

# PHYSICS CONTENT FACTS

The following is a list of facts related to the course of Physics. A deep foundation of factual knowledge is important; however, students need to understand facts and ideas in the context of the conceptual framework. This list is not intended to provide a comprehensive review for State and National Assessments. Its purpose is to provide a highlight of the factual material covered in Physics. This list is not all inclusive, be sure to check Nevada State Standards and your district syllabi.

## ELECTRICITY

- A coulomb is a unit of charge ( $1\text{C} = 6.3 \times 10^{18}$  electrons), an amp is a unit of current [coulomb/sec] and a volt is a unit of potential difference [joule/coulomb]
- The electric force between two objects depends directly on the object's charge and decreases rapidly as the charges separate  $F = k \frac{q_1 q_2}{r^2}$
- Short fat cold wires make the best conductors
- An electron has a negative elementary charge. A proton has a positive elementary charge. One elementary charge =  $1.6 \times 10^{-19}$  coulombs
- Adding a resistor in series increases the total resistance of a circuit
- Adding a resistor in parallel decreases the total resistance of a circuit
- All resistors in series have equal current (I)
- All resistors in parallel have equal voltage (V)
- The current in a circuit is directly proportional to the voltage across the circuit and inversely proportional to the resistance of the circuit  $I = \frac{V}{R}$
- If two charged spheres touch each other, then add the charges and divide by two to find the final charge on each sphere (charge flows until there is no difference in charge)
- Insulators do not contain free electrons
- Ionized gases conduct electric current using positive ions, negative ions, and electrons
- Electric fields all point in the direction of the force on a positive test charge
- Electric fields between two parallel plates are uniform in strength (except at the edges)
- Millikan determined the charge on a single electron using his famous oil-drop experiment
- All charge changes result from the **movement of electrons** not protons (an object becomes positive by losing electrons)