

# Avondale Discovery Farm

## Primary Worksheets

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Department of Agriculture  
Government of Western Australia



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# Site 1 - Shelter Belt

## What's this site about?

The row of trees and bushes planted along this roadway is called a shelter belt. It was planted in 1992.

## Activity 1: Shelter

Imagine it's a cold, windy day and you're not allowed inside any of the classrooms at school. Where would be the most comfortable place to sit during that kind of weather?

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Why would you prefer to be there than in the middle of the school oval?

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Now take a look at the shelter belt in front of you. The farmer has spent thousands of dollars on fencing on both sides of the shelter. Why do you think the farmer did that? Was the farmer trying to keep things in or out? Discuss this with your friends and write your opinions here.

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Look at the way the shelter belt has been planted. Can you see a pattern? Explain your answer here:

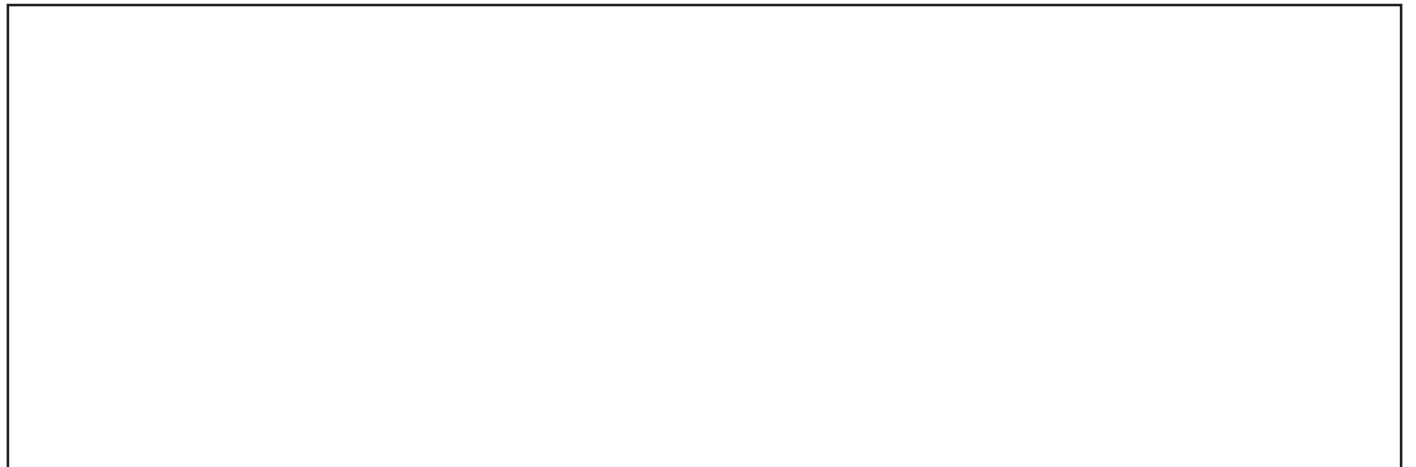
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Draw a rough sketch of a section between two fence posts. Use arrows with labels to explain what you think the farmer may have been trying to do when this was planted.



## Activity 2: Shelter for what? Shelter from whom?

Have a closer look at the plants and animals in the shelter belt, then use the things you see plus your own ideas to fill out this table:

Shelter for...	Shelter from...

Are there any creatures on your 'Shelter for...' list that eat insects? Mark them with a \*

How do you think these creatures would help the farmer?

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Draw a creature that might live in the shelter belt.



# Site 2 - The Gazebo

## What's this site about?

When it rains, the water on the ground forms small streams. These small streams will join with other small streams as the water makes its way to the creek. Each of these small streams comes from a catchment. A catchment is an area where all of the water ends up in the same stream.

A catchment area can be small like the roof of a house or hundreds of kilometres wide where many small catchments channel their water into the same waterway or river, for example from the Avon River into the Swan River.

## Activity 1: Local catchments, distant rivers

As you drive from the wandoo trees look over to your left (west). You will see parts of the land which act as catchments. These catchments are part of a much bigger catchment called the Swan-Avon Catchment. Why do you think it is called the *Swan-Avon* catchment? The map below might help.

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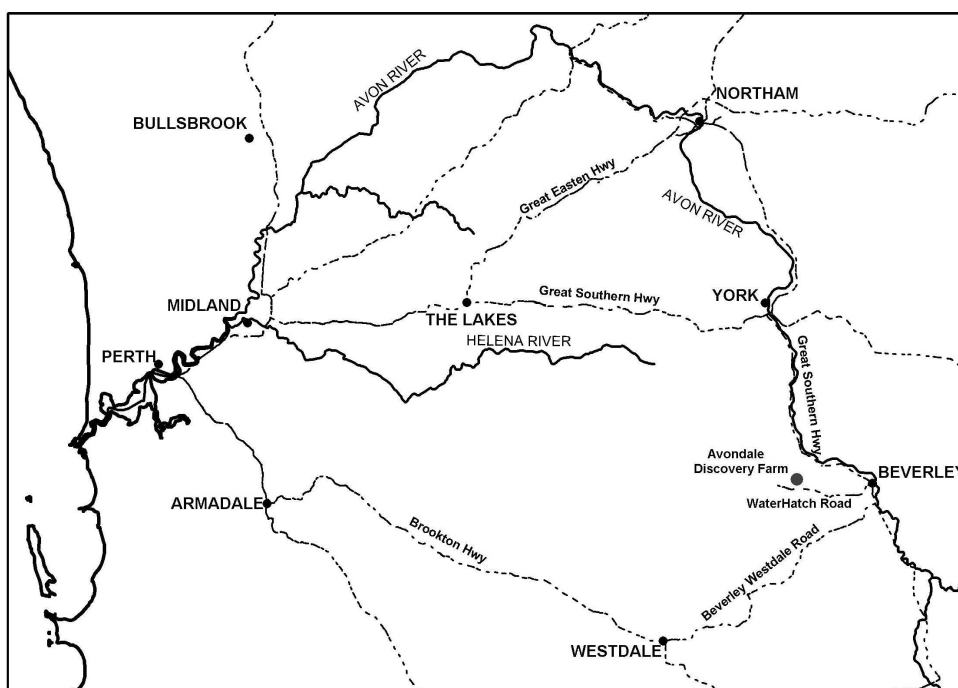
If there was a heavy rainfall at Avondale Discovery Farm, where would the water from this small catchment go?

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Before you finish at this site, look through the hole bored in the post labelled "Dale River meets Avon". If you have driven from Gwambygine you have crossed the Dale River. Now use the map below to draw in the flow of the water from this catchment.



## Activity 2: Making plans

### What's this site about?

Farm planning is used to decide where different activities will occur on the farm. The farmer maps the farm, drawing in features such as slope, soil type and erosion potential to show areas with similar features. These areas are called land management units, and each land management unit is suitable for different purposes.

Draw your own farm map of the area in front of you. Use the key to mark in important features of the land.

- \* rocky sections
- yards and buildings
- ≡ hilly areas

Shade areas that you think would be good for growing crops. Why did you choose those areas?

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## Activity 3: Washed away

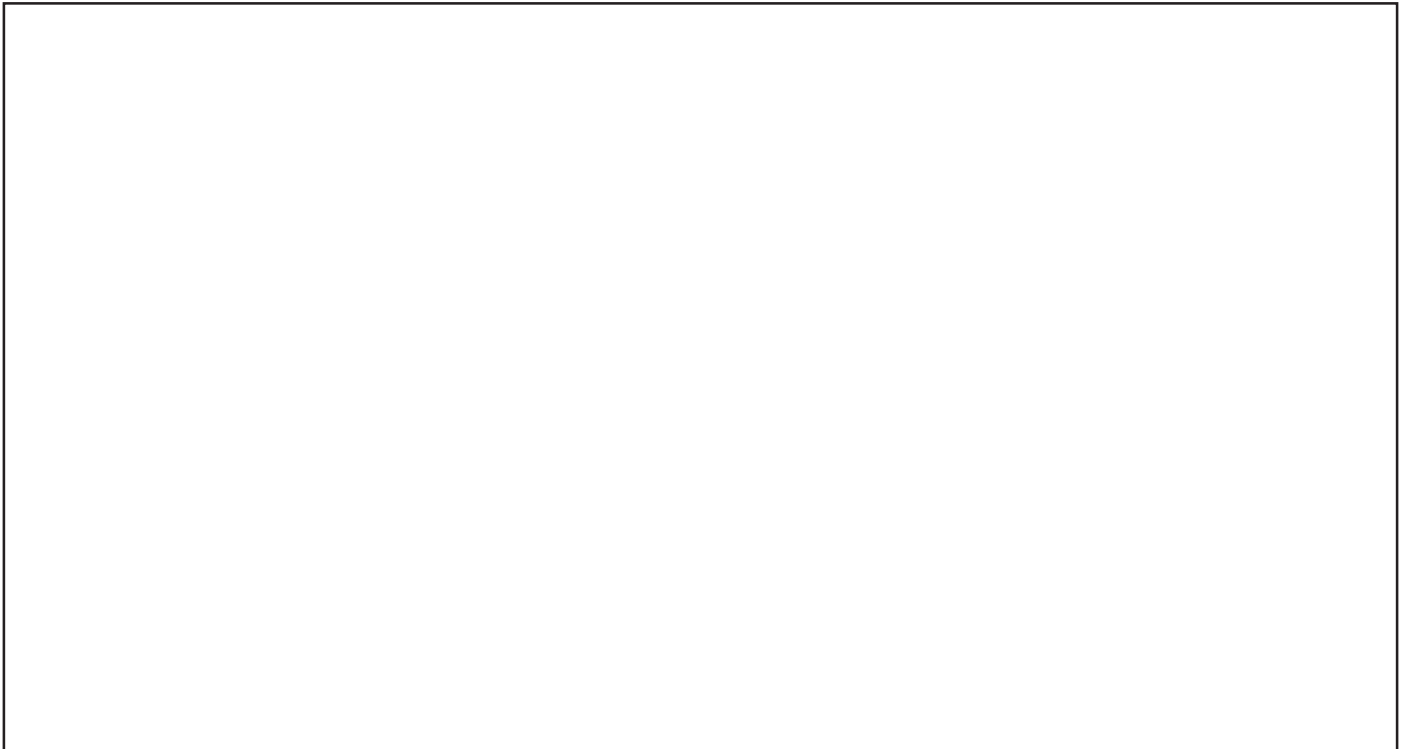
### What's this site about?

When heavy rains fall on the slopes of the farmland directly in front of the gazebo the rainwater tries to run down the hill and into the creek. Running water picks up any loose soil and carries it away. This is usually the richest soil - the topsoil. When the water slows down or stops, it drops the soil it is carrying. This process is called soil erosion.

Can you see what the farmer has built to try and prevent soil erosion? These are called contour banks. Look through the hole in the post labelled "contour bank".

A contour line is an imaginary line on the ground which joins points of equal height. Water trapped behind a bank of earth built along a contour line (a contour bank) cannot flow downhill, giving the water time to soak into the soil instead of carrying the topsoil down the hill.

Draw a diagram below to show how the farmer's idea works. Use labels to explain what you are showing.



What problems might be caused by soil erosion? Think about the places that are left without topsoil as well as the places where the topsoil eventually lands.

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Would you advise the farmer to plough his fields up and down the hills or in line with the contour banks? Why?

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# Site 3 - Northern Boundary

## What's this site about?

New soil gradually forms from exposed rock. One centimetre of soil may take hundreds of years to form. Road cuttings such as the one you can see at this site provide a good opportunity to look at the topsoil and what lies beneath it.

Soil with a good structure is light, open and crumbly. This makes it easier for the roots to grow through the soil and helps the roots get water and air.

## Activity 1: You call it dirt, plants call it home

Walk off the road for two or three steps into the York gum stand, taking care not to collapse the road bank. Part the grass and carefully study the soil surface.

Describe what the soil surface looks like:

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Scoop up a handful of soil. Feel the texture. Notice how it feels loose, light and almost fluffy and how it sticks in crumbs.

Soil which has a good structure is like this. It is easy for the roots of the plants to push through it, it is easy for rainfall to soak into and there are air pockets in the soil (roots need air too!).

Keep the soil in your hand, but don't squash it. You will damage its structure.

Now walk over to the soil which is being farmed. Choose a spot where the soil surface is not disturbed. Compare the soils for differences and similarities on the table below:

Soil qualities	York Gum side	Farm side
Colour on the surface		
Size of surface particles		
Old plant material		
Appearance of the soil		
Feel of the soil		

Put a \* next to the type of soil that would be easiest for plants to live in. Why do you think the soils are different?

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# Site 4 - Vegetated Creekline

## What's this site about?

Native plants alongside creeks and rivers are very important for protecting water quality and preventing soil erosion on the river banks. If sheep and cattle are kept out, it allows native plants to grow.

## Activity 1: Saving the rivers

Walk along the road so that you are looking from the road down along the creek bed.

The soil along this section is rich. The grass beneath the trees grows thickly and the trees are strong and thick too. This would be a good place to grow crops for sale or pastures for sheep to eat. However the farmer has fenced the creek and its banks off for quite a distance each side of the creek.

What is the farmer trying to keep in ?

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What is the farmer trying to keep out?

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Why would a farmer do that?

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Imagine what would happen if the sheep were allowed in to eat the grass.

Write a word to describe a part of the area as it is now, then in the "After" column how it might be after the sheep had been in for a month.

	Before the sheep	After the sheep
Grass		
Soil		
Bush seedlings (baby plants)		
Creek banks		
Creek water		

# Site 5 - Farm Labourers Sign

## What's this site about?

The vegetation along this creek forms a wildlife corridor. Birds can use these corridors of vegetation along streams, fences and roads to safely move around the farm from the nature reserve.

Many native birds at Avondale are free farm labourers. They are nature's pest controllers. Magpies and ravens are great grub gobblers, using their beaks like pick-axes to dig them up; medium size birds like cuckoo-shrikes crunch caterpillars off the leaves of shelter trees and the little birds like robins, wrens and thornbills catch bugs on the ground and amongst the crops.

## Activity 1: Birds on the farm

Use a bird book to identify all the birds you see on your visit to Avondale. If you don't have a bird book with you, draw or describe the birds so you can look up their names later.

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Birds cannot survive and breed with insect supplies alone. Complete the following table to show what birds need and how those needs are met.

A BIRD NEEDS:	THEY CAN GET THIS FROM:
Food	insects in the paddocks
Water	
Escape from predators	
A place to rest	
Protection from the weather	

Write a list of ways that farmers can help birds survive and breed each year.

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# Site 6 - Agroforestry

## What's this site about?

This site is used to produce both timber and crops in the same paddock. The trees are harvested sustainably for use on the farm. This means that small quantities of timber are removed to supply items such as fence posts, tool handles and building materials. The farmer could also sell the wood to a commercial producer.

This site also acts as a buffer for the nature reserve so that the native plants are not so affected by wind borne farm chemicals and weed seeds.

## Activity: Seeing the wood and the trees

The trees here are planted in a certain pattern. Compare this pattern to the contour of the hill. What do you notice?

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Why do you think there is such a wide space between the rows of trees?

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Think back to the other worksheets you've completed, particularly sites 1, 2 and 5. List some benefits (apart from money) of having lots of trees on the farm.

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# Site 7 - Roaded Catchment

## What's this site about?

Roaded catchments are an efficient way of collecting water and diverting it into farm dams. The clay soil is compacted so that water (rainfall) runs across the top of the soil instead of soaking into it. This is the opposite of what is required in paddocks. The 'roads' are built so that the water runs across them efficiently but causes as little soil erosion as possible.

A collection drain receives the gentle runoff from each road and directs it into a 'sump'. In the sump the water slows down so that almost all the dirt carried in the water is left behind before the water flows into the dam. This means that soil doesn't clog up the dam. The sump can be cleaned in summer when there's very little rain.

# Site 8 - Rotating Crops

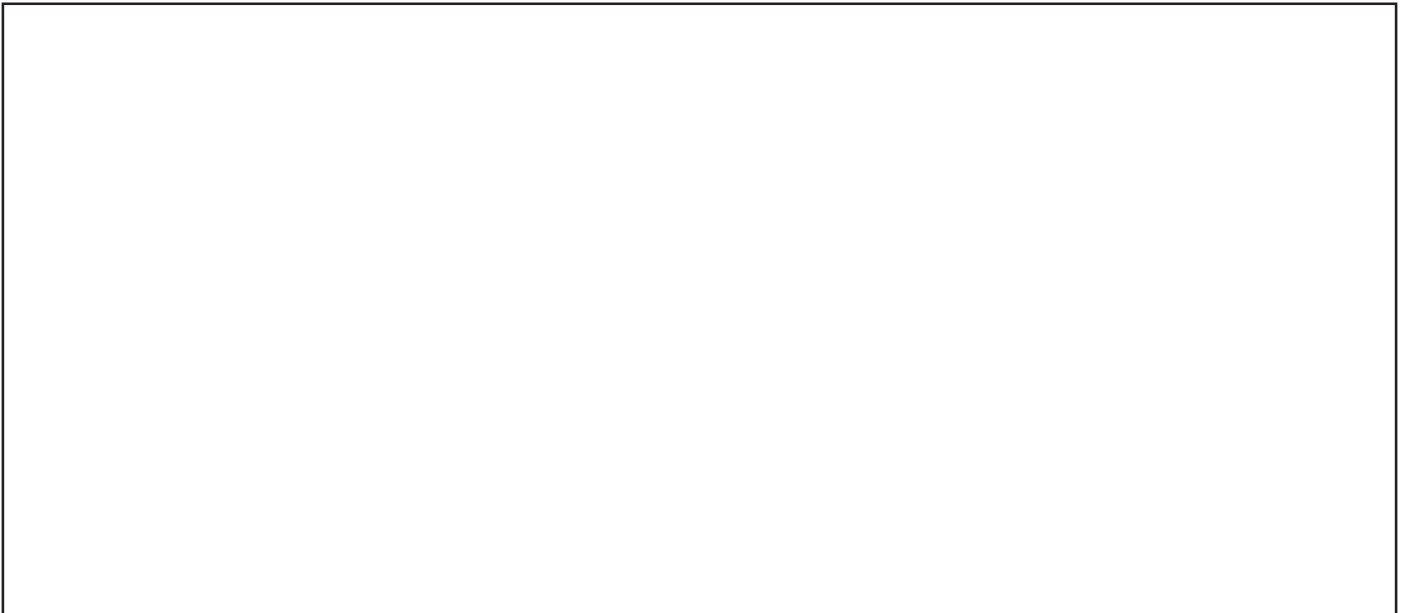
## What's this site about?

If a farmer was to always grow the same crop in the same paddock, there would be problems. After a few years the soil would get tired and worn out, the weeds would become hard to kill, and diseases would harm the crop.

To avoid these problems, the farmer changes the crops and pasture around in a cycle, called a rotation. By rotating the crops, the soil has a chance to rest, and by planting special crops called "leguminous crops" the farmer can add life into the soil. Rotating crops and pastures also helps control the weeds and diseases.

## Activity: Rotating but staying still

Write down the crops in this rotation (from the sign) and draw in arrows to show the cycle of rotation.



Leguminous plants (or legumes) are important because they add nitrogen into the soil. A bacterium lives on the roots of the legumes and changes nitrogen from the air into a form that other plants can use. Nitrogen is essential for plant growth.

Sort these plants into the correct columns below:

barley; chickpeas; wheat; lucerne; faba beans; clover; oats; serradella; lupins

Legumes	Cereals	Pasture

Which group (legumes, pastures or crops) has the paddock behind the sign been used for most recently?

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# Landcare Centre and Swan-Avon Catchment Caravan

You'll find the answers to all these questions in the Landcare Centre and in the Swan-Avon Catchment Caravan next door. Work through the activities in any order at your own pace.

## Activity 1: Land Use - Changing The Balance

What impact did Aborigines have on the environment?

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What style of farming did the first settlers use? Was this successful?

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What results do farmers want nowadays?

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## Activity 2: Land Under Pressure

List the environmental problems that resulted from early farming methods.

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## Activity 3: Landcare - Restoring the Balance

What are farmers doing today to solve the problems you found in activity 2?

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## Activity 4: Landcare - knowing the soil types

Describe why a farmer would be interested in the original, natural vegetation of an area.

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Name three different soil types. Give an example of a commercial crop that would grow best on each type you have named.

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## Activity 5: Landcare - looking after our soils

What common activities on the farm can cause compaction of the soil?

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What is stubble? Why would farmers want to retain stubble?

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Today farmers have a number of choices when managing their stubble. What are these choices?

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What technological development made this choice possible?

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Fill in the following table:

CROP	USES	%EXPORTED	\$EXPORT VALUE
Wheat			
Wool			
Barley			
Canola			
Field Peas			

# Extension Activities

## Activity 1: From the Avon Catchment to the world

One half of Western Australian wheat is produced in the Avon catchment as well as one fifth of the barley, worth about five hundred million dollars per year. Much of the grain is exported to the Middle East, Asia, the Russian states.

1. On the map of the world below draw arrows from the Avon catchment area to each of the areas of the world mentioned. Colour those areas and give your map a title.



2. What are some of the products made from wheat and barley?

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3. Why is it important for Australia to sell its products to other countries?

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4. List 20 products on the shelves of supermarkets that come from the produce of farms.

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5. What could happen if people stopped farming the land? What would we eat, wear?

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## Activity 2: Book maker

As a class or in small groups, make a book titled *Landcare on a Wheatfarm - How it Works*.

Before your visit to Avondale, research some non-fiction picture books from your school or community library to get an idea of how to lay out the book and what sorts of pictures you will need. Some research about farms and soil problems will also help.

Plan your shots so that you have photos that illustrate all you want say. Make notes about any features you want to explain in your photos.

Back at school, make a story board from a large sheet of paper to place out your pictures and plan your text before actually making your book. This will help you decide what order to place your pictures in and how many pages you will need.

Your finished books will make a good reference for your school library.

Alternatively, you might prefer to design a powerpoint presentation for another class at school, using photos taken with a digital camera.

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## Activity 3: A major drama

In small groups or as a class, produce a dramatisation of landcare issues. One suggestion would be to act out the picture book *Bilbies and Salinity: A question of balance* - your teacher should have a copy of this in the *Salinity in the Classroom* education kit. Alternatively, try this play developed by Perth Zoo:

### Players:

- 1/8 of the class represent trees - dressed in green and brown
- 2/5 of the class represent water - dressed in blue
- 2/5 of the class represent salt - dressed in white
- 2 or 3 students represent people - farmers, miners, city/country people.
- 1 or more storytellers

**Storyteller:** In the beginning the land was covered with trees. The trees lived in the soil and also protected the soil.

**Storyteller:** Europeans discovered the land and wanted to use the soil. They began to clear away the trees so they could get to the soil. (*Farmer, miners etc 'mow' down the trees by walking past the trees with a rope strung between them. Trees crash dramatically down and curl up into balls*)

**Storyteller:** As the trees were cleared, the water began to rise. (*Water begins to rise up slowly from the floor*)

**Storyteller:** And as the water rose it dissolved salt stored deep in the soil and carried it to the soil surface. (*Water group lifts salt up to standing position as they rise*)

**Storyteller:** The land was becoming very sick. Often valleys became salty pools. Suddenly people began to realise the reason for this.

**People - (farmers etc):** We must plant some trees. We can grow our crops between the trees. (*Farmers etc. mime planting a seed on the 'ball' of the fallen trees*)

**Storyteller:** Soon trees were being planted all over the country. (*Trees begin to unfold and sprout very slowly*)

**Storyteller:** At first the trees really struggled, but gradually the water level was pulled back down as the trees used up the extra water. (*Trees pull down on the water as they begin to stand*)

**Storyteller:** And the salt was slowly washed back down too. (*The water pulls the salt back down as it returns to floor level*)

**Storyteller:** This valley has been brought back to health but there are still many other areas which need help.

**Everyone:** Australians, your country needs you. (*All actors point at the audience*)

**The End**