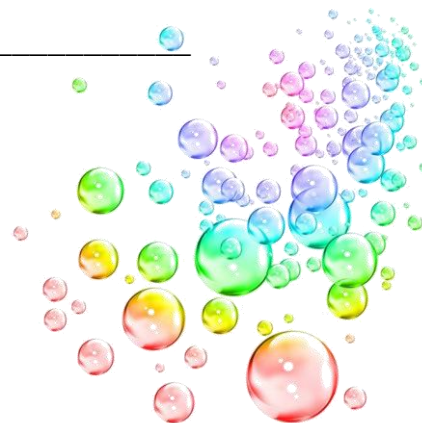


Name: _____ Date: _____

Breathing Cells Activity – Breathing Bubbles Worksheet



Observations

Record the pH colors of the **four unknown solutions**. What do you think each solution is?

Solution #1: color of indicator: _____ What is it? _____

Solution #2: color of indicator: _____ What is it? _____

Solution #3: color of indicator: _____ What is it? _____

Solution #4: color of indicator: _____ What is it? _____

What is the color of the indicator *before breathing into it*? _____

Record **how many breaths** it takes to change the indicator color (list results in table below):

	Number of Breaths	
	At rest...	After exercising...
Trial 1 (partner #1)		
Trial 2 (partner #2)		

Results

What color did the indicator change? Why?

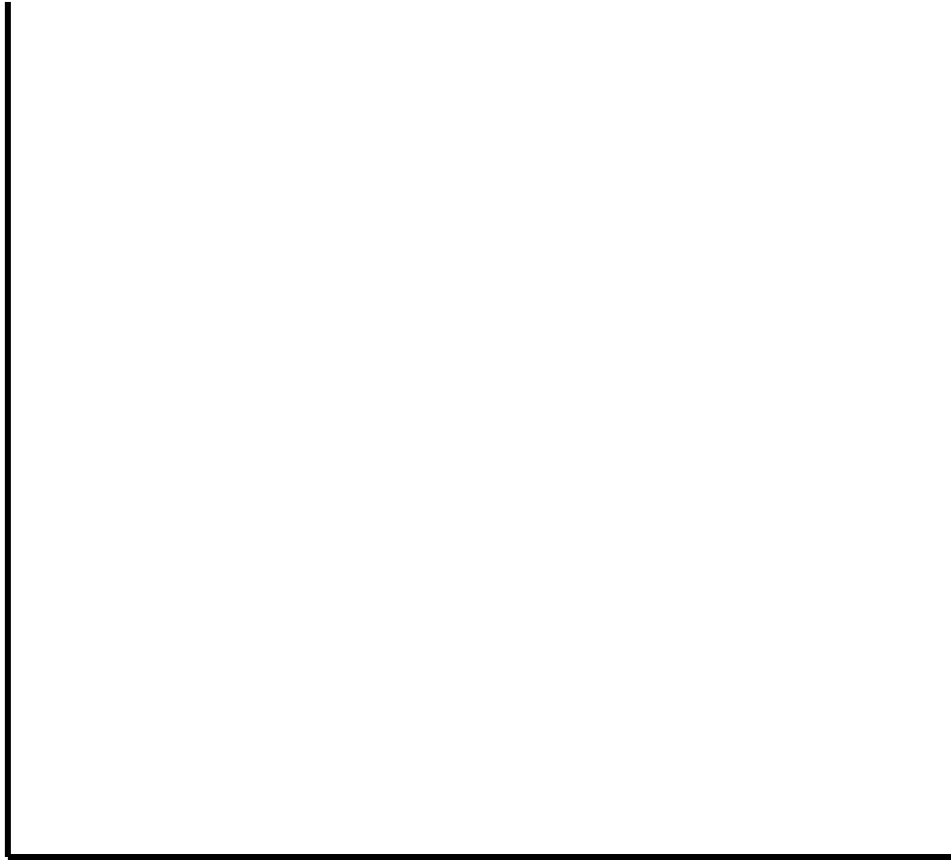
Did the indicator change more quickly after exercising or at rest? Why?

Did the indicator change more quickly depending on which partner was blowing in the straw? Why?

Name: _____ Date: _____

Graphing

Create a histogram showing the differences between the number of breaths at rest and the number of breaths after exercising for each trial.



Engineering and Bioremediation

Why are engineers interested in understanding how cellular respiration affects pH?

Name: _____ **Date:** _____

How can engineers use pH to measure bioremediation?

Think about the activity you just completed. What recommendations could you make to an engineering company who is doing bioremediation for a contaminated environmental site to increase the rate at which the cells clean up the pollution?
