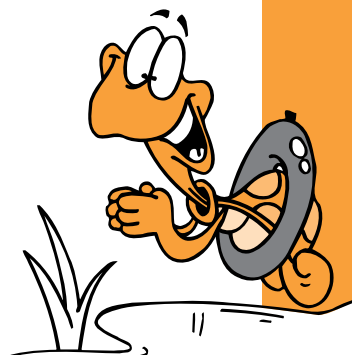


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The Salinity Sequence

I

FOCUS

- How does salinity occur?

OBJECTIVES

- Listen to / read the process of salinity
- Recall, sequence and illustrate the process of salinity

BACKGROUND

Background information can be found on the 'The Salinity Sequence' Student Worksheet or see Welcome 'Salinity Background'.

NOTES

This activity is designed as an introductory overview about salinity. If conducted at the beginning of the week, the concept may be quite unfamiliar to students. However, consolidation will come with the science experiments and other activities that follow. You may wish to have students complete the Extras activity, 'Salinity and Me' before commencing this activity.

LEARNING TASKS

- 1 Read the information sheet aloud to students or have them read it individually or in groups.**
 - Refer to the salinity poster when applicable.
- 2 Develop students understanding of the process by either:**
 - Discussing the information.
 - Cutting the pieces of information to put in sequence.
- 3 Students demonstrate their recall and knowledge of the process by any of the following methods:**
 - Make a pictorial flow chart of the process by choosing the main steps, illustrating them and writing brief captions.
 - Make a flow chart in groups with members taking responsibility for one step in the process.
- 4 Make a class mural to depict the various steps.**
 - Use any medium you like – hand drawn illustrations, painting, collage etc.

CSF II LINKS

- ENGLISH 4.1 Listening & Speaking
4.1 Reading
4.1 Writing
- THE ARTS 4.1 Art

MATERIALS

- 'The Salinity Sequence' Student Worksheet
- Salinity Poster (see back of folder)
- Illustration materials
- Art materials

EXTENSION

Paint a mural on the OUTSIDE of your classroom windows with paints diluted with dishwashing liquid. It will create a stimulating learning environment and, at the end of the week, it will wash right off!

ASSESSMENT

How well did students grasp the salinity process? What do their flow charts indicate about their depth of understanding? Can they retell the process to a peer?



The Salinity Sequence - Student Worksheet

Name _____



USE this information to make your salinity sequence.

Salinity is caused when the rising watertable brings natural salts in the soil to the surface.

----- ✂ -----
When it rains, water hits the ground and either runs off the surface, gets evaporated or soaks into the ground. Where vegetation is present, the water that soaks into the ground will filter down to a layer of plant roots.
----- ✂ -----

When the watertable rises, it dissolves salts that are locked up in the rocks and soils, and brings them to the surface of the ground.

When the watertable gets to within 2 m of the soil surface, it enters the plant root zone. The salt in the water limits plant growth and can kill plants.
----- ✂ -----



The dry soil sitting above the watertable soaks up groundwater (like how a piece of tissue sitting on a wet surface soaks up water). This is called **capillary rise**.
----- ✂ -----

Capillary rise brings very salty water to the soil surface. When the water evaporates, the salt left behind forms a crust on top of the soil. Many plants cannot tolerate salt, so they die.
----- ✂ -----

Areas where we can see these salty crusts, or where groundwater seeps or flows from the ground, are called **discharge** areas.
----- ✂ -----

Plant roots act like a sponge, soaking up water and drying out the soil. This is why trees and deep-rooted shrubs and grasses are so important.
----- ✂ -----

Recharge and discharge areas may be many kilometres apart. This means that farmers in one area may be suffering with salinity caused by problems many kilometres away.
----- ✂ -----

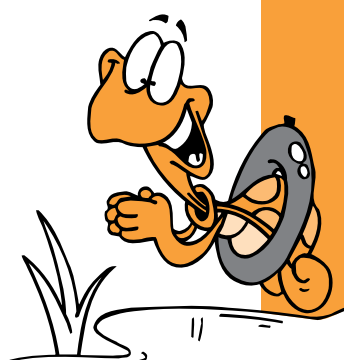
When the sponge created by tree roots is full, leftover water seeps further into the soil and is eventually stopped by layers of rock or clay.
----- ✂ -----

Landholders can plant native trees, shrubs and grasses (which have deep roots) to use up the water that seeps into the ground. This reduces salinity problems.
----- ✂ -----

The water begins to build up towards the surface as **groundwater**, flooding from below. The upper surface of this groundwater is called the **watertable**.
----- ✂ -----

Salinity is best managed by many landholders working together rather than by individuals working alone.

Regions where water soaks into groundwater are called **recharge zones**. They are often found on hillsides where fractured rocks are sticking out of the ground or are found close to the surface.
----- ✂ -----



What Can Be Done?



FOCUS

- How can salinity problems be managed?

OBJECTIVES

- Use a website to research specific information
- Skim read factual text and identify key words
- Use e-mail to share learning

BACKGROUND

See the Website for all necessary information. While technology is an important component of education programs, one limitation is that technology is constantly changing. If Internet access is a problem or you find that this website no longer works, see 'Resources - What Can Be Done' on the CD and alter the activity accordingly. You could also scan the web for alternate sites and activities prior to the lesson.

NOTES

This activity works well as a prerequisite to the SOSE activity, 'Everybody Makes A Difference', as students will have a greater awareness of ways to manage salinity. Part or all of the worksheet can be completed according to the time available.

LEARNING TASKS

- 1 As a whole class, in small groups or individually, go to the website: www.sheppstc.org.au
- 2 Students follow instructions, moving through the website via links to find the necessary information.
- 3 Throughout the session, students will be:
 - Completing comprehension questions
 - Finding out how your school could become involved
 - Sharing news about your school.

ANSWERS TO COMPREHENSION QUESTIONS

Part A

- 1 Lowering the watertable

Part B

- 1 Soil, water, vegetation, habitat, wildlife and climate
- 2 By using an EC Meter
- 3 Answers will vary e.g. to identify and manage salinity problems
- 4 Eucalypts and acacias
- 5 Lower high watertables, provide habitat and income and can be used as fodder
- 6 Where watertables are high and soil is already salt affected
- 7 Answers will vary e.g. to prevent stock eating plants
- 8 Waterwatch

CSF II LINKS

- ENGLISH 4.1 Reading
4.4 Reading
4.3 Writing

MATERIALS

- **Computers** with Internet access
- **'What Can Be Done?'** Student Worksheet
- **Pen / pencil**
- **'What Can Be Done'** Alternate Resource (see 'Resources' on the CD) (optional)

EXTENSION

Hold a class meeting to discuss the possibility of planning a revegetation project, applying for a salinity grant or participating in Waterwatch. Ideas could be forwarded to the Junior School Council.

ASSESSMENT

Could they locate and scan information on the Internet? Were they able to interpret text containing some unfamiliar ideas and information? Did students write accurate and well structured responses to comprehension questions, using appropriate vocabulary and punctuation?



What Can Be Done? - Student Worksheet

Name _____



Part A

ENTER the address: www.sheppstc.org.au

CLICK on the following links in turn; 'Education', 'Salinity Resource Centre Online', 'Salinity Explained' then 'Managing Salinity'.

READ the information here as an introduction to how salinity can be managed. The main point in the introduction is written in **bold text**.

FINISH this sentence.

The main salinity control options for farmers focus on _____

Part B

CLICK on the link, 'Salinity Control Options'.

READ the questions below so you'll be aware of the information you require.

SKIM READ the webpage. Remember skim reading is scanning text for headings and key words to find the information you're after, then reading word for word to locate the specific details you need.

ANSWER the questions below.

PROPERTY MANAGEMENT PLANS

1 When a farmer makes a plan, he considers all of his assets. These may include:

MONITORING SOIL & WATER SALINITY

2 How can farmers measure soil and water salinity?

3 Why do you think it would be important to find this information out regularly?

PLANTING DEEP-ROOTED TREES

4 Which native tree species are deep-rooted and thirsty?

5 Plantations of trees are effective because they

PLANTING SALT-TOLERANT SPECIES

6 Where would you plant salt-tolerant species?

FENCING OUT LIVESTOCK

7 Why do you think it is so important that livestock are kept out of regeneration areas?

MONITORING WATERTABLES

8 What is the name of the education program, which helps communities find out what is happening to the watertables in their area?

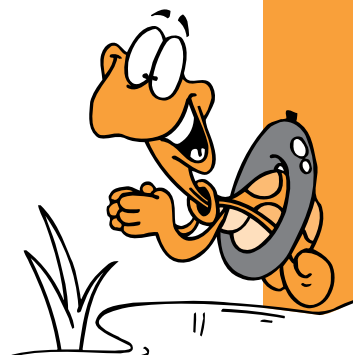
Part C

SCROLL to the top of the webpage and click on 'Teacher Resources' then 'Salinity Grants'.

READ about ways your school could get involved in Saltwatch.

SCROLL to the top, click on 'Saltwatch' and scroll down to the question, 'What has your school or Landcare group been doing as part of Saltwatch?'

CLICK on 'Email' to tell the Salinity Resource Centre what you are doing.



FOCUS

- What words are associated with salinity?
- What do they mean?

OBJECTIVES

- Use a dictionary to locate words
- Define salinity related terms in own words

BACKGROUND

The words listed on the following pages describe salinity causes, processes, impacts and management options. Salinity is a significant environmental problem, but there are ways we can work together to reduce its impacts. It is essential students have an understanding of these terms.

NOTES

This is a very flexible activity. Choose from the suggested learning tasks below according to your individual teaching style and student learning needs. You can add words to the list depending on your students understanding of the list provided

LEARNING TASKS

The worksheet could form a part of students salinity booklets and be completed gradually as terms are introduced and discussed in various learning tasks.

1 Hand out sheets for students to complete.

- Complete as a whole class activity or in small groups as a rotation activity in a literacy block
- Locate terms and definitions in dictionaries
- Students can copy definitions then articulate in their own words, or define the words using student's own understanding of the words.

2 Encourage students to use words on the list to construct sentences.

- To make an open-ended task, students could construct their own glossary and choose the terms they wish to include
- This activity could be conducted once in the week or several times as an assessment tool to evaluate existing knowledge and knowledge development.

3 Write definitions onto large pieces of card to be displayed around the classroom.

CSF II LINKS

- ENGLISH 4.1 Reading
4.3 Speaking & Listening

MATERIALS

- *'Salt Language'* Student Worksheet
- **Butchers paper** or large pieces of card
- **Markers**
- **Dictionaries** (optional)

EXTENSION

Make an illustrated dictionary for display. Add new words to the students' word list and learn through the English activity *'Pizza Smart Spelling'*.

ASSESSMENT

Can students locate words in a dictionary efficiently, making use of guidewords? Did students apply appropriate vocabulary to practical situations? Did students increase their understanding of salinity concepts?



Salty Language - Student Worksheet

Name _____



WRITE the definition of each word below.

• Agriculture _____

• Catchment _____

• Crops _____

• Desalination _____

• Discharge _____

• Dryland Salinity _____

• Evaporation _____

• Landcare _____

• Pasture _____

• Perennial _____

• Precipitation _____

• Recharge _____

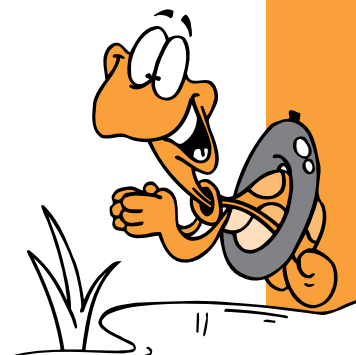
• Revegetation _____

• Salinity _____

• Transpiration _____

• Vegetation _____

• Watertable _____



FOCUS

- How do I use different words?

OBJECTIVES

- Identify parts of speech in written text
- Differentiate between grammatical forms of words
- Insert appropriate parts of speech into sentences

BACKGROUND

Salinity is an enormous environmental, economic and social problem in our community. By using creative and well structured sentences, students are able to describe and comment on salinity issues in a variety of ways. This will help students to motivate others to take action.

NOTES

These grammar activities can be completed one at a time by the class or as rotation activities by small groups during a literacy block. These grammar activities will help students in various writing tasks throughout their studies.

LEARNING TASKS

Students complete worksheets individually or in groups.

Activity 1 - Nouns and Adjectives

- Students identify nouns in written text
- Sort them as common / proper nouns
- Identify adjectives in a descriptive paragraph
- Add appropriate adjectives to describe given nouns.

Activity 2 - Verbs and Tense

- Students identify 'doing' verbs in written text
- Write verbs as suitable actions for given nouns
- Label sentences according to past, present or future tense
- Complete a crossword, changing verbs into past tense.

Activity 3 - Word Building

- Read of related words built from the base word 'salt'
- Observe how word building changes a word's grammatical form
- Identify salinity related words as nouns, verbs or adjectives
- Build base words by adding prefixes and suffixes.

Activity 4 - Play scattegories to conclude these activities.

- Given a letter of the alphabet students must think of as many nouns / verbs / adjectives that begin with that letter within a given time limit .

CSF II LINKS

ENGLISH 4.3 Reading
4.3 Writing

MATERIALS

- 'Groovy Grammar' Student Worksheets
- Dictionaries (optional)

EXTENSION

The English activity, 'Poetry with Pizzazz' is an excellent way to consolidate grammar skills and apply them in a practical context to enhance the descriptive nature of written text.

ASSESSMENT

Did students identify parts of speech in text? How well could they add appropriate nouns, verbs and adjectives to text, differentiate tense and build words from base words?



Groovy Grammar - Student Worksheet 1

Name _____



Activity 1 - Nouns and Adjectives

1 Nouns are naming words.

- Common nouns** - everyday objects e.g. boy, river, pencil, gate.
Proper nouns - names of important things such as people, places, books, days and months e.g. Anne, May, Bendigo, Lord of the Rings. These nouns begin with capitals.

a Circle the nouns in the following paragraph and sort them into the table on the right:

During August, Saltville held several meetings to discuss the problem of salinity. Tom, a local farmer, spoke about how his farm had changed. The soil and water had become salty and his stock and crops were deteriorating. 'The Salty Times' published an article about the event on the following Wednesday.

COMMON NOUNS	PROPER NOUNS

2 Adjectives are describing words.

- Adjectives** - notice how the underlined adjectives make these nouns much more interesting:
enormous tree narrow creek prosperous farm enthusiastic community

a Underline the adjectives in the following paragraph and circle the nouns that are described.

The energetic Landcare group dug dozens of deep holes to plant the healthy, young seedlings. The bare ground would soon be covered with thirsty trees and the rising watertable would hopefully subside. Native animals might return to this new habitat one day.

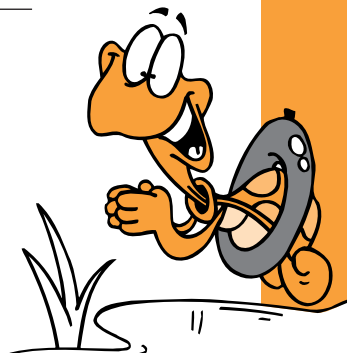
3 Add an adjective to describe the nouns below.

_____ soil _____ environment
_____ farmer _____ water

4 Add a noun that each adjective could describe.

rising _____ salty _____
angry _____ deep _____

5 Write your own descriptive paragraph below. Underline any verbs you wrote and circle any nouns.



Groovy Grammar - Student Worksheet 3

Name _____



Activity 3 - Word Building

From a base word, related words can be built by adding letter groups at the beginning (prefixes) and letter groups at the end (suffixes). Part of the base word can be removed when making a related word.

Base word	Related words
salt	salty, saltier, unsalted, saltiest, saline, salinity, desalinate (the 't' in 'salt' has been removed to make these)

Changing the base word usually changes its part of speech. For example, 'salt' can be used as a noun but the words built from it may be adjectives or verbs.

- 1 For each of the words in bold below, identify if it is a noun, verb or adjective and shade it BLUE if it is a noun, RED if it is an adjective and GREEN if it is a verb.

When **salty** seawater is **desalinated**, it becomes drinkable.

Dryland **salinity** refers to **salinity** that occurs in non-irrigated farming areas.

The concentration of **salt** in soils and water is measured in EC units.

Adding **salt** to water produces a **saline** solution.

Urban **salinity** occurs when watertables rise in towns.



- 2 **CHALLENGE** The word 'salt' is not a noun in the sentence below. What part of speech is it?

The drover knew he must **salt** the meat to make it last the long, hot journey.

- a Use your own ideas to build the base words below and make related words.

Base word

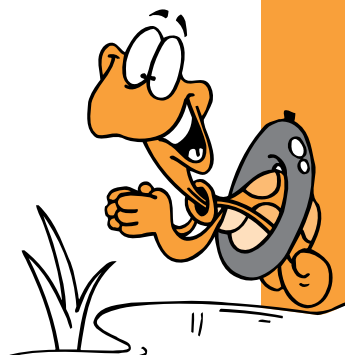
plant

Related words

- b Put three words you built into sentences, identify if they are nouns, verbs or adjectives and shade them: BLUE if they are nouns, GREEN if they are verbs and RED if they are adjectives.

- 3 **CHALLENGE** Like 'salt', 'plant' can be two different parts of speech depending on how it is used.

It can be a _____ OR it can be a _____



FOCUS

- How can I learn my salinity spelling words?

OBJECTIVES

- Apply a variety of strategies to learn spelling words
- Evaluate and identify preferred learning styles

BACKGROUND

'Pizza Smart' is based on the idea that everyone can be 'smart' in different ways. Assisting students to identify which 'smart' they will help them to learn salinity concepts more easily. The North Central Catchment Management Authority organises learning opportunities based on different 'smarts'.

NOTES

The terms used throughout this themed week, see English activity, '*Salty Language*', can be used to form your students' spelling list. Complete the spelling activities during class time or as homework tasks.

LEARNING TASKS

1 Work with students through the activities described below to determine which 'smart' they are.

• BODY SMART

Trace words on each others' backs or manipulate playdough to make words. Skip, jump or bounce a ball as you say letters, clap syllables, make letters with your body or write words in the air or sand.

• LOGIC SMART

Make your own dictionary by listing words and their meanings, sort words according to criteria e.g. syllables, spelling rules, patterns.

• SELF SMART

Devise tricks to remember words, keep a journal, test yourself, study the look / sound of words and use imagination to remember them.

• MUSIC SMART

Sing your spelling words. Words with six letters can be sung to 'Happy Birthday' and seven letters to 'Twinkle Twinkle'.

• WORD SMART

Break words into syllables, look for patterns, look-up meanings, create sayings e.g. to remember 'piece' you can say a 'a piece of pie'.

• PEOPLE SMART

Play noughts and crosses or hangman using spelling words, have conversations with family where you speak by spelling out words.

• PICTURE SMART

Make and illustrate a poster, paint words, jumble / unjumble words.

MATERIALS

- Dependent on which 'smart' activity you are coordinating

EXTENSION

Students make comments about Pizza Smart Spelling in their salinity booklets. Which strategies did they enjoy? Which strategies assisted them?

ASSESSMENT

Conduct a pre-test at the start of the week and a post-test at the end. How have student spelling results changed?



Be A Super Salinity Scientist



FOCUS

- How is a science experiment conducted?
- How is a science report written?

OBJECTIVES

- Scan an Internet website to study a written genre
- Insert details to complete a written science report

BACKGROUND

Scientific experiments are an important way of determining and finding solutions for problems within our environments. Designing and conducting experiments is vital for producing accurate and useful results. These results would affect treatment options in addressing salinity issues.

NOTES

This activity is a vital step in developing students' understanding of the science report genre. It should be completed before students write their reports of science activities. If Internet access is a problem or you find that this website no longer works, see '*Resources - Be A Super Salinity Scientist*' on the CD and alter the activity accordingly. You could also scan the web for alternate sites and activities prior to the lesson.

LEARNING TASKS

1 As a whole class, in small groups or individually, students go to the website:

<http://members.optushome.com.au/wingchan1/ian/salinity/>

2 Students follow instructions, searching the website via links to scan information, locate relevant details and complete the unfinished science report.

3 Discuss the structure of a science report.

- Common features (aim, method, results, discussion, conclusion)
- The need for specific details and clear, step by step instructions
- The language used in each part
- The use of diagrams and captions
- The difference between results and conclusions

4 Discuss the bean experiment.

- Why did Ian stop and take results when he did?
- What practical applications do Ian's conclusions have?

CSF II LINKS

- ENGLISH 4.1 Reading
4.3 Reading
4.4 Reading

MATERIALS

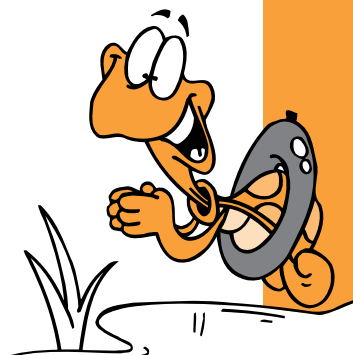
- **Computers** with Internet access
- **Coloured pencils**
- '*Be A Super Salinity Scientist*' **Student Worksheet 1 & 2**
- '*Be A Super Salinity Scientist*' **Alternate Resource** (see 'Resources' on the CD) (optional)

EXTENSION

Go on to read Experiment 3 on the website and prepare an oral summary for the class.

ASSESSMENT

Were students able to identify the typical features of the science report and explain the purpose of each element? Could they locate and scan information on the Internet?



Be A Super Salinity Scientist - Student Worksheet 1

Name _____



ENTER the address: <http://members.optushome.com.au/wingchan1/ian/salinity/>

CLICK on 'My Experiments'.

READ experiment 1, taking note of the four water solutions used and the way the report has been written in sections.

FILL IN the headings for each section of the science report on your worksheet.

CLICK on the link to 'Page 2'.

READ experiment 2 carefully.

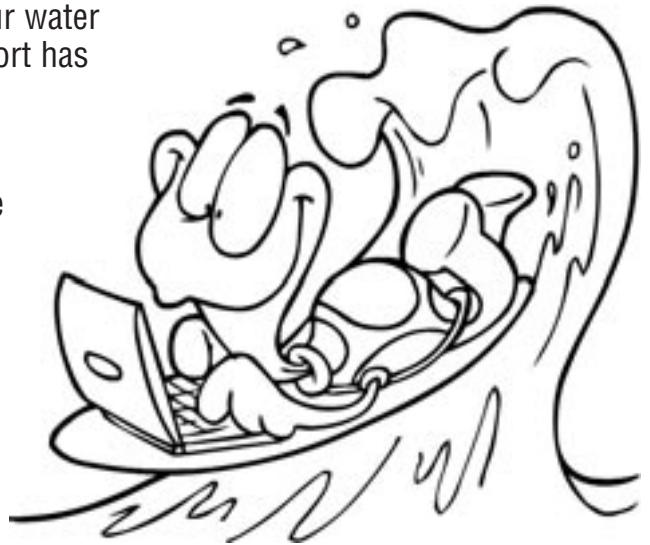
COMPLETE your work.

HINT details about the four solutions in the Method cannot be found on this web page. Can you remember where you read about them on this site?

CHECK your work.

CLICK on 'Home' and locate details about the author of these science experiments, reports and this web page.

WRITE those details at the bottom of your worksheet to complete the science report.



Be A Super Salinity Scientist - Student Worksheet 2

Name _____



An experiment with beans

Date _____

To study the effects of _____ on the _____.

I put _____ in four different jar lids and wet them with the four different solutions of water:

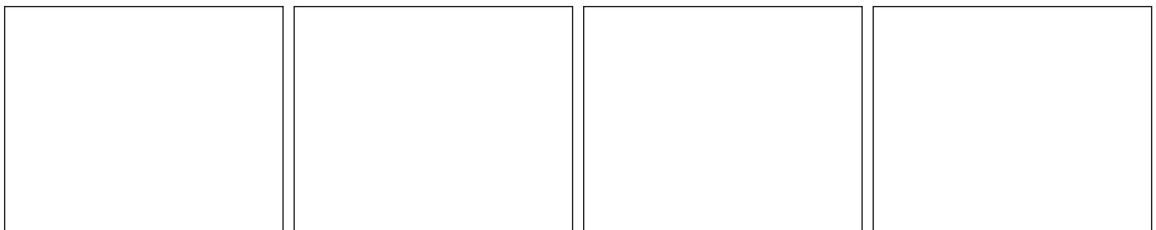
- A 2 cups of water with _____
- B 2 cups of water with _____
- C 2 cups of water with _____
- D 2 cups of water with _____

_____ were put in the cotton wool to see how they'd germinate. Three types of beans were used. They were _____, _____ and _____. Results would be taken when the beans in Solution _____ had all started to germinate.

On _____ I observed the beans in this experiment. The results from the four solutions are as follows:

- A No salt _____ have started to germinate.
- B 5 ml of salt Some green beans and some chick peas have started to germinate.
- C 10 ml of salt Only _____ green bean has started to germinate. Chick peas and red beans showed nothing.
- D 20 ml of salt _____.

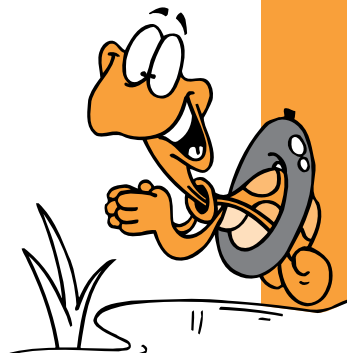
Fill in the pictures below



- A All beans have started to germinate.
- B Only some beans and some chick peas have started to germinate.
- C Only one green bean has shown signs of germination.
- D There were no signs of germination.

The experiment shows that salinity has _____ on the germination of seeds. It also shows that the _____ was the most salt-tolerant of the three different seeds, followed by the _____. The red bean was the _____ and was therefore most affected by salinity.

Source: Ian Chan, Year 5 student, Remeemer Baptist School, Sydney



FOCUS

- What creative images does salinity / salinity management inspire?

OBJECTIVES

- Study the structure of a Diamante Poem
- Brainstorm and select appropriate vocabulary
- Write and publish a Diamante Poem

BACKGROUND

Our environment has provided stimulus for many poets. Environmental problems including salinity can be very emotive. Students can express their feelings about environmental change through this activity. As further background, you may consider looking for poetry in your school or public library that deals with salinity or other environmental issues.

NOTES

Diamante Poems have a rigid structure based on grammatical forms. This activity compliments the English activity, 'Groovy Grammar'. Completing a Cinquain Poem is a simple alternative for students. It has four lines, the first two as per a diamante, line 3 is a short sentence about line 1, and line 4 is a repeat of line 1.

LEARNING TASKS

- 1 Display the Diamante Poem example on an overhead transparency.**
 - Read the poem as a class, discuss the words used, their purpose and their effectiveness
 - This example could also be photocopied and given to students as a model to help with their poems.
- 2 Brainstorm with students to create a list of salinity related words and their opposites, this will give students examples of poem topics. Your list may include:**
 - healthy tree / dead tree
 - wheat / lucerne
 - forest / field.
- 3 Write a poem as a class, using brainstorming and negotiation.**
- 4 Students select a topic and plan their poems.**
 - Brainstorm to compile a list of words.
- 5 Students edit their work with a peer or teacher, analysing word choices as the first priority then checking punctuation and spelling.**
- 6 Publish poems by hand or on computer, then illustrate and share.**

CSF II LINKS

- ENGLISH 4.1 Writing
4.3 Writing
4.4 Writing

MATERIALS

- 'Poetry with Pizzazz' Teacher Task Card
- Thesaurus'
- Materials for publishing

EXTENSION

Compile poems to make a class book and either send it to another school or to your Regional Waterwatch Coordinator.

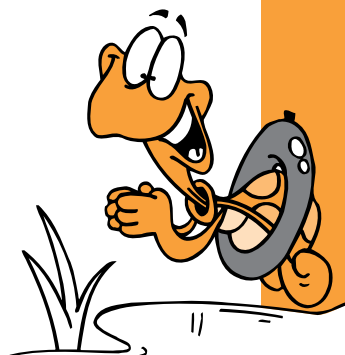
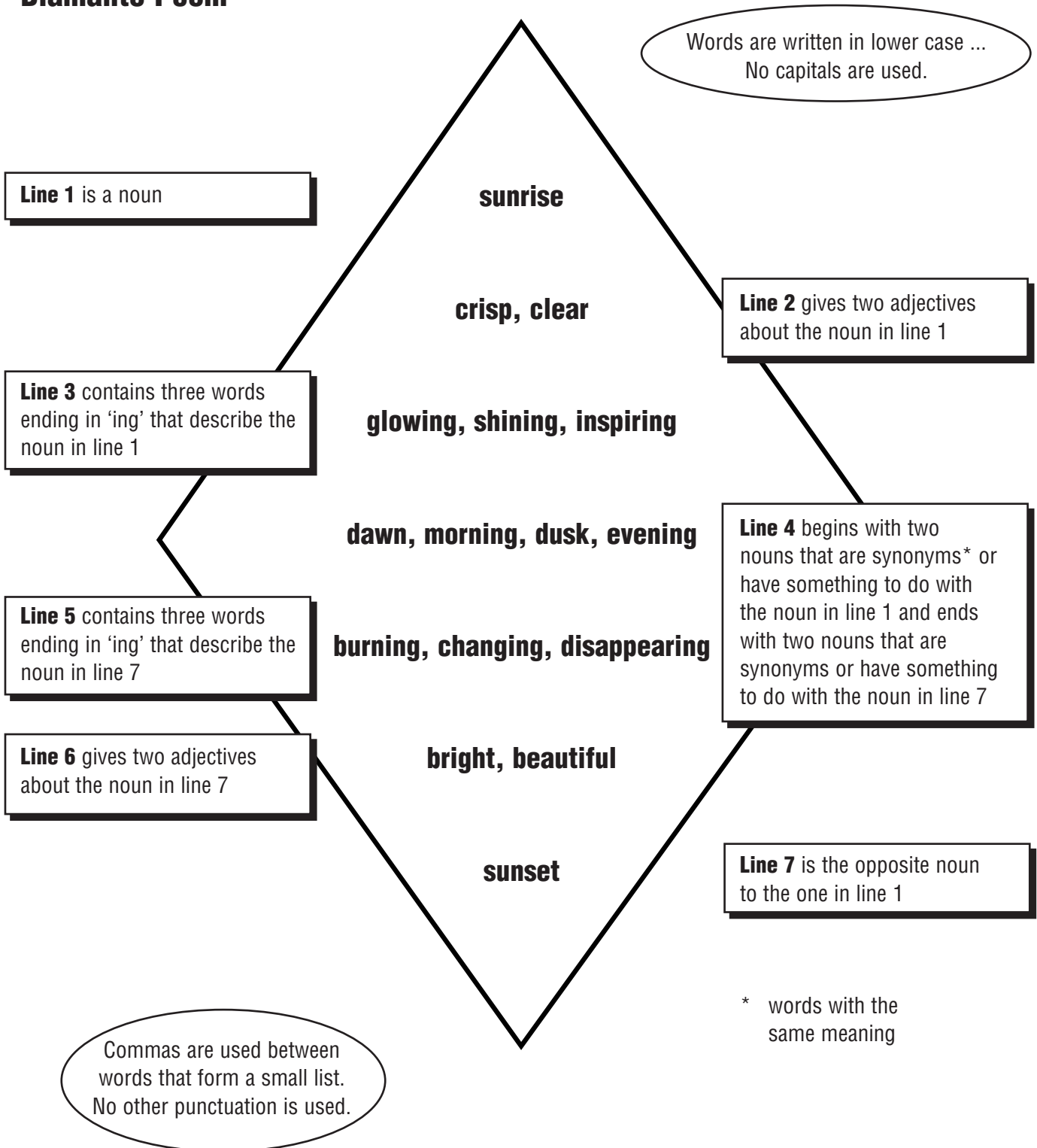
ASSESSMENT

Were students able to generate expressive poems by using descriptive vocabulary? Did they follow the structure of Diamante Poems?



Poetry With Pizzazz - Teacher Task Card

Diamante Poem



FOCUS

- Who is tackling the salinity issue and how?
- How can we diversify to use salt positively?

OBJECTIVES

- Study the structure of a newspaper report
- Discuss and summarise salinity related issues

BACKGROUND

The people involved in dealing with salinity issues range from experts in the field of natural resource management to community groups such as Landcare and individual landholders. The methods used and the success rates of management options vary, depending on how big the problem was to begin with and what resources are available.

NOTES

This activity can be implemented as a guided reading session with small groups or the whole class during Literacy Block. Numerous reading and writing activities can be generated from these recent media reports that examine a wide variety of salinity related issues.

LEARNING TASKS

- 1 Choose one or two newspaper articles to use as a media study.**
 - The articles provided cover the topics of salinity management planning, research and local action to reduce salinity impacts
 - Identify and discuss the features of a newspaper report, the details provided in each section and the vocabulary used
 - Use the articles in Guided Reading sessions, using the teacher notes provided as the basis for discussion and analysis.
- 2 Students read newspaper reports, highlight the main points then prepare a written or oral summary of the issue.**
- 3 Groups, or individuals within groups, prepare oral summaries and report back as 'experts', sharing the main details and answering questions from the group.**
- 4 Use the texts to study grammar and punctuation or revise research skills such as locating key words.**
- 5 Students generate comprehension questions from the text for their peers to answer.**

CSF II LINKS

- ENGLISH 4.1 Writing
4.1, 4.2, 4.3, 4.4
Reading
4.1 Speaking &
Listening
- SOSE 4.2 Geography
4.1 Economy & Society

MATERIALS

- *'The Salty Times' Student Worksheets 1, 2 & 3*
- **Computers** with Internet access (optional)

EXTENSION

Examine an issue in your local area and write a newspaper report about it. Consider ways in which the texts read may instigate opportunities for community involvement. Invite local farmers to your school to share their own experience with salinity.

ASSESSMENT

Could students identify both explicit and implicit messages in the text? Were they able to identify main points and supporting details. Were they able to summarise information?



The Salty Times - Student Worksheet 1

Name _____



READ the article below and answer the questions.

Innovative plan to tackle dryland salinity

Dryland salinity in North Central Victoria will be tackled in a strategic plan released by North Central Catchment Management Authority (NCCMA) today.

The Draft Second Generation Dryland Salinity Management Plan was produced by NCCMA in partnership with the Department of Primary Industries (DPI) and community representatives, with funds from the National Action Plan for Salinity and Water Quality and the Victorian Government.

It provides a fresh approach to the control of dryland salinity, building on lessons from the past to improve the outlook for the future management of this key environmental issue.

According to NCCMA Board Member, Terry Simpson, the Draft Plan is an innovation in salinity planning built on experience and knowledge obtained over the past ten years.

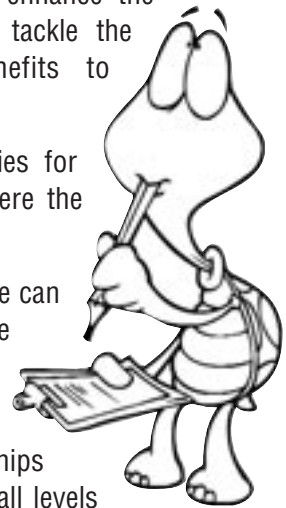
“Dryland salinity has long been recognised as one of the main threats to natural resources, agricultural production, water quality and infrastructure in the North Central Region,” said Mr Simpson.

“By changing our approach to salinity management, we expect to achieve long-term economic, social and environmental improvement, enhance the capacity of communities to tackle the problem and provide benefits to downstream water users.”

“This Draft Plan sets priorities for action across the region, where the Plan will be implemented.”

“The aim is to invest where we can make a difference and get the best return on investment,” he continued.

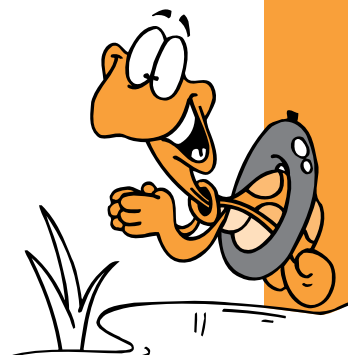
This plan relies on partnerships between the community and all levels of government to ensure the success is seen by future generations. Members of the community are invited to comment on the plan which can be downloaded from the website at www.nccma.vic.gov.au/whatsnew/whats_new.htm



Article adapted from NCCMA media release 14 April 2003

Notes

- What does NCCMA stand for and what are they responsible for?
- How might this plan help the environment?
- In what ways might it also help local economies?
- How has NCCMA assisted in the development of this plan?
- Why has this plan been made available to the community for comments?
- How does this article make you feel?
- What details are provided in the introduction, body and conclusion?
- Research the NCCMA further by visiting the website: www.nccma.vic.gov.au



The Salty Times - Student Worksheet 2

Name _____



READ the article below and answer the questions.

Salt-tolerant wheat helps Aussie farmers

Australian farmers living with salt-affected land will soon benefit from a variety of 'durum' wheat sourced from ancient Persia.

Italian pasta makers consider Australian durum wheat the best quality in the world but its sensitivity to salt has limited where it can be grown.

The new variety, bred by CSIRO Plant Industry and NSW Agriculture, will give farmers in salt-affected areas the opportunity to grow durum wheat and attract its higher prices, while increasing Australia's world market share in premium wheat.

"There are two ways salt tolerance occurs in cereals," says Dr Rana Munns, senior research scientist at

CSIRO Plant Industry. "One is the exclusion of salt by the plant's roots, the other is tolerance of salt in the leaves. Bread wheat has one and barley has the other, but modern durum wheat has neither."

Dr Munns and Dr Ray Hare, from Enterprise Grains Australia, discovered an ancient salt-tolerant durum wheat variety that excluded salt. The team were able to breed the tolerance of the ancient wheat variety into current Australian varieties.

"Our test results show that the new durum wheat has salt tolerance,



giving growers in salt-affected areas an alternative profitable crop," says Dr Munns.

"If field trials are successful, a salt-tolerant durum wheat variety could be available to growers within three years."

The research is a collaborative project between CSIRO and NSW Agriculture, with support from the Grains Research and Development Corporation (GRDC).

Article adapted from CSIRO media release 12 December 2002

More information - Dr Rana Munns, CSIRO Plant Industry.

Media assistance - Tony Steeper, CSIRO Plant Industry.

Notes

- Where has the information in this article come from?
- How does the headline make you feel?
- What do the words in the headline tell you before you even read the article?
- What mood does the introductory paragraph set? How?
- Why can this new wheat plant tolerate salt when others can't?
- When will this new variety of wheat be available?
- What advantages would this new plant have for farmers?
- How might this salt-tolerant crop help reduce salinity impacts?



The Salty Times - Student Worksheet 3

Name _____

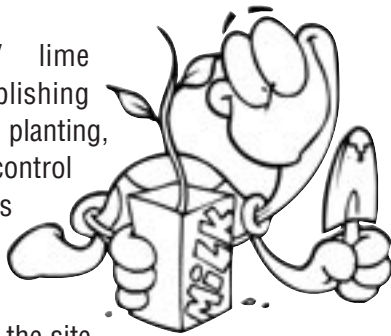


READ the article below and answer the questions.

Farmers take charge

Upper Bet Bet farmers Rob and Lyn Bright are working with the Department of Primary Industries (DPI) Dryland Salinity Program to develop a demonstration site showing the benefits of combining a range of options to address salinity, coupled with severe erosion.

Trialling gypsum / lime applications, re-establishing ground cover and tree planting, together with erosion control earthworks make this site interesting to other farmers.



Activities undertaken at the site are funded through the North Central Dryland Salinity Program, supported by the North Central Catchment Management Authority and funded by the National Action Plan for Salinity.

Bare salt scolds bordering extensive gully erosion was already present when Rob and Lyn purchased the property three years ago. The property, although generally productive, is intersected by an extensive,

badly eroded gully system that drains into the Bet Bet Creek.

“This area of the catchment exports more than 1 000 kg over hectare of salt annually into the creek” reports Rob.

Local tree species, suited to the site were plant around the entire area. Waubra Primary School students planted 750 trees. “They learnt about the value of trees and examined a direct seeding machine” said Rob.

Rob has erected a sign to recognise the efforts of the students. He says “It is great that they can follow the growth of the trees over the coming years to see the effect of their work.”

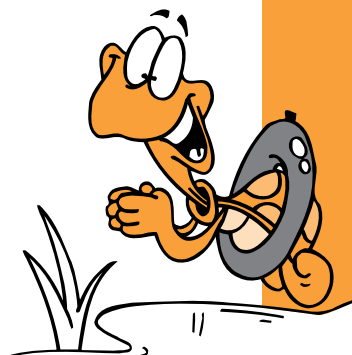
Lyn Bright says the demonstration site was a great tool for other farmers to use when considering how to tackle their own erosion and salinity problems.

“We are using deep-rooted perennial grasses to revegetate hillsides that are the upper catchment for the gully. This will help us to achieve our ultimate goal of tackling the cause of the problem rather than the symptom” concluded Lyn.

Article adapted from Department of Primary Industries media release 14 July 2003

Notes

- Who are the farmers featured in this article?
- What moods are created in the introduction, body and conclusion of the article? Why?
- Can you use an atlas to locate the creek affected by the property?
- Who assisted the Brights with funding to improve their farm ?
- Why do you think the school students were involved in the planting?
- What positive steps has the Brights been taking to combat the salinity problem?
- If you could speak to the Brights, what would you say?
- The conclusion of the article contains a message. What is the moral of the article?



FOCUS

- What are the effects of salt on controlled experiments?

OBJECTIVES

- Conduct an oral presentation in front of the class
- Evaluate the oral presentations of class members

BACKGROUND

Creating community awareness is a large part of managing issues in the environment. An effective method for addressing an issue or revealing new information is through oral presentations.

NOTES

Students' prior experience with public speaking will determine how this activity is run. The evaluation sheet provided can be used by you and by students to evaluate each of the presentations. This activity provides a follow-on for presenting results from science activities.

LEARNING TASKS

- 1 After completing written science reports, students share their expertise with the class in the form of an oral presentation.**
- 2 Explain to students the key components of their oral presentations.**
 - Outline their experiment, state results, report conclusions and explain inferences made about the relationships between their experiment and salinity in our natural environment.
- 3 Encourage students to use visual aids to support verbal explanations.**
 - This may include setting up the experiment in front of the class or displaying diagrams. Allow question time.
- 4 While oral reports are presented, the teacher and students complete evaluation sheets.**
 - Evaluations should be shared to provide feedback for presenters.
- 5 Students complete evaluations in their salinity workbooks.**
 - What were my strengths?
 - What worked well?
 - What and how could I improve for future presentations?

CSF II LINKS

- ENGLISH 4.1 Speaking & Listening
4.2 Speaking & Listening
4.3 Speaking & Listening
4.4 Speaking & Listening

MATERIALS

- *'You Be The Expert' Student Worksheet*
- **Students science reports** and any necessary props / diagrams they have prepared to assist them.

EXTENSION

Oral presentations could be recorded on video and played back for a visual evaluation by students. Take your reports to NCCMA to show staff and visitors.

ASSESSMENT

How did students organise subject matter, present an experiment summary, adjust pace, volume and pitch and use facial expressions and gestures when speaking? How did they respond to audience feedback? How insightful were students' comments about their own performances?



You Be The Expert - Student Worksheet

Name _____



Experiment title _____

Presented by _____

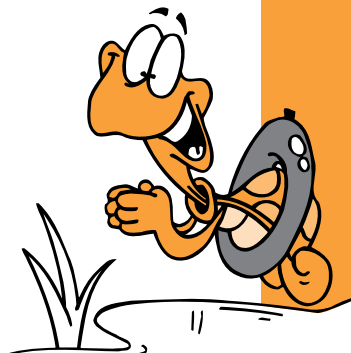
Place a cross on each line to comment on the presentation.

	Needs improvement	Satisfactory	Very well done
• State the aim of the experiment clearly	_____	_____	_____
• Outline the materials used	_____	_____	_____
• Describe the methods used	_____	_____	_____
• Understand and report results	_____	_____	_____
• Briefly and clearly state conclusions	_____	_____	_____
• Relate the experiment to salinity problems in our environment	_____	_____	_____
• Speak at a suitable pace	_____	_____	_____
• Speak at a suitable volume	_____	_____	_____
• Say words clearly	_____	_____	_____
• Use diagrams or props	_____	_____	_____
• Respond to audience questions	_____	_____	_____
• Use effective body language	_____	_____	_____
• Maintain eye contact	_____	_____	_____

If the oral presentation was a group performance, how did they:

• Share the speaking between members	_____
• Change speakers	_____

What could have made this presentation even better?



FOCUS

- If I were a part of the environment and affected by salinity, what experiences would I have?

OBJECTIVES

- Adopt the identity of a living or non-living thing
- Write a creative piece of fictional text while in role

BACKGROUND

Salinity affects both the non-living and the living components of an ecosystem. The effects of salt on the living components may be quite severe including animal migration, illness / disease, deaths and changed species. Non-living components may also deteriorate e.g. a road might crack, or buildings can be damaged.

NOTES

To immerse themselves in a role and express what their character sees, hears, feels, smells and tastes, students will require quite a solid knowledge of salinity issues. This is a cross-curricular activity with the possibilities only limited by students' imaginations.

LEARNING TASKS

- 1 Students take on the identity of a living or non-living thing and write an account of their experiences during one day.**

Character choices may include:

- Non-living: soil, a riverbank, lake, fencepost, windmill
- Living: fish, native plant, salt, beetle, frog, tree.

- 2 Students select a format in which to write a creative piece.**

Choices could include:

- A cartoon strip
- A short story
- A letter (e.g. a windmill might write a letter to the farmer).

- 3 Students plan their writing according to their chosen format, considering the setting, characters, plot, structure and time frame.**

- 4 Students write their pieces, paying attention to the five senses.**

What will they see, hear, taste, smell and feel?

- 5 Give students opportunities to share their work with others, then revise and edit their pieces with a teacher or peer.**

- 6 Review a format for publishing the student's work and complete this final stage of the writing process.**

CSF II LINKS

- ENGLISH 4.1 Writing
4.2 Writing
4.3 Writing
4.4 Writing

MATERIALS

- **Writing materials**
- **Dictionaries** (optional)
- **Thesaurus** (optional)

EXTENSION

Published pieces could be: compiled into a class book for fellow students or parents; dramatized for junior students; recorded onto audio tapes and donated to the Junior School's listening posts; or printed in the school newsletter.

ASSESSMENT

Were students able to generate creative ideas, apply interesting vocabulary, use punctuation, use resources and confer with others to enhance their writing? What does their piece show about their knowledge of salinity issues?



FOCUS

- How would a salt afflicted setting affect the storyline of well-known fairy tales?

OBJECTIVES

- Read and retell well-known fairy tales
- Rewrite fairytales, altering plot, setting and characters

BACKGROUND

By adapting their own fairy story set in a salinity affected world, students will gain a clearer understanding of the ways in which salinity impacts. Salinity can affect living and non-living components of the story including, plants, wildlife, buildings and roads.

NOTES

Time invested in reading and retelling well-known fairy tales will be a valuable chance for students to revisit them and prepare for the task. This activity could be carried out as a discussion or as the week's major writing piece.

LEARNING TASKS

- 1 Read well-known fairy tales aloud, to refamiliarise students with the storylines, characters and plots. Fairy tales may include:**
 - Snow White and the Seven Dwarfs
 - Jack and the Beanstalk
 - Hansel and Gretel
 - The Three Little Pigs.
- 2 Discuss the settings, characters, plot and morals of the stories.**
- 3 Consider the way each story would be altered if the worlds in which they took place were afflicted by salinity. For example:**
 - Would Jack's beanstalk have grown so vigorously?
 - Could Little Red Riding Hood have picked so many flowers?
 - Would Sleeping Beauty have been surrounded by forest?
- 4 Students plan and rewrite a fairy tale, modifying the setting, plot and characters, applying knowledge gained during Saltwatch Week.**
- 5 Publish finished stories, read onto an audio tape or dramatise.**

CSF II LINKS

- ENGLISH 4.1 Reading
4.2 Reading
WRITING 4.1 Writing
4.2 Writing
4.3 Writing
4.2 Speaking & Listening
THE ARTS 4.1 Drama

MATERIALS

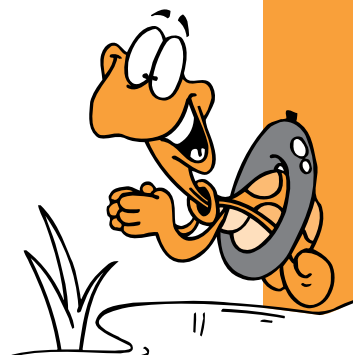
- Fairy tales
- Writing materials
- Audio tapes and recorder
- Props for drama

EXTENSION

The fractured fairy tales could be: presented to junior students; recorded onto audio tapes and donated to the Junior School's listening posts; or published in the school newsletter.

ASSESSMENT

How imaginative were students' fractured fairy tales and how well did they apply knowledge of salinity in their modifications to setting, plot, characters and morals?



FOCUS

- How do actions affect all members of a catchment?
- How can communities deal with salinity issues?

OBJECTIVES

- In role, identify pros and cons of various scenarios
- Understand how catchments are interdependent

BACKGROUND

The health of a catchment is often reflected in the health of its waterways. Catchments are affected positively and negatively by the activities of residents and community members. It is important to understand how people affect the environment and each other.

NOTES

This activity can be adapted to reflect real local issues. For example, your community may have relied on wool / cattle / fruit / tourism, now land must be cleared for crops / a shopping center / winery / tourist park etc. This is a fantastic activity for the teacher to take a back seat role, enabling students to have ownership.

LEARNING TASKS

- 1 Read 'Dilemma for Pete and his town' on task card 1.**
 - Discuss some the situation and potential concerns for Pete, the environment and the community.
- 2 Fill in the blanks for the 'A Dilemma for _____' story. Display on an overhead transparency and discuss the issues and identify key terms, major points and supporting details.**
 - How the action may benefit the community and catchment
 - How the proposed action may have a negative impact
 - Who / what needs to be considered when formulating a solution
 - Why individuals may have different views about managing salinity.
- 3 Assign roles to students using task card 2.**
 - Brainstorming opinions, arguments and supporting details
 - The Chairperson needs to guide the discussion, inviting participants to have their say or right of reply, keeping the discussion on the subject and promoting solution seeking.
- 4 Prepare for the town meeting by arranging tables and chairs and setting rules for debating (all opinions are heard and valued).**
- 5 Conduct the town meeting.**
 - The aim of the meeting is to reach a point where all parties compromise and agree on a plan for the future.
- 6 Act as secretary, taking the minutes by writing pros, cons and compromises on the board as the meeting progresses.**

CSF II LINKS

- ENGLISH 4.1, 4.2, 4.3, 4.4
Speaking & Listening
4.4 Reading
4.1 Writing
- THE ARTS 4.2 Drama

MATERIALS

- Overhead transparency of 'Debating a Dilemma' Teacher Task Cards 1 & 2

EXTENSION

In role, students write a mock letter to the editor expressing their views.

ASSESSMENT

Were students able to prepare information and opinions for the context at hand, adopt an appropriate verbal style to suit the needs of the audience and respond to others views?



Debating A Dilemma - Teacher Task Card 1

Dilemma for Pete and his town

Farmer Pete owns a well-forested property in the hills of the Avoca River catchment. Due to the low price of wool and the increase in management costs, many graziers have been looking for alternative enterprises. Pete wants to clear his land to grow crops. The local community are concerned that the clearing will cause the watertable to rise and bring salt to the surface. Pete decided to call a town meeting to address the problem and come up with possible solutions.



A Dilemma for _____

Your town is currently facing some serious environmental, economic and social issues. For many years, the community has prospered, enjoying the success of the _____ industry.

However, due to changing times the community is now in a situation where _____

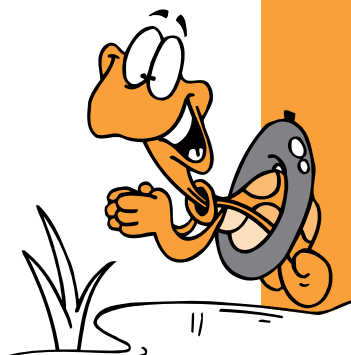
There is land available in the hills of your local catchment. This land is covered by established stands of trees. These trees would be cleared if plans to establish _____ go ahead.

Your town is located on low-lying flats. The primary school, footy club, shopping area, playground and community buildings such as the library and town hall are all situated in this area. The town's water supply is fed by a creek that starts in the hills nearby.

The catchment is already experiencing signs of salinity and there are fears that further clearing will cause a rise in the watertable with salts coming to the surface.

How might this situation affect the health of your catchment and members of your community?

Complete a town meeting where all parties compromise and agree on a plan for the future for the community, industry and environment.



Debating A Dilemma - Teacher Task Card 2

ELDERLY FARMER	CHAIRPERSON	YOUNG FARMER
TOWN RESIDENT	TOWN RESIDENT	SCHOOL CHILD
SCHOOL CHILD	FOOTBALL COACH	BUSINESS OWNER
BUSINESS OWNER	LOGGER	ENVIRONMENTALIST
WOOD CRAFTSMAN	SALINITY OFFICER	MOTHER
FATHER	SENIOR CITIZEN	UNEMPLOYED YOUTH
RETIREE	RETIREE	TOURIST OPERATOR
PRESIDENT OF BUSH WALKING CLUB	NATIONAL PARKS OFFICER	ANGLING CLUB MEMBER

