PRINCETON UNIVERSITY

MATERIALS ACADEMY

PROBLEM: ***Sneaker Static***

MATERIALS: Adjustable Ramp Protractor
Various Footwear

PROCEDURES:

1. Adjust the ramp so that the angle of elevation is zero.
2. Place the test footwear on the ramp.
3. Place the protractor on the side of the ramp so that the angle of elevation can be measured accurately.
4. Slowly raise the ramp until the test footwear starts to move down the ramp.
5. Record your data.
6. The coefficient of static friction is equal to the tangent of the angle at which the tested footwear begins to slip down the ramp.
7. Record your data.
8. Repeat procedures 1-7 for each of the other types of footwear.

OBSERVATIONS: ***Data Chart***

Type of Footwear	*Angle of Elevation*	*Coefficient of Static Friction*

CONCLUSIONS:

1. Define the term static friction.

2. How did you determine the coefficient of static friction?

3. Which type of tested footwear had the greatest coefficient of static friction?

4. Which type of tested footwear had the lowest coefficient of static friction?

5. What would a pair of footwear that tested with a high coefficient of friction enable its wearer to do that a pair of footwear that tested with a low coefficient of friction could not?

6. Determine if each of the factors below would increase or decrease an object's coefficient of static friction:

Weight	Increase	Decrease
Surface Area	Increase	Decrease
Rougher Surface	Increase	Decrease

7. Rate the following substances as either having a high coefficient of static friction or a low coefficient of static friction:

Glass	High	Low
Gravel	High	Low
Ice	High	Low
Sandpaper	High	Low
Water	High	Low

NAME _____ **DATE** _____