CHEM 191 Workshop 1.1: Scientific Tools

Name: _____

Please complete this worksheet and turn it in by the end of the class period. Show all work for credit.

Refer to "Scientific Tools" by Roland Stull and Chemistry: Atoms First *Sections 1.4 & 1.6, and Appendices B, C, and D for more information.*

1. For the following *values*, list the **magnitude**:
   - 6.34×10^{-9} m _____
   - 4×10^{3} μF _____
2. List the SI **prefix** and it's multiplier value for each of the following *values*:
   - 1.01×10^{2} kPa _____
   - 500 mg _____
3. List the **units** for each of the following *values*:
   - 2.4 g _____
   - 1,013 mbar _____
4. Write the following numbers in scientific notation:
   - 3,100,000 _____
   - 100 _____
   - 0.1 _____
   - 0.0524 _____
   - 1 part per million (ppm) _____
   - 5 parts per billion (ppb) _____
5. Give the name (e.g. *nano-*) and multiplier (in scientific notation, e.g. 10^3) indicated by the following SI abbreviations:

	Name	Quantity
• c	_____	_____
• G	_____	_____
• k	_____	_____
• m	_____	_____
• μ	_____	_____
• n	_____	_____
• M	_____	_____

6. Convert the following and show your work for each.

- 65°F to °C _____ °C

- 65°F to K _____ k

- 1 in to millimeters _____ mm

- 1.5 in to meters _____ m

- Typical atmospheric pressure in Cullowhee of 33.23 inHg to hPa _____ hPa

7. Complete the following table.

Abbreviation	Unit	Quantity Measured	Base or Derived?
kg	gram	mass	base
mPa	_____	_____	_____
_____	meter	_____	_____
C	_____	_____	_____
°C	_____	_____	_____
K	_____	_____	_____
_____	mole	_____	_____
_____	second	_____	_____
_____	part per billion	_____	_____
mbar	_____	_____	_____
M	_____	_____	_____

8. Calculate the following. Remember to include units in your answer where necessary.
   - $(2.8 \times 10^{-9}) \times (5.7 \times 10^{-3})$ _____
   - $(3.5 \times 10^{6}) \div (29 \times 10^{10})$ _____
   - 35 m ÷ 408 mm _____
   - 35 km - 200 m _____

9. A can of soda contains 12.0 oz of liquid. How many milliliters is this? Show your work.