

# RAFT IDEAS

**Topics:** Balance, Manual Dexterity, Center of Gravity

## Materials List

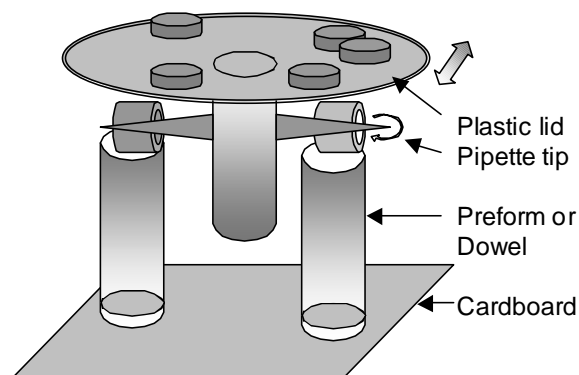
- ✓ 3 Preforms or dowels, ~15 cm (6") long
- ✓ 2 pipette tips or small plastic cones
- ✓ ~10 cm (~4") diameter plastic lid
- ✓ 2 ~2.5 cm (~1") plastic cylinders (donut shapes)
- ✓ cardboard for base
- ✓ Hot glue
- ✓ 30-40 pennies

This Activity can be used to teach:

- Motion (pushes and pulls) (CA Science Standards: Grade 2, 1.c)
- Balanced Forces (CA Science Standards: Grade 8, 2)
- Observation and Science Process Skills (CA Science Standards: Grade K-8, Investigation and Experimentation)

# Balancing Your Budget

## A RAFTy Balance Game



Objects are more stable when they have a low center of mass. This game allows students to investigate balance and discover that raising an object's center of mass increases its tendency to tip over... and they have fun in the process!

## Assembly

1. Hot glue two pipette tips (small plastic cones) to opposite sides of a preform or dowel about 4 cm (~1½") from one end, so that you form a lowercase T.
2. Hot glue two preforms or dowels (the posts) to a piece of cardboard to serve as the base of the balance. Make sure that the two posts are separated to allow the third preform or dowel to swing easily between them – about 4 cm (~1½") apart.
3. Loosely fit a cylinder (donut shape) over each pipette tip, then hot glue the sides of the cylinders to the tops of the posts so that the long section of the T swings freely between the posts.
4. Hot glue a plastic lid on top of the center preform to form a tray (you may need to glue a small piece of cardboard between the preform and the lid as a spacer or stiffener).

## Playing the Game (for 2-4 players)

1. Each player takes turns placing a penny on the top lid of the balance, trying not to tip the balance over (trying to keep the pennies from spilling). The last player to place a penny without spilling wins the game.

## The Science Behind the Activity

Every object has a center of mass, which is the object's balance point. In the case of this game, placing pennies on the top tray raises the center of mass, causing the system to become less stable. By playing this game, students learn that the distribution of mass affects the center of mass of a system.

## Taking it Further

Students can try using other small objects on the balance tray, or objects with different weights, such as mixtures of different coins.

Assign students to play 10 games. In each game, students should gather data on the number of pennies they were able to place each time, find the average, and present their findings in a graph.

**Web Resources** - Visit [www.raft.net/more](http://www.raft.net/more) for how-to videos and more ideas!