

Friction (p. 126 – 130)**I. Static & Kinetic Friction**

1. Define the term kinetic friction.

Kinetic Friction – force exerted on one surface by another when the two surfaces rub against each other

2. List three examples of kinetic friction occurring.

1. Baseball runner sliding
2. Moving a dresser
3. pencil on paper

3. One or both objects are moving when kinetic friction is present.

Circle One : True False

4. Define the term static friction.

Static Friction – force exerted on one surface by another when there is no motion between two surfaces
(No movement = harder pushed causes more friction)

5. List three examples of static friction occurring.

1. Pushing a heavy safe
2. Pushing football skids (small person)
3. Tractor pull

6. Once the force applied is greater than the ~~minimum~~^{maximum} static friction, an object begins moving.Circle One : True False7. Circle the letters of the properties that do not affect frictional forces?

- a. Surface materials
- b. Surface area in contact
- c. Speed of the motion
- d. Normal force

Tire misconception

Still same materials touching

8. The harder one object is pushed against the other, the ~~less~~^{more} the force of friction produced.Circle One : True FalseNewton's 3rd Law

9. More force is required to move an object over a smooth surface rather than a rough surface.

Circle One : True False

10. Define the term coefficient of kinetic friction.

Coefficient Of Kinetic Friction – slope of a line, μ_k , between two surfaces, relating frictional force to normal force

11. What does F_N represent?

F_N = normal force (force exerted by surface on object)

12. What does μ represent?

μ = coefficient of friction (k = kinetic; s = static)

13. Write out the formula to determine kinetic friction force.

$F_{f, kinetic} = \mu_k F_N$

$F_{f, kinetic} = \text{Newtons}$
 $F_N = \text{Newtons}$
 $\mu_k = \text{No units}$

14. Define the term coefficient of static friction.

Coefficient Of Static Friction – dimensionless constant depending on the two surfaces in contact
 (used to calculate maximum static friction to overcome)

15. Write out the formula to determine static friction force.

$F_{f, static} \leq \mu_s F_N$

16. The maximum static friction to overcome before movement can begin is $\mu_s F_N$.

Circle One : True False

17. When determining the frictional force present in a system, F_f and F_N are at right angles to each other.

Circle One : True False

Set coordinate system in compliance!

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 Table
 Typical Coefficients
 of Friction