

# Wizards of Wright

## Lesson: UV Rays

Use WOW! Lesson Intro to begin.

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| <p><b>Background Info for Wizards:</b></p>          | <p>The goal of this lesson is for students to understand that we need protection from the harmful rays of the Sun. You can discuss with them the different ways to protect ourselves...slip on long sleeves or cover-ups; slap on a hat; slop on some sunscreen; and wrap some sunglasses on. This lesson is a great reminder of how the sun may be damaging our skin, even when we don't think about it.</p> <p>Students will make a reminder they can take with them.</p> |
| <p><b>Materials:</b></p>                            | <ul style="list-style-type: none"> <li>- Sun, Earth and Moon signs</li> <li>- Small amounts of UV Beads</li> <li>- 3 or 4 baggies</li> <li>- different SPF Sunscreens</li> <li>- UV Flashlight</li> <li>- large bag of beads</li> <li>- tinted car windows</li> <li>- UV Flashlight</li> <li>- cases of beads</li> <li>- pipe cleaners</li> <li>- tray</li> <li>- UV Flashlight</li> </ul>  |
| <p><b>Lesson Time:</b><br/><b>45-60 minutes</b></p> | <p>Introduction: 3-5 minutes<br/>         Student Activity #1: 5-10 minutes<br/>         Guided Lesson #1: 4 minutes<br/>         Guided Lesson #1: 4 minutes<br/>         Wizard Demonstration #1: 10 minutes<br/>         Wizard Demonstration #2: 5 minutes<br/>         Student Activity #2: 10-15 minutes<br/>         Conclusion: 5 minutes</p>   |
| <p><b>Learning Targets:</b></p>                     | <p>After the lesson and activities, students should understand that:</p> <ul style="list-style-type: none"> <li>- The Sun produces ultraviolet (UV) light.</li> <li>- UV light can be dangerous and can burn our skin.</li> <li>- There are different ways to protect ourselves from UV Rays.</li> </ul>  |

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| <p><b>Introduction for Students:</b><br/>3-5 minutes</p> | <p>Ask the students what they already know about the Sun.</p> <p>Add these facts if they haven't already been discussed.</p> <ol style="list-style-type: none"> <li>1. The Sun gives life to the Earth.</li> <li>2. The Sun is one of millions of stars.</li> <li>3. The Sun is the star we are closest to.</li> <li>4. The Sun is over 4.5 billion years old.</li> <li>5. If the Sun were the size of a beach ball then Jupiter would be the size of a golf ball and the Earth would be as small as a pea.</li> <li>6. It takes about 8 minutes for the sunlight to get to us on earth.</li> <li>7. It is dangerous to look directly at the Sun.</li> <li>8. In the past many people believed that the Earth did not move and that the Sun rotated round the Earth.</li> </ol>   |
| <p><b>Student Activity #1:</b><br/>5-10 minutes</p>      | <p>Select <b>three volunteers</b> for a quick activity.</p> <p>You need a student to represent the Sun, the Earth, and the Moon. (hand them the accurate sign to hold so that other students can remember which is which)</p> <ul style="list-style-type: none"> <li>- <i>The student representing the Sun should stay stationery.</i></li> <li>- <i>The Earth should rotate (slowly) as it revolves around the Sun. Take the opportunity to explain, or have students explain, what is happening during the rotation vs. the revolution.</i></li> <li>- <i>The Moon should rotate, even more slowly, around the Earth.</i></li> <li>- <i>Explain to the students that this is not exact, but should give a good visual of how it is actually happening.</i></li> </ul> <p><b>Ask these questions:</b></p> <p><b>Q: How do the Earth and Moon receive light?</b> The Earth receives its light from the sun.</p> <ul style="list-style-type: none"> <li>- The Earth spins on its axis.</li> <li>- It makes one complete <u>rotation</u> in a 24-hour period (1 day).</li> <li>- The Earth also <u>rotates</u> around the Sun.</li> <li>- When the Earth rotates around the Sun it is called a <u>revolution</u>.</li> <li>- It takes the Earth 365 days (1 year) to complete one revolution around the sun.</li> </ul> |

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|   | <p><b>Q: What causes day and night?</b> Day and night are caused by the Earth's <u>rotation</u>.<br/>- The Earth makes one complete rotation in a 24 hour period (1 day). This is what causes day and night.</p> <p><b>Q: Which of the three objects is the largest?</b> Sun</p> <p><b>Q: Which one is the smallest?</b> Moon</p>   |
| <p><b>Guided Lesson #1:</b><br/>4 minutes</p> | <p><b><u>Introduction of UV Rays:</u></b></p> <p>Explain to the students that part of the light the sun sends to earth includes <b>invisible UV rays</b>. UV rays cause sun-tanning, sun-burning, and other skin damage.</p> <p>Discuss some facts about UV rays.</p> <ol style="list-style-type: none"> <li>1. Your skin is an excellent detector of ultraviolet (UV) radiation/rays. When you expose your skin to sunlight, your skin will either turn brown (a suntan) or red (a sunburn). This is a signal of overexposure to the sun and damage to your skin.</li> <li>2. Everyone, even dark skinned people, are at risk for sunburn.</li> <li>3. Fair skinned, blue-eyed blonds, and redheads are especially at risk of being sunburned.</li> <li>4. We need exposure to the sun. It is our primary source of vitamin D. But, it doesn't take a long time for us to get the amount we need.</li> <li>5. When we stay in the Sun for periods of time without skin protection the UV rays can cause minor and major damage. Damage can include skin damage, sun poisoning, eye damage, and even cancer.</li> <li>6. UV rays are strongest during summer.</li> <li>7. UV rays reflect off of snow and water, increasing the probability of sunburn.</li> <li>8. Even on cloudy or cool days UV rays travel through the clouds and reflect off sand, water and even concrete.<br/>We are sometimes unaware if we are developing sunburn on cooler or windy days, because the temperature or breeze keeps our skin feeling cool.</li> </ol> |

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|   | <p>9. Most UV is blocked by our Earth’s ozone layer and atmosphere, but some still gets through and can be detected.</p> <p><i>Show the poster representing the Ozone layer and how much protection we really have.</i></p>  |
| <p><b>Guided Lesson #1:</b><br/>4 minutes</p> | <p>I want to introduce you to a way to remind ourselves about UV rays, and that we need to protect our skin. Let’s use these UV beads.</p> <p><b>Show a small sample of the beads that will be used.</b></p> <ul style="list-style-type: none"> <li>– We can use these as a sensor. They will detect ultraviolet light.</li> <li>– These beads change color when exposed to ultraviolet light. The beads are all white in visible light. In UV light you will see different colors.</li> <li>– The beads are white now, because we aren’t exposed to any UV light. They will turn bright colors when exposed to UV rays and will become darker and brighter the longer they are exposed to UV rays. Then, when there is no more UV light, the beads will become white again.</li> <li>– You will even see the beads begin to turn colors even on a cloudy day because UV rays are still there. Which tells us that we need to protect our skin even on cloudy days.</li> <li>– These beads can help us stay alert!</li> </ul> <p><b>Ask the students for some ways that we can protect ourselves. If needed, lead them to the ideas of Sunscreen.</b></p> <ul style="list-style-type: none"> <li>- We know that exposure to UV radiation is harmful to skin cells.</li> <li>- We shouldn’t call this product sunblock. Their ingredients don’t “block” UV light. They absorb part of the UV ray so we don’t get the full intensity.</li> <li>- Their sun protection factor (SPF) tells us how effective they are.</li> <li>- Some UV rays get through the lower SPFs but many are stopped by the higher SPFs.</li> </ul> <p><b>Make sure the students understand the difference in the SPF numbers.</b></p> <p><b>Discuss:</b> Sunscreen products don’t last forever. They break down over time so it’s a good idea to get a new bottle each summer.</p> |

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| <p><b>Wizard Demonstration #1:</b><br/>10 minutes</p> | <p><b><i>Let's test some Sunscreens. Point out the different SPF numbers.</i></b></p> <p><b><i>There will be 4 baggies for beads. Have a sharpie available for bag labeling.</i></b></p> <ol style="list-style-type: none"> <li>1. in the sun with sunscreen – SPF X</li> <li>2. in the sun with sunscreen – SPF X</li> <li>3. in the sun with sunscreen – SPF X</li> <li>4. in the sun without sunscreen</li> </ol> <p>Shine UV light on the baggies.</p>  |
| <p><b>Wizard Demonstration #2:</b><br/>5 minutes</p>  | <p>This is a good time to show how UV rays may affect our skin while riding in a car, even if the windows are tinted.</p> <p>(You can use sunglasses for this lesson as well.)</p>  |
| <p><b>Student Activity #2:</b><br/>10-15 minutes</p>  | <p>Invite students to make a bracelet or keychain with UV beads.<br/>Each student gets a pipe cleaner.<br/>Students can put 5-10 beads on their bracelet.</p> <p>Have small groups come up to your table to make their bracelet.<br/>You will need to twist the pipe cleaner for them.<br/>Wait and go around with the UV flashlight after all students have a bracelet.<br/>The UV flashlight, <u>best used by an adult</u>, will show the students what they've created.</p> <p><b><i>There are coloring sheets for the students to be working on as they wait their turn.</i></b></p> <p>If the teacher can take them outside when they are finished, that would be great.</p> |
| <p><b>Conclusion:</b><br/>5 minutes</p>               | <p><b><u>Review the objectives:</u></b></p> <ol style="list-style-type: none"> <li>1. <i>The Sun produces ultraviolet (UV) light.</i></li> <li>2. <i>UV can be dangerous and can burn our skin.</i></li> <li>3. <i>The Earth's atmosphere provides significant, but not complete, protection from UV.</i></li> <li>4. <i>There are ways to detect UV rays and ways to protect ourselves from it.</i></li> </ol>   |

**One last reminder:**

UV rays react with a chemical called **melanin** that's found in skin. A sunburn develops when the amount of UV exposure is greater than what the melanin can handle. **Every child needs sun protection.** The lighter someone's natural skin color, the less melanin it has to absorb UV rays and protect itself. The darker a person's natural skin color, the more melanin it has. But both dark- and light-skinned kids need protection from UV rays because any tanning or burning causes skin damage.

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