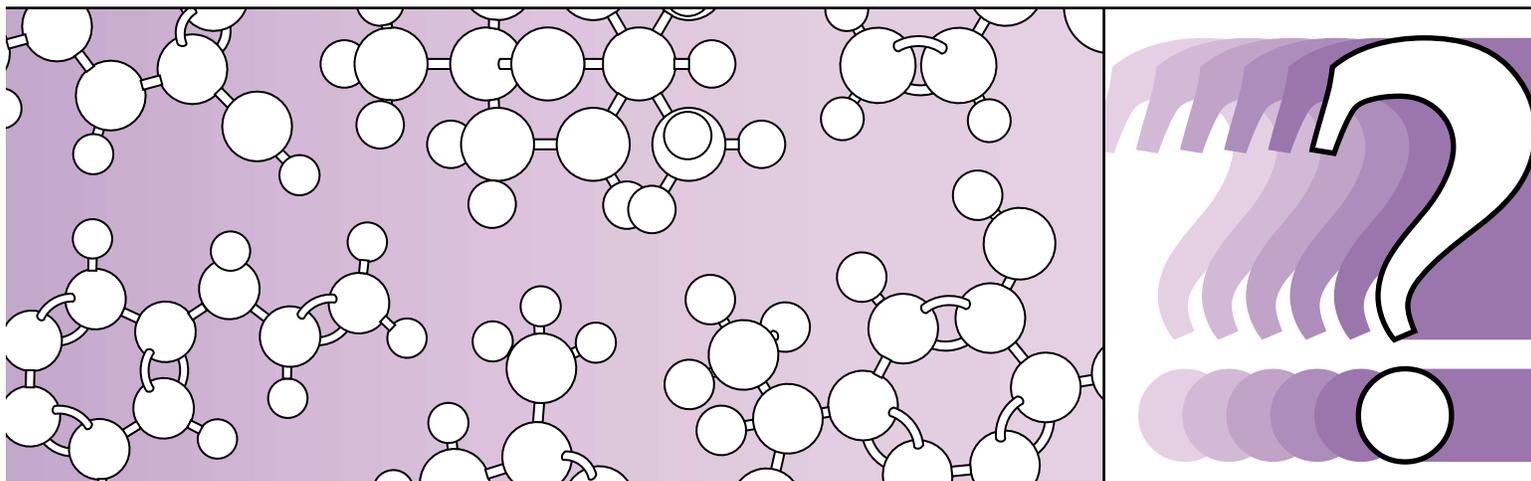


The Pfizer Foundation Biochemistry

Discovery Lab

**Build the molecules
that make the
holes in bread**



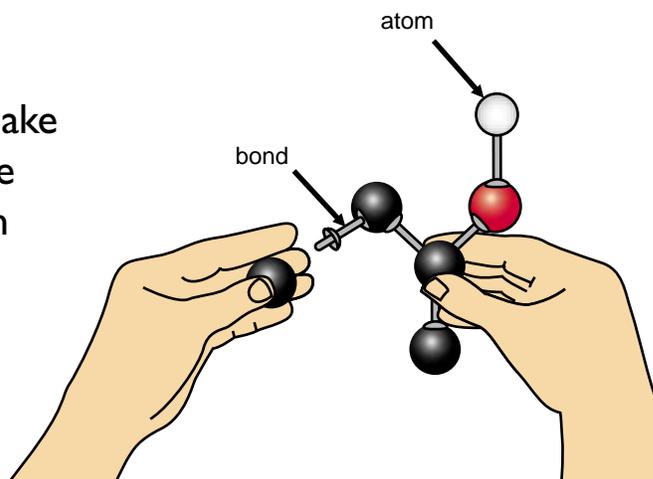
Have you ever noticed the holes in bread?

**They come from a chemical reaction
that happens as the bread is made.**

**Use molecule models
to see how the
chemical reaction works.**

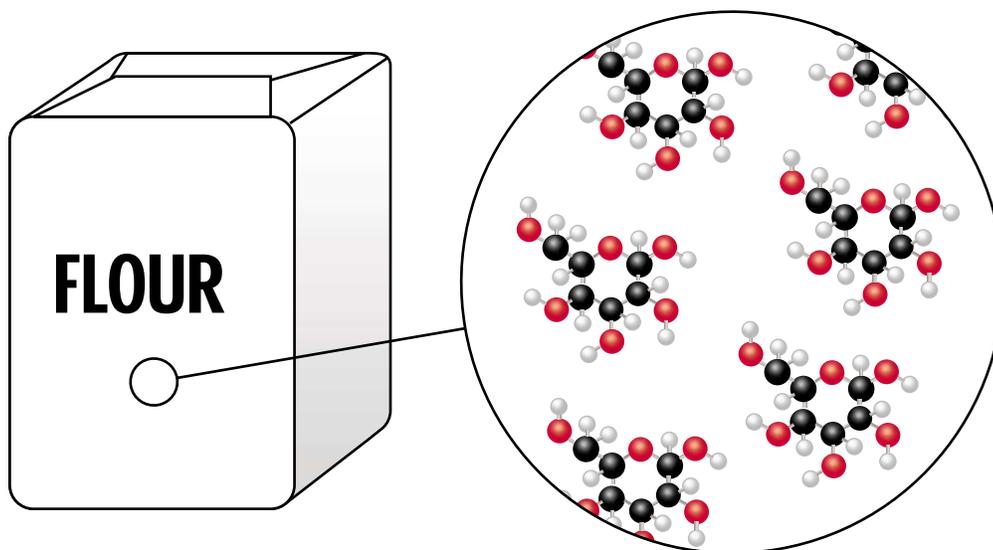
Find the sugar molecule model in the case and use the atom pieces to build your own. You need 6 carbon atoms, 6 oxygen atoms and 12 hydrogen atoms.

Different people in your group could make different parts of the same molecule, then join them together.



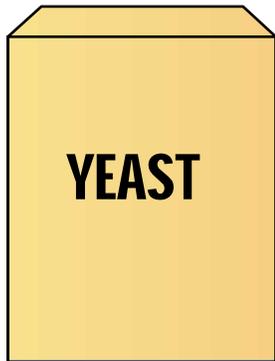
-  carbon atom
-  oxygen atom
-  hydrogen atom

Sugar molecules are in flour, one of the ingredients of bread.



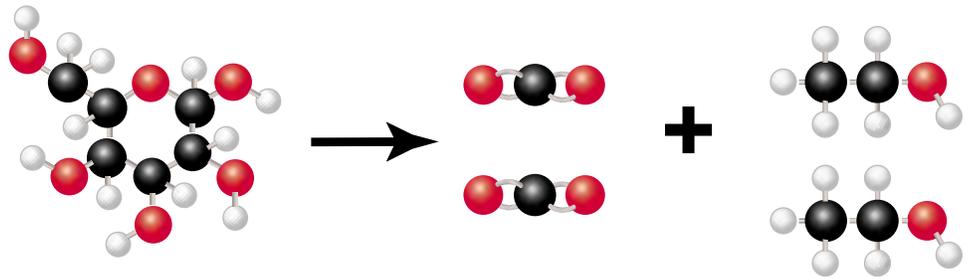
Your model of a sugar molecule is millions of times larger than a real sugar molecule.

Another ingredient for bread is yeast.



Yeast eats the sugar molecules in the flour.

The yeast breaks the sugar molecules apart into carbon dioxide and alcohol molecules:



sugar molecule
(in flour)

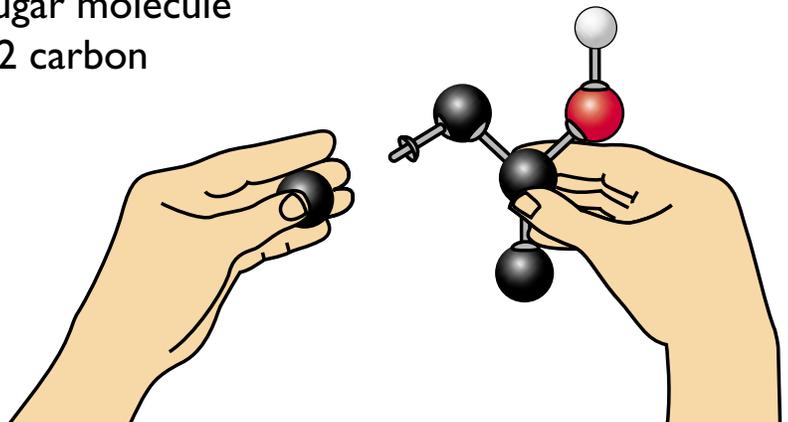
carbon dioxide
molecules

alcohol
molecules

Find the carbon dioxide and alcohol molecules in the case.

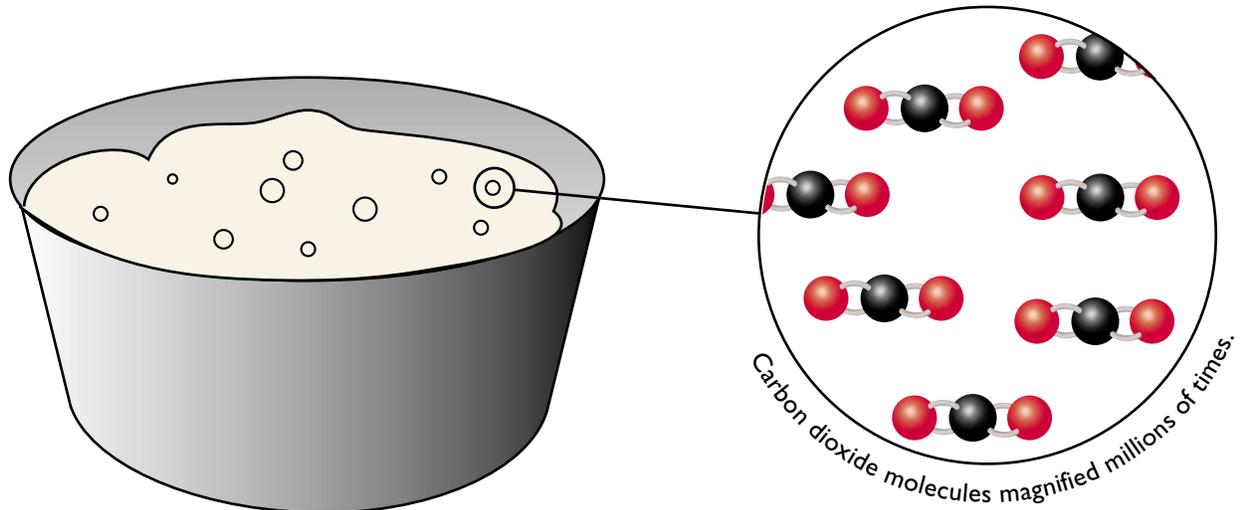
Just like the yeast, break apart your sugar molecule and use its atoms (the balls) to build 2 carbon dioxide and 2 alcohol molecules.

You will need some new bonds (gray sticks).

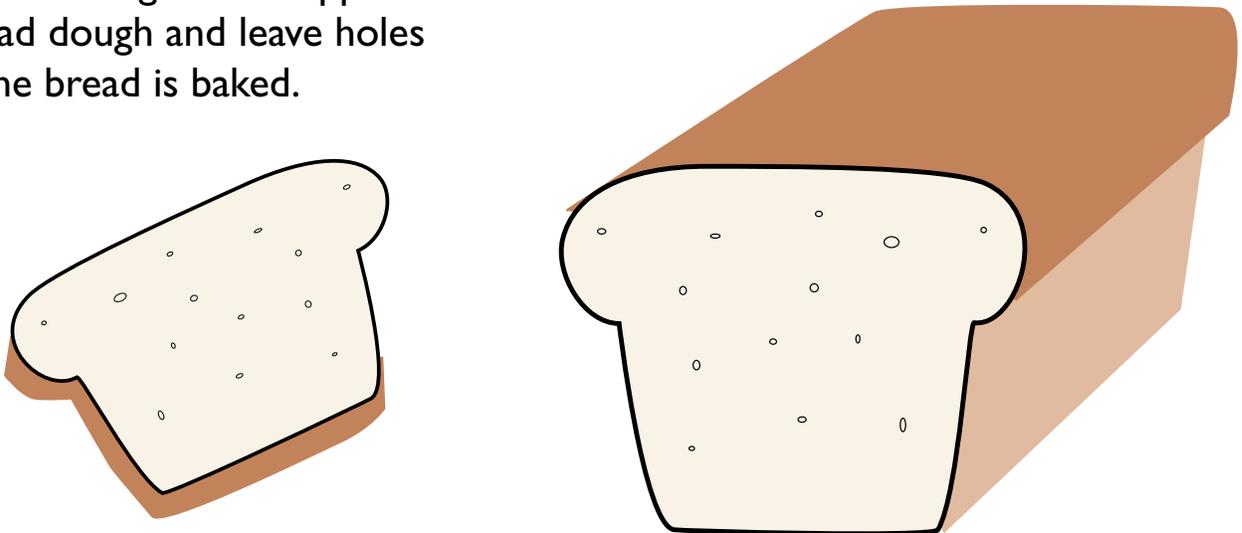


How does this chemical reaction make holes in bread?

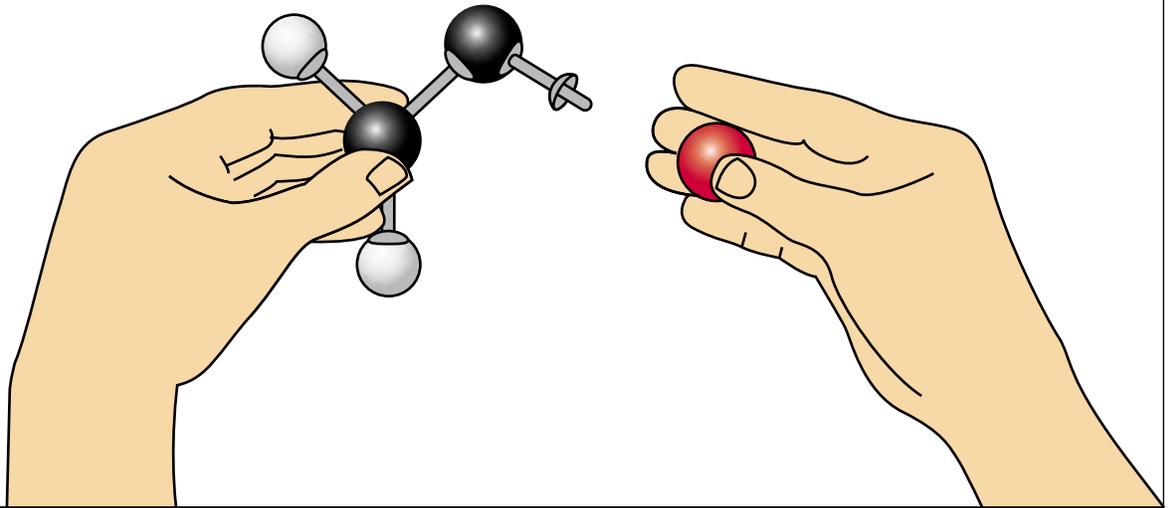
The carbon dioxide molecules made by the yeast form bubbles of gas in bread dough.



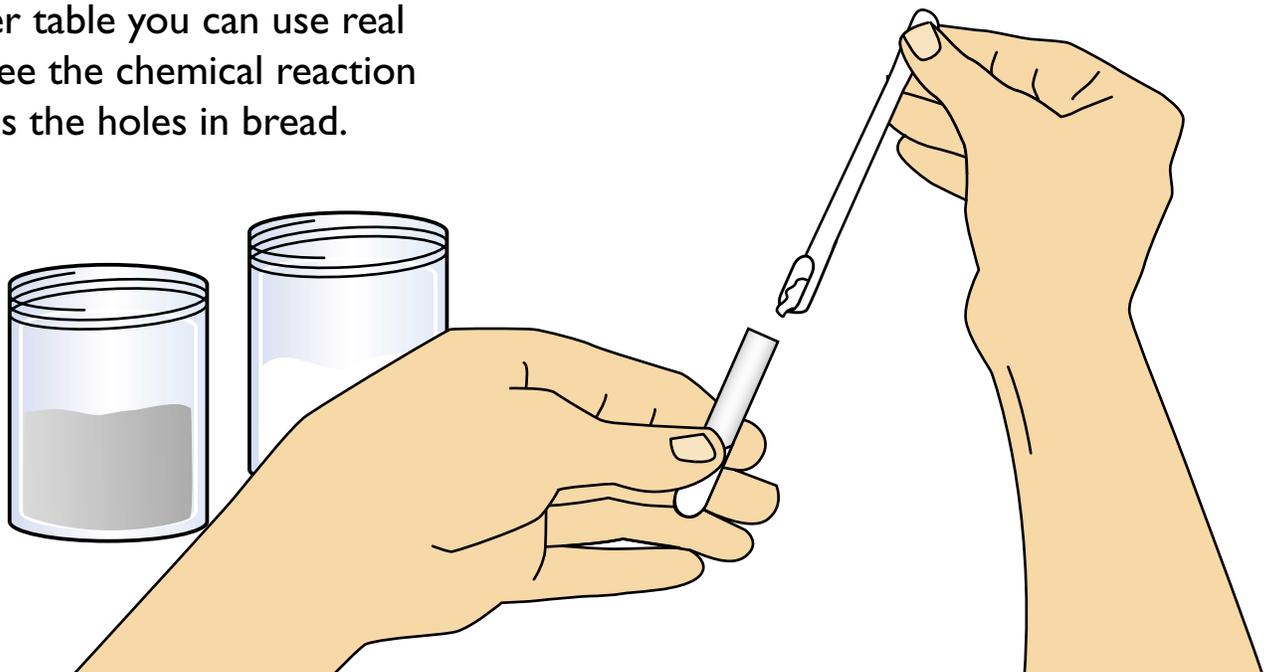
The bubbles of gas are trapped in the bread dough and leave holes when the bread is baked.



When you are done,
pull your molecule models
apart for the next person.



At another table you can use real
yeast to see the chemical reaction
that makes the holes in bread.



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