Photosynthesis Game

Object: to be the first person to produce one molecule of glucose for the plant cell.

For 2-4 players, players must be able to add up numbers to 48.

To get ready to play:

1) Print up at least 4 copies of the cards on heavy weight paper and cut out the cards. Put all of the cards in a paper or gift bag or box that you can not see into and mix them up. You can use the bag or box to store your game!

2) Print each player a check sheet to keep track of how they are doing in the game.

Rules

1. Each player selects 5 cards out of the bag or box without peeking.
2. Decide who goes first by who can get heads the most times in a row by tossing a coin. The person who goes first picks one extra card out of the bag.
3. To take your turn:
   1. Record up to three of the cards that you need on your check sheet.
   2. Discard the cards you record face up on the discard pile. If you record less than 3 cards, then discard cards you do not want to total 3. The top card will be available for the next player to pick up if they want it, so think about which card is worse and put it on top.
   3. End your turn by picking 2 new cards out of the bag so that you have 5 total cards again. Any time the bag is empty dump all of the cards except the top one in the bag and shake it to mix.
   4. The next person in the clockwise direction begins their turn by either picking up the discarded top card OR a new card out of the bag. Then they do steps 1 and 2 and 3.
   5. A person wins when they complete their check sheet with:
      1. 1 chlorophyll
      2. 6 carbon dioxide
      3. 6 water
      4. 48 photons

|  | Game one | Game two | Game  three |
| --- | --- | --- | --- |
| 1 chlorophyll | 1\_\_\_\_  Complete\_\_\_\_ | 1\_\_\_\_  Complete\_\_\_\_ | 1\_\_\_\_  Complete\_\_\_\_ |
| 6 water | 1\_\_\_. 2\_\_\_\_  3\_\_\_. 4\_\_\_\_  5\_\_\_\_. 6\_\_\_\_  Complete\_\_\_\_ | 1\_\_\_. 2\_\_\_\_  3\_\_\_. 4\_\_\_\_  5\_\_\_\_. 6\_\_\_\_  Complete\_\_\_\_ | 1\_\_\_. 2\_\_\_\_  3\_\_\_. 4\_\_\_\_  5\_\_\_\_. 6\_\_\_\_  Complete\_\_\_\_ |
| 6 carbon dioxide | 1\_\_\_. 2\_\_\_\_  3\_\_\_. 4\_\_\_\_  5\_\_\_. 6\_\_\_\_  Complete\_\_\_\_ | 1\_\_\_. 2\_\_\_\_  3\_\_\_. 4\_\_\_\_  5\_\_\_. 6\_\_\_\_  Complete\_\_\_\_ | 1\_\_\_. 2\_\_\_\_  3\_\_\_. 4\_\_\_\_  5\_\_\_. 6\_\_\_\_  Complete\_\_\_\_ |
| 48 photons  From sunlight! | 4\_\_\_\_8\_\_\_\_12\_\_\_16\_\_\_  20\_\_\_24\_\_\_28\_\_\_32\_\_\_  36\_\_\_40\_\_\_44\_\_\_48\_\_\_  Complete\_\_\_\_ | 4\_\_\_\_8\_\_\_\_12\_\_\_16\_\_\_  20\_\_\_24\_\_\_28\_\_\_32\_\_\_  36\_\_\_40\_\_\_44\_\_\_48\_\_\_  Complete\_\_\_\_ | 4\_\_\_\_8\_\_\_\_12\_\_\_16\_\_\_  20\_\_\_24\_\_\_28\_\_\_32\_\_\_  36\_\_\_40\_\_\_44\_\_\_48\_\_\_  Complete\_\_\_\_ |
| Made glucose | I won!\_\_\_ | I won!\_\_\_ | I won!\_\_\_ |

* 1. The Check Sheet

Want to know way more about photosynthesis?

<https://www2.estrellamountain.edu/faculty/farabee/biobk/BioBookPS.html>

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| --- | --- |
| 1 chlorophyll  *Chlorophyll makes plants green* | 1 carbon dioxide  *The same gas that is in soda pop bubbles* |
| 2 carbon dioxide  *The carbon atoms in the glucose come from the carbon dioxide* | 3 carbon dioxide  *The gas enters the plants leaf through the stomata, small openings in the leaf* |
| 1 water molecule  *Water has two hydrogen atoms bonded to the same oxygen* | 2 water molecules  *The hydrogen atoms in the glucose come from the water* |
| 3 water molecules  *Water is drawn in the the roots and used to make sap* | 4 photons  *The chlorophyll absorbs the energy of the photons, which are particles of light* |
| 8 photons  *The photons that chlorophyll a absorbs are between 400 and 450 nanometers in wavelength* | 12 photons  *Find out more about photons at <https://www.ducksters.com/science/physics/photons.php>* |