# Oranges

Will they sink or float? What's happening?

# SAILS inquiry and assessment unit overview

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| **Name** | Oranges |
| **Key content/concepts** | * Density * Archimedes principle |
| **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 (recording data and observations) * Scientific literacy (critiquing experimental design) |
| **Assessment methods** | * Classroom dialogue * Teacher observation * Peer-assessment * Self-assessment * Worksheets * Student devised materials * Presentations |

Table 1: Assessment of skills developed in the Oranges SAILS unit

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| **Skill** | **Emerging** | **Developing** | **Crafting** | **Extending** |
| **Developing hypotheses**  **Asking inquiry questions** | The group discuss a number of questions and agrees on one they feel is testable.  E.g. “Does the skin/shape/amount of air in the fruit make it float/sink?” | The group raise a testable question with reasoning from previous science ideas they have encountered.  E.g. “Is it the amount of air that makes the fruit float because this lowers its overall density?” | The group raise a testable question that forms a hypothesis.  E.g. “How does the amount of air in the fruit alter its ability to float?” | The group raise a testable question that forms a hypothesis and explains what results to look for to prove or disprove the hypothesis.  E.g. “Does removing the peel cause it to sink?” relates to the hypothesis that the waxy skin helps the fruit to float. |
| **Planning investigations**  **Testing hypotheses** | The group place the fruit in water and then make a change in the fruit (e.g. squashing it flat or making holes in it) and describe what happens. | The group mark the water level on the fruit or container and then make a change in the fruit (e.g. squashing it flat) and take a second measurement of water level or measure the difference in the way it floats after treatment | The group select one variable to test and take measurements of the water level as they make changes in that variable. | The group attempt to set up a fair test that measures changes in the output variable as they change the input variable. They take at least five readings for each. |
| **Communication** | The group describe what they did to test their idea | The group describe what they set out to test and present their results | The group explain and present their ideas and results and how they tried to be rigorous. | The group explain what they set out to test, present their results and discuss their confidence in their findings. They also suggest improvements for doing their investigation. |