

Title: Mass on an Inclined Plane

Purpose:

- to practice using an online Physics simulation
- to investigate factors associated with friction and movement on an inclined plane

Procedure:

Open Physics Exploration

Go to my computer...local disk C...Exploration of Physics Vol. I
Click on the *Exploration of Physics* Icon
Go to *Motion* and then *Mass on an Inclined Plane*
Explore how the simulation works for about 5 minutes

Settings: Use these for ALL simulations

- Bounce OFF
- Initial height at the TOP
- y(m) on y axis
- t(s) on x axis
- 5 s on x axis (right above the t(s))

Experiment 1: Relation of friction and angle for a mass sliding down an inclined plane

1. Reset the simulation. Set mass to 1.0kg, angle at 0° , velocity at 0.0 m/s, and coefficient of friction at 0.00.
2. Predict the relation between coefficient of friction and minimum angle for a block to slide down an inclined plane.
3. Determine minimum angle for block to start to slide for coefficients of friction 0.00—0.50 (Use Data Charts Below)
4. Repeat for masses of 5.0 kg and 10.0 kg
5. Construct a multiline graph of friction (x) vs angle (y) for each mass tested.

Experiment 2: Relation of mass, velocity, and time for a mass sliding down an inclined plane

1. Reset the simulation. Set mass to 1.0 kg, angle at 25° , velocity at 0.0 m/s, and coefficient of friction at 0.25.
2. Predict the relation between initial velocity down plane and time to reach the bottom.
3. Determine time to reach bottom of inclined plane for masses 1.0–10 kg and velocities 1.0–10.0 m/s. (Use Data Charts Below)
4. Repeat the simulation for angle of 45° and coefficient of friction of 0.45.
5. Construct a multiline graph of velocity (x) vs time (y) for each mass and angle/coefficient of friction data set.

Discussion:

- Follow lab write-up [guidelines](#). Remember to support states with data from your experiments!

Conclusion:

- You should have 2 conclusions from this lab!

Reflection:



Data Charts For Experiment 1

Mass 1.0 kg, Velocity 0.0 m/s	
C of Friction	Angle (°)
0.00	
0.05	
0.10	
0.15	
0.20	
0.25	
0.30	
0.35	
0.40	
0.45	
0.50	

Mass 5.0 kg, Velocity 0.0 m/s	
C of Friction	Angle (°)
0.00	
0.05	
0.10	
0.15	
0.20	
0.25	
0.30	
0.35	
0.40	
0.45	
0.50	

Mass 10.0 kg, Velocity 0.0 m/s	
C of Friction	Angle (°)
0.00	
0.05	
0.10	
0.15	
0.20	
0.25	
0.30	
0.35	
0.40	
0.45	
0.50	

Data Charts For Experiment 2

Angle 25° Friction 0.25 Mass 1.0 kg	
Velocity (m/s)	Time (s)
0.0	
1.0	
2.0	
3.0	
4.0	
5.0	
6.0	
7.0	
8.0	
9.0	
10.0	

Angle 25° Friction 0.25 Mass 5.0 kg	
Velocity (m/s)	Angle (°)
0.0	
1.0	
2.0	
3.0	
4.0	
5.0	
6.0	
7.0	
8.0	
9.0	
10.0	

Angle 25° Friction 0.25 Mass 10.0 kg	
Velocity (m/s)	Angle (°)
0.0	
1.0	
2.0	
3.0	
4.0	
5.0	
6.0	
7.0	
8.0	
9.0	
10.0	

Angle 45° Friction 0.45 Mass 1.0 kg	
Velocity (m/s)	Time (s)
0.0	
1.0	
2.0	
3.0	
4.0	
5.0	
6.0	
7.0	
8.0	
9.0	

Angle 45° Friction 0.45 Mass 5.0 kg	
Velocity (m/s)	Time (s)
0.0	
1.0	
2.0	
3.0	
4.0	
5.0	
6.0	
7.0	
8.0	
9.0	

Angle 45° Friction 0.45 Mass 10.0 kg	
Velocity (m/s)	Angle (°)
0.0	
1.0	
2.0	
3.0	
4.0	
5.0	
6.0	
7.0	
8.0	
9.0	

