# Ultraviolet radiation

UV radiation – To tan or not to tan?

# SAILS inquiry and assessment unit overview

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| **Name** | Ultraviolet radiation |
| **Key content/concepts** | * Sources of UV radiation * Detecting UV radiation and exposure levels * How to reduce UV exposure |
| **Level** | * Lower second level |
| **Inquiry skills assessed** | * Planning investigations * Developing hypotheses * Forming coherent arguments * Working collaboratively |
| **Assessment of scientific reasoning and scientific literacy** | * Scientific reasoning (drawing conclusions; analysis of data) * Scientific literacy (critical thinking) |
| **Assessment methods** | * Classroom dialogue * Teacher observation * Peer-assessment * Self-assessment * Student devised materials (documentation of inquiry process) * Presentations |

Table 1: Criteria for assessing the skills of planning investigations and carrying out an investigation

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| --- | --- | --- | --- |
| **Inquiry skill** | **1** | **2** | **3** |
| **Planning an investigation** | The student suggests how an investigation might be designed, but not in detail. | The student suggests how an investigation might be designed, but the design is incomplete in some respect.  The design can, with some revisions, be used for systematic investigations. | The student plans an investigation where the design includes which variables to change and which to be held constant, in which order to perform different parts of the investigation and which equipment is to be used. |
| **Carrying out an investigation** | The student carries out an investigation from the beginning to end, but needs constant support by the teacher, peers or detailed instructions.  The student uses equipment, but handles the equipment in a way that is not always safe.  The student sporadically documents the investigation in writing and with pictures. | The student carries out an investigation from the beginning to end, but sometimes needs support by the teacher, peers or detailed instructions.  The student uses equipment safely.  The student documents the investigation in writing and with pictures, but the documentation is incomplete or lacks accuracy. | The student carries out an investigation from the beginning to end, either alone or as an active participant in a group  The student uses equipment safely and appropriately.  The student accurately documents the investigation in writing and with pictures. |

Table 2: Rubric for the assessment of the skill of developing hypotheses

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| **Inquiry skill** | **1** | **2** | **3** |
| **Developing hypotheses** | The student poses a number of questions, but does not make a distinction between questions possible to investigate and questions not possible to investigate. | The student, with the support of others, revises questions so that they become possible to investigate. | The student revises own or others’ questions, so that they become possible to investigate systematically. |

Table 3: Rubric for the assessment of scientific reasoning and forming coherent arguments

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| **Inquiry skill** | **1** | **2** | **3** |
| **Interpreting results and drawing conclusions** | The student draws conclusions, but only uses a limited amount of the results from the investigation.  The student compares the results from the investigation with the hypothesis. | The student draws conclusions, based on the results from the investigation.  The student compares the results from the investigation with the hypothesis. | The student draws conclusions, based on the results from the investigation.  The student relates the conclusions to scientific concepts (or possible models and theories).  The student compares the results from the investigation with the hypothesis.  The student reasons about different interpretations of the results. |
| **Documenting and discussing** | The student documents the investigation with an everyday language and contextual pictures, drawings, etc.  Uses the documentation in discussions around how the investigation was carried out.  Discusses the investigation in an everyday language. | The student documents the investigation with text and pictures and supports the documentation with graphs and tables.  Uses the documentation in discussions around how the investigation was carried out and the results obtained.  Discusses the investigation and results obtained, but combines everyday language with scientific concepts. | The student documents the investigation with text and pictures and supports the documentation with graphs, tables, and appropriate scientific symbols and representations.  Uses the documentation in discussions around all parts of the investigation, including the conclusions drawn and how the investigation might be improved.  Discusses the investigation and results obtained with the use of scientific terminology. |
| **Observation skills** | The student identifies easily observable properties among the objects studied. | The student identifies easily observable properties among the objects studied, as well as less obvious properties.  Uses several different properties to describe an object | The student identifies easily observable properties among the objects studied, as well as less obvious properties.  Uses several different and relevant properties to describe an object.  Makes use of more than one of the senses, and also makes use of appropriate technological aids when observing objects. |