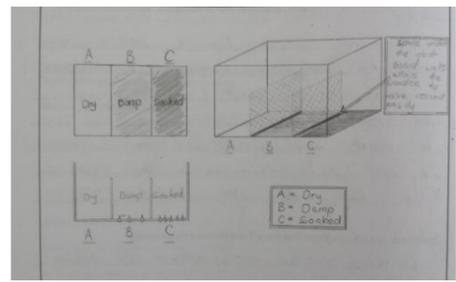
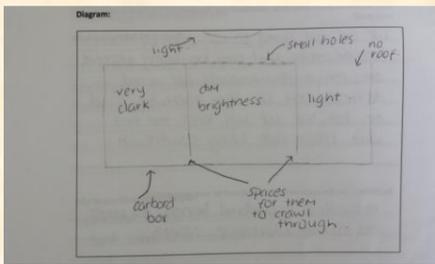


# Assessment of inquiry during a woodlice investigation

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## Designing experiments

### Typical experimental set-ups



### Difficulty distinguishing variables

**Questions to be answered:**  
 What conditions of temperature and humidity do woodlice prefer to inhabit?  
**Predictions:** Use any scientific knowledge you already have, answer the following questions. Try and be as clear as you can in your answers.  
**What do you think will happen?**  
 I think that the woodlice will be drawn to the area where it is most humid and normally they are found in the rotting in heated and moist places.

You have chosen one variable from the 3 suggested earlier. What other variables do you think might be important for woodlice?  
 The material which they are living on is under a very important thing like to live in bark.  
**What do you think will happen?**  
 I will make all the other variables stay the same so the results are most accurate. We will keep the light the same by having a lamp over all the areas. We will keep the materials all the same in each area too.

## Making predictions - Formulating hypotheses

### Student A: A basic approach needing further thought and explanation

Which variable have you decided to investigate?  
Amount of Moisture  
**Formulating your hypothesis:**  
 Now you have decided which variable you would like to investigate, use the space below to explain the question(s) you are trying to answer (or the problem(s) you are trying to solve).  
**Questions to be answered:**  
 → How much moisture do wood lice like?  
 → Do wood lice swim?

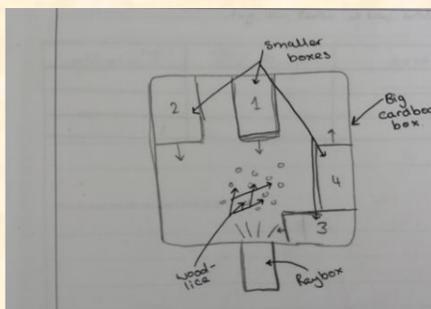
**Predictions:** Use any scientific knowledge you already have, answer the following questions. Try and be as clear as you can in your answers.  
**What do you think will happen?**  
 I think the wood lice will go to the slightly damp piece of wood.  
**Why do you think this will happen?**  
 Because you usually find wood lice in damp rooey wood.

### Student G: More sophisticated hypothesis formulation with detailed explanation

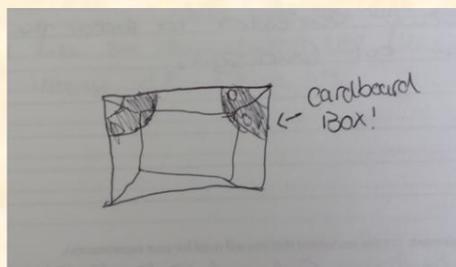
Which variable have you decided to investigate?  
The food preferences of woodlice.  
**Formulating your hypothesis:**  
 Now you have decided which variable you would like to investigate, use the space below to explain the question(s) you are trying to answer (or the problem(s) you are trying to solve).  
**Questions to be answered:**  
 (Author) Out of 4 types of food, which is the one they prefer the most? Out of rotting wood and fresh wood which do they prefer?

**Predictions:** Use any scientific knowledge you already have, answer the following questions. Try and be as clear as you can in your answers.  
**What do you think will happen?** The woodlice will first go for the rotting wood, and maybe the fresh wood, but it would not go for the bark or the (green) rot-aid.  
**Why do you think this will happen?** Woodlice are decomposers so they will like the rotting wood, they might go for the fresh wood because it is now dead because it isn't attached to the tree anymore. They won't go for bark because they are still fresh. As it isn't a corner of the underneath I think the rot-aid will be over looked.

## Written Communication: further clarification required



"The woodlice hotel"



"Unspecified accommodation"

## Introduction

An inquiry-based module on the living conditions of woodlice (activity proposed by SAILS team at Malmo University) was carried out over 5-6 class periods with Irish students aged 15-16. Students were asked to investigate at least one variable that might affect the life of a woodlouse. Assessment of various aspects of inquiry was carried out using written student reports, and during the activities.

### Lesson 1

- Open discussion in small groups
- Previous concepts/knowledge
- Asking testable questions
- Choosing a variable to investigate
- Drawing of experimental setup
- Equipment list
- Woodlice requirements!

### Lessons 2-3

- Report booklets started
- Chamber construction
- Equipment distribution
- Experiments carried out
- Initial results gathered, analysed and presented

### Lessons 4-5

- Repeating experiments
- Re-formulating hypotheses
- Experimental re-design
- Replication
- Drawing conclusions
- Presenting data
- Written communication

## Summary of Findings

Written reports alone were often not indicative of a students progress

- some students are just good at writing reports
- some students may be poor at written communication but excel in experimental design or analysing data

It is necessary to carry out some assessment while the inquiry activity is underway.

It is difficult to collect data on every student.

Assessment problems arise when some students are assessed at the beginning of the inquiry, and others near the end.

It can be difficult to judge the extent to which parroting, aping and transcribing is happening.

The difficulties with the transition from summative to formative: teachers are dependent on quantifiable grades.

There are only a limited number of aspects of inquiry that can be assessed effectively even over 5 class periods.

Many students are unsure of themselves in the absence of instructions on how to carry out the investigation.

### Suitability of the activity for assessment of inquiry

- Applicable to groups of different ages/ levels of ability
- Open-ended, i.e. a variety of solutions is possible
- Students are in control over direction and methods
- Students draw on existing concepts/knowledge
- Activity stimulates curiosity
- Encourages the search for new data
- Students are responsible for analysis/presentation of data

## References:

Harrison, C. (2014): Assessment of Inquiry Skills in the SAILS Project. *Science Education International* Vol. 25, Issue 1, 2014, 112-122.