

UC Group 2: Implementation Notes, 05 Aug 2020

Jeff Rodriguez-- AP Physics C E&M. Using Gauss' law, determine the electric field for symmetrical spherical arrangements of spheres and shells.

Students will derive the electric field as a function of radius for several arrangements of spheres and shells.

Students will use Jupyter notebooks to edit and write python code which will correctly simulate the gaussian system. The code will output a plot of electric field vs distance. Students will submit an answer document on schoology server where they will derive the systems and attach plots

College Prep Physics- Kinematics Unit supplement as an application to understanding kinematic terms, relationships between variables, and plotting variables. Students will complete Jupyter notebooks :Distance and Velocity. I will consider Projectile with air resistance if time permits

Emily Rosen

Second semester I will be teaching an intro and higher level engineering course and planning to implement mobile data measurement devices as well as Google colab notebooks but not sure specifically what I will do with these. Specific plans for course will be made by end of Oct 2020.

General implementation of tools for a labs and activities fall 2020 Hybrid Teaching (H Physics): Google Colaboratory Notebooks; Physics mobile app(physics toolbox of phyphox); Tracker; Excel; old fashioned lab materials

1. Data collection: Data will be collected w old school instruments (stop watch, measuring tape, etc) OR physics mobile apps.
2. Data analysis: Tracker will be used to analyze videos; Google colab notebooks will be used for more general data analysis; spreadsheets (excel) will be used for more specific quantitative analysis.

Specific Implementation Plans (To be continued throughout the semester...)

Week 1 (week of 8/17): Introduce course, introduce physics, begin 1 D kinematics, graphing motion.

****Labs/Technology:**

1. Intro to Google colab (adapt and edit from Quarknet PD)
2. Colab Position Time Graph activity (adapt and edit from Quarknet PD)

Week 2 (week of 8/24): Graphing motion, kinematic equations as applied to horizontal motion and free fall.

****Labs/Technology:**

1. colab velocity time graph (adapt and edit from Quarknet PD)
2. Intro Tracker and install w tech department
3. Record and graph 1 D motions w Tracker: constant velocity, accelerating horizontal motion, free fall (this needs development/write up by me)

Week 3 (week of 8/31): Wrap up 1D kinematics, introduce vectors. 1D kinematics unit test.

****Labs/Technology:**

UC Group 2: Implementation Notes, 05 Aug 2020

1. Build an egg drop. Record acceleration w mobile app and use colab notebook (adapt and edit notebook created for phone drop in quarknet PD)
2. Acceleration on an incline-measure data w mobile app and analysis in spreadsheet?? (this one needs development/write up by me)

Week 4 (week of 9/8): Vectors and projectile motion.

**Labs/Technology:

1. Tracker record projectile motion video/data and corresponding position/velocity graphs. (needs development/write up)
2. Shoot for your grade lab at home??

Week 5 (week of 9/14): Projectile motion, introduction to Newton's laws of motion. 2D kinematics unit test.

**Labs/Technology:

1. Newton's Second Law Lab using mobile apps imported into colab notebook. I still need to think this out. Look at accel for changing force w constant mass and then repeat for changing mass constant force. Looking at general trend w colab notebook not specific quantitative analysis.

Amanda Duritsch -

Will implement position and velocity graphs in physics and physical science courses in order to have students use some coding along with graphical analysis. Will fit into kinematics/motion units already in place for both courses.

With physical science freshmen, might utilize the earthquake and tides colab notebooks at the beginning of the year when looking at data analysis and graphing.

Will finish developing the notebook I was working on to have students use their cell phones to analyze the period of a pendulum with phyphox

Jacqui Montgomery --

Use immediately w/o much or any revision:

Probability, Position graphs, Velocity graphs, Projectile in Air, Earthquake, Global Temps, Tides, Muon Mass

Revise/Rethink/Develop:

Creating Jupyter Notebooks, Quarknet lessons, Tracker, Physphox/Physics Toolbox/Science Journal as data collection tool

This year is a mess to plan, but...I think I will definitely use some of the phone sensor data collection. I don't know if I'll use Jupyter to analyze it or just use Google Sheets. I am planning to use the notebooks we looked at as we get to appropriate sections of our curriculum.