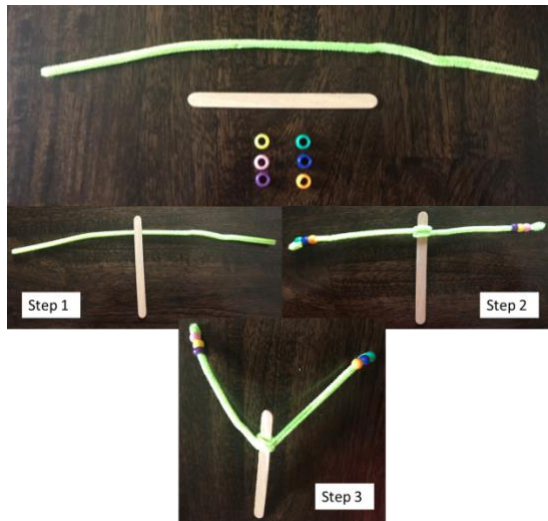


# DIY Air Force Activities: Balancing Act



## Materials:

- 2 popsicle sticks
- pipe cleaner
- pony beads (6-10)
- 5 pennies or washers
- hot glue



## Bonus activity:



The Earth's gravity is what keeps our feet on the ground. It is what causes objects to fall. While gravity pulls things to the ground, an object's center of gravity is what prevents it from falling over. Humans have a center of gravity that keeps us balanced when we stand up and walk! An object's center of gravity is the point at which its weight is the same on all sides. Think about a plate on a table. If only small part of the plate is hanging over the edge, the plate will stay on the table. But what happens if you were to push the plate over the edge even more a little at a time? Eventually the plate is going to fall off! This is because the plate was off its center of gravity. Let us try doing our own experiments to explore center of gravity.

## Directions:

1. Take your pipe cleaner and lay it out straight on a table. Then take your popsicle stick and place one end of it over the pipe cleaner (leaving approximately  $\frac{1}{4}$  inch hanging over the top). Make sure the stick is in the middle of your pipe cleaner.
2. Wrap one end of your pipe cleaner around the popsicle stick one time. Then take the other end of your pipe cleaner and wrap it around the popsicle stick one time. Next, add three pony beads to each end of your pipe cleaner and bend the ends up so the beads do not fall off.
3. Finally, slightly bend both sides of the pipe cleaner downwards. Place the short end of the popsicle stick on the tip of your finger and let go of it.

*Note: If you are having trouble getting yours to balance on your finger properly, readjust your pipe cleaner to make sure it is as centered as possible on the popsicle stick.*

What happens if you add more beads to one side of the pipe cleaner? Will it still balance? Does it matter if the pipe cleaner is longer on one side than the other? Try changing the position of beads. **Bonus activity:** Take your other popsicle stick and **have an adult** glue 3 pennies to one end and 2 to the other. Try to balance the stick across your finger **HINT:** the center of gravity may no longer be in the middle of the stick! Why? Remember, the center of gravity requires equal weight on both sides!

## Air Force Associations:

When pilots steer their planes, they are actually rotating them around the plane's center of gravity. As the plane flies, it consumes fuel. This alters the planes weight distribution and thus its center of gravity. Pilots must constantly adjust the controls to keep the airplane balanced!