



**My Brain Keeps Me Alive ( 🧠 A Brain Facts Story)  
(2<sup>nd</sup> Grade – 7-8 yrs.)  
Demonstration: Using a Spirometer**



**STORY CONNECTION – SLIDES 7-8 (Approx Time: 10-15 mins)**

Your brain does not magically get oxygen out of the air. It needs your lungs to help to get the oxygen out of the air we breathe. To get the oxygen that the body needs, we must breathe. Now, you may be thinking to yourself...I do not need my brain to breathe...I can breathe whenever I want to. Well, you are kind of right. But your brain knows HOW MUCH and WHEN you need to breathe.

**Materials needed:**

- An empty plastic bottle that holds 2-3 liters or an empty 1-gallon milk jug—lids are needed
- A flexible or bendy straw
- A large bowl
- Water
- Sharpie or permanent marker
- Measuring cups

**Preparation needed:**

- Gather all supplies and have it readily available
- Watch the video of this demonstration - <https://www.sciencekiddo.com/lung-capacity/> (Scroll down to the video)
- Fill large bowl half-way with water
- Fill bottle/jug with water or have access to sink to do so
- *Suggestion:* Practice this demo before showing it to student(s)

**Instructions:**

1. From slide 8 in the story, we learned that most people could hold their breath from 30 seconds up to 2-3 minutes. The longest time breath held voluntarily (male) is 24 min 37.36 sec, achieved by Budimir Sobat (Croatia), in Sisak, Croatia, on 27 March 2021. ([https://www.guinnessworldrecords.com/world-records/longest-time-breath-held-voluntarily-\(male\)](https://www.guinnessworldrecords.com/world-records/longest-time-breath-held-voluntarily-(male)))
2. Ask your student(s) if they have ever thought about why they could not hold their breath that long. It is because oxygen is so important to keep you alive that even though you may want to hold your breath longer, your brain makes you breathe.
3. This demonstration will give student(s) an idea of how much lung capacity they have by using a homemade spirometer. A spirometer is a device used for measuring the air capacity of the lungs.
4. This activity is written as a demonstration; however, it can be done as more of an experiment if the materials and support staff are readily available.

### Creating the Spirometer

5. Fill the plastic bottle or milk jug all the way to the top with water (may do before the demo begins).
6. Put on the lid.
7. Turn the bottle upside down.
8. Submerge the upside-down bottle into the large bowl (should be filled halfway with water already).
9. Take the lid off while the bottle is under the water in the bowl.  
*\*\*NOTE: Be careful not to squeeze the bottle and let out any of the water.\*\**
10. Take the short end of the bendy straw and put that end into the bottle. The long end of the straw should be above the water.
11. Take a deep breath and exhale gently into the straw until your lungs are empty. Your air will push the water from the bottle into the bowl. All the air you exhaled gets trapped in the top of the bottle.
12. Carefully, make a line on the bottle where the new water level is while the bottle is still upside down in the bowl.

### Measuring Lung Capacity

13. To measure how much air you had in your lungs, take the bottle out of the bowl and empty the remaining water out of it.
14. Now, fill the bottle with water to the same line you drew after blowing out your air.
15. Pour this water into a large measuring cup to see how much it is. This will give you an idea of how much air you had in your lungs.
16. You can redo the demonstration with some student(s) if you would like to compare the capacity of an adult and a child. Make sure to use a new straw each time.
17. In closing, talk about the demonstration and reiterate how important it is for the brain and the lungs to work together so we can breathe and live. Also, ask student(s) what they can do to keep their lungs healthy so they can do their job of helping you breathe. Answers might include not smoking, exercising, breathing clean air, doing breathing exercises, etc.

Demonstration Idea Credit and Video: <https://www.sciencekiddo.com/lung-capacity/>