar has very different properties than its individual elements. Sugar is white, solid, and tastes sweet. Pure carbon makes up the dark graphite lead in pencils. On Earth, pure hydrogen is typically a gas. On Earth, pure oxygen is a gas we breathe. Which of the following is true about sugar?

- Sugar is different from the atoms it is made of in many ways.
- Sugar is a gas.
- We breathe sugar.
- Sugar makes up dark pencil lead.

**DAY #4 - DIRECTIONS: Review Days 1-3 by marking all the correct answers.**

What is an element?

- the center of the atom
- two or more different kinds of atoms joined together
- a basic type of matter, which cannot be broken down into simpler substances by ordinary physical or chemical processes
- a particle that moves around the nucleus of an atom and has a negative charge

What is an atom?

- the smallest particle of an element that still has the properties of that element
- one particle in the nucleus of an atom that has a positive charge
- the largest piece of an element that still has the properties of that element
- the smallest particle of an element that does not have the properties of that element

What is a nucleus?
- the center of an atom
- the top of an atom
- a particle with a neutral charge
- the outside of an atom

What is a proton?
- a particle that moves around the nucleus of an atom and has a positive charge
- one particle in the nucleus of an atom that has a negative charge
- one particle in the nucleus of an atom that has a positive charge
- one particle in the nucleus of an atom that has a neutral charge

What is a neutron?
- one particle in the nucleus of an atom that has a negative charge
- a particle that moves around the nucleus of an atom and has a positive charge
- one particle in the nucleus of an atom that has a neutral charge
- a particle that moves around the nucleus of an atom and has a neutral charge

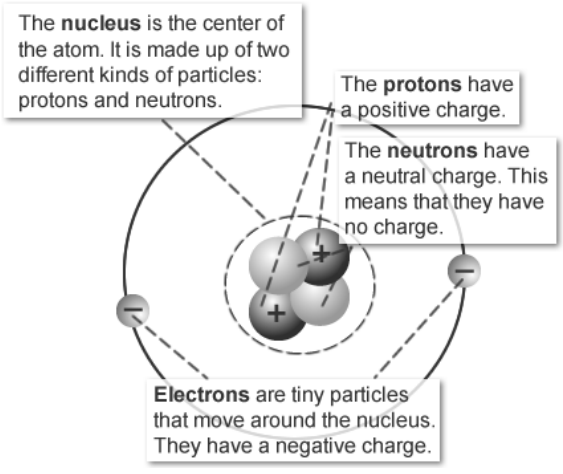
What is an electron?
- a particle that moves around the nucleus of an atom and has a neutral charge
- a particle in the nucleus of an atom that has a negative charge
- a particle that moves around the nucleus of an atom and has a negative charge
- a particle that moves around the nucleus of an atom and has a positive charge

What is a molecule?
- ten or more atoms bonded together
- a combination of atoms that cannot be broken apart while still retaining the same properties as the larger substance that it is a part of
- two different types of atoms that are bonded together
- the splitting apart of two or more atoms

What is a compound?
- a substance resulting from bonds between atoms from different elements
- a substance resulting from a split between atoms in a molecule
- a substance resulting from bonds between two atoms of the same element
- a substance resulting from bonds between ten or more atoms of the same element

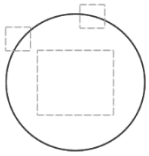
**DAY #5 - DIRECTIONS: Review and complete the activities after each.**

- There are many different types of atoms, called elements.
- All elements are made up of atoms.
  - Atoms are made up of protons, neutrons, and electrons.
- Two different kinds of atoms can combine to form a compound.
- A molecule is a combination of atoms that cannot be broken apart while still retaining the same properties as the larger substance that it is a part of.




Which of these items is NOT made of at least one element?
- oxygen
- pencil lead
- your backpack
- the ocean
- none of the above

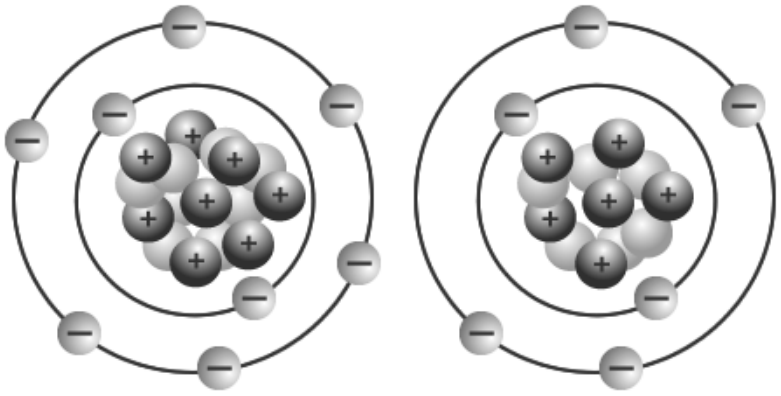
Build a neutral helium atom:



1. Add the protons, neutrons and electrons
2. Add the positive (+) and negative (-) symbols too

Oxygen atoms are different from carbon atoms. Different atoms are identified based on the different numbers of protons within their nuclei. The number of neutrons and electrons in an atom can change, but the number of protons is always the same in atoms of the same element. Which of the following is always a difference between these two atoms?

- They have different numbers of protons.
- They have different numbers of nuclei.
- They have different numbers of electrons.
- The have different numbers of neutrons.



oxygen atom carbon atom

Two or more atoms of one kind can make up _____ when they bond. A molecule with two or more different kinds of atoms is called _____.

Which statement about elements is FALSE?

- They can combine to form new substances.
- They exist in many states in nature.
- They make up all matter in the universe.
- none of the above

Ron has a gold watch and a silver ring. What can you tell Ron about these items?

- The watch is made of an element, but the ring is not.
- The ring is made of an element, but the watch is not.
- The watch and the ring are made of the same kinds of atoms.
- The watch and the ring are made of different kinds of atoms.

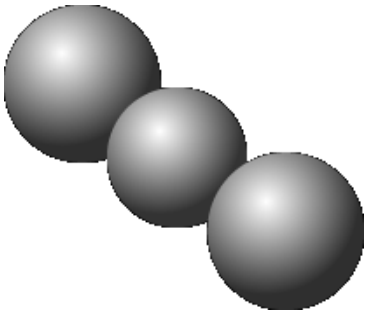
An aluminum atom has 13 protons. If an atom of aluminum has a neutral charge, how many electrons should be moving around outside the nucleus?

13 0 26 12

If one aluminum atom has 13 protons, what must be true about any atom with exactly 13 protons?

- Any atom with 13 protons has 0 neutrons.
- Any atom with 13 protons has 0 electrons.
- Any atom with 13 protons is a carbon atom.
- Any atom with 13 protons is an aluminum atom.

This group of atoms is the smallest combination of atoms that retains the properties of a substance called carbon dioxide. It is made of 1 carbon atom and 2 oxygen atoms. Which of the following are true about carbon dioxide? Check all that are true.



- It is a compound.
- It is a single atom.
- It is an element.
- It is a molecule.