

3.1 – Early Ideas About Matter

Time Travel Alert!
Start your temporal engines now!



Greeks

No scientific method early on – only philosophy.
Explanations of events based on life experiences.



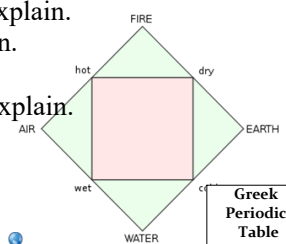
Greeks

Elements were Earth, Air, Fire, and Water,
which could be divided infinitely.

There was also a 5th element called “Aether”.

What are these be made of, and why do you think so?

1. A cow - all four - you explain.
2. Wood - all four - explain.
3. Steam - fire, water, air.
4. A diamond - all four - explain.



Democritus (460 – 370 B.C.)

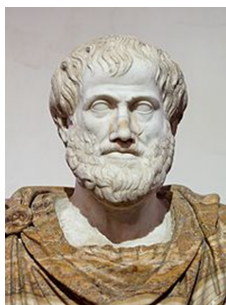
Matter not infinitely divisible – atom idea.
Atoms can't be created or destroyed.
Different sizes/shapes → move through empty space.
His ideas were way ahead of his time, but he had only philosophy to defend them.



Aristotle (Jones) (384 – 322 B.C.)

Stated that empty space can't exist.
Challenged atoms – believed in Earth, Air, Fire, Water model.
He asked “What holds atoms together?” to which there was no answer.

So influential was Aristotle that his denial of atom's existence went unchallenged for 2000 years.



Aristotle Jones

John Dalton (1766 – 1844)

An English chemist who revived the atomic concept in
1700's, by conducting Chemistry experiments which
wound up supporting Democritus' ideas.



John Dalton

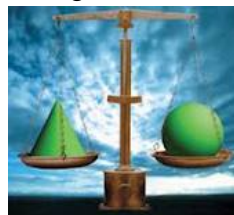
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Dalton's Theory:

1. Matter made of small particles called atoms.
Atoms of one element are:
 2. - indivisible and indestructible,
 3. - identical in size, mass, chemical properties,
 4. - different from those of other elements.
5. Atoms combine in simple whole number ratios to form compounds.
6. During reaction, atoms in a compound are separated, combined, or rearranged.

Significance

His theory explains the Law of Conservation of Mass atoms rearrange during reactions; are not created or destroyed.



Disengage Time Machines now.

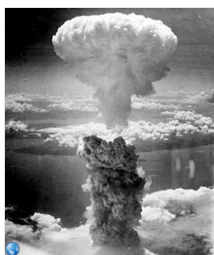
Drawbacks

Humanity has learned that his theory is not totally accurate.

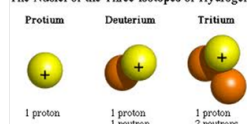
5. Which of John Dalton's points are inaccurate, and how are they?

1. Atoms are divisible.

2. Different elemental isotopes have different masses.



The Nuclei of the Three Isotopes of Hydrogen



Homework

Preview 3.2

3.1 Problems in your Booklet
Due: Next Class.