

Solubility and Like-Dissolves-Like

Use this worksheet after reading the lesson to practise the key ideas and prove you can meet the success criteria.

Name _____

Date _____

Class _____

1. Key Ideas

Oil spills are devastating — and stubbornly hard to clean up. Why doesn't oil just dissolve in seawater? Dry cleaning removes grease stains that water can't touch — how? Both questions have the same answer: "like dissolves like." The polarity of the solvent and solute must be compatible for dissolution to occur. This single principle explains everything from drug delivery to industrial extraction to why you can't clean a greasy pan with cold water.

- The principle "like dissolves like"
- Why ionic compounds and polar molecules dissolve in polar solvents

2. Success Criteria

By the end, you should be able to:

- The principle "like dissolves like"
- How polarity determines solubility
- Definitions of miscible, immiscible, hydrophilic, hydrophobic

3. Key Terms

Key idea

The central concept from Solubility and Like-Dissolves-Like.

Evidence

Information, observations or calculations used to support an answer.

Explain

Give a reasoned answer that links cause and effect.

Apply

Use a learned idea in a new example, problem or scenario.

4. Activity: Build the Lesson Map

Use the lesson to complete the table. Keep answers brief but specific.

Prompt	Your answer
Main concept	
Important example	
Common mistake to avoid	
How this links to the next lesson	

5. Short Answer Questions

1. 6. A chemist has a mixture of iodine (I_2) and sodium chloride (NaCl) dissolved in water. They want to extract the iodine using hexane. Explain why this extraction works, with reference to the principle of "like dissolves like" and the IMFs involved.

BAND 3 **4 MARKS**

2. 7. The amino acid glycine has the formula H_2N-CH_2-COOH . It has both an amino group ($-NH_2$) and a carboxylic acid group ($-COOH$). Predict whether glycine would be more soluble in water or hexane, and justify your prediction using IMF reasoning.

BAND 4 **3 MARKS**

3. 8. Explain, using the concept of IMF compatibility, why $BaSO_4$ is insoluble in water despite being an ionic compound. In your answer, refer to lattice energy and hydration energy.

BAND 5 **3 MARKS**

6. Extend: Apply the Idea

BAND 5/6

5 MARKS

A student gives a memorised answer about Solubility and Like-Dissolves-Like but does not use evidence or reasoning.

Improve the answer by writing a stronger response that uses accurate terminology, a relevant example and a clear explanation.

7. Multiple Choice

1. What is the best first step when answering a question about Solubility and Like-Dissolves-Like?

- A. Identify the key concept being tested
- B. Write every fact from memory
- C. Ignore the command word
- D. Skip examples and evidence

2. Which answer would show stronger understanding of Solubility and Like-Dissolves-Like?

- A. An answer with accurate terms and reasoning
- B. A copied definition only
- C. A single-word response
- D. An answer with no example

3. What should you do if a question asks you to explain?

- A. Link the idea to a reason or cause
- B. List unrelated facts
- C. Only draw a diagram
- D. Write the shortest possible answer

8. Success Criteria Proof

Finish with evidence that you can do each success criterion.

SUCCESS CRITERION 1

Prove that you can: The principle "like dissolves like"

BAND 3 **2 MARKS**

SUCCESS CRITERION 2

Prove that you can: How polarity determines solubility

BAND 4 **3 MARKS**

SUCCESS CRITERION 3

Prove that you can: Definitions of miscible, immiscible, hydrophilic, hydrophobic

BAND 5 **4 MARKS**

One thing I still need help with:
