

43.1 Deep Space



Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction



Summarize your understanding of each paragraph.

Deep space exploration (or deep-space exploration) is the branch of astronomy, astronautics and space technology involving exploring the distant regions of outer space. Physical exploration of space is conducted both by human spaceflights and by robotic spacecraft.

At present the furthest space probe mankind has constructed and launched from Earth is Voyager 1, which was announced on December 5, 2011 to have reached the outer edge of the Solar system, and entered interstellar space on August 25, 2012.

Research in deep space is ongoing and rapidly developing. In 2011, after the retirement of the space shuttle, NASA announced its intentions to invest money into developing three technologies vital to deep space exploration.

In June 2013, NASA announced the selection of eight American astronauts that will begin to train for future deep space missions beyond low Earth orbit. NASA intends that these eight astronauts to train for future Mars or asteroid travel.

Read/Summarize Text



1. Read the passage.
2. Underline key expressions in each sentence.
3. Re-write each word (or expression) you underlined.
4. Summarize the passage.

Interstellar travel

Interstellar travel is the term used for hypothetical crewed or uncrewed travel between stars or planetary systems.

Interstellar travel will be much more difficult than interplanetary spaceflight; the distances between the planets in the Solar System are less than 30 astronomical units (AU)—whereas the distances between stars are typically hundreds of thousands of AU, and usually expressed in light-years.

Because of the vastness of those distances, interstellar travel would require a high percentage of the speed of light; huge travel time, lasting from decades to millennia or longer; or a combination of both.

https://en.wikipedia.org/wiki/Interstellar_travel

Re-write words you underlined

Using a complete sentence, summarize or rephrase the passage

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

Solar sail

This article is about spacecraft propulsion by radiation pressure of sunlight.

Solar sails (also called light sails or photon sails) are a proposed method of spacecraft propulsion using radiation pressure exerted by sunlight on large mirrors. A useful analogy may be a sailing boat; the light exerting a force on the mirrors is akin to a sail being blown by the wind. High-energy laser beams could be used as an alternative light source to exert much greater force than would be possible using sunlight, a concept known as beam sailing.

Solar sail craft offer the possibility of low-cost operations combined with long operating lifetimes. Since they have few moving parts and use no propellant, they can potentially be used numerous times for delivery of payloads.

Solar sails use a phenomenon that has a proven, measured effect on spacecraft. Solar pressure affects all spacecraft, whether in interplanetary space or in orbit around a planet or small body. A typical spacecraft going to Mars, for example, will be displaced thousands of kilometers by solar pressure, so the effects must be accounted for in trajectory planning, which has been done since the time of the earliest interplanetary spacecraft of the 1960s. Solar pressure also affects the orientation of a craft, a factor that must be included in spacecraft design.

The total force exerted on an 800 by 800 meter solar sail, for example, is about 5 newtons (1.1 lbf) at Earth's distance from the Sun, making it a low-thrust propulsion system, similar to spacecraft propelled by electric engines, but as it uses no propellant, that force is exerted almost constantly and the collective effect over time is great enough to be considered a potential manner of propelling spacecraft.



https://en.wikipedia.org/wiki/Interstellar_travel

Artist's concept of The Planetary Society's LightSail spacecraft with its sail deployed. The cubesat has encountered several difficulties on its debut flight. Credit: The Planetary Society.

<https://www.space.com>

Draw Illustration



Copy and Label the Illustration in the Space Provided

Hubble Space Telescope



https://en.wikipedia.org/wiki/Hubble_Space_Telescope

Draw (Copy) the Illustration Here

Interpret a Graph



Write the title of the graph _____

Circle the type of chart this represents

Bar Chart Line Chart Pie Chart Other

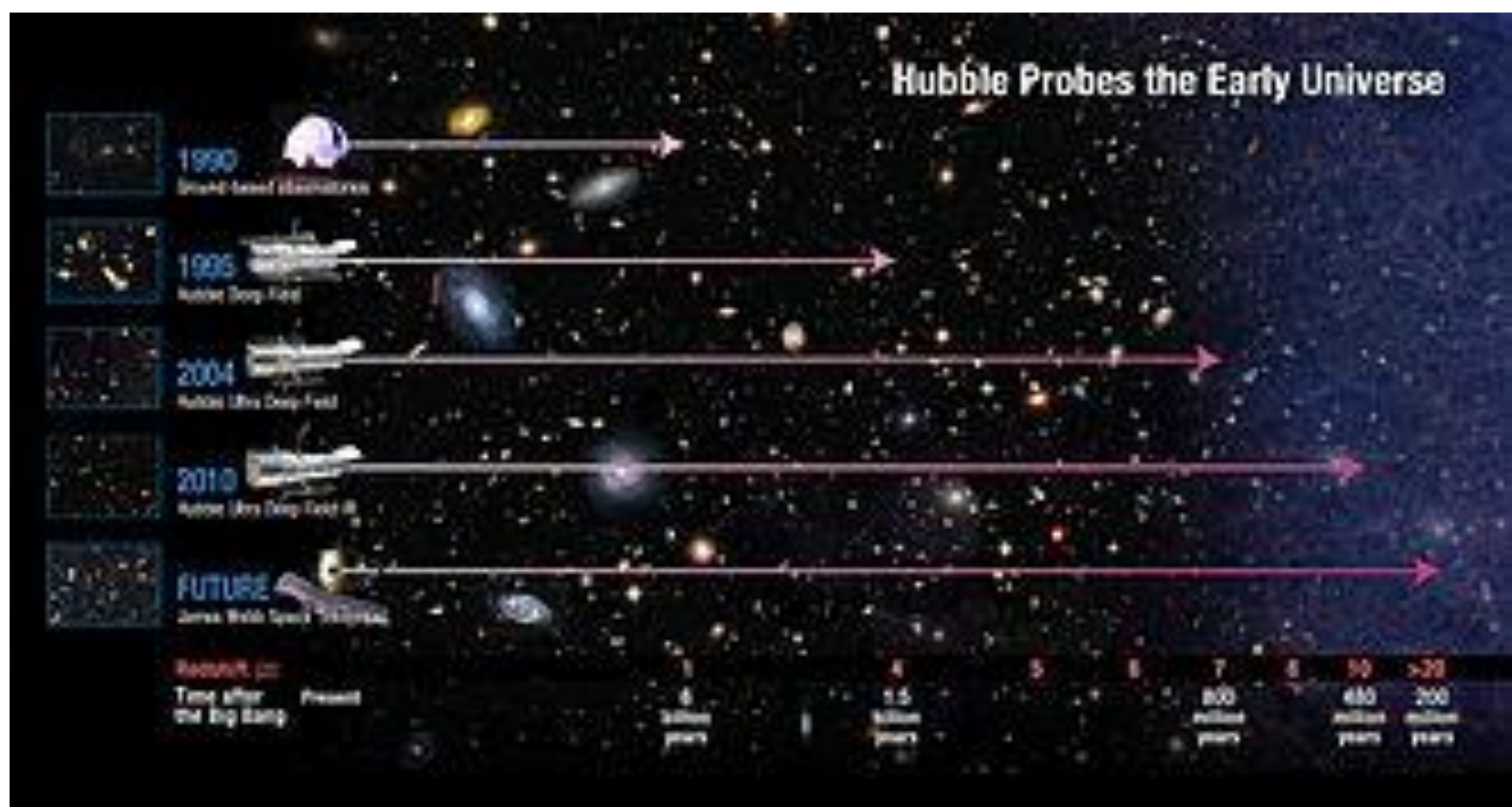
If applicable,

What does the X-axis represent _____

What does the Y-axis imply _____

Summarize what this graph represents or conveys

https://en.wikipedia.org/wiki/Hubble_Space_Telescope



Show-Off Your Smarts!



Instructions

- Complete as an individual.
- Use “critical thinking” skills – avoid using generic responses which would apply to almost any topic.

Q1. How can this information be applied to your life?

Q2. How might this information apply to US government policies?

Q3. What is a specific way Earth Scientists can apply this information?

Q4. How would you summarize this information to your ancestors?

Q5. How does this topic connect to math?

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic. Use a process, pyramid, relationship diagram, and one additional sketch of any kind.

Process

Pyramid

Relationship

Sketch