

Intro Screen

Explore the relationships between applied force, spring force, displacement and equilibrium.

DRAG the pincer to control the applied force

VIEW force and displacement vectors

DISPLAY magnitude of the vectors

COMPARE two springs simultaneously

Hooke's Law

Systems Screen

Investigate how the applied force, spring force, and effective spring constant change when two springs are connected in series or parallel.

SEE the spring thickness change as spring const. is adjusted

ADJUST the stiffness of the springs

COMPARE total and component spring forces

INVESTIGATE springs in series and parallel

Hooke's Law

Energy Screen

Explore how the applied force, displacement, and spring constant affect the potential energy stored in the spring.

The screenshot shows the PhET Hooke's Law Energy screen. At the top, there are two graphs: 'Potential Energy' on the left and 'Potential Energy' on the right. The left graph shows a blue bar representing potential energy, and the right graph shows a blue parabolic curve representing potential energy versus displacement. Below the graphs is a 3D model of a spring with a red pincer. At the bottom, there are two sliders: 'Spring Constant' (ranging from 100 to 400 N/m) and 'Displacement' (ranging from -1 to 1 m). The current values are 300 N/m and -0.715 m. A control panel on the right side of the screen has several options: 'Bar Graph' (unselected), 'Energy Plot' (selected), 'Force Plot' (unselected), 'Energy' (checkbox, unselected), 'Applied Force' (checkbox, unselected), 'Displacement' (checkbox, unselected), 'Equilibrium Position' (checkbox, selected), and 'Values' (checkbox, unselected). A green arrow points to the 'Equilibrium Position' checkbox. A green box on the left says 'TRACK the displacement' with an arrow pointing to the displacement slider. A green box on the right says 'PLOT the Energy or Force in the system' with an arrow pointing to the 'Energy Plot' option. A green box on the right says 'SHOW the equilibrium position' with an arrow pointing to the 'Equilibrium Position' checkbox. A green box on the right says 'CONTROL the displacement' with an arrow pointing to the displacement slider. A green box on the left says 'SEE the amount of potential energy stored in the spring' with an arrow pointing to the potential energy bar graph. The PhET logo and navigation icons are at the bottom.

TRACK the displacement

SEE the amount of potential energy stored in the spring

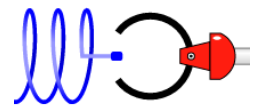
PLOT the Energy or Force in the system

SHOW the equilibrium position

CONTROL the displacement

Model Simplifications

- The thickness of the spring is used to indicate the spring constant. The springs on the Systems screen have fewer coils due to space constraints (which would reduce the spring constant). To maintain consistency, springs with the same spring constant have the same thickness, regardless of the number of coils.
- The pincer will release when the applied force (or displacement) is set to zero. However, the pincer remains closed while being dragged through the equilibrium position.



Suggestions for Use

Sample Challenge Prompts

- Explain how the spring force and applied force are related to one another.
- Predict what happens to the displacement when the spring constant is doubled while the applied force is kept constant.
- Compare and contrast the component spring forces for the series and parallel systems.
- Explain how the spring constant affects the shape of the Energy and Force plots.

See all published activities for Hooke's Law [here](#).

For more tips on using PhET sims with your students, see [Tips for Using PhET](#).