Phet Simulator: Build a Molecule! Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

1. Go to the following: <http://phet.colorado.edu/en/simulation/legacy/build-a-molecule> and click **Play**.
2. Use the kits below to create the molecules and complete the collections! (Notice there are several kits you can use and that all kits can be refilled). But first, answer the following:
3. How would you explain the difference between an **element** and an **atom**? (Think about water or H2O, for example)

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| --- | --- | --- | --- | --- |
| Collection 1 | | | | |
| **Chemical Formula** | **Name of Molecule** | **# of elements** | **# of atoms** | **Sketch**  **(3D or Ball & Stick)** |
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| Collection 2 | | | | |
| **Chemical Formula** | **Name of Molecule** | **# of elements** | **# of atoms** | **Sketch**  **(3D or Ball & Stick)** |
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| Collection 3 | | | | |
| **Chemical Formula** | **Name of Molecule** | **# of elements** | **# of atoms** | **Sketch**  **(3D or Ball & Stick)** |
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1. Have you noticed some molecules only work in certain arrangements? (If not, complete another collection and pay attention to this.) Choose one molecule and give examples of arrangements that do not work and ones that do:

Molecule chosen: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unaccepted arrangement (sketch): Accepted arrangement (sketch):

1. Click on the **Collect Multiple** Tab on the top of the Simulator window and complete the tables below:

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| --- | --- | --- | --- | --- | --- |
| Collection 1 | | | | | |
| **Chemical Formula** | **Name of Molecule** | **# of molecules** | **# of TOTAL elements** | **# of TOTAL atoms** | **Sketch** |
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| Collection 2 | | | | | |
| **Chemical Formula** | **Name of Molecule** | **# of molecules** | **# of TOTAL elements** | **# of TOTAL atoms** | **Sketch** |
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1. By now, you should be able to answer the following questions. If not, do another collection and pay attention to the following.
2. What does the big 2 in 2CO2 mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What does the little 2 in 2CO2 mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Click on the **Larger Molecules** tab at the top of the simulator window. Use the atoms available to try and build the ***largest*** molecules you can!

Sketch:

a) Name of Molecule: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chemical Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# of total elements: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# of total atoms: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Name of Molecule: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sketch:

Chemical Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# of total elements: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# of total atoms: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_