

Student Name: _____

Date: _____

Section 1: Multiple Choice (25 pts)

1. The central theme of Chemistry: Atomic Theory & Bonding is:

- A) Memorization
- B) Analysis of scientific phenomena
- C) Art and creativity
- D) Social studies

2. Advanced scientific reasoning involves:

- A) Guessing
- B) Data analysis, modeling, and evidence-based conclusions
- C) Reading only
- D) Copying results

3. Quantitative data means:

- A) Opinions
- B) Numerical measurements
- C) Drawings
- D) Descriptions

4. A null hypothesis states:

- A) A relationship exists
- B) No relationship between variables
- C) The experiment failed
- D) The hypothesis is correct

5. Statistical analysis helps:

- A) Make experiments shorter
- B) Determine if results are significant
- C) Change the hypothesis
- D) Avoid calculations

6. In Chemistry: Atomic Theory & Bonding, a key process we studied is:

- A) Random guessing
- B) Systematic investigation
- C) Avoiding labs
- D) Art projects

7. Peer-reviewed research is important because:

- A) It's always correct
- B) Experts evaluate the methodology
- C) It's faster to publish
- D) It avoids data

8. Percent error measures:

- A) How big the data is
- B) How close to the accepted value
- C) The sample size
- D) The number of trials

9. A control group receives:

- A) The experimental treatment
- B) No treatment/standard conditions
- C) Double the treatment
- D) Random treatment

10. Scientific theories:

- A) Are just guesses
- B) Are well-supported explanations tested many times
- C) Cannot change
- D) Are the same as laws

Section 2: Matching (10 pts)

1. Atomic Theory & Electron Config

2. Chemical Bonding

3. Chemical Reactions Intro

4. Thermochemistry

5. Independent variable

A. First concept in this upper unit

B. Second concept: lab activity focus

C. Third concept: data analysis component

D. Fourth concept: culminating activity

E. What the scientist deliberately changes

Section 3: Show Your Work (10 pts)

1. Explain the most significant concept from Chemistry: Atomic Theory & Bonding and how it applies to real-world science.

2. Design an advanced experiment related to Chemistry: Atomic Theory & Bonding. Include hypothesis, IV, DV, constants, and how to measure results.

3. Analyze this claim: 'We only tested one sample, but our results prove the hypothesis.' What is wrong with this conclusion?

Multiple Choice:

1. B
2. B
3. B
4. B
5. B
6. B
7. B
8. B
9. B
10. B