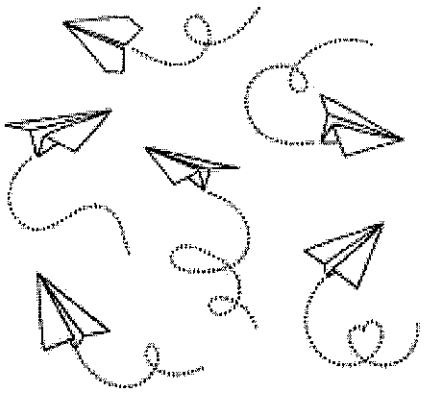
# Science Summer Learning Packet

for incoming 6th grade Lady Pumas



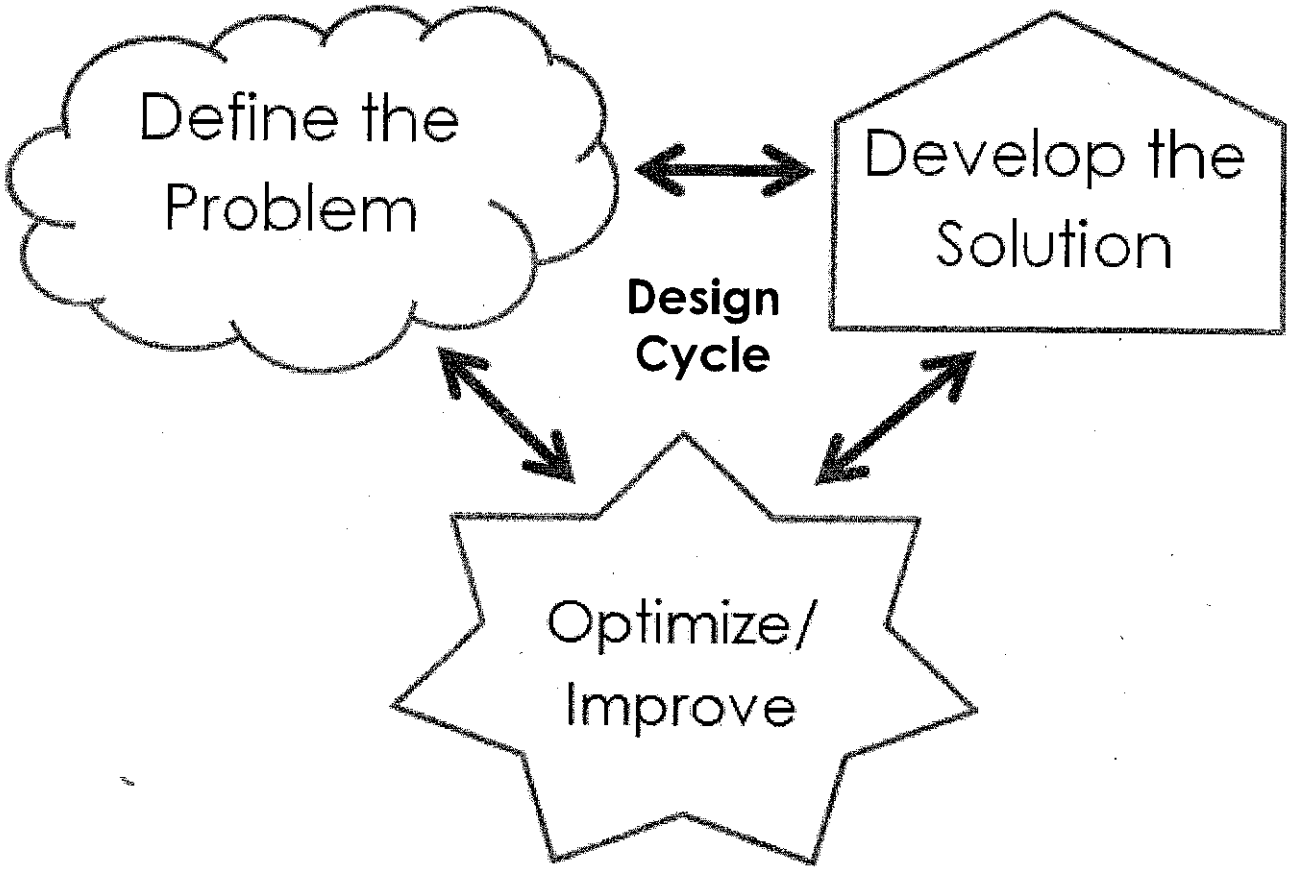
Welcome new Lady Pumas to CCPSG! It has been part of our culture from the beginning to make sure you keep your mind active and engaged over the summer. Attached you will find a science activity that is fun, interactive, and challenging all based on scientific design and engineering. Your task is to complete this packet over the summer. On the first day of school, bring your packet along with your "best" plane. We will have a competition to see which plane is the "top flyer"! Be creative with the design of your plane - The Sky's The Limit!

Name _____

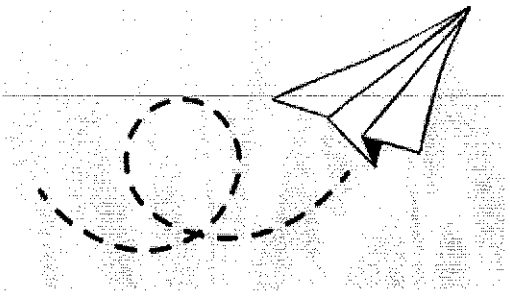
Due the first day of school

# Engineering Design Cycle

The Engineering Design Cycle is a process that helps to organize your thoughts and guides you as you work through solving a scientific problem. The cycle consists of several steps. We are focusing on 3 of them: Defining the Problem, Developing a Solution, and Optimizing/Improving. Defining the Problem means you will identify the situation that needs solving. Next, Developing a Solution is creating a plan to solve the problem. Finally, Optimizing/Improving is testing the idea and making corrections to the testing to confirm or deny the outcome. We will be using this process throughout the year as we encounter problems that need to be solved. Below is a visual blueprint that represents the Engineering Design Cycle.



# Paper Airplane Contest



**Objective:** Students will be able to use the engineering design cycle and problem solving skills to create an airplane that flies the farthest or most accurate.

**Materials:**

Sheet of paper (no bigger than 8.5 x 11 inches)
This packet to record your data
Yard stick (or something to measure with)
Any additional materials of your choosing

**Procedures:**

1. Watch the following video to engage your mind. https://www.youtube.com/watch?v=IhCeOgaNILs
2. Explore airplane designs. Use the internet to research ideas.
3. Create your airplane
4. Test your airplane several times
5. Make adjustments to your plane
6. Now, fly your plane 3 time and be sure to record your measurement data in the tables below

**Data Collected:**

Distance: To measure your distance follow the steps below:

1. Determine a starting point (like a crack in the sidewalk)
2. Throw your plane and allow it to land
3. Measure from your starting point to the closest part of your plane
4. Repeat for 3 trials
5. Record your answers in the data table below

| Trials | 1 | 2 | 3 |
|---|---|---|---|
| Distance (In inches) | | | |

Accuracy: To determine your accuracy follow the steps below:

1. Mark an X or spot on the ground.
2. Stand 10 feet away from your mark
3. Throw your plane and measure how far away you are from the target
4. Repeat for 3 trials
5. Record your answers in the data table below

| Trials | 1 | 2 | 3 |
|---|---|---|---|
| How far from mark (target)? (In inches) | | | |

**Follow Up Questions:** (You may use an additional piece of paper if necessary to answer the questions.)

1. Explain what problems you encountered when designing your airplane?

2. What variables did you change? How did each change help/hurt the design of your plane?

3. Looking at the results of your data, evaluate which competition (farthest/most accurate) would your plane do the best in?

4. Identify the parts of the Engineering Design Cycle.
    a. Define the Problem -
    b. Develop the Solution -
    c. Optimize/Improve -

5. Rewatch the video link, if needed, https://www.youtube.com/watch?v=lhCeOgaNILs What challenges did Emila Earhart face as she pursued her dreams of becoming a pilot?

6. Amelia Earhart opened doors for future women pilots/aviators. Identify a modern day female aviator.

7. If you could change one thing about this assignment what would it be?