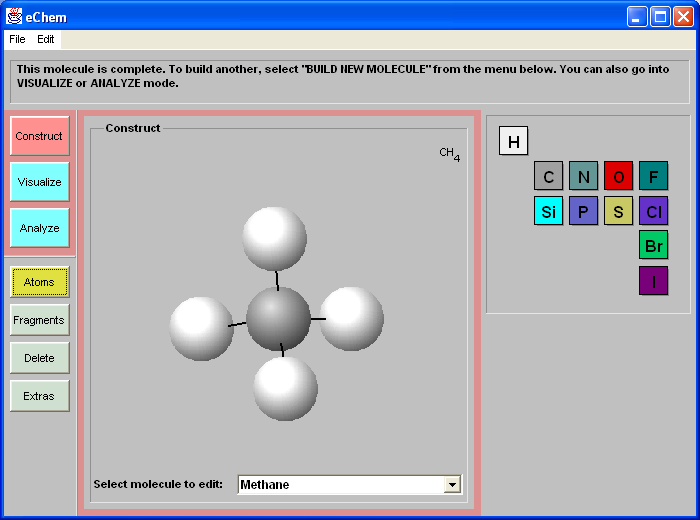
**Using eChem to Model Molecules**

eChem is a free online software that allows students to create virtual, three-dimensional models of molecules. eChem was created by the Center for Highly Interactive Classrooms, Curricula & Computing in Education (Hi-Ce) at the University of Michigan. It is available at:

* eChem Structure Building Applet: <http://www.sciencegeek.net/eChem/eChem.html>
* hi-ce.org: <http://hi-ce.org/echem/index.html>



**eChem Instructions:**

1. Run eChem from one of the websites listed above (or from the computer if installed).
2. To construct the model of methane (CH4), start on the left side of the screen. When you see “Construct,” “Visualize,” and “Analyze.”
3. Click “Construct.”
4. In the popup window, enter the name of molecule: methane.
5. Click “Atoms,” and select “C” (carbon) from element table on the right side of the screen.
6. Select bond arrangement. In this case, select “tetrahedral” as the hybridization of carbon and click on the canvas (the large area in the middle of the window).
7. Select “H” (hydrogen) from the atom table.
8. Add hydrogen atoms to the carbon’s bond by clicking on the bonds of carbon.

**Notes:**

1. You can see a rotating structure; just hold down the mouse button and move the cursor.
2. Did you attach a wrong atom on carbon (like adding an oxygen atom for methane)? Select “Delete” on the left side of screen, and click the atom ball you want to erase.
3. If you are going construct a new model, pull down the bottom menu on the canvas, and select “build a new molecule.”
4. The “Visualize” button allows you to view the molecule in three different ways.
5. If you entered multiple molecules, the “Analyze” button allows you to check the pattern by choosing “Carbon Count” and “Atom Count” as column headers.

Enjoy!

