

Atomic Theory, Periodicity & Bonding: Chemistry 11/12 Main Lesson

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Required Materials

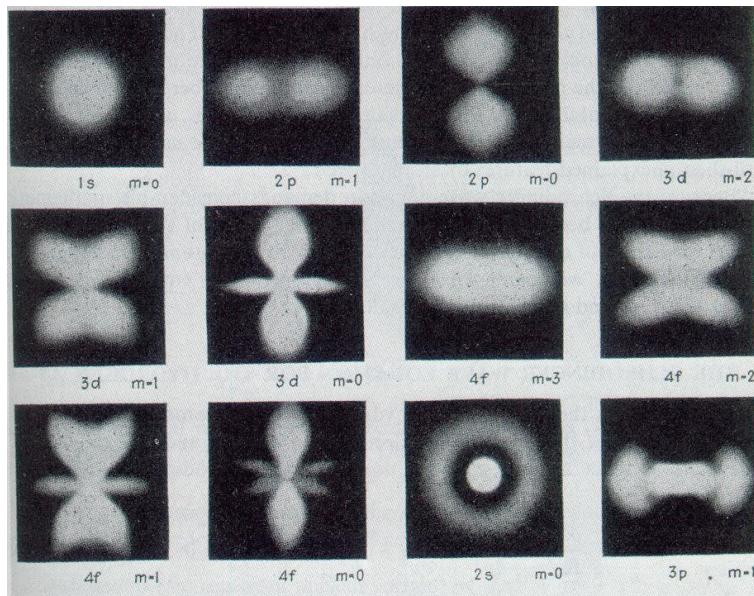
- Main Lesson Book (duotang provided)
- Pencil, Eraser, colouring materials
- Notebook, blank paper
- Calculator
- Agenda

Assessment/Evaluation

Component	Assessment	% of Grade
Main lesson book	Summative / Reflective	40
Weekly Tests	Summative	30
Biography/Presentation	Summative/Reflective	20
Participation & Assignments	Formative / Reflective	10

Summary

The grade 11 year is one in which the students move from the understanding the world in terms of a process to the antipathy point of view in understanding the gesture or deeper nature. We focus primarily on the question ‘why’ as the students become aware of both the distinction and connection between self and the world. In Periodicity, students look at the microscopic, the infinitely small and the invisible. Students investigate the chemical elements as found in the Periodic Table of the Elements, and through a variety of experiments they discover why they are organized as they are. Examining such familiar compounds as table salt, water and carbon dioxide, they develop a basic understanding of atomic theory, sub-atomic particles and their participation in the bonding of individual elements into compounds.



Topic Overview

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1			Matter & Substances	Boyles Law	Law of Definite Proportions
2	Law of Conservation of Mass & Matter	Laws of Electro-chemistry	Aristotle Periodic Table	Boyle Atomic Forces	Priestley Atomic Charges
3	Lavoisier/ Dalton	Faraday	Mendeleev	Van der Waals	Crookes & Thompson Atomic Model
4	Enthalpy	Protons	Ionization & Bonding		
	Planck	Rutherford	Lewis		Bohr
	Wave Theory	Quantum Mechanics	Electro-negativity Scale	VESPR Theory	Wrap Up
	De Broglie	Schrodinger & Heisenberg	Pauling	Tsuchida, Sidgwick & Powell	

Main Lesson Book

Students are asked to create a book of their own work that documents their learning. Grades will be awarded for the following areas: comprehension, completeness, accuracy organization and esthetics, diagrams and processing/analyzing data and information. Up to half of all main lesson pages may be typed, with the exception of diagrams and drawings which are to be completed by hand.

Weekly Tests

Weekly tests held on Friday will cover the material from earlier in the week (previous Friday-Thursday), including reactions, content, calculations, skills, labs and applying knowledge. Tests will take approximately 30 minutes to complete and require the use of a calculator. As the weeks build, concepts and skills will also compound, relying on information from previous weeks. Topics learned in previous weeks are fair game for subsequent tests.

Participation & Homework

Active and respectful participation will be evaluated daily, reinforcing good communication skills, positive classroom culture and engaged discussion. Labs will require student to work efficiently and independently, safely and understand the processes/reactions they are experimenting with. Finally, homework will be checked periodically throughout the week and deadlines for assignments will be observed to ensure students are managing their time and workload effectively.

Biography & Presentation

- 1-page biographical sketch
- Portrait drawing of scientist
- 3-5 minute in-class presentation

As a component of the main lesson, students will complete a biographical sketch of a scientist who made a significant contribution to developing the current view of the atomic theory. Students will write up a 1-page paper on the influences and contributing factors in both the individual's life, and society that supported their discovery. Discoveries, experiments and theories of the atomic model that the particular scientists made will be presented by the teacher in class as a component of the lesson material.

Students will give a 3 to 5-minute presentation of their findings and complete a portrait drawing of the scientist. In this report, students will be examining the question: How did the scientist come to their discovery? What impact did this discovery have on society? Information to be covered in the presentation:

- Background, education, social status
- Major life events
- Current forces in society: government, religion, values, beliefs
- Major influences in scientist's live/discovery
- Impact of discovery on the field of science, and impact on the views of society

Available scientists:

- Robert Boyle
 - Joseph Priestley
 - Anton Lavoisier
 - John Dalton
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- Michael Faraday
 - Dimitri Mendeleev
 - Johannes van der Waals
 - Sir William Crookes
 - JJ Thompson
 - Marie Curie
-
- Max Planck
 - Ernest Rutherford
 - Gilbert N. Lewis
 - Nils Bohr
 - Louis De Broglie
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- Erwin Schrodinger
 - Werner Heisenberg
 - Linus Pauling
 - James Chadwick

Working Together

We shape our self
to fit this world

and by the world
are shaped again.

The visible
and the invisible

working together
in common cause,

to produce
the miraculous.

I am thinking of the way
the intangible air

passed at speed
round a shaped wing

easily
holds our weight.

So may we, in this life
trust

to those elements
we have yet to see

or imagine,
and look for the true

shape of our own self,
by forming it well

to the great
intangibles about us.

— David Whyte