DIY Air Force Activities:

Density Diversions

Materials:

- any size mason jar or empty peanut butter jar
- baby oil
- oil based food coloring
- water based food coloring
- water
- measuring cup

OR

- tall glass or mason jar
- a variety of the below liquids
- eye-dropper or turkey baster

Density is the amount of mass in a given volume. Think about an elevator. The volume is the 3 dimensional size of the elevator. As people (mass) are added to the volume of the elevator, it becomes more tightly packed. A crowded elevator has more density. There is more mass in the same volume. Liquids also have density. Due to the properties of liquids they can be mixed but will separate back out and layer in order of density. The densest liquid will go to the bottom and the least dense will float to the top! Follow the directions below to make your own density jars. Give them a shake and the colors mix, then watch the colors layer back out. This is a fun way to explore color mixing! What happens if you mix a red and blue layer together? What about a blue and yellow layer? Make a series of jars to learn about primary and secondary colors!

1. Density jar:

a) Fill empty jar halfway with water, pour water into measuring cup.
b) Add water based food coloring to water to achieve desired color.
c) Pour colored water back into the jar.
d) Measure out an equal amount of baby oil in the measuring cup.
e) Add oil based food coloring to the oil. It is best to select a different color than the water. Primary colors work best (red, blue, or yellow)
f) Add colored oil to the jar and secure lid. Make sure it is closed tightly!
g) Give your jar a shake! Watch the liquids mix and separate back out! How do the colors change when mixed?

2. Liquid Layers: Following the guide on the left, see what household liquids you can layer in your mason jar or glass using the eye-dropper or turkey baster. If you mix them do they separate back out?

Air Force Associations:

There are two types of flying machines that allow for lift to overcome gravity. The first type, called aerodynamic machines such as helicopters and airplanes, rely on thrust and forward speed to produce lift. The second type, aerostatic machines, such as hot air balloons and lighter than air-type craft, rely on the differences in air density for lift. Hot air balloons rise into the air because the density of the air (warmer air) inside the balloon is less dense than the air outside the balloon (cooler air).