**BUILDING A LUNG MODEL- DESIGN CHALLENGE LAB**

NAME

**Goal:** USING THE MATERIALS LISTED BELOW, DESIGN AND BUILD A FUNCTIONAL LUNG MODEL THAT BREATHES IN AND OUT USING THE SAME SCIENTIFIC PRINCIPLES AS THE HUMAN LUNG.

**MATERIALS:**

* 600mL plastic bottle (with base cut off) = Parietal plura
* 2 round balloons (30 cm diameter)= left and right lung
* 1 round balloon (30 cm diameter)= diaphragm
* plastic straw= trachea and bronchi

Materials used to secure your respiratory structures:

* rubber band
* sticky tape
* scissors
* ball of plasticine clay (4 cm diameter)

**WHAT TO DO**

1. Research the role and structure of each of the structures above and write them below. When learning about what these structures do, think about how you will use the materials above to create your model.

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| **Structure** | **Anatomy** | **Function** | **Model ideas** |
| Parietal pleura |  |  |  |
| Lung |  |  |  |
| Diaphragm |  |  |  |
| Trachea |  |  |  |
| Bronchi |  |  |  |

1. Study the physiology of inspiration and expiration using your textbook, p. 445 – 448, or use the notes. Draw a flow chart or diagram that shows how the lungs draw air in and force air out.
2. Plan your model: Create a plan by describing or sketching how you will build a working model of the respiratory system’s gross anatomy. You must include all the structures above in your model.

Have your teacher approve your plan and then you can collect your materials and see if it works.

1. Build your model. If it doesn’t work, make adjustments until it does. Evaluate your initial design below- Did it work the first time? What were important variables or strategies you used to make it successful? If it didn’t work, what did you overlook in your initial design? What did you have to change in order to make them work successfully?

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1. Describe the scientific reason of why this model works. Explain what is pulling in the air and moving the air out. Using the anatomy and physiology vocabulary in your answer.

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1. Is this model a perfect representation of the human body? Explain why or why not using the anatomical structures in your answer.

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1. Predict what would happen if you punctured the bottle? Explain why you think this would happen using science to back it up.

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