|  |  |
| --- | --- |
| Science Skills | Practice  | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_ |

# Units

1. Rewrite the following fraction units in the “European Standard” exponent notation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| $$\frac{m}{s}$$ |  |  | $$\frac{J}{K}$$ |  |
| $$\frac{kg × m}{s^{2}}$$ |  |  | $$\frac{J}{K×mol}$$ |  |
| $$\frac{kg}{s^{2}A}$$ |  |  | $$\frac{1}{s}$$ |  |

1. List the seven fundamental base units and their abbreviations

|  |  |  |
| --- | --- | --- |
| Length |  |  |
| Mass |  |  |
| Time |  |  |
| Electric Current |  |  |
| Temperature |  |  |
| Amount of Substance |  |  |
| Luminous Intensity |  |  |

# Unit Conversion

1. Convert 167 g to kg
2. Convert 0.0043 GW (gigawatts) to mW (milliwatts)
3. Convert 10,853 cm to km
4. Convert 439,000 cm2 to m2

1 in = 2.54 cm

1. Convert 125 in3 to cm3
2. Express 61,200 in normalized scientific notation.
3. Express .00004203 in normalized scientific notation.

# Dimensional Analysis

1. Is this equation valid? Note that *t* is in s, *v* is in ms-1, *a* is in ms-2, *x* is in m, *F* is in kgms-2 and *m* is in kg.

***v*2 = *ax***

1. Is this equation valid? Note that *t* is in s, *v* is in ms-1, *a* is in ms-2, *x* is in m, *F* is in kgms-2 and *m* is in kg.

***t* = v / F**

1. What are the units of the constant g this equation? (be sure to write with negative exponents if needed)

|  |  |  |
| --- | --- | --- |
| $$g=G\frac{m}{r^{2}}$$ | **Variable** | **Unit** |
| Mass**m** | Kilogram[kg] |
| Radius**r** | Meter[m] |
| Gravitation Constant**G** |  [N m2 kg-2] |
| Gravity**g** |  |

# Significant Digits

1. Record the number of significant digits for the numbers below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0.23 |  |  | 1.0020 |  |
| 1.23 |  |  | 12 × 10-2 |  |
| 1.203 |  |  | π |  |
| 1.230 |  |  | 0.00010000 |  |
| 0.002 |  |  | 5.98 × 1024 |  |
| 1.002 |  |  | 1.60 × 10-19 |  |

# Uncertainty

1. Complete the following table with checkmarks or X’s





1. What is the measured length of this line in cm? Use the amount of significant figures a wooden meter stick is capable of supplying and include the uncertainty as well.
2. You use an electronic balance to find that your action figure weighs 4.52 grams.
	1. What is the absolute uncertainty in the measurement?
	2. What is the percentage uncertainty in the measurement?
3. Calculate the Absolute and Percentage Uncertainty for the following set of data

|  |
| --- |
| 22.5 s |
| 20.8 s |
| 19.6 s |
| 28.3 s |
| 21.7 s |
| 20.4 s |

|  |
| --- |
| Absolute: |
| Percentage: |

1. Kinetic Energy is calculated using the equation EK = ½mv2, you measure the mass to be 50 ± 0.5 kg and the velocity to be 20 ± 0.4 m s-1. Calculate the value and uncertainty for the kinetic energy.

|  |
| --- |
| Absolute: |
| Percentage: |

1. You stack two blocks on top of each other, what is the uncertainty of the overall height?

Block A: 28.1 ± 0.8 cm | Block B: 12.6 ± 0.6 cm

|  |
| --- |
| Absolute: |
| Percentage: |