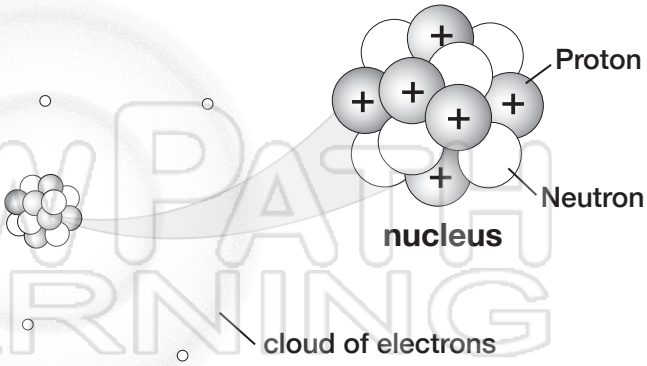
Properties of Atoms

Name _____ Class _____ Date _____

Atoms are the **basic building blocks** of **matter** that make up everything around us. An **atom** is the **smallest part of an element** that has all the properties of that element.

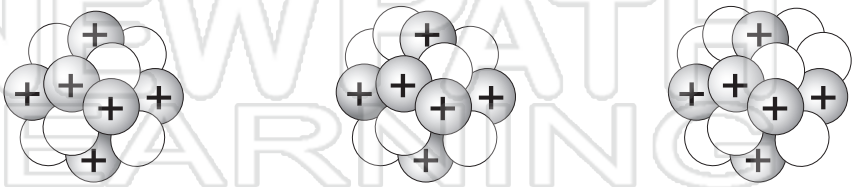
The **modern atomic model,** suggests that an atom has two particles in the **nucleus**, a **proton** which carries a **positive charge** and a **neutron** or neutrally charged particle. Surrounding the nucleus is an **electron cloud** with **electrons** which carry a **negative charge,** moving in various directions.



Carbon atom model

The a… …umber and n… of pro… …ame …ass

Atoms with the same number of **protons** and a different number of **neutrons** are called **isotopes**. For example, the three isotopes of **Carbon** have the same number of **protons** (or the same **atomic number**) and **electrons** but they differ in their number of **neutrons** and thus have a **different atomic mass**.



Carbon-12
6 neutrons

Carbon-13
7 neutrons

Carbon-14
8 neutrons

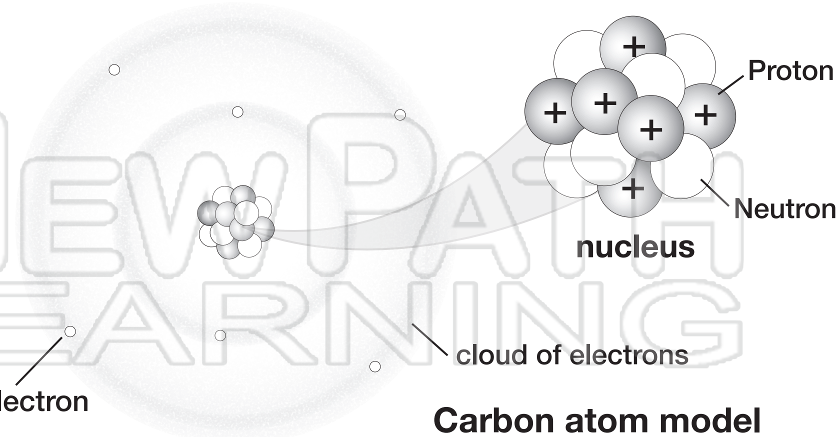
Properties of Atoms

Name ______________________ Class ____________ Date ____________

Valence Electrons & Bonding

Electrons surrounding the **nucleus** are organized in **energy levels**. An **electron** that is in the **outermost energy level** of an atom is a **valence electron**.

A **valence electron** determines an atom's **chemical properties** and whether an atom will form **bonds**. A **bond** is the force that **joins atoms** together forming a new substance.



Carbon atom model

Electron Dot Diagram

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PREVIEW

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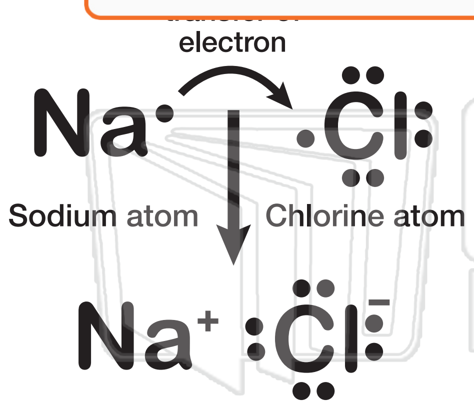

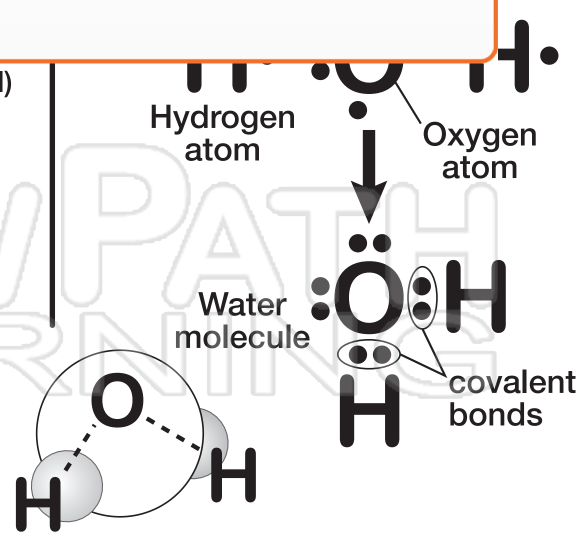

Properties of Atoms

Name _____ Class _____ Date _____

Fill in the graphic organizer with appropriate details. For all ovals that are not labeled, provide **both** labels and details.

electrons

_____

_____

_____

_____

PREVIEW

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Atomic Mass

_____

_____

_____

_____

Properties of Atoms

Name _____ Class _____ Date _____

Fill in the blanks. **Answer** the questions.

Electrons surrounding the _____ of an atom are organized in _____ **levels. An electron** that is in the _____ **energy level** of an atom is a _____ **electron.**

A _____ **electron** determines an atom's _____ **properties** and whether an atom will form _____. A _____ is the force that _____ **atoms** together forming a new substance.

Nam ces.

Desc

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Properties of Atoms

Answer Key - example

Fill in the graphic organizer with appropriate details. For all ovals that are not labeled, provide **both** labels and details.

electrons

are negatively charged,
surround the nucleus in
electron clouds

neutrons

a

protons

xist
the

Atomic Number

the number of protons in
the nucleus of an atom

Atomic Mass

the sum of protons and
neutrons in the nucelus

Properties of Atoms

Answer Key - example

Fill in the blanks. **Answer** the questions.

Electrons surrounding the nucleus of an atom are organized in energy levels. An **electron** that is in the outermost energy **level** of an atom is a valence **electron.**

A valence **electron** determines an atom's chemical **properties** and whether an atom will form bonds. A bond is the force that joins **atoms** together forming a new substance.

Nam ces.

Desc

Ionic bonds - formed when one or more valence electrons are transferred from one atom to another. Example - Na^+Cl^-

Covalent bonds - formed when atoms share electrons to bond them together. Example - H_2O