Student:_____

How Things Work

Homework 2 – Due Sunday, June 17, in class

INSTRUCTIONS FOR ANSWERING QUESTIONS 1-2 & 5-10

PLEASE READ CAREFULLY

Questions 1-2 & 5-10 below are provided as aids for you *to learn* from the textbook. In order *to learn* from these questions you must do the following:

(1) Carry out Active Reading of the corresponding section. By Active Reading I mean reading seeking understanding. This is done by reading slowly, taking notes, highlighting, asking and writing down questions, re-reading, explaining things to yourself in your own words, discussing with your peers, asking the instructor, etc.
(2) After Active Reading answer the questions in writing WITHOUT looking at the answers available in the book.
(3) Read your own answer and verify that it represents your best understanding of the question. If you are not satisfied, revise your answer.
(4) Compare your answer with that provided in the book.
(5) If there is agreement, you understood the concept.
(6) If there is disagreement, study the section again and attempt another answer.
(7) Repeat steps (2) through (6) until your answer agrees with the book.
(8) If you cannot answer to your satisfaction, contact the instructor for discussion.

No verbatim rendering, copying, or paraphrasing from answers in the textbook will be accepted!

Based on your understanding of the concept of inertia and physical measurements, answer the following "Check your understanding/Check your figures" questions from the textbook:

1) Check Your Understanding #1: A Puck on Ice (**Textbook p. 6**)

2) Check Your Understanding #2: Changing Trains (**Textbook p. 8**)

Perform **Active Reading** of Section 1.2 in the textbook (Pages 13-22) and carry out the following activities:

3) Write a 1-page summary presenting the most important ideas of Section 1.2.
(No verbatim rendering, copying, or paraphrasing accepted.)

4) Compare and contrast the concepts of Weight and Mass of an object.

Answer the following "Check your understanding/Check your figures" questions from the textbook.

5) Check Your Understanding #1: Weight and Mass (**Textbook p. 15**)

6) Check Your Figures #1: Weighing in on the Moon (**Textbook p. 15**)

7) Check Your Understanding #2: Half a Fall (**Textbook p. 16**)

8) Check Your Figures #2: The High Dive (**Textbook p. 17**)

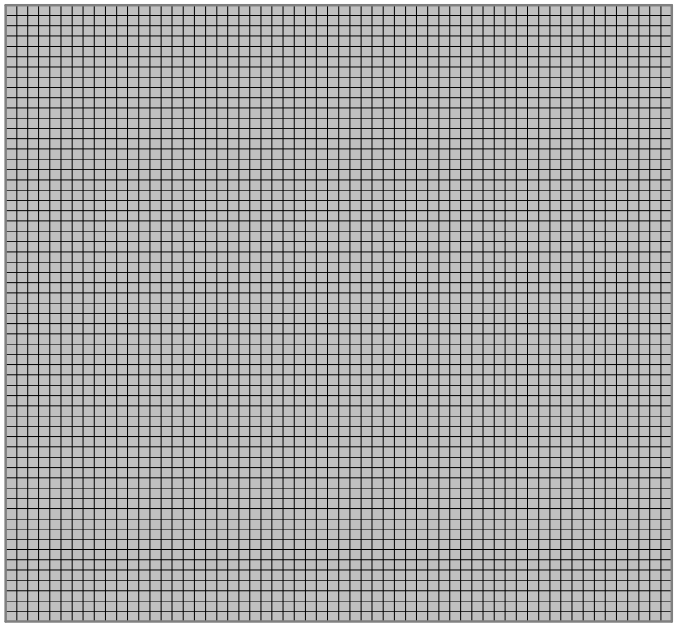
9) Check Your Understanding #3: Half a Fall Again (**Textbook p. 18**)

10) Check Your Figures #3: Extreme Physics (**Textbook p. 18**)

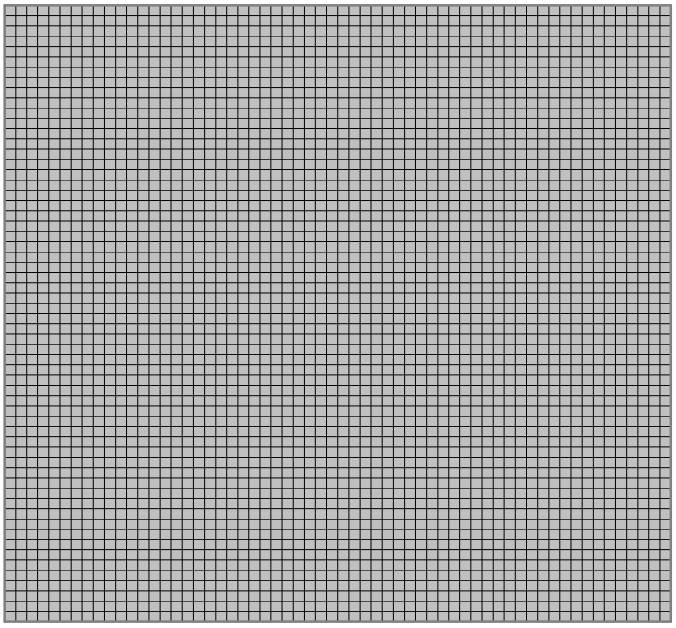
11) After a PHS101 class, a student who has a mass of 60 kg, leaves Campbell and walks East along University Blvd. toward the UAB Medical Center. Luckily, the student finds all crossing signals green, so she does not have to stop at all during her entire walk. The student's position measured from Campbell Hall (reference point) changes with time according to the following table:

Car in front of:	Time (seconds)	Distance East of Ref. Point (meters)
Campbell Hall	0	0
	5	9
	10	18
	20	36
	24	43.2
	30	54
	40	72
	50	90
	60	108

a) Make a graph of how the student's *distance* from Campbell Hall changes with time.



b) Make a graph of how the students's *speed* changes with time.



c) Determine the acceleration of the student.

12) Discuss how the *distance*, the *speed*, and the *acceleration* of the student change with time.

13) What can you say about the net force acting on the **student**?

14) A 8.0 kg cart is subject to a force of 67 N. Determine the magnitude of the cart's acceleration.

15) A 15,000 kg truck is accelerating at 0.58 m/s^2. What is the force acting on the truck?