Exp No: 04

Conformation of inverse-square law for Newton's universal law of gravitation

Resources:

Link for online lab:

List and link for the graph-plotting softwares:

- Desmos (Online): **Link for the "Desmos" software**
- Graph (Offline): **Link for the "Graph" software**

Tutorials:

- Tutorial link for plotting in ***Desmos*** : _____

  https://www.youtube.com/watch?v=-lIUNWVKnUY

- Tutorials link for the ***Graph*** :

  How to install graph software:

  https://youtu.be/e19JqLJMx3A

  How to draw a curve using graph software:

  https://youtu.be/QBkdzU_8vVo

  How to calculate the slope of a line using graph software:

  https://youtu.be/z4cMiUFu5j8

Video-link (Experiment #4):

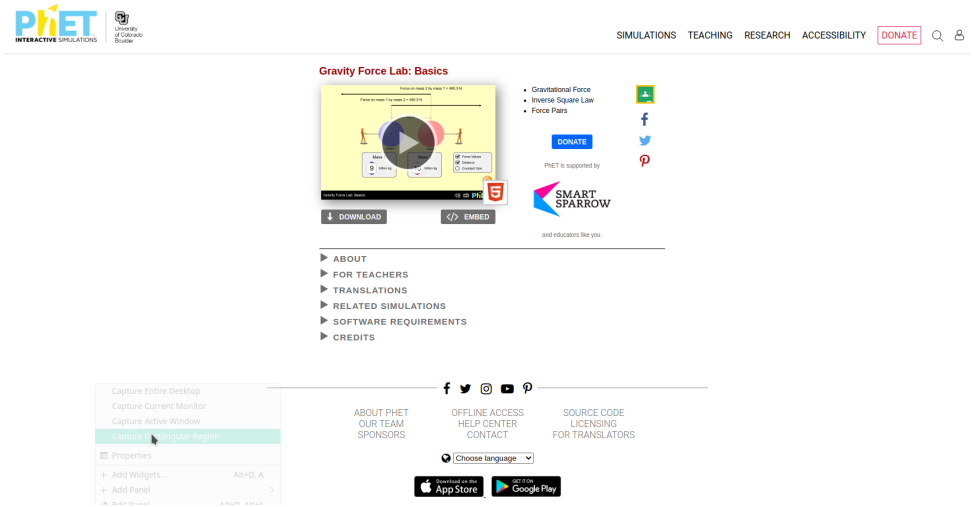
Purpose:

- Describing how the force between two masses changes with distance.

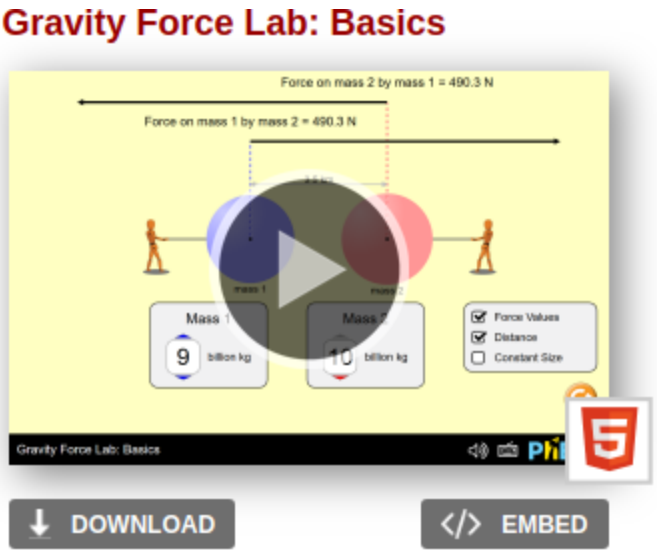
Procedure:

1. Open up the Gravity simulation on the PhET website.

   https://phet.colorado.edu/en/simulation/gravity-force-lab-basics



2. Click on the **"play"** button triangle and start the sim.



3. Check all three boxes on the right hand side (Force values, Distance, Constant Size).

4. Set "***Mass1"*** and "***Mass2" to* 5** (billion Kg). ***Both masses*** will **remain constant** throughout the experiment.

5. For the different values of ***Distance*** (Table-1), calculate force, and record these values in **Table-1**.

6. Plot ***ln(F) vs ln(1/d)*** graph using recorded data from **Table-1.** You may use any software you like. (Specified softwares is recommended).

Answer the following questions using ONE sentence:

1. ##How will the force of attraction between two objects change if the separation between their centres, d is doubled?

2. ##Will the force of attraction be different for each object if they vary in mass?

3. ##Will halving the mass of each of the objects change their force of attraction?

4. ##Now suppose you double the mass of one of the objects keeping the other constant, how will the force of attraction change?

5. ##Will the force of attraction change if measured on a different planet?