Balance Toys

By adjusting the center of gravity you can make a whimsical and surprising toy.

Related exhibits: none
Related toys: Webble Wobbles®, Bozo Bop Punching Bags®, Jenga®
Time: 10 minutes
Ages: 5 and up
Staff: Floor staff or volunteer
Safety: no issues

Materials:

- Person/butterfly template copied on cardstock or boxboard.
- Balance stands (e.g., an unsharpened pencil held up by a wad of clay, for a more permanent stand drive a large-headed nail into a small piece of wood)
- Scissors
- Markers
- Paper clips, pennies (or other items for weight) (paper clips are easily moved around, for final products, tape weight to the back of the toy so it's hidden.)

Procedure:

1. Begin by discussing your center of gravity and how you balance yourself. Stand on two feet, then on one. How does our body move? What if we hold one foot way out to the side? Observe how you and others adjust your weight to stay balanced. Have participants try some fun little balance tricks such as standing with their heels against a wall while attempting to touch their toes.
2. Show a template and have participants predict where it will balance. Check by balancing it on the balance stand. Then show them the same template, which has been weighted in the hands. Again predict where it will balance. What caused the balance point to move?
3. Have each person cut out and decorate a template.
4. Let them experiment with balancing each cut-out on a balance stand.
5. Add paper clips to see what interesting ways the template will balance. Can it stand on its head?

Questions to Ask:

How do you balance a donut-shaped item? Where is its center of gravity? Is it possible that the center of gravity is located in the hole? How should you weight the item to balance it?

Extensions:
Design other shapes to balance.
Design mobiles or stabiles (mobile-like structures that sit on a stand or surface versus being hung). Discuss the work of kinetic artists such as Alexander Calder.

Science Concepts:
The center of gravity is the spot where the center of the mass of an item is located and is known as its balance point. The center of gravity is determined by how the mass of the item is distributed. Gravity pulls down on an object, but if it is being pushed up at its precise center of gravity it will be stable and balanced. The center of mass isn't always visually intuitive and how an item is weighted can make for an unexpected balance point.