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Curriculum Units by Fellows of the National Initiative
2021 Volume IV: The Sun and Us

Analyzing Electromagnetic Wavelengths and Their Interactions

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For millennia humanity has revered the stars and local celestial bodies. The light, i.e., electromagnetic waves, emitted by the Sun combined with its interactions with our atmosphere have provided us with a small oasis in the dark vacuum of space. Today our fundamental understanding of electromagnetism has given rise to a technological revolution. This three-week unit attempts to provide students with an opportunity to explore electromagnetism by investigating the components of digital devices. Students' cellphone usage is typically confined to social media or texting. However, a myriad of scientific principles and engineering design are at their fingertips. Students will investigate the properties associated with various electromagnetic wavelengths and their associated interactions with matter. Students will acquire mastery in electromagnetic wave properties, types of wave interactions as well as a fundamental understanding in the function(s) of various technological components (i.e., TV and cellphone). To assess mastery, students will develop a research proposal that seeks to improve a feature that utilizes the electromagnetic radiation in an existing digital device.

(Developed for Physics, grade 11; recommended for Physics, grades 11-12)