

You can draw here

# Physics 111 - Class XY

## Logistics & Diagnostics

Do not draw in/on this box!

September 10, 2021

You can draw here

You can draw here

# Logistics/Announcements

- Lab this week:
- HW due this week on Thursday at 6 PM
- Test/Bonus Test: Window is Friday 6PM - Sunday 6PM
- Learning Log due on Saturday at 6 PM
- HW and LL deadlines have a 48 hour grace period

ca.prairielearn.com/pl/course\_instance/2344/instance\_question/8953275/


Physics 111, 2021WT1 Assessments Gradebook HW1 Firas Moosvi stu

### HW1.1. Intro-Instructor

Who is the course instructor for Physics 111 ?

- ☐ (a) Dr. Sheldon Cooper
- ☐ (b) Dr. Isaac Newton
- ☐ (c) Dr. Rosalind Franklin
- ☐ (d) Dr. Daniel Shiffman
- ☐ (e) Dr. Firas Moosvi
- ☐ (f) Dr. Donna Strickland

Problem is licensed under the [CC-BY-NC-SA 4.0 license](#).



**Save & Grade** 5 attempts left **Save only** Additional attempts available with new variants ?

### Homework 1

**Assessment overview**

Total points: 0/10

Score: 0%

### Question

Value: 1

History:

Awarded points: 0/1

**Report an error in this question**

**Previous question**

**Next question**

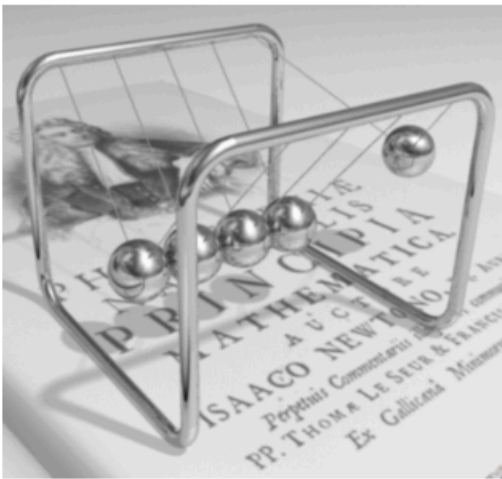
- “Report an issue” only works one-way, we cannot respond to students 😞
- Many of you are asking questions about the concepts, which is better done on ED Discussion...
- So we will turning off this feature until it is improved.
- Thanks for your patience and your engagement/feedback!

# Class Outline

- Introduction to Chapters 1 and 2
- Clicker Questions
- Problem Solving Template
- Activity
- Debrief

# Introduction





Physics 111

Search this book...

Unsyllabus

ABOUT THIS COURSE

Course Syllabus (Official)

Course Schedule

Accommodations

How to do well in this course

GETTING STARTED

Before the Term starts

After the first class

In the first week

Week 1 - Introductions!

PART 1 - KINEMATICS

Week 2 - Chapter 2

Readings

Videos

Homework

Lecture

Test

Lab

Learning Logs

COURSE FEEDBACK

Anonymous Feedback Form

Powered by Jupyter Book

Videos

Below are the assigned videos for this week. The videos are collapsible so once you're done with one, you can move to the next one. In the sidebar on the right, you can use the checklists to keep track of what's done.

Required Videos

1. Introduction to Significant Figures

Introduction to Significant Figures with Examples

Copy link

131.9 mm

Watch on YouTube

- Notes
- Direct link to Mr. P's page

2. Working with Significant Figures

3. Introduction to Tip-to-Tail Vector Addition

Introduction to Tip-to-Tail Vector Addition, Vectors and Scalars



Copy link

Checklist of items

- ☐ Video 1
- ☐ Video 2
- ☐ Video 3
- ☐ Video 3
- ☐ Video 3

# Clicker Questions

# CQ.2.1

Q: How many of the following items are **VECTORS**() and **Scalars** () ?

- Distance travelled
- Density
- The position in 3 dimensions
- The average velocity
- Drag
- The position in a 1 dimensional system



# Problem Solving Template

PHYSICAL REVIEW PHYSICS EDUCATION RESEARCH **16**, 010123 (2020)

---

## Template for teaching and assessment of problem solving in introductory physics

E. W. Burkholder<sup>1,\*</sup> , J. K. Miles,<sup>2</sup> T. J. Layden,<sup>2</sup> K. D. Wang,<sup>3</sup>  
A. V. Fritz<sup>4</sup> , and C. E. Wieman<sup>1,3</sup> 

# 1. Framing

Visual Representation

Relevant Concepts

Similar Problems

Assumptions and Simplifications

Information Needed

# 1. Framing

Visual Representation

Assumptions and Simplifications

Relevant Concepts

Information Needed

Similar Problems

# 2. Planning

Solution Plan

Rough Estimate

# 1. Framing

Visual Representation

Assumptions and Simplifications

Relevant Concepts

Information Needed

Similar Problems

# 2. Planning

Solution Plan

Rough Estimate

# 3. Execution

Carry-out Plan for solving

- Work in algebra/symbols until the BITTER end
- Plug in numbers at the LAST step

# 1. Framing

Visual Representation

Assumptions and Simplifications

Relevant Concepts

Information Needed

Similar Problems

# 2. Planning

Solution Plan

Rough Estimate

# 3. Execution

Carry-out Plan for solving

- Work in algebra/symbols until the BITTER end
- Plug in numbers at the LAST step

# 4. Answer Checking

Compare to Estimate

Units Check

Limits Test

Getting (UnStuck)



# 1. Framing

Visual Representation

Assumptions and Simplifications

Relevant Concepts

Information Needed

Similar Problems

# 2. Planning

Solution Plan

Rough Estimate

# 3. Execution

Carry-out Plan for solving

- Work in algebra/symbols until the BITTER end
- Plug in numbers at the LAST step

# 4. Answer Checking

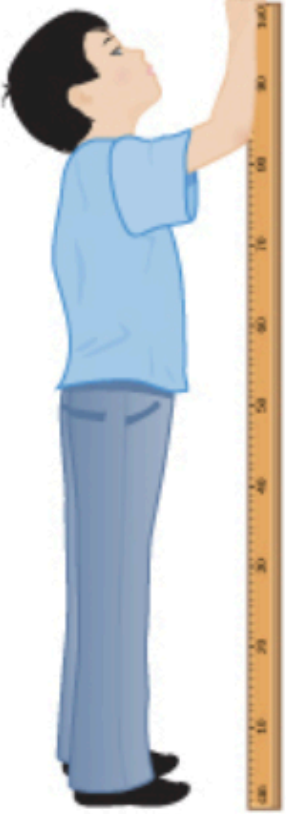
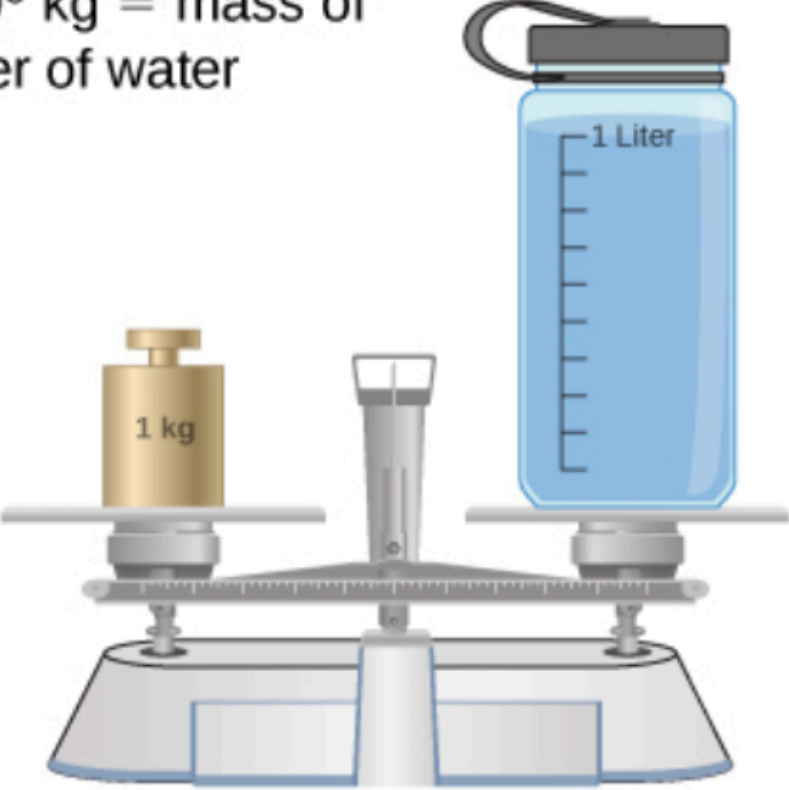
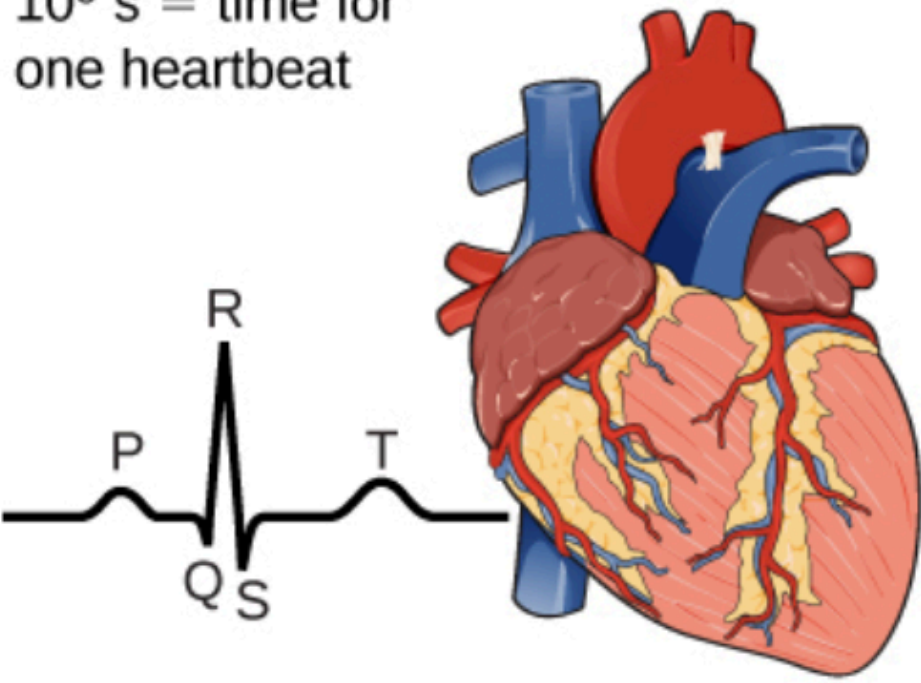
Compare to Estimate

Units Check

Limits Test

Getting (UnStuck)

# Activity

Length in Meters (m)	Masses in Kilograms (kg)	Time in Seconds (s)
$10^{-15}$ m = diameter of proton	$10^{-30}$ kg = mass of electron	$10^{-22}$ s = mean lifetime of very unstable nucleus
$10^{-14}$ m = diameter of large nucleus	$10^{-27}$ kg = mass of proton	$10^{-17}$ s = time for single floating-point operation in a supercomputer
$10^{-10}$ m = diameter of hydrogen atom	$10^{-15}$ kg = mass of bacterium	$10^{-15}$ s = time for one oscillation of visible light
$10^{-7}$ m = diameter of typical virus	$10^{-5}$ kg = mass of mosquito	$10^{-13}$ s = time for one vibration of an atom in a solid
$10^{-2}$ m = pinky fingernail width	$10^{-2}$ kg = mass of hummingbird	$10^{-3}$ s = duration of a nerve impulse
$10^0$ m = height of 4 year old child 	$10^0$ kg = mass of liter of water 	$10^0$ s = time for one heartbeat 
$10^2$ m = length of football field	$10^2$ kg = mass of person	$10^5$ s = one day
$10^7$ m = diameter of Earth	$10^{19}$ kg = mass of atmosphere	$10^7$ s = one year
$10^{13}$ m = diameter of solar system	$10^{22}$ kg = mass of Moon	$10^9$ s = human lifetime
$10^{16}$ m = distance light travels in a year (one light-year)	$10^{25}$ kg = mass of Earth	$10^{11}$ s = recorded human history
$10^{21}$ m = Milky Way diameter	$10^{30}$ kg = mass of Sun	$10^{17}$ s = age of Earth
$10^{26}$ m = distance to edge of observable universe	$10^{53}$ kg = upper limit on mass of known universe	$10^{18}$ s = age of the universe

**Figure 1.4** This table shows the orders of magnitude of length, mass, and time.

# Debrief

**See you next class!**