PHYSICS NAME_____
LAB: **COEFFICIENT OF FRICTION FOR A TOY CAR ON A HILL** DATE _____ PERIOD ___

LAB PARTNERS: 1_____ 2_____ 3_____ 4_____
5_____

PURPOSE: To find the coefficient of sliding friction of the tires of a toy car relative to masonite.

PROCEDURE:
1. Obtain a masonite board with which you can set up an inclined plane for the car to climb.

2. Record a brief description of the car used in the space provided.

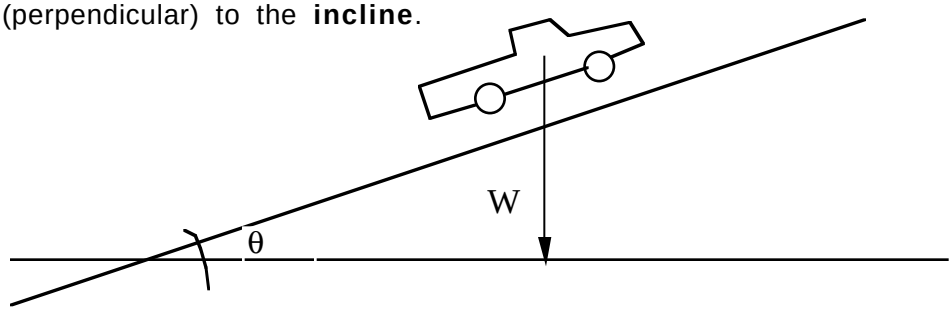
3. Determine the mass of the car and record in the space provided.

4. Adjust the angle of the inclined plane so that while attempting to climb the hill, the car will essentially remain in the same position with its wheels spinning. Record the angle in the space provided.
NOTE: The car may not remain in a stable position; it may veer off to one side or the other. Run a few trials, and use your best judgment for the angle.

FORCE DIAGRAM:
On the diagram of the vehicle below, draw and **label** vectors representing the following forces:
W **$F_{\parallel}$** **$F_{\perp}$** **F_n** **F_f**

The forces should be drawn so that the special relationship between W, W_x and W_y is evident.

Be sure that F_n, the "normal" force, is drawn so that it unquestionably looks "normal" (perpendicular) to the **incline**.



DATA/CALCULATIONS/CONCLUSION:

1. Description of car: _____

2. Mass of car = _____g = _____kg

3. Angle: _____degrees

4. Weight of car = (m)(g) = _____kg x _____m/s/s = _____N

5. $F_{\parallel}$ = W sin _____ = _____N x _____ = _____N

6. $F_{\perp}$ = W cos ____ = _____N x _____ = _____N

7. $F_f = F_{\parallel}$ = _____N $F_n = F_{\perp}$ = _____N

8. $\mu_k = \frac{F_f}{F_n}$ = $\frac{\text{_____N}}{\text{N}}$ = [ ] check your work: tan θ = tan ____ = [ ]