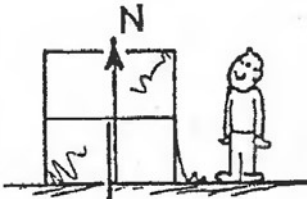


# CONCEPTUAL *Physics* PRACTICE PAGE

## Chapter 4 Newton's Second Law of Motion

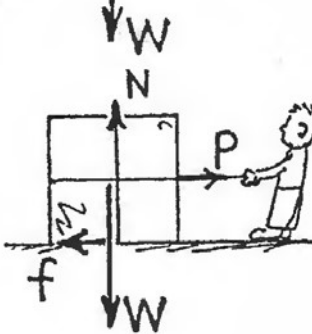
### Friction



1. A crate filled with delicious junk food rests on a horizontal floor. Only gravity and the support force of the floor act on it, as shown by the vectors for weight  $W$  and normal force  $N$ .

a. The net force on the crate is [zero] [greater than zero].

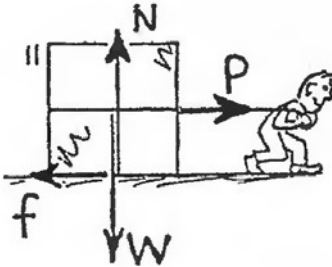
b. Evidence for this is \_\_\_\_\_



2. A slight pull  $P$  is exerted on the crate, not enough to move it. A force of friction  $f$  now acts,

a. which is [less than] [equal to] [greater than]  $P$ .

b. Net force on the crate is [zero] [greater than zero].

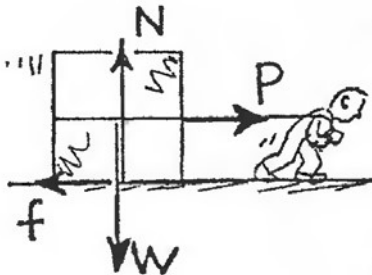


3. Pull  $P$  is increased until the crate begins to move. It is pulled so that it moves with constant velocity across the floor.

a. Friction  $f$  is [less than] [equal to] [greater than]  $P$ .

b. Constant velocity means acceleration is [zero] [more than zero].

c. Net force on the crate is [less than] [equal to] [more than] zero.



4. Pull  $P$  is further increased and is now greater than friction  $f$ .

a. Net force on the crate is [less than] [equal to] [greater than] zero.

b. The net force acts toward the right, so acceleration acts toward the [left] [right].

5. If the pulling force  $P$  is 150 N and the crate doesn't move, what is the magnitude of  $f$ ? \_\_\_\_\_

6. If the pulling force  $P$  is 200 N and the crate doesn't move, what is the magnitude of  $f$ ? \_\_\_\_\_

7. If the force of sliding friction is 250 N, what force is necessary to keep the crate sliding at constant velocity? \_\_\_\_\_

8. If the mass of the crate is 50 kg and sliding friction is 250 N, what is the acceleration of the crate when the pulling force is 250 N? \_\_\_\_\_ 300 N? \_\_\_\_\_ 500 N? \_\_\_\_\_