

Water's Hidden Reach

Read how water dissolves and carries materials.

6.6.a "water is referred to as the universal solvent;"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline sentences that explain why water is called the universal solvent, circle each material that dissolves, and box each material that does not dissolve.

Why Water Dissolves So Much

- ① Water moves through soil, streams, and living things, carrying materials along the way. Scientists often call water the universal solvent because it can dissolve more kinds of substances than any other liquid. When a substance dissolves, its tiny particles spread evenly through the water and form a solution. For example, a spoonful of table salt seems to disappear in a glass of water, but the salt particles are still present. Evaporation can leave the salt behind again.
- ② Water molecules have uneven electrical charges. One part of each molecule is slightly negative, and another part is slightly positive. These charges pull on ions and other charged or polar particles. In salt, water pulls sodium and chloride ions away from the crystal and surrounds them. In sugar, water can attract parts of the sugar molecules and separate them from one another. This ability lets water carry minerals in groundwater and nutrients through plant stems.
- ③ The name universal solvent does not mean water dissolves every material. Oil does not mix with water because oil molecules are not attracted to water in the same way. Sand may be carried by moving water, yet its grains do not dissolve. Temperature and the amount of material also matter. Warmer water can often dissolve more solid material, while water holding as much dissolved material as it can may leave extra solid at the bottom. Water's dissolving power affects rivers, rocks, and bodies.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Why do scientists call water the universal solvent?

2 What does water do to salt when salt dissolves?

3 How does water dissolve sugar, according to the passage?

4 Why does the name universal solvent not mean that water dissolves everything? Use one example from the passage.

3 YOUR TURN _____ Your own words

Choose a substance not named in the passage. Write three sentences that predict whether it will dissolve in water, explain your prediction using water's charges, and describe one test you could do.

PART 1 • READ AND MARK

Underline sentences that explain why water is called the universal solvent, circle each material that dissolves, and box each material that does not dissolve. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Why do scientists call water the universal solvent?	Water can dissolve more kinds of substances than any other liquid.
2	What does water do to salt when salt dissolves?	Water pulls sodium and chloride ions away from the salt crystal and surrounds them.
3	How does water dissolve sugar, according to the passage?	Water attracts parts of the sugar molecules and separates the molecules from one another.
4	Why does the name universal solvent not mean that water dissolves everything? Use one example from the passage.	Water does not dissolve every material. Oil does not mix with water, or sand grains can be carried by water without dissolving.

PART 3 • YOUR TURN (SAMPLE ANSWER)

I predict baking soda will dissolve in water. Its sodium and bicarbonate ions are attracted to the charged parts of water molecules, which can separate and surround the ions. I would stir a measured amount into water and check whether a clear solution forms without grains settling.

Accept any reasonable prediction that connects water's uneven charges to attraction for ions or polar particles. The proposed test should involve mixing the substance with water and observing whether it forms a solution or remains separate.