

Chapter 1

Introduction to Biomechanics

1 – 3: Due **Thursday, January 16th**

You may use any resources you find valuable to complete these assignments including web based resources, the library, textbooks, your great Aunt Edna, the Oracle at Delphi, anything. Getting to know your resources and how to use them is extremely valuable. Therefore, for all External Brain assignments I will not assign specific chapters or page numbers. Instead, I encourage you to take time at the beginning of the semester to become familiar with the layout of your resource.

No matter what resource you end up using, **make sure to include an appropriate citation. To receive credit all assignments (except problems) MUST include citations.** Please use complete APA formatted citations. For more information regarding how to cite different sources please consult the online writing lab at Purdue University. The website is:

<https://owl.english.purdue.edu/owl/resource/560/01/>

Please note that you may answer the questions/layout the responses in whatever manner is most accessible to you. This may include written responses, tables, charts, drawings, etc... The layout should be neat, easy to read, and show that some time was spent creating a resource which will be a useful study tool in the future.

Learning Objectives: Upon completion of the following topic (from in class lectures and completion of the external brain assignments), you will be able to:

1. Describe and provide examples of how biomechanics may be studied at many levels, ranging from single cell to full organism.
2. Analyze how a solid understanding of biomechanics may be relevant to your current studies in kinesiology future career goals.
3. Define the basic sub-disciplines of mechanics and explain how they relate to each other.

Assignments:

1. Use words or images to provide an example of something which a biomechanist might study at each of the following levels. Remember, biomechanics typically involved the **study of movement or forces causing the movement:**
 - Whole organism level
 - System level
 - Organ level
 - Tissue level
 - Cell level
 - Cellular subunits level

2. Using either Pubmed or Google Scholar, find an article showing an example of biomechanics being applied for either 1) improving health or 2) improving sport performance. Include the abstract from the article, complete APA formatted citation, and a short explanation for how you think this article represents biomechanics being applied to this specific area.

3. Basic Vocabulary and Conceptual Relationships

Create a concept map or schematic diagram which shows the relationship among the following terms. Be sure to include definitions for the words:

- Mechanics
- Rigid body dynamics
- Deformable body mechanics
- Statics
- Dynamics
- Kinematics
- Position
- Velocity
- Acceleration
- Kinetics
- Force
- Torque