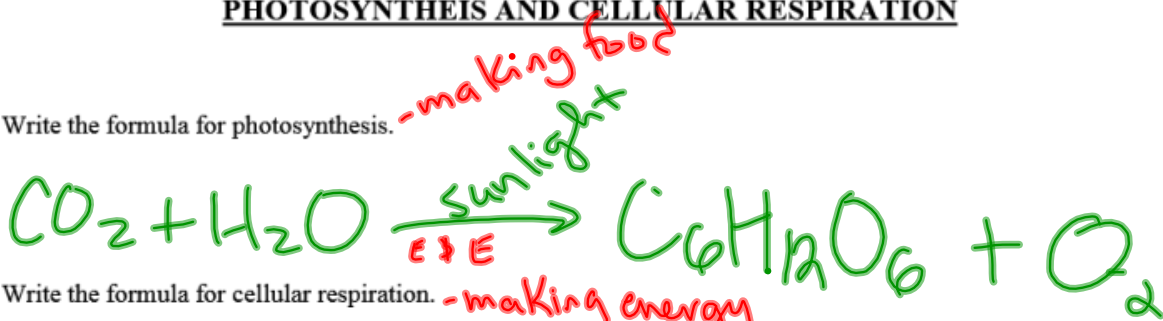


NAME _____

**OBSERVING THE RELATIONSHIP BETWEEN
PHOTOSYNTHESIS AND CELLULAR RESPIRATION**

Write the formula for photosynthesis.



Write the formula for cellular respiration.



Bromthymol blue (BTB) is a pH indicator, turning different colors depending on the pH of the solution.

Color of BTB in an acidic solution yellow Color Indicates CO₂
Color of BTB in a basic solution blue Color Indicates no CO₂

Materials

Test tubes	corks	BTB	elodea	straw
2 racks	lamp	dark cabinet	beaker	marker

Procedure

1. Obtain 2 test tubes. Write your name on both tubes and also label one "light" and the other one "dark".
2. Measure 25 ml of BTB into a small beaker and using a straw, blow carbon dioxide into the BTB until it turns yellow.
3. Pour the yellow BTB solution into the tube labeled "light" until the tube is approximately 2/3 full.
4. Add a sprig of elodea to the tube and put a cork on the top of the tube.
5. Place this tube in rack labeled "light tubes".
6. Fill the other tube labeled "dark" 2/3 full with the original dark BTB solution.
7. Add a sprig of elodea to the tube and put a cork on the top of the tube.
8. Place this tube in the rack labeled "dark tubes".
9. The "light tubes" will be incubated overnight with a bright light shining on them.
10. The "dark tubes" will be incubated overnight in a dark cabinet.

Prediction:

Tube	Starting Color of BTB	Ending Color of BTB	Reaction Taking Place In Tube
Y/L	yellow	blue	no CO ₂ photosynthesis
BL	blue	blue	no CO ₂ photosynthesis
Y/D	yellow	yellow	resp.
BD	blue	yellow	release CO ₂ respiration
Blue	blue		

at no
plant
Questions

1. Explain why the color of the BTB solution changed after you exhaled into it.
2. Explain the color change that took place in the tube in the light.
3. Explain the color change that took place in the tube in the dark.
4. What kind of organisms carry out photosynthesis and when does it occur?
5. What kinds of organisms carry out cellular respiration and when does it occur?
6. Why do plants (autotrophs) need animals (heterotrophs) in order to survive?
7. What would happen if plants carried out photosynthesis and cellular respiration at the same rate?