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| **Date**: September 16, 2025 |
| **Subject**: Chemistry |
| **Grade**: 12 |
| **Duration**: 80 Minutes |
| **Topic**: Atomic Structure and the Periodic Table |
| **Subtopic:** Dalton’s Atomic Theory and Theoretical Change |
| **Number of Students**: 12 [Girls: 10] [Boys: 2] |
| **General Objectives**:  *On Completion of this lesson, students will be able to*:   * Understand that theories in chemistry are subject to change.   **Specific Objectives**:  *By the end of the lesson, students will be able to:*   1. State the postulates of Dalton’s atomic theory. 2. Identify limitations and modifications of Dalton’s atomic theory. 3. Discuss the process of theoretical change in science using Dalton’s theory as an example. 4. Explain the criteria used when scientific theories are accepted. |
| **Key Scientific Attitudes:**  Critical thinking, communication, collaboration, cooperation, open-mindedness |
| **Content**   * ***Postulates of Dalton’s Atomic Theory*:**   + All matter is composed of tiny indestructible particles called atoms that cannot be created, destroyed or subdivided.   + Atoms of one element cannot be converted into atoms of another element.   + All atoms of a given element are identical, in weight and other properties, and are different from atoms of any other elements.   + Atoms can combine with each other in simple whole number ratios. |
| **Instructional Sequence**  ***Engage:***   * **Activity**: Present students with the following scenario:   “*In the early 1800s, Dalton proposed that atoms were indivisible. Today, however, we know about subatomic particles like protons, neutrons, and electrons. If Dalton was ‘wrong’, why do we still study his theory?”*   * **Discussion prompt**:   + Should outdated theories still be taught?   + How does science deal with new evidence? * This provokes curiosity and connects to the nature of science.   ***Explore:***   * **Activity**: Students work in pairs to **match Dalton’s postulates** with **modern modifications**.   Example:   * Postulate: Atoms are indivisible. * Modification: Atoms are divisible into subatomic particles. * Provide a worksheet/table for them to fill in. * Students share responses and justify why modifications occurred.   ***Explain:***   * Teacher leads a mini-lecture + guided discussion:   1. Outline Dalton’s ***five postulates***.   2. Explain the ***scientific evidence*** that led to modifications (discovery of electron, isotopes, nuclear model, etc.).   3. Introduce the ***process of theoretical change***:      + Evidence vs. theory fit      + Accuracy and reliability of data      + Replicability of experiments      + Consensus in the scientific community      + Influence of societal/technological factors (e.g., invention of the cathode ray tube). * Use a timeline (1803 → 1897 → 1911 → 1932) showing how the atomic model evolved.   ***Elaborate:***   * **Activity**: Case Study Debate   + Divide class into groups: each group represents a scientist (Dalton, Thompson, Rutherford, Bohr, Chadwick).   + Each group presents ***how their model improved upon previous ones*** and why it was more accepted.   + Emphasize the ***criteria of theory acceptance*** in their arguments. * Students reflect: “*What does this tell us about how scientific knowledge develops?*”   ***Evaluate:***   * Quick write: Students answer the following in their notebooks:   + State one postulate of Dalton’s theory and its modern modification.   + Explain why Dalton’s theory was not simply discarded but modified.   + List two criteria that scientists use when accepting or rejecting a theory. * Teacher collects for formative assessment. |