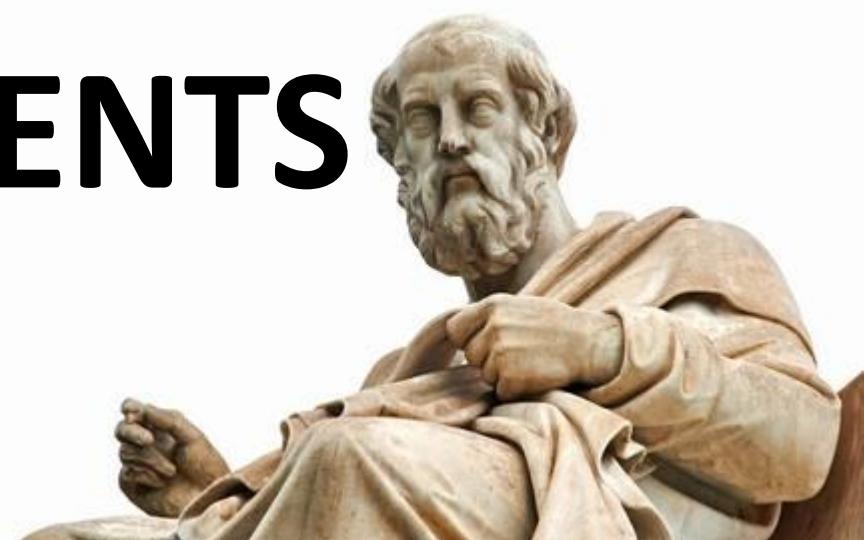


IDEAS OF ANCIENT GREEKS ON ATOM/ELEMENTS





Ancient Greeks

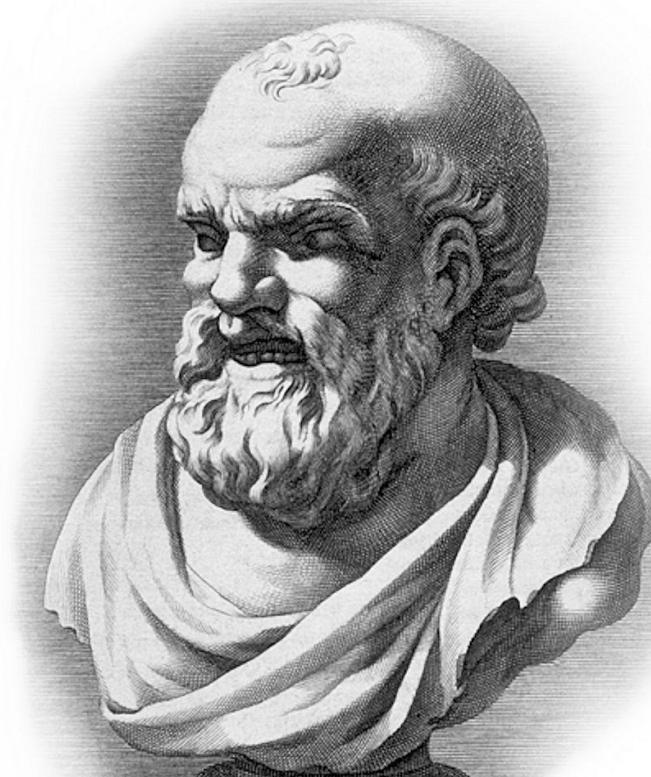


- What is an atom?
- What do you think are the ideas of people about atoms during ancient times?

Democritus

He proposed that all matter is made up of tiny, indivisible particles called **atoms**

greek “atomos” - uncuttable



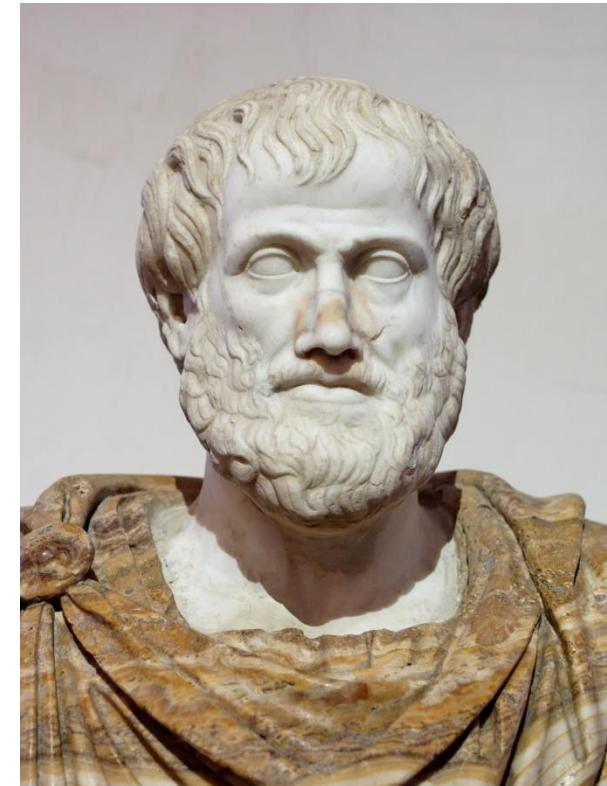
Democritus

Atoms:

- Completely solid
- Homogeneous
- Different shapes and sizes

Aristotle

A Greek philosopher that believed that everything in the universe is made up of the 4 elements: air, fire, water and earth.



Aristotle

Argued that believing that the atom is indivisible, puts a restriction to God.

Ideas of the Ancient Greeks about Atoms

- Democritus concluded that matter could not be divided into smaller and smaller pieces infinitely.
- Democritus called this indivisible smallest possible piece of matter an **atom**.
- The philosophers who shared the idea of Democritus about atom were called **atomists**.

Ideas of Atomists about Atoms

- Atoms are small, hard, made of the same materials, and had different sizes and shapes.
- Atoms could be combined, always moving, and infinite in number.
- Only a few people accepted these ideas.

- Who are the ancient people who made valuable contributions to the concept of elements?

Greeks on the concept of Element

Anaximenes – thought everything was made up of Air



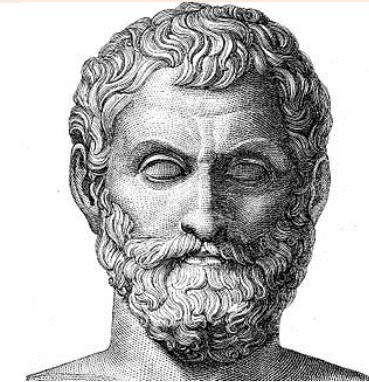
Heraclitus – thought fire made up everything



Greeks on the concept of Element

Thales – believed that all was made up of water

Xenophanes – assumed that everything was made up of earth



How Greeks view Elements

- The philosopher **Anaxagoras** argued that there was an infinite number of elementary natural substances in the form of infinitesimally small particles that combined to comprise the different things in the universe.

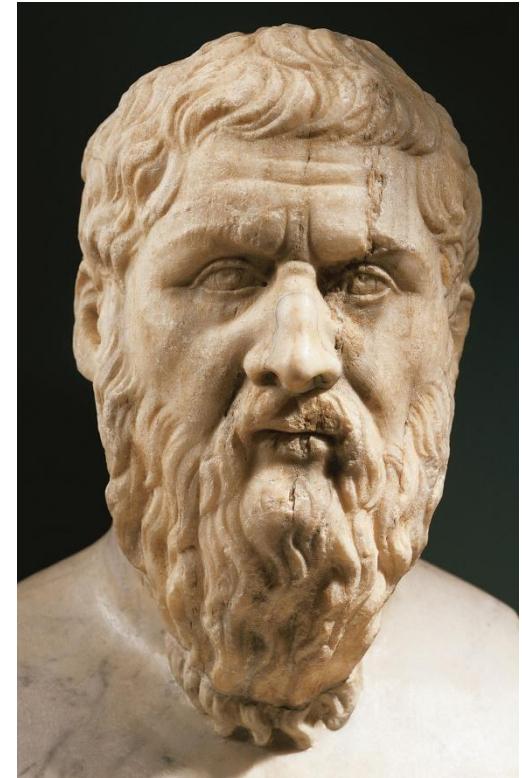
Empedocles

Proposed that air, fire, water and earth are primordial substances.



Plato

First used the term
Element from the Greek
word “στοιχεῖον”
(stoicheion) meaning
smallest division.

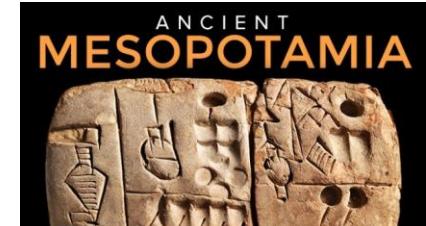


How Greeks view Elements

Aristotle, on the other hand, believed that the four elements could be balanced in substances in an infinite number of ways, and that when combined gave proportions of “essential qualities,” hot, dry, cold and wet.

Application of Concept in Different Civilizations

- The Mesopotamians had techniques to utilize metals like **gold and copper**.
- They even assigned certain symbols to match metals with the heavenly bodies such as the Sun and Moon.
- They also made use of other materials such as **dyes, glass, paints, and perfumes**.



Egyptian Civilization

- The Egyptians adapted techniques from the Mesopotamians and perfected the use of **bronze, dye and glass** that the Greeks later copied

Chinese Civilization

- The Chinese also had their own processes for **metalwork and ceramic materials**, but they especially focused on finding minerals, plants and substances that could prolong life.
- Some of the substances discovered in **Chinese medicine** have been found to have actual positive effects while others were found useless or even harmful, like mercury.

Indian Civilization

- The Indians, like the Chinese, had a kind of alchemy (rasayana) that looked at different substances and practices for **Vedic medicine**.
- They also perfected the **use of iron and steel** and were well-known manufacturers of **dyes, glass, cement, solutions for textiles, and soap**.

Let's Sum Up!

1. Describe the ideas of Ancient Greeks about atoms
2. Describe the ideas of Ancient Greeks about elements

EVALUATION

1. He proposed that all matter is made up of tiny, indivisible particles called **atoms**.
2. First used the term *Element* from the Greek word “stoicheion” meaning smallest division.

Questions:

3. Believed that everything in the universe
is made up of the 4 elements.
4. He believed that all was made up of
water

Questions:

5. He thought that everything was made up of Air
6. The Egyptians practiced Vedic medicine

Questions:

7. The Mesopotamians had techniques to utilize metals like gold and copper.
8. The Chinese focused on finding minerals, plants and substances that could prolong life.

Questions:

9. Indians perfected the use of iron and steel and were well-known manufacturers of dye.
10. The Greeks copied the use of bronze, dye and glass from Mesopotamians.