

Name: \_\_\_\_\_ Period: \_\_\_\_\_



# Lab 11: Cell Respiration of Different Sugars

Pre-Lab Questions: Answer the following questions in FULL sentences!

1. Write out the chemical reaction of cellular respiration.
2. What is Bromothymol blue? Describe how we are going to use Bromothymol blue to show whether or not yeast undergoes cellular respiration in different sugars. (Hint: read the introduction!)
3. In the table on the first page, the four sugars that we will test are listed. Also listed is the enzyme an organism needs in order to breakdown that sugar and use for cellular respiration.
  - A. If yeast is unable to breakdown sucrose, what enzyme does it NOT have? Given our experiment, how will you know? (Hint: what kind of change will you see or not see?)
  - B. If yeast is ABLE to breakdown lactose and use for cell respiration, what enzyme does it HAVE? Given our experiment, how will you know?
4. In your lab group's set up, you will have a Control container and an experimental container with a sugar solution (glucose, sucrose, lactose, or starch) in it. In 1-2 sentences, describe what you think will happen in each.
5. Lastly, create the data table in your lab notebook after listing the materials. In the "Hypothesis" column put a "+" if you think that yeast will be able to use that particular sugar for cell respiration or put a "-" if you think yeast will be unable to utilize that sugar.

Data Table: (You will be sharing the "sugar" data with other lab groups!)

Sugar Type	Test Tube Color at 0 Hours	Hypothesis (+ or -)	Test Tube Color at 24/48 Hours	Respiration Occurred, Used Sugar (+ or -)	Enzyme(s) that are present or not present
Control (no sugar)	Blue				
Glucose	Blue				
Sucrose	Blue				
Lactose	Blue				
Starch	Blue				

Color Key:  
B = Blue  
BG = Blue-Green  
G = Green  
YG = Yellow-Green  
Y = Yellow

**Conclusion Questions:** Answer in FULL sentences!

- Using your knowledge of the cellular respiration reaction, describe why there was a difference in the results in your Control container and some of the “sugar” containers.
- Why do you think a second capped test tube containing Bromothymol blue was included in the containers?
- Which of the sugar types was yeast UNABLE to utilize for cell respiration? Why do you think this is? (Hint: use the info table on page one listing required enzymes!)
- You, as an animal, produce amylase, sucrase, and lactase in your digestive system. Which sugars are you able to breakdown and use for cellular respiration? Why?
- The sugar maltose is a glucose + glucose bonded together (this is the “malt” sugar that is added to malt milkshakes FYI). To break down maltose and use the monosaccharides for cell respiration, an organism must have maltase enzyme. If you were to complete the same experiment as we just did but with yeast in a maltose solution, the Bromothymol blue test tube would turn yellow. In 1-2 sentences, describe what this result means.

Score:			
1	2	3	4
Data table is not complete; many questions have not been answered OR questions have been answered but with little thought, accuracy, or thoroughness. Questions must be redone.	Data table is not complete but does have some info; most questions have been answered, but answers are not complete, and/or are not thorough, and/or are inaccurate.	Data has been accurately collected and put in data table; questions have been answered completely, but some are not accurate and/or are not thoroughly thought out.	Data has been accurately collected and put in data table; questions have been answered thoroughly, completely, and thoughtfully. No changes need to be made.

