SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

UV Beads Part 2 **Grade 10 Applied – Light and Applications of Optics**

Lesson Plan

Assessment	AFL – feedback, AOL - rubric
Cross-curricular	Health, Phys.Ed., Technology

Big Ideas

- A wide range of technologies utilizes the properties of light and colour.
- The behaviour of light depends on the materials with which it interacts.

Learning Goals

- Learn to conduct an experiment and collect visual results
- Learn to interpret what our results mean

Materials

Sunscreens of various ages and/or SPF levels
Various light sources (CFL bulb, Fluorescent Tube bulb, incandescent bulb, etc.)
Various types, qualities of sunglasses
Various thicknesses of glass, plastic, and other clear materials
UV Beads Part 2 Inquiry Write Up
UV Beads Part 2 Summative Assessment
Smarter Science Framework posters (https://smarterscience.youthscience.ca/)

Safety Notes

UV radiation from the sun can cause sunburns.

Specific Expectations

A1.1 formulate scientific questions about observed relationships, ideas, problems, and/or issues, make predictions, and/or formulate hypotheses to focus inquiries or research
A1.2 select appropriate instruments and materials for particular inquiries
A1.4 apply knowledge and understanding of safe practices and procedures when planning investigations; ... safe operation of electrical equipment, ... with the aid of appropriate support materials.
A1.5 conduct inquiries, controlling some variables, adapting or extending procedures as required, and using standard equipment and materials safely, accurately, and effectively, to collect observations and data
A1.6 gather data from laboratory and other sources, and organize and record the data using appropriate formats, including tables, flow charts, graphs, and/or diagrams
A1.8 analyse and interpret qualitative and/or quantitative data to determine whether the evidence supports or refutes the initial prediction or hypothesis, identifying possible sources of error, bias, or uncertainty
E2.1 use appropriate terminology related to light and optics
E2.5 investigate how various objects or media reflect, transmit, or absorb light
E3.1 describe various types of light emissions and how they produce light
E3.2 identify and label the visible and invisible regions of the electromagnetic spectrum, and identify the colours that make up visible white light

Description

This is **lesson two** of two lessons on UV radiation. Students should have a basic understanding of the electromagnetic spectrum. Students need the completed UV Beads Inquiry Plan from Part 1.

Introduction

- Before class begins the teacher will have read the student 'Inquiry Plans' and written descriptive feedback on them.
- Depending on the Independent Variable (IV) that students choose to manipulate, and the availability of school materials, teachers may need to gather materials that students have planned to use but cannot bring from home (ex. Different light sources).
    - If these materials are not available in the school the teacher should indicate possible modifications or new directions of inquiry in the descriptive feedback.
- REVIEW INQUIRY PLAN: Students will receive their Inquiry Plan (completed the previous day) back from teacher.
- They will meet in their inquiry group and carefully read over the descriptive feedback provided by their teacher.
- Students will erase and make any necessary changes indicated by the teacher.
- They will show their teacher that they have understood the feedback and made the necessary changes before moving on.

Action

- GATHER MATERIALS: Students gather materials brought from home or supplied by the teacher.
- EXPERIMENT: Students follow their planned experimental procedure and collect their data (represented physically or digitally).
    - Students should be reminded to record what their 'control group' looks like.
- GALLERY WALK: After collecting all data, students will record on chart paper, a whiteboard, or a chalkboard in their area, their experimental question (this can be found on their Inquiry Plan).
    - Half of the group members will stay with their question while half will rotate around the room, group to group. At each stop, the group member(s) remaining will read their question and briefly describe what they tried and what they learned.
    - Once a full rotation has happened, group members will switch places and repeat.
    - The intent of this Gallery Walk is twofold. It allows students to see what others have learned while also giving them time to verbally practice discussing their conclusions.
- INQUIRY WRITEUP & SELF ASSESSMENT: Students will receive 'Inquiry Write-up' from their teacher.
    - This is the summative product and should be completed individually with assistance from the teacher or support staff.
- Students will also receive the 'Inquiry Summative Assessment' and should circle how they feel they have performed on the rubric as a self-assessment.
    - If students work quickly they may have these completed but more likely students will need to complete this work at home or in successive school periods.

Consolidation/Extension

- The teacher should assess student work using ‘Summative Assessment’ including their assessment the student’s completed self-assessment on the same page.
    - NOTE: ‘Inquiry Summative Assessment’ is based upon Ontario Science Curriculum Achievement Chart but has been modified to be specific to the current activity.