



Teach Challenging Science Concepts through Inquiry

Engage Students' in Grades 6 to 8 in
Critical Thinking, Collaboration, and Research

**“...excellent curriculum support...
Recommended.”**

—Internet@Schools



Pathways: Science uses a consistent, easy-to-implement inquiry approach to help students understand difficult but essential earth, life, and physical science concepts. Lessons immerse students in thinking like scientists by making predictions, collecting evidence from a wide variety of sources—curated videos, images, text, graphs, and interactives—drawing conclusions, and writing evidence-based arguments. Each standards-correlated lesson is accompanied by a complete set of teacher resources, including simple methods for assessing student progress. Perfect for STEM!

SUBJECTS	STANDARDS-CORRELATED LESSON EXAMPLES
Earth Systems	The Earth's structure, the ocean, weather, and related phenomena.
Energy	Simple machines, electricity, types of energy, magnets, heat and temperature, and conservation.
Force and Motion	Velocity and acceleration, effects of gravity, the forces of action and reaction, and buoyancy.
Genetics and Evolution	Genes, DNA, and chromosomes, inheritance of traits, plant and animal diversity, mutations.
Light and Sound	Color, how light travels, radiation, reflection and refraction, the nature of sound.
Living Systems	Cells, body system interactions, respiration, photosynthesis, plant stems, plant mass
Matter	Mass, density, properties and nature of matter, solids, liquids, and gases, solutions
The Environment	Ecosystems, energy resources, food chains and food webs, global warming, predators and prey
The Nature of Science	Laws and theories in science, scientific models, theories and hypotheses in science
The Universe	Earth's seasons, solar and lunar eclipses, stars, the moon and its phases



The Predict—Investigate—Conclude Process Builds Key Science Knowledge!



Predict

All **solutions** are mixtures, but not all mixtures are **solutions**! Look at the mixtures shown below. Then classify each substance by placing it in the correct category.

Using ideas from the activity you just completed, state one characteristic of a **solution**.

Based on what I just did, I think ...

Solution	Not a Solution
seawater Incorrect Brass is a solid solution made of two other solids: copper and zinc. The metals form an even mixture when they are heated to a very high temperature.	milk orange juice brass glass

Students make predictions about each lesson's main concept to uncover their prior knowledge. They are asked to critically analyze their thinking around challenging topics in multiple ways, helping to bring any misconceptions to the surface.

Students dig for evidence from multiple sources to support or contradict their predictions. As they collect and evaluate evidence, students build research and critical thinking skills essential to success in Science and English/Language Arts.

Investigate

QUESTION What happens to a substance when it dissolves in a liquid?
MY IDEA When a substance dissolves, its particles spread out in the liquid.

Recommended Resources

Article Solution Viewed	Video Salt Removal from Natural Salt Water Viewed	Article Density of Seawater Not viewed	Graph Solubility of Different Solids in Water Notes taken	Article Salt from Seawater Viewed	Image Charged Portions of a Water Molecule Viewed	Article Saturated Solution Viewed
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Your notes from this resource:

Which of the four substances compared in the graph is not a solute?
MY NOTE Chalk

What information in the graph relates to your idea?
MY NOTE The amount of a substance that can be dissolved in a given quantity of solvent is a measure of the substance's solubility.

Teacher Notes

Finish your investigation

Conclude

QUESTION What happens to a substance when it dissolves in a liquid?
CORRECT IDEA When a substance dissolves, its particles spread out in the liquid.

This idea is correct because...

A substance dissolves when its particles spread out in a liquid, forming a solution. The substance is the solute, and the liquid is the solvent. The solute can be a solid, a liquid, or a gas. The particles of the substance spread out evenly throughout the liquid. After the substance dissolves, it cannot be separated from the solution. One example of this process is the addition of food coloring to water. The dye spreads throughout the water and cannot be separated from the water afterward.

Select an idea to see why it is incorrect.

- When a substance dissolves, it melts into the liquid around it.
- When a substance dissolves, it becomes smaller and loses mass.
- When a substance dissolves in liquid, it changes into a different substance.

See these resources for more information.

Article Solutions	Image Ions in Solutions	Article Density of Seawater
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Ideal for informal assessment, "Conclude" gives students an opportunity to demonstrate how they have revised their understanding of the topic.



"Pathways lets me differentiate because it's meant for everyone. Every single topic is a match with what we are teaching."

—Colleen Tombs, 8th Grade Science Teacher, Rahway (NJ) Middle School