

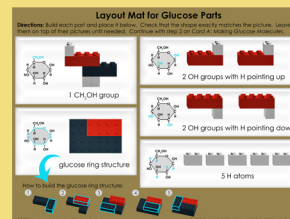
# Card A: Making Glucose Molecules

## Introduction

Why is glucose important? Just like you, plants need food. But plants don't eat food, they create their own: glucose! Plants do this through photosynthesis. Photosynthesis is a chemical reaction that uses light energy to change carbon dioxide and water into glucose and oxygen. You can model photosynthesis by building the molecules out of LEGO® bricks. Glucose is a complicated molecule, so follow the instructions carefully.

## Directions:

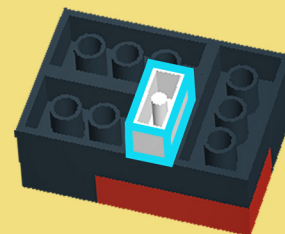
- 1 To make glucose you need: 6 carbon atoms, 6 oxygen atoms, and 12 hydrogen atoms. Build and place all the parts on the *Layout Mat for Glucose Parts*. Leave the parts on top of their pictures until needed.



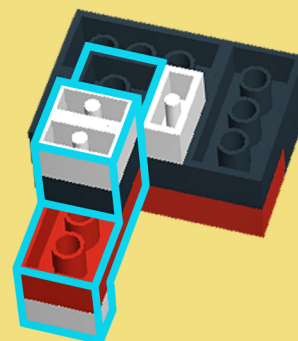
- 2 Pick up the glucose ring structure from the *Layout Mat for Glucose Parts*. Flip it away from you so you can see the bottom:



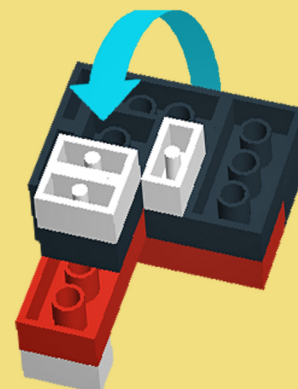
- 3 Add a hydrogen atom to the bottom carbon:



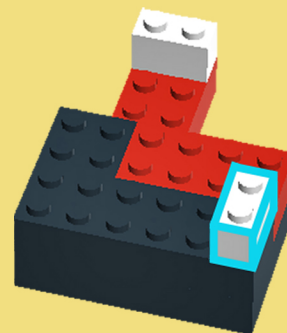
- 4 Add the CH<sub>2</sub>OH group (by its carbon atom) next to the hydrogen atom:



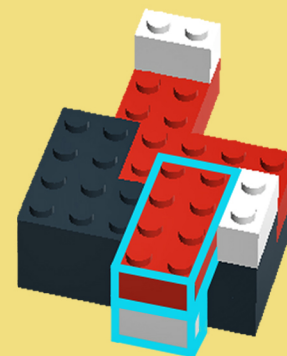
- 5 Flip the structure towards you:



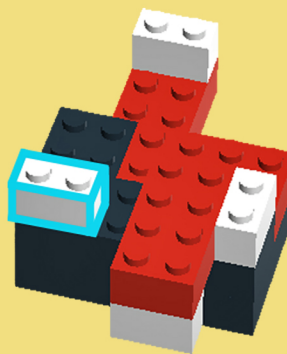
- 6 Make sure the  $\text{CH}_2\text{OH}$  group is pointing away from you, and add a hydrogen to the front right carbon atom:



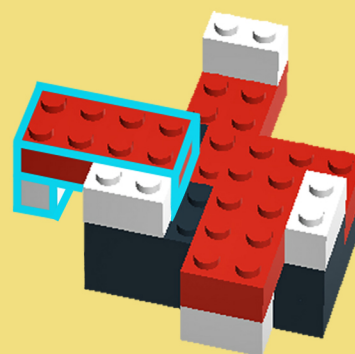
- 7 Add an OH group (with the H pointing down) on the same carbon, next to the new hydrogen atom:



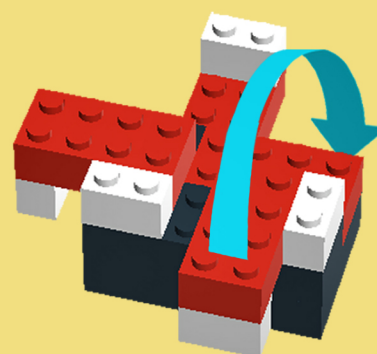
- 8 Add a hydrogen to the front corner of the left carbon atom:



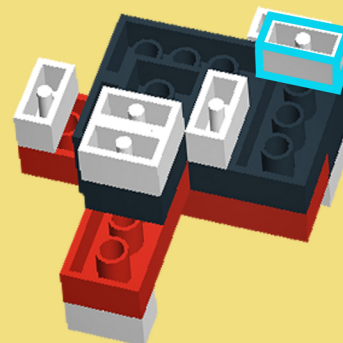
- 9 Add an OH group (with the H pointing down) on the same carbon, next to the new hydrogen atom:



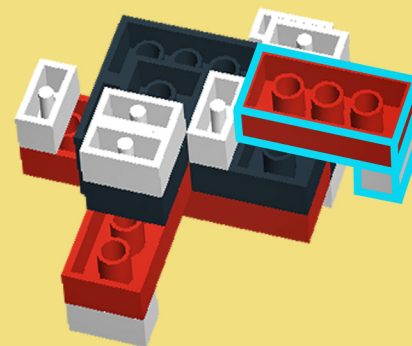
- 10 Flip the structure away from you so you can see the bottom.



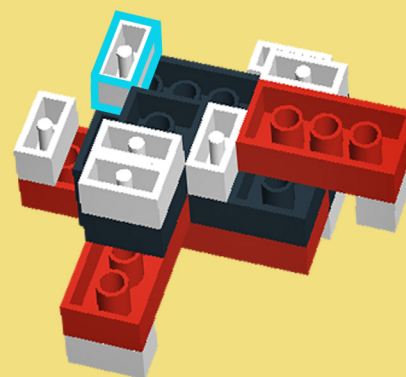
- 11 Add a hydrogen to the corner of the carbon atom on the right:



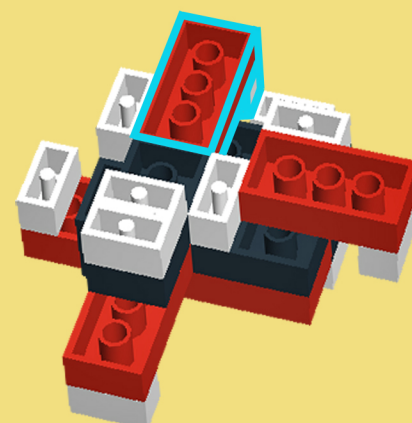
- 12 Add an OH group (with the H pointing up) on the same carbon, next to the new hydrogen atom:



- 13 Add a hydrogen to the corner of the only empty carbon atom:



- 14 Add the last OH group on the same carbon, next to the new hydrogen atom:



- 15 Check your LEGO glucose molecule using the *Glucose Check Mat*.

## Conclusion

Plants make glucose for food. Glucose is used for quick energy or stored as starch for later use. Glucose is also made into cellulose, the main component of wood. When you eat parts of plants, like fruits, vegetables, and grains, you are eating food made through photosynthesis!