

Types of Energy PHET Simulations Name _____ Date _____

All links for definitions and simulations found on Google Classroom

Pre-Lab Definitions:

Kinetic Energy (KE , E_k) – The energy of a _____. No motion, no _____. Depends on _____.

Potential Energy due to gravity (PE_g , E_g , PE_{grav}) - The potential to move based on _____. More height, more _____ energy. No height, no potential _____ energy.

Elastic potential energy (E_{el} , E_{elas}) – The potential to move due to the _____ or compression of a _____ or rubber band. No _____ object, no E_{el} .

Thermal (heat) energy (E_{Therm} , E_{heat} , E_{int}) – The energy _____ ‘steals’ and turns into _____ or internalized thermal energy. This energy is not able to _____ to potential or kinetic in our models. _____ friction to occur.

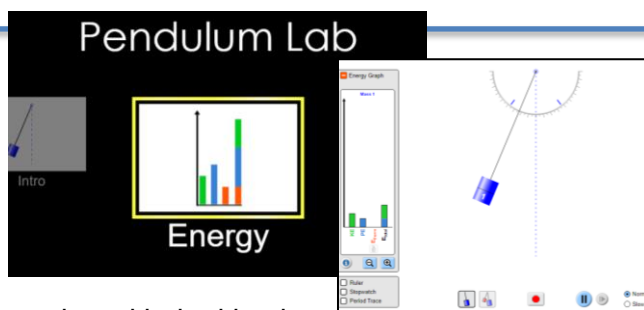
Work –occurs when energy is _____ or _____ from an object or system by an _____ agent. Work is the only thing that can change _____ in these models today.

PENDULUM LAB

Click Energy. Click and drag the pendulum to about 35 degrees to start the motion. You may press the SLOW button in the bottom if it makes it easier to view.

Watch the energy bars as the pendulum swings.

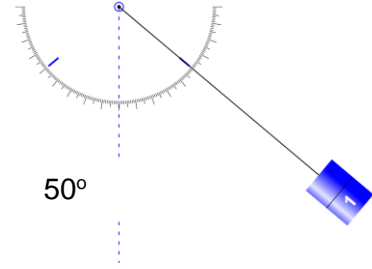
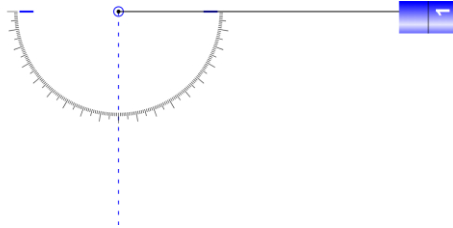
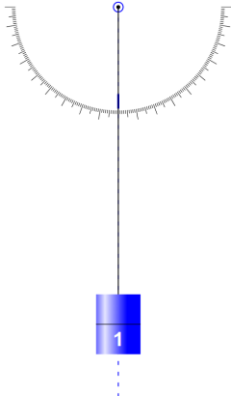
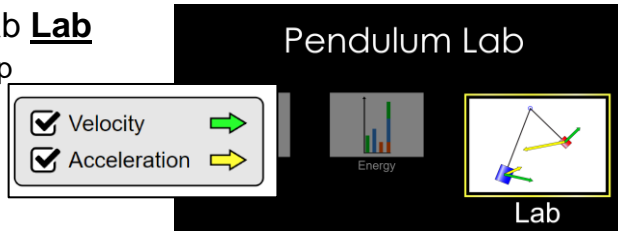
1. Explain (in words or with a drawing) what you see happening with the kinetic and potential energy:
2. When the pendulum is all the way to one side, slide gravity to maximum. Describe what happens to the pendulum and its energies.
3. When the pendulum is furthest up what is its only energy?
4. When the pendulum is at its low point, what is its only energy?
5. Does the total energy ever change?
6. Put FRICTION to max. What energy now shows up and what happens to the pendulum?



Go back to main page and click on **Pendulum Lab Lab**

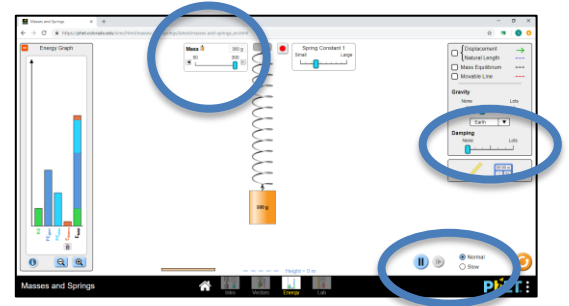
Click so that velocity & acceleration arrows show up

Draw the velocity & acceleration arrows on the diagrams below at the various positions



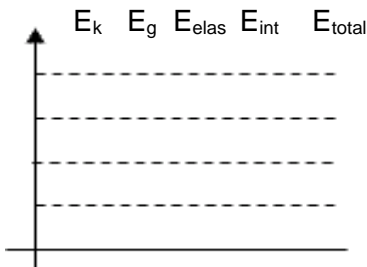
MASSES AND SPRINGS and select ENERGY

- Set MASS to maximum (300 g)
- Set DAMPING (friction) to ZERO
- Hit SLOW on the bottom right if it helps.
- Click and drag mass to the spring

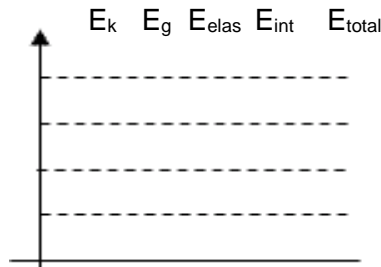


Circle the following answers

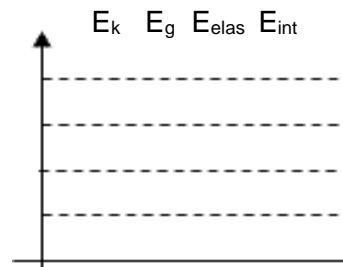
1. Where is KE (kinetic) the highest: **Bottom** Middle Top
2. Where is PE_{grav} (potential from gravity) the highest: Bottom **Middle** Top
3. Where is PE_{elas} (elastic) the highest: **Bottom** Middle Top
4. Does the total ever change? **YES** NO
5. Draw all the energies of the spring at the following points:



spring at the top



spring half way down



spring at the bottom

6. When the spring gets to the top, Make mass HALF as big. What happens to all your energies?
7. Put damping (friction) on. What changes in your energy bars and what eventually happens to the mass and spring?
8. Think of the forces acting on the mass. What is the force pulling the mass and thus the spring down to stretch it?