

Jeopardy Questions

- Define C.E., B.C.E., and circa
 - Common Era, Before Common Era, about
- How did ancient civilizations attempt to explain how the universe began?
 - Using Creation Stories
- The area of land near the Tigris and Euphrates Rivers was called what?
 - Fertile Crescent
- What was Empedocles most important idea?
 - All matter in universe is composed of 4 basic elements – air, water, fire, earth
- Who predicted a solar eclipse in 585 BCE and calculated the height of a pyramid by measuring its shadow and the angle of the sun?
 - Thales
- 6th century BCE Ionian philosopher, mathematician, scientist who said the origin of all matter is water?
 - Thales
- Did the ancient Babylonians and the Chinese base their calendar on the Moon or the Sun?
 - Moon
- Why was Herodotus important to the history of science?
 - World's first historian – he collected and organized information and approached the study of the past scientifically.
- What ancient people inhabited present-day Lebanon and were known for their ship-building, navigation skills, and the alphabet?
 - Phoenicians
- According to Empedocles, what were the two forces that guide all growth and actions?
 - Strife and Love
- Who was the 5th century BCE Greek who said that the four basic elements are earth, air, fire, and water?
 - Empedocles
- How long did the ideas of Empedocles endure?
 - 2300 years! Until the eighteenth century.
- Legend says that this famous ancient scientist/philosopher died by jumping into a volcano.
 - Empedocles
- What are the big questions of science that both ancient and modern people ask?
 - What is the Universe, when did it begin, who are we, how are we connected?
- What distinguished the thinking of the 'A-team' (four scientist/philosophers born in Ionia) from the majority of people of their time?
 - That reason rather than superstition was the explanation of events in nature, not that angry gods caused disasters
- Name two advantages to a Sun-based calendar.
 - Stays in line with the seasons; keeps accurate measure of time (365.25 days)

- Did the ancient Egyptians base their calendar on the Moon or Sun?
 - Sun
- Name two advantages to a lunar-based ancient calendar.
 - Allow people to predict light nights for hunting; moons repeating pattern provides reliable way to track time; mystic, god-like
- What hypothesis did Democritus state on which future scientists could base their work?
 - Early atomic theory - all matter is composed of indestructible atoms
- Define inductive reasoning and provide an example.
 - Specific to general
- Define deductive reasoning and provide an example.
 - General to specific
- What are Arabic numbers?
 - 1, 2, 3, etc.
- Indicate the following on a circle: diameter, radius, circumference.
- Describe the process of “squaring the circle” and why it was done?
- What is mathematical expression or equation for pi?
 - Circumference/Diameter
- What is the word for “the love of wisdom”?
 - Philosophy
- What were the only tools ancient people (Greeks) had to understand the world around them?
 - Observations of the sky, reason and logic, mathematics
- A shrine where Greeks went to worship Apollo and to hear prophecies of future events?
 - Oracle at Delphi
- Did the Ionians know about gravity?
 - No
- Matter that cannot be changed into a simpler form by ordinary chemical means; scientists now know of more than 100 of these?
 - elements
- 6th century BCE Ionian scientist, philosopher who said that air is the source of all matter; Mars and Venus are not stars and the earth is flat.
 - Anaximenes
- 5th century BCE Ionian/Greek scientist, philosopher who said that the Moon is made of ordinary matter (tiny seeds, like earth) and reflects the light of the Sun
 - Anaxagoras
- 6th century BCE Ionian philosopher, scientist who believed in many inhabited worlds, including the Moon; described the earth as a cylinder with a flat top that floats on top of the universe with nothing holding it; called the Father of Astronomy
 - Anaximander
- Why was Ionia a center of intellectual ferment?
 - Crossroads connecting many civilizations – Egypt, Sumeria, Babylon, India, Mongolia, China.

- What is the brightest star that the Egyptians based the beginning of their new year on it's reappearance?
 - Sirius
- Who invented and used the cuneiform language?
 - Sumerians
- What is one of the earliest known great civilizations (5000 yrs ago), located in modern day Iraq?
 - Sumer (Sumerians)
- Which can be tested and proved right or wrong – myth or science?
 - Science
- The square of the hypotenuse (the longest side) of a right triangle equals the sum of the squares of the other two sides – draw this theorem and provide its name.
 - Pythagorean Theorem
- Who determined that music has a mathematical order, introduced the 8-note octave and developed Greek musical theory?
 - Pythagoras
- This ancient Greek believed that everything in the world could be explained through mathematics. All is number, he said.
 - Pythagoras
- A number that cannot be turned into a ratio of two integers is called what?
 - Irrational number
- This Ionian believed that atoms are the smallest substance in the universe that can't be cut or destroyed and is basic to everything else
 - Democritus
- Why was the theory of atoms not advanced for 22 centuries after Democritus proposed it?
 - Lacked technology to experiment, prove
- What is the name of the physical principle that causes molecules to become less organized?
 - entropy
- This scientist/philosopher looked for beauty, truth, and clarity. He studied the human soul and told followers to "know thyself".
 - Socrates
- This scientist/philosopher believed the Sun, stars, and planets were attached to perfect, hard, crystal spheres.
 - Aristotle
- When planets appear to move backward, this optical illusion is called.
 - Retrograde motion
- The divine, everlasting element that Aristotle believed the heavens were made of was called
 - Aether
- 3rd century BCE Greek who believed that the Earth rotates on an inclined axis and revolves around a larger stationary Sun; also figured out the size of the Moon and its distance from the Earth.
 - Aristarchus

- Explain the difference between Hypothesis, Theory, and Fact by providing definitions of each.
 - Hypothesis – a possible and reasonable explanation for a set of observable facts
 - Theory – a well-tested explanation of observable facts; a verified hypothesis
 - Fact – information that has been tested and shown to be accurate by competent observers of the same phenomenon
- Explain how we can learn how molecules (atoms) behave if we cannot see them with our eyes?
 - By observing how food color spreads in different temp water
- What famous ruler was the student of Aristotle?
 - Alexander the Great
- What is “the science of correct reasoning”?
 - Logic
- What was the title of Aristotle’s book about the universe?
 - On the Heavens
- Aristotle believed this was upward motion which makes the elements fire and air rise
 - Levity
- Describe Aristotle’s cosmology (belief about the universe)
 - Believed in an eternal, unchanging universe; the Sun, stars and planets circle an unmoving Earth at the center of the universe
- What is the term used to describe an Earth-based universe?
 - Geo-centric
- What is the term used to describe a Sun-based universe?
 - Helio-centric
- 3rd century BCE Greek who believed the Earth rotates on an inclined axis and revolves around a larger stationary Sun
 - Aristarchus
- Geography Questions (locate these on a black line map):
 - Mediterranean Sea
 - Ionia
 - Aegean Sea
 - Tigris and Euphrates River
 - Mesopotamia
 - Egypt
 - Nile
 - Athens Greece

Final Jeopardy:

Imagine you are explaining how things work to an alien who is visiting Earth. Explain why the Earth has seasons. Write out your explanation; use diagrams if necessary or you may act it out, as long as your explanation is clear and correct.