

Worksheet Significant Figures Questions and Answers PDF

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Part 1: Building a Foundation

What is the definition of significant figures?

Hint: Consider what contributes to the precision of a number.

- A) Digits that are placeholders in a number
- B) Digits that contribute to the precision of a number ✓
- C) Only the non-zero digits in a number
- D) Only the zeros in a number

Significant figures are digits that contribute to the precision of a number.

Which of the following numbers have three significant figures?

Hint: Look for numbers that contain three meaningful digits.

- A) 0.00456
- B) 123 ✓
- C) 4500
- D) 7.00 ✓

The numbers with three significant figures are 123 and 7.00.

Explain why leading zeros are not considered significant figures.

Hint: Think about the role of leading zeros in a number.

Leading zeros are not significant because they only serve as placeholders.

Identify the number of significant figures in each of the following:

Hint: Count the meaningful digits in each number.

1. 0.078

2

2. 506

3

3. 3.400

4

0.078 has 2 significant figures, 506 has 3, and 3.400 has 4.

Which rule applies when rounding the number 2.356 to two significant figures?

Hint: Consider how rounding affects the digits.

- A) Round up to 2.4 ✓**
- B) Round down to 2.3

- C) Round to 2.35
- D) Keep as 2.356

When rounding 2.356 to two significant figures, you round up to 2.4.

Part 2: Comprehension and Application

How many significant figures are in the number 0.05060?

Hint: Count the meaningful digits, including trailing zeros.

- A) Two
- B) Three
- C) Four ✓
- D) Five

The number 0.05060 has four significant figures.

Which of the following statements are true about significant figures?

Hint: Evaluate the statements based on the rules of significant figures.

- A) Trailing zeros in a decimal number are significant. ✓
- B) Leading zeros are always significant.
- C) Zeros between non-zero digits are significant. ✓
- D) All zeros in a whole number are significant.

The true statements are A and C.

Describe the significance of using significant figures in scientific calculations.

Hint: Think about how precision affects results.

Significant figures ensure that calculations reflect the precision of measurements.

If you multiply 3.2 (two significant figures) by 4.56 (three significant figures), how many significant figures should the result have?

Hint: The result should have the same number of significant figures as the factor with the least significant figures.

- A) Two ✓
- B) Three
- C) Four
- D) Five

The result should have two significant figures.

You are given the numbers 5.00 and 0.0032. Which of the following operations will result in a number with three significant figures?

Hint: Consider how each operation affects significant figures.

- A) Addition
- B) Subtraction
- C) Multiplication ✓
- D) Division

Addition and subtraction will not yield three significant figures, but multiplication will.

Calculate the result of $12.345 + 0.06$ and express it with the correct number of significant figures.

Hint: Consider the least precise measurement when adding.

The result is 12.41, expressed with four significant figures.

Part 3: Analysis, Evaluation, and Creation

Which of the following best describes the impact of significant figures on precision and accuracy?

Hint: Think about how significant figures relate to measurement quality.

- A) They increase accuracy but not precision.
- B) They increase precision but not accuracy.
- C) They affect both precision and accuracy. ✓
- D) They have no impact on precision or accuracy.

Significant figures affect both precision and accuracy in measurements.

Analyze the following numbers and select those that have four significant figures:

Hint: Look for numbers that contain four meaningful digits.

- A) 0.004500 ✓
- B) 450.0 ✓
- C) 4500
- D) 0.04560 ✓

The numbers with four significant figures are 0.004500, 450.0, and 0.04560.

Explain how significant figures can affect the outcome of a scientific experiment.

Hint: Consider the role of precision in experimental results.

Significant figures can lead to different interpretations of data and affect the reliability of results.

In a lab experiment, you measure a length as 12.0 cm and a width as 0.045 cm. What is the area, and how many significant figures should it have?

Hint: Calculate the area and consider the least precise measurement.

- A) 0.54 cm² with two significant figures ✓
- B) 0.54 cm² with three significant figures

- C) 0.540 cm² with three significant figures
- D) 0.540 cm² with four significant figures

■ The area is 0.54 cm² with two significant figures.

Evaluate the following statements and select those that reflect the importance of significant figures in real-world applications:

Hint: Consider how significant figures impact various fields.

- A) They ensure consistency in scientific communication. ✓
- B) They are only important in theoretical calculations.
- C) They help in maintaining precision in engineering designs. ✓
- D) They are irrelevant in everyday measurements.

■ The true statements are A and C.

Propose a real-world scenario where significant figures play a crucial role, and explain the potential consequences of ignoring them.

Hint: Think about fields where precision is critical.

■ Ignoring significant figures can lead to errors in calculations, affecting outcomes in fields like engineering and medicine.