



The sun's UV

Levels F-6

Learning intention

To understand the impact of the sun's ultraviolet (UV) radiation in Australia and our proximity to the equator.

Victorian F-10 Curriculum Links Content descriptions

Science

Foundation - Level 2: People use science in their daily lives.

Level 3 - 4: Science knowledge helps people to understand the effects of their actions.

Level 5 - 6: Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives.

Introduction

Using a world map, identify the equator explaining what it represents. Also, explain to the students the concept of the two hemispheres.

Activity

In the classroom outline the shape of the world using masking tape, adding in the equator line.

Share with students that areas close to the equator receive more sunshine and have more intense ultraviolet (UV) radiation.

Using a torch show the students how when you hold the torch directly above an area, it projects a similar area of light but when you hold the torch diagonally, the area of light projected is larger and less intense.

To further enhance this concept, outline the area the torch covers on the map. This link explains the concept in more detail (https://www.hko.gov.hk/education/edu06nature/ele_srad_e.htm)

Reflection

- Ask the students to think about how the sun affects them in Australia.
- Are they close to the equator?
- What does this mean for them?
- Go over the 5 SunSmart steps to protect against the sun's UV radiation.

Game

Once you have explained the concept, the students can play the game 'Equator'.

When you call 'equator' students run to the equator and curl into a ball.

For 'home' they move to where Australia would be on the map and squat.

For 'protection' they stand where Australia is marked on the map and role-play putting on a hat, sunscreen and finding a shady place to sit.

Glossary UV radiation

Ultraviolet (UV) radiation is energy from the sun that can't be seen or felt. Too much UV can damage the skin and eyes and lead to skin cancer.

Equator

The equator is an imaginary line in the middle of the North and South poles and divides the world into the northern and southern hemispheres. (Reference for further information <https://www.nationalgeographic.org/encyclopedia/equator/>)

UV radiation

Background information from ARPANSA

<https://www.arpansa.gov.au/understanding-radiation/radiation-sources/more-radiation-sources/sun-exposure/frequently-asked-questions>

High UV levels

Due to its geographical location and close proximity to the equator, Australia experiences some of the highest levels of UV in the world.

The earth's elliptical orbit brings the earth closer to the sun in January (during summer in the southern hemisphere) resulting in higher levels of UV. Also, relatively clear atmospheric conditions and the influence of ozone depletion over Antarctica contribute to higher levels of UV in the southern hemisphere than at similar latitudes in the northern hemisphere.

The most important factor affecting the level of the sun's UV at the earth's surface is the height of the sun in the sky.

When the sun is higher in the sky, the UV has a shorter path to travel through the atmosphere, so less UV is absorbed resulting in higher levels of UV reaching the surface.

When the sun is low in the sky, the UV has a longer path to travel so more UV is absorbed and scattered by the atmosphere resulting in less UV reaching the earth's surface.

UV vs heat

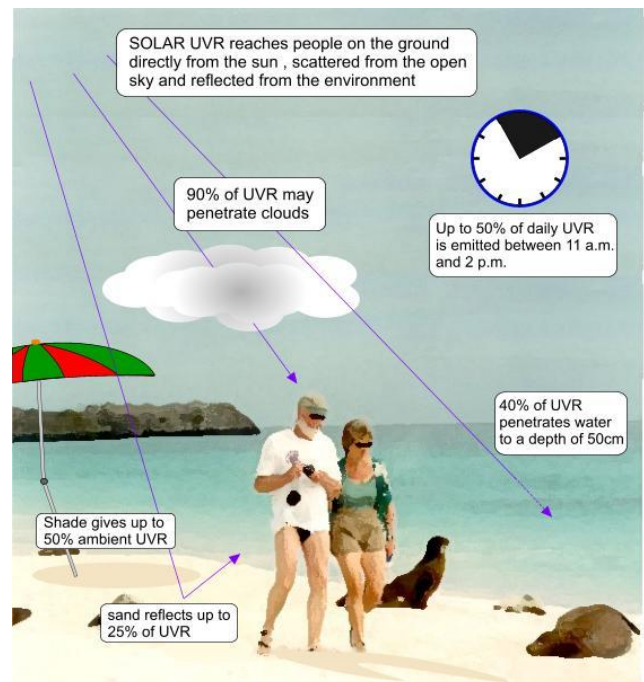
Whatever the weather, if UV levels are three or higher, sun protection is recommended.

You can't see or feel UV. UV and temperature peak at different times of the day. UV is usually highest around midday but the temperature is often highest later in the afternoon. In general there is a misconception that high temperatures and UV intensity are related. Many people think high temperatures means high UV levels and low temperatures means they don't need to worry about sun protection.

UV can be high on cool cloudy days and warm sunny days. In Victoria UV levels are usually three and above from mid-August to the end of April.

Factors affecting UV levels

- time of day
- time of year
- proximity to the equator
- seasonal effects
- cloud cover
- scattering in the open sky
- reflections from the environment
- altitude



<https://www.arpansa.gov.au/understanding-radiation/what-is-radiation/non-ionising-radiation/ultraviolet-radiation>