Name:

SOLAR SAILS-Reading Practice

A- Read the FIRST PART of the text. Are the sentence true (T) or false (F)?

Space is humankind's greatest mystery, and scientists and engineers want to learn more about the universe. So, how can we further explore the universe? How do we send things into space to collect data? How do we power and propel satellites and space probes? What are better ways we could travel through space?

To learn about the universe, we send astronauts, space shuttles, satellites and space probes to unknown regions of space to collect and send back information about the unknown. To send satellites and probes far into space, engineers design rockets to provide the thrust needed to escape the Earth's gravitational pull. Unfortunately, rockets have limitations that restrict how far and how quickly we can send satellites into space.

1- The text IS about exploring the universe. T ☐ F ☐

2- We ONLY explore space through SPACE SHUTTLES. T ☐ F ☐

3- The people and machines we send, HAVE NOT taught us about space. T ☐ F ☐

4- Rockets NEED to have thrust to escape Earth's gravity. T ☐ F ☐

5- Rockets have NO LIMITS in how quick and far they may go. T ☐ F ☐

B- Read the SECOND PART of the text. Name 2 problems of having FUEL POWERED rockets

Rockets are limited by the amount of fuel they can carry. Then, once their fuel runs out, they are unable to provide any more thrust to move the satellite or probe. The speeds that rockets can achieve are often not fast enough for scientists to explore far from Earth because it takes many months or even years for them to reach relatively close destinations. For example, sending a satellite to Mars takes 150-300 days, which is nearly a year. In order to send satellites beyond our solar system and even deeper into space, we need a way to provide prolonged propulsion throughout the entire space journey.

6- Problem 1

7- Problem 2

C- UNSCRAMBLE the words into a sentence.
ADD correct capitalization and punctuation.

8- we to study the universe send people and machines

9- to escape gravity a lot of thrust spacecrafts need

10- heavy fuel very is

11- of fuel can also run out ships

12- a solution need space engineers

D- Read the THIRD PART of the text, to work with the next SENTENCES and FRAGMENTS

One answer to this engineering problem is the *solar sail*. Solar sails use sunlight to move vehicles through space, much the same way wind pushes sailboats across water. A solar sail spacecraft has large reflective sails that capture the momentum or movement of the light from the sun and use it to push it. This type of ship may reach further places in space since it does not run out of fuel, as long as it has contact with light. It may also reach speeds that would be practically impossible for chemical rockets to achieve. This may happen because this type of ship is much lighter than a rocket moved by fuel. Furthermore, considering there is no resistance in space, a solar sail powered ship will continue to accelerate throughout its entire voyage.

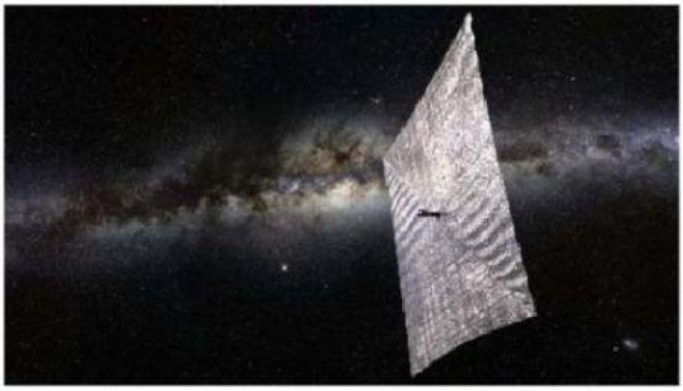

Figure 1. A solar sail.

Figure 2. Two engineers work on a cube-satellite that will be launched into space to test the deployment mechanism for a solar sail—the silver folded sheet

If the sentence is COMPLETE. You need to
a) Copy the sentence
b) Capitalize it
c) Add punctuation

If it is a FRAGMENT. You need to
a)Copy AND COMPLETE the sentence
b) Capitalize it
c) Add punctuation

13- One answer to this engineering problem

14- solar sails use the sun's energy to push a satellite through space

15-solar powered satellites don't

E- Write 2 SENTENCES about solar sails.

16-SENTENCE 1-

17-SENTENCE 2-

F- Write 2 QUESTIONS about solar sails.

18-QUESTION 1-

19-QUESTION 2-

G- Complete the given sentence starter using because, but, and so.

20-Ships with solar sails do not need to carry fuel BECAUSE

21-Ships with solar sails do not need to carry fuel SO

22-Ships with solar sails do not need to carry fuel BUT

H-Complete the sentences to COMPARE and CONTRAST fueled rockets to solar sails

23- LIKE fueled rockets, solar sails need a lot of thrust to

24- UNLIKE fueled rockets, solar sails do not need to carry

Fueled rockets can only go so far without running out of fuel,

25- ON THE OTHER HAND solar sails can continue to navigate as long as