



a WOW Lab

BLUEPRINT

Light Bending JELL-O

Achievements and Competencies

Learning Outcomes

Grades 7-9	Grades 10-12
Optics	Waves

Achievements and Competencies are based on the Common Framework of Science Learning Outcomes (K-12) set by the Canadian Council of Ministers of Education (1997).

Specific Expectations

Grade 8

PHYSICAL SCIENCE

Optics

208-5 State a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict the effect of a dense liquid on the angle of refraction of light).

Through the use of lasers and JELL-O pieces of different shapes and colours, students can make predictions about the effect of a dense liquid on the angle of refraction of light.

209-2 Estimate measurements (e.g., estimate light intensity and angles of incidence and reflection).

Students will calculate the speed of light inside JELL-O by estimating the angle of incidence and the angle of refraction, which will then allow them to calculate the index of refraction of JELL-O.

209-6 Use tools and apparatus safely (e.g., use lasers appropriately, and consider potential dangers related to the use of various devices producing electromagnetic radiations, such as microwave ovens and ultraviolet lamps).

In the *Light Bending JELL-O* activity, lasers are used to calculate the speed of light, the critical angle of JELL-O, and the colour absorption of JELL-O. The lasers are then used to complete the *Optical Course*.

210-11 State a conclusion based on experimental data and explain how evidence gathered supports or refutes an initial idea (e.g., conclude that solutes in water affect refraction and explain the effect of various concentrations of solutes on diffraction).

The experimental data obtained in the *Light Bending JELL-O* activity allows students to understand how Snell's law governs the relationships between four different variables: the speed of light in air, the speed of light in different materials, the angle of incidence and the angle of refraction.



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Light-Bending JELL-O - Achievements and Competencies

Grade 11

PHYSICS

Waves

212-3 Design an experiment identifying and controlling major variables (e.g., design an experiment to measure the sensitivity of certain living things to sound).

Students will design a method of using either red or green lasers and various JELL-O shapes and colours to obtain the appropriate data needed to calculate the speed of light in air and in different materials, and to estimate the angle of incidence and the angle of refraction.