

# TOPIC 3.1

## How does electromagnetic radiation shape your world?

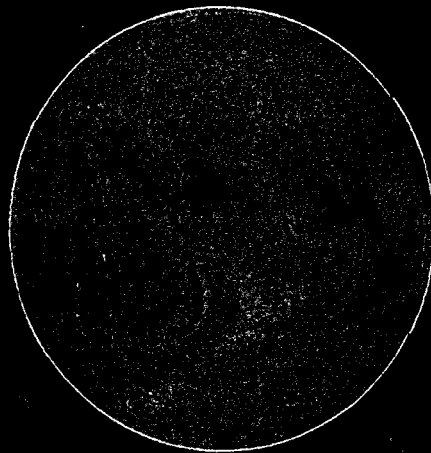
### Key Concepts

- Electromagnetic radiation is an important part of your world.
- Sources of electromagnetic radiation are all around you.
- Electromagnetic radiation enhances how we sense our world.

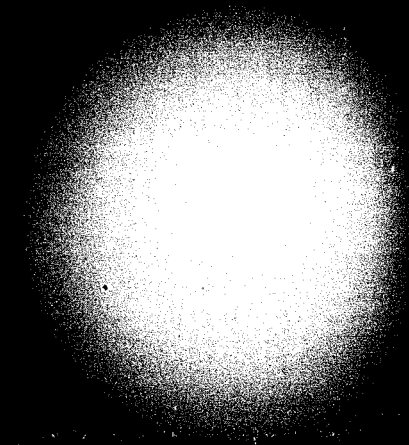
### Curricular Competencies

- Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest
- Co-operatively design projects
- Identify a question to answer or a problem to solve through scientific inquiry
- Consider social, ethical, and environmental implications of the findings

**E**lectromagnetic radiation is a form of energy. It is given off by many different sources on Earth and throughout the universe. However, most of the electromagnetic radiation that reaches Earth comes from the Sun. The images shown here are all of the Sun. They are made by different telescopes, each of which detects a different type of electromagnetic radiation. Some types of electromagnetic radiation given off by the Sun are harmful to living things, including you. Other types are essential to the survival of life on Earth.



Infrared telescope

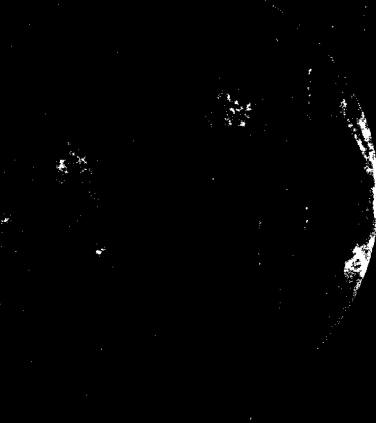


Optical telescope

# Starting Points

Choose one, some, or all of the following to start your exploration of this Topic.

- 1. Identifying Preconceptions** Visible light is only one type of electromagnetic radiation given off by the Sun. What other types have you heard of? How are they used? How do they affect your life?
- 2. Communicating** Electromagnetic radiation is a form of energy. Use a graphic organizer to review what you already know about energy.
- 3. Questioning and Predicting** Earth is knocked out of its orbit! It reads like the storyline of a science fiction movie, but imagine if this happened. Earth travels farther and farther from the Sun until the Sun is just a pinpoint of light in a dark sky. What changes would take place on Earth if it no longer received the Sun's energy? Brainstorm as many ways as you can think of.



Ultraviolet telescope



X-ray telescope

## Key Terms

There is one key term that is highlighted in bold type in this Topic:

- electromagnetic radiation

Flip through the pages of this Topic to find this term. Add it to your class Word Wall along with its meaning. Add other terms that you think are important and want to remember.

## CONCEPT 1

# Electromagnetic radiation is an important part of your world.

### Activity

#### Electromagnetic Radiation on Prime Time

Congratulations! Your production team has scored a job to produce a two minute science segment on a local news show. Your segment is called "Electromagnetic Radiation in Your World." It will feature one way that electromagnetic radiation is making headlines. You can research one of the ideas on these pages, or you can find another story that interests you. The format is up to you. Working with your team members, create a script to fill your air time.

**Figure 3.1** Electromagnetic radiation is often discussed online and covered by the news.

As shown in **Figure 3.1**, electromagnetic radiation shapes your world. Without it, there would be no cell phones, television, wireless Internet, or even life on Earth. Scientists have defined seven different types of electromagnetic radiation. These are radio wave, microwave, infrared, visible light, ultraviolet, X-ray, and gamma-ray radiation. Each type has expanded human ability or discovery in some way.

### Tweets



**Science Fest** @scifest

A Canadian scientist has identified repeating FRBs (fast radio bursts) from space for the first time. Origin is unknown. Any guesses?

Collapse Reply Delete Favourite

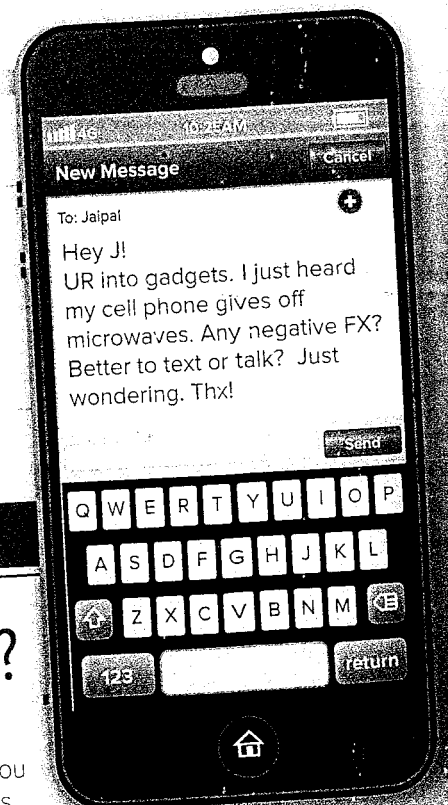
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RETWEETS



## How Much UV is Too Much?

Attention Sun-lovers! The good news is sunlight improves mood and its ultraviolet radiation helps you make vitamin D. The bad news is that it also causes skin cancer, premature aging, and eye damage.



# Dig This

## X-Rays Solve Mystery


Archaeologists studying First Nations artifacts at the Sunshine Coast Museum have dated some to be over 5000 years old. X-ray technology has uncovered other information,

too. A technique called X-ray fluorescence has helped archaeologists determine where the stone came from originally.

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### Blue Light Blues




Scientists studying blue light—the type of visible light given off by TVs and computer, tablet, and phone screens—have found evidence that it is linked to health and sleep problems.

Posted by BlogThis at 7:48 AM

breaking-news/bc-bird-cams-catch-after-hours-clutch

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### BC Bird Cams Catch After-Hours Clutch



Wondering what ospreys are up to in Nelson at midnight, or eagles near Sidney just before dawn? The cams let you view parents and nestlings even in the dark thanks to infrared radiation. The birds cannot see it, but the cameras can.

### HOSPITAL NEWS 25

## New Gamma Cameras for Hospital

Lions Gate Hospital in North Vancouver has a pair of new gamma cameras to diagnose heart disease, cancer, and other conditions. A tracer injected into the patient gives off gamma rays, which the cameras detect to make 3-D images of inside the body.

**Before you leave this page . . .**

1. Why do you think sunglasses have special lenses that filter out ultraviolet radiation?
2. Why might you want to limit the amount of time you spend in front of an electronic screen at night?