

Physical Science Note Pages

Unit 2: Matter, Lessons 1 -6




Unit 2 VOCABULARY: Lessons 1-6

Unit 2 Lesson:	WORD	DEFINITION
1	atom	
1	electron	
1	element	
1	neutron	
1	nucleus	
3	atomic mass	
3	atomic number	
3	isotope	
4	Periodic Law	
6	chemical changes	
6	physical changes	
6	molecule	
6	compound	




Unit 2 Lesson 1: Atoms

My Notes From Class:

MATTER:

-  Matter is what we often call _____. It is all the solids, liquids, and gases around us.
-  All matter is made up of _____. The properties of these tiny particles determine the properties of matter.
-  When something is made up of only ONE TYPE OF ATOM, we call it an _____

ATOMS:

-  **ATOMS:** Tiny particles that are the fundamental building block of all matter
-  Atoms contain even smaller particles:
 - **Electrons:** are negatively charged particles that move around the center, or nucleus of an atom
 - Atoms have a solid center, or _____.
 - The nucleus contains _____ which are positively charged, and _____ which have NO charge (we say they are “neutral”)
-  With the discovery of these particles WITHIN the atom, scientists had to change the atomic _____.

Extra Space for Important Information:

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Unit 2 Lesson 2: Atomic and Mass Numbers

My Notes From Class:

Structure of an Atom:

- Most of an atom's **mass** is found in the _____
- The nucleus contains the P _____ (positively charged) and N _____ (with no charge)
- Circling** the nucleus are the negatively charged _____.

Protons Determine the Atom's "Identity":

- Atomic Number:** the number of _____ in every atom of an _____.
- All atoms of an element have the same number of protons in the nucleus.
- Atomic number is different for each element.

Electrons Determine an Element's Properties

- Electrons give an element its "personality."
- Electrons form chemical _____ with other atoms during chemical reactions.
- Atoms can _____ or _____ electrons
- If the number of electrons changes, the overall electrical _____ of the atom can change.

Neutrons Affect an Atom's Mass

- Isotope:** atoms of the same element with _____ numbers of _____ but same number of protons.
- Neutrons do not get involved in _____, so their presence does not affect the chemical _____ of an element.
- Atomic Mass:** the sum of the number of protons and the number of neutrons in a single atom.
- More neutrons in an isotope **increase** the atomic mass
- The "atomic mass" you will see listed in the Periodic Table of Elements reflects an **average** of all the known isotopes of an element – that's why it's not a whole number.
- Stable Isotopes:** are the ones that make up the **naturally** occurring isotopes of an element

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Unit 2 Lesson 3 is OPTIONAL – just mark it “complete” in the OLS 😊

Unit 2 Lesson 4: Elements and the Periodic Table

My Notes From Class:

Discovering Elements:

- 🌀 For hundreds of years, scientists have been observing the **properties** of materials.
- 🌀 **Properties** means the **way materials break down or combine with other materials.**
- 🌀 **Elements:** materials that cannot be broken down further. ALL atoms of an element are the _____.
- 🌀 Scientists tried to classify elements in **groups with similar properties.** They hoped that understanding the **pattern of these groups** would lead to a **deeper understanding** of the nature of matter.

Periodic Table of the Elements:

- 🌀 As scientists discovered new elements, they tried to arrange elements in a **table** in a **way that made sense**, called the **Periodic Table of the Elements.**
- 🌀 **Periodic Law:** states that the **properties of elements are periodic** or recurring as the elements increase in _____.
- 🌀 At room temperature.....
 - Elements with black symbols are **solid at room temperature.**
 - Elements with blue symbols are **liquids at room temperature.**
 - Elements with red symbols are **gases at room temperature.**
 - Elements with symbols in green are **not found in nature.**

Extra Important Information:

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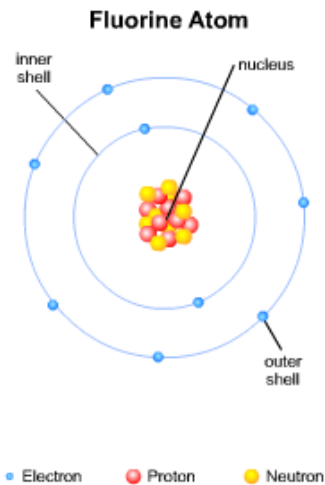
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Unit 2 Lesson 5: Design of the Periodic Table

My Notes From Class:

Electrons Determine the Pattern of Elements in the Periodic Table

- 🌀 For some time chemists **tried to find a pattern in the properties** of the different elements.
- 🌀 In the early 1900s, it was discovered that the arrangement of the _____ in the atoms **determines the pattern of the elements**.
- 🌀 All matter is made of incredibly small units called _____.
- 🌀 Materials are either pure elements or combinations of elements.
- 🌀 **Elements** are made of only one kind of _____.
All other materials are **combinations of the elements**.
- 🌀 **Example: The Element Fluorine**
 - **EVERY** atom in **PURE Fluorine** looks like the one to the right, with the _____ number of protons, neutrons, and electrons
- 🌀 **Elements are arranged in the Periodic Table according to:**
 1. Atomic number (1,2,3, 4, etc...)
 2. Number of electrons in the outer _____

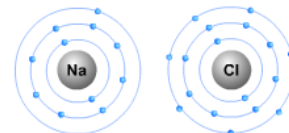


Electrons Can Be Shared or Exchanged

- 🌀 When elements combine to form compounds, chemical _____ form between the atoms.
- 🌀 **Bonds** form when atoms _____ or _____ electrons in a way that gives each atom a complete outer shell.
- 🌀 Most elements **WANT to have 8 electrons in the outer shell**.

🌀 **Example: Reaction between Sodium and Chlorine:**

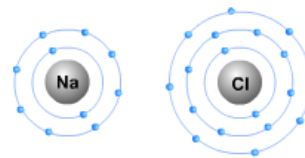
1. Sodium has 1 electron in its outer shell, while Chlorine has 7
2. **Sodium gives up its one outer electron** and becomes "stable" with a "new" outer shell of 8 electrons



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3. Chlorine **GAINS** the electron given up by sodium, and it too becomes "stable" with 8 electrons in its outer shell
4. This exchange creates charged atoms:
 - Sodium now has a **positive** charge
 - Chlorine now has a **negative** charge



Extra Important Information:

Unit 2 Lesson 6: Molecules

My Notes From Class:

How Are Molecules Formed?

- 🔬 **Molecule:** A molecule forms when **two or more atoms join together** to form a chemical _____.
- 🔬 **Chemical bonds** form when atoms share or exchange _____ to complete each other's outer _____ of electrons.

Chemical and Physical Changes

- 🔬 **Chemical change:** A chemical change occurs when chemical _____ between atoms are formed or broken.
Examples: burning, rusting, and digesting food
- 🔬 **Physical change:** Physical changes occur when a substance changes _____ forming or breaking chemical bonds.
Examples: melting, boiling, folding, and cutting

Compounds

- 🔬 **Compound:** a substance containing atoms of _____ or more different **elements**
- 🔬 Compounds have **different properties** (meaning they behave differently) than the elements that make them up.
Example: Brown **RUST** is a _____ resulting from the **chemical bonding** of the iron nail (a black metal) and oxygen (a clear gas).



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