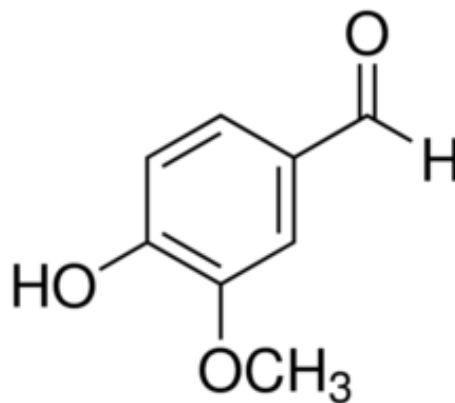


# Oh Sweet Tooth!

## ***This Week's Hints:***



- *It is extracted from a plant*
- *It can be used as a flavoring agent in food, beverages and pharmaceuticals*
- *Very sweet in smell*



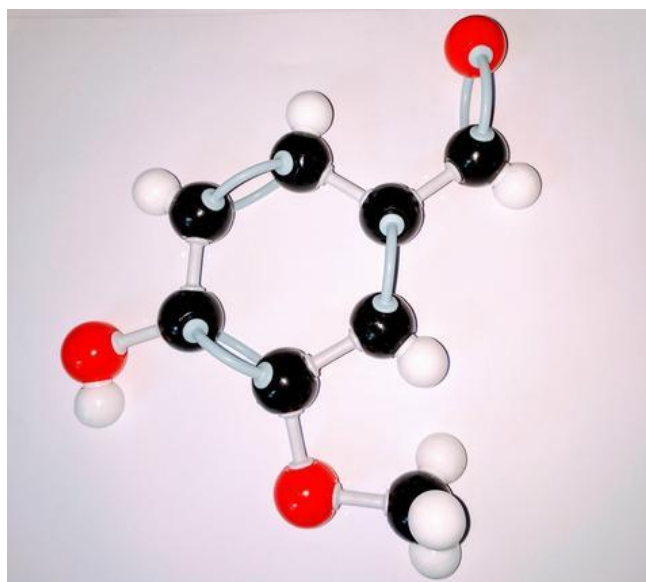
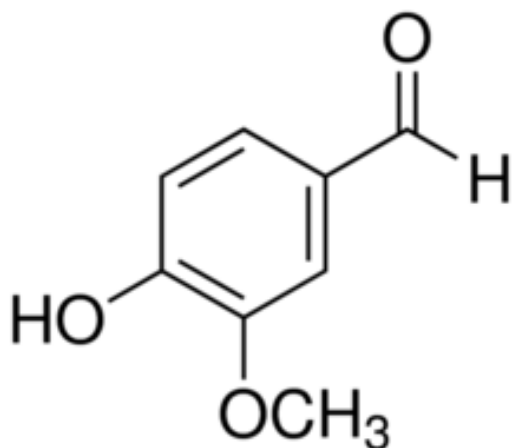
V \_\_\_\_\_ I \_\_\_\_\_ L \_\_\_\_\_

# ***That's Right! This Week's Molecule will be **Vanillin!*****

## **Here's a bit of information about *Vanillin*:**

Vanillin is a phenolic compound which has a phenolic ring, an aldehyde group, hydroxyl and ether group. It is derived from vanilla bean, as which synthetic vanillin is now used very often as a flavouring agent in foods. This is because natural vanilla tends to be more expensive than vanillin.

## **So What Does *Vanillin* Looks Like in Chemistry?**



## **Let's Get Building!**

Using your ***Student Molecular Set from Duluth Labs***, let's create Vanillin. You'll need:

- 8 Carbon Atoms
- 8 Hydrogen Atoms
- 3 Oxygen Atoms
- 7 Medium connectors (single covalent bonds)
- 8 Long connectors (double bonds)
- 8 Short connectors (hydrogen bonds)
- Molecular Tool (for Disassembly)

Put aside all the atoms and connectors needed.

We will be building this molecule in a clockwise rotation with the carbon atom in the 6:30 position. Using the chemical structure above as a representative, we will start by building a **Benzene Ring**.

- First using a carbon atom and 2 long connectors, attach another carbon atom to



form a double bonded carbon.

- Then using a medium connector, attach a carbon atom to the double bonded



carbon.

- Using 2 long connectors, attach another carbon atom to form another double bonded



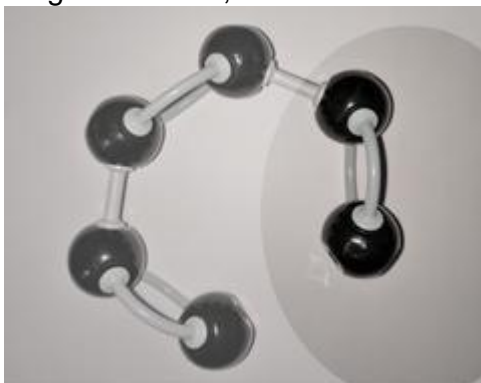
carbon.

- Using a medium connector, connect a carbon atom to the double bonded



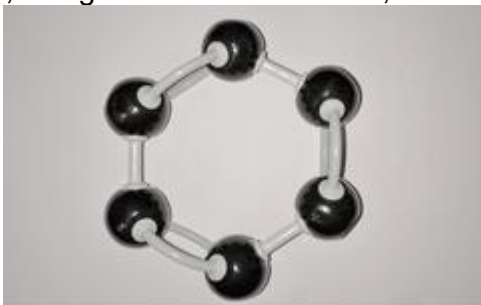
carbon.

- Using 2 long connectors, attach another carbon atom to form another double bonded



carbon.

- Finally, using a medium connector, connect both carbon atoms to each

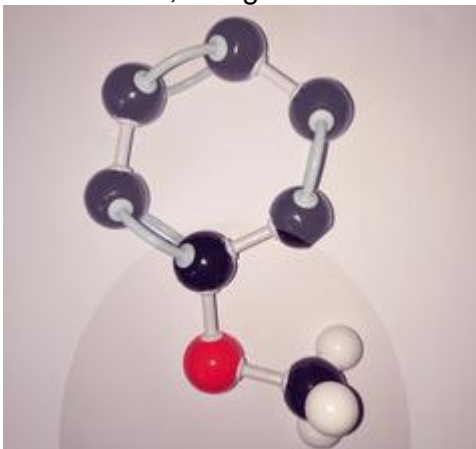


other.

**At this stage, we now have our Benzene Ring! Now lets add all the functional groups to create Vanillin.**

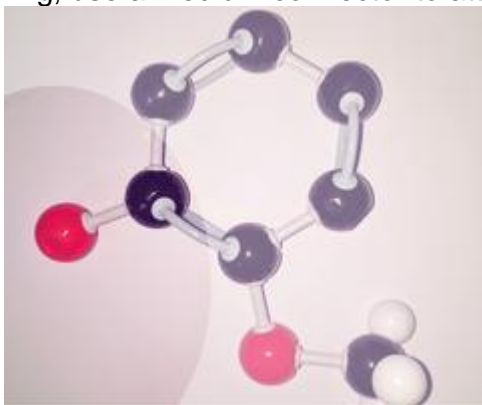
**Starting with the carbon at the 6:30 position, we are going to create the OCH<sub>3</sub> group.**

- Using a medium connector attach an oxygen atom, then using another medium connector attach a carbon atom. Thereafter, using 3 short connectors attach 3



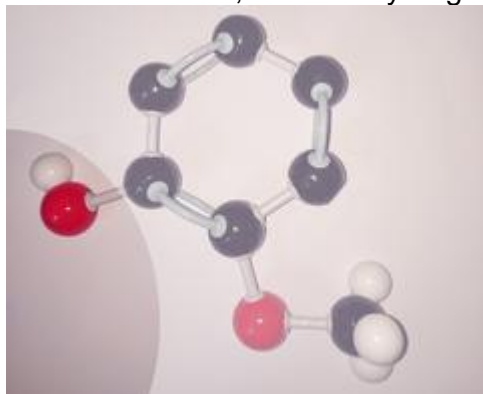
hydrogen atoms to the carbon.

- Going in a clockwise position, at the next carbon atom ( for this example: carbon #2) in the ring, use a medium connector to attach an oxygen



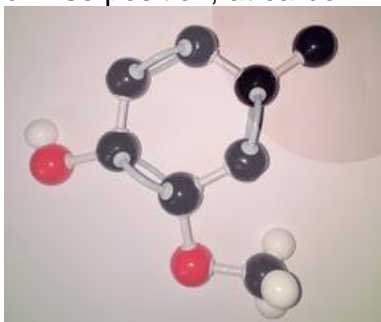
atom.

- Using a short connector, attach a hydrogen atom to the oxygen atom forming an OH

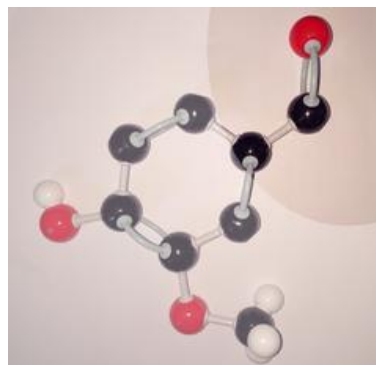


group.

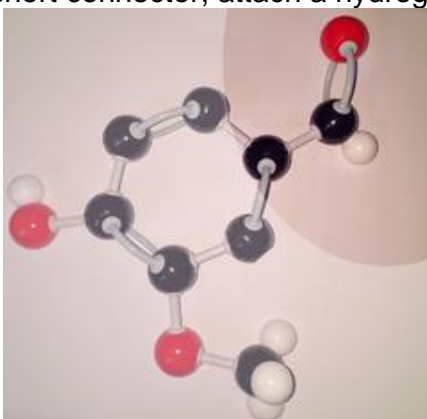
- Going in a clockwise position, at carbon #5, use a medium connector to attach a



carbon atom.



- Using 2 long connectors, attach an oxygen atom
- Using a short connector, attach a hydrogen atom to the carbon free



electron.

- Now that we have added all the functional groups, it is time to use the remaining small connectors and attach hydrogen atoms to the free electrons on the carbon atoms throughout the molecule.

