

**Lesson 2 Activity Handout**

Name _____

Description: In this activity, you will find the total weight and mass of the drone by using a scale. The weight of your drone determines things like how high the drone can fly and how long it will remain airborne. Knowing the mass and weight of your drone is also important due to laws concerning drones. The FAA mandates that all drones over 250 g and under 55 lbs. need to be registered. You will also find out if your drone needs to be registered with the FAA. Your group will use a scale to determine the mass or weight of your drone, depending on the type of scale your group has. Using the formulas below, you will be able to calculate whatever quantity your scale does not determine.

$$F = ma$$

$$m = \frac{F}{a}$$

Pre-Activity Questions - Before you get started with the activity answer the following questions as a group:

1. What quantity does your scale determine?
2. What formula will you use to determine the other quantity (either mass or weight)?
3. List the parts of the drone you think you should weigh (you should come up with 8).

Once you have answered the above questions complete the following steps. Each cadet in the group should complete each role and your group should have at least three measurement tables completely filled out:

Materials:

- Scale
- Pen/activity log

Roles: Take turns completing each role.

1. Pilot – check in/out the drone, keep group materials organized, compare and compute results.
2. Engineer – measuring and use the balance
3. Project Manager – record the data determined by the engineer

Steps:

1. The pilot should check out the drone.
2. The project manager should take out their project log.
3. The engineer should begin by zeroing the scale or triple beam balance (video for triple beam balance: <https://www.youtube.com/watch?v=lf5lQjffBfc>).
4. The engineer should then



7. Do you think, if you averaged the drone measurements of the entire class, you would have a more accurate or less accurate mass or weight? Explain your reasoning.