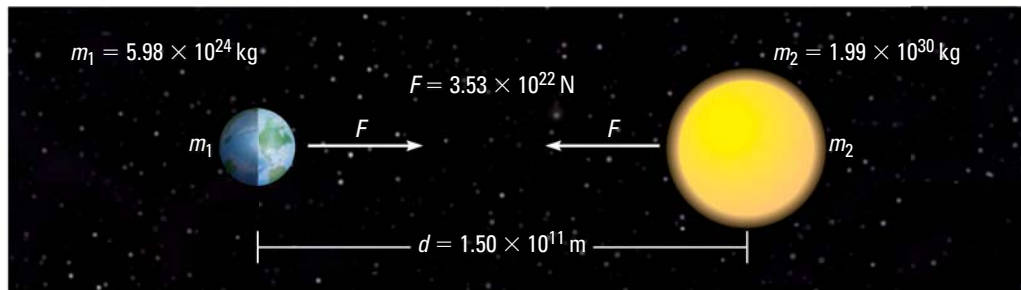
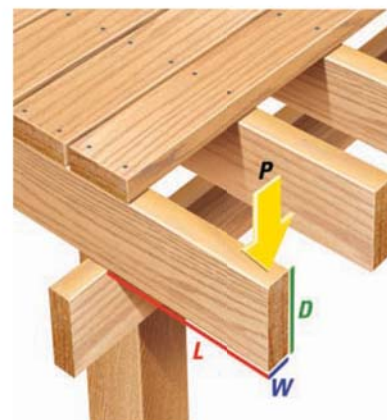


41. **TAKS REASONING** The law of universal gravitation states that the gravitational force  $F$  (in Newtons) between two objects varies jointly with their masses  $m_1$  and  $m_2$  (in kilograms) and inversely with the square of the distance  $d$  (in meters) between the two objects. The constant of variation is denoted by  $G$  and is called the *universal gravitational constant*.



- a. **Model** Write an equation that gives  $F$  in terms of  $m_1$ ,  $m_2$ ,  $d$  and  $G$ .
- b. **Approximate** Use the information above about Earth and the Sun to approximate the universal gravitational constant  $G$ .
- c. **Reasoning** Explain what happens to the gravitational force as the masses of the two objects increase and the distance between them is held constant. Explain what happens to the gravitational force as the masses of the two objects are held constant and the distance between them increases.
42. **CHALLENGE** The load  $P$  (in pounds) that can be safely supported by a horizontal beam varies jointly with the beam's width  $W$  and the square of its depth  $D$ , and inversely with its unsupported length  $L$ .
- a. How does  $P$  change when the width and length of the beam are doubled?
- b. How does  $P$  change when the width and depth of the beam are doubled?
- c. How does  $P$  change when all three dimensions are doubled?
- d. Describe several ways a beam can be modified if the safe load it is required to support is increased by a factor of 4.



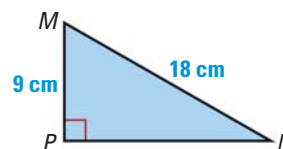
**MIXED REVIEW FOR TAKS** **TAKS PRACTICE** at classzone.com

**REVIEW**

TAKS Preparation p. 324; TAKS Workbook

43. **TAKS PRACTICE** What is the approximate area of  $\triangle MNP$ ? **TAKS Obj. 6**

- (A)  $40.5 \text{ cm}^2$  (B)  $57.3 \text{ cm}^2$   
 (C)  $70.1 \text{ cm}^2$  (D)  $114.6 \text{ cm}^2$



**REVIEW**

TAKS Preparation p. 544; TAKS Workbook

44. **TAKS PRACTICE** The solid at the right has 14 faces: 8 hexagons and 6 squares. How many vertices does the solid have? **TAKS Obj. 7**

- (F) 24 (G) 32  
 (H) 44 (J) 88

