



WAVE Demonstration

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| Author | Elmond E. Decker – Affiliate Societies Council | | | | | | | | | | | | | | | | | | | | | | | | |
| Grade Level | Suggested grades 4 th -8 th , high school wizard available upon request | | | | | | | | | | | | | | | | | | | | | | | | |
| Abstract | What do microwave ovens, antennas, cell phones, radio, light TV, sound and water all have in common? ...WAVES! During this physical science lesson, the W.O.W! Wizard will introduce students to wave energy, how it travels, and its characteristics. The demonstration is designed to give the students a basic understanding of the physical properties of waves. The W.O.W! Wizard will conduct a variety of activities to investigate wave relationships and energy transfer-emphasizing waves are in air, water, and light. | | | | | | | | | | | | | | | | | | | | | | | | |
| Objectives | <ul style="list-style-type: none"> ▪ Students will observe waves and interpret what they see. ▪ Students will learn the science behind wave energy. ▪ Students will be able to correctly identify the parts of a wave. | | | | | | | | | | | | | | | | | | | | | | | | |
| Pre-Visit | <p>_____ Complete the <i>W.O.W! Photo Release Form</i></p> <p>_____ Make sure there is an overhead projector is available.</p> <p>_____ Print a class-set <i>Focus for Listening</i> – optional</p> | | | | | | | | | | | | | | | | | | | | | | | | |
| Photos/Video | <p>Kit includes:</p> <table style="width: 100%; border: none;"> <tr> <td>Wave Manual</td> <td>(2) Wave Trays</td> </tr> <tr> <td>Dominoes</td> <td>(3) Jump Ropes</td> </tr> <tr> <td>(2) Slinky</td> <td>(2) Tuning Forks</td> </tr> <tr> <td>Rope</td> <td>Plastic Dropper</td> </tr> <tr> <td>Polarized lenses</td> <td>Prism</td> </tr> <tr> <td>Dry Erase Markers</td> <td>Singing Rod</td> </tr> <tr> <td>Rosin</td> <td>Parabolic Reflector</td> </tr> <tr> <td>Light Bar</td> <td>Sound Bar</td> </tr> <tr> <td>Radiometer</td> <td>Screen Radio Cage</td> </tr> <tr> <td>AM/FM Radio</td> <td>Weather Radio</td> </tr> <tr> <td>Plastic Parabola</td> <td>Plastic Arc Scribe w/holes</td> </tr> <tr> <td>(2) Singing Sound Tubes</td> <td></td> </tr> </table> | Wave Manual | (2) Wave Trays | Dominoes | (3) Jump Ropes | (2) Slinky | (2) Tuning Forks | Rope | Plastic Dropper | Polarized lenses | Prism | Dry Erase Markers | Singing Rod | Rosin | Parabolic Reflector | Light Bar | Sound Bar | Radiometer | Screen Radio Cage | AM/FM Radio | Weather Radio | Plastic Parabola | Plastic Arc Scribe w/holes | (2) Singing Sound Tubes | |
| Wave Manual | (2) Wave Trays | | | | | | | | | | | | | | | | | | | | | | | | |
| Dominoes | (3) Jump Ropes | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) Slinky | (2) Tuning Forks | | | | | | | | | | | | | | | | | | | | | | | | |
| Rope | Plastic Dropper | | | | | | | | | | | | | | | | | | | | | | | | |
| Polarized lenses | Prism | | | | | | | | | | | | | | | | | | | | | | | | |
| Dry Erase Markers | Singing Rod | | | | | | | | | | | | | | | | | | | | | | | | |
| Rosin | Parabolic Reflector | | | | | | | | | | | | | | | | | | | | | | | | |
| Light Bar | Sound Bar | | | | | | | | | | | | | | | | | | | | | | | | |
| Radiometer | Screen Radio Cage | | | | | | | | | | | | | | | | | | | | | | | | |
| AM/FM Radio | Weather Radio | | | | | | | | | | | | | | | | | | | | | | | | |
| Plastic Parabola | Plastic Arc Scribe w/holes | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) Singing Sound Tubes | | | | | | | | | | | | | | | | | | | | | | | | | |
| Post-Visit | <p>_____ Complete the brief post-visit survey</p> <p>http://www.surveymonkey.com/s/WOWDemoSurvey</p> | | | | | | | | | | | | | | | | | | | | | | | | |
| Best Teaching Practices | <ul style="list-style-type: none"> ▪ Learning Cycle ▪ Hands-on/Minds-on Learning ▪ Inquiry ▪ Discussion ▪ Probing Questions | | | | | | | | | | | | | | | | | | | | | | | | |

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| Standard Alignment | <p>As a result of the demonstration, students should develop an understanding of</p> <ul style="list-style-type: none"> ▪ Motion and Forces ▪ Position of Motion of Objects ▪ Transfer of Energy ▪ Interactions of Energy and Matter |
| Content Knowledge | <p>Waves are the way energy moves from place to place. There are waves everywhere. Waves consists of vibrating particles. As waves move, energy is carried from place to place. The wave moves the particles do not. Think about a cork in a pool of water. A distrubance creates the rippling of a water. The cork bobs up and down, while the wave continues to travel. Another example is spectators at a sporting event performing “the wave”. The spectator’s motions are up and down (vibrations) - the people do not move along the wave. The wave, however, moves through the stadium, section by section.</p> <p>Energy is the ability to do work. Work is moving something a distance against a force. So water, electrons, or some sort of small particles are moving back and forth at potentially incredible speeds against a force. Each particle does work on another particle which gets it moving, which then does work on another particle getting it moving, which then gets another moving and so on... Particles moving and doing work on other particles is <i>energy</i> and <i>waves</i> are how energy moves.</p> |
| Safety | Not applicable |
| Applications | Cell phone Technology, Radio and TV signals, Microwave Ovens and X-Rays |
| Assessment | Completion of <i>Focus for Listening</i> |
| Other Considerations | <p>Additional Materials/Resources:</p> <ul style="list-style-type: none"> ▪ <u><i>Slinky Scientific Shindig</i></u> – VHS video ▪ <u><i>Bill Nye’s Waves</i></u> – DVD with supplemental resources ▪ <u><i>On My Wavelength</i></u> – www.labtvonline.org <p>All materials available from the W.O.W! Lending Library upon request</p> |
| Skillsheet(s) | <i>Focus for Listening</i> |