# Up there... how is it?

How to live on the International Space Station?

# SAILS inquiry and assessment unit overview

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| **Name** | Up there... how is it? |
| **Key content/concepts** | * Gravity * The study of gravity in the International Space Station * Effect of microgravity on everyday activities * Impact of scientific and technological development in society |
| **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 (choosing appropriate experiment for evaluation; argumentation) |
| **Assessment methods** | * Classroom dialogue * Teacher observation * Worksheets * Student devised materials (investigation report) |

Table 1: Assessment of reasoning skills. Adapted from: Galvão, C., Reis, P., Freire, A. M., & Oliveira, T. (2006). Avaliação de competências em ciências. Porto: Edições ASA.

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| Criteria/Performance levels | Rating |
| ***Formulate questions*** |  |
| Formulates clear and creative questions, related to the topic under study | 4 |
| Formulates uncreative questions, but clear and related to the topic under study | 3 |
| Formulates questions, but with little purpose or relevance to the topic under study | 2 |
| Doesn’t formulate questions | 1 |
| ***Formulate hypotheses*** |  |
| Formulates relevant hypotheses, well-grounded in scientific knowledge | 4 |
| Formulates relevant hypotheses, but with some flaws in scientific knowledge | 3 |
| Formulates weak hypotheses, with little grounding in scientific knowledge | 2 |
| Doesn’t formulate hypotheses | 1 |
| ***Planning an Investigation*** |  |
| Research plan designed is clear, concise and complete | 4 |
| Effective research plan but lacks description of some materials or procedures | 3 |
| Effective research plan but needs reformulation. It doesn’t consider variables or important limitations | 2 |
| Ineffective research plan. Needs major help or it doesn’t present any research plan | 1 |
| ***Present and explain ideas*** |  |
| Presents and explains ideas with scientific accuracy and carries out a well-grounded debate | 4 |
| Participates in the presentation, explains and discusses ideas, but with some scientific in accuracies | 3 |
| Participates in the presentation, but with great difficulty on explaining ideas and with little discussion. Discourse presents scientific inaccuracies | 2 |
| Doesn’t participate in oral presentation | 1 |
| ***Overcoming difficulties*** |  |
| Shows capacity to overcome difficulties individually | 4 |
| Shows capacity to overcome difficulties but sometimes needs help | 3 |
| Seeking to overcome difficulties individually, but needs help | 2 |
| Does not try or does not show capacity to overcome difficulties. In great need of help | 1 |

**Teacher guide for the construction and application of an instrument for formative assessment**

1. Before class
   1. Build an assessment instrument considering that the main focus will be on *planning investigations* and *working collaboratively* (communication skills);
   2. Adapt the task to students and to the context.
2. In class
   1. At the beginning of the process clarify the assessment criteria (in particular those relating to *planning investigations* and *working collaboratively*).
   2. At the end of the process, apply a semantic differential to students for identification of their perceptions related to the assessment process.
3. After class
   1. Assess student artefacts, having regard to the developed instrument and produce written feedback;
   2. Reflect on the assessment process.

Note: Evidence collected can include student artefacts, classroom video recording (optional) or other evidence.