PS – Activity #14

Gravity, Don't Let It Get You Down

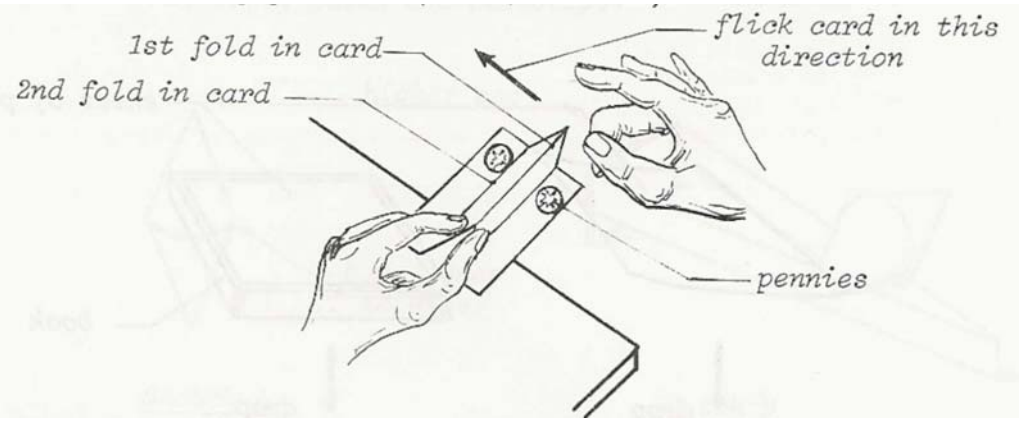
QUESTION: Do heavier objects fall faster than lighter objects?

MATERIALS:

aluminum foil - 2 pieces	paper clip - 2
aluminum pan	pennies - 2
index card	washers - 6

PROCEDURE:

1. Fold the index card in half, then fold each side 1/3 from the end outward.
2. Place a penny on each side of the center ridge of the card and hold one end of the card on the table edge. See figure below.



3. You are going to flick the ridge of the card to the side. This will fling one penny several meters away and at the same moment the other penny will drop straight to the floor. Which of the two pennies will hit the floor first? Write your prediction in the Data section.
4. Flick the card and listen to the click of the penny hitting the floor. Did you hear two clicks or one click? Record your observation.
5. Repeat step 4 two more times.
6. Now place one washer on each paper clip. Hold one paper clip and washer with your right thumb and index finger. Hold the other paper clip and washer with your left thumb and index finger. You are going to drop both washers from the same height at the same time so that they both land in the aluminum tray at the same time. Try this several times until you can consistently get them to hit the pan at the same time.
7. Now add another washer to the paper clip you were holding in the right hand. When you drop the two set-ups at the same time, which do you think will hit first? Record your prediction in the Data section.
8. Drop the two set ups at the same time. Record what happens.

9. Repeat steps 7 and 8 three more times, adding a washer to the paper clip in the right hand each time. Be sure to make a prediction **BEFORE** each drop.
10. Now get the two squares of aluminum foil. Keep one flat and crumple the other. Predict which will hit first if both are dropped at the same time. Record your prediction.
11. Drop both pieces of foil at the same time. Record which hit first.
12. Now crumple the other piece of foil so that both the crumpled pieces are about the same size and shape. Which will hit first? Record your prediction.
13. Go ahead and drop both crumpled pieces of foil at the same time. Record which hit first.

DATA:

NUMBER OF WASHERS		WHICH WILL HIT FIRST?			WHICH HIT FIRST?		
LEFT HAND	**RIGHT HAND**	**RIGHT**	**LEFT**	**TIE**	**RIGHT**	**LEFT**	**TIE**
1	**2**						
1	**3**						
1	**4**						
1	**5**						

		WHICH WILL HIT FIRST?			WHICH HIT FIRST?		
LEFT HAND	**RIGHT HAND**	**RIGHT**	**LEFT**	**TIE**	**RIGHT**	**LEFT**	**TIE**
Flat	**Crumpled**						
Crumpled	**Crumpled**						

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QUESTIONS:

1. What is gravity?

2. What two factors determine the strength of gravitational attraction between two objects?

3. What is the difference between mass and weight?

4. In the experiment with the two pennies, which one hit first?

5. Does gravity pull the same on all objects?

6. Do objects always fall at the same rate?

7. On Earth, what force works against gravity?

8. Research, in books or on the internet, to find out how space scientists use the gravitational attraction of large objects in space to power some satellites.