

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Static Forces Worksheet

*example answers*

In your group, choose one person to be the test subject, another to make measurements, and another to record measurements and values.

1. What is the approximate area of the sole of the shoe (in  $\text{cm}^2$ )?

$$28 \text{ cm} \times 10 \text{ cm} = 280 \text{ cm}^2$$

Convert your answer to  $\text{m}^2$ .

$$0.28 \text{ m}^2$$

2. What is the mass of the person wearing the shoe (in kg)?

$$60 \text{ kg}$$

3. Calculate the force of the person standing on the ground, using Newton's second law.

$$\begin{aligned} F &= m \cdot a \\ F &= 60 \text{ kg} \cdot 9.8 \text{ m/s}^2 \\ F &= 588 \text{ N} \end{aligned}$$

4. What is the pressure on the sole of the shoe, assuming the weight is evenly distributed?

$$\begin{aligned} P &= F/A \\ P &= 588 \text{ N} / 0.28 \text{ m}^2 \\ P &= 2,100 \text{ Pa} \end{aligned}$$