

1) When did life first appear in the universe?

As far as we know, life appeared 4 billion years ago.

2) How long have human beings existed on the Earth?

Modern humans have existed for 200,000 years.

3) Describe what the Earth was like in the beginning.

A chaos of fire formed in the wake of its star, the Sun; molten rock, surging from the depths; an atmosphere devoid of oxygen, thick with water vapor, full of carbon dioxide; a furnace.

4) What enabled life to flourish on the Earth?

Water. At the right distance from the Sun, the Earth was able to conserve water in liquid form.

5) What primitive life forms transformed the Earth into a place suitable for life? How did this take place?

Archeobacteria, or blue-green algae; primitive plant cells, they transformed the atmosphere by producing oxygen.

6) What happened to the carbon that once poisoned Earth's atmosphere?

It is trapped in the Earth's crust. Microorganisms grew shells by tapping into the carbon in the atmosphere that had dissolved in the ocean; when they died, the shells sank and accumulated on the sea bed; they drained carbon from the atmosphere so other life forms could develop.

*HOME Worksheet – Part I*  
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7) Why is water described in the documentary as one of the most unstable forms of matter?

It takes a liquid form as running water, a gaseous form as water vapor, and a solid form as ice (all within a temperature range of only 100° C).

8) Where does most of the oxygen in the atmosphere come from?

Algae that tint the surface of the oceans have produced most of the oxygen in the atmosphere.

9) When did the first towns come into being and why? What was the result of this change?

Towns appeared around 6,000 years ago and allowed humans to defend themselves more easily. By living in towns, humans became social beings, meeting and sharing knowledge and crafts; they became civilized.

10) Why is it that the relationship between humans and the planet used to be evenly balanced?

In the past, humans only took from the Earth what was necessary to survive, as all of the things humans needed to survive had to be gotten through the use of muscle power alone.

11) What is termed in the documentary as "humans' first great revolution?" Why?

Agriculture was humans' first great revolution as it changed our relationship to nature. It brought an end to the uncertainty of the hunting and gathering lifestyle and resulted in the first surpluses. Agriculture gave birth to cities and to civilizations.

12) What forms of energy freed humans from their reliance on muscle power?

Coal, gas, and oil (the fossil fuels)

13) Over the past 60 years, how fast has the Earth's population increased?

It has almost tripled.

14) How many people now live in cities?

Over half of the Earth's seven billion inhabitants now live in cities.

15) What city is termed as the world's first megalopolis? How does this city rank in terms of the world's economies?

New York City was the first megalopolis. If treated as a separate nation, New York would have the world's 16<sup>th</sup> largest economy.

16) How much energy does a liter of oil generate?

Equal to 100 pairs of hands working for 24 hours.

17) Although the U.S. produces enough grain to feed two billion people, what is most of the grain used for?

Most of the grain the U.S. produces goes toward the production of livestock feed and bio-fuels.

18) What did the expansion of cultivated land and single-crop farming encourage? How has this problem been dealt with? What's wrong with this solution?

This led to the development of parasites (insects which consume crops). To solve the problem of parasites, chemical pesticides were developed. Unfortunately, pesticides seep into our land, air, and water, and are harmful to our health.

19) Over the last century, how many crop varieties have been wiped out?

Three-quarters of all the crop varieties humans have developed since we began agriculture were wiped out over the past century.

20) How many liters of water does it take to produce one kilo of beef?

It takes 13,000 liters of water to produce one kilo of beef (not to mention livestock feed, farm equipment, fuel for transportation, and so on).