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6.0.C.2 Hands-on PhET Phase Properties

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PhET site: "State of Matter: Basics"

Click on Water. Click on gas.

- 1) Just watch for a bit. What do you see happening? Note the temperature. What scale is it on?
- 2) Now, do something that will decrease the temperature. Do you change T directly? What are you doing to change the T? Note what happens to the molecules.
- 3) Cool so that the water clearly becomes liquid and not gas. What are the characteristics of molecular particles in the liquid phase? Contrast that with molecular particles in the gas phase.
- 4) Adjust heating/cooling until (visually) it looks like you are at the boiling point. Then check the temperature. Is the simulation behaving correctly?
- 5) Cool so that the water becomes liquid and eventually solid. What are the characteristics of molecular particles in the solid phase? Contrast that with molecular particles in the liquid phase.
- 6) Adjust heating/cooling until (visually) it looks like you are at the freezing point. Then check the temperature. Is the simulation behaving correctly?
- 7) Cool so that the water becomes definitely solid. Take specific note of how the molecules are arranged.
- 8) Change to oxygen. Click on solid if necessary. Repeat the steps you took for water, but go from solid to liquid to gas. Make the same observations along the way. Find the melting point and boiling point. Go up to 500 K.

Identify anything you found surprising or new from the simulation about solids, liquids, or gases. And anything specific about oxygen or water.