

Name:

Date:

The following selection is an article about Ulyana Horodyskyj's science fair project. Read the article. Then answer the following questions.

TEEN SCIENTIST SOARING

Imagine presenting *your* science fair project to an audience of over 100 veteran rocket scientists, listening intently to hear what you had to say. With noticeable confidence, that's what 14-year-old Ulyana Horodyskyj did last summer before members of the Advanced Propulsion Research Workshop at the Jet Propulsion Laboratory (JPL) in Pasadena, CA. The project?

solar sail = a huge, lightweight sail powered by sunlight

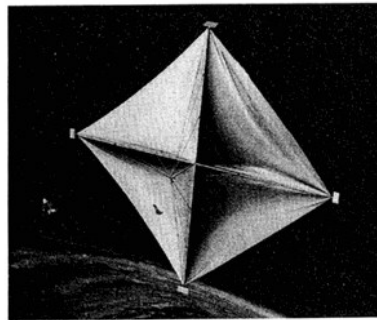
Her discovery that plus or minus 35.26 degrees is the ideal tilt angle required to achieve maximum thrust by a solar sail.

"The conference wasn't intimidating at all, just a little nerve-wracking," said Horodyskyj, then a ninth-grader from North Royalton, OH. "This hasn't sunk in yet. It's all a little overwhelming."

And understandably so. Overnight, Horodyskyj joined the ranks of propulsion research scientists for her work with solar sails. Additionally, the school science project earned her the right to represent the United States at the national Youth Science Forum in London, placed her first in several science fairs, and won her \$20,000 in scholarships.

Through computer simulations using Newton's laws of motion, Kepler's laws of orbital motion, and the method of Euler,¹ Horodyskyj demonstrated her technique for estimating the trajectory of a solar sail, noting how forces of gravity and sunlight influence the sail's propulsion. She concluded her presentation with

trajectory = path



a look at solar sails' ability to hover continuously over planet poles and function without fuel.

Though the project started out small, it grew and attracted the support of two older brothers, her father, and various scientists. Robert L. Forward, vice president and chief scientist at Tethers Unlimited, Inc., a JPL contractor, answered many of Horodyskyj's questions. "Her research report showed trial and error," Forward said. "One could see that she was actually learning during the process. This project has clearly helped her experience discovery."

Apparently, the end of the discovery period is nowhere in sight. Horodyskyj plans to continue working on solar sails, broadening her horizons to discover more about the effects of different shapes and various steering mechanisms.

¹Euler: Newton, Kepler, and Euler were well-known scientists.

- 1: Ulyana Horodyskyj says the conference was not intimidating. The word *intimidating* means about the same as
- A boring
 - B frightening
 - C exciting
 - D tiring

- 2: The author captures the readers' interest at the beginning of the article by
- F suggesting that readers put themselves in Horodyskyj's place
 - G explaining the details of Horodyskyj's science fair project
 - H describing the purpose of the conference
 - J providing readers with background information about solar sails
- 3: This article is mainly about
- A a student who wanted to become famous
 - B the procedure used in estimating the trajectory of a solar sail
 - C a student who received international attention for her science fair project
 - D the process for completing a complex science fair project
- 4: Which phrase best describes how Ulyana Horodyskyj felt when she presented her science fair project to the members of the Advanced Propulsion Research Workshop?
- F nervous, but confident
 - G happy, but cautious
 - H curious, but unsure
 - J reluctant, but brave

Read this poem by Sami Mahdi about morning. Then answer the following questions.



by Sami Mahdi

- 1 Darkness slowly lifts
2 the yawning street
3 shakes off the remnants of long sleep
- 4 garbage still heaped at the corners
5 the shops still closed
6 and little trees search for their reflections
7 in the shining window panes.
- 8 Now the houses begin to show some movement
9 a window opens here
10 a balcony there as a lovely shadow
11 emerges with the morning light
12 A little while, then quickly
13 the earth goes crazy
14 a bus appears,
15 then another,
16 then another,
17 and people rush forth in every street and alley.

Translated by May Jayyusi

- 5: Read these lines from the poem:

*the yawning street
shakes off the remnants of long sleep*

Remnants means about the same thing as

- A hours
 - B memories
 - C last traces
 - D hidden dreams
- 6: Look at lines 8 through 11 of the poem again. Which phrase best characterizes that section of the poem?
- F great commotion
 - G mild stirrings
 - H thrilling suspense
 - J mysterious happenings
- 7: The “little trees” in the poem are described as if they were
- A trying to wake up
 - B yearning for water
 - C looking in the mirror
 - D expecting to grow taller
- 8: The main contrast in the poem is between
- F the coolness of dawn and the heat of the day
 - G early morning and late afternoon
 - H inactivity and motion
 - J dirt and cleanliness