

**Lesson plan by** Katy Hobson, Experiment from *The Usborne Big Book of Experiments*

**Lesson:** Gravity experiments

**Length:** 30-35 minutes

**Age/Grade intended:** 5<sup>th</sup> grade

**Academic Standard:**

Science 5.3.6 – Demonstrate that things on or near the earth are pulled toward it by the earth’s gravity.

**Performance objective:**

Upon completing the experiments, the students will define gravity using at least one example they observed during the experiment.

**Assessment:** The students will complete a quick-write at the end of the lesson to describe what they learned about gravity through their experiments and the class discussion. The teacher will collect these papers along with the lab sheets to find out what the students learned and if they are ready to move onto the parachute activity.

**Advanced preparation:**

Make copies of the lab sheets

For each pair: two sheets of paper, a ball, a pen, and a stone

**Step-by-step procedure**

**Introduction:** (Engage) “Have you ever noticed how an object that is in the put into the air always falls back down to the ground? See, watch! If I throw this pen up into the air, what happens? It falls back to the ground. What causes this to happen? Is there any way to stop it? Does it matter how big or small, light or heavy the object is? Today we are going to explore this concept to see what we can find out!”

**Step-by-step plan:**

(Explore) You will be working with your science partner (*Gardner – Interpersonal*), and each pair will need two sheets of paper, a ball, a pen, and a stone. With these different objects, you’ll be exploring the phenomenon that we just talked about – how objects always seem to fall back to the ground. Follow the directions on the lab sheet in order to complete these experiments successfully.

As the students work, walk around encouraging their experiments and asking questions.

Level I – How would you describe what is happening? Why does it happen?

Level II – Can you explain what is happening when the objects fall to the ground?

Level III – What would result if objects stayed in the air?

Level IV – What conclusions can you draw based on your observations?

Level V – Can you predict the outcome if you tested a boulder and a stone? (other pairs of objects, too)

Level VI – Based on what you know, how would you explain what’s happening?

(Explain) Students will come back together as a class and discuss their findings. Why do the objects fall to the ground? They come back because of gravity, a force that pulls objects back to earth. Gravity has the same effect on the objects, regardless of their weight, so they land at the same time. The flat paper falls slow than the crumpled paper because air comes up underneath it and slows it down. Since the flat paper has more surface area, more air gets trapped underneath.

(Elaborate) How does gravity affect our everyday life? How would it affect something such as a parachute? Tomorrow, we are going to make parachutes and see how they are affected by gravity.

**Closure:** If you want to challenge your friends or family, take two sheets of paper and write “heavy” on one and “light” on the other. See if they are able to find a way to make the “heavy” paper land first if both papers are dropped from the same height at the same time. (Evaluation) Very quickly, take out a clean sheet of paper and tell me what you learned about gravity today through your experiments and through our discussion. What is gravity? How does it work? How do you know? When you are finished, staple this paper to your lab sheet and turn both of them into the science tray.

### **Adaptations/Enrichment**

A student who understands and is able to define gravity should move onto the parachute experiment in order to receive enrichment.

A student with ADHD or an emotional disability should be paired with a student who stays on task and works well with that student.

A person with a writing disability may type their answers or explain them orally to the teacher.

### **Self-Reflection**

How did the students do completing the experiments?

Were they able to observe what was happening and communicate their observations on the lab sheet?

Were they able to define gravity and support their definition with an example?

Are they ready for the next lesson, or do we need to spend more time on this?

How can this lesson be improved?

Name: \_\_\_\_\_

1. Experiment with (gently!) tossing paper, a ball, a pen, and a stone in the air. What happens to the crumpled up sheet of paper when you throw it into the air? What happens to the ball? What happens to the pen? What happens to the stone? Do you think that this would happen to all objects? Explain why or why not.
2. Hold the stone in one hand and a crumpled up sheet of paper in the other. Which one is heavier? Predict what will happen if you drop them at the same time.
3. Drop the stone and the paper at the same time from the same height. Try this several times. Which one lands first? Why do you think this happens?
4. Experiment with the different objects. Try the pen and the ball at the same time, the paper and the pen, and so on. Write down at least 3 more pairs and which one lands first in each.
5. Now, you're going to have a paper race. You will need another sheet of paper, which will stay flat. Take the flat paper in one hand and the crumpled paper in the other. Drop them from the same height and the same time, and repeat this procedure a few times. Which one lands first, and why do you think this happens?