

The **Diffusion** simulation allows students to explore how two gases mix. Experiment with concentration, temperature, mass, and radius to determine how these factors affect the rate of diffusion. Use the Center of Mass and Particle Flow Rate representations to determine when the system reaches equilibrium.

The screenshot shows the PhET Diffusion simulation interface. A central window displays a dark space filled with blue and orange particles. A vertical green line acts as a divider. Above the window, a 'Data' panel shows particle counts (91 blue, 58 orange, 9 blue, 142 orange) and average temperatures (338 K and 262 K). To the right, a control panel allows adjusting 'Number of Particles', 'Mass (AMU)', 'Radius (pm)', and 'Initial Temperature (K)'. Below these are checkboxes for 'Center of Mass', 'Particle Flow Rate', 'Scale', and 'Stopwatch'. At the bottom, there are play/pause buttons, speed settings (Normal, Slow), and a refresh button. The PhET logo is in the bottom right corner.

TRACK the number of particles and temperature on each side

EXPERIMENT with number, mass, radius, and initial temperature.

MEASURE diffusion rate

VISUALIZE the flow of particles between sides

SWITCH color profile to Projector Mode

Insights into Student Use

- Students may take some time to discover that they can quickly change values by holding down the arrow buttons.

Model Simplifications

- The particle-particle collisions are modeled as hard sphere collisions. A detailed description of the model can be found [here](#).
- The Particle Flow Rate arrows are proportional to the number of particles that have crossed the midline and is time-averaged over 300 ps.

Suggestions for Use

Sample Challenge Prompts

- Explain how two gases mix.
- Describe what the Particle Flow Rate arrows represent.
- Design an experiment to determine the factors which affect the rate of diffusion.

See all published activities for Diffusion [here](#).

For more tips on using PhET sims with your students, see [Tips for Using PhET](#).