

Learning Outcomes

After going through this module, you are expected to:

1. Discuss key developments in the concept of the atomic structure; and
2. Give brief explanations of each of the models of atomic structure.

THE STRUCTURE OF ATOM

ACTIVITY 1 Write your answer below.

1. What is atom? _____

Most atomists like Democritus and advocates of atomic theory believed that the atom was a fundamental, indestructible, indivisible particle. This is sometimes known as the *billiard ball concept of the atom*.

ACTIVITY 2

1. Find out why it is called billiard ball concept of the atom. Write your answer on your paper briefly. (3-5 sentences only)

Robert Brown observed, under a microscope, that pollen suspended in water ejected particles that caused a jittery, irregular motion. This would later be called Brownian motion. Later on in the 20th century, this observation would be used by Albert Einstein and a French physicist, Jean Perrin, to mathematically and experimentally confirm John Dalton's Chemical Atomic Theory. This made the atom an undeniable part of how we thought about the universe. The atom is no longer debatable, the way it was in the time of the Greeks, the alchemists and Lavoisier.

FOUR ATOMIC MODELS

1. Plum-Pudding Model

Later in 1897, Joseph John Thomson published the idea that electricity was in particles that were part of the atom. Experimenting with cathode rays, he established the mass and charge properties of these particles. These particles were named electrons. In 1904, he came up with the plum-pudding model, which was an idea of what the atom looked like based on his experiments.

He would later conclude that the electron was not the only source of mass in the atom. This implied that the atom was composed of other particles.

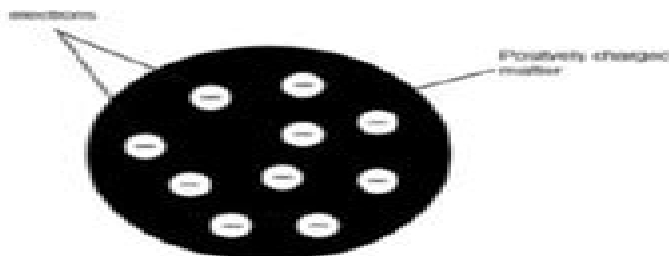


Figure 1. Thomson's plum-pudding model, a sphere with a uniformly distributed positive charge and enough embedded electrons to neutralize the positive charge. A plum pudding is a sort of cake with raisins embedded in it.

2. Rutherford's atomic Model

Ernest Rutherford, a student of Thomson's, who was among many who studied radioactivity. He concluded that radioactivity occurred due to changes on a subatomic level, or changes within the atom itself. In 1902, he worked in Thomson's laboratory where he distinguished two kinds of radiation based on their penetrating

power: α (alpha) and β (beta). He studied these types of radiation and noticed, from his experiments, that alpha particles would sometimes bounce off at a high angle when made to penetrate a very thin gold foil.

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JA Banks



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Bridging Research and Practice in Science Education Eilish McLoughlin,Odilla E. Finlayson,Sibel Erduran,Peter E. Childs,2019-08-27 This edited volume presents innovative current research in the field of Science Education The chapter s deal with a wide variety of topics and research approaches conducted in a range of contexts and settings Together they make a strong contribution to knowledge on science teaching and learning The book consists of selected presentations from the 12th European Science Education Research Association ESERA Conference held in Dublin Ireland from 21st to 25th August 2017 The ESERA community is made up of professionals with diverse disciplinary backgrounds from natural sciences to social sciences This diversity enables a rich understanding of cognitive and affective aspects of science teaching and learning The studies in this book will stimulate discussion and interest in finding new ways of implementing and researching science education for the future The twenty two chapters in this book are presented in four parts highlighting innovative approaches to school science emerging identities in science education approaches to developing learning and competence progressions and ways of enhancing science teacher education This collection of studies showcases current research orientations in science education and is of interest to science teachers teacher educators and science education researchers around the world with a commitment to bridging research and practice in science teaching and learning **The London County Council Gazette** ,1912 **Federal Register** ,1968 **The Louisiana School Review** ,1902 **Canadian Books in**

Print ,1984 *Perspectives and Trends in Education and Technology* Anabela Mesquita, António Abreu, João Vidal Carvalho, 2021-11-17 This book presents high quality peer reviewed papers from the International Conference in Information Technology Education ICITED 2021 to be held at the ESPM Higher School of Advertising and Marketing Sao Paulo Brazil between the 15th and the 17th of July 2021 The book covers a specific field of knowledge This intends to cover not only two fields of knowledge Education and Technology but also the interaction among them and the impact result in the job market and organizations It covers the research and pedagogic component of Education and Information Technologies but also the connection with society addressing the three pillars of higher education The book addresses impact of pandemic on education and use of technology in education Finally it also encourages companies to present their professional cases which is discussed These can constitute real examples of how companies are overcoming their challenges with the uncertainty of the market **Handbook of Research on Science Education, Volume II** Norman G. Lederman, Sandra K. Abell, 2014-07-11 Building on the foundation set in Volume I a landmark synthesis of research in the field Volume II is a comprehensive state of the art new volume highlighting new and emerging research perspectives The contributors all experts in their research areas represent the international and gender diversity in the science education research community The volume is organized around six themes theory and methods of science education research science learning culture gender and society and science learning science teaching curriculum and assessment in science science teacher education Each chapter presents an integrative review of the research on the topic it addresses pulling together the existing research working to understand the historical trends and patterns in that body of scholarship describing how the issue is conceptualized within the literature how methods and theories have shaped the outcomes of the research and where the strengths weaknesses and gaps are in the literature Providing guidance to science education faculty and graduate students and leading to new insights and directions for future research the Handbook of Research on Science Education Volume II is an essential resource for the entire science education community Improving Science Education in the United States Claude W. Gatewood, 1963 **Peterson's Private Secondary Schools 2007** Thomson Peterson's, 2006-04 Lists and describes schools in the United States and Canada *The American School Board Journal* ,1916 Report of the Annual Meeting of the South African Association for the Advancement of Science ,2001

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Table of Contents Physical Science Paper 1 Grade11 2014

1. Understanding the eBook Physical Science Paper 1 Grade11 2014
 - The Rise of Digital Reading Physical Science Paper 1 Grade11 2014
 - Advantages of eBooks Over Traditional Books
2. Identifying Physical Science Paper 1 Grade11 2014
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Physical Science Paper 1 Grade11 2014
 - User-Friendly Interface
4. Exploring eBook Recommendations from Physical Science Paper 1 Grade11 2014
 - Personalized Recommendations

- Physical Science Paper 1 Grade11 2014 User Reviews and Ratings
- Physical Science Paper 1 Grade11 2014 and Bestseller Lists
- 5. Accessing Physical Science Paper 1 Grade11 2014 Free and Paid eBooks
 - Physical Science Paper 1 Grade11 2014 Public Domain eBooks
 - Physical Science Paper 1 Grade11 2014 eBook Subscription Services
 - Physical Science Paper 1 Grade11 2014 Budget-Friendly Options
- 6. Navigating Physical Science Paper 1 Grade11 2014 eBook Formats
 - ePub, PDF, MOBI, and More
 - Physical Science Paper 1 Grade11 2014 Compatibility with Devices
 - Physical Science Paper 1 Grade11 2014 Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Physical Science Paper 1 Grade11 2014
 - Highlighting and Note-Taking Physical Science Paper 1 Grade11 2014
 - Interactive Elements Physical Science Paper 1 Grade11 2014
- 8. Staying Engaged with Physical Science Paper 1 Grade11 2014
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Physical Science Paper 1 Grade11 2014
- 9. Balancing eBooks and Physical Books Physical Science Paper 1 Grade11 2014
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Physical Science Paper 1 Grade11 2014
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Physical Science Paper 1 Grade11 2014
 - Setting Reading Goals Physical Science Paper 1 Grade11 2014
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Physical Science Paper 1 Grade11 2014
 - Fact-Checking eBook Content of Physical Science Paper 1 Grade11 2014

- Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
- 14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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