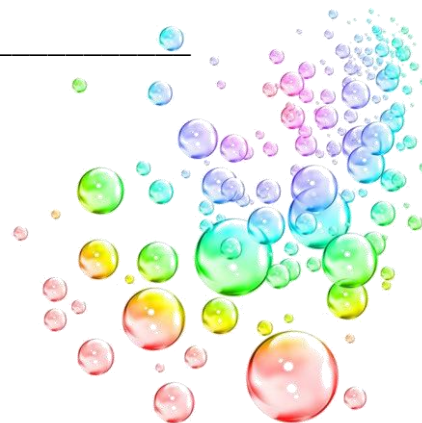


Name: \_\_\_\_\_ Date: \_\_\_\_\_

## 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...
<b>Trial 1 (partner #1)</b>		
<b>Trial 2 (partner #2)</b>		

### Results

What color did the indicator change? Why?

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

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

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Engineering and Bioremediation

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

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How can engineers use pH to measure bioremediation?

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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?

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