

Author(s)	Avatar(s) & Environment	Suggested Learner Audience
Simulations for Secondary Science Teachers Conference Amy Bekins Dr. Martha Day Dr. Meenakshi Sharma Dr. Jomo Mutegi Dr. David Slykhuis Mursion Jordan Don	Host Avatar(s) Nina/Michael Simulation Avatars Ciara, Angela, Jordan, James, Stephanie Environment [ML3z] HSI Classroom	<ul style="list-style-type: none"> Pre-service Chemistry teachers
Delivery Mode(s) Available for Scheduling 1:1, Facilitated Group		
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Learner-Facing Vignette:

You are a High School chemistry teacher teaching an instructional unit on the polarity of water. You assigned the following assignment.

Draw a model which shows the polarity of water as well as the molecular interactions that cause surface tension in a drop of water. As you develop your model, consider the following:

- Make sure you label the partial charges in the water molecules.
- Make sure the interface (point where two systems meet/interact) between the water molecules and air particles is clearly shown.

Your class of five worked in pairs and one student volunteered to work alone. They have completed their assignments. You will now review each group's work (see supplemental materials) and elicit student thinking.

Outcome:

Elicit each student's thinking on their assignment.

Strategies/Best practices to consider:

- Ask open ended questions and ask follow up questions for clarification based on concepts/misunderstandings that you uncover.
- Match the students language
- Do not interject your understanding or assumptions into the students understanding

Information about Intensity Level: Low

- Low intensity sessions are meant to build confidence for the learner. This setting is recommended for first time learners.

Supplemental Materials:

This scenario is gearing toward practicing the following of the [Next Generation Science Standards 8 Practices of Science & Engineering](#):¹

Developing and Using Models
A practice of both science and engineering is to use and construct models as helpful tools for representing ideas and explanations. These tools include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations.
Constructing an Explanation (for science)
The products of science are explanations.
Obtaining, Evaluating, and Communicating Information
Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity.

Information for Course Instructor Scenario Selection:

This lesson utilizes the following Next Generation Science Standards listed below:²

- HS.PS1.3** - Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
- RST.9-10.7** - Translate quantitative or technical information expressed in words in a text into visual form (e.g. a table or chart) and translate information expressed visually or mathematically into words.

Student Prior Knowledge

You have already taught instructional units on the following topics, but students still have varying levels of understandings on each topic:

Intermolecular Forces

Covalent Bond

Electronegativity

Polar molecules

Nonpolar molecules

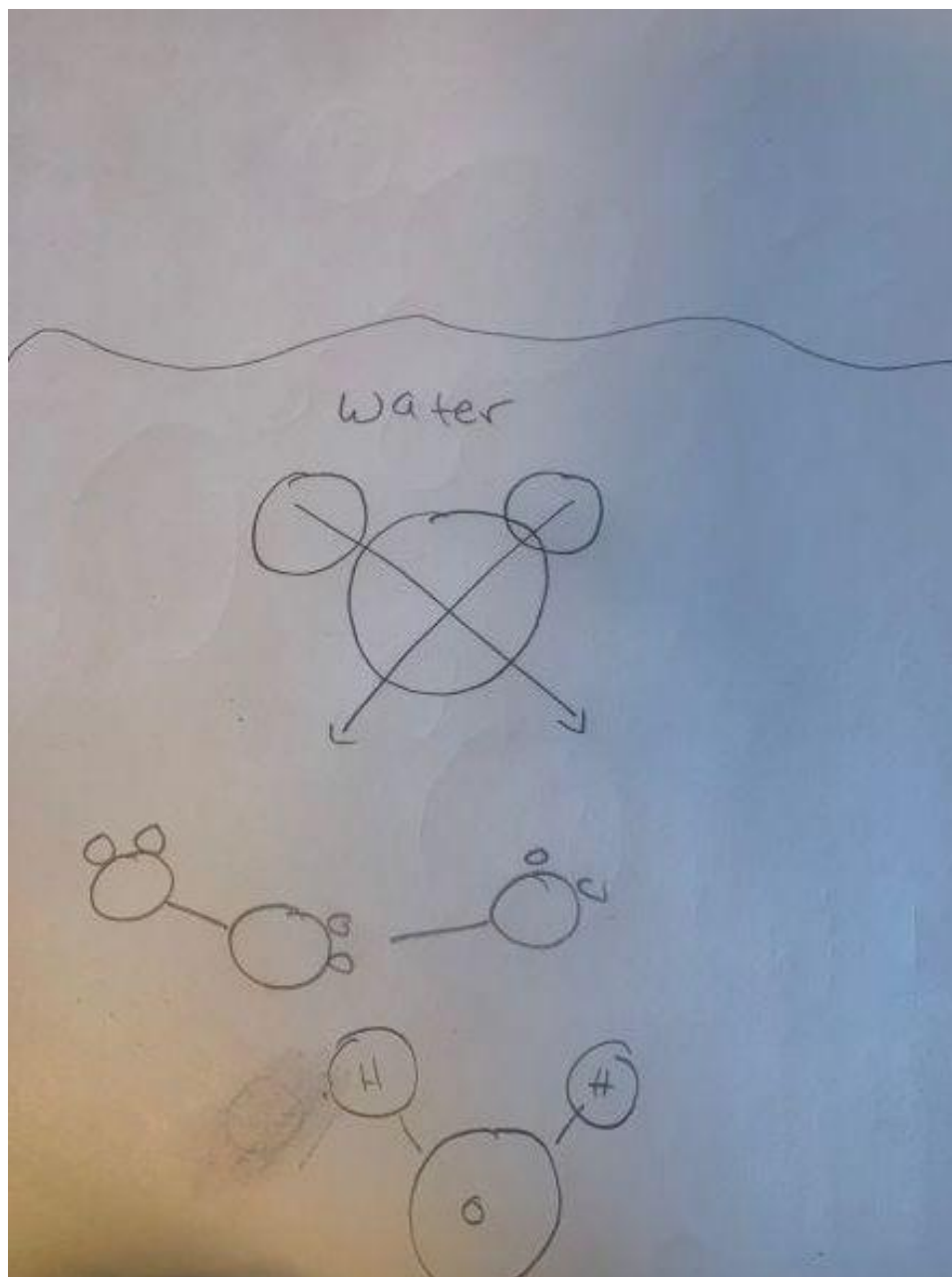
Hydrogen bond

Surface Tension

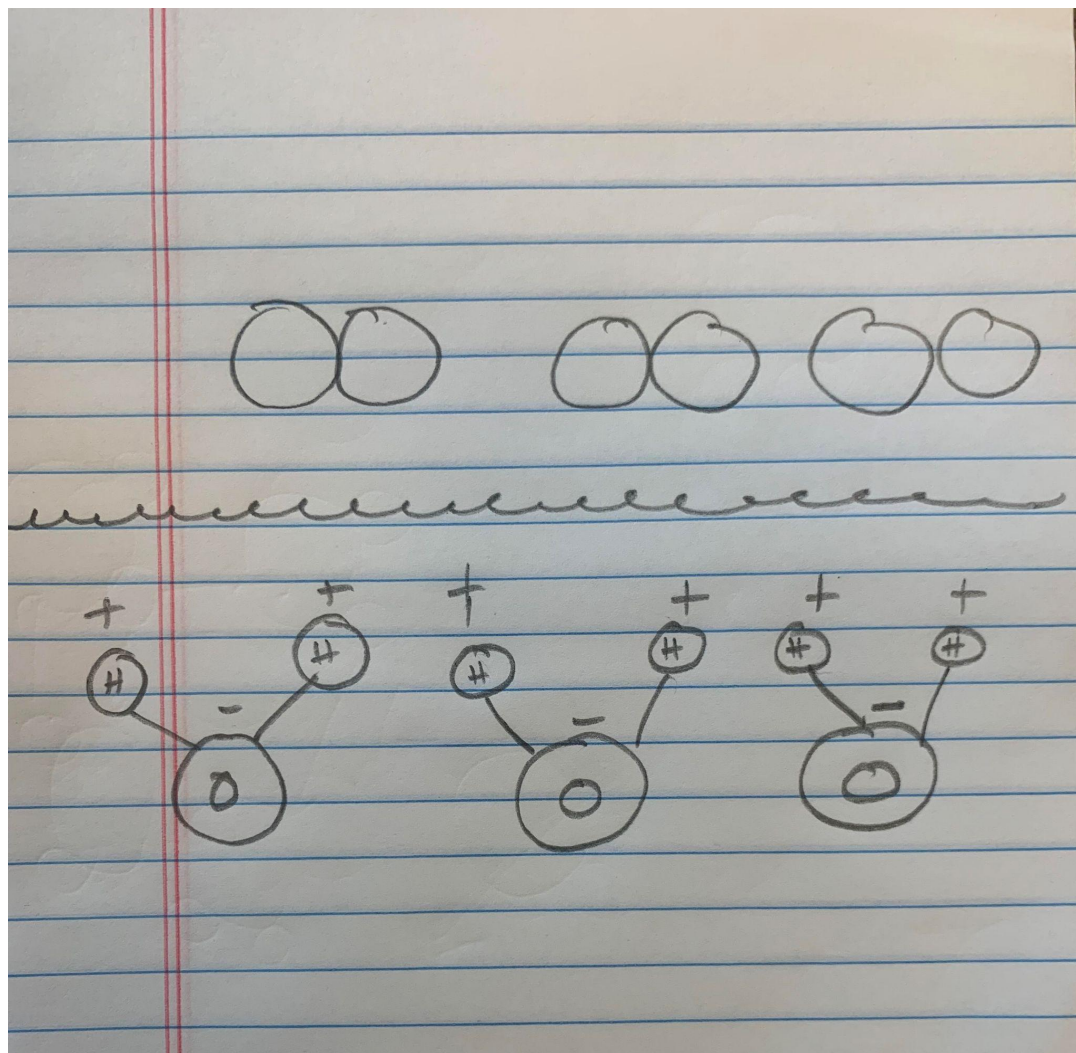
¹ NSTA, and using information from Appendix F of the Next Generation Science Standards © 2011, 2012, 2013 Achieve, Inc. "Science and Engineering Practices." *National Science Teaching Association*, 2014, <https://ngss.nsta.org/practicesfull.aspx>. Accessed 10 8 2021.

² Achieve. "Next Generation Science Standards." [Next Gen Science](https://www.nextgenscience.org), 2013, <https://www.nextgenscience.org>. Accessed 10 July 2021.

Ciara and Jordan



Angela and James



Stephanie

