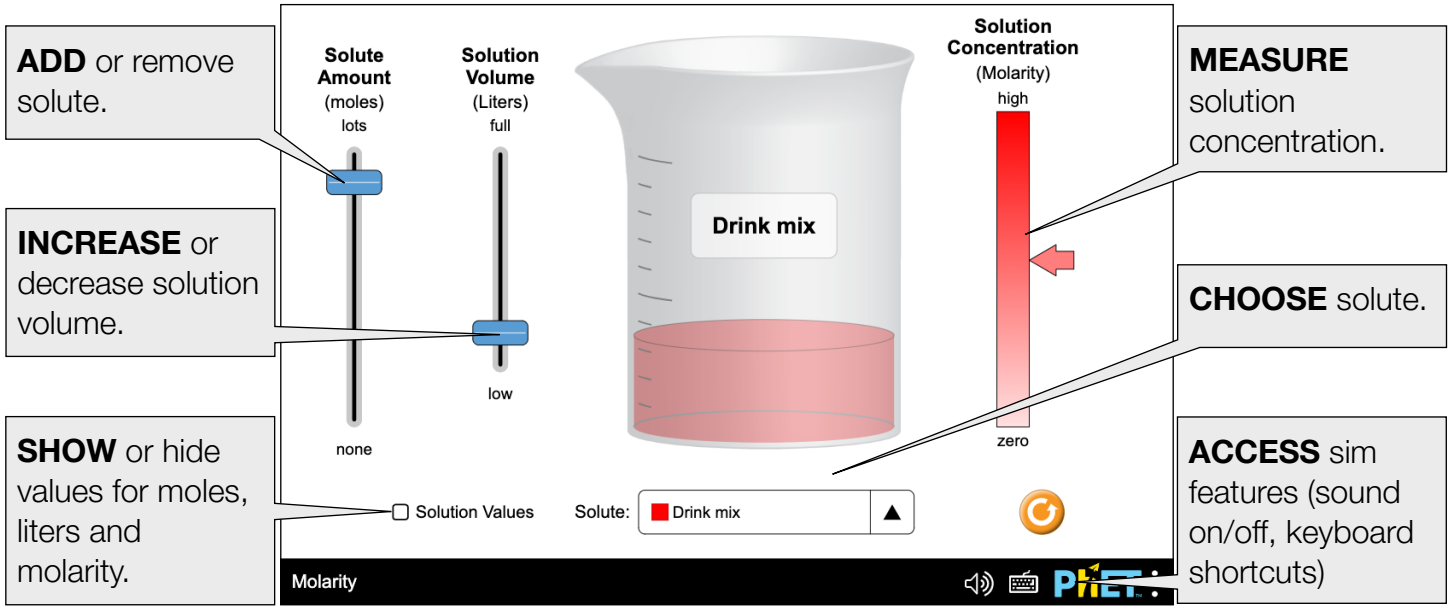
PhET Tips for Teachers

Molarity

The **Molarity** simulation allows students to qualitatively and quantitatively explore the relationships between solute amount, solution volume, and solution concentration.

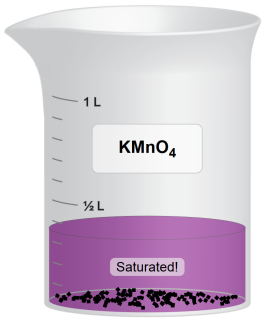


Insights into Student Use

- We recommend using the sim to help students determine qualitative relationships between molarity, moles, and liters before having students complete quantitative problems or data collection.
- The sim demonstrates saturation but does not explain why different solutes have different solubilities. In interviews, students were able to connect saturation to the idea of having "more solute than water can dissolve". Our Concentration simulation addresses the topic of saturation in more detail.
- The Drink Mix example provides a real-world link to the concept of concentration to help students make connections to the chemical examples.

Model Simplifications

- Solution volume is the combined volume of solute and water.
- By design, not all solutions will reach saturation. The number of moles that can be added is limited to the range of 0.2-1.0 moles so that students can explore some solutions for the full concentration range (0-5 M).
- Drink mix is assumed to have the same solubility as sucrose.
- Solubility of each solution listed was calculated at 25^{0}C, except for $AuCl_3$ and Drink mix (sucrose), which were based on data taken at 20^{0}C.
- Precipitate will not appear until the amount of solute exceeds the concentration at saturation.



Inclusive Features

Sound and Sonification

- A tone plays that changes with the magnitude of the concentration of the solution to emphasize the change in concentration by either the amount of solute or volume of the solution, *decreasing* in pitch with *increasing* concentration.
- As the solution passes saturation, the concentration tone becomes a *twinkle* that gets deeper in pitch with more precipitate.
- See the Sound Features Video for more useful tips on how concepts and sound are integrated in this sim. See the published Sound Design Documentation for more details on all sounds in this simulation.

Interactive Description

- This simulation features interactive description to support non-visual access, delivered only while using screen reader software. See the Introduction to Interactive Description video for more info on how to use this feature.
- Teachers can access the A11y View here to decide if this sim's interactive description meets their instructional needs. *Reminder: A11y View is not intended for student use and will not provide a good experience for learners using screen reader software.*

See the simulation page for all supported inclusive features.

See all published activities for Molarity here.
For more tips on using PhET sims with your students, see Tips for Using PhET.