

Engineering Your Balloon

Science Review:

1. Whether or not an object will float depends on both *mass* and *volume*
2. An object with a small mass and large volume will float, while an object with a large mass and small volume will sink.
3. We can combine mass and volume by calculating *density*:

$$D = \frac{M}{V}$$

4. An object that has a lower density than a surrounding gas, such as air, or liquid, such as water.

1. Kinetic energy is the energy of moving particles or objects.
2. When we heat a substance, the particles in the substance move faster and kinetic energy increases.
3. As the particles move faster, they collide with each other more often and with more force, pushing each other apart. As a result, particles with more kinetic energy tend to expand.

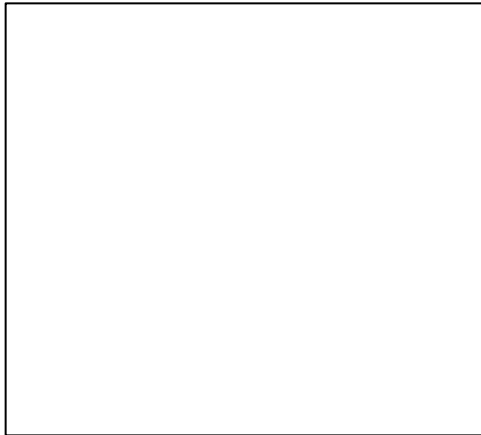
Engineering Process

1. Identify the problem

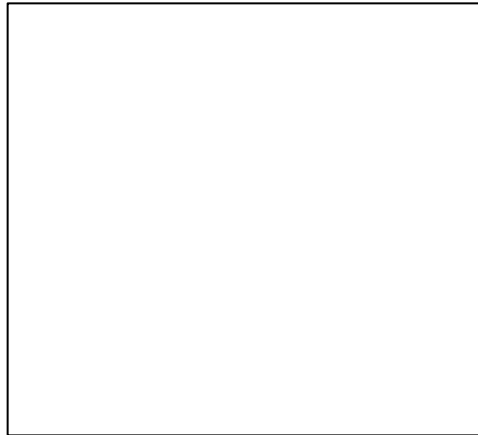
Goal: Build a hot air balloon that will float for the maximum amount of time

Constraints: You are limited to 12 sheets of tissue paper and one class period to build your balloon

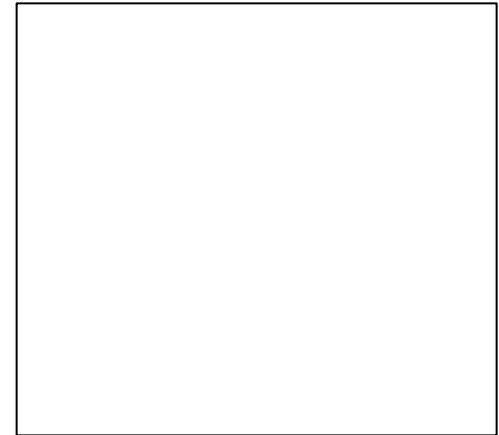
2. Brainstorm ideas



Idea 1



Idea 2



Idea 3

Engineering Process

3. Analyze ideas

Describe one good thing and one bad thing about each design:

Idea 1:

Good:

Bad:

Idea 2:

Good:

Bad:

Idea 3:

Good:

Bad:

4. Select a design

Which design did you choose?

Why did you choose this design?

Engineering Process

5. Revise the design

Make an improved sketch of the design you selected. Mark the dimension (sizes) of its parts and answer the question below.



Recognizing trade-offs

How does your design achieve a large volume and good stability without adding too much mass?