



## TEACHER GUIDE

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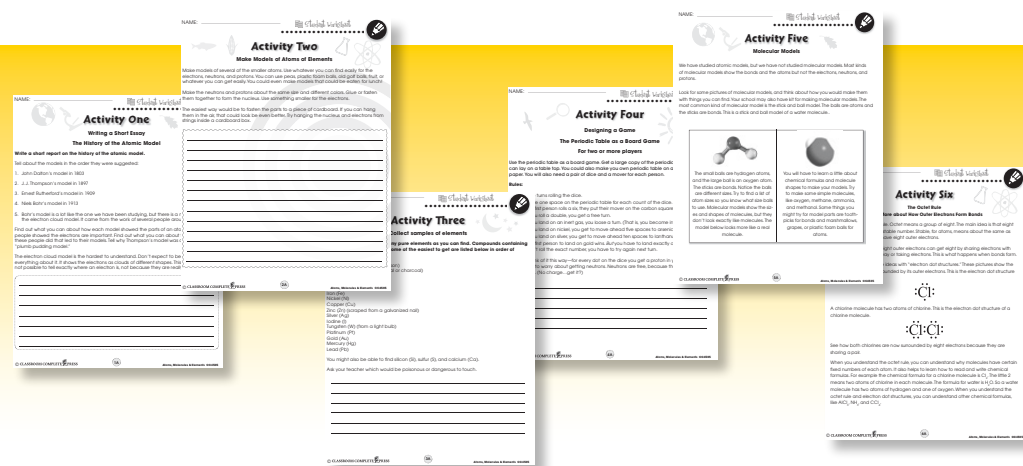
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### 3 EASY STEPS to receive your 6 Bonus Activities!

- Go to our website:  
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- Click on item CC4505 – Atoms, Molecules & Elements
- Enter pass code CC4505D





## What Are Elements?

1. Circle **T** if the statement is TRUE or **F** if it is FALSE.

- T F** a) There are about 100 different kinds of atoms.
- T F** b) Molecules contain two or more atoms.
- T F** c) Fire, air, earth, and water are all elements.
- T F** d) Forming rust is a chemical property of iron.
- T F** e) All atoms have the same number of electrons.
- T F** f) All atoms are the same size.

2. Draw one line from each word on the left to its meaning.

- |           |   |   |
|-----------|---|---|
| bonds     | a | the parts of an atom equal in number to the atom's electrons  |
| chemical  | b | the properties that tell how and when an atom forms molecules |
| electrons | c | the connections that hold atoms together                      |
| elements  | d | materials made of one kind of atom                            |
| protons   | e | the parts of an atom that circle the nucleus                  |



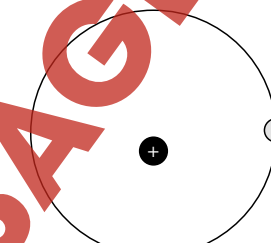
## What Are Elements?

**Y**ou learned earlier that there are about 100 kinds of atoms. A material made of only one kind of atom is called an **element**. Some elements you may know about are iron in nails, helium in balloons, and iodine in medicines.

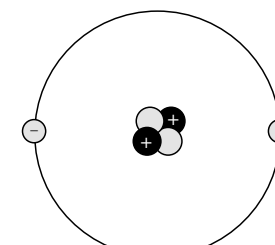
The atoms of each element have different chemical and physical properties. But why are the atoms different? Atoms of each element have a different number of protons in their nucleus. Hydrogen is the simplest element. Its atoms have only one proton. Uranium has much larger atoms with 92 protons.

Remember that the number of protons in an atom equals the number of electrons. Hydrogen atoms have one electron and uranium atoms have 92 electrons. The number of electrons in the atoms of an element give the element its chemical properties. This is because different numbers of electrons cause atoms to form bonds in different ways.

Atoms of the Two Simplest Elements



A Hydrogen Atom



A Helium Atom

Name **TWO** things that are different about atoms of different elements.



Elements can be made of single atoms, or they can be made of molecules. The helium in helium balloons is made of separate atoms. You may remember that oxygen we breathe is made of molecules that have two oxygen atoms bonded together.

Long ago people thought there were only four elements: fire, air, earth, and water. Now we know that none of these are elements. Water molecules are made of hydrogen and oxygen atoms. The other three are mixtures of different molecules.



## What Are Elements?

1. Put a check mark (✓) next to the answer that is most correct.

a) How many elements are there?

- A three
- B four
- C about 100
- D many millions

b) Why do all atoms of an element have the same chemical properties?

- A They all have the same size electrons.
- B Their electrons all have the same charge.
- C They all have the same number of neutrons.
- D They all have the same number of electrons.

c) Long ago, people believed there were four elements: fire, air, earth, and water. How many of these are called elements today?

- A none
- B one
- C two
- D three

2. a) Circle the words that are the names of elements.

air      helium      hydrogen      iron      sunlight      water

b) Underline the words that are made of elements but are not elements.

air      helium      hydrogen      iron      sunlight      water



## What Are Elements?

3. Tell what an *element* is. Use the word "atoms" in your answer.

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4. What is the *simplest* element?

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5. Name *two* other elements.

---

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### Extensions & Applications

6. Look back at the pictures of the atoms of hydrogen and helium. Hydrogen has one proton in its nucleus circled by one electron. Helium has two protons and two neutrons in its nucleus circled by two electrons.

Make drawings of atoms of the elements **carbon** and **lithium**. For both atoms, put the first two electrons in an inner circle and the other electrons in an outer circle.

Carbon has six protons and six neutrons in its nucleus, circled by six electrons.

Lithium has three protons and four neutrons in its nucleus. You will have to figure out how many electrons circle the nucleus of a lithium atom.



NAME: \_\_\_\_\_

After You Read 



# What Are Elements?

3. Tell what an *element* is. Use the word "atoms" in your answer.

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4. What is the *simplest* element?

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## Extensions & Applications

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3.

A material made of one kind of atom

4.

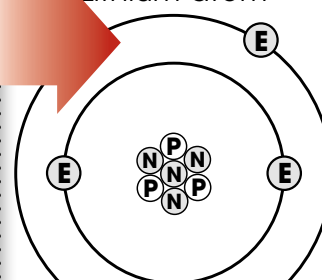
Hydrogen has the simplest atoms

5.

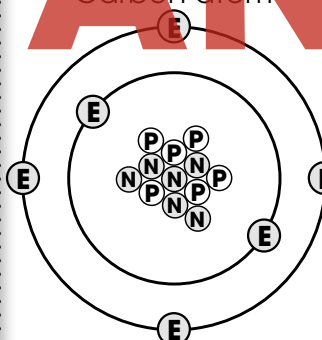
Answers will vary

6.

Lithium atom



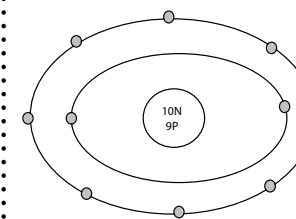
Carbon atom



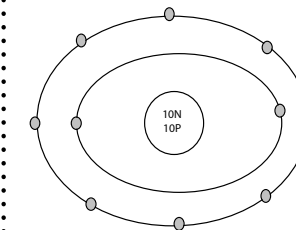
**E** Electron  
**P** Proton  
**N** Neutron

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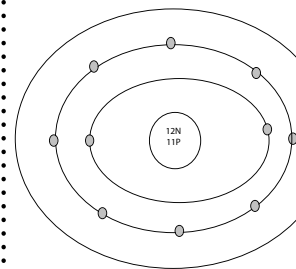
Fluorine:



Neon:



Sodium:



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# EASY MARKING ANSWER KEY