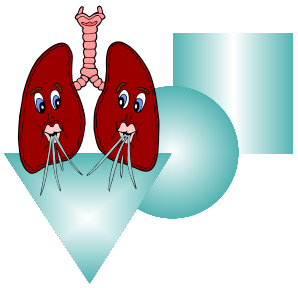
Part II. Teacher Materials

Facilitating the Debate: Justify the Builder's Log



Teacher Directions:
When students have completed their **"Pulmo Park Builder's Log,"** the teacher can process out this activity by leading a classroom debate on the justification of student answers. Students have been prompted on the **Builder's Log** to make matches by thinking about which lab activity best demonstrates a function of the respiratory system. The teacher can create a rubric for evaluating student's participation in this activity (see reference section on creating a rubric).

1. **Explain:** Students need to understand that everyone needs to participate in this discussion. Groups must work as teams in making their arguments. Communication and collaboration must be evident.

2. **Write on the board:**

   - *Lab* _____ best represents the structure and function of *Visual number* _____ because _____ _____.
   - We *agree* with group _____ . However, we would like to add _____.
   - We *do not agree* with group _____ because _____ _____.

3. **Explain:**

   A. For groups to make an argument they must lead with one of the above statements and everyone in the group must be ready to defend the argument.

   B. Each person must elaborate on the argument.

   C. Begin with volunteer groups and progress to each group.

   D. All groups must have a turn to argue the first *Visual/Lab*. justification; then any group may progress to the next *Visual/Lab* argument.

   E. The teacher will prompt with questions as needed. Some ideas for prompts are listed below.

4. **Begin:** Allow volunteer groups to go first and progress through labs. Allow students to take as much control as possible with the debate. The teacher's role is to be a mediator and prompter for important information.

Below are questions for prompting the students. Use these only as needed to encourage more communication in the debate. Use prompts when lab is being debated.

Lab A. Blue Print: There is O_2 Here!

What gasses primarily make up the air we breathe?
What is the make-up of air that is inhaled?
What is the make-up of air that is exhaled?
How do you explain the difference in air that is inhaled and air that is exhaled??

Lab B. Blue Print: Dust Removal!

What is the reason for the "walk around the school" part of this experiment?
What ideas validate that particles get into the airway?
How will dust particles interact with the airways?
How can your body reduce the number of particles getting into the airways?

Lab C. Blue Print: Everything is Expanding and Contracting!

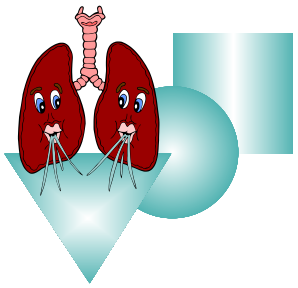
What relationship exists between the bottle, the top balloon, the bottom balloon, and the lungs?
How does the diaphragm change the volume of the rib cage?
What happens to the inner balloon when the rib cage volume increases?
What happens to the inner balloon when the rib cage volume decreases?
What are the limitations of this model?

Lab D. Blue Print: Just Enough Pressure!

How does the volume of air affect the pressure it exerts?
Why do you think the marshmallow candy expands as you pull back the plunger of the syringe?
Why do you think the marshmallow candy shrinks as you push in the plunger of the syringe?
How is volume and air pressure related to our respiratory system?

Lab E. Blue Print: Exchange It!

What evidence in this model will support that CO_2 leaves the lungs when we exhale?
What causes the change in color in the carbonated water?
Why does the plain water stay the same color?
How *could* you do another test that might verify that oxygen is being exchange for CO_2?



Lab F. Blue Print: Model of Diffusion

What observations can you make about the color changes in the 2 beakers?

In Beaker A, what substance had to move through the baggie membrane?

In Beaker B, what substance had to move through the baggie membrane?

How does this process relate to what happens in our respiratory system?

Lab G. Blue Print: Branching Out!

What are the components of the bronchial tree and how does it compare to cauliflower?

Why is it important for the airways in the respiratory system to branch out?

Lab H. Blue Print: Break Down the Surface!

Why do the alveoli tend to collapse?

How does surfactant help prevent the collapse of the alveoli?

Imagine an insect skimming across the surface of the lake, how does this relate to surface tension?

What does the detergent do to surface tension?

What is the significance of surfactant in relation to alveoli?