

**Chapter  
2**
**Performance Task (continued)**
**Precisely Perfect**

Building and carpentry are two areas in which it is very important to carefully measure and calculate. Space exploration is another. What level of accuracy is needed for a telescope? How does this level change depending on what you are viewing?

Different telescopes can help you see many things, such as a bird's nest in a tree, the surface of the Moon, or deep into space. Greater distances require more accurate telescopes. The accuracy of a telescope is measured in arcminutes and arcseconds, which are units of angular measurement. There are 60 arcminutes in 1 degree, and there are 60 arcseconds in 1 arcminute.

1. Use a rational number to complete each statement.

$$1 \text{ arcminute} = \underline{\hspace{2cm}} \text{ degree}$$

$$1 \text{ arcsecond} = \underline{\hspace{2cm}} \text{ arcminute}$$

$$1 \text{ arcsecond} = \underline{\hspace{2cm}} \text{ degree}$$

In Exercises 2–5, use the table below, which shows the accuracy of seven telescopes.

Telescope	Accuracy (arcseconds)
Hubble Space Telescope	$\frac{7}{1000}$
Spitzer Space Telescope	0.5
Kepler Space Telescope	10
Standard 16-inch Telescope	1
SWIFT Space Telescope	240
CoRoT Space Telescope	$\frac{1}{2}$
Standard Beginner's Telescope	$1\frac{52}{100}$

**Chapter  
2****Performance Task** (continued)**Precisely Perfect**

2. A telescope that can pinpoint an object to within 1 foot is less accurate than a telescope that can pinpoint an object to within 1 inch. Order the telescopes from least accurate (greatest number of arcseconds) to most accurate (least number of arcseconds). If two or more telescopes have the same accuracy, list them in alphabetical order.
  
  
  
  
  
  
  
  
  
  
3. Which two telescopes have the same accuracy? How accurate are these telescopes?
  
  
  
  
  
  
  
  
  
  
4. Which telescope is 10 times more accurate than the Kepler Space Telescope? Explain the calculations you used to find your answer.
  
  
  
  
  
  
  
  
  
  
5. It is no surprise that the Hubble Space Telescope is more accurate than a Standard 16-inch Telescope that you might have at home. How many times more accurate is the Hubble Space Telescope? Round your answer to the nearest whole number. Justify your answer by showing your work.