



Science Fair Projects

3rd Grade to 5th Grade

Title: Human Body

"Take a Deep Breath"

Stating the Problem - The Big Question

In your project you can compare the lung capacities of many different people, Is there a relationship between lung capacity and a person's age, size or sex? Write a question that asks what you want to find out from your experiment.

Forming a Hypothesis - A Smart Guess

What do you think? Do boys have a larger lung capacity than girls? Do tall people have a greater lung capacity than short people? How about adults and teenagers? Write a sentence that tells what you think you will find out from your experiment.

Planning the Procedure

Your lungs do a fantastic amount of work. Each day a person breathes in and out about 12,000 liters of air. What does your body do with all of this air? Does every breath empty your lungs completely of air? These and many other questions are best answered by reading about your lungs and respiratory system. Begin your project by reading books, magazine articles and encyclopedic articles about your lungs and how they work.

Your experiment will require you to measure a person's lung capacity. It is difficult to measure the total lung capacity because even after a person exhales, much air still remains in the lungs. You can more easily measure the amount air that a person can force out after inhaling as deeply as possible.

The volume of air that is exhaled can be measured with an instrument called a spirometer. You may be able to borrow one from a school, doctor or respiratory therapist. If you can't find one to borrow, you can always make a simple one with a gallon jar, a funnel cut from the top of a plastic bottle, a rubber hose and a dishpan. Label the volume of the gallon jar from the bottom up using a measuring cup and water. (1/4 cup = 60ml = 66cm).

This project is from Daryl Vriesenga's book, *Science Fair Projects, Grades 4-6*, Michigan, Schaffer Publications, 1990. The Guide is available on line at: SchooDoodle.com



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"Take a Deep Breath" (continued)

Cut a small slit in the side of the funnel and insert one end of the hose. Place the funnel upside-down in a dishpan full of water. Have a partner fill the jug with water, hold a thumb over the jug's mouth and then place the jug on top of the funnel, holding it steady. Each person tested should take a deep breath and exhale into the hose. Make a list of the materials you will need. Write a detailed step-by-step description of your experiment. Make a chart on which to record the results of your tests. Here is a simple of what you might use.

Chart

Person	Volume of Breath			
	Attempt #1	Attempt #2	Attempt #3	Attempt #4
Name _____ Age _____ Sex _____ Weight _____				
Name _____ Age _____ Sex _____ Weight _____				

Recording Results

Take a deep breath... and blow! Record the volume of each breath. Use the table or charts that you prepared for recording the results. After each person exhales into the machine, be sure to clean the mouthpiece.

Drawing a Conclusion

Before you performed your experiment, you made a prediction, or hypothesis, about lung capacity. How accurate was your prediction? Write a report that explains what you learned. In your report include your Big Question, hypothesis, a description of your experiment, the tables that show your results and your conclusion,

Display

Your display is one way that you can share your project with others. People will be interested to see the tables, charts and graphs that you have prepared to compare breathing capacities. Also include your spirometer.

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