



waterwise
Queensland

years
4 and 5

Water:
Learn it for life!

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Water: ^o ^o Learn it for life!

years
4 and 5
units 1-2

As dwellers on the world's driest inhabited continent, Australians are coming to realise we must conserve water and use it wisely. The decisions we make about how we use our water now have implications for the future.

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Unit 1: Water windows

yesterday, today and tomorrow

Introduction

In this unit, students investigate how the understanding of water as a precious and finite resource has changed over time in their local area. They explore changes in land use around local water sources and changes in attitude

toward sustainable management of water resources in their local area.

Students have the opportunity to use the visual arts to communicate changing patterns of water use in their local area across a number of generations. The focus of this unit is on the sustainable use of water in communities.

Essential Learnings for this unit—By the end of Year 5

Ways of working	Knowledge and understanding
Science	
<p>Students are able to:</p> <ul style="list-style-type: none"> › draw conclusions that are supported by evidence, reproducible data and established scientific concepts. 	<p>Science as a human endeavour</p> <p>Science is a part of everyday activities and experiences.</p> <ul style="list-style-type: none"> › Science can help to make natural, social and built environments sustainable and may influence personal human activities.
Studies of Society and Environment	
<p>Students are able to:</p> <ul style="list-style-type: none"> › collect and organise information and evidence › draw and justify conclusions based on information and evidence 	<p>Place and space</p> <p>Environments are defined and changed by interactions between people and places.</p> <ul style="list-style-type: none"> › Interactions between people and places affect the physical features of the land, biodiversity, water and atmosphere › Sustainability of local natural, social and built environments can be influenced by positive and negative attitudes and behaviours › Maps have basic spatial concepts that describe location and direction, including north orientation and four compass points, symbols and a legend or key.
The Arts	
<p>Students are able to:</p> <ul style="list-style-type: none"> › create and shape artwork by organising arts elements to express personal and community values, beliefs and observations › present artwork to informal and formal audiences, using art techniques, skills and processes. › respond to artwork by identifying and interpreting the influences of social, cultural and historical contexts, using art elements and languages › reflect on learning to identify new understandings and future applications. 	<p>Visual art</p> <ul style="list-style-type: none"> › Visual art involves selecting visual arts elements, concepts, processes and forms (both 2D and 3D) to express ideas, considering different audiences and different purposes, through images and objects. › Warm (red, orange, yellow) and cool (blue, green, purple) colour schemes, and mixed and complementary colours, are used to create tone and variation. › Line is used to suggest movement and direction › Regular, irregular, open, enclosed, overlapped and adjacent shapes are used to create categories and position.

Key concepts

- ◆ Water is needed to sustain life.
- ◆ Water for communities can come from a variety of sources such as bores, dams and creeks.
- ◆ Humans, agriculture, industry and the natural environment require water.
- ◆ Human activities impact on the quality of water.
- ◆ Everyone's actions contribute to the sustainable use of water.

Assessment overview

Students use the visual arts as a medium to communicate the impact of human activity on places over time, and their preferred future vision. Students compose a reflection to demonstrate their understanding of the issues surrounding sustainable water use in which they draw conclusions supported by evidence.

Essential Learnings for assessment—By the end of Year 5

Ways of working	Knowledge and understanding
Science	
<p>Students are able to:</p> <ul style="list-style-type: none"> › draw conclusions that are supported by evidence, reproducible data and established scientific concepts. 	<p>Science as a human endeavour</p> <p>Science is a part of everyday activities and experiences.</p> <ul style="list-style-type: none"> › Science can help to make natural, social and built environments sustainable and may influence personal human activities.
Studies of Society and Environment	
<p>Students are able to:</p> <ul style="list-style-type: none"> › collect and organise information and evidence. › draw and justify conclusions based on information and evidence 	<p>Place and space</p> <p>Environments are defined and changed by interactions between people and places.</p> <ul style="list-style-type: none"> › Interactions between people and places affect the physical features of the land, biodiversity, water and atmosphere.
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Unit 1 overview

Phase	Lesson
Engage	
To capture interest and discover what we think we know	<ul style="list-style-type: none"> › Lesson 1—Water, water, everywhere Students read and discuss Dreamtime stories about water, and discuss the Indigenous perspectives implicit in them. Students map their ideas to show their understanding of water in the local area.
Explore	
To have shared, hands-on experiences	<ul style="list-style-type: none"> › Lesson 2—Going on a water wander Students embark on a field trip to learn more about water issues and infrastructure in their local area. › Lesson 3—Picture this Students explore ways to communicate meaning through visual arts. › Lesson 4—Catchment catch-up Students build up a picture of the way water works in their local catchment. › Lesson 5—Shared perspectives Students interact with guest speakers to gain an understanding of the changing patterns of usage of a local water source as an indicator of future scenarios.
Explain	
To demonstrate what we have learned by exploring	<ul style="list-style-type: none"> › Lesson 6—Opening a water window Students discuss Jeannie Baker's book <i>Window</i> to stimulate discussion into the impacts of growth in their local area on the water resources. (Also refer to Nadia Wheatley's book <i>My Place</i>.)
Elaborate	
To build understanding through an investigation	<ul style="list-style-type: none"> › Lesson 7—Ever-changing water view Students plan and create four pieces of art centred on one body of water to show its use under traditional Indigenous ownership, in pioneering times, the modern day, and in the future. (Assessment)
Evaluate	
To review and reflect on learning	<ul style="list-style-type: none"> › Lesson 8—Water reflections Students write a reflection as a result of their learning journey. › Lesson 9—Art on show Students display and describe their artistic timelines as part of a Waterwise art celebration to promote the sustainable use of water resources. (Assessment)



Assessable elements

» The Arts

- Knowledge and understanding
- Creating
- Presenting
- Responding
- Reflecting

» Study of Society and Environment

- Knowledge and understanding
- Investigating
- Communicating

Linking locally

- ◆ Students can visit sites in the local area where water is accessed, used, treated or released. These could include dams, water treatment plants, sewage treatment plants, creeks, streams or rivers.
- ◆ Invite a guest speaker to talk to the class to provide historical information about the local area. Guest speakers could include grandparents, senior citizens, and representatives from farm or other industry groups, or the local museum or historical society. Local community elders can be invited to provide a relevant Indigenous perspective. Protocols that explain how the visit should be organised are on page 22 of *Embedding Aboriginal and Torres Strait Islander Perspectives in Schools*, available at www.education.qld.gov.au/schools/indigenous/docs/indig-persp.pdf.

Taking action

- ◆ Students display their artworks in a public place to promote the sustainable use of water resources. Guests such as parents/carers, members of the school and wider community, local artists, media representatives, and local, state or federal government representatives could be invited to view the display.

Bibliography

Baker, J. (1991) *Window*. Sydney, NSW: Random House.

de Bono, E. (1992) *Serious Creativity*. New York: Harper Business.

Wheatley, N. (1987) *My Place*. Melbourne, Vic: Collins Dove.

❖ Student assessment task

Unit 1: Water windows—yesterday, today and tomorrow

» Setting the scene

The local creek bank that you and your family might picnic on has not always been as it is today. In pioneering times it could have been the place where teams of bullocks pulled creaking wagons down the bank, across the creek and up the other side. Before European settlement, traditional Aboriginal owners of the land may have speared fish in the creek's clear waters, and collected paperbark to cook them in. What it will be in the future will be decided by the decisions we make today.

In this task, you will prepare artworks and a reflection to explain how water was used in the past and how it will be used in the future. You will participate in an art show to teach other people what you have learned.

» Purpose of the task

For you to show how well you can:

- › make conclusions based on evidence about water use in our local area
- › create four artworks (picture poem) which go together to make a picture timeline. These artworks will show how important it is to manage our water resources wisely now and in the future.

» Products to be completed

1. Four artworks that create a picture timeline and tell a story about how the use of local water resources has changed over time, and how we can better manage our water in the future. The arts works will be set in indigenous times, pioneering times, modern times and the future.
2. Student reflection about your research and ideas.

Resource 1 (continued)

❖ Stages in the learning journey	Checklist	
	Student	Teacher
1. Students use a slip-writing diagram to show what they already know about water.		
2. Students write predictions before taking part in an excursion.		
3. Students reflect on their excursion and their predictions.		
4. Students use a slip-writing diagram to show what they learned on their excursion.		
5. Students explore the art and design elements of space, contrast, balance and pattern using photographs from the excursion.		
6. Students explore the idea of catchments and the interconnectedness of water in their local area.		
7. Students write questions to ask a guest speaker, and reflect on the speaker's responses.		
8. Students explore the Jeannie Baker book <i>Window</i> and learn more about picture poems.		
9. Students participate in a 'hot potato' activity to build up ideas for their own picture poems (artworks).		
10. Students complete first drafts of their four-part artworks, and exchange feedback with their classmates.		
11. Students complete final drafts of their artworks and help organise the art show.		
12. Students write a reflection, explaining the things they have learned about water use in their local area, presenting suggestions and conclusions backed by evidence.		
13. Students present their artworks and reflections to an audience.		

Name.....

Student assessment grid

Unit 1: Water windows—yesterday, today and tomorrow

Criteria		Descriptors	
Artworks <ul style="list-style-type: none"> › show change over time › show how people affect places › use colour, line, shape or texture to show meaning › show that the decisions we make today affect the future. 	My picture poem (artworks): <ul style="list-style-type: none"> › is historically accurate › makes many clear links between people and their effect on places › clearly communicates a well-researched message effectively using colour, line, shape or texture. › effectively makes my audience think about sustainable water use. 	My picture poem (artworks): <ul style="list-style-type: none"> › is fairly historically accurate › shows how people affect places › communicates a message to my audience using colour, line, shape or texture. › shows my understanding of the need for sustainable water use. 	My picture poem (artworks): <ul style="list-style-type: none"> › shows some change over time › shows people and places › communicates to my audience poorly. Some use of colour or line or shape, or texture. › shows water uses but does not send a message about sustainability.
Reflection <ul style="list-style-type: none"> › explains my understanding of water use in our local area › includes evidence › supports the meaning of my artworks. 	My reflection: <ul style="list-style-type: none"> › shows my comprehensive understanding of the water issues in my local area › draws insightful conclusions supported by appropriate evidence › clearly explains the meaning of my artworks. 	My reflection: <ul style="list-style-type: none"> › shows my understanding of some water issues in my local area › draws conclusions supported by evidence › explains the meaning of my artworks. 	My reflection: <ul style="list-style-type: none"> › mentions some water issues in my local area › draws some conclusions and presents some evidence › is about water issues not shown in my artworks.

Water, water, everywhere

» Lesson overview

In this lesson students are introduced to the assessment task. The lesson engages their interest, and discovers what they already know about water in their local area, and reveals any misconceptions they may have.

Students consider the ideas about water contained in Indigenous Dreaming stories. Slip-writing is modelled and then used to create a record of prior knowledge.

Constructive peer review is used to provide feedback.

» Lesson objectives

Students know and understand that:

- a slip-writing diagram can be used to represent words, ideas, tasks or other items linked to and arranged around a central key word or idea
- communities obtain water from various sources such as bores, dams and creeks.

» Opportunities for assessment

In the 'Engage' phase of learning, the focus is on finding out what students know about the sources and uses of water in the local area, and how they interconnect. Students show this through their slip-writing diagram.

» Equipment

For the class

- several examples of artworks containing depictions of water
- selection of Aboriginal Dreamtime stories about water
- 10–20 large slips of paper for the whole-class activity
- Blu-Tack

For each student

- 10–20 small slips of paper, all the same* colour
- one sheet of A4 paper for presentation
- glue
- ruler
- task sheets and assessment grids.

* Paper of another colour will be used for slip writing in Lesson 2.

» Preparation

Source Dreamtime stories such as *The Guardian of the Rivers: The Rainbow Snake* by Michael J. Connolly, available from <www.dreamtime.auz.net/default.asp?PageID=50&n=The+Guardian+of+the+Rivers.htm>.

Other Aboriginal Dreamtime stories about water can be found at <www.dreamtime.auz.net/default.asp?PageID=41&n=Water>.

» Lesson steps

1. Show students the works of art. Model expressing an opinion about the art backed by evidence. For instance, you could say:

‘I think the water in this picture looks dangerous because it’s a dark colour and has big waves.’

‘In my opinion, this water would be lovely to jump into because it looks cool and refreshing.’

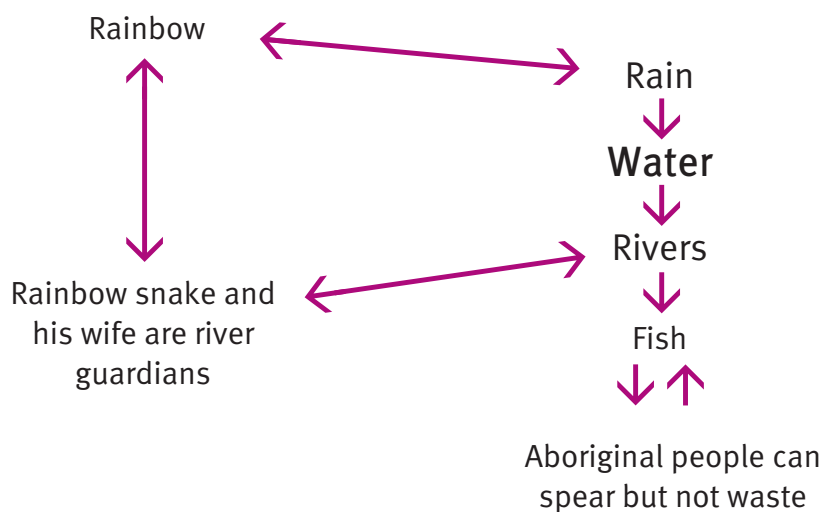
Ask the students to express some opinions about the art backed by evidence. Provide cues and allow time for students to generate more thoughtful answers to this question.

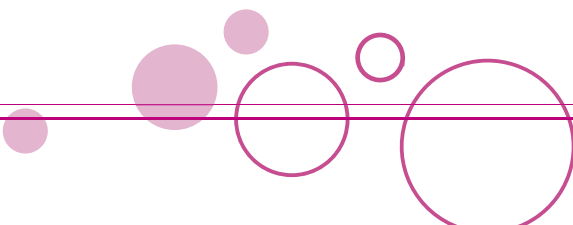
2. Discuss some of the artistic elements used in the images. Write the words ‘pattern’, ‘contrast’, ‘balance’, and ‘space’ where students can see them, and refer to these terms during the discussion.

Ask the students:

- Can you see any patterns in these images?
 - Are contrasting colours like black and white or red and blue used?
 - How have the artists used the space in these pictures? Is the space filled with one large object or several smaller objects?
 - Do you think the picture looks balanced, or are some things in it too big or too small for your liking?
3. Explain that at the end of this unit, the class will be putting on an art show of their own works for invited visitors. Explain that the theme of the art show will be water and how we can use it more wisely. To prepare for this event, the class is going to learn about how water works in our local area. Explain that their planning and artworks will provide part of the assessment of this unit (Resource 1—‘Student assessment task’).

Diagram—The Guardian of the Rivers: The Rainbow Snake



- 
4. Introduce the Aboriginal Dreamtime stories about water you have chosen. Read several stories, choosing one to summarise. Read the chosen story a second time, and then ask students to tell you the main ideas.
 5. Write these words on slips of paper large enough for all the students to see and attach them to a board. Explain that this is called ‘slip writing’ and that the next step is to use lines or arrows to connect the ideas that go together. Collaboratively arrange the slips and add arrows or lines. Give the diagram a title.
 6. Give each student 10–20 small slips of paper of a particular colour. Explain that they are to write on them all the water words they know, writing only one word or term on each slip. Prompt students to think about sources and uses of water in the local area. When they have finished, ask students to arrange their slips on the larger sheet of paper in a way that shows how the words can be grouped or linked. When they are satisfied with the arrangement, students can glue the slips on the paper and then add lines or arrows to connect ideas that go together.
 7. Help students recognise that, during this unit, you want them to understand not only what they are learning but how they are learning it. Prepare a class ‘Unit planner’ (Resource 2). This can be laminated and reused for other class units.

» Curriculum links

Science

Attempt to create rainbows using pump bottles to spray water mist in sunlight.

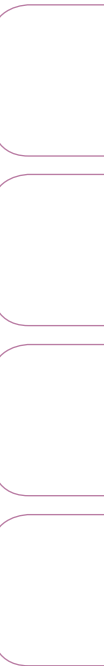
Research rainbows and the colour spectrum.

Experiment with viewing and locating an object at the bottom of a body of water; discuss the optical illusions that occur, and any adjustment that spearing a fish in water would necessitate.

English

Discuss the moral of the ‘Guardian of the Rivers’ story (waste); look for other traditional stories that have this or other morals.

Write stories in the Dreamtime style that deal with conservation of precious resources.



Resource 2

Unit planner

A unit planner is a tool for helping students learn about learning (metacognition). Student learning through the unit is tracked on separate charts with the following titles:

- › Key concepts
- › Questions
- › Class activities
- › What have I found out?
- › How did I sort out this information?
- › What now?

Type up the key concepts for the unit. Explain each one to students as you stick them onto the left-hand column of the grid. Encourage students to record in the next column any relevant questions that arise during the unit.

Every few days, take time to reflect on what students have learned; what activities they have participated in to help them learn; and what graphic organisers or strategies they have used to help them sort out their learning.

The end of the unit is a chance for the class to work collaboratively and decide what they will do now with this new information. For example, students could display their artworks in public and ask guests to donate a coin to a local Landcare Australia or catchment group, or to plant a tree.



Unit planner

Going on a water wander

» Lesson overview

In the previous lesson, students identified what they already know about the sources and uses of water in the local area. In this lesson, through shared, hands-on experiences, students explore further the sources and uses of water in the local area. To do this, students undertake a field trip to gain firsthand knowledge of water infrastructure.

This excursion should focus on sustainable water-use practices; these could be demonstrated on an industrial or farm site, water storage facility, water or sewage treatment plant, local wetland or other sites of interest.

» Lesson objectives

Students know and understand that:

- water is a valuable resource
- water demand management is a priority at all levels of government
- humans, agriculture, industry and the natural environment require water
- human activities impact on the quality of water
- human settlement is determined by the availability of resources.

» Opportunities for assessment

Modifications to the students' slip-writing diagram as a result of knowledge gained on the field trip will show developing understanding of local water issues. The reflections on their predictions may also demonstrate concept development.

» Equipment

For the class

- digital cameras
- background information on the people/places to be visited

For each student

- local area map showing whole catchment from <http://maps.google.com.au/> or obtained from the local municipal council.
- student journal
- 10–20 small slips of paper (for use after the excursion; different colour to that used in Lesson 1)
- one A4 sheet of paper (for after the excursion)

» Preparation

- Plan an excursion to local sites where water is being stored, utilised, and treated or recycled.
- Collate background information on the people and places to be visited.
- Organise permission forms from parents/carers.

Optional: Provide images or photographs of 'no water' situations such as a landscape affected by drought, or a hose with no water.

» Lesson steps

1. Prior to departure, look at the local area catchment map and discuss the excursion route with students.
2. Make predictions about the water activities that will be experienced at each site. Ask students to record their predictions in their student journals.
3. Conduct the excursion, linking landscape features with map symbols and taking photographs where appropriate.
4. After the excursion, working as a whole class and using the photographs as stimulus, summarise onto a flow chart the uses and reuses of water in the local supply area.
5. Discuss whether there is enough water to meet the needs of the local area. Ask students to consider what might happen if the population of the area doubled, or if there was a sustained drought. Ask students to give their opinions, backed by evidence, about these scenarios.
Optional: You could provide photographs or images of areas in severe drought, or a hose with no water.
6. Ask students to identify the positive and negative impacts of human activity on the quality of water in the local area. Some examples of student responses could be: 'local residents have dumped grass clippings and plant prunings on the banks of the local creek. The dumped waste washed into the creek causing it to become dirty. Weed species from garden waste now grow along the creek. Farmers and local residents have planted trees along the creek and now less soil runs into the creek when it rains.'
7. Ask students to write on individual slips of paper words learned on the excursion. Prompt students to identify new scientific words or terms. These slips can be added to the existing slip diagram, or a new diagram begun.
8. Students compare their predictions with their experiences on the excursion. What was different? What was the same? Ask them to record their reflections in their journals using full sentences.

A student journal is a record of the student's ideas, observations and experiences. It can include text, diagrams, drawings and images. The journal is a 'thinking diary' that should be dated and written in chronological order. Make sure that the students use full sentences in their journals. Refer to appendix in the PrimaryConnections units that explains the use of journals in more detail. The PrimaryConnections units are available from Australian Academy of Science at <www.science.org.au/primaryconnections/>.

» Curriculum links

English

Using a flow chart, explain other water-related activities such as washing up, cooking pasta, and washing a pet. Highlight the need for Waterwise behaviours where relevant, such as washing the dog using a bucket of water rather than a running hose.

Picture this

» Lesson overview

In the previous lesson, students explored a local site or sites where water is sourced, stored or treated. The focus of this lesson is to learn about the artistic elements of pattern, balance, contrast and space. Photographs from the excursion provide stimulus for visual artworks through which students communicate meaning.

» Lesson objectives

Students know and understand that:

- visual art involves using materials to control, design and modify elements and design concepts to make images and objects.

Students are able to:

- create artworks by selecting, arranging and applying arts elements to communicate meaning
- present and display artworks to communicate meaning to formal and informal audiences.

» Opportunities for assessment

The degree of skill shown with manipulation of design elements to create meaning can be observed and recorded.

» Equipment

For the class

- art supplies such as paint, brushes, crayons, charcoal, chalk, pastels and pencils

For each student

- art paper
- sketching pencil (4B is ideal)
- eraser
- copy of at least one photograph from the excursion (preferably a landscape)

» Preparation

Before the lesson, print sufficient copies of the excursion photographs so that each student has at least one. Enlarge one photograph of a landscape, if possible.

» Lesson steps

1. Draw students' attention to the enlarged photograph from the excursion. Explain that many visual artists base their work on photographs.
2. Discuss the photograph in terms of the visual art elements such as line, shape, colour and texture as well as design concepts such as pattern, balance, contrast and space.
3. Ask students how they would go about creating visual art.
4. Give students a sheet of paper and the photograph from which they will work. Explain that they should sketch some outlines on the page before using the art supplies to experiment with various effects. Ensure that they understand that this is purely an exploratory activity and that you are not aiming for display quality work.
5. Students come together at the end of the lesson to talk about the techniques and materials that gave the most satisfactory result. Encourage them to express this as an opinion supported by evidence—for example, 'I preferred the pastels to the paint as the paints were hard to control and the pastels gave a soft effect.'
6. Using one photograph from the excursion as a focus, discuss with students whether a photograph taken in the same location a hundred years previously would have shown the same scene. Imagine what the scene looked like before European settlement, and what it might look like one hundred years into the future.
7. Ask students to make a prediction based on evidence about the future use of water in their local area. Predictions could include:
 - 'I predict that water restrictions will be everyday practice for non-essential water use.'
 - 'I believe all homes will have rainwater tanks and mini greywater treatment plants because water will be too valuable to use only once.'
8. Remind students that they will be exploring these ideas and using the art and design elements of pattern, balance, contrast and space in their art task. Explain the creative process (Resource 3) in terms the students can understand.

» Curriculum links

Science

Discover more about how cameras work and the colour spectrum.

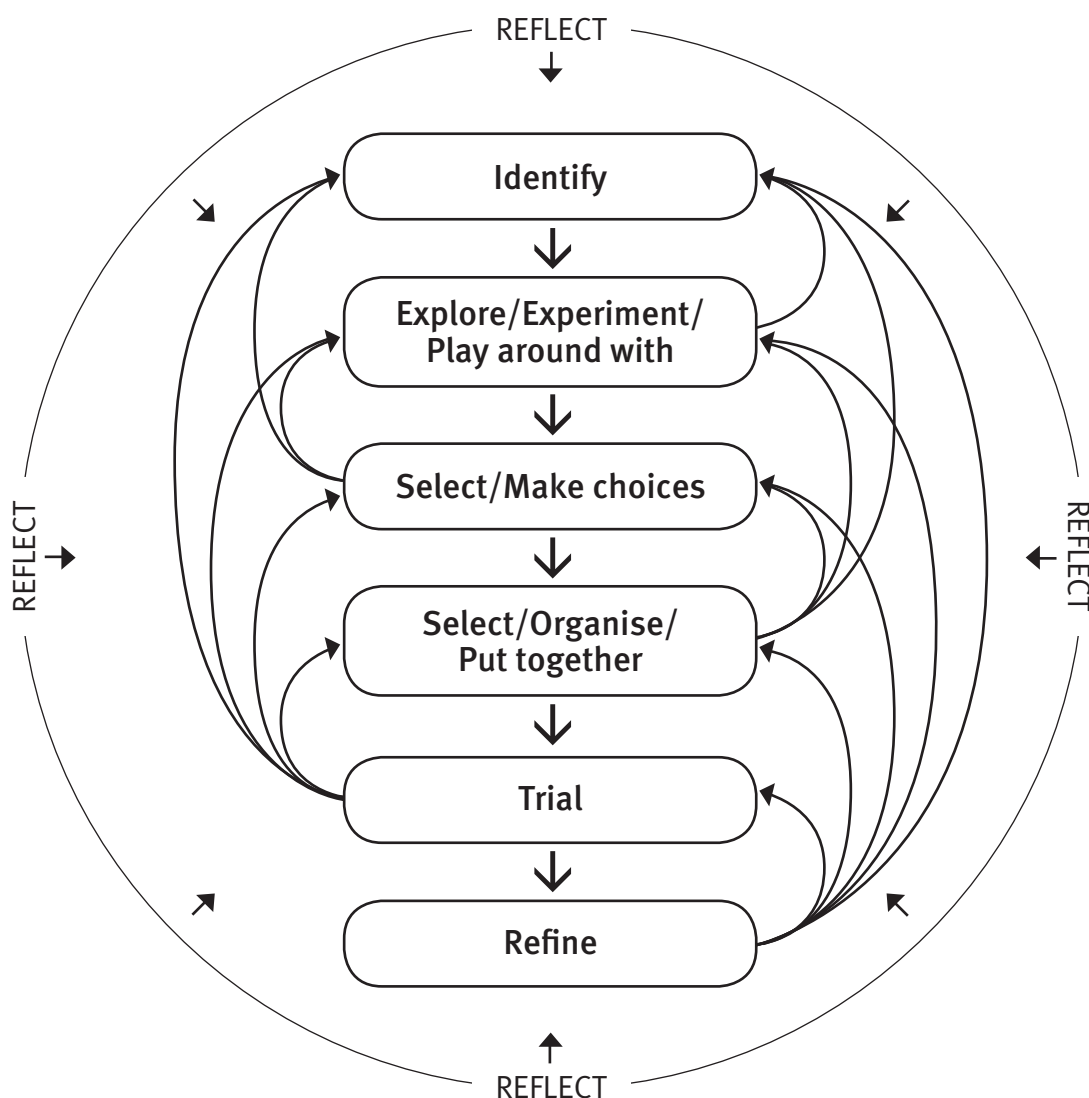
The Arts

Create colour wheels and learn more about contrasting and complementary colours.

Resource 3

The Arts—A creative process

- › Creating is an important aspect of The Arts.
- › It is essential that students are taught how to create, rather than just being asked to create.
- › The creative process is iterative.
- › Students' creative skills develop over time.



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Catchment catch-up

» Lesson overview

In the previous lesson, students explored the visual elements of artworks in preparation for creating their own visual art. The focus of this lesson is to allow students to:

- undertake further research into the concept of a catchment
- build an understanding of the ways in which water flows through their local area
- predict the effect of various activities on water quality.

Students use this information to plan the key messages for their artworks.

» Lesson objectives

Students know and understand that:

- maps consist of basic features
- humans, agriculture, industry and the natural environment require water
- human activities impact on the quality of water
- human settlement is determined by the availability of resources
- everyone's actions contribute to sustainable use of water resources.

» Opportunities for assessment

Students' developing understanding of the impact that various activities have on water quality can be monitored through entries in their journals.

» Equipment

For the class

- photographs from the excursion
- enlarged copy of catchment map
- cork board
- string or wool
- scissors
- thumb tacks or push pins
- letter cards marked A, B, C, D, E
- *Optional:* pictures of other places in the local area involving water

For each student

- A4 copy of a catchment map
- colour pencils
- student journal

» Preparation

- To source a map of your catchment, contact your local council, catchment group or natural resource management regional body <www.regionalnrm.qld.gov.au/my_region>.
- Pin the enlarged copy of the catchment map to the centre of a pin board.
- Pin the photographs around the map.

» Lesson steps

1. Draw the students' attention to the catchment map and ask them what it is. Discuss the features that define it as a map. Highlight the fact that a map is a picture of a place drawn on a flat surface and that it has certain features such as a title, compass points, a north indicator, a scale and a key.
2. Explain to the class that this map is described as a 'catchment area map'; ask the students to discuss in pairs the possible meanings of the term 'catchment'.
3. Inform the students that one definition of a catchment is that it is an area drained by a river or body of water. Brainstorm different types of water bodies such as creeks, dams, lakes, billabongs, oceans, seas, swamps or wetlands.
4. Trace the movement of water through the catchment. If possible, using the map or atlas locate the higher ground within the catchments and trace the watercourses to and through human settlements.
5. Discuss the water that is in the catchment but does not show on a map: the water stored underground. Discuss the ways in which this groundwater is brought to the surface. (Refer to *Background Information for Teachers* for more details.)
6. Refer to the photographs from the excursion and ask students to recall the water activities or processes they observed at each venue. Use wool and pins to connect each picture to the location at which it was taken.
7. Discuss which bodies of water were involved in the activities at each site. For example, if you visited a dairy farm, the sites would be the locations where:
 - the farmer pumps water from a dam for cows to drink
 - the farmer washes down the bails with water from a bore
 - this wash-water flows into an effluent pit and is used to irrigate pastures.
8. Give students their individual catchment maps and ask them to locate the bodies of water on them. Decide how these could be identified using colour and a key. If there is no room on the map, consider creating the key on a separate piece of paper.
9. Model colouring the bodies of water on the enlarged map and ask the students to do the same on their copies and to record the information on a key.
10. Use general categories for the activities that happen in the rest of the catchment, such as city, suburban, industrial, farming, recreational areas and national parks. Shade the maps appropriately, adding the new information to the key.
11. On the enlarged map, designate points on various bodies of water with the letter cards. Working in groups of two or three, ask the students to rank the bodies of water from most to least polluted.
12. Ask students to write in their journals a conclusion backed by evidence such as 'I believe point C where the river flows down the mountain would be the least polluted because the water came from the rain and no pollution has flowed into it'.

13. Pose the question to students: is there a connection between human settlement and the availability of water? Take all suggestions. Hopefully students will be able to locate (and possibly name) the water source at some settlements within the catchment.
14. Explain that the class is going to be hosting a guest speaker in the next lesson to give a different point of view about water in the local area. Describe the speaker to the students and ask them to write appropriate interview questions in their journals. Prompt students to consider seeking information from the guest speaker about:
- traditional or earlier uses of water and the sources of water
 - changes in waterways, sources or uses.

Encourage students to write open-ended questions, rather than questions that have a closed ('yes' or 'no') answer.

» Curriculum links

Science

Research the magnetic poles of the earth to discover why and how a compass helps us find our way.

SOSE

Read about the navigation methods and the adventures of ancient explorers.

English

Have a treasure hunt using a map and a series of clues.

Watch or read examples of interviews.

Maths

Research the various terms for bodies of water and put these in order from largest to smallest volume (amount) of water.

Shared perspectives

» Lesson overview

In the previous lesson, students explored the concept of a catchment and the impacts that human activities have on the quality of water. The focus of this lesson is to research some alternative views of water in the local area.

Students interact with guest speakers from the local Indigenous community, senior citizens and farm or other industry groups. Alternatively, the students could visit a local historical museum to gain an understanding of the changing patterns of usage of a local water source.

» Lesson objectives

Students know and understand that:

- humans, agriculture, industry and the natural environment require water
- human activities impact on the quality of water
- human settlement is determined by the availability of resources
- water is a valuable resource.

» Opportunities for assessment

Questioning of guest speakers will show developing understanding of changing attitudes to and uses of water in the local area.

» Equipment

For the class

- excursion photographs as discussion starters
- catchment map from Lesson 3

For each student

- student journal

» Preparation

Organise guest speakers from the local Indigenous, senior citizen, farming or industry group to visit the class, or arrange a visit to a local historical museum. Prepare the speakers or museum staff by telling them that they will be asked to share insights about historical sources and uses of water, significance and value of water, and changing perspectives on a local community water source. They may want to select appropriate photographs, books or artefacts to show to students.

» Lesson steps

1. Welcome the guest speaker to the classroom. Invite the guest speaker to present, and then to answer student questions. Alternatively, if guest speakers are unavailable, you could visit the museum, interact with guest speakers via telephone or email, or read firsthand accounts from historic sources such as newspapers or diaries held in the local or state library, or the historical society.
2. Ask students to record in their journals the answers provided by the guest speaker. You could record or video your guest's presentation so that students can review the information. Make sure you gain approval from your guest first, and use the recordings for only the purposes negotiated.
3. Remind students about their art task and ask if any ideas have been generated by the guest speaker. For instance, an Indigenous speaker may have talked about the uses of paperbark for cooking, water-carrying or funeral rites. If paperbark trees are found locally, students could show one of these activities in their picture. Ask students to record their new ideas in their journal.

» Curriculum links

Maths

Graph population figures for the region before European settlement, in pioneering times and today, and those predicted for the future.

English

Write a recount of the visit to the museum or from guest speakers using students' journal notes as prompts.

Opening a water window

» Lesson overview

In the previous lesson, students gained an understanding of the changing patterns of usage of a local water source. In this lesson, students are introduced to using a pictorial timeline like that in Jeannie Baker's book, *Window*. Students consider how this could be used as a tool to communicate the ways in which growth and practices in their local area have impacted on water resources. Students take part in a 'hot potato' brainstorming session.

» Lesson objectives

Students know and understand that:

- time can be represented by sequences
- visual art involves using materials to control, design and modify elements and design concepts to make images and objects
- interactions between people and places impact on physical features of the land, biodiversity, water and atmosphere.

» Opportunities for assessment

Observation of the 'hot potato' sheets will allow teachers to gauge students' understanding of water use through time.

» Equipment

For the class

- a copy of *Window* by Jeannie Baker, or access to the internet and her website at <www.jeanniebaker.com>

For each group of four students

- A3 sheets of paper labelled 'Indigenous times', 'Pioneering times', 'Modern times' and 'The future'

For each student

- student journal

» Preparation

Familiarise yourself with the work of author and illustrator Jeannie Baker, in particular with her book *Window*. Read the article 'Window on a changing world' at <www.jeanniebaker.com/focus_web/window_on_a_changing_world.htm>.

» Lesson steps

1. Show and discuss *Window* by Jeannie Baker.
2. Explain that Jeannie Baker describes *Window* as a ‘picture poem’, which tells a story without words. The clues to the story are embedded in the images. Discuss the key ideas in the story—for example, urbanisation, change over time, the sustainable use of resources.
3. Ask students to read the following quote from Jeannie Baker.

‘I try to show in the book that we’re all part of the changes that are happening in Australia and in the world as a whole. Each of us might make very small changes like, perhaps, digging up the native plants in our backyard. But if enough people make changes like that, those small changes together in fact make one big change. So it’s trying to get that concept across, how we all do play a part in it. The child in the story is making changes in his own backyard, and you can see, in the end, the small changes together making quite big changes in his backyard.’

4. Ask students to give an opinion about how successful Jeannie Baker is in communicating her ideas. Ask them to support their opinions with evidence—for example, ‘I think Jeannie Baker was successful because she showed the boy planting a tree, which quickly grew, making a big change in the backyard.’
5. Ask students to discuss this story’s effectiveness at communicating the idea of change over time. Consider what Jeannie Baker may have shown if her view had been a local water source, and brainstorm some general ideas as a group.

Encourage students to identify:

- the key ideas about changes that have occurred in the ways we use water
 - the key messages that need to be made more widely known about managing our water resources in the future
 - the small things we can do to reduce the amount of water used at home and at school.
6. Explain to students that they are going to play an ideas-generating game called ‘Hot potato’. Divide students into groups of four and show them the sets of four A3 sheets of paper, each sheet labelled with one of these headings: ‘Indigenous times’, ‘Pioneering times’, ‘Modern times’, and ‘The future’.

Explain that each person in the group will take turns to set down their ideas on each of the four sheets. (This means that there will be four contributions on each sheet, so no-one should take up the whole space.) They will have between one and three minutes to write or draw things that might happen at and around a water source (river, creek, pond or billabong) in that particular era.

At the end of the allotted time, the sheet is passed to the next person in the group. Everyone in the group records their ideas on all of the sheets.

A kitchen timer is a useful tool to cue students to pass the sheet to the next member of their group.

7. After the groups have finished the 'Hot potato' game, the whole class comes together to share responses, add more suggestions and collate them on four master sheets.
8. Ask students to select ideas from these master sheets which they may want to use in their picture poems (artworks), and write them in their journals.
9. Discuss any research that will be required. For instance, students might say:

'I will need to look at pictures of Aboriginal boat building so that I can show this in my first picture.' or

'I want to show a horse and plough at work near a riverbank and I will need to research these.'

Students will also need access to local information about current and future water management strategies such as the use of rainwater tanks, recycled water, greywater and purified recycled water. Refer to *Background Information for Teachers* and contact your council water resource officers for locally relevant information.
10. Schedule a visit to the library or computer room where necessary, or provide historical pictures and accounts in the classroom to allow this research to take place.

» Curriculum links

English

Read Jeannie Baker's other books.

The Arts

Experiment with mixed-media collage.

Explain

Ever-changing water view

» Lesson overview

In the previous lesson, students conducted research on the changing patterns of water use in their local area. In this lesson, students focus their research ideas as they plan, review and create their four artworks depicting activities impacting on a local water source in Indigenous, pioneering, modern and future time periods.

» Lesson objectives

Students know and understand that:

- time can be represented by sequences
- visual art involves using materials to control, design and modify elements and design concepts to make images and objects
- interactions between people and places impact on physical features of the land, biodiversity, water and atmosphere
- responding involves interpreting and evaluating the influences upon visual artworks.

» Opportunities for assessment

The finished artworks provide evidence of the extent to which students have completed the task as outlined on the 'Student assessment task' sheet (Resource 1).

» Equipment

For the class

- visual art reference books
- photographs from excursion

For each student

- art paper for draft and final copies
- art materials and tools suited to the medium or style chosen: sketch, watercolour, crayon, collage, mixed media, etc.
- student journal
- 'Student assessment task' sheet (Resource 1)

» Lesson steps

1. Explain that students are to plan, review and begin creating their four-part artworks. Remind students that their four images need to work together to tell a story without words. For additional information on teaching visual art skills, refer to the Queensland Studies Authority The Arts syllabus, sourcebook guidelines and sourcebook modules at www.qsa.qld.edu.au/syllabus.html.

Whizzy's Incredible Journeys (Pick-a-Path book) was developed so students in the Early Years could develop a view of water in their surroundings. This book can be a powerful teaching tool for Years 4 and 5. Show page 2 (overall landscape view) to students who are preparing and planning their own artwork, and ask them to analyse and discuss how the book illustrator has captured a present-day view of water, and what water messages are conveyed in this picture.

2. Ask students to consider the main ideas they want their artwork to tell. Possible ideas could include:
 - 'I want to show how precious water is.'
 - 'I want to show how people affect water by the things they do.'
 - 'I want to show how people doing lots of little things can combine to make big changes for the environment—like tree planting or putting in rainwater tanks.'
3. Ask them to write their key ideas in their journals and explain that these will form the basis of their reflection assessment task.
4. Review the 'Student assessment task' sheet (Resource 1) and discuss the assessable elements. A teacher comment could be, 'You need to show change over time. How could you do that?' To which

a student might reply, 'You could show clear water with fish in it in the Indigenous picture, which is muddy from cattle in the pioneering picture, dry because of a dam in the modern picture, and flowing again because people all have water tanks in the future picture.'

Ask open-ended questions to prompt students to think about the task on a deeper level.

5. Revisit ideas generated in the 'hot potato' activity in the previous lesson, and ideas students have written in their journals. Ask students to highlight the ideas that fit best with their key ideas.
6. Hand out paper for preparing first drafts; allow students to enter the planning and experimenting phase of depicting the same watercourse at the time of Indigenous, pioneer, modern and future habitation. Encourage them to experiment with a range of art materials (paint, crayon, pastel, pencil) to find the one they believe will best communicate their key ideas.
7. Pair students and ask them to peer-review their partner's first drafts. Remind students that they should use the 'Student assessment task' sheet (Resource 1) to help give positive and constructive feedback—for example, 'Your pictures are well drawn but not in correct time sequence because people didn't drive cars in pioneering times.' Remind students that advice must be given and received in the spirit of helpfulness.
8. Inform students that visual artists respond to and reflect on their work to improve what they do. Let students know that they, too, will respond and reflect upon their's and others' artworks.

Facilitate students to respond to their artwork by reading and discussing the following questions. Allow students to think and answer the questions, either orally or as a written response.

- What ideas about changes in water use in your local area are you communicating in your artwork?
 - Which element or elements did you use? (For example... 'I used line or colour or shape or texture to communicate my water use ideas').
 - How have you used them? For example, 'I used different shades of green and brown to show the change in the number of trees in the area over time'.
9. Create final copies of the artistic sequence. Ask students to give their artworks a title that reinforces their key ideas, such as 'Small actions make big changes' or 'No water—no life'.

»Curriculum links

The Arts

Examine other works of art that are created as sequences.

Sing songs that have parts, such as rounds.

English

Write poems to accompany and extend the artworks.

Water reflections

» Lesson overview

In the previous lesson, students produced their artwork. In this lesson, students write the conclusions they have reached as a result of their learning journey. The evidence-based conclusions they have reached will be used to introduce and extend their artwork.

» Lesson objectives

Students know and understand that:

- interactions between people and places impact on physical features of the land, biodiversity, water and atmosphere.

» Equipment

For each student

- completed artwork
- student journal
- 'Student assessment task' sheet (Resource 1)

» Lesson steps

1. Plan the practical aspects of the art show, such as:
 - Where will it be held?
 - Who will be invited?
 - How will the art be displayed?
 - Which community members should be invited (local artists, media, guest speakers, representatives from the local council)?

Create invitations, or designate someone to create and send them out. Ask students for creative suggestions for ways that the class can make their water art show a special celebration.

2. Remind students that they are also writing a reflection about their learning journey. Review and discuss the 'Student assessment task' sheet (Resource 1).
3. Point out that knowledge and understanding of local water issues are an assessable element. Brainstorm these and write them on the board. Examples of local water issues include drought, algal bloom in a waterway, and the high cost of irrigation water.
4. Point out that students need to make conclusions backed by evidence. Practise doing this orally using the issues already identified—for example, 'I conclude that farmers in our catchment area are fertilising crops incorrectly. The evidence for this is the presence of algal bloom in some waterways which is caused by fertiliser run-off and cause fish to die.'

5. Ask students to read through their student journals to find the evidence and conclusions they have reached. Remind them to pay special attention to the key ideas that they have shown in their artworks because this is an assessable element.
6. Allow students to compose a first draft and good copy of their reflection.
7. Organise a time for students to practise reading their reflection to an informal audience, which will reinforce the need for them to speak audibly.

» Curriculum links

The Arts

Examine pictures of other artwork and try to decipher the key idea of the artist.

Art on show

» Lesson overview

In the previous lesson students wrote an evidence-based conclusion. This lesson provides an opportunity for students to respond to and reflect upon their's and others artwork.

» Lesson objectives

Students know and understand that:

- reflecting is a valuable learning tool and can improve understanding and inform future learning.

» Opportunities for assessment

The extent to which the students' artwork and reflection display a grasp of the Essential Learnings for the unit is assessed using the 'Guide to making judgements' (Resource 4).

» Equipment

For the class

- display space

For each student

- completed artwork
- completed reflection

» Lesson steps

1. Organise a member of the school or local community to open the art show.
2. Ask students to introduce their artworks and read their reflections one at a time.
3. Allow invited guests to tour the art show, providing feedback to the students.
4. Spend time with each student, assessing their tasks on the 'Student assessment task' sheet (Resource 1).
5. To conclude the unit, refer students to the 'Unit planner' (Resource 2) charts:
 - What have I found out?
 - How did I sort out this information?
6. Use a Think-Pair-Share strategy to encourage students to think about their own responses before sharing with the class. Ask the teams to share any new ideas with the class.

In a Think-Pair-Share activity, students spend some time individually thinking about and recording their ideas. They then share their ideas with a partner and decide on the list for their pair. Two pairs of students form teams of four to develop a team list.

7. At the end of the lesson, ask students to reflect on the 'What now?' chart of the 'Unit planner'. Pose the following questions to students:
 - What did you find difficult to do in creating your artwork?
 - What did you find easy to do in creating your artwork?
 - If you were to do the four art works again what would you change or do differently?

What within the visual arts would you like to learn more about? (e.g. 'I want to learn how to blend and use different colours'. 'I want to learn how ____ (classmate) created the different coloured backgrounds.')

Students could respond to questions using a Think, Pair, Share strategy.

» Curriculum links

The Arts

Visit a gallery to see other artists' work on show.

ICT

Create a virtual gallery of the class's work.

Resource 4

Assessable elements	Task-specific descriptors				
	A	B	C	D	E
<p>Task-specific assessable elements</p> <p>The Arts <i>Knowledge and understanding</i> <i>Creating</i> <i>Presenting</i></p> <p>Understands the use of artistic elements to express ideas for a particular audience.</p> <p>Creates artworks by using arts elements to show how a waterway has changed over time.</p> <p>Presents artworks to express ideas to an audience.</p>	<p>Demonstrates an accurate understanding of the use of artistic elements to express ideas about how a waterway has changed over time and how the waterway can be managed in the future. Creates artworks that show insight and skilfully use arts elements.</p> <p>Presents artworks with skill and control to express ideas.</p>	<p>Demonstrates a thoughtful understanding of the use of artistic elements to express ideas about how a waterway has changed over time and how the waterway can be managed in the future. Creates artworks that are informed and effective in their use of arts elements.</p> <p>Presents artworks effectively to express ideas.</p>	<p>Demonstrates a credible understanding of the use of artistic elements to express ideas about how a waterway has changed over time and how the waterway can be managed in the future. Creates artworks that are relevant and competent in their use of arts elements.</p> <p>Presents artwork credibly to express ideas.</p>	<p>Demonstrates a superficial understanding of the use of artistic elements to express ideas about how a waterway has changed over time and how the waterway can be managed in the future. Creates artworks that are variable in their use of arts elements.</p> <p>Variable presentation of artwork to express ideas.</p>	<p>Demonstrates a rudimentary understanding of the use of artistic elements to express ideas about how a waterway has changed over time and how the waterway can be managed in the future. Creates artworks that minimally use arts elements. Presents artworks minimally to express ideas.</p>
<p>Studies of Society and Environment <i>Knowledge and understanding</i> <i>Communicating</i></p> <p>Draws conclusions about how humans have affected a waterway.</p>	<p>Comprehensively explains how humans have affected waterways and how water resources can be managed sustainably. Draws well-justified conclusions about the effect of humans on a waterway.</p>	<p>Thoroughly explains how humans have affected waterways and how water resources can be managed sustainably. Draws thoughtful conclusions about the effect of humans on a waterway.</p>	<p>Competently explains how humans have affected waterways and how water resources can be managed sustainably. Draws relevant conclusions about the effect of humans on a waterway.</p>	<p>Disjointed explanation of the ways that humans have affected waterways and how water resources can be managed sustainably. Draws narrow conclusions about the effect of humans on a waterway.</p>	<p>Minimal explanation of the ways that humans have affected waterways and how water resources can be managed sustainably. Draws vague conclusions about the effect of humans on a waterway.</p>

Feedback.....