



TEACHING IDEAS SHARED FROM SAILS TEACHER EDUCATION PROGRAMME

Design and build a 3-D food pyramid



This resource has been developed through the SAILS Teacher Education Programmes (2012-2015) but was not developed as a finalized SAILS Inquiry and Assessment Unit. These materials are shared to inspire further use of inquiry and assessment of inquiry skills in the science classroom.

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Junior Certificate Science Investigations

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Science Investigations – Junior Certificate Biology - Food

Overview

Title:	Design and build a 3D food pyramid	
Target Group:	Junior Certificate Science/ Home Economics	
Time required:	Two full 40 minute lessons, two 10-15 minute periods at end of other lessons Students will work at home/in groups outside of school times if the incentive is good enough!	
Materials required:	One A3 sheet for each team Students provide all other material	
Preparatory Work:	<ol style="list-style-type: none"> 1. The class to be divided into teams 2. Roles within teams are understood 3. Team selects rotation of roles from one investigation to the next 	
Skills to be measured:	<ol style="list-style-type: none"> 1. Teamwork 2. Creativity 3. Planning 4. Problem Solving 	
Links to the Science Curriculum:		
	Main Topic	Sub-topics
	1A1 Food	Contents of a variety of food products as described on their labels Food as a necessary source of energy and as a growth material for the body Constituents of a balanced diet
	<ol style="list-style-type: none"> 1. OB1 recall that a balanced diet has six constituents: carbohydrates (including fibre), fats, proteins, vitamins, minerals and water, each with different functions 2. OB2 describe a food pyramid and give examples of types of food recommended in a balanced diet 	

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Introduction

We begin this project by asking students to read over the Food Pyramid section of the textbook and have two questions prepared before the next lesson. Question preparation allowed for a deeper learning process, as just reading the text may not always mean any information is internalised.

Lesson 1

Design Day

The first lesson commences with the class divided into teams; the teams are then given 2 minutes to decide on roles (leader, scribe and contributors).

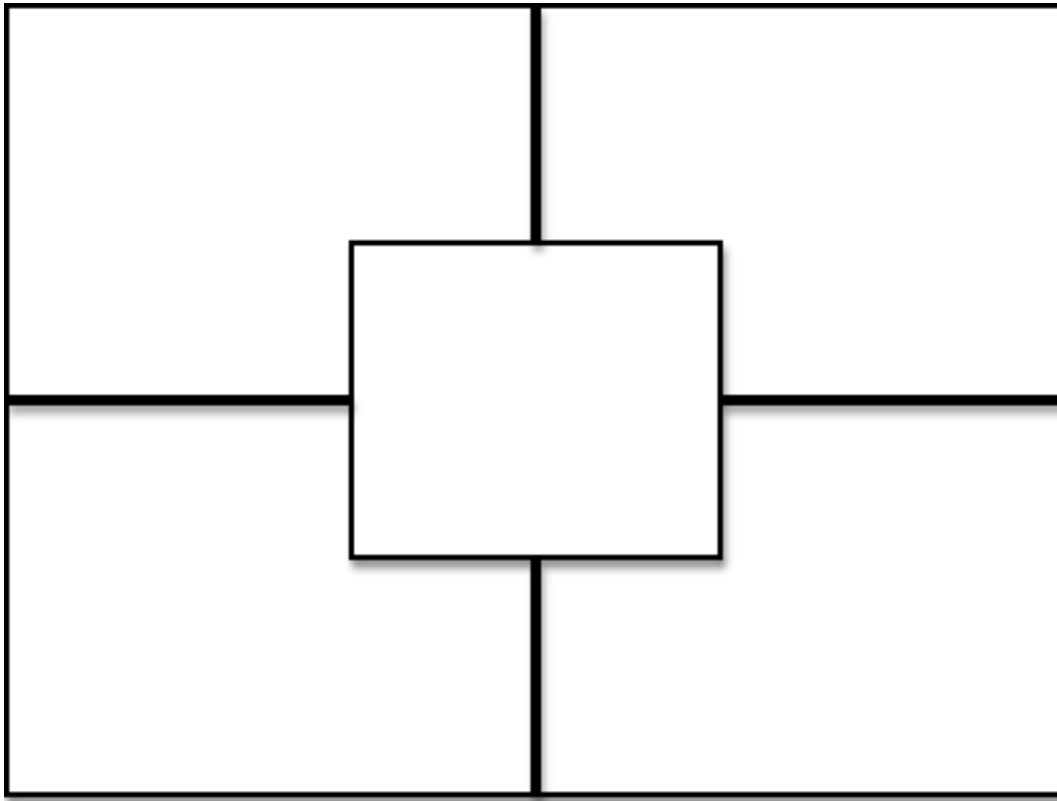
Teams are asked to formulate the 4 x 2 questions from the homework.

Questions are presented to the class, with solutions. Outstanding questions are answered in a discussion session. Time involved: 15 minutes approx.

The task is given: Design and build a 3D Food Pyramid

A rubric is presented to each student.

An A3 sheet is distributed to each team:



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An explanation is given on how to use the A3 sheet:

1. Students name their team
2. Students write their ideas/draw their designs in their own corner of the sheet
3. Leader facilitates a discussion on the results
4. Team agree on what design and course of action required to build the pyramid
5. The final design, the materials required, their procurement, who does what and when are all noted in the centre section of the A3 sheet

The students begin work (approx 20 minutes). This period should only involve students writing in their own corner of the sheet.

Collect the sheets.

Homework is to write out their thoughts on the project, allowing the students to crystallise their individual concept.

End of lesson 1

Interim Lessons

Time the next two lessons to allow 10 minutes free at the end of each.

Distribute the A3 sheets; allow team discussion during both lessons. This allows time for the students to internalise the information and processes involved.

Give plenty of notice of the date and requirements for Lesson 2 to allow students to have work and materials ready.

NOTE: the centre section should not be filled in without agreement within the team.

Lesson 2

Construction day.

This lesson can only be successful if the teams have plenty of room, all of their material and a certain amount of purposeful endeavour. Prepare the conditions by having the teams well spread out, with desks pulled together and chairs placed away from the work area. Noise levels will have to be kept down also, as there may be lessons going on in adjacent classrooms. A steady patrol of the classroom is

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required to ensure that everyone is working. 'Visits' to see what neighbouring teams are doing should be discouraged.

An extension is to have the teams present their work in class, if there is time.

Judging work: using the rubric, announce the results of your findings.

The winner's prize can be anything of the teacher's choosing. Our winners visited their former primary school and presented their work. Two teams liaised with the woodwork teacher and built wooden structures. One now forms a permanent display in the Biology laboratory, the second was presented to the primary school we visited.

Final homework: Write a 300-word (minimum) reflection on your project work and how you felt during the research/design/build process.

Did it work?

A poll was run on www.edmodo.com; the results were:

This was very useful, I learned a lot and enjoyed the project

52.38%, 11 vote(s)

I learned some things about food when I did the project, I liked the project

42.86%, 9 vote(s)

I would prefer to have learned from a book

0 vote(s)

I did not understand what to do, I did not learn much

4.76%, 1 vote(s)

I learned nothing

0 vote(s)

This indicates a vote of confidence in the process from the students.

Our end of term examination, shared across 4 classes in the same year, included a lengthy question on the food pyramid. The question was very well answered by the students of our class. This indicates that the method of learning was as least as effective as that carried out in the other three classes, as all classes are of equal ability.

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Appendix 1

Rubric for 'Design and Build a 3D Food Pyramid' Project

If using % marks, A = 85 -100%, B = 70 – 84%, C = 55 – 69%, D = 40 – 54

	D	C	B	A
Learning outcomes realised	Inaccuracy in the food groups	All food groups accurate	Food groups accurate, events clearly visible	Food groups accurate, events clearly visible, observer is informed at a glance through clever use of images, etc.
Detail	Incomplete detail	All details included in the pyramid	All details included, clearly differentiated	All details included, clearly differentiated, effective & engaging presentation
Reflection	Simple narrative with errors and gaps	Simple narrative	Narrative with concise detail; shows understanding of the process and the subject matter	Narrative with concise detail; shows deep understanding of the process and the subject matter; analyses and synthesises