



Get the Data

Visit EOSS <http://1.usa.gov/RkSMFA> to recreate the scene shown above.
Recommended operating system: MS Vista or later; Browser: MS Internet Explorer 8 or later.

Step 1 – Click on the ‘Visual Controls’ tab and make sure that the following items are selected with a ‘white spot’: spacecraft, planets, labels, orbit lines, trails and metric.

Step 2 - Activate the ‘Distance Tool’ by pointing cursor at a planet name label (example ‘Sun’) and right-clicking mouse. Select bottom function ‘Measure distances’. Then point to destination target name label (example ‘Mars’) and left-click mouse to open From-To measurement panel. Read out the distance in kilometers. Also provided is the light travel time!

Answering Questions

Some stars are so big that if our solar system orbited them, many of its planets would be inside these stars! The radius of our sun is about 700,000 kilometers. Sometimes it is helpful to use our own solar system as a measuring stick to get a better idea of how big stars can get as they evolve!

Solve the following proportional relationships to get each star’s radius in kilometers. Then use *Eyes on the Solar System* to measure this distance from the center of our sun, and see how many planets are swallowed up by each star!

Math Challenge

Problem 1 – Capella is 12 times as big as our sun.

Problem 2 – Polaris the ‘North Star’ is 46 times our sun’s radius.

Problem 3 – Rigel is 78 times the radius of our sun.

Problem 4 – Antares has a radius of 620 million kilometers.

Problem 5 – VX Sagittari is 1520 times the radius of our sun.

Answer Key

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For this EOSS view on July 12, 2012 the distance to the planets from the Sun were:

Mercury 69 million km;	Mars 234 million km;
Venus 106 million km;	Jupiter 749 million km;
Earth 151 million km;	Saturn 1457 million km.

Problem 1 – Capella is 12 times as big as our sun.

$12 \times 700,000 \text{ km} = 8,400,000 \text{ km}$. The surface is inside the orbit of Mercury.

Problem 2 – Polaris the ‘North Star’ is 46 times our sun’s radius.

$46 \times 700,000 \text{ km} = 32,200,000 \text{ km}$. This surface is inside the orbit of Mercury.

Problem 3 – Rigel is 78 times the radius of our sun.

$78 \times 700,000 \text{ km} = 54,600,000 \text{ km}$. The surface is inside the orbit of mercury.

Problem 4 – Antares has a radius of 620 million kilometers.

$620 \times 700,000 \text{ km} = 434,000,000 \text{ km}$. The surface has engulfed Mercury, Venus, Earth and Mars!

Problem 5 – VX Sagittari is 1520 times the radius of our sun.

$1520 \times 700,000 \text{ km} = 1,064,000,000 \text{ km}$. The surface has engulfed all planets inside the orbit of Saturn!