

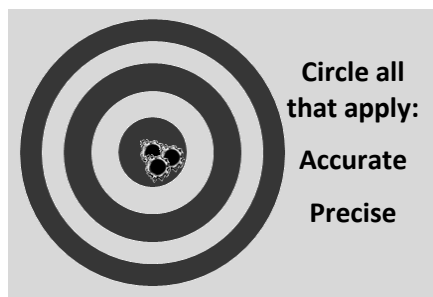
Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Notes: Accuracy, Precision and Significant Figures

Define **accuracy**: \_\_\_\_\_

Define **precision**: \_\_\_\_\_



Circle all that apply:  
Accurate  
Precise



Circle all that apply:  
Accurate  
Precise



Circle all that apply:  
Accurate  
Precise

An instrument's accuracy and precision are related to what? \_\_\_\_\_

What is an **increment**? \_\_\_\_\_

What does not directly affect precision? \_\_\_\_\_

Which of the following will allow measurement of a liquid's volume with the greatest precision?

- A 100 ml cylinder graduated in 2 ml increments
- B 50 ml cylinder graduated in 1 ml increments
- C 25 ml cylinder graduated in 0.5 ml increments
- D 500 ml cylinder graduated in 25 ml increments

How do we convey the precision of instruments? \_\_\_\_\_

What do most numbers in science represent? \_\_\_\_\_

### RULES FOR SIGNIFICANT FIGURES

1. Non-zero digits and zeros between non-zero digits are always significant.
2. Leading zeros are not significant.
3. Zeros to the right of all non-zero digits are only significant if a decimal point is shown.
4. For values written in scientific notation, the digits in the coefficient are significant.
5. In a common logarithm, there are as many digits after the decimal point as there are significant figures in the original number.

Why are **leading zeroes** included in numbers? \_\_\_\_\_

How do you show precision with **trailing zeroes**? \_\_\_\_\_

What instruments can you use to add precise volumes of liquid to a solution?

\_\_\_\_\_

What do we mean by "*degree of confidence*"? \_\_\_\_\_

What do we have to do if we want to report data with a higher degree of precision?

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How can you prevent confusion with data? \_\_\_\_\_

Decide how many significant figures are in each of the following numbers.

|  |                                |  |  |  |
|--|--------------------------------|--|--|--|
| <b>2.6 x 10<sup>4</sup></b><br>____ sig figs   | <b>230507</b><br>____ sig figs | <b>3.25</b><br>____ sig figs                   | <b>0.0067</b><br>____ sig figs                 | <b>300</b><br>____ sig figs                    |
| Rounded to<br>correct sig figs:                | <b>75.0</b><br>____ sig figs   | <b>1250</b><br>____ sig figs                   | <b>2004</b><br>____ sig figs                   | <b>11400</b><br>____ sig figs                  |
| <b>2503</b><br>____ sig figs                   | <b>.0024</b><br>____ sig figs  | <b>1.25 x 10<sup>23</sup></b><br>____ sig figs | <b>3.00</b><br>____ sig figs                   | <b>200.0</b><br>____ sig figs                  |
| <b>20.</b><br>____ sig figs                    | <b>35.0</b><br>____ sig figs   | <b>740</b><br>____ sig figs                    | <b>1050</b><br>____ sig figs                   | <b>6800</b><br>____ sig figs                   |
| <b>6.02 x 10<sup>23</sup></b><br>____ sig figs | <b>.00020</b><br>____ sig figs | <b>0.00025</b><br>____ sig figs                | <b>900</b><br>____ sig figs                    | <b>90.0</b><br>____ sig figs                   |
| <b>10.2</b><br>____ sig figs                   | <b>10405</b><br>____ sig figs  | <b>160</b><br>____ sig figs                    | <b>1.90 x 10<sup>-2</sup></b><br>____ sig figs | <b>120.</b><br>____ sig figs                   |
| <b>2304</b><br>____ sig figs                   | <b>.00012</b><br>____ sig figs | <b>8.2 x 10<sup>-12</sup></b><br>____ sig figs | <b>2.50</b><br>____ sig figs                   | <b>9800</b><br>____ sig figs                   |
| <b>125.0</b><br>____ sig figs                  | <b>260</b><br>____ sig figs    | <b>380.</b><br>____ sig figs                   | <b>0.00790</b><br>____ sig figs                | <b>1.005 x 10<sup>3</sup></b><br>____ sig figs |
| <b>0.0034</b><br>____ sig figs                 | <b>1050</b><br>____ sig figs   | <b>0.0010</b><br>____ sig figs                 | <b>13.70</b><br>____ sig figs                  | <b>70.</b><br>____ sig figs                    |

**Addition/Subtraction Rule:**

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**Multiplication/Division Rule:**

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Each of the problems below shows what the calculator reported as the answer. Correctly round each answer to the correct number of significant figures based on the operation that was performed.

|  |   |
|--|---|
| <b>52.12 g + 10.4 g = 62.52 g</b><br>Rounded to correct sig figs: _____        | <b>11.5 g ÷ 14 mL = 0.82142857</b><br><b>g/mL</b>                               |
| <b>21.6 mL - 16.3 mL = 5.3 mL</b><br>Rounded to correct sig figs: _____        | <b>8.4 N × 2.16 m = 18.144 N·m</b><br>Rounded to correct sig figs: _____        |
| <b>20.56 g ÷ 16 mL = 1.285 g/mL</b><br>Rounded to correct sig figs: _____      | <b>16.8 g + 5.26 g = 22.06 g</b><br>Rounded to correct sig figs: _____          |
| <b>12.8 mL - 3.19 mL = 9.61 mL</b><br>Rounded to correct sig figs: _____       | <b>12.52 g × 7.84 m/s = 98.1568 g·m/s</b><br>Rounded to correct sig figs: _____ |
| <b>8.26 m ÷ 2.187 s = 3.77686328 m/s</b><br>Rounded to correct sig figs: _____ | <b>4.5 mol ÷ 6.234 L = 0.72184793 M</b><br>Rounded to correct sig figs: _____   |