Name _____ Date _____ Period_____

Engineering Project

Design Challenge

Problem – Your group needs to create a **working** hot air balloon **prototype**.

Criteria –Only allowed to use the following materials (will be provided)

□ Garbage bag □ String □ Straws □ Tin foil □ Glue □ Candles □ Ruler □ digital balance

1. Gather Information

Use a computer to research information about building porotype hot air balloons. Make sure to gather information of the supplies, measurements, and steps used.

2. Prototype Design Plan

In the space provided, draw and label your hot air balloon. Make sure to label the building steps, materials needed, and the measurements

3. Create Prototype

You must show the teacher the information gathered and the design before you may gather supplies. You do not receive more than you planned and cannot ask for more supplies if you "forget" any materials.

4. Test Prototype

Hot Air Balloon Prototypes will be tested outside. We will go out as a class to test.

5. Redesign Prototype

Brainstorm ways to improve your prototype, try them out and retest your improved design.

6. Evaluate Prototype

Answer the following questions about engineering your prototype and the atmosphere

1. What challenges did you have as a group?

2. Did the prototype work the first time? Explain Why

3. Why do you think it is important to have exact and careful measurements to make the hot air balloon prototype?

4. What happened to the garbage bag when the candles were burning? Explain why

5. What happened to the garbage bag when the candles were not burning? Explain why

6. How is energy being transferred between the gas molecules inside the garbage bag?

7. Explain why a hot air balloon can rise in the Earth's atmosphere.