Name: _____ Period: _____ Date: _____

Observing Basic Gravity Lab
Astronomy

Introduction: Let's have some fun with that miraculous, transparent force called *gravity*. Gravity is the driving force for many of the motion patterns we see in astronomy, so let's check out some simple renditions of what gravity can do to simple objects and how strong it actually can be.

Part 1: Water Fall… Incoming!

Materials:

- paper cup
- pencil
- water
- drop location (deep sink)
- paper towels

Procedure:

1. Gather the materials for your group.
2. Take the sharp pencil tip and punch a hole in the center of the bottom of the paper cup.
3. Using your finger, plug the hole at the bottom and fill the paper cup with water over the drop location (In this case, the deep lab sink.) Hold the cup up to the height of the faucet (about a foot higher than the sink).
4. Release your finger over the hole and observe what the water does. What happened? (Tough stuff I know…)

5. Predict what would happen if you released both your finger from the hole and the entire cup itself. What do you think would happen? Explain.

6. Let's put it to the test! But this time, only fill the cup half way so that it doesn't splash out everywhere when it hits the base of the sink. Hold up the cup to the height of the faucet with your finger over the hole and release both the cup and your finger at the same time. <u>WATCH OUT! WATER WILL FLY!</u> What happens? How is this different than step 4? (outside of the obvious fact that the cup fell…) Explain.

7. Using the paper towels, wipe up the water around the sink and return materials to their proper locations.

Part 2: Free Falling

Materials:

- ping pong ball
- styrofoam ball (1)
- styrofoam ball (2)
- paper ball
- meter stick

Procedure:

1. Collect materials.
2. Compare and contrast these four objects. How are they similar and how are they different? Explain.

3. Predict what will happen when all three are dropped from the same height and explain why that is your prediction.

4. Have the tallest member of your group stand on a chair (BE VERY CAREFUL!) with all three objects.
5. Using the meter stick, measure out 2 meters and hold the objects at that height.
6. Release all 4 objects at the same time.
7. Create a data table below that displays your results for 5 total trials.

*** That means it needs to have labels, units, an average for each object, etc.***

8. Do the results match up to your predictions? Why or why not?

9. Return the objects to their appropriate locations as specified by your instructor. What wasn't taken into consideration with this part of the lab that could have a big influence on these objects? Explain.

Part 3: Which is Stronger: Gravity or a Magnet?

Materials:

- a circle magnet
- 3 small paper clips
- a ruler

Procedure:

1. Gather the materials.
2. Lay one paperclip on the lab table and set the ruler perpendicular to it so that you can measure height in cm.
3. You will be seeing how close the magnet has to get to the paperclip before the magnetic attraction out does the strength of gravity. Predict how low the magnet can get (height wise) before the magnetic force pulls the paperclip to the magnet.

4. Slowly lower the flat side of the magnet down along the ruler until the paperclip jumps to the magnet and record the height in cm in a data table below. Conduct a total of 5 trials and calculate an average.

5. Is the average height close to the prediction that you had? If not, why do you think that is?