Honors Physics Summer Work

Thanks for your interest in Physics!

The goal of summer work:
In order to have class time to get into the more advanced and interesting sections/projects (like motors, astronomy and/or building a Rube Goldberg machine), some of the fundamental concepts taught in 9th grade and Algebra must be reviewed and completed over the summer.

Students who do not complete the summer work and quizzes need to reconsider their enrollment in Honors Physics! The grade received for doing your summer work makes a significant impact on your 1st MP grade. Making a commitment to completing all of the summer work on time, usually indicates a student who willing to do the level of work needed to be successful in class.

In the fall, we will use 3 class periods in school to review/discuss the summer work before a test on it

Good Luck, email me at william.baker@redclay.k12.de.us or through Schoology if you have questions. Remember, Mr. Baker is also on summer break, so expect delays in response time.

Requirements for summer work

Part 1:

Complete the **Intro to Physics True False online assessment Quiz** first! This online assessment is meant to determine your preconceived ideas about important concepts in Physics, much of which we will discuss in class. Please take this before you start the rest of your summer work. **Do NOT research the questions or study for this test.** I am looking for an honest assessment of your own background knowledge in physics and astronomy using this exam. Grades for the quiz are based on completeness and truthfulness, **not the number of correct answers** you achieve. You will receive Formative credit for completion of this part.

This is due AUGUST 1st (11:59 pm) through Schoology

Part 2: Create an outline/notes

The following sections in the book go over topics you should have discussed in previous math and/or 9th grade physical science courses. Creating notes/outlines about the topics we discuss has proven useful when reviewing for tests, as long as you write it in your own words. Most of my review sheets are based on outlines of the subject matter

Do the following for each Section outlined on the topics listed below:

1) Create a concept list or outline composed of all **important** (including but not limited to bold and italized) words and concepts identified in the section. For each word/concept:
    a. write a small definition and explanation for each if you are unfamiliar with it (in your own words)
    b. Identify the page(s) where the info on the concept was located (useful for you to refer back to when reviewing)

2) Make a note which concepts you want/need to discuss in the review class periods at the start of the school year

You will **receive Formative credit** for completion of this part.

This work is due to be handed in by first day of class

Outline of topics covered in summer work

1) **Scientific Math** (Textbook Chapter 1)
    a. Scientific notation
    b. Metric Conversion
    c. Significant figures
    d. Dimensional analysis
    e. Scientific Method
    f. Precision and accuracy
    g. Difference between laws, theories and hypothesizes
    h. Graphing the results

2) **Fundamentals of motion** (Textbook Chapter 2)
    a. Relative motion-Frame of Reference
    b. Scalar vs Vector values
    c. Distance, displacement
    d. Speed, velocity
    e. Particle model version of motion graph
    f. Position –time graphs (1 dimension)
        i. Steepness
        ii. Angle/direction
        iii. Meaning or a curve/straight line
    g. Determining average velocity
        i. $V = d/t$
        ii. Determining the slope of a line and its meaning in a P-t graph

3) **Forces Fundamentals** (Textbook Chapter 4)
    a. Contact and field forces
    b. Net force
    c. Know the difference between weight and mass of an object
    d. Normal forces
    e. Free Body Diagrams
    f. Compare inertia, mass, weight and force
    g. Newton's 1^{st} , 2^{nd}, and 3^{rd} laws

4) **Energy** (Textbook Chapter 6)
    a. Definition, units for each
    b. Connection between energy, work and forces
    c. Types of energy
    d. Calculating GPE, KE, and EPE

e. Law of Conservation of mechanical energy

Part 3: Practice questions from textbook

Answer all questions for each section listed below. Odd questions in the "Problems" section have answers in the back of textbook. Show all work for each question. ***Amount of work on each question determines grades, not the answer***. You will **receive Formative credit** for completion of this part.

This work is due to be handed in by first day of class

Practice questions are found in the WHITE covered textbook with Giancoli as the author

Section 1: **Scientific Math**

A) "**Misconceptual Questions" section** pg 17 questions 1-5
"**Problems**" pg. 18-20 questions 1, 3a and e, 7,13, 15, 19

B) Answer the following additional questions:

1) A guest on a certain news talk show equates a well-known theory (like Theory of Evolution) with a best 'guess' and states the this theory has not been 'proven' true . What is your response to the guest's assertions? Explain your response.

2) Should Quantum theory be formally described as a theory? Explain your response.

3) Is Newton's Law of Universal Gravitation considered a theory? Explain your response.

Section 2: **Fundamentals of motion**

"**Questions**"section: pg 41 questions 1, 2, 3, 16
"**Misconceptual Questions**" pg42 1, 9
"**Problems**" pg 43-46 1, 3, 5, 7, 13

Section 3: **Force Fundamentals**

"**Questions**": pg 98-99 questions 3, 5, 7, 10, 13, 15, 17
"**Misconceptual Questions**" pg 99-100 questions 1, 8, 9

"**Problems**" pg 101-103 questions 1, 2, 3, 10

Section 4: **Energy**

"**Questions**": pg 161-162 questions 6, 13, 15, 19
"**Misconceptual Questions**" pg 163 3, 4, 6, 12, 14
"**Problems**" pg 165-167 19, 34, 35 40, 47, 49, 74

Part 4: Math review handouts (There are 3)

Math is crucial for scientists and engineers to accurately describe and predict outcomes of using concepts of physics. Taking this class requires near daily use of algebra, geometry and some basic pre-calculus concepts for success. We will review some of the more advanced math in class, but I expect each student to be competent in the math needed to complete the following review.
The grade for this section will be **Summative** (in terms of completion and showing work, not correctness)

A) The Summer Math review handout
B) Practice rearranging equations for physics (this is the last page of the handout given out with the textbook, but will a separate document online)

These are due to be handed in by the first day of class

Part 5: Online Quizzes (There are 4)

These quizzes are meant to check your progress and competency in the subject matter. The quizzes are meant to be done by yourself. A **90%** correct score is the minimum requirement for full credit. The grade is **summative** in nature. The quizzes can be taken a **maximum of 4 times** to achieve the minimum score during the summer months. **Note**- The Schoology grading program is NOT flexible in terms of grading variations on answers. I will look at each attempt and update your actual score online.

These are due one week BEFORE the first class

Again, I can not stress the difference between success and the lack of it in my class depends on your willingness to work.