# Electricity

Electric current – lighting up the darkness!

# SAILS inquiry and assessment unit overview

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| --- | --- |
| **Name** | Electricity |
| **Key content/concepts** | * Introduction to conductivity and electric circuits * Simple electric circuit * Conductivity of different materials |
| **Level** | * Lower second level * Upper second level |
| **Inquiry skills assessed** | * Planning investigations * Developing hypotheses * Forming coherent arguments * Working collaboratively |
| **Assessment of scientific reasoning and scientific literacy** | * Scientific reasoning (identifying connections between concepts; choosing components for and electrical circuit) * Scientific literacy (searching for information; using scientific terminology; explaining concepts scientifically) |
| **Assessment methods** | * Classroom dialogue * Teacher observation * Peer-assessment * Self-assessment * Worksheets * Student devised materials (mind maps, documentation of inquiry, drawings of electric circuits) * Other assessment items (post-activity test) |

Table 1: Assessment of individual student’s contributions during a brainstorming activity

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Student name** | **Context – history, everyday life** | | | **Scientific words, meaning** | | | | **Scientific symbols, circuits** | | |
| **Prior knowledge** | **Engagement** | **Creativity** | | **Engagement** | **Prior knowledge** | **Creativity** | | **Engagement** | **Prior knowledge** |
| **Name 1** |  |  |  | |  |  |  | |  |  |
| **Name 2** |  |  |  | |  |  |  | |  |  |
| **Name 3** |  |  |  | |  |  |  | |  |  |

Table 2: Rubric for the assessment of the skill of drawing a mind map

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assessed Skill** | **Emerging** | **Developing** | **Consolidating** | **Extending** |
| **Drawing a mind map** | The student’s mind map is empty or full of words unrelated to the concept of electricity | The student draws a mind map containing only a few words and/or the words are listed with no relation to each other | The student draws a mind map with more than 10 words, both scientific and belonging to everyday language, but the visualisation of relationships and categories is poor | The student draws a mind map with more than 10 words, both scientific and belonging to a common language, with a good visualisation of the relationships and categories |

Table 3: Rubric for the assessment of students’ ability to draw an electric circuit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assessed skill** | **Emerging** | **Developing** | **Consolidating** | **Extending** |
| **Drawing an electric circuit** | The student...  ... chooses a set of adequate objects: a bulb, two wires and a battery but does not draw any pictures | The student...  ... chooses a set of four adequate elements and draws a schematic drawing that is not completely correct | The student...  ... chooses a set of four adequate elements and draws a completely correct schematic drawing of a simple circuit, but does not draw a circuit with additional materials | The student...  ... chooses a set of four adequate elements and draws two schematic drawings completely correctly |

Table 4: Rubric for the assessment of planning investigations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assessed Skill** | **Emerging** | **Developing** | **Consolidating** | **Extending** |
| **Planning investigation of conducting properties of different materials** | The student...  ... lists a limited number of objects made of 1-2 different kinds of materials but does not write the plan at all or the investigation plan is incomplete | The student...  ... lists a limited number of objects made of 1-4 different kinds of materials and the investigation plan is almost correct | The student...  ... lists a limited number of objects made of over 4 different kinds of materials and the investigation plan is almost correct | The student...  ... lists a limited number of objects made of over 4 different kinds of materials and the investigation plan is complete |

In order to assess the skill of searching for information, the following 4-level rubric can be used. The rubric should be utilised to evaluate the work of a number of students, selected prior to the lesson for this particular assessment.

Table 5: Rubric for the assessment of searching for information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assessed Skill** | **Emerging** | **Developing** | **Consolidating** | **Extending** |
| **Searching for information** | The student...  ... finds information from 1-2 sources, but does not pay attention to the independence of the sources; summary is incorrect or incomplete and does not quote the source | The student...  ... finds consistent information from 1-2 sources, but does not pay attention to the independence of the sources; summary is almost correct, but does not quote the source | The student...  ... finds consistent information from at least two substantially different sources; summarises it in 3-4 almost correct sentences, quotes all or almost all sources of information | The student...  ... finds consistent information from at least two substantially different sources; summarises it in 3-4 correct sentences, quotes all sources of information |

Table 6: Self-assessment tool for assessing the skill of working collaboratively

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Self-assessment card** | **0 (not at all)** | **1** | **2** | **3** | **4** | **5** | **6 (very much)** |
| **1.** I was involved in planning the experiment |  |  |  |  |  |  |  |
| **2.** I carried out the given tasks |  |  |  |  |  |  |  |
| **3.** I helped colleagues |  |  |  |  |  |  |  |
| **4.** I was involved in collection of data |  |  |  |  |  |  |  |
| **5.** I was active in performing the experiment |  |  |  |  |  |  |  |
| **6.** I communicated properly with the others |  |  |  |  |  |  |  |

Table 7: Peer-assessment card for the assessment of working collaboratively

|  |  |  |  |
| --- | --- | --- | --- |
| **Peer-assessment card** | **Peer 1** | **Peer 2** | **Peer 3** |
| **1.** Did your colleague take part in planning the experiment? |  |  |  |
| **2.** Did your colleague take part in carrying out the given tasks? |  |  |  |
| **3.** Did your colleague help the group? |  |  |  |
| **4.** Did your colleague engage in data collection? |  |  |  |
| **5.** Did your colleague take part in performing the experiment? |  |  |  |
| **6.** Did your colleague communicate properly in the group? |  |  |  |