Normal Force and Friction   Name:_____

Part I. Fill in the missing pieces of information.

FORCE NAME	SYMBOL	DESCRIPTION
Tension		
		Force that opposes motion.
	F_g	
		Support force that acts perpendicular to a surface.
	F_A	

2) An box has a mass of 3.8 kg. What is the normal force acting on the box if it is resting on a table top on…
   a) Earth   b) the Moon (1/6 g)   c) Jupiter (2.54g)

3) A book has a mass of 2.5 kg. What is the normal force (on Earth) acting on the book under the following scenarios?
   a) The book is resting on a table.   b) You press down on the book with   c) You lift the book up with a force
                                                 a force of 5 N.   of 5 N.

Part II. Relationships
4) The force of friction is _____proportional to the normal force.
5) The force of friction is _____proportional to µ (coefficient of friction).

The force of friction acting on an object is 20 N. The object is on a lab table.

6) What will the new F_f be if the µ between the surfaces   9) What will the new F_f be if the table is moved to the
   is doubled?   moon where g is 1/6th of what it is on Earth?

factor changed	new force of friction

factor changed	new force of friction

7)   What will the new F_f be if the normal force is reduced   10) What will the new F_f be if the velocity of the object is
   by 1/3rd?   tripled?

factor changed	new force of friction

factor changed	new force of friction

8) What will the new F_f be if the mass of the object is   11) What will the new F_f be if the surface area of the
   doubled?   block is cut in half?

factor changed	new force of friction

factor changed	new force of friction

Part III. Practice Problems

12) A 38 N sneaker moving along a table, coefficient of friction of 0.2, at a constant velocity. What is the frictional
force between the sneaker and the table?

14) A 15 kg tricycle rolls along a horizontal street at a constant velocity of 4.0 m/s. The frictional force exerted on
the object is 26 N. What is the coefficient of sliding friction between the tricycle and the street?

15)   An object moving along a horizontal surface at a constant velocity of 800m/s has a frictional force of 30 N acting
on it. If the coefficient of sliding friction between the object and the surface is 0.7, what is…
a) the normal force acting on the object?   b) the weight of the object?   c) the mass of the object?

16) A 100 N force pulls a 20 kg box to the right and gives it an acceleration of 4 m/s^2.
            a) What is the net force on the box?   c) What is the F_N on the box?

20 kg

            b) What is the force of friction?   d) What is the coefficient of friction?

17) A 600 N force to the left is applied to a box of mass 30 kg. If the coefficient of sliding friction between the box
and the floor is 0.4, at what rate does the box accelerate?

30 kg