ACTIVATE YOUR STUDENTS

An inquiry-based learning approach to sustainability

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MIDDLE PRIMARY

curriculum corporation

Contents

Introduction

This series has been designed to help you activate your students and get them involved in their environment.

By nurturing an environmental awareness in our students we encourage the development of lifelong learning through relevant acquisition of skills. By actively investigating environmental issues, students:

- achieve a sense of moral ownership for and pride in the world around them
- build on their own interests and develop their own activities
- question the validity of existing information
- model appropriate methods for gathering data and information and analysing it
- actively seek reinforcement for the skills they develop
- achieve satisfaction for a job well done.

Learning approaches

Learning as it is applied to today's curriculum is progressive and developmental. The tasks become more complex and the knowledge increasingly refined. As students progress through the stages of learning they are seen to be moving towards their desired goals and achievements. The productive opportunities to learn and do that are featured in this series allow students to progress from one level to the next in a continuous, coherent way.

Problem-based learning is a pedagogical approach that involves the whole class of students in planning and establishing their own learning through a unit of their own choosing. The environmental problem is identified through a range of general topics such as ***food and hunger*** or ***sustainable living***. Questions are then used to identify the problem that will be explored and observed, and possible solutions proposed.

For example:

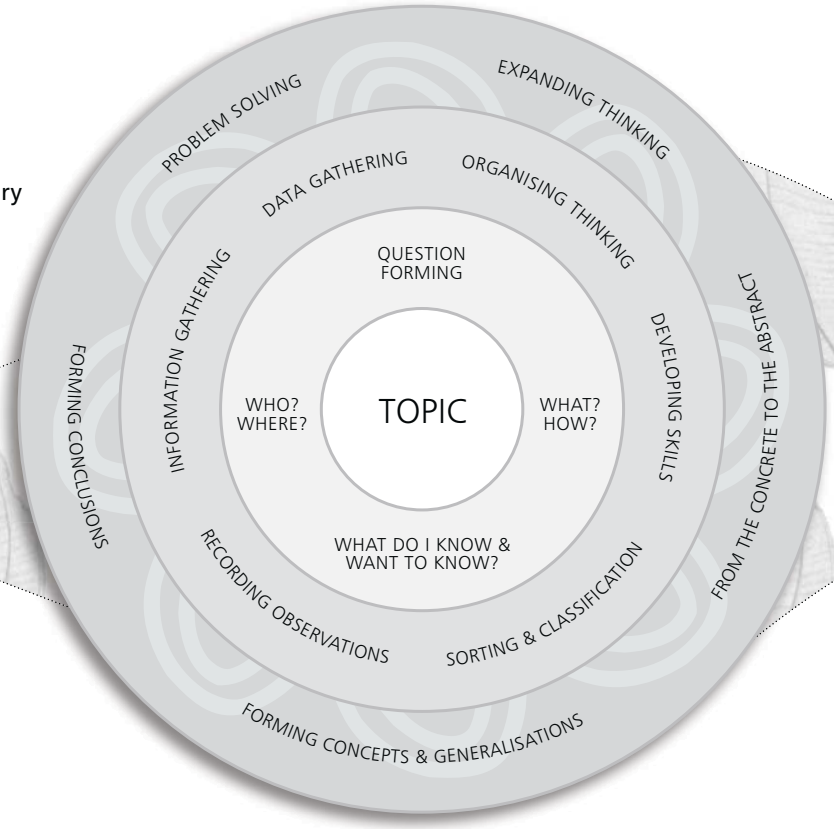
1. Identify an environmental area for study
   Sustainable living within our school.
2. Define a problem to study and observe
   How much food and its packaging is wasted within our school each day?
3. List the objectives for study
   Observe and report on the amount of food and packaging that is thrown in the bin at the end of each lunch period.
4. List the methods for observation
   Counting, listing, weighing, etc.
5. List the materials needed for observation.
6. Suggest possible solutions
   How can we reduce food waste in our school?
7. Present the results of the study
   How will we present our findings to our school and our community?

Inquiry-based learning is a practical approach to learning that involves students forming their own questions about a topic and then exploring their answers. Question-forming is part of the plan; problem-solving is part of the outcome.

Inquiry-based learning encourages ownership and responsibility as students actively search for and construct knowledge and its meaning through a variety of research methods and resources. As part of this process students encounter challenging and conflicting ideas and can begin to transfer what they have learnt to new circumstances.

Like concentric circles, the influence of their environment becomes stronger as children grow and become interested in finding out more – from their immediate focus on themselves, to their homes, their communities and eventually their world.

➢ The ripple effect of inquiry learning



Activate your students

Each book in this series incorporates three units, based on different environmental issues, which have been proposed according to syllabus guidelines and the outcomes of national curriculum profiles. The series recognises that the communication skills of speaking, listening, reading, writing and spelling are fundamental to each learning domain, and should be incorporated into the daily lesson planning of each unit.

The three middle primary units are:

- Communities and food
- Communities and transportation
- Communities and their buildings

These units have been developed as a guide for broader unit planning. By having the basic structure provided, the teacher is then encouraged to build a more detailed and involved unit and carry this over to further thematic units of choice. The suggested inquiry can be used as a whole-class investigation, with students determining their own independent inquiry alongside this model.

Each unit is structured to follow these important steps in problem-based and inquiry-based learning:

Unit One

Communities and food

Teacher planning guide

All children have rights and responsibilities as citizens of the community in which they live. They have the right to be fed, clothed and housed in a safe environment. However, they often don't realise that all living things that share their environmental community also have the right to live freely and safely. How do children develop an awareness of their own role in this community and the world? How do they develop a sense of responsibility for caring for their world now and in the future?

Resource kit

- general collection and observation equipment such as jars and plastic containers
- pots and utensils for cooking and food preparation
- statistics in chart form about nutrition
- statistics about nutrition in third world countries for comparison
- a variety of examples of food packaging
- access to the Internet for statistical searches
- access to computers for research and presentation
- charts containing nutritional information

As the world's population grows there is increasing pressure on our planet's ability to feed everyone. In poorer countries land is cleared of trees and shrubs so that crops can be planted. In these countries there is little conservation of land, water and air. The children of today will need to provide solutions in the future to confront this growing problem. What do today's farming practices mean for the children's own futures?

Quick tips

- Establish meanings for the terms ***populations***, ***communities*** and ***sustainability***.
- Establish the importance of the relationship between feeding ourselves and feeding the world's population.
- Establish the importance of examining by-products of food such as waste and food packaging.
- Demonstrate the proper handling of food in preparation for cooking and the safe use of equipment.
- Beware of students' enthusiasm focussing on the sensation of tasting and eating, instead of the purpose of environmental sustainability.
- Encourage students to think outside their classroom and their local community.
- Encourage the practice of good safety methods for students and for every other living thing around them.

Stimulate

What does the topic of food suggest? A child's interest can be easily stimulated through use of the senses. Give your students a hands-on experience with food while preparing them for more extensive study of food, its sources, supply, surpluses, scarcity, and nutrition.

What food is that?

The object of giving students a hands-on experience of touching, smelling and looking closely at varieties of foods is to pique their natural curiosity and actively engage them in the unit. Class discussion will establish knowledge they already have, let students share their knowledge and establish some things they want to know more about.

1. Purchase a variety of exotic fruits and vegetables – kinds that are not likely to be commonly served at any home-cooked meal. Some examples are artichoke, Jerusalem artichoke, broccolini, coloured cauliflower, baby corn, pitaya or dragon fruit, custard apple, guava, cassava, jackfruit, breadfruit, mangosteen, rambutan and lychee.
2. Pass each whole fruit or vegetable around the classroom and ask if anyone can identify it.
3. Encourage students to look at all parts of each item. What do they see or smell?
4. After all students have seen the whole fruit or vegetable, slice small bits for a taste test.
5. Students with food allergies should not participate in tasting.

What spice is that?

Another activity to stimulate the taste buds is to try different sprinkles of spices.

1. Prepared beforehand buttered slices of bread cut into small cubes.
2. Sprinkle a small amount of a spice such as cinnamon, caraway, mint, cloves, chives, dill, lemongrass, cumin, ginger and paprika over the bread cube. Small amounts of spice will have a pleasant taste without being overpowering.
3. Students can smell the spice first, then taste it, then guess the spice and rate it in taste preference.

Further suggestions

- Potatoes come in many varieties and colours. There are several varieties of sweet potato and at least a dozen varieties of potato including blue ones, pink ones and yellow ones. Compare potato types.
- From a variety of weekly and monthly magazines select luscious, mouth-watering advertising photos of popular foods, especially desserts. Save these photos for comparisons and reports that can be made later in the unit.

See Activities 1.1 (p 15) and 1.2 (p 16)

Nutritional information

Your cereal box also contains nutritional information. Most boxes list that information in quantity per serving and also quantity per 100 grams. For comparison with others in your class you will list the nutritional information on your box as quantity per 100 grams.

DEFINITION:
a kilojoule (kj) is a unit of measure of the amount of energy that food provides to our bodies when we eat it.

- In the chart below, list the nutritional information on your cereal box as quantity per 100 grams.
- Not all cereals will have the same information. You can add additional items in the blank boxes.

Energy	..... kj	Dietary fibre	
Protein		Sodium (salt)	
Fat		Thiamine	
Total Carbohydrates		Riboflavin	
Sugars		Niacin	
Calcium		Iron	

- When you have finished your table, gather in groups of three or four students to compare information. Ask each other questions about the nutritional information.

Example questions:

- *Whose cereal had the highest amount of energy?*
- *Whose cereal had the highest amount of fat?*
- *Whose cereal had the highest amount of sugar?*
- *What conclusion can we make from this?*