

Learning Centre 7

The Planning and implementing an environmental education program should reflect the accumulation of and access to, a comprehensive file of suitable resource material.

At the end of this Learning Centre, students will have—

- 1 become aware of the wide field of resources available in the field of environmental education, to the classroom teacher.
- 2 been stimulated to explore all available and potential resources prior to developing and administering an environmental education program.

A pool of resources has been assembled and placed on reserve in the School of Education Library. As you work through each learning centre you may also find it valuable to refer to the readings and audio-visual information available. This would act as excellent supplementary material that would enable you to pursue an area of interest in greater detail, or even to elaborate upon any issue that is not clear to you.

In order to easily identify relevant information, the materials have been catalogued in the following manner.

- 1 Curriculum information available in package form and also in a wide ranging series of articles dealing with many of the issues relevant to planning an Environmental Education program in a school.
- 2 Membership bodies. Included in the file are newsletters from various associations involved in Environmental Education programs. Students may find membership of some of these bodies valuable in providing information which is topical, relevant, up to date and practical to the classroom situation.
- 3 Alternative information centres which provide a further avenue for relevant information.
- 4 Case study. A comprehensive report has been compiled on the case study carried out at Drysdale Primary School. All students should carefully examine the contents of this report as it will provide a valuable insight into the conduct of an environmental education program in a primary school classroom.
- 5 Audio-visual information—will be available in the form of slides, audio cassettes, video cassettes and film. For example, students should accompany their reading of the case study with a viewing of an interview conducted with the teacher in charge of the program trialled at Drysdale State School.
- 6 Library resources. Apart from the resources listed above, students should consult the library catalogue for relevant texts and journals which are present and which will have valuable information. To assist in this, a list of environment-oriented journals is included in the file.

It is important to note that a Resource file is never complete, but must be an on-going obligation of any teacher. To this end the Resource file will be constantly supplemented with incoming information and students should ensure that they regularly visit the catalogues so as to make use of any further data. Of course adding to the file should be the responsibility of *all* those engaged in studying environmental education—staff and students alike. Students should therefore feel free to inject new material into the file in order that those undertaking the course this year and in future years, can be guaranteed a wide spectrum of ideas and information which will add depth and breadth to the field of study.

Postscript

Remember that the Resource file is a key source of information for all of us and we must accept the responsibility for maintaining it, and, when possible, adding to it.

The curriculum design model in practice: Drysdale Case Study

Prepared for the Course Team by Lindsay Fitzclarence

Background Information

The purpose of this case study is to exemplify how the principles, which we see as underpinning environmental education programs, can find expression in a school program. It is also hoped that this study will clearly demonstrate some of the practical teaching considerations necessary for the successful study of an environmental issue.

This written account is supported by a case study including a number of examples of the children's work, and a videotape which are available from the School of Education Library. The videotape contains an interview with the teacher concerned and also contains examples of some of the actual teaching activities.

School: Drysdale State School
Teacher: Mr. P. Payne
Grade: 3
Time: August/December 1978

The following should be read in conjunction with the videotape and the earlier parts of this study guide.

stage 1 Issue identification

- 1.1 The discussion of the meaning of 'environment' took 30-40 minutes during which time as many children as possible were asked to expound their views and share stories.
- 1.2 The delimitation of the local area included the Drysdale/Clifton Springs area, despite the fact that three or four children lived outside these boundaries. This then became the local environment (and therefore the scene of the study). The time span for discussion was the first 7 months of the school year.
- 1.3 The children were then asked to write about events of interest which had occurred in the local environment during the past year. These events were to be classified under the headings of 'Bad Changes', 'Good Changes' with a third category of possible Future Changes. It should be noted that this last task proved to be very demanding for most of the children and very few included suggestions as to a future change. The reason for this would seem to be that this abstract concept (future change) is beyond the intellectual capabilities of most children of this age.

A summary of the children's ideas

Bad changes

- increasing litter in the school
- increasing litter on the beach
- increasing number of houses being built and taking up available open space (14 mentions) *
- shops being built and taking up available open space
- the building of a new boat ramp creating a dirty and muddy area (3 mentions)

* The most likely reason for this large number of references to using up of available open space would seem to be that the class had discussed this matter in the previous week.

- cutting down local trees
- building of a new 'sewerage drain' at the beach
- scallop boats dropping seaweed near the beach
- air pollution increasing with more cars



An example of open land
for sale

Good changes

- school gates built
- the extension of the area of the schoolyard (3 mentions)
- trees and flowers growing in homes
- the development of playground areas (4 mentions)
- new houses being built which bring along new friends
- the building of new school toilets (3 mentions)
- the mobile library coming to Drysdale
- the opening up of a swimming pool

1.4 A general class discussion provided opportunity for individual children to provide other class members with a basic knowledge of their chosen issues. Following the class discussion the teacher attempted to focus the children's attention on the issues which contained more scope for detailed examination, 3 'good' and 3 'bad' changes were identified for closer scrutiny.

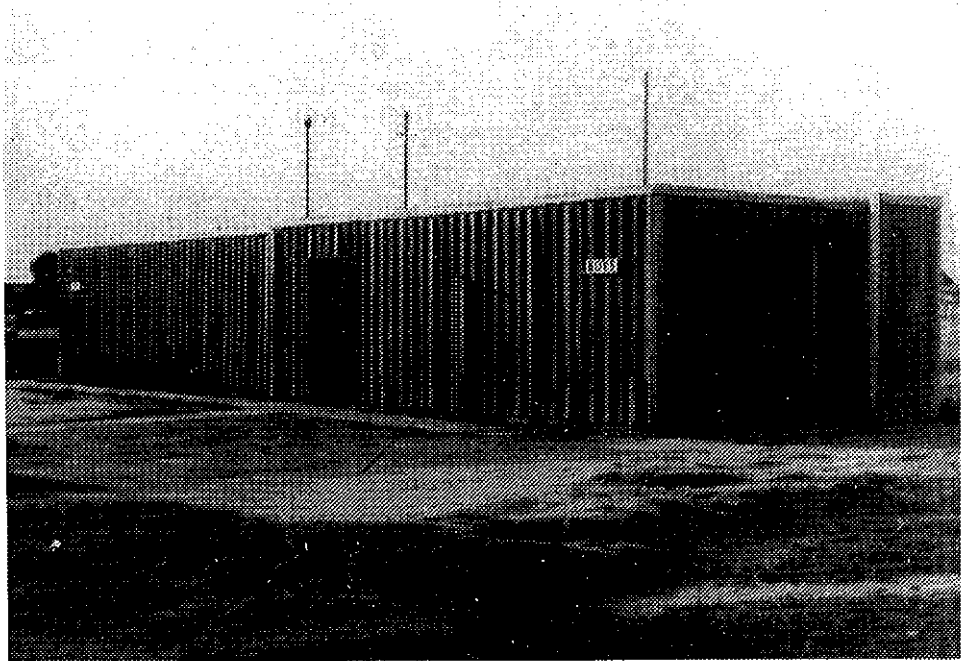
The *good changes* included:

- the building of new school toilets,
- the opening up of a swimming pool,
- the development of playground areas.

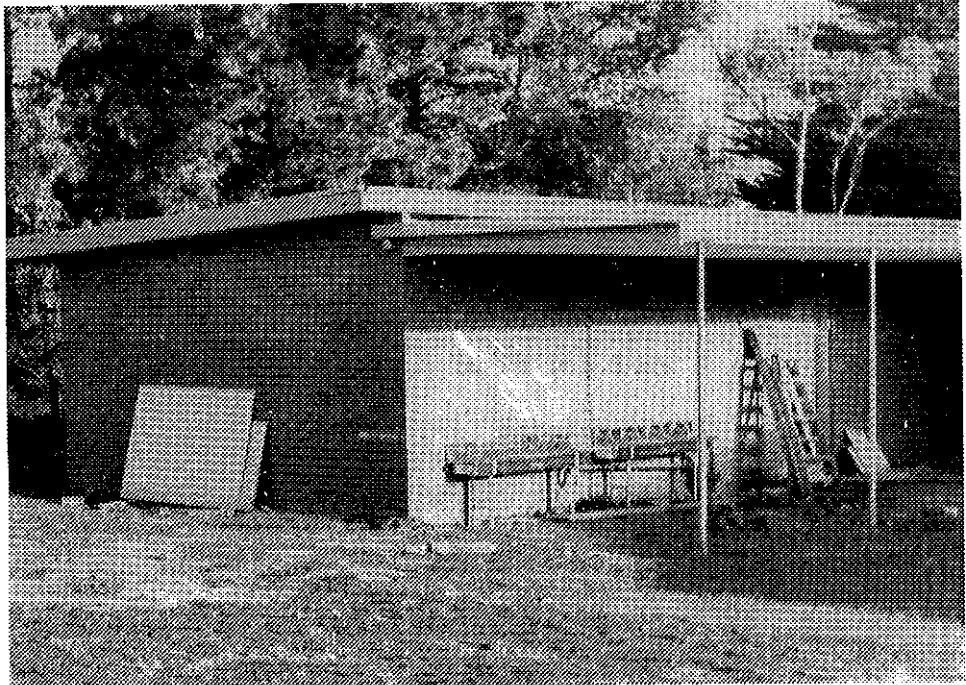
The *bad changes* included:

- the increasing number of houses being built and taking up available open space,
- the building of a new boat ramp which created a dirty and muddy area,
- the building of a new 'sewerage drain' at the beach.

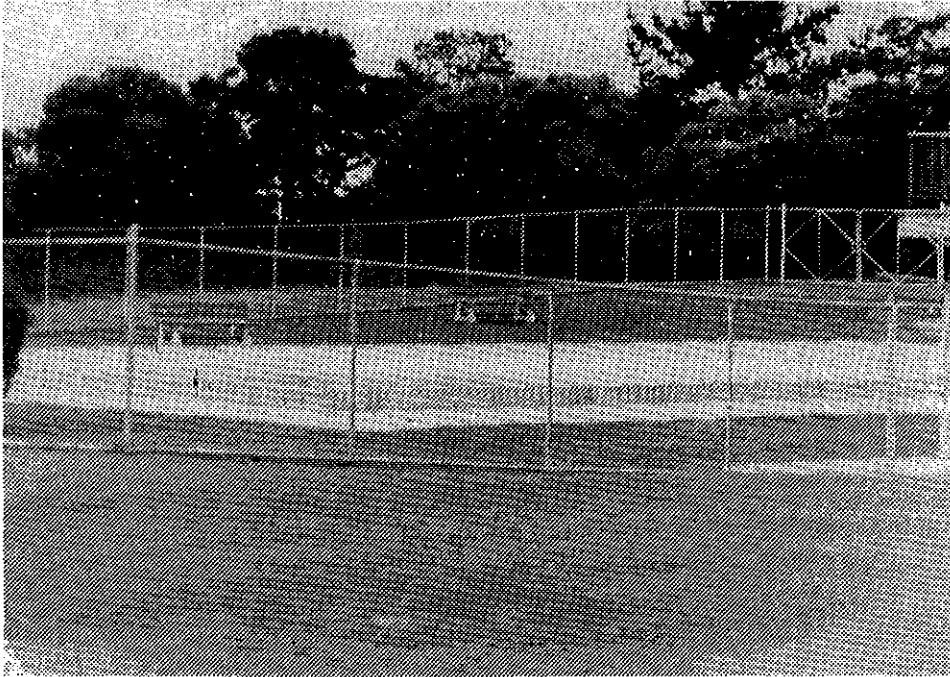
The old Drysdale School toilets



The new Drysdale School toilets



The swimming pool at the Community Centre

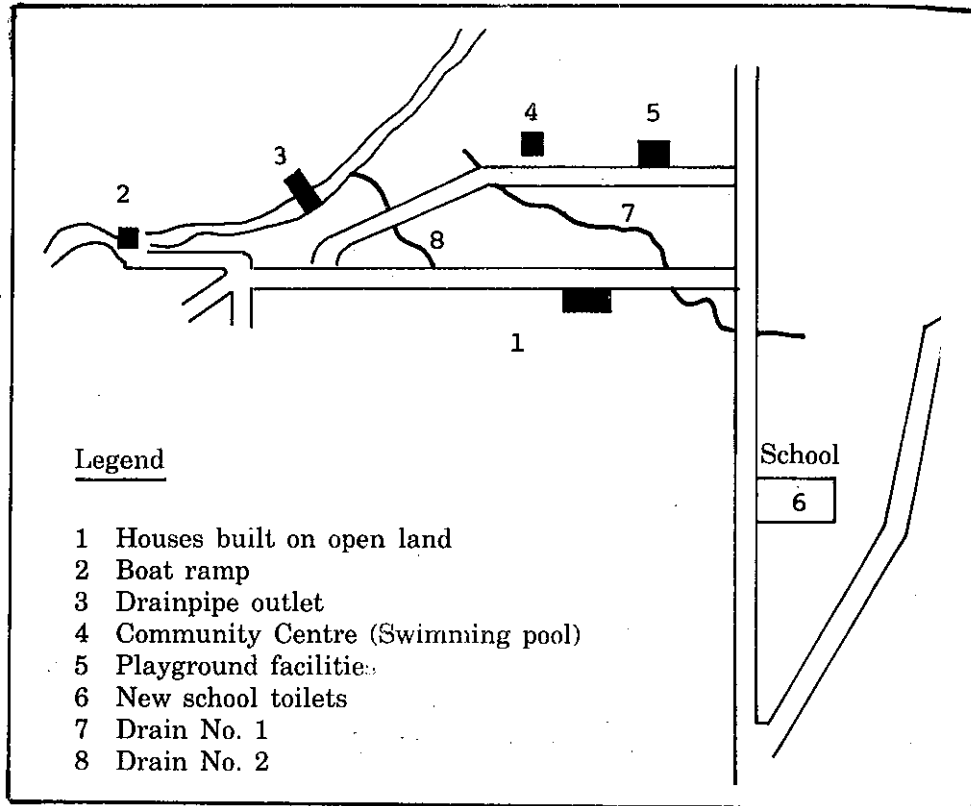


- 1.5 This step was taken in the form of an excursion whereby each area mentioned in the short list of good and bad changes was visited. Preparation for this excursion included gaining permission of the School Principal, enlisting the help of two parents to join the group on excursion day and preparing a detailed handout for each child to use prior to and on the day. The preparation of the handout (details are provided in Appendix 1) involved Mr. Payne in a personal visit to all the proposed sites of examination and in three instances to enlist the assistance of local people to talk to the children about a particular area. Two of these people spoke to the children at the actual site on excursion day, while the third visited the school beforehand.

The actual excursion took a total of 4 hours in which time the class walked approximately 4 miles and visited 4 different sites, including, the boat ramp, drainpipe outlet, golf course/Community Centre, vacant blocks of land yet to be built upon.

- 1.6 On the day following the excursion the class discussed the different areas under examination and wrote a short story concerning their impression of what they had seen.

During the discussion the teacher posed several questions which endeavoured to throw some light on the issues which appeared to provide the most scope for an indepth study. This was an important teaching consideration as it was obvious that some issues which had intrinsic appeal for the children (e.g. the swimming pool at the Community Centre) lacked sufficient support information for a detailed study. Following all discussion, one issue was selected, by popular agreement, for an indepth study. The issue chosen was that of the 'Sewerage Outlet' at the local beach.



Drysdale/Clifton Springs environmental education excursions

1.7 The children were asked to discuss the issue with their parents in preparation for the commencement of the study.

During the day prior to this commencement time, the teacher prepared a visual display of photographs of the area concerned. These photos had been taken on the day of the excursion.

The drainpipe outlet



1.8 In order to brainstorm the issue in an effective manner, certain ground rules for the activity were explained. The following format was applied:

- 1 The children were to think of as many questions as they could about the issue in 15 to 20 minutes
- 2 Quantity rather than quality was stressed. Therefore,
 - Anything goes
 - All questions to be recorded
 - No one can laugh at another person's questions
- 3 The children were to think of ideas and possible solutions to problems

Thus the class was divided into four groups and a recorder for each was appointed. The basic idea for this work period was for each group to determine means of finding out as much as possible about the Sewerage Outlet.

At the completion of the work time (25 minutes) each group reported their findings and ideas to the rest of the grade. It should be noted that the role of the teacher during this time was one of resource or assistant, rather than leader.

The information gained from each group was written on the chalkboard in either question or solution form. That is the children in their own way had looked at the problem in terms of vital questions to be asked about the central issue *and* in some cases possible means of finding out answers to these questions. Included below is the composite list of ideas drawn from this brainstorming session.

Questions asked about the 'Sewerage Outlet'

- 1 Where do the drain pipes come from?
- 2 Why have pipes leading into Corio Bay?
- 3 How do the drains get polluted?
- 4 Are the drains carrying polluted water?
- 5 Are the gutters causing pollution?
- 6 Where is the polluted water coming from?
- 7 Does the water contain sewerage?
- 8 Is it sewerage?
- 9 Does sewerage damage things?
- 10 How did the rubbish (tyres etc.) get into the drains?
- 11 Why was rubbish allowed to be put in to the drains?
- 12 Is water pressure causing foam in the water?

Possible experiments which might help answer the questions

- 1 Filter some water.
- 2 Look at some water in a cup.
- 3 Investigate some water by looking at it through a microscope.
- 4 Water a plant with some of the water.
- 5 Compare clean and dirty water.
- 6 Put a fish in some of the water.



The drainpipe outlet

It should be noted that the teacher helped the children in the phrasing of some of their questions and experiment ideas, however the ideas were mainly the initiative of the children.

Stage 2 Activity pool

The composite list of questions and possible experiments provided the framework for the detailed study. The teacher arranged a number of activities in a sequential order which would set about providing answers to the different questions. Thus the following activities were planned.

- i Scope for discussion and analysis of program direction.
- ii A second excursion.
- iii The provision of a stock of books/articles and 16mm film on the topic of water pollution.
- iv A visit to the local Council offices.
- v A series of experiments evolved from the children's ideas in the brainstorming session.

Stage 3 The program

Aim: The determination of causes and effects of water pollution in the open drainage system of the Drysdale/Clifton Springs area.

Selected activities	Objectives	E. E. principles						
		1	2	3	4	5	6	7
1 Discussion of the direction of the program		.				.		
2 Excursion 2	Environmental awareness		
3 Follow up class work from Excursion 2	Environmental knowledge and skills	.	.				.	
4 Classroom experiments	Environmental knowledge and skills
5 Program conclusion	Decision making ability	.					.	

Activity checklist

Activity 1

This included a review of what had happened to this point and a look at further directions of the program.

Activity 2

Excursion 2 The aim of this excursion was to attempt to determine the sources of the water coming from the 'sewerage drainpipe'. At this stage the children had no idea of the source.

The excursion was conducted during an afternoon (2 3/4 hour period) with the assistance of one parent. One problem which is worth noting here is that the distance covered was approximately 4 miles which proved too difficult for most children (given the time available) and resulted in a late return to school.

As it was not possible to follow the actual drain at the centre of the issue (it was part of an underground system) the teacher determined that the class should follow 2 similar drainage systems (Drain 1 and Drain 2) that also terminated at the beach. This would allow the children to study water which was from basically the same source. Thus this was a form of a 'simulation activity'. Refer to the map of Drysdale/Clifton Springs area on page 114.

As was the case with the first excursion, the children had an investigation sheet to fill in during the activity. The preparation of the investigation sheet had necessitated the teacher in pre-visiting the excursion site in order to plan for specific points of observation. Details of this worksheet are included in Appendix 3.

Specific details of the excursion

Several points of interest arose during the excursion, including a litter collection from one of the drains and a lengthy discussion of how water flowed from the houses into the gutters then into the drains. Some children observed the fact that many houses did not appear to have drainpipes leading directly to the gutters, and therefore posed the question, 'Where does the water from these houses go?'. This led to a discussion on seepage and water finding the lowest level.

A final point of interest to come from this excursion involved a walk to the termination point of one of the drains, during which time the children walked through long grass on a Council easement. All the leaders were very much aware of the danger of snakes during this period, which points to the need for care to be taken during activities like this.

Activity 3

This was a follow-up to the excursion and included the completion of the excursion sheets and the drafting of a letter to the council. The letter was an outgrowth of the children's concern at the dumping of rubbish in the drains and their desire to have something done about it. Accordingly part of the excursion included a clean up of the area. Through class discussion the suggestion of a letter to the Council provided a solution to the children's need to express dissatisfaction with the rubbish situation.

In the excursion follow-up the teacher made a display of photographs taken during the walk and also read some stories on water pollution. These stories were from books in the school library, and included—

Exploring Ecology

Conserving the earth's resources.

The how and why wonder book of ecology.

The pond that turned into a puddle.

Pollution.

Conservation.

The whump world.

Activity 4

This was the stage in the program where the various experiments, thought up in the Brainstorming Session, were conducted.

The teacher ordered the sequence of activities to create a smoothness of flow through the experiments. However it should be noted that this was a flexible arrangement due to the initial uncertainty of the outcomes of the different experiments and the desire to allow the children to follow up any particular areas of interest. Subsequently several experiments were organised almost entirely by the children because of a desire to see 'what would happen'. One such example is the experiment of watering two plants, one with tap water and the other with drain water. The children took full responsibility for this experiment including the arranging for monitor lists for the watering and measuring of the plants. (See Experiment 5 in Appendix 4). This stage of the program took several weeks.

Experiment 1 and 2

The children examined samples of the drain water by looking and smelling it, and comparing the sensory responses to those associated with clean tap water.

Experiment 3

In this experiment the children compared samples of the drain water with some dirty water (made by the teacher). This water had dirt mixed in and looked similar to the drain water. After this, the different samples were given time to settle with the mixture eventually clearing when the dirt settled at the bottom and the drain water remaining discoloured. Discussion as to what might cause this discolouration then followed.

Experiment 4

In order to determine exactly what was in the drain water the children (under the teacher's direction) decided to cause a sample to fully evaporate. This was done by natural evaporation in the classroom.

Experiment 5

This was an ongoing project which took 3 weeks to complete, and involved a comparison of growth rates of two plants. The first plant was watered with only drain water, while the second plant was watered with tap water. With the teacher's help the children set up experimental controls including using equal amounts of water and rotating the plant's position each day so as to provide equal light conditions. This experiment proved to be of special interest to the children and was an obvious avenue for further investigation.

Experiment 6

In this experiment a goldfish was purchased for close examination. Initially the fish was placed in a bowl of tap water during which time the children studied its swimming and breathing patterns. The children then discussed their observations. Following this the fish was removed from the tap water and placed in a bowl of drain water. During this stage the children watched the fish to try to observe any differences in its swimming and breathing. After a short observation period the fish was returned to the clear water. A discussion on the characteristics of fish followed and it was obvious that this topic also provided an avenue for investigations of other water creatures and the effects of different water on physical functioning.

Experiment 7

In this case the children poured some drain water through a filter and attempted to determine if this process made the water cleaner. In retrospect this experiment should have come earlier in the sequence and been linked with the work done on evaporating a sample of drain water.

Experiment 8

The aim of this experiment was to help clarify, in the children's minds, what forms of matter were going into the drain water. Thus the children set out to duplicate water of the type found in the drain. It should be noted that the teacher needed to stress that children concentrate on the inclusion of only substances which they thought might be in the drain water.

Due to the 'messy nature' of this exercise, it was conducted outside the classroom in the School's art/craft wet area.

Experiment 9

This was an unscheduled exercise, but undoubtedly one of the significant teaching/learning moments in the program. Following the production of simulated drain water, the teacher posed the question, 'What will we do with the water we have made?' The initial reaction of some children was that the water should be poured into the school drainage system, however several other children were quick to react to this idea, pointing out that this would only contribute to the dirty water in the drains. An alternative suggestion was then put forward as a possible solution. This was an outgrowth of Experiment 4 and involved allowing the water to evaporate and then burning the residue. Thus with the teacher's help the water was put on the roof of the school in order to assist in the evaporation process.

Throughout the period of experimentation, time was allowed for prior and follow-up discussion. During several of these discussions the problem of seepage was identified as a major problem. This particular aspect of the issue would have been assisted in the excursion stage by a visit from a Council Officer, who might have been able to help clarify exactly where the drain water was coming from.

Conclusion and resulting action

Throughout the experiment in Stage 3, the children kept a workbook which was designed to tie together the work and to help formulate some conclusions aimed at answering the central questions relating to the causes and effects of localised water pollution. The workbook also allowed each child to express how he/she felt about the issue at the concluding stage of the study.

The final stage of the program involved posing the question, 'What can we do about the polluted drain water?' With assistance from the teacher, the children wrote letters to the local Council and to the local Member of Parliament. The letters included details of the study and asked for some action to be taken. The teacher selected one of the children's letters for passing on to the Council and the Member of Parliament.

Several weeks after the letter was sent, the teacher received notice from the Council that signs prohibiting the dumping of rubbish had been placed alongside the drains. The final response to the letters came in the form of a visit from the Minister of Conservation on a follow up to a letter passed on by the local Member of Parliament. A copy of a newspaper article highlighting the visit and a letter written by the Minister are included in Appendix 6.



Teachers's comments

This program was initially discussed and then implemented to satisfy a desire to promote a more meaningful and relevant approach to education. The three domains of Cognitive, Affective and to a lesser extent Psycho-Motor were broadened and developed most advantageously. Having completed a pilot study for ECT313 Environmental Education, a number of observations should be considered.

Environmental education possesses a great deal of interdisciplinary potential. Development into other subject areas was carried out only to a limited extent because of a number of constraints beyond my control. For example, following the August vacation, I had only half a day's contact with Grade 3 as the grade teacher returned from long service leave. This greatly reduced available time for relevant follow up and proved particularly frustrating because of the many potential interesting topics which arose out of the work. Undoubtedly children were highly motivated and improvements in the quality of output in the following area was evident.

- 1 Communication skills—written and oral expression including sentence structure, punctuation and vocabulary improved during the period of the program;*
- 2 Attitudes—at the end of the program, most children had developed a positive attitude to a major problem confronting all societies, namely water pollution. Feedback from important figures resulted in an elevation of the children's self esteem and a recognition of the weight children's voices can carry. The fact that public recognition was centred on one particular individual could justifiably be criticised, but should not detract from the rewards experienced by all children.*
- 3 Thinking skills—the development of the children's powers of comprehension, interpretation, analysis and synthesis of ideas all improved.*

The program proved a beneficial learning experience for me personally. Aspects of the program have illuminated some areas of the teaching/learning process. For example, I am now more aware that concepts can be developed by learning through direct experience and that in some cases this is a more gradual process than I had anticipated. This was especially the case with Experiments 2 and 8. I also feel that there has to be a familiarisation time between teacher and students before embarking on such a program. An improvement in the harmony of thought between children and teacher proved to be a contributing factor to the success of the program. This had been anticipated prior to the actual start of the program and was subsequently proven to be important.

In conclusion, the program and its interdisciplinary potential proved so successful and enjoyable that time has been allocated for environmental education during 1979. In addition, because of the advantage offered to a child's learning experiences arising from an inter-disciplinary approach to education, I will be endeavouring to include thematic teaching in other general studies areas.

*Phil Payne
Grade 3 teacher
Drysdale Primary School*

Worksheets for Excursion 1

NAME:

INVESTIGATION

INVESTIGATE—means to think about something and come up with some answers.

We have chosen 3 good and 3 bad changes in our area in the last year. Now we are going to investigate them and see why they are good and why they are bad.

However, there are certain rules which we have to follow:

- 1 Work with a partner. Keep your eye on your partner. Work answers out together.
- 2 Remember the rules of the road. Act sensibly.
- 3 Keep together. Please don't run off.

If there is not enough room to answer questions, use the back of this page. Write neatly so that you will be able to read your notes when we get back. Rest your sheets on your folder.

You will need—your lunch, a pencil,
a drink, these sheets,
strong legs, and a head (also a brain)
your folder,

BAD CHANGES—

(1) MORE HOUSES

POINTS TO CONSIDER—

- 1 Gutters have been made. However, there are flatter sections about every 25 metres. Why have they made these parts of the gutter flatter?
- 2 There are no footpaths. In the section of grass in the middle of the road trees are growing. Think of a reason why there are no footpaths like in Geelong. Why grow trees in the middle of the road?
- 3 Have you seen many 'For Sale' signs on vacant blocks of land?
- 4 Why are there signs like 'Bellarine Fencing'?
- 5 How many houses have you seen that are being built?
- 6 Imagine you return to Drysdale in 20 years. Write a few sentences about what you think it will be like. (Use back of page.)

POINTS TO CONSIDER—

- 1 What are some of the things you can do in this area?
- 2 How often do you and your family come and use this playground?
- 3 Do you think there should be more playgrounds?
- 4 Do you know if other people use this playground?
- 5 What would you like more? More playgrounds or more open space to play in? Why?
- 6 Why has this playground been built if there is still plenty of space around Drysdale to play in?
- 7 Do children need playgrounds? Why?
- 8 How does this area make you feel? Good, happy, sad—Explain your answer.
- 9 Why do you think this has been a good change?

GOOD CHANGES—

(2) SWIMMING POOL

POINTS TO CONSIDER—

- 1 How much do you use the pool?
- 2 How do you use it?
- 3 Why was it built?
- 4 What other people use it? Do they use it much?
- 5 The swimming pool is only about 150 metres from the sea. Why can't you swim in the sea water? Why have a swimming pool?
- 6 Do you like this area? Is it pretty or ugly?
- 7 Has the pool helped you, your family, your friends? How?

GOOD CHANGES—

(3) NEW SCHOOL TOILETS

POINTS TO CONSIDER—

- 1 We already have toilets. Why build new ones?
- 2 What is wrong with the old toilets?
- 3 What grades should be closest to the toilets?
Are they?
- 4 Do you think we should have new toilets?
- 5 Are more children going to use them?
- 6 Did you like going to the old toilets?

BAD CHANGES—

(2) BOAT RAMP

POINTS TO CONSIDER—

- 1 Look around you—smell, listen and look. How do you feel about this area?

- 2 Make a list of the things you think are
pretty—

ugly—

- 3 Make a list of things you see and smell along the beach next to the boat
ramp.
See—

Smell—

- 4 Why is the boat ramp being fixed?

- 5 Have you seen many houses with boats parked close by?

- 6 The seaweed near the boat ramp—how did it get there?

- 7 What are the large mounds of dirt in the area going to be used for?

- 8 Do you know if this area gets used much by people?

- 9 Would you like to have your own boat?

POINTS TO CONSIDER—

- 1 How many pipes can you see that have sewerage running out of them?
- 2 Is this sewerage or is it something else? Is it clean? Does it smell?
- 3 What do you notice in the drains along the side of the road? Is it clean? What is it?
- 4 Where do the small and large pipes come from? What goes into them?
- 5 Have a quick look along the beach where the large pipe empties. Is the sand clean?

Are there any birds?

What things do you notice?

What would live there?

Anything else?
- 6 Is the metal pipe still used? What was it used for?
- 7 What beautiful things do you see around here? What ugly things do you see?

PLAYGROUNDS

Kathryn E. P

I think the playground is a good change because the children can come and play. My family sometimes come to play there I reckon there should be more playgrounds because the children need to play. There is lots of room for the playgrounds why dont they build them? Lots of people use the playgrounds. It would ~~make~~ me feel happy if they had more playgrounds.

SWIMMING POOL

NAME JULIE CRINE

The Swimming Pool is a good change because in Summer it is hot. We dont want to go to the boat ramp and swim in seaweed and pollution water. I think the pool is better because even the poor fish die at the boat ramp and what would we have to eat? The pool helped me, my family, and my ~~fr~~ ~~fr~~ friends how to swim. You cannot swim in the sea because

Sewerage. Outlet.

Name Andrew Darby.

One Monday at 9:30 our grade went on a investigation to three bad changes and three Good Changes and we went to the boat Ramp there was Sewerage was going into the beach and polluting the water the fish were dying and poisoning the fish and when you get fish and chips you should look out for poisoning fish and when you can die when

some people can get a fever and die some people can eat it and die when you get fish at the boat ramp and can a fish can die and get poisoning.

Worksheets for Excursion 2

NAME:

INVESTIGATION

The idea of this second excursion is—

- 1 to collect water so that we may conduct some experiments with it. The experiments might tell us about the quality of the water.
- 2 to work out where the water coming out of the pipe comes from.

Things to Look at:

- 1 Bridge on road
Where does the water in the gutter come from?
Describe the water (clean, dirty, smelly)
Where do you think it goes to?
- 2 Gutter number 1
Is the water flowing? How fast? Is there much?
Is it clean?

Follow the gutter up a little way—

- (1) Make a list of rubbish you see in or close to the water.
How did it get there?
- (2) How does water get into the gutter?
Why have 2 pipes under the road?
Where does the gutter go to?
- (3) Gutter number 2 describe the water.
Where does it go to?
Where does it come from?
Is it the drain pipe near the boat ramp that we are worried about?
- (4) Drain Pipe
Describe the water (clean, dirty).
Is there much water?
How do you feel about the area now?
If the 2 other gutters are emptying into the bay further around the bay, where is this water coming from?
Do things grow very well in this area?
Do you notice any changes?

Samples of Class Experiments

EXPERIMENT NO. 5

GROWTH RATES OF 2 PLANTS

One plant is to be watered with tap water. The other plant with drain water. We will have to use equal amounts of water so that we don't cheat.

On this sheet we will record heights each day and any change in the appearance of the plants. The idea is to compare the effect of the two types of water on the growth and appearance of the plants.

DATE	HEIGHT OF PLANT		COMMENTS (appearance, color, growth)
	TAP	DRAIN	
23/10			

NAME:
EXPERIMENT NO. 6

While visiting the boat ramp area we have noticed a couple of dead fish. This experiment is not to see if the drain water will kill the fish but to see its reaction (how it acts) when put in the water. However, we have to note how it acts in tap water to start with.

Part 1: Description of movement etc. in tap water.

Part 2: Description of reaction when placed in drain water for a few



NAME:
EXPERIMENT NO. 8

MAKING OUR OWN POLLUTED WATER

In this experiment we are trying to make water exactly like the drain water. It must (1) have the same appearance, (2) have the same smell

However, if we are going to make it the same as what we think the drain water is we will have to put only those things in the water that we think are in the drain water.

In the space below we will make a list of things we put in the water. We will also write down how much we put in.

INGREDIENTS	QUANTITY
1 Tap Water	about 1 litre
2	
3	
4	
5	
6	
7	

NAME:

We have completed a number of experiments. An experiment should tell us something. We carried out the experiments to see if the water really was polluted.

Experiment 1—Looking at the water
Did it look polluted?

Experiment 2—Smelling the water
Did it smell polluted?

Experiment 3—Mixing dirt and water
Did this experiment tell us that the drain water had more than just dirt and water? How?

Experiment 4—Goldfish
How did the fish act? Why?

Experiment 5—Evaporation Comparison
What was left in the drain water and clean water dishes after the water evaporated?

Experiment 6—Plants
What happened to the 2 plants?

Experiment 7—Filtering the water
What was left on the tissue paper?

Experiment 8—Making polluted water
Were lots of things needed to make polluted water?

DO YOU THINK THE DRAIN WATER IS POLLUTED WATER?

DO YOU THINK THE DRAIN WATER WILL DAMAGE OUR ENVIRONMENT AND LIVES?

DOES THE DRAINPIPE WORRY YOU?

WHY?

EXPLAIN HOW THE WATER IN THE DRAIN BECAME POLLUTED.

IF NOTHING IS DONE ABOUT THE DRAINPIPE WHAT DO YOU THINK WILL HAPPEN IN THE NEXT FEW YEARS?

WHAT CAN WE DO?

Drysdale P.S.
Springs Rd.
Drysdale 3222
4/12/1978

Dear Mr Cude,
Can you help us
we need a treatment plant at
Clifton Springs area. Because
it is killed fish and we have
been doing experiment for five
month now we need a treatment
plant there. We hope you can put
one there. We have been studying
the bay and we have watering
plant and they died. We thank
at it is polluted.

Your sines Andrew Darby

Drysdale Primary S.
Springs Rd.
Drysdale, 3222.
4/12/78.

Dear Mr. Gude,

The reason
I am writing this letter
is because we want all the
polluted rays clean because
Geelong has got big pipes
and it runs into the rivers
then their are pipes that
treatment plants water. When
we went on our excursions
and we have been doing the
experiment for five months.

Dear Mr. Gude,

The reason why I
am writing this letter because my
grade has had excursions for
five months. The grade and Mr
Payne are trying hard to stop pollution
The grade is wondering if you and
your friends can make a treatment
plant for Drysdale and Clifton Spring.
The grade will raise money
to help. Some people in the grade
thing is not pollution
Your Sincerely Lisa Jagard

ern



SCHOOL
ADDRESS
TELEPHONE

Drysdale PS.
Springs Rd
Drysdale 3222

Dear Mr Gude,

The reason why we are writing this letter is to help clean the Cotter Bay. We are worried about the pollution. The class has been doing a lot of experiments to find out if the water is polluted. We have been on a lot of excursions to the boat ramp and we have collected some dirty water. Our teacher has brought two plants exactly the same in height. We have watered one plant with drain water and another one with tap water. The tap water plant has grown much faster and healthier than

the drain water plant. We did another experiment with a fish. We put the fish in some clean water. He liked it and then we put him in some drain water. He did not like it so we took him out. At the boat ramp, the same thing has been happening because fish have been dying because of the pollution and floating into land. When the class collected some water from the drain we all smelt it. I thought it smelt like very very bad eggs. When we did an experiment with dirt and water it was nothing like the drain water. When we did one filtering the drain water on a tissue paper we

poired the drain water on it about four times and on the tissue was a very very sooty mark. An other experiment we did was to evaporate some drain water on one dish and put tap water in an other dish. We wait until it was all dried up and then we looked at them. On the drain water dish there was a brown mark. On the tap water dish there was nothing. We would like a treatment plant just like the one at school. Could you help?

YOURS FAITHFULLY

MARCELLE CULLEN

The girl, Marcelle Cullen, wrote the letter as part of a class project that included conducting experiments and making observations of local examples of pollution.

With her classmates at Drysdale Primary School, Marcelle tested domestic water drained into the bay from Clifton Springs homes and found it polluted. She also took note of the pollution the drainage system has caused around the boat ramp located on the strip of beach near her home.

She then wrote about her findings to Mr. Phil Gude who passed the letter on to the Minister of Conservation, Mr. Borthwick.

Mr. Borthwick decided to reply in person to Marcelle because he was impressed by her letter and by someone of her age being concerned about pollution.

Clifton Springs needs a treatment plant, he told Marcelle when he called on her at her parents' home yesterday.

"All the houses here should be seweraged."

"Pollution is brought about by us, by people with unsewered houses and by waste that goes down the sink.

"It is aggravated by some councils not insisting on the use of grease traps.

"These days, if Clifton Springs were being sub-divided the subdivider would be required to put in sewerage.

"Here you are dependent on enough people coming to live in the area for sewerage to be put on."

Local MLA for East Geelong, Mr. Phil Gude, who accompanied Mr. Borthwick on the visit, said the area had already been surveyed for sewerage.

In her letter, Marcelle wrote how the class put a fish in water collected from the drain near her home. "He did not like it so we took him out," she said.

"At the boat ramp the same thing has been happening, because fish have been dying because of the pollution.

"When the class collected some water from the drain we all smelt it. I thought it smelt like very, very bad eggs," she wrote.

She finished the letter by asking for a treatment plant "like the one at school".

9-year-old takes an interest

The initiative a nine-year-old girl took in writing to her local MLA about pollution at her back-door may hasten the installation of sewerage at her parent's Clifton Springs property.

Mr. Borthwick said her letter was thoughtful and sensitive. "I get quite a few letters but not in those terms where the child has developed a point of view by doing a series of projects."

"Most children write and say, 'what are you going to do about cleaning up the Yarra?' Few of them have investigated their local resource spot," he said.

Marcelle's approach was of HSC standard. "Her letter shows everyone can do something about pollution if concerned enough, in their own way. I noticed beer cans along the beach. That's a form of pollution.

"If everyone was as concerned as you, there

would be a lot less thoughtless things being done," Mr. Borthwick told Marcelle.

Marcelle's letter was written on behalf of her classmates at Drysdale Primary School and as part of an environment project organised by her teacher, Mr. Phillip Payne.

While Marcelle may not get her treatment plant as soon as she hopes, the Minister did give her one definite promise of a comprehensive kit of pollution study aids issue by the Conservation Department.

Marcelle said she would give some thought to Mr. Borthwick's suggestion about becoming a scientist.

- Mr. Borthwick and Marcelle inspect the seaweed problem on the beach below her house.





The Ministry
for Conservation

From the office
of the Minister

240 Victoria Parade,
East Melbourne, Victoria.

Postal address: Box 41,
East Melbourne, Vic. 3002.

Telephone ~~4XXXXX~~
651 4011

Miss Marcelle Cullen
150 Bayshore Drive
CLIFTON SPRINGS via
DRYSDALE 3222

22nd January, 1979

Dear Marcelle,

It was a very great pleasure for me to meet you and your family on Friday.

I was impressed by your letter to Mr. Gude and even more so in meeting you. You are a beautiful young lady.

As I again read your letter, it is my wish that all young Australians show an understanding and concern for things about them as you do. We will have a lovely country to work and play in if we all feel that way.

In a separate package, I am sending you some papers and pamphlets that may interest you and your friends at school.

Please thank Mum and Dad for bringing you up from Lorne so that I could meet you and thank your teacher at Drysdale for showing you the way to understand the problems of pollution.

Kindest regards

W.A. BORHWICK
MINISTER FOR CONSERVATION

CLIFTON SPRINGS LOT OWNERS ASSOCIATION

ESTATE

PRESIDENT Mr. W.J. Atherfold
13 Dederang Avenue
Clifton Springs, Vic. 3222

SECRETARY Mrs. I. Ryan
27 Boonderabbi Drive
Clifton Springs, Vic. 3222

February 13, 1979

Miss M. Cullen
150 Bayshore Avenue
Clifton Springs
Vic. 3222

Dear Marcel,

The Committee representing the Clifton Springs Lot Owners Association, wish to congratulate you on your project work, "Pollution of the Environment", as featured in a recent press article.

Sewerage of Clifton Springs has been very high on the list of priority works which this Committee has been urging to the Bellarine Shire Council, State Rivers and Water Supply Commission, Geelong Waterworks and Sewerage Trust and to people living in the area, who have been somewhat apathetic in the past.

We hope you and your class mates will continue to take an active interest in matters such as this, which is of such great importance to us all.

Yours sincerely



W.J. Atherfold
Honorary President

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Glossary

In this developmental edition of the study guide, we have not included a glossary. As you read through the text, we would like you to build up your own glossary in the space below. Write down any terms that hindered your comprehension of the text and then let the Course Team have a list of the terms you feel should be included in the future edition of this course.

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