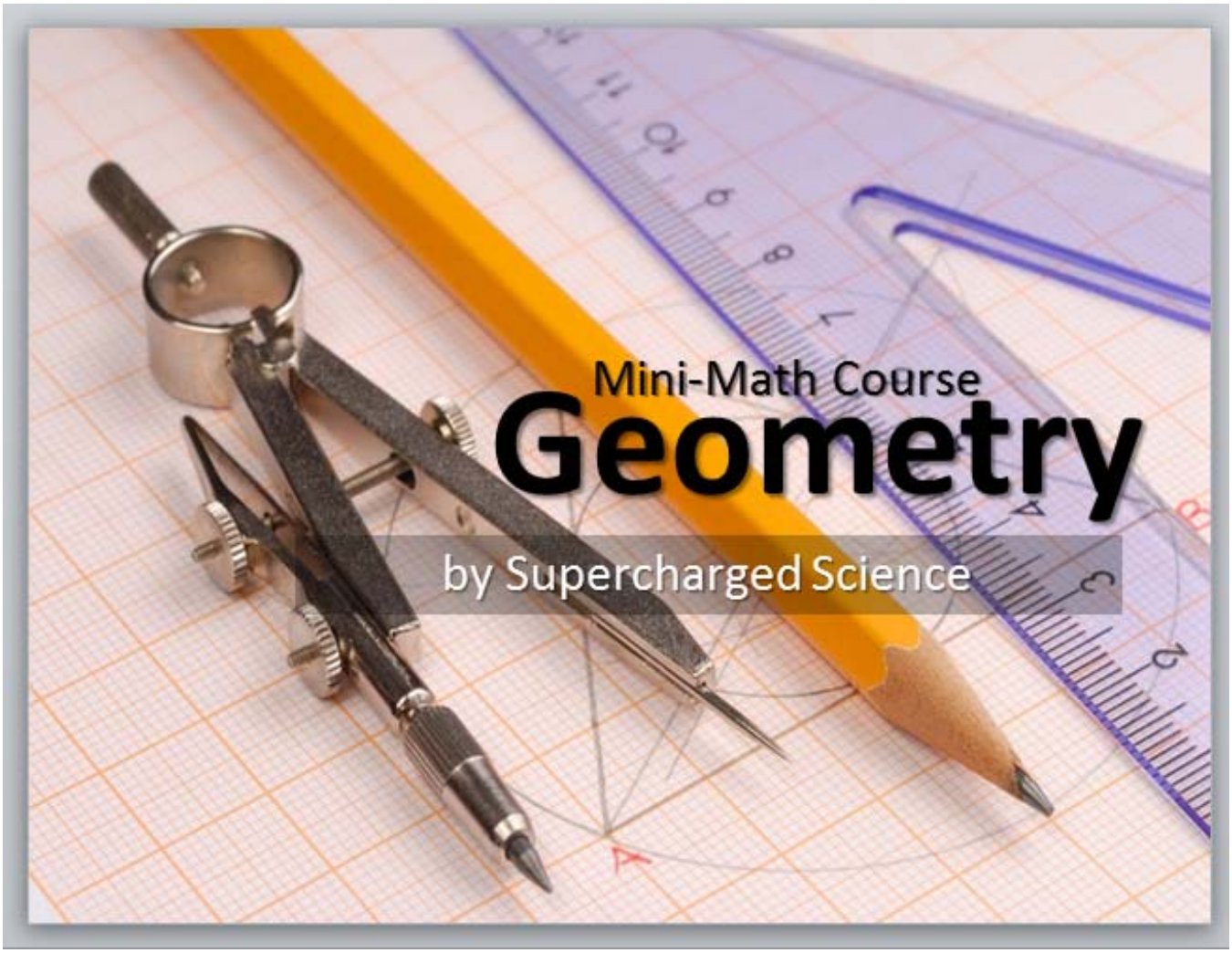
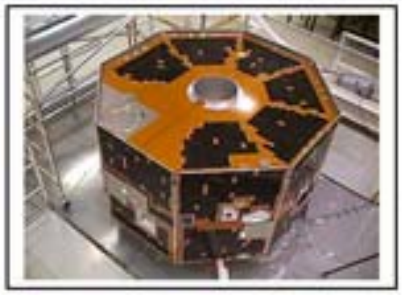

Mini-Math Course
Geometry
by Supercharged Science

Geometry Basics

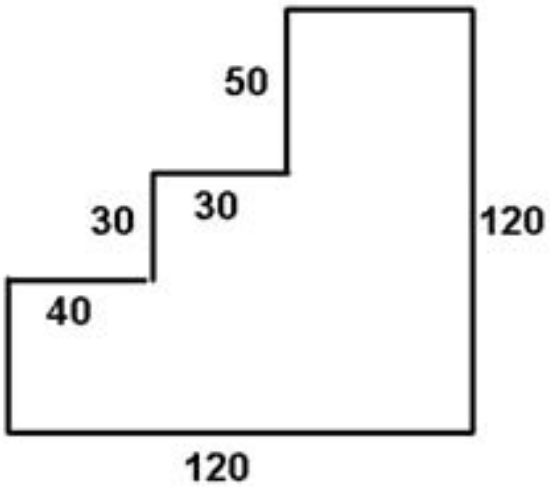
- **Point**
- **Line** connects points and extends infinitely in both directions
- A **ray** is like a laser – it starts at one end and goes on infinitely.
- A **line segment** starts at one end and ends at the other.
- An **angle** is when two rays meet at a point measured in "degrees".
- **Parallel** lines never meet.
- **Perpendicular** lines meet at a 90 degree angle.

Solar Electricity #1

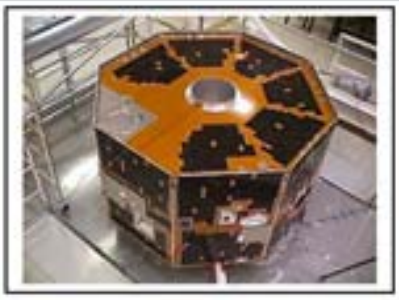


The solar cells can provide 0.03 watts per square centimeter, and the satellite needs 257 watts.

Is there enough surface area in the figure to the left to meet the electrical needs?

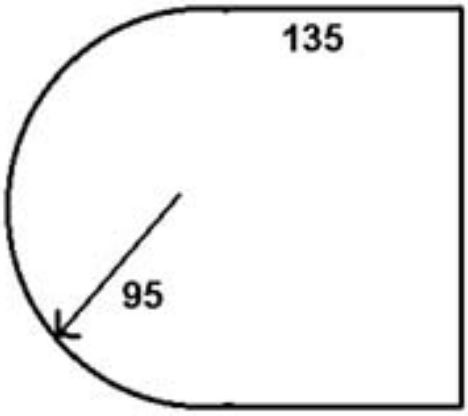


Solar Electricity #2

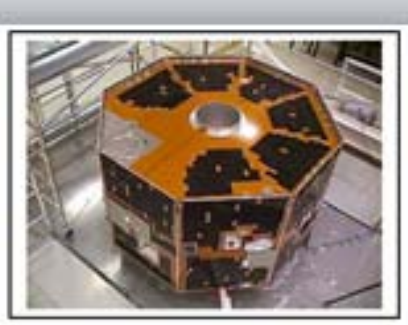


The solar cells can provide 0.03 watts per square centimeter, and the satellite needs 957 watts.

Is there enough surface area in the figure to the right to meet the electrical needs?

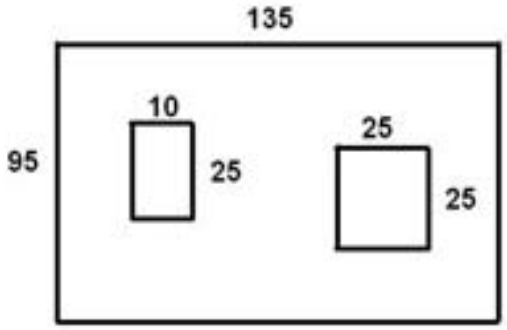


Solar Electricity #3

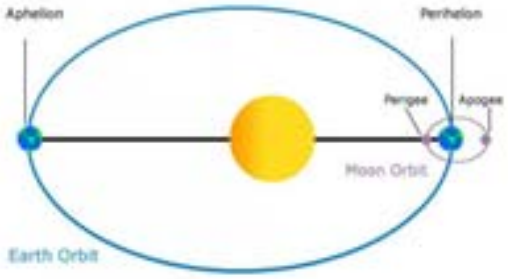


The solar cells can provide 0.03 watts per square centimeter, and the satellite needs 759 watts.

Is there enough surface area in the figure to the left to meet the electrical needs?

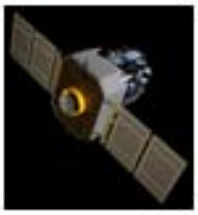


#4 Changes in the Sun's Diameter

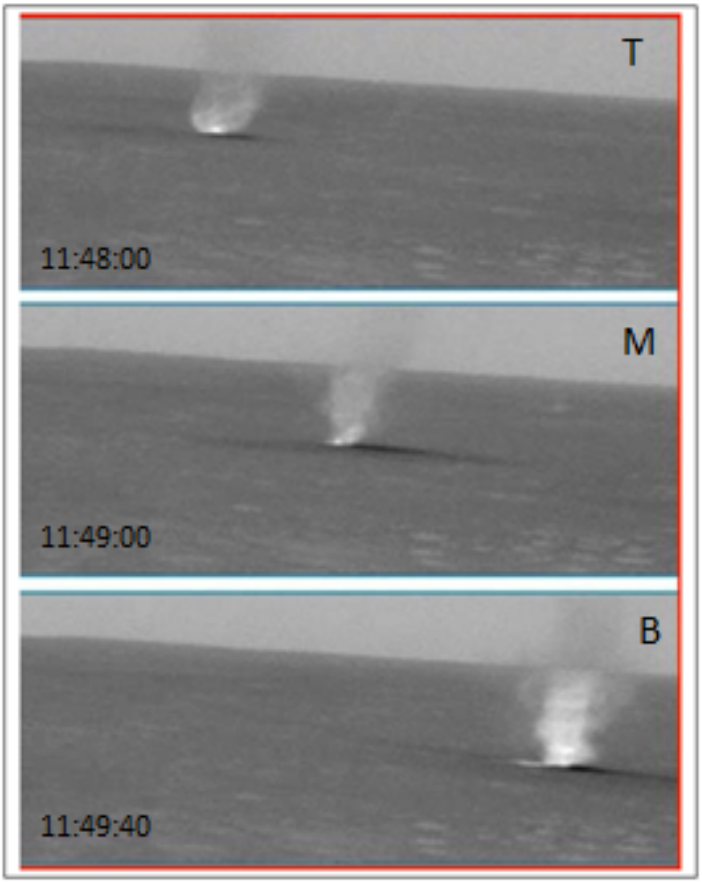


1. What is the average diameter of the Sun?

2. What percentage did it change compared to its average diameter?



"peri" = near



#5 Martian Whirlwinds

The whirlwind was about 1.0 km from the rover at the start of the sequence of images on the slopes of the "Columbia Hills."

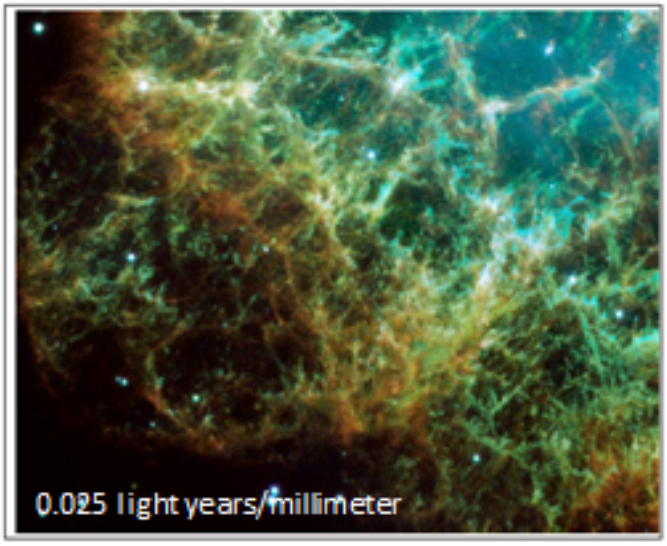
How far did it travel?

How fast was it moving?

Was it accelerating?

#6 Exploding Star Calculations

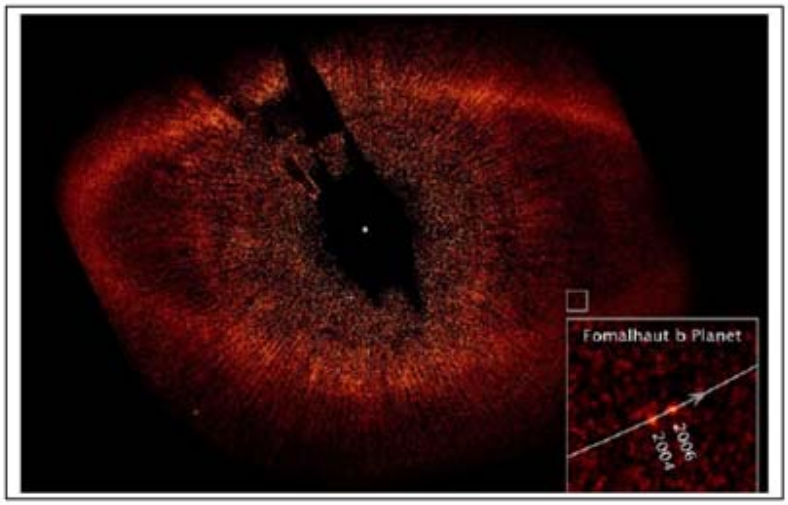
Crab Nebula image taken in 2005 by the Hubble Space Telescope.



Problem 1 – What is the average speed of the expanding gas cloud in kilometers/hour?

1 light year = 62,000 AU
1 AU = 150 million kilometers
1 year = 8,760 hours

#7 Distant Planet Detection



Problem 1 – How far was the planet from the star in 2006?

Problem 2 – How many years would it take the planet to make a full orbit around its star?

(Planet traveled 1.2 AU small box on lower right of image)

The scale of the image is 2.7 AU/millimeter.
1.0 AU = 150 million kilometers
1 year = 8760 hours