# Light and Geometric Optics: Unit Overview

**SNC2D, Grade 10 Science (Academic), Unit 5.** 16 classes of 75 minutes, plus a summative work period and one class for the unit test (18 classes, about four weeks).

### The big question

How do mirrors and lenses control light, and how do the technologies built on them affect our lives?

Students explore the electromagnetic spectrum and light emission, then investigate reflection and refraction with cheap, safe labs (flashlight slit beams, spoons, clear plastic, water, a light pipe and magnifying glasses). They draw ray diagrams, describe images with SALT, use the mirror and thin lens equations and n = c/v with one consistent sign convention, explain total internal reflection, instruments, the eye and natural light shows, and evaluate vision and light technologies, including the work of Canadians Willard Boyle and Donna Strickland. All data sets and problems are original.

## Lessons

| # | Lesson | Classes | Question | Expectations | What's inside |
|---|---|---|---|---|---|
| 1 | **What Is Light?** | 1 | What is light? | E3.2, E2.1 | Spectrum; remote and phone camera |
| 2 | **Making Light** | 1 | How is light made? | E3.1 | Emission stations; LED savings |
| 3 | **Laws of Reflection Lab** | 1 | How does light reflect? | E2.2, A1.4 | Slit beam and mirror; optics safety |
| 4 | **Images in Plane Mirrors** | 1 | Where is the image? | E2.3, E3.3 | Clear plastic and erasers; SALT |
| 5 | **Curved Mirrors** | 1 | What do curved mirrors do? | E2.2, E2.3 | Spoon mirrors; f = R/2 |
| 6 | **Ray Diagrams for Curved Mirrors** | 1 | How do we find the image? | E3.3 | Three rays; five positions |
| 7 | **The Mirror Equation** | 1 | Where exactly is the image? | E3.3, A1.13 | Mirror and magnification equations |
| 8 | **Refraction Lab** | 1 | How does light bend? | E2.4, E3.7 | Water and acrylic data; trends |
| 9 | **Index of Refraction and the Speed of Light** | 1 | How much does light slow down? | E2.6, E3.7, A1.12 | n = c/v; disappearing glass |
| 10 | **Total Internal Reflection** | 1 | When does a boundary become a mirror? | E3.4 | Critical angle data; light pipe |

© 2026 K9solutions

| # | Lesson | Classes | Question | Expectations | What's inside |
|---|---|---|---|---|---|
| 11 | **Converging Lenses** | 1 | What images do lenses make? | E3.5, E2.5 | Measure f; three rays; SALT |
| 12 | **The Thin Lens Equation** | 1 | Can we predict lens images? | E2.5, A1.13 | Predict and test with a lens |
| 13 | **Optical Instruments** | 1 | How are instruments designed? | E3.6 | Four stations; magnification |
| 14 | **Eyes and Vision Technology** | 1 | How do we see and correct vision? | E1.1, A2.1 | Model eye; dioptres; jigsaw; careers |
| 15 | **Light Technology and Society** | 1 | How has light technology helped us? | E1.2, A2.2 | Device analysis; Boyle, Strickland |
| 16 | **Nature's Light Shows** | 1 | What explains rainbows and mirages? | E3.8 | Apparent depth; water prism |

## Assessment

| Type | In this unit |
|---|---|
| Assessment for learning | A handout task in every lesson, quick checks and exit tickets |
| Assessment as learning | Self-checks against success criteria; plan approval before the summative |
| Assessment of learning | Optical Device Design Challenge with rubric (suggested weight 7% of the final mark) and Unit Test with answer key (suggested weight 5%) |

## What's included

In the Start Here folder:

- **Summative Task and Rubric:** design, build, test and evaluate a periscope, pinhole camera or pizza-box solar oven, with ray diagrams, a Growing Success rubric and a checklist
- **Unit Test and Answer Key:** about 45 minutes, 44 marks: spectrum, reflection, SALT, mirror and lens equations, index of refraction, total internal reflection and a fibre-optic application, with worked answers

Safety: every hands-on activity has safety notes. Never look at the Sun through any lens or device; lasers are teacher-only Class 2 and never aimed at eyes; battery flashlights only near water; glass by the edges. One sign convention (real is positive) is used throughout, and every calculation was checked.

## What's in each lesson

- Teacher lesson plan with expectations, timed sequence, differentiation, look-fors and answer guides
- Slides with speaker notes
- Student handouts and organizers
- Editable Word and PowerPoint files, plus PDFs

© 2026 K9solutions