

Intro Screen

Play with objects on a teeter totter to learn about balance.

DISPLAY the forces in the system

REMOVE supports

DRAG items onto the plank

SEE the masses of the objects

Balancing Act

Intro Balance Lab Game

PhET

Balance Lab Screen

Explore how to balance the plank using various objects, and determine the masses of mystery objects.

OBSERVE if level (green arrow) or not (gray arrow)

USE marks to determine distance

MEASURE the distance from the fulcrum

SELECT bricks, people, or mystery objects with an unknown mass

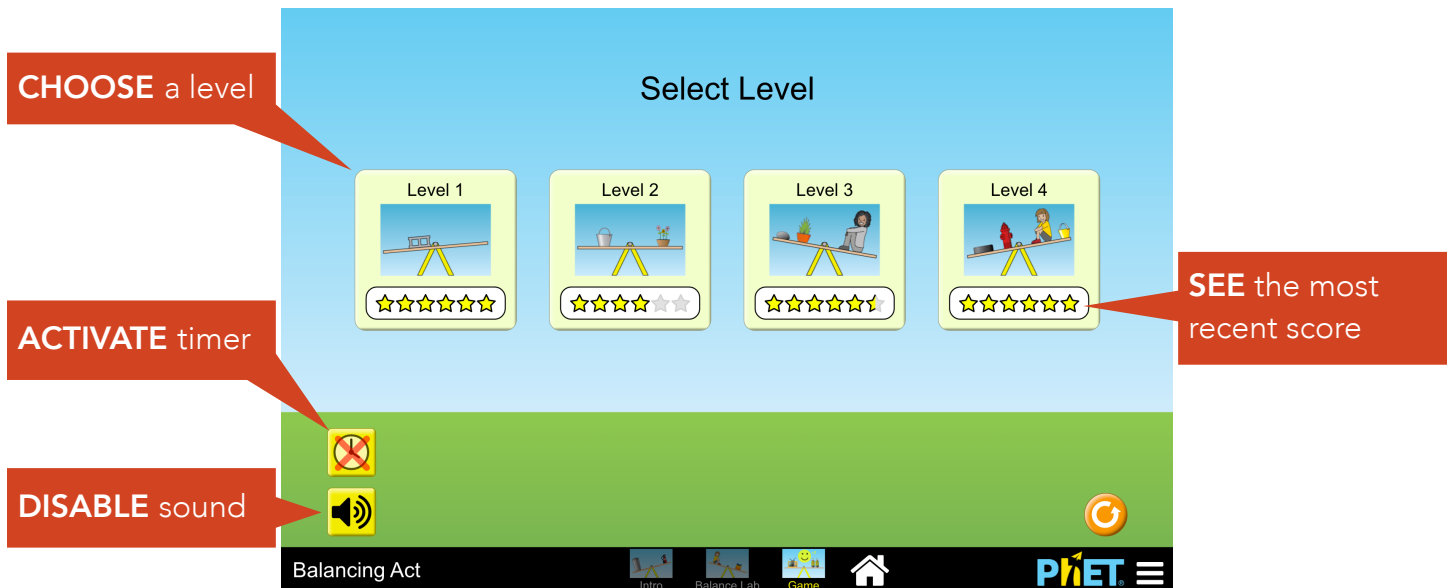
Balancing Act

Intro Balance Lab Game

PhET

Game Screen

Solve puzzles about balancing – add an object to balance the plank, predict the direction the plank will move when the supports are removed, or determine the mass of an unknown object. As the level increases, the challenges become more difficult.

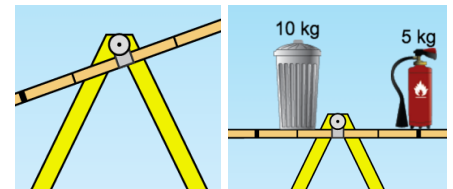


Insights into Student Thinking

- Middle school students tend to put many objects on the board. The Intro Screen was added to help simplify the investigation. It may be helpful to have a discussion about how position of a heavy object can be used to balance a light one.
- The games are provided to help students build skills, some students toggle back to the first screen to test their ideas and this seems helpful.

Model Simplifications

- The pivot point is slightly vertically offset from the center of mass of the plank. This was done so that if the plank is in an unbalanced situation (left) and then the student makes the total torque zero (right), the plank will level. In a centered pivot situation, a zero torque would not cause motion.
- Object mass is considered to be centered and in the plank; the white line below the object shows the location.
- The Mystery Objects have varying mass which is not related to the size. We have refrained from publishing the masses, upon the request of teachers.
- The Force vectors are shown as initiating at the base of the objects instead of from center of mass to help beginning students build their own ideas easily.



Suggestions for Use

Challenge Prompts

- Balance two objects with unequal masses.
- Predict how adding an object (or repositioning an object) will affect the motion of the plank.
- Design an experiment to determine the mass of a mystery object.
- Create a general rule to describe how the plank will tilt.

See all published activities for Balancing Act [here](#).

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