# Collision of an egg

Mechanics in motion – what factors affect forces and collisions?

# SAILS inquiry and assessment unit overview

|  |  |
| --- | --- |
| **Name** | Collision of an egg |
| **Key content/concepts** | * Mechanics – force and momentum * Collision of a free falling egg with ground surfaces * Understanding the relationship of egg collisions with daily life situations * Identification of effects on the forces during collision * Designing an experiment – identifying variables, taking measurements |
| **Level** | * Lower second level * Upper second level |
| **Inquiry skills assessed** | * Developing hypotheses * Planning investigations * Working collaboratively |
| **Assessment of scientific reasoning and scientific literacy** | * Scientific reasoning (drawing conclusions, critiquing experimental design) * Scientific literacy (presentation of scientific data, communicating scientifically) |
| **Assessment methods** | * Classroom dialogue * Teacher observation * Peer-assessment * Self-assessment * Student devised materials (experimental plan, graph, documentation of inquiry, recordings, reports) * Presentations |

Table 1: Rubric for the assessment of forming inquiry questions

|  |  |  |  |
| --- | --- | --- | --- |
| **Inquiry skill** | **Level 1** | **Level 2** | **Level 3** |
| **Forming inquiry questions** | The student is not helped by the question, is not able to recognise the connections. | The student recognises the connection between the question and the experiment, but the question does not help. | The student recognises the connection between the question and the experiment and implements the answer systematically. |

Table 2: Rubric for the assessment of developing hypotheses

|  |  |  |  |
| --- | --- | --- | --- |
| **Inquiry skill** | **Level 1** | **Level 2** | **Level 3** |
| **Developing hypotheses** | The student formulates a hypothesis but is unable to explain it. | The student formulates a hypothesis and is able to explain it with the help of questions. | The student explains the hypothesis and supports it with scientific facts. |

Table 3: Rubric for the assessment of planning investigations

|  |  |  |  |
| --- | --- | --- | --- |
| **Inquiry skill** | **Level 1** | **Level 2** | **Level 3** |
| **Planning investigations** | The student makes suggestions on how the experiment should be carried out, but is unable to proceed and does not understand the process. | The student makes suggestions on how the experiment should be carried out and understands the process, but is unable to proceed. | The student makes suggestions on how the experiment should be carried out and understands the process, can proceed with the planning of the experiment. |
| **Implementing the investigation**  **Recording observations** | The student implements the experiment with help from the teacher and writes down observations sporadically. | The student implements the experiment with some help needed occasionally and writes down observations inaccurately. | The student implements the experiment without help and writes down observations accurately. |

Table 4: Rubric for the assessment of scientific reasoning and forming coherent arguments

|  |  |  |  |
| --- | --- | --- | --- |
| **Inquiry skill** | **Level 1** | **Level 2** | **Level 3** |
| **Drawing conclusions** | The student demonstrates the experiment, however uses little observation data to explain the hypothesis. | The student demonstrates the experiment, uses the data collected during the experiment to explain the hypothesis. | The student demonstrates the experiment, uses the data collected during the experiment to explain the hypothesis and explains the reasons behind the observations. |
| **Evaluating the experiment**  **Recognising mistakes** | The student recognises the possible mistakes and determines the credibility of the results. | The student recognises the possible mistakes and determines the credibility of the results.  Identifies own mistakes. | The student recognises the possible mistakes and determines the credibility of the results.  Explains the effects of mistakes on the results. |