

Test Bank for Introductory Chemistry - A Foundation 10th Zumdahl

Chapter 01

1. Which branch of science deals with the materials of the universe and the changes that these materials undergo?
- biology
 - geology
 - chemistry
 - astronomy

ANSWER: c

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25.1.2 - Describe why chemistry is often called “the central science.”

TOPICS: A-head: What is Chemistry?

KEYWORDS: Bloom's: 1

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2. Chemistry is often referred to as the _____.

- important science
- central science
- critical science
- fundamental science

ANSWER: b

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25.1.2 - Describe why chemistry is often called “the central science.”

TOPICS: A-head: What is Chemistry?

KEYWORDS: Bloom's: 1

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3. A change where one or more substances become different substances is a(n) _____.

- chemical change
- physical change
- atomic change
- elemental change

ANSWER: a

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25.1.2 - Describe why chemistry is often called “the central science.”

TOPICS: A-head: What is Chemistry?

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KEYWORDS: Bloom's: 1
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4. Which of the following is a chemical change?

- a. sugar burns and blackens
- b. ice melts
- c. a paper is crumpled up into a ball
- d. a paperclip is bent

ANSWER: a
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25.1.2 - Describe why chemistry is often called “the central science.”
TOPICS: A-head: What is Chemistry?
KEYWORDS: Bloom's: 2
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5. CFCs are responsible for breaking down which molecule in the upper atmosphere?

- a. oxygen
- b. nitrogen
- c. ozone
- d. carbon dioxide

ANSWER: c
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25.1.1 - Identify at least two real-world examples in which principles from chemistry have helped move society forward.
TOPICS: A-head: Chemistry: An Introduction
KEYWORDS: Bloom's: 1
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6. When solving a problem, you must first recognize the problem and state it clearly. Some information becomes known or something happens that requires action. This is also known as _____.

- a. making an observation
- b. formulating a hypothesis
- c. performing an experiment
- d. interpreting a theory

ANSWER: a

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POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.3 - Explain what it means to solve problems using a scientific approach.
TOPICS: A-head: Solving Problems Using a Scientific Approach
KEYWORDS: Bloom's: 1
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DATE MODIFIED: 5/29/2025 3:38 AM

7. When solving a problem, you must propose possible solutions to the problem or possible explanations for the observation. This is also known as _____.
a. making an observation
b. formulating a hypothesis
c. performing an experiment
d. interpreting a theory

ANSWER: b
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.3 - Explain what it means to solve problems using a scientific approach.
TOPICS: A-head: Solving Problems Using a Scientific Approach
KEYWORDS: Bloom's: 1
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8. When solving a problem, you must decide which of the solutions is the best or decide whether the explanation proposed is reasonable. To do this, we search our memories for any pertinent information or we seek new information. Searching for new information is also known as _____.
a. making an observation
b. formulating a hypothesis
c. performing an experiment
d. interpreting a theory

ANSWER: c
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.3 - Explain what it means to solve problems using a scientific approach.
TOPICS: A-head: Solving Problems Using a Scientific Approach
KEYWORDS: Bloom's: 1
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9. The process that lies at the center of scientific inquiry is called _____.
a. chemistry
b. engineering
c. the scientific method
d. discovery

ANSWER: c

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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10. A gardener notices that the tomato plants growing in one section of their garden are significantly taller and have produced more ripe tomatoes compared to the tomato plants in another section of the same garden. Which step of the scientific method is this?
a. making an observation
b. formulating a hypothesis
c. performing an experiment
d. interpreting a theory

ANSWER: a

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

DATE CREATED: 5/29/2025 3:55 AM

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11. A gardener believes that tomato plants grow faster in full sunlight. Which step of the scientific method is this?
a. making an observation
b. formulating a hypothesis
c. performing an experiment
d. interpreting a theory

ANSWER: b

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

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LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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12. A gardener plants tomato plants in a sunny area and a shady area to see which growing conditions will lead to taller plants. Which step of the scientific method is this?

- a. making an observation
- b. formulating a hypothesis
- c. performing an experiment
- d. interpreting a theory

ANSWER: c

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

DATE CREATED: 5/29/2025 4:01 AM

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13. A measurement is also known as a(n) ____.

- a. hypothesis
- b. qualitative observation
- c. quantitative observation
- d. experiment

ANSWER: c

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

DATE CREATED: 5/29/2025 4:11 AM

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14. Which of the following is a qualitative observation?

- a. Gold is a yellow metal.
- b. A gold nugget has a mass of 3.5 g.
- c. A piece of gold foil is 5.9 cm long.
- d. A piece of gold foil is 1.5 mm thick.

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ANSWER: a
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 2
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15. Which of the following is a qualitative observation?
- a. The plant grew 5 centimeters in height over the past week.
 - b. The music has a lively tempo.
 - c. There are 12 students in the classroom.
 - d. The temperature of the water is 75°F.

ANSWER: b
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 2
DATE CREATED: 5/29/2025 4:16 AM
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16. Which of the following is a quantitative observation?
- a. The flower petals have a velvety texture.
 - b. The soup has a savory aroma.
 - c. The fabric feels soft and smooth against my skin.
 - d. The ball traveled at a speed of 105 miles per hour.

ANSWER: d
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 2
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17. Which of the following is a quantitative observation?

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- a. The painting features bold brushstrokes.
- b. The thunder sounds like a loud, booming clap.
- c. I added 2 tablespoons of milk to my coffee.
- d. The mug feels warm and comforting in my hands.

ANSWER: c

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 2

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18. Which of the following is a quantitative observation?
- a. The air is thick with the smell of exhaust fumes.
 - b. The plant appears to be thriving in the dappled sunlight.
 - c. The average noise level is 70 decibels.
 - d. The sauce has a tangy flavor.

ANSWER: c

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 2

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19. Which of the following is **not** a step in the scientific method?
- a. making an observation
 - b. formulating a hypothesis
 - c. performing an experiment
 - d. changing results to agree with your hypothesis

ANSWER: d

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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20. True or false? A natural law is a statement that describes an observed behavior.

a. T

b. F

ANSWER: a

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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21. True or false? A hypothesis is a possible explanation for an observation.

a. T

b. F

ANSWER: a

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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22. True or false? A theory is a set of tested hypotheses that gives an overall explanation of some part of nature.

a. T

b. F

ANSWER: a

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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23. Generally, observed behavior that can be formulated into a statement, sometimes mathematical in nature, is called a(n) _____.

- a. observation
- b. measurement
- c. theory
- d. natural law

ANSWER: d

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

DATE CREATED: 5/29/2025 4:29 AM

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24. The statement “The total mass of materials is not affected by a chemical change in the materials” is called a(n) _____.

- a. observation
- b. measurement
- c. theory
- d. natural law

ANSWER: d

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 2

DATE CREATED: 5/29/2025 4:31 AM

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25. A set of tested hypotheses that gives an overall explanation of some part of nature, is called a(n) _____.

- a. observation
- b. measurement
- c. theory
- d. natural law

ANSWER: c

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

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LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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26. Something done to test a hypothesis that produces new observations is called a(n) _____.

- a. experiment
- b. measurement
- c. theory
- d. natural law

ANSWER: a

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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27. A quantitative observation _____.

- a. contains a number and a unit
- b. does not contain a number
- c. always makes a comparison
- d. must be obtained through experimentation

ANSWER: a

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.

TOPICS: A-head: The Scientific Method

KEYWORDS: Bloom's: 1

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28. Which of the following is a quantitative observation?

- a. The piece of metal is longer than the piece of wood.
- b. Solution 1 is much darker than solution 2.
- c. The temperature of the liquid is 60°C.
- d. The liquid in beaker A is blue.

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ANSWER: c
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 2
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29. A quantitative observation is called a measurement. Is this statement true or false?

- a. T
- b. F

ANSWER: a
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 1
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30. Which of the following is a qualitative observation?

- a. The leaf is 9 cm long.
- b. The temperature of the room increased by 8°C.
- c. The plant is short.
- d. The weight of the book is 4.5 pounds.

ANSWER: c
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 2
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31. Theories can change as more information becomes available.

- a. T
- b. F

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ANSWER: a
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 1
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32. A theory is also known as a(n) _____.

- a. observation
- b. model
- c. law
- d. experiment

ANSWER: b
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 1
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33. True or false? A law tells what happens; a theory is our attempt to explain why it happens.

- a. T
- b. F

ANSWER: a
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.4 - List the steps in the scientific method.
TOPICS: A-head: The Scientific Method
KEYWORDS: Bloom's: 1
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34. In order to learn chemistry, you should _____.

- a. memorize everything

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- b. .memorize nothing
- c. memorize most things
- d. memorize certain things

ANSWER: d
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.5 - Paraphrase at least two effective strategies for learning chemistry.
TOPICS: A-head: Learning Chemistry
KEYWORDS: Bloom's: 2
DATE CREATED: 5/29/2025 6:02 AM
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35. If you cannot do a chemistry problem, you should ____.
- a. review the relevant material and try again
 - b. give up
 - c. immediately look at the solution to the problem
 - d. search for the answer online

ANSWER: a
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.5 - Paraphrase at least two effective strategies for learning chemistry.
TOPICS: A-head: Learning Chemistry
KEYWORDS: Bloom's: 2
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36. Which of the following statements is not a good strategy for learning chemistry?
- a. Learn the vocabulary.
 - b. Memorize important information.
 - c. Learn from mistakes.
 - d. Avoid asking questions.

ANSWER: d
POINTS: 1
DIFFICULTY: easy
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.5 - Paraphrase at least two effective strategies for learning chemistry.
TOPICS: A-head: Learning Chemistry
KEYWORDS: Bloom's: 2

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37. If you make a mistake in a chemistry problem, you should _____.

- a. copy the answer from someone else.
- b. give up.
- c. immediately move on to a different type of problem.
- d. analyze the feedback and learn from your mistake.

ANSWER: d

POINTS: 1

DIFFICULTY: easy

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

LEARNING OBJECTIVES: ICAF.ZUMD.25. 1.5 - Paraphrase at least two effective strategies for learning chemistry.

TOPICS: A-head: Learning Chemistry

KEYWORDS: Bloom's: 2

DATE CREATED: 5/29/2025 6:07 AM

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