Investigating Cellular Respiration

Directions: Write the purpose, read the reading and background information, then answer any questions in completed sentences.

Purpose: What are the raw materials and products of cellular respiration?

Background Information:

- Cellular Respiration is an oxidation process that takes place in the cells that gives all living things the energy they need to grow, reproduce, and survive.
- *Combustion* a rapid form of oxidation that releases heat and, in many cases, light.
- Oxidation the process by which substances combine with oxygen
- *Bromthymol blue* is an indicator that turns a greenish yellow color the presence of carbon dioxide

Hypothesis

a. What are the 3 waste products of cellular respiration?

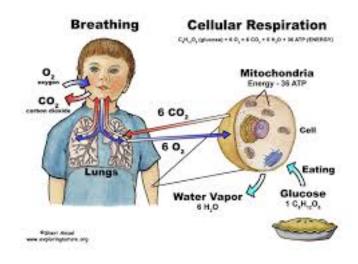
Mini:

Procedures:

1. Have the teacher light the candle that is on top of the wooden block.

A – What are the 3 products of combustion

Cover the beaker up with the aluminum foil.
B- What substance was taken away?



Procedure:

- 1) Copy the data table down.
- 2) Fill one of the two test tubs with enough water so that when the stopper is in the tubes, the longer pieces of plastic tubing in the stopper extends no more than 1 cm into the liquid.
- 3) Insert one of the straw mouthpieces into the rubber end of the apparatus.
- 4) Using the graduated cylinder, pour enough Bromthymol blue solution into the empty large test tube so that when the rubber stoppers are placed on the two tubes, the longer pieces of plastic tubing extend no more than 1 cm into the liquid. AND longer tube is attached at the top to the rubber.
- 5) Record the color of the Bromthymol blue into the data table under "starting"



- 6) Using a thermometer take the temperature of the BLUE water in the test tube and recorded that number in the data table under "starting temp". The red part of the thermometer needs to be down and in the BLUE water.
- 7) Remover the thermometer and put the apparatus back on the test tube.
- 8) Have a group member breath into the straw for 3 minutes.
- 9) Record the color of the Bromthymol blue into the data table under "ending"
- 10)Place the thermometer back into the water test-tube and record the temperature in the data table under "ending temp". Dump out the solutions in both test tubes down the sink drain.
- 11)Repeat this process for all 3 trials, you should start with fresh water and Bromthymol blue each trial.
- 12) Read the thermometer and record the temperature / color of the Bromthymol on your data table.

	Trial 1		Trial 2		Trial 3		Average		Difference
	Starting Temp	End temp	Starting Temp	End temp	Starting Temp	End temp	Starting	Ending	(End – start)
Temperature									
Color of Bromthymol Blue									

Analyzing the data:

- g) Did the temperature of the water change after you exhaled into it?
- h) What was the change?
- i) What would a change in the temperature of the water indicate about your exhaled air?
- j) What does this tell you must be a product of cellular respiration?
- k) What did you observe in the color of the Bromthymol blue from the starting temperature reading to the reading three minutes later?
- I) What does this indicate the presence of?
- m) What is another product of cellular respiration?

Procedure:

- 1) Hold the beaker up to your mouth.
- 2) Exhale on the beaker.

Analyzing the data

- n) What do you notice?
- o) What must be the third product of cellular respiration?
- p) Summarize the purpose of this inquiry in relation to the 3 products of cellular respiration.
 - a. Hint 1 what does Bromthymol blue test for?
 - b. Hint 2 Why did you use a thermometer?
 - c. Hint 3 Why did you breath into the glass beaker (or desk)?