

## Welcome

### Welcome

Thank you for choosing to incorporate the **River Detectives** program within your school curriculum. The program aims to engage students in sustainability activities with a focus on water quality and catchment health. The North Central Catchment Management Authority (CMA) values communicating the importance of our natural resources to young people and considers education to be a high priority. The updated **River Detectives** program is aligned with AusVELS; an incorporation of the Australian Curriculum F-10 within the curriculum framework first developed for the Victorian Essential Learning Standards (VELS).

The **River Detectives** program allows students to explore and understand key river health and water quality concepts in north central Victoria. In addition to learning through participating in the program, students also make a real contribution to the bigger picture of catchment health through scientific monitoring and reporting. This contribution influences the decision making of Natural Resource Management (NRM) organisations such as the North Central CMA. Students experience hands on learning in outdoor environments which can contribute to increased creativity, health and wellness, build sustainable communities and economies, and strengthen human connections.

The North Central Waterwatch Coordinator will visit your school throughout the year to demonstrate how to monitor the health and quality of your waterway and provide any additional information necessary for your investigations.

### Aim

The aim of the **River Detectives** program is to create and nurture a sense of connectedness between young people and their local waterways. This will be achieved through instilling a sense of pride and responsibility in primary school students to maintain the health and integrity of our natural resources and ecosystems.

### Goals

To engage schools and students in:

- ◆ participating in a variety of **River Detectives** activities throughout the school year while at the same time meeting AusVELS requirements
- ◆ becoming the 'eyes and ears' on ground, and in water, for NRM organisations
- ◆ collecting scientific information which contributes to regional decision making
- ◆ exploring and understanding the cultural heritage of north central Victoria
- ◆ understanding the importance of local waterways and their significance to the wider community
- ◆ having fun, enjoying the experience and taking home sustainability messages to their family.

The **River Detectives** program has been devised with Year 3 & 4 students in mind; however, it can easily be adapted to primary students at any level.

## River Detectives

### The River Detectives Program

The **River Detectives** program is divided into four sections.

Part 1: Introduction

Part 2: Water Science

Part 3: River Detectives Get Wet

Part 4: Super Soggy Extras

Each section has a teacher and a student component. The teacher's component provides the background to what your students are doing and why. The student sections provide the instructions to complete the tasks.

Part 1 - Introduction - provides background about **River Detectives**, it also explains why you are doing what you are doing and it lists the links to AusVELS.

Part 2 - Water Science - provides information on chemical tests that are to be carried out on a monthly basis. These tests include: Electrical Conductivity, Turbidity, pH, Reactive Phosphorus, Air and Water Temperature. These results will be entered into the online database, which can be found at <https://vicdata.waterwatch.org.au/>

Part 3 - River Detectives Get Wet - provides information on activities that your students will participate in throughout the year. The activities provide opportunities to explore the physical and biological elements of river health. These include:

- ◆ Story of a River
- ◆ Saltwatch Week
- ◆ Macroinvertebrates

Part 4 – Super Soggy Extras - provides additional activities that you may like to engage your students in as part of the **River Detectives** program. These include:

- ◆ Getting Froggy
- ◆ Homely Habitats
- ◆ Urban Stormwater
- ◆ Making Macros

We hope that you thoroughly enjoy the *River Detectives* Manual and we look forward to sleuthing local waterways with you and your students throughout the year

## AusVELS

## Australian National Curriculum

The use of the learning and teaching activities in *River Detectives* may contribute to the achievement of AusVELS Discipline Based Learning elements in the Domain of Science for Foundation to Year 6. Relevant Content Descriptions are provided in the tables below to assist teachers to make decisions about the appropriateness of these activities for their students. Teachers may adapt these activities to contribute to the achievement of Content Descriptions within other Sub-Strands of Science or other Domains.

## Foundation Level Science

## Science Understanding

Living things have basic needs, including food and water

Daily and seasonal changes in our environment, including the weather, affect everyday life

## Science as a Human Endeavour

Science involves exploring and observing the world using the senses

## Science Inquiry Skills

Explore and make observations by using the senses

Engage in discussions about observations and use methods such as drawing to represent ideas

Share observations and ideas



## AusVELS

### Level 1 Science

#### Science Understanding

Living things have a variety of external features

Living things live in different places where their needs are met

Observable changes occur in the sky and landscape

#### Science as a Human Endeavour

Science involves asking questions about, and describing changes in, objects and events

People use science in their daily lives, including when caring for their environment and living things

#### Science Inquiry Skills

Participate in different types of guided investigations to explore and answer questions, such as manipulating materials, testing ideas, and accessing information sources

Use informal measurements in the collection and recording of observations, with the assistance of digital technologies as appropriate

Use a range of methods to sort information, including drawings and provided tables

Through discussion, compare observations with predictions

Represent and communicate observations and ideas in a variety of ways, such as oral and written language, drawing and role play

## AusVELS

### Level 2 Science

#### Science Understanding

Living things grow, change and have offspring similar to themselves

Different materials can be combined, including by mixing, for a particular purpose

Earth's resources, including water, are used in a variety of ways

#### Science as a Human Endeavour

Science involves asking questions about, and describing changes in, objects and events

People use science in their daily lives, including when caring for their environment and living things

#### Science Inquiry Skills

Participate in different types of guided investigations to explore and answer questions, such as manipulating materials, testing ideas, and accessing information sources

Use informal measurements in the collection and recording of observations, with the assistance of digital technologies as appropriate

Use a range of methods to sort information, including drawings and provided tables

Through discussion, compare observations with predictions

Represent and communicate observations and ideas in a variety of ways, such as oral and written language, drawing and role play

## AusVELS

### Level 3 Science

#### Science Understanding

Living things can be grouped on the basis of observable features and can be distinguished from non-living things

#### Science as a Human Endeavour

Science involves making predictions and describing patterns and relationships

Science knowledge helps people to understand the effect of their actions

#### Science Inquiry Skills

With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge

Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate

Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends

Compare results with predictions, suggesting possible reasons for findings

Reflect on the investigation; including whether a test was fair or not

Represent and communicate ideas and findings in a variety of ways, such as diagrams, physical representations and simple reports



AusVELS

Level 4 Science

Science Understanding

Living things have life cycles

Living things, including plants and animals, depend on each other and the environment to survive

Earth's surface changes over time as a result of natural processes and human activity

Science as a Human Endeavour

Science involves making predictions and describing patterns and relationships

Science knowledge helps people to understand the effect of their actions

Science Inquiry Skills

With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge

Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate

Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends

Compare results with predictions, suggesting possible reasons for findings

Reflect on the investigation; including whether a test was fair or not

Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports

## AusVELS

### Level 5 Science

#### Science Understanding

Living things have structural features and adaptations that help them to survive in their environment

Solids, liquids and gases have different observable properties and behave in different ways

#### Science as a Human Endeavour

Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena

Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives

Scientific knowledge is used to inform personal and community decisions

#### Science Inquiry Skills

Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate

Use equipment and materials safely, identifying potential risks

Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate

Compare data with predictions and use as evidence in developing explanations

Suggest improvements to the methods used to investigate a question or solve a problem

Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts



## AusVELS

### Level 6 Science

#### Science Understanding

The growth and survival of living things are affected by the physical conditions of their environment

Changes to materials can be reversible, such as melting, freezing, evaporating; or irreversible, such as burning and rusting

Sudden geological changes or extreme weather conditions can affect Earth's surface

#### Science as a Human Endeavour

Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena

Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives

Scientific knowledge is used to inform personal and community decisions

#### Science Inquiry Skills

Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate

Use equipment and materials safely, identifying potential risks

Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate

Compare data with predictions and use as evidence in developing explanations

Suggest improvements to the methods used to investigate a question or solve a problem

Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts

## AusVELS

## Direct relationships with other Domains

Domain	Domain aims	River Detectives Activity
English	<ul style="list-style-type: none"> <li>Learn to listen to, read, view, speak, write, create and reflect on increasingly complex and sophisticated spoken, written and multimodal texts across a growing range of contexts with accuracy, fluency and purpose</li> <li>Appreciate, enjoy and use the English language in all its variations and develop a sense of its richness and power to evoke feelings, convey information, form ideas, facilitate interaction with others, entertain, persuade and argue</li> </ul>	<p>Students interpret the main ideas and purpose of the <b>River Detectives</b> manual</p> <p>Students are exposed to new scientific terminology</p> <p>Students reflect on <i>Story of a River</i> using a Y Chart and writing an acrostic poem</p> <p>Students interpret and choose relevant descriptive statements in <i>Homely Habitats</i></p>
Communication	<ul style="list-style-type: none"> <li>To communicate successfully, students need to develop the knowledge, skills and behaviours to effectively present information, ideas and opinions in a range of forms, including verbal, written, graphic, multimedia and performance, appropriate to their context, purpose and audience</li> </ul>	<p>Students are encouraged to describe what they see throughout activities.</p> <p>Students dramatise events in <i>Story of a River</i></p> <p>Students justify, persuade, explain and compare in text and in speech</p> <p>Students use tables, charts and diagrams</p>
Thinking Processes	<ul style="list-style-type: none"> <li>Students collect information from a range of sources to answer their own and others' questions. Students use open-ended questioning and integrate available information to explore ideas</li> </ul>	<p>Students are required to predict and make conclusions, answering closed and open questions</p> <p>Students are encouraged to evaluate and reflect on activities</p>
Information and Communications Technology	<ul style="list-style-type: none"> <li>Students make adjustments to their equipment and apply techniques that are ergonomically sound</li> </ul>	<p>Students handle all the equipment and are verbally guided through experiments, such as testing for reactive phosphorus</p>

## AusVELS

## Direct Relationships with other Domains

Domain	Domain aims	River Detectives Activity
Health & Physical Education	<ul style="list-style-type: none"> <li>Engaging in physical activity, games, sport and outdoor recreation contributes to a sense of community and social connectedness. These are vital components of improved wellbeing</li> </ul>	Visiting monitoring site for water quality testing and in <i>Homely Habitats</i>  Leap frog activity in <i>Getting Froggy</i>  Collecting water samples for <i>Saltwatch Week</i>
Inter-personal Development	<ul style="list-style-type: none"> <li>Learning opportunities and experiences that will support their learning across the curriculum, particularly in relation to working in teams where collaboration and cooperation, sharing resources and completing agreed tasks on time are highlighted</li> </ul>	Small activity groups  Group members are required to interact and communicate  Dramatisation in <i>Story of a River</i> requires teamwork and interaction  Sharing resources and cooperating in <i>Macroinvertebrate Sampling</i>
The Arts	<ul style="list-style-type: none"> <li>Learning in the Arts allows students to communicate their perceptions, observations and understanding of structures, functions and concepts drawn from other areas of the curriculum. The Arts are a vehicle for confronting and exploring new ideas</li> </ul>	Creating a macroinvertebrate model using a variety of artistic materials in <i>Making Macros</i>  Dramatisation of the <i>Story of a River</i>  Sketching the riparian environment in <i>Homely Habitats</i>  Adding a riparian environment for their model in <i>Making Macros</i>
Design, Creativity and Technology	<ul style="list-style-type: none"> <li>Using tools, equipment, materials/ingredients and systems components safely and creatively to make quality products and/or systems</li> </ul>	Creating a macroinvertebrate model using a variety of artistic materials in <i>Making Macros</i>



## AusVELS

## Direct relationships with other Domains

Domain	Domain aims	River Detectives Activity
Mathematics	<ul style="list-style-type: none"> <li>Students estimate and measure length, area, volume, capacity, mass and time using appropriate instruments.</li> <li>Students recognise and use different units of measurement</li> </ul>	<p>Students are required to utilise different units of measurement in water quality testing activities</p> <p>Students are required to apply &lt; and &gt; signs</p>
Civics and Citizenship	<ul style="list-style-type: none"> <li>Students demonstrate understanding of the contribution of people from many culturally diverse groups of the community</li> <li>Opportunities to investigate and participate in activities that support sustainable practices, social justice and underpin the future wellbeing of societies from a local to a global level</li> </ul>	<p>Students consider the way in which indigenous people used and valued the land</p> <p>Students learn how to make positive contributions to river health, and therefore their community, through testing water quality</p> <p>Students plan strategies to be a positive influence on the health of waterways</p>
Humanities - History	<ul style="list-style-type: none"> <li>Knowledge, understanding and appreciation of the forces that shape societies</li> <li>Understanding and use of historical concepts, such as continuity and change, cause and effect</li> </ul>	<p>Reading about and seeing first hand, the cause and effect of waterway pollutants</p> <p>Understanding the attitudes, practices and natural cycles of different eras in <i>Story of a River</i></p>
Humanities - Geography	<ul style="list-style-type: none"> <li>Investigate some of the significant natural processes that operate across Australia (rainfall, drought, flood), and how people react</li> <li>Students explore how humans have affected the environment</li> </ul>	<p>Knowledge and understanding of these concepts comes through nearly every activity in the <b>River Detectives</b> program</p>