**Student Opinion Survey of 3D Technology in the Classroom**

This survey is completely anonymous and will help the chemistry department develop 3D technology for your future chemistry courses. Your honest opinion is greatly appreciated.

**For each question 1-10 please circle one response that best describes your opinion.** For the sake of this survey, please consider "lectures" to mean *both* lectures and recitations combined.

(1) How many lectures presented a 3D molecule as a 2D object such as on a chalkboard, transparency, or in power point?

**1 Lecture** **2** **3** **4** **5 or more lectures**

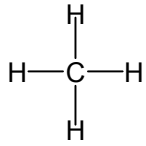
(2) How many lectures used a **pseudo-3D** representation of a 3D molecule (i.e., a representation that did not require special glasses to be worn by the audience, but in which the three dimensionality of the moleucle was conveyed to the viewer through shading, sizing, and rotation)?

**1 Lecture** **2** **3** **4** **5 or more lectures**

(3) How many lectures used the **real-3D** projection system (which requires special glasses to be worn by the audience) to display molecules?

**1 Lecture** **2** **3** **4** **5 or more lectures**

(4) How comfortable are you at mentally converting the 2D drawing shown at the right into a 3D molecule?




**Not Comfortable=1** **2** **3** **4** **5=Very Comfortable**

(5) To what degree did the **real-3D** projection system (for which you had to wear special glasses) help you understand and become proficient at **Molecular Geometry**?

**No Help=1** **2** **3** **4** **5=Extremely Helpful**

(6) To what degree did the **real-3D** projection system (for which you had to wear special glasses) help you understand and become proficient at **Chirality (enatiomers, isomers, etc.)**?

**No Help=1** **2** **3** **4** **5=Extremely Helpful**

(7) To what degree did the **real-3D** projection system (for which you had to wear special glasses) help you understand and become proficient at **Conformational Analysis**?

**No Help=1** **2** **3** **4** **5=Extremely Helpful**

(8) To what degree did the **real-3D** projection system (for which you had to wear special glasses) help you understand and become proficient at **Steric Effects**?

**No Help=1** **2** **3** **4** **5=Extremely Helpful**

(9) To what degree did the **real-3D** projection system (for which you had to wear special glasses) help you understand and become proficient at **Reaction Mechanisms**?

**No Help=1** **2** **3** **4** **5=Extremely Helpful**

(10) Overall, to what degree did the **real-3D** projection system (where you had to wear special glasses) help you understand and become more proficient at the assignments that involved visualizations or graphical representations of molecules?

**No Help=1** **2** **3** **4** **5=Extremely Helpful**

Please Turn Over

(11) Complete the following sentence by checking only one choice.

I would like to see the 3D system used more in this class and in future chemistry courses because...

- ❑ it helps me with the difficulty I have with spatial relationships.
- ❑ it makes chemistry more interesting and fun.
- ❑ it improves my understanding of chemistry.
- ❑ it is a good waste of chemistry class time.
- ❑ ...Actually, since it was not helpful to me, I do not want to see it used more.
- ❑ Other (state): _____

_____

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_____

(12) Rate the following four tools as to their effectiveness in helping you understand and visualize the three dimensional nature and interactions of molecules.

| | **Not effective** | | **Effective** | | **Very Effective** |
|---|---|---|---|---|---|
| 3D perspective drawings | **1** | **2** | **3** | **4** | **5** |
| Chime plugin for browsers (or similar plugins or standalone programs) | **1** | **2** | **3** | **4** | **5** |
| Model kits | **1** | **2** | **3** | **4** | **5** |
| Real-3D projection system (for which you had to wear special glasses) | **1** | **2** | **3** | **4** | **5** |

(13) Do you think there was a distinct advantage to using the **real-3D** projection system compared to relying on traditional 2D representations? (Circle one) **Yes** **No**

Why? _____

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(14) Please feel free to share any additional comments or suggestions below, regarding "visualization" issues and concerns.

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Thank you for your comments; they will help us improve our teaching **and** the learning of future students.