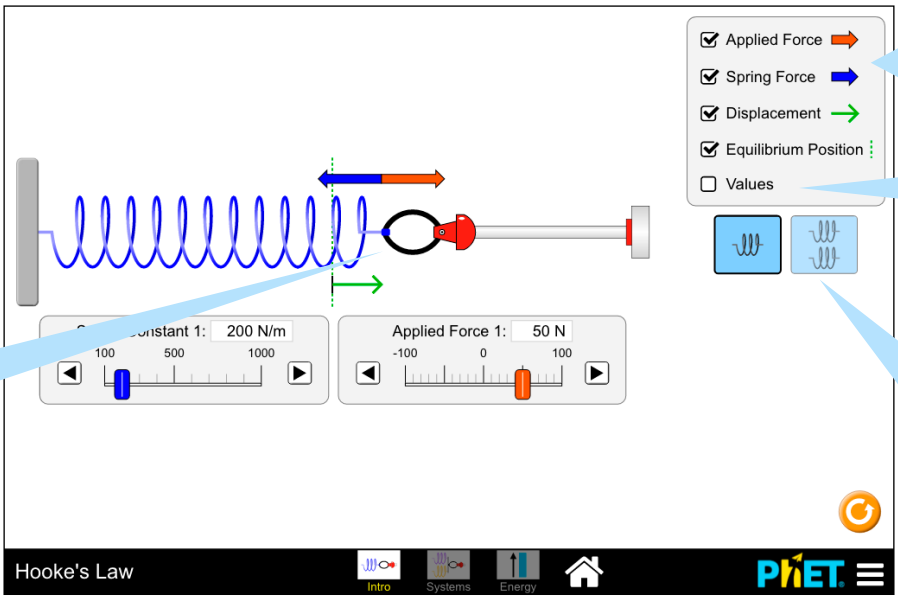
PhET Tips for Teachers — Hooke's Law

Intro Screen

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



VIEW force and displacement vectors

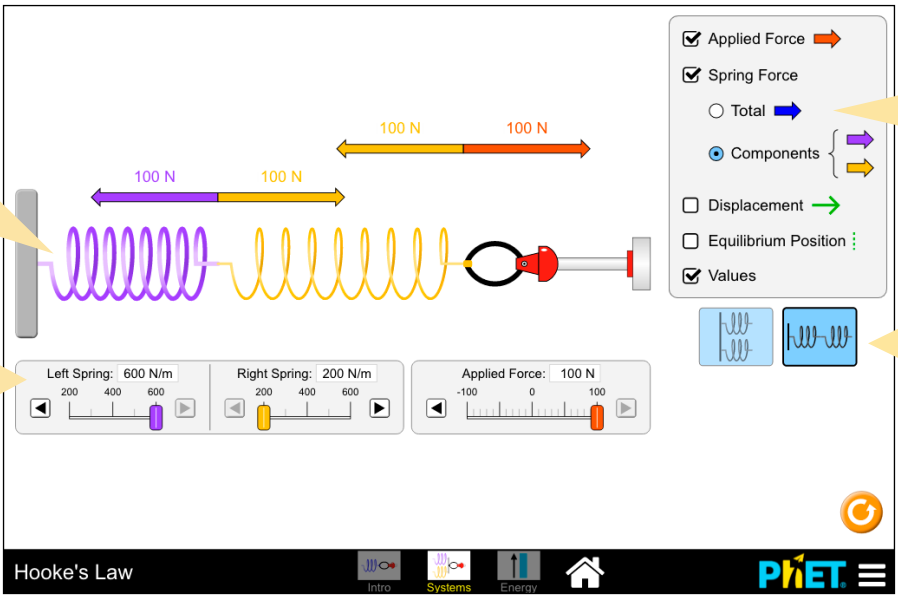
DISPLAY magnitude of the vectors

DRAG the pincer to control the applied force

COMPARE two springs simultaneously

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

COMPARE total and component spring forces

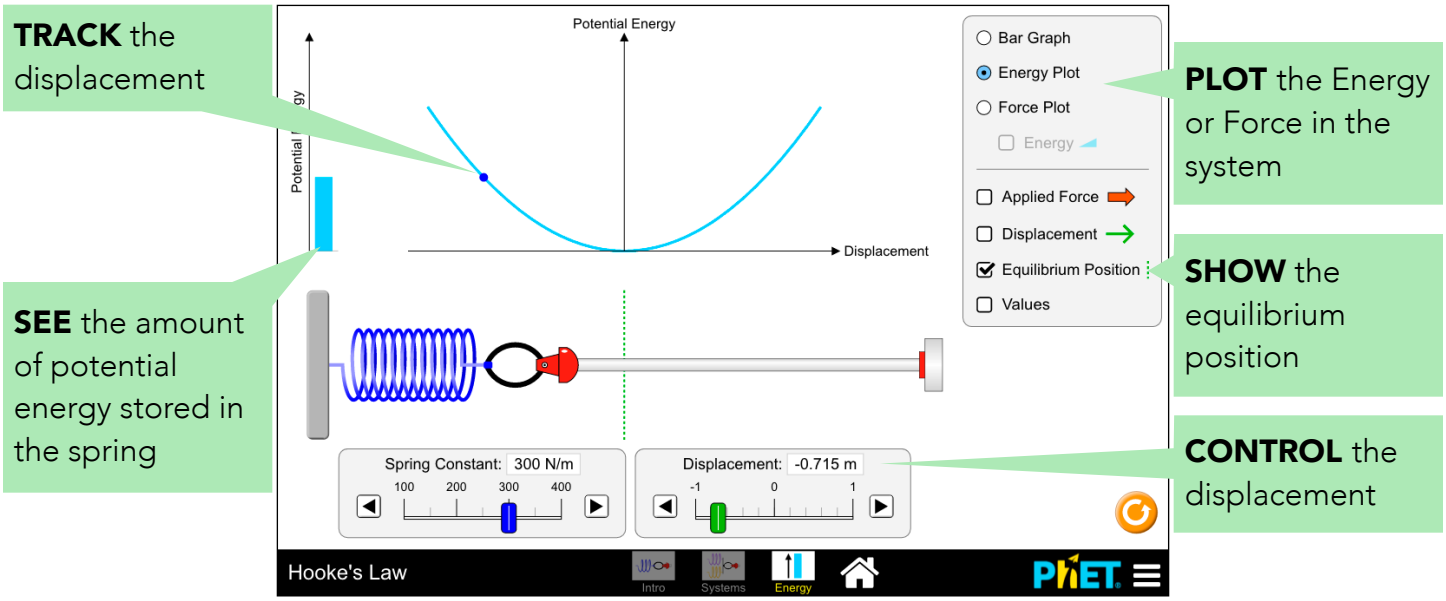
ADJUST the stiffness of the springs

INVESTIGATE springs in series and parallel

Rouinfar, October 2015

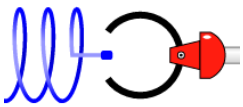
Energy Screen

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



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.

Rouinfar, October 2015