2ND CLASS LEVERS
Instructor Guide

SCHEDULE
- Introduction
- Springboard Build
- Optional Challenges
- Wrap Up

OBJECTIVE
Day 3 introduces 2nd class levers. 2nd class levers can be identified by the load placed between the fulcrum and effort. This setup changes some of the capabilities of the lever. Learn about what some of the applications for these capabilities are. Also learn how to calculate and communicate exactly what kind of advantage these levers give.

VOCABULARY
Students identify and explain terms in their own words.
- **Input**: The Power or Energy applied to an object, like a Lever.
- **Effort Arm**: The length of the lever between the fulcrum and the effort.
- **Load Arm**: The length of the lever between the fulcrum and the load.
- **Mechanical Advantage**: The amount that the force of the effort is multiplied by the lever. Calculate the mechanical advantage by dividing the load by the effort needed to balance the arm.
- **Double Levers**: A form of lever where two lever arms are connected together at the fulcrum.
- **Second Class Lever**: A lever where the load is between the fulcrum and the effort. A 2nd class Lever always provides a mechanical advantage.

CHALLENGE 1: Force and Output
Create a 2nd class lever and rest the end of the effort arm onto a digital scale. As long as the lever is not moving it is a balance of moments. Place a load along different locations of the lever, recording the measurements of the effort each time.

CHALLENGE 2: Levers in the Body
When someone stands on their tip-toes the foot, heel, and calf muscle make a 2nd class lever!
Make a model of an ankle where the leg can be lifted by moving the heel while the toes are on the ground.
2ND CLASS LEVERS
Springboard

Required Materials

- Angular Block 30 (Qty 4)
- Angular Block 60 (Qty 4)
- Building Block 7.5 (Qty 1)
- Link 30 (Qty 2)
- Spring Cam (Qty 2)
- Building Block 15x30x5 with Groove and Pin (Qty 3)
- Building Block 30 (Qty 5)
- Base Plate 120x60 (Qty 1)
- Mounting Plate 15x90 (Qty 2)

Set one assembly aside until step 5.

Stop
2nd Class Levers
Springboard Continued...

From Step 1

From Step 2

x1
x2
x3

x1