π IN THE SKY³

Just like NASA's science and engineering pros, use pi to keep Earth's science satellites powered while Mercury transits the sun.

Discover more "π in the sky" math problems at:

jpl.nasa.gov/edu/nasapidaychallenge

SUN SCREEN

A transit occurs when a planet passes in front of the disk of a star. As seen from Earth, only Mercury and Venus transit our star, the sun. During a transit, there is a slight dip in the amount of solar energy reaching Earth, which can be found using this equation:

$$B\% = 100\left(\frac{\pi r^2}{\pi R^2}\right)$$

B = percentage drop in the brightness of the sun
r = the radius of the planet as it appears from Earth (in arcseconds)
R = the radius of the sun as it appears from Earth (in arcseconds)

With many solar-powered satellites orbiting Earth, it's important to know what impact a dip in solar energy might have.

If 1,360.8 w/m² of solar energy reaches the top of Earth's atmosphere, how many fewer watts reach Earth when Mercury (diameter = 12 arcseconds) transits the sun (diameter = 1,909 arcseconds)?

LEARN MORE ABOUT MERCURY
solarsystem.nasa.gov/planets/mercury