

# Acid-Base Models — Arrhenius to Brønsted-Lowry

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

Every model of acids and bases in history was overturned by one molecule that didn't fit — and the model we use today still has limits scientists are pushing against.

- The four acid-base models: Lavoisier, Davy, Arrhenius, Brønsted-Lowry
- Why ammonia is a base in Brønsted-Lowry but cannot be classified by Arrhenius

## 2. Success Criteria

By the end, you should be able to:

- The four acid-base models: Lavoisier, Davy, Arrhenius, Brønsted-Lowry
- Each model's definition of an acid and base
- The specific limitation that caused each model to be replaced

## 3. Key Terms

### Arrhenius acid

A substance that produces  $H^+$  ions when dissolved in water.

### Brønsted-Lowry acid

A proton ( $H^+$ ) donor in an acid-base reaction.

### Brønsted-Lowry acid

A proton ( $H^+$ ) donor in an acid-base reaction.

### Brønsted-Lowry base

A proton ( $H^+$ ) acceptor in an acid-base reaction.

### Conjugate acid-base pair

Two species differing by one  $H^+$  that interconvert.

### pH

The negative logarithm of hydronium ion concentration.

## 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. Explain this lesson goal in your own words: "The four acid-base models: Lavoisier, Davy, Arrhenius, Brønsted-Lowry". Use one specific example from the lesson.

**BAND 3** **2 MARKS**

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2. Apply this idea to a new example: "Each model's definition of an acid and base". Show your reasoning clearly.

**BAND 4** **3 MARKS**

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3. Analyse why this idea matters for understanding Acid-Base Models — Arrhenius to Brønsted-Lowry: "The specific limitation that caused each model to be replaced".

**BAND 5** **4 MARKS**

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## 6. Extend: Apply the Idea

BAND 5/6

5 MARKS

**A student gives a memorised answer about Acid-Base Models — Arrhenius to Brønsted-Lowry 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.

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## 7. Multiple Choice

1. What is the best first step when answering a question about Acid-Base Models — Arrhenius to Brønsted-Lowry?

- 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 Acid-Base Models — Arrhenius to Brønsted-Lowry?

- 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 four acid-base models: Lavoisier, Davy, Arrhenius, Brønsted-Lowry**

**BAND 3** **2 MARKS**

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### SUCCESS CRITERION 2

**Prove that you can: Each model's definition of an acid and base**

**BAND 4** **3 MARKS**

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### SUCCESS CRITERION 3

**Prove that you can: The specific limitation that caused each model to be replaced**

**BAND 5** **4 MARKS**

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**One thing I still need help with:**

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