1.       Why is the sky blue? (electromagnetic spectrum, photon energy absorption, electron excitation,sunsets, etc.) - LED laser and rock demo

2.       What causes the aurora borealis (Northern Lights)? (electromagnetic spectrum, photon energy absorption, electron excitation, Earth’s magnetic field, thermosphere, etc.) – glow in the dark stars and lasers demo

3.       What causes a rainbow? (refraction, light optics, electromagnetic spectrum, H2O molecules, shape of rainbow, which way to look to find a rainbow, etc.) – prisms and white light demo

4.       Why does running warm water on a jar lid make it easier to twist off? (Heat, expansion, specific heat capacity) – metal vs. wood demo

5.       What causes lighting/thunder? (electric charge, volts/current, plasma, heat, ionization, discharge, energy transfer – light, sound, electrical, decibels, etc.) – Vandergraph machine spark or static electricity discharge

6.       Why do you feel dizzy when you spin? (fluids, equilibrium, inner ear, semicircular canals, acceleration, hair cells, etc.) – accelerometer jar demo

7.       What is sound and how do your ears detect it? (sound energy, decibels, cochlea, stirrup bone, auditory nerve, electric energy, acoustics, outer ear, inner ear, middle ear, eardrum, frequency of vibration, pitch, etc.) – frequency test

8.       How does a plane take off and fly? (thrust, lift, drag, high/low pressure, Bernoulli principle, Coanda effect, Newton’s 3rd law, angle of attack, etc)

9.       What causes wind? (temperature, heat, air density, equilibrium, sea/land breeze, etc.) – water tank heat flow demo

10.   Why can birds sit on power lines without being electrocuted? (current, volts, closed/open circuits, grounded, etc.) – Vandergraph machine

11.   What causes the tides? (force of gravity, moon tidal effect, Sun tidal effect, Universal Gravitation equation, etc.)

12.   Why do people say that looking at the stars is looking back in time? (photons, speed of light, travel time, distance, etc.)

13.   Why is ice the only solid that floats? Why is this important? (density, H2O, hydrogen bonds, heat energy, minimum liquid water temperature, phases – gas, solid, liquid, etc.)

14.   Why are our hands a poor judge of temperature? (heat vs. temperature, conduction, transfer, thermal conductivity, etc.) – porcelain vs. wood demonstration room temperature

15.   Why do humans sweat? How does it cool them off? (perspiration, heat, radiation, conduction, convection, heat transfer, evaporation, heat of vaporization, etc. ) – evaporation cooling demo

16.   Why is your breath visible in winter but not in summer? (relative humidity, water vapor, temperature, heat, density, etc.)

17.   How do electric chargers work (like electronic toothbrush) that don’t touch metal to metal? (electromagnetic radiation, transformer, induced current, AC current, etc.) – voltmeter magnet demo

18.    What is a shooting star? (air friction, meteor, meteorite, meteoroid, heat, star, atmosphere, thermosphere, mesosphere, vaporization, etc.)