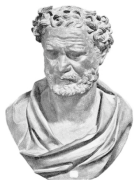

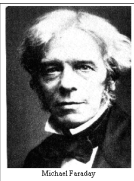


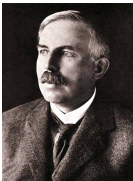
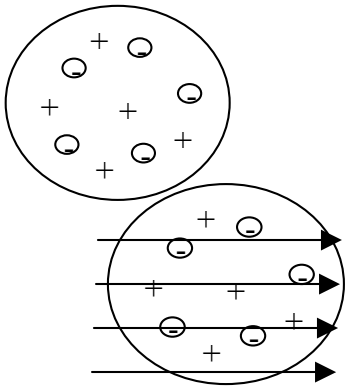
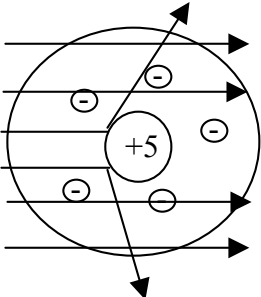



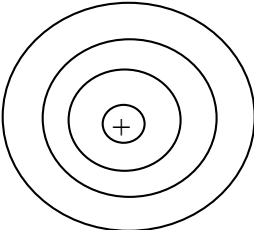


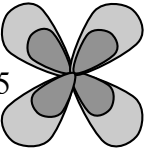


## Atomic Theory Timeline

Democritus	John Dalton	Michael Faraday	J. J. Thomson	Robert Millikan	Ernest Rutherford
~450 BC 	1803 	1839 	1896 	1909 	1909 
Greek philosopher	English schoolteacher	English chemist	English physicist	American physicist University of Chicago	New Zealand scientist
<p>All matter around us is made of indivisible tiny particles—“<u>atomos</u>”</p> <p style="text-align: center;">(p.91)</p>	<p style="text-align: center;"><b><u>Dalton’s Atomic Theory</u></b></p> <ol style="list-style-type: none"> <li>Elements are made of tiny particles called <u>atoms</u>.</li> <li>Atoms of one element are <u>identical</u> while atoms of different elements are <u>different</u>.</li> <li><u>Conservation</u> of atoms—rearrangement in RXN (Lavoisier previously stated this in terms of the Law of Conservation of Matter)</li> <li>Different atoms form compounds in <u>constant ratios</u>. (Proust previously stated this in terms of the constant mass ratios) (p.92)</li> </ol>	<p>The structure of atoms is somehow related to <u>electricity</u>.</p> <p style="text-align: center;">(p.95)</p>	<p>Discovered atoms have negative particles (<u>electrons</u>) using a cathode ray tube.</p> <p>Discovered electron’s charge to mass ratio: <math>1.76 \times 10^8 \text{ C/g}</math></p> <p style="text-align: center;">(p. 97-98)</p> <p style="text-align: center;"><b><u>Thomson’s Plum Pudding Model, 1900</u></b></p> <p>Electrons are dispersed in a <u>uniform</u> positive charge. (p. 62 &amp; 101)</p> 	<p>Measured the <u>charge</u> of an electron using oil droplets.</p> <p>Electron’s charge: <math>1.60 \times 10^{-19} \text{ C}</math></p> <p>Electron’s mass: <math>9.11 \times 10^{-28} \text{ g}</math></p> <p style="text-align: center;">(p. 98)</p> <p style="text-align: center;"><b>Versus</b></p>	<p style="text-align: center;"><b><u>Rutherford’s Nucleus Theory</u></b></p> <p>Positive charge is not like a pudding, but concentrated in the <u>nucleus</u> as shown in the <b>Gold Foil (alpha particle) experiment</b></p> <p>*Most of an atom is empty space</p> <p style="text-align: center;">(p. 100-102)</p> <p>*1919- named positive charge the <u>proton</u> (+1) *1932- Rutherford and James Chadwick discover <u>neutron</u> in nucleus (no charge)</p> 

## Atomic Theory Timeline

<p><b>Henry Moseley</b></p> <p>(1887-1915)</p> 	<p><b>Niels Bohr</b></p> <p>1911</p> 	<p><b>Louis de Broglie &amp; (Schrödinger)</b></p> <p>1924</p> 
<p>English scientist Rutherford student</p>	<p>Danish physicist</p>	<p>French graduate student</p>
<p><b><u>Moseley's Atomic #</u></b> Each element contains a unique number of <u>protons</u>. (atomic #)</p> <p style="text-align: center;">(p. 104)</p>	<p><b><u>Bohr's Orbit Model</u></b> *Electrons <u>orbit</u> the nucleus. *Model based on the hydrogen atom *Energy of the electrons is <u>quantized</u>.</p> <p style="text-align: center;">(p. 136-138)</p> 	<p><b><u>Wave Mechanical Model</u></b> *Electrons can act like <u>particles</u> and <u>waves</u> (just like light) *Electrons occupy orbitals. <b>Orbitals are nothing like orbits.</b> They are areas of <u>probability</u> (90% of electron probability) *Clinton Davisson and Lester Germer performed experiments to support the wave mechanical model.</p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="margin-right: 10px;">S orbital P. 142</div>  </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="margin-right: 10px;">P orbital P. 142</div>  </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">D orbital P. 145</div>  </div> </div>