AP PHYSICS

Name: _____

Period: _____ Date: _____

DEVIL PHYSICS

BADDEST CLASS ON CAMPUS

GIANCOLI READING ACTIVITY

Section 4-8 to 4-9

1. Big Idea(s):
   a. Big Idea 3: The interactions of an object with other objects can be described by forces.
   b. Big Idea 4: Interactions between systems can result in changes in those systems.
2. Enduring Understanding(s):
   a. 3.A: All forces share certain common characteristics when considered by observers in inertial reference frames.
   b. 3.B: Classically, the acceleration of an object interacting with other objects can be predicted by using $\vec{a} = \frac{\sum \vec{F}}{m}$.
   c. 4.A: The acceleration of the center of mass of a system is related to the net force exerted on the system, where $\vec{a} = \frac{\sum \vec{F}}{m}$.
3. Essential Knowledge(s):
   a. 1.C.1: Inertial mass is the property of an object or a system that determines how its motion changes when it interacts with other objects or systems.
   b. 3.A.2: Forces are described by vectors.
      i. Forces are detected by their influence on the motion of an object.
      ii. Forces have magnitude and direction.
   c. 3.A.3: A force exerted on an object is always due to the interaction of that object with another object.
      i. An object cannot exert a force on itself.
      ii. Even though an object is at rest, there may be forces exerted on that object by other objects.
      iii. The acceleration of an object, but not necessarily its velocity, is always in the direction of the net force exerted on the object by other objects.
   d. 3.A.4: If one object exerts a force on a second object, the second object always exerts a force of equal magnitude on the first object in the opposite direction.
   e. 3.B.1: If an object of interest interacts with several other objects, the net force is the vector sum of the individual forces.
   f. 3.C.4: Contact forces result from the interaction of one object touching another object and they arise from interatomic electric forces. These forces include tension, friction, normal, spring (Physics 1), and buoyant (Physics 2).
4. Learning Objective(s):

a. (1.C.1.1): The student is able to design an experiment for collecting data to determine the relationship between the net force exerted on an object, its inertial mass, and its acceleration.

b. (2.B.1.1): The student is able to apply $\vec{F} = m\vec{g}$ to calculate the gravitational force on an object with mass m in a gravitational field of strength g in the context of the effects of a net force on objects and systems.

c. (3.A.2.1): The student is able to represent forces in diagrams or mathematically using appropriately labeled vectors with magnitude, direction, and units during the analysis of a situation.

d. (3.A.3.1): The student is able to analyze a scenario and make claims (develop arguments, justify assertions) about the forces exerted on an object by other objects for different types of forces or components of forces.

e. (3.A.4.1): The student is able to construct explanations of physical situations involving the interaction of bodies using Newton's third law and the representation of action-reaction pairs of forces.

f. (3.A.4.2): The student is able to use Newton's third law to make claims and predictions about the action-reaction pairs of forces when two objects interact.

g. (3.B.1.1): The student is able to predict the motion of an object subject to forces exerted by several objects using an application of Newton's second law in a variety of physical situations with acceleration in one dimension.

h. (3.B.1.2): The student is able to design a plan to collect and analyze data for motion (static, constant, or accelerating) from force measurements and carry out an analysis to determine the relationship between the net force and the vector sum of the individual forces.

i. (3.B.1.4): The student is able to predict the motion of an object subject to forces exerted by several objects using an application of Newton's second law in a variety of physical situations.

j. (3.C.4.1): The student is able to make claims about various contact forces between objects based on the microscopic cause of those forces.

k. (3.C.4.2): The student is able to explain contact forces (tension, friction, normal, buoyant, spring) as arising from interatomic electric forces and that they therefore have certain directions.

l. (4.A.3.1): The student is able to apply Newton's second law to systems to calculate the change in the center-of-mass velocity when an external force is exerted on the system.

5. Read sections 4-8 and 4-9 in your textbook.
6. Use the Cornell Notes system to take notes on the lesson material. You have the following options:
   a. You can print multiple copies of one of the forms on the following pages of this document and handwrite your notes.
   b. You can use the MS Word form supplied below and type your notes.
      i. You can then print your work and submit a hardcopy, or
      ii. Upload your work to Focus. If you choose this option, you must use a filename in the format, "LastnameFirstinitialPerXAsgnmtName". For example, "SmithKPer4ReadActT9-3.doc"
   c. You can take notes on notebook paper using the Cornell Notes format and submit the hardcopy.
7. When using this form, remember the **Five R's of Notetaking**:
   a. ***Record*** – the most important or emphasized information

b. ***Reduce*** – and synthesize information wherever possible, making it as concise as you can

c. ***Recite*** – read your notes out loud

d. ***Reflect*** – and consider how this information is connected to your personal experiences and what you already know

e. ***Review*** – look over your notes more than once

8. As a minimum, you must include notes on the following topics:

   a. Rolling friction

   b. Kinetic friction

   c. Normal force

   d. Coefficient of kinetic friction

   e. Static friction

   f. Coefficient of static friction

   g. Resolving the force of gravity on an inclined plane into two components: one down the plane and one into the plane

   h. Computing the force of friction for an object on an inclined plane

   i. ***New and Improved***, ***Special Deluxe***, Problem Solving Process

9. Answers may be typed or neatly printed. Drawings may be freehand, but try to make use of the 'Shapes' or 'Insert Clipart" functions of MS Word.

10. ***A reading assignment may contain drawings that would be useful in your notes. If you have scanning capability, you should practice scanning pictures and inserting them into documents. As you prepare for college, you should consider investing in a desktop printer-scanner-copier. Just remember that for formal reports you have to cite any images that you insert into your document. You don't have to cite scanned images for this exercise unless you use a source other than the textbook.***

11. ***Also try to use MS Equation to write equations as much as possible. Practicing now will pay great dividends later when you start writing IA's.***

CORNELL NOTES and the 5 R's

Record – the most important or emphasized information
Reduce – and synthesize information wherever possible, making it as concise as you can
Recite – read your notes out loud
Reflect – and consider how this information is connected to your personal experiences and what you already know
Review – look over your notes more than once

Name:

Date:

Topic:

Questions/Key Points	**Notes**

SUMMARY:

Name _____

Date _____

CORNELL NOTES

Topic _____

Questions/key points	Notes

Summary