

PRACTICE

Activity 8: Unbalanced and Balanced Forces

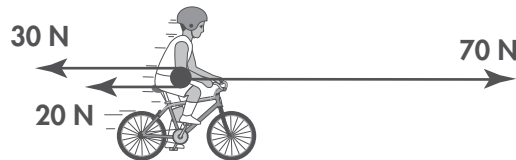
Name _____

Date _____

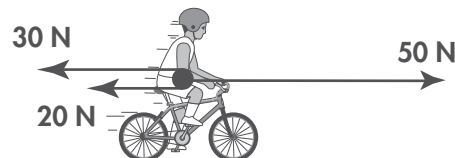
Class _____

1. What is the standard unit of force strength, and who is it named after?

2. Suppose a bicycle experiences forces like those shown by the force arrows with the force strengths in the picture below. What is the strength and direction of the unbalanced force on the bicycle?



3. Later, the forces on the bicycle are like those shown by the force arrows in the picture below. What is the strength and direction of the unbalanced force on the bicycle?



4. In the Yukon, a team of four dogs heading west across a snow-covered plain exerts a force of 2000 N on a loaded sled. As the sled is moving, there is a wind blowing toward the east that exerts a force of strength 400 N on the sled. In addition, there is a friction force of 700 N resisting the motion of the sled. What is the strength and direction of the unbalanced force on the sled?

5. Consider a situation where you are pushing to the left with a force of strength 10 N against a heavy chair, but the chair is *not moving*. Because the chair is not moving, the multiple forces acting on it must be balanced. Assume that a friction force is preventing you from moving the chair. Find the strength and direction of the friction force.
6. Three boys and two girls engage in a tug of war. Simon, Antonio, and Chan exert forces of 30 N, 45 N, and 20 N on the rope, all directed to the left. Rosalie and Luisa exert forces of 20 N and 30 N on the rope, both directed to the right.
- a) What is the strength and direction of the unbalanced force on the rope?
- b) Elizabeth joins the girls in the tug of war and balances the forces on the rope. What is the strength and direction of the force Elizabeth exerts on the rope?