C2 W16

Experiment Title: Shape Up (#189)

The Scientific Method by Emoticons

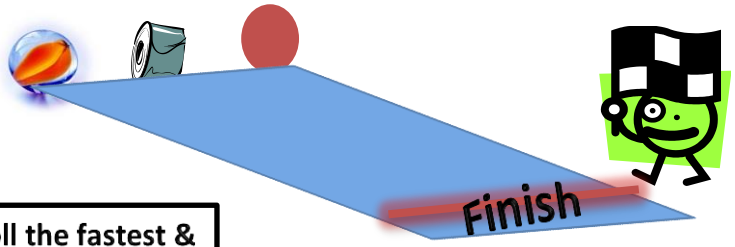
Purpose

To determine how shape affects speed.

I wonder which object will win the race?

Hypothesis

Circle One



Which object will roll the fastest & make it to the finish line first?

Materials

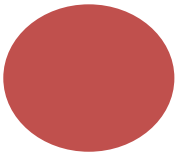
- card table
- 2 books of equal thickness
- 2 jar lids, the same size
- 1 large roll of masking tape
- marble
- masking tape
- helper

Procedure

1. Tilt the card table by placing a book under two of the legs.
2. Place the lid tops together and tape their edges to form a disk.
3. Ask your helper to hold the disk made from the lids at the top of the incline while you hold the marble & roll of tape in line with the disk.
4. Release all three objects at once.

Results

Circle the Winner!



Conclusion

The *rolling speed* is related to the *distribution of weight* around the object's *center of gravity* (the point at which an object balances).

The center of gravity of all the objects in this experiment is at their geometric center, but each has a different weight distribution.

The closer the weight is to the center of gravity, the less energy it takes to rotate the weight.

Given the same amount of energy, the marble moved fastest because its weight is closest to its center of gravity and the hollow tape roll moved the slowest because it's weight is located farthest from its center of gravity.

C2 W16

Experiment Title: Breakthrough (#190)

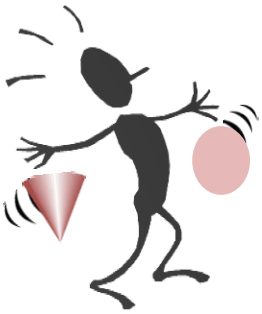
The Scientific Method by Emoticons

Purpose

To demonstrate how the *shape of an object* affects its falling speed.

Which object will hit the ground first when I drop them?

Hypothesis



Circle which object you think will hit the ground first.

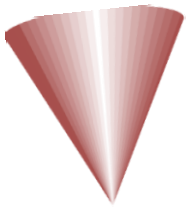
Materials

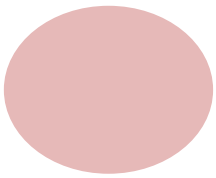
- 2 sheets of typing paper
- pencil
- compass
- ruler
- scissors
- cellophane tape

Procedure

1. On each sheet of paper, draw a circle with an 8 inch diameter & cut both circles out.
2. On one of the paper circles, cut a slit from the outside to the center.
3. Overlap the cut edges to form a cone. Use a 1 inch piece of tape to secure the edges.
4. Put an equal-sized piece of tape in the center of the flat piece of paper to keep the weights of both circles equal.
5. Hold the circle in one hand & the cone, point side down, in the other, at the same height.
6. Drop the cone & the paper circle at the same time.
7. Observe as they fall & strike the floor.

Results





Which shape sliced through the air faster & hit the ground first?

Circle your result.

Conclusion

On Earth, falling objects pass through a layer of air called the *atmosphere.*

As the objects fall, they *collide with air molecules* that exert an upward force on them. The amount of the uplifting force depends on the surface area of the object.

The flat sheet of paper has a larger surface area & many molecules of air push upward on it causing it to fall more slowly than the cone.

As the cone falls, it has less surface area so it breaks through the air molecules with fewer of them striking its surface, & thus falls faster.