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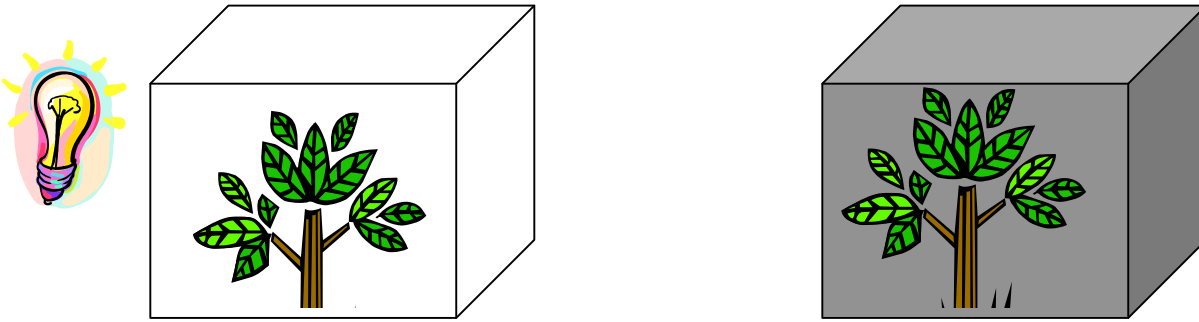
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## Biology: Understanding Photosynthesis

Photosynthesis requires light energy to proceed, but most plants are not in the sun 24 hours a day. What reactions are taking place during the night? Consider the following experiment to help you answer the questions below.

You have two sealed boxes. One is clear with a light source shining into it, and the other is completely dark. In each box is placed a healthy, genetically identical plant with no known disorders or diseases. Both plants have access to adequate water and nutrients. At the end of one week, both plants are still alive, but one is clearly doing better than the other.



1. What INPUT products are required for photosynthesis?
2. What INPUT products are required for cellular respiration?
  - Glucose (carbohydrate), O<sub>2</sub>
3. What are the output products of photosynthesis?
4. What are the output products of cellular respiration?
  - ATP, CO<sub>2</sub>, water
5. After one week in the box, which plant will be healthier and why?
6. Why are BOTH plants still alive?
  - The 'clear' plant has access to sunlight so it can continue to photosynthesize. Even though it has a limited supply of CO<sub>2</sub>, it can use the CO<sub>2</sub> generated by cellular respiration and still continue to do photosynthesis.
  - The 'dark' plant does not have access to sunlight, so it can't photosynthesize. It can, however, use reserve starch molecules in cellular respiration to maintain the plant.
7. Which gasses will increase in each box and why?
8. Which gasses will decrease in each box and why?
  - CO<sub>2</sub> will decrease in the clear box because it is being used up in photosynthesis.
  - O<sub>2</sub> will decrease in the dark box because it is being used up in cellular respiration.
9. In which box is the Calvin Cycle taking place and why?
10. In which box is cellular respiration taking place and why?
  - Both boxes, cellular respiration makes energy by breaking down large carbohydrate molecules. Plants use cellular respiration for growth and repair.