S2 Physics

Space Physics

Homework

Homework 1: The Solar System

1. Our Solar System is made up of various objects.

   a. Name the star that our planet orbits around.

   b. Name the 8 planets in our solar system.

   c. Which of these planets is the largest?

   d. What is meant by the term "light year?

   e. Copy and complete the table below showing the distances in light minutes or light years.

Destination	Distance (light years or light minutes)
Earth to Sun	
Sun to our nearest star	
To the edge of our galaxy	

2. Danielle and Sean are discussing eclipses. Sean explains to Danielle that a lunar eclipse occurs when the Moon passes through the Earth's shadow.

   What is meant by a solar eclipse?

3. Try to find out, from the internet or books;

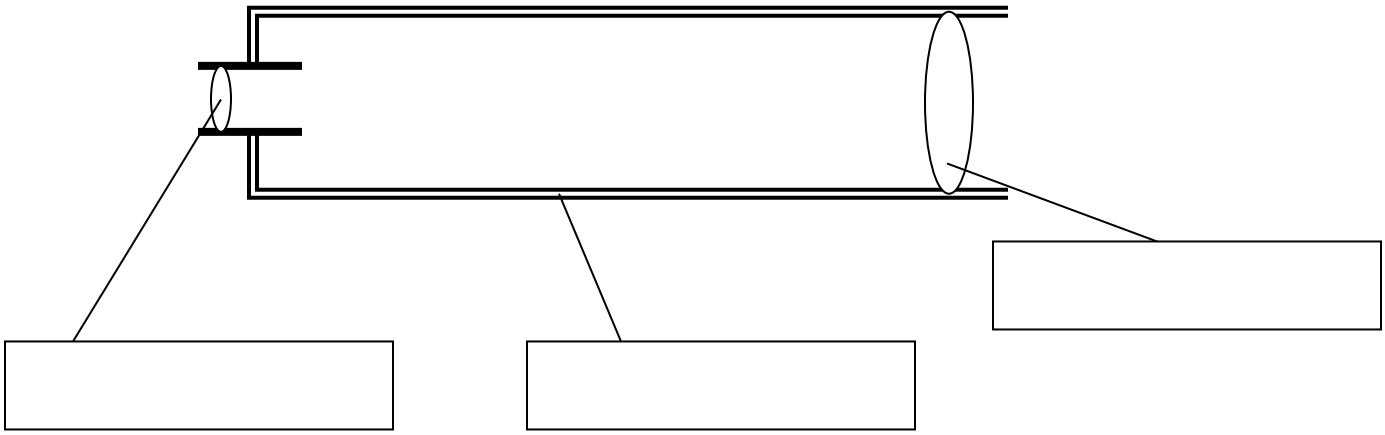
   a. When the next lunar eclipse will occur.

   b. The name of the nearest star to our own sun.

Homework 2: Signals from Space

1. The diagram below shows a refracting telescope.

   a. Copy the diagram and label the parts.



   b. When using the telescope shown the diameter of objective lens is reduced, what effect will this have on the image seen?

2. Astronomers also use a radio telescope to look at the sky. An optical telescope collects the light with the objective lens. What does a radio telescope use to collect radio waves?

3. The Hubble telescope is a telescope that has been put into orbit above the Earth. It was launched in 1990. However the mirror was incorrectly ground and it required correction. It now provides some groundbreaking pictures.

   Try to find out:

   What advantages does a telescope in space have over a telescope on Earth?

Homework 3: Space Travel

1. A space probe is sent to Mars to search for the presence of water.

    a. Draw a diagram showing the forces acting on the rocket during launch.

    b. For most of the journey between Earth and Mars the rocket motor is switched off. Explain how the probe can still travel towards Mars even though the motor is off.

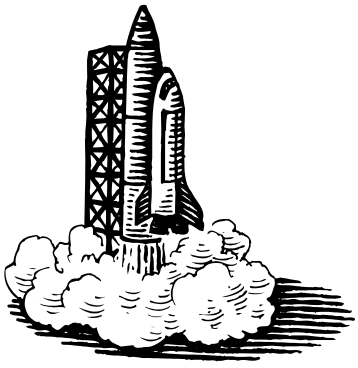
    c. Explain why large stellar distances are a problem for space travel, especially outside our solar system.

2. a. Why do spaceships not fall down to the ground when they orbit Earth ?

    b. While in orbit, objects appear to float around the space craft. Why does everything behave as if gravity has been turned off ?

3. a. Why does an astronaut on the moon weigh so little ?

    b. Which planet would make the astronaut feel the heaviest ?



Homework 4: Origins & Endings

1. The beginning …

   Scientists believe that our universe formed in the "Big Bang."

   a. Explain what observation led to the "Big Bang" theory.

   b. Are there any problems with the theory?

2. The middle …

   Scientists have studied stars and astronomical bodies to help us understand them better.

   a. Describe what happens to a star as it ages.

   b. What is a "black hole?"

3. The end …

   a. What is meant by "The Big Crunch?"

   b. What is meant by "The Big Freeze?"

   c. What evidence surprised scientists and led to the idea of "The Great Rip?"

4. The others …

   It has often been debated that we might not be the only planet with life forms in the Universe.

   a. Using the internet try to find out what SETI is.

   b. Do you think that Earth is the only planet in the Universe to hold life? Give reasons for your answer and also explain why others might disagree with you.