



**Year 7
Geography**

**Place and
Liveability**

Liveability in the Wimmera Region

Wimmera Catchment Management Authority

Introduction

Liveability can be defined as ‘An assessment of what a place is like to live in, using particular criteria, for example, environmental quality, safety and security, education and health provision, access to shops and services, recreational facilities and cultural activities’ (Victorian Curriculum). In a semi-arid agricultural region such as the Wimmera, liveability is influenced greatly by access to a reliable source of fresh water.

Due to a range of factors such as climate change, changes to land use and an increased demand, the Wimmera’s water resources are under threat. In the last thirty years, for example, annual rainfall has decreased by 9%. This, in turn, threatens the liveability of many towns and farms in the region.

The Wimmera Catchment Management Authority (CMA) is tasked with building ‘a healthy Wimmera catchment where a resilient landscape supports a sustainable and profitable community.’ (<https://wcma.vic.gov.au/about-us/>) They work at a range of scales and with a huge range of stakeholders to protect and enhance the condition of the region’s environment. As such, the Catchment Authority can be seen as a key player in preserving and improving the liveability of the region.

The Natural environment

The Wimmera is characterised by the flatness of the landscape, broken in the south by the Grampians range/ Gariwerd which gives rise to many of the region’s rivers and by Mount Arapiles, an outlier of the range. The Wimmera’s waterways are oases in a relatively dry landscape. Major catchments include the Wimmera Basin and the eastern part of the Millicent Coast Basin. The Wimmera contains 25% of Victoria’s wetlands which are predominantly in the south west of the region. This area also contains a valuable groundwater resource, supporting a significant irrigation and grazing industry.

(<https://wimmera.rcs.vic.gov.au/region/about-the-wimmera/>)



Figure 1 View from Mount Arapiles

The Human environment

The Wimmera is home to more than 60,000 people, a number that is slowly increasing. The population is notably older than the Australian population as a whole (a median age of 46) and with a much lower percentage of the population having arrived in Australia as migrants. Around one-third of the population lives on farms or in small towns of less than 2,000 people. The largest settlement in the region is the city of Horsham with a population of 16,000 people.

Several First Nations people groups maintain a deep and continuing connection to the landscapes of the region. The CMA developed the Regional Catchment Strategy in partnership with representatives of local indigenous groups.

The landscape is dominated by broadacre cropping, covering 1.2 million hectares or 53% of the region. There are several large national parks that preserve unique and notable natural environments. These include the Grampians National Park in the south and the Little Desert National Park in the north-west.

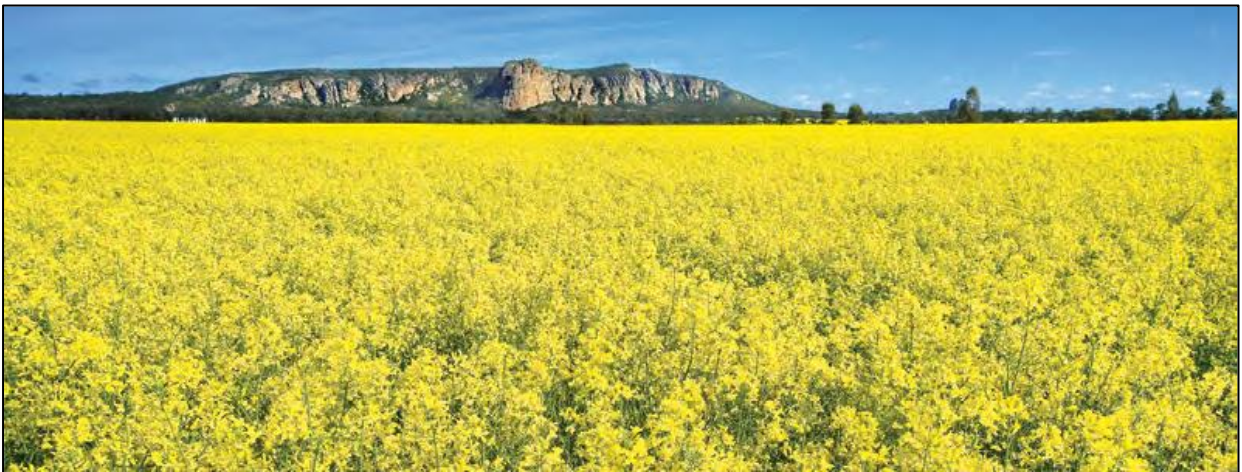


Figure 2 Canola field near Natimuk. Source: <https://wcma.vic.gov.au/wp-content/uploads/2022/05/wimmera-regional-catchment-strategy-rcs-2013-19.pdf>]

Year 7 Curriculum Links

‘Place and liveability’ focuses on the concept of place through an investigation of liveability. Students examine factors that influence liveability and how it is perceived, the idea that places provide us with the services and facilities needed to support and enhance our lives, and that spaces are planned and managed by people.’

(<https://victoriancurriculum.vcaa.vic.edu.au/the-humanities/geography/curriculum/f-10#level=7-80>)

Lesson number	1	2	3	4	5	6	7/8/9
Geographical concepts and skills							
Explain processes that influence the characteristics of places		x		x	x		x
Identify, analyse and explain spatial distributions and patterns and identify and explain their implications		x	x	x	x	x	x
Identify, analyse and explain interconnections within places and between places and identify and explain changes resulting from these interconnections			x			x	
Collect and record relevant geographical data and information from useful primary and secondary sources, using ethical protocols	x	x	x	x	x	x	x
Select and represent data and information in different forms, including by constructing appropriate maps at different scales that conform to cartographic conventions, using digital and spatial technologies as appropriate		x	x		x		x
Analyse maps and other geographical data and information using digital and spatial technologies as appropriate, to develop identifications, descriptions, explanations and conclusions that use geographical terminology		x	x		x	x	
Geographical knowledge							
Factors that influence the decisions people make about where to live and their perceptions of the liveability of places	x		x				x
Influence of accessibility to services and facilities; and environmental quality, on the liveability of places		x	x	x	x		
Environmental, economic and social measures used to evaluate places for their liveability, comparing two different places	x						
Influence of social connectedness and community identity on the liveability of places			x				x
Strategies used to enhance the liveability of places, especially for young people, including examples from Australia and Europe						x	x

Lesson objectives and outcomes

By the end of this unit students will understand the link between features of the natural and human environments and the liveability of a region. In particular, they will understand the role of water in the environment in determining liveability in a semi-arid region.

They will understand the ways in which people have transformed this landscape in the past and continue to transform it today in order to create a liveable place. They will also understand the roles of major players such as farmers and catchment authorities in managing a scarce resource and the impact of this on liveability.

Through a range of geographic activities, including guided fieldwork activities, they will learn about liveability in the Wimmera at the local and regional scales. They will also develop an understanding of changes at the national and global scales and the ways in which these changes are experienced in a local area.

Key skills and vocabulary

Throughout the lessons, specific step-by-step instructions are provided for particular geographic skills. These include

- Working with a GIS map
- Constructing and interpreting climate graphs
- Working with census data
- Working with statistics
- Constructing a GIS map
- Exploring water resources using Google Earth
- Describing patterns on a graph
- Exploring a database
- Field work techniques including water quality testing, using GNSS, surveying and sketch mapping.
- Writing a field report

Key vocabulary

- Place
- Liveability
- Community
- Urban
- Rural
- Natural environment
- Semi-arid
- GIS
- Topography
- Climate graph
- Census
- Distribution
- Groundwater
- Environmental flows
- Climate change
- Sustainability
- Scale
- Database
- Fieldwork
- Research question
- Hydrosphere
- Lithosphere
- Atmosphere
- Biosphere
- Geospatial technology
- Evaluating effectiveness
- Water quality
- Turbidity
- pH
- Salinity
- Field report

Learning Intention/s	Prior Knowledge	Potential Classroom Activities	Key vocabulary	Differentiated learning	Resources
Lesson 1: What is Liveability?					
<p>Students consider the concept of liveability and apply this concept to three communities: an urban community, a rural community and their own community.</p>	<p>Little prior knowledge is assumed although some introductory activities from a textbook on the concept of liveability may help some students.</p>	<p>Begin with a classroom discussion to establish students' understanding of the word 'liveability'. There are some ideas for discussion built into the opening paragraph of the lesson plan.</p> <p>Use Figure 1 to expand on this discussion. Working in pairs, students brainstorm one of the segments in this diagram to develop a list of community features that could be included under each of these headings. These should then be combined in a master list either in an online collaboration space or on the white board. This could then lead to a discussion about how these could be measured.</p> <p>Task one then focuses on two communities in Victoria: an urban location and a rural location. Its fine if the student answers to these activities are general at this stage, the aim is to get students thinking about how liveability is impacted by location.</p> <p>Students are then introduced to a liveability survey to demonstrate one way that this can be measured. Students will need to be shown how a survey such as this is administered. This can lead onto a discussion of the weaknesses and strengths of a survey such as this: objective vs subjective measures for example. It should also be pointed out that for the 'law and order' section, high scores are for low levels of crime etc.</p> <p>The final activity is for the students to complete a liveability survey for their own community, this could be an ideal homework activity.</p>	<p>Place Liveability Community Urban Rural</p>	<p>Many of the activities in this worksheet can be completed individually, in pairs or in group discussions. Using the think, pair, share classroom strategy is a useful system for students reluctant to join class discussions.</p> <p>An extension activity is possible by creating a spreadsheet to compare the liveability in the three locations.</p>	<p>Worksheet 1: What is Liveability?</p> <p>Liveability survey from Geogspace: http://www.geogspace.net.au/files/Care/Exemplars/Yr7/17.5.1%20Neighbourhood%20liveability%20survey.pdf</p>

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Lesson 2: Introduction to the natural features of the Wimmera region.					
<p>Students develop an understanding of the Wimmera region and some of its natural features.</p> <p>Students are introduced to two key geographic skills: Working with a GIS map to develop descriptions and conclusions and constructing and analysing a digital climate graph.</p>	<p>Students would find it useful to use an atlas to locate the Wimmera within the state of Victoria.</p>	<p>Students begin with a location map of the Wimmera. This region is often described and mapped as part of the larger Wimmera Southern Mallee region but this unit focuses on the area administered by the Wimmera Catchment Authority as shown in figure 1 and the online GIS map.</p> <p>Students then use a GIS map to describe key natural features including the topography, rivers and wetlands. There is a short video tutorial on using this map at https://wcma.vic.gov.au/wimmera-interactive-catchment-map/ which students may find useful.</p> <p>Once students have become familiar with the features of the map, it is often a good idea to give them some time to explore other layers and to be responsible for their own learning.</p> <p>When constructing a climate graph for a town in the region, in this case Nhill, it is possible to complete this with pencil and paper but this online tool is relatively simple to use and by introducing it in Year 7, students will be able to construct climate graphs in other geography units in later years.</p>	<p>Natural environment Semi-arid GIS Topography Climate graph</p>	<p>Alternative activities: Students could search for images of various natural features of the Wimmera and use these to illustrate features located on the GIS map.</p> <p>For students who wish to explore more GIS maps with more complex spatial information, there is a wide range freely available at http://maps.ga.gov.au/interactive-maps/#/</p> <p>There is an extension activity in the final part of the worksheet</p>	<p>Worksheet 2: Introduction to the natural features of the Wimmera region.</p> <p>https://wcma.vic.gov.au/wimmera-region/</p> <p>http://www.bom.gov.au/climate/data/index.shtml?bookmark=200</p>

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Lesson 3: Liveability and the Human Environment					
Students will learn about the people and built environment of the Wimmera region. They will also be introduced to three important geographic skills: working with census data and constructing a GIS map.	It would be useful for students to have used a GIS map before attempting to construct one. Lesson #2 contains a suitable activity. Students should also have a good understanding of liveability.	This is a skills-based lesson so check that the instructions given suit your students before starting. The skills build through the lesson from using data to constructing their own GIS maps. It is a good idea for the teacher to be familiar with new skills before attempting them with the class. Spend 30 minutes or so playing with the features of Google Maps that allow you to complete your own map if you haven't used this programme before. You may need to change some of the initial instructions depending on the IT set up at your school.	Liveability Census GIS Distribution	Students should be encouraged to expand on each of the skills outlined in this lesson. For example, when working with census data, students could explore their own statistical region and compare this with the Grampians region. When constructing a GIS map, students could add descriptions and photographs to each point on the completed map.	The instructions for completing a GIS map using Google Maps are at https://support.google.com/mymaps/answer/3024454?hl=en&co=GENIE.Platform%3DDesktop
Lesson 4: Liveability and the Natural Environment					
Students explore the importance of the natural environment, particularly water, in liveability. They work independently and in group settings to enhance their learning.	No prior knowledge is necessary but it may be useful for teachers to consider using parts of worksheets 1 and 3 in the learning resource 'Water in the World – Wimmera region case study'.	Task 1 may be best done in teams or pairs depending on the abilities of your students. When each student or team has completed the table, use the information to generate a class discussion about the impacts of the natural environment on liveability. When researching the uses of water in the Wimmera, be aware of the reading levels of your students. Rather than having them read all of the information, print each page and highlight the relevant section from the website. There is a guide to jigsaw grouping at https://www.teachervision.com/group-work/jigsaw-groups-for-cooperative-learning The final part of the lesson is an introduction to the First Nations peoples of this region. This will be developed in more detail in a future publication.	Natural environment Groundwater Environmental flows	While the two follow up activities from task 1 focus on water resources, students could be encouraged to explore other natural features of the Wimmera environment including fertile soils and biodiversity. Students could select one of the five First Nations groups listed and conduct an internet search of this group.	https://www.gtav.asn.au/resources/levels-7-8/year-7-water-in-the-world--wimmera-region-case-study https://wimmera.rcs.vic.gov.au/themes/ https://www.youtube.com/watch?v=Yle76lhY5oU

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Lesson 5: Threats to the water resources of the region					
<p>This lesson is designed to prepare students for features they may see in the field.</p> <p>Students learn about threats to water resources at a range of scales by using guided activities, including the use of aerial and satellite imagery, and personal research.</p>	<p>This lesson is designed to flow on from lesson 4 which focuses on the use of water resources. This allows you to point out that using a natural resource, such as water, may have negative impacts on that resource.</p>	<p>The first activity is designed to encourage students to think about the ways in which water use may have a negative impact. Four photographs are provided but you may wish to add more to this activity. In particular, photos from your intended fieldwork site. The list of impacts in Task 4 may give you some ideas about other photographs to use.</p> <p>Task 2 touches on the way in which climate change has impacted rainfall patterns in Victoria. You may choose to use this as a springboard into a broader discussion of climate change. The best resources for this, including short videos are on the Bureau of Meteorology website, listed in the resources section.</p> <p>The Google Earth activity helps students to explore water resources over a large area. This can easily be adapted or expanded to examine water resources in your local area or your fieldwork area.</p> <p>The final activity introduces students to the geographic concept of scale from local to global as they assess threats to water resources. You may like to allocate topics to particular pairs in your class to make sure that each threat and its scale is explored.</p>	<p>Climate change Scale</p>	<p>All of the activities in the worksheet could be adapted to a particular location rather than the whole of the Wimmera region. In particular, this could be used to prepare students for fieldwork at a particular location.</p> <p>Task 4: Rather than a fact file, students could produce posters for display. This could even be in the form of Wanted poster.</p>	<p>http://www.bom.gov.au/climate/</p> <p>https://www.google.com/earth/versions/</p> <p>https://wimmera.rcs.vic.gov.au/themes/water/rivers-and-streams/</p>

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Lesson 6: Improving liveability					
<p>Students learn about one of the ways in which communities improve the liveability of the place in which they live. They use a variety of skills including map and graph reading to develop this understanding .</p>	<p>This lesson is intended to lead on directly from lesson 5: Threats to water resources.</p>	<p>In lesson 5, students were given the opportunity to research a threat to water resources. Start this lesson by asking them how this threat could be minimized. Through class discussion, explain that by responding to these threats, liveability is improved.</p> <p>The introductory section on the history of water use and the Millennium drought is designed for students to learn about a threat to liveability and to see how people have responded to such threats. There is a lot of information on the Millennium Drought online, including in the Victorian Government report listed in the resources section. Students analyse the graph using the PQE method.</p> <p>When exploring the Wimmera-Mallee pipeline you could use Google Earth to show the locations of the reservoirs in the south of the region. If you have time, students could construct a Google Earth tour of this area.</p> <p>The final activity requires students to manipulate a GIS map. This activity has been left quite open so students can choose their own area of interest. If this lesson is being used as a springboard for fieldwork in the region, you could focus their attention on this location. Each GIS map works a little differently but there are instructions for using a GIS map in Lesson #2 that may be useful.</p>	<p>Liveability Database</p>	<p>There are several opportunities for differentiated learning in this worksheet. Students could research further the Millennium Drought and the way in which it threatened water security. Students with a particular interest, could research the way in which the pipeline was constructed, there is a link in the Resources section. Students could construct a Google Earth tour of the Grampians showing the main reservoirs.</p>	<p>https://www.water.vic.gov.au/drought-and-dry-conditions/millennium-drought-report</p> <p>https://www.storagemanager.com.au/reservoir-levels-and-other-information/reservoirs-level-summary</p> <p>http://ancr.com.au/wimmera_mallee_pipeline.pdf</p>

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Lesson 7 Fieldwork Preparation					
<p>Students are introduced to geography fieldwork techniques and prepare to apply these techniques during a field trip to the Wimmera River in Horsham.</p>	<p>This lesson, and the two that follow, are the culmination of a series of lesson on liveability in the Wimmera region. At the very least, students need to have completed the activities in lessons 4 and 5.</p>	<p>This lesson will vary from school to school depending on the preferences of individual teachers. It is recommended that you spend at least one lesson (preferably a double lesson) preparing students for fieldwork rather than trying to explain skills and key knowledge while in the field.</p> <p>The following lesson, ‘Lesson 8 Fieldwork Activities’ contains a series of fieldwork activities. Depending on your class, your own expertise and the time you have to complete the activities you may decide to not complete all of the activities or to adapt some of them.</p> <p>For example: The use of the Epicollect 5 app to collect and map spatial data. Once you have become familiar with this app, it is relatively easy to use but you need to set up a project on the app (best done on a computer) which students then complete on their phones. When they are back in class, they can access all of the collected data and manipulate it to make simple maps on their computers. There are many tutorials online to get you started but you may prefer to print maps of each fieldwork site and ask students to complete the same activity on these paper maps.</p> <p>Similarly, water quality testing will rely on your expertise and available equipment. There is a YouTube clip in the ‘suggested resources’ column that introduces testing water quality which you should watch and show your students before the field trip. You may decide to leave out the activities regarding water quality.</p>	<p>Fieldwork Research question Hydrosphere Lithosphere Atmosphere Biosphere Geospatial technology</p>	<p>As explained in the ‘Potential Classroom Activities’ column, teachers should adapt the fieldwork activities depending on available resources, teacher expertise and class requirements.</p>	<p>A 2017 study into the social and economic value of the Wimmera River: https://www.westwimmera.vic.gov.au/files/assets/public/documents-amp-publications/plans-amp-strategies/wimmera-southern-mallee-soci-economic-value-of-recreational-and-environmental-water-2017.pdf</p> <p>A description of the method to test water salinity: https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0006/168882/water-salinity.pdf</p> <p>A video clip showing various methods of measuring water quality: https://youtu.be/nZj7x5ZR6QU</p> <p>Epicollect5 Data Collection user guide: https://docs.epicollect.net/</p> <p><i>The Glovebox Guide to Wimmera Wetland Birds and The Glovebox Guide to Wimmera Frogs</i> available from the Wimmera Catchment Management Authority.</p>

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Lesson 8 Fieldwork activities					
<p>Students visit 3 sites on the banks of the Wimmera River in Horsham to examine ways in which local authorities and communities have improved the liveability and amenity of these sites.</p>	<p>Students need to have prepared for these fieldwork activities by completing the activities in lesson 7.</p>	<p>This lesson contains a range of activities suitable for Year 7 geography students. You should evaluate your own expertise and that of your students, as well as the material covered thus far to decide which of these activities to complete. They are relatively close together so there is little travel time (by bus) between them. To complete all of the activities you will need about half a day. Note that there are no toilets at sites 1 and 2 and no shelter at site 1. By finishing at site 3, students can sit at comfortable picnic tables, under shelter, and complete any activities they have missed throughout the day.</p> <p>One of the activities at site 2 requires students to ask three visitors three simple questions. Some students can find this difficult so you may need to adapt or omit this activity. Similarly, if you have no water quality testing equipment (ask a science teacher), you may need to adapt or omit these related activities at sites 1 and 3.</p>	<p>Evaluating effectiveness Water quality Turbidity pH Salinity</p>	<p>There are some suggestions in the classroom activities column.</p> <p>Tasks 2 and 3 at site 2 provide opportunities for differentiation. For example, you may decide to provide students with a list of potential improvements if they are struggling to develop their own. Some students may prefer to complete these activities on their own while others may need more support.</p>	<p>Water quality testing kit. Epicollect5 or outline maps of three sites. <i>The Glovebox Guide to Wimmera Wetland Birds</i> and <i>The Glovebox Guide to Wimmera Frogs</i>. Printed fieldwork booklets</p>

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Lesson 9 Field Report					
<p>Students process data from their field trip to produce a field report in response to a research question.</p>	<p>Students need to have completed a fieldtrip (lessons 7 and 8). It is assumed that for many students, this is their first geography fieldtrip.</p>	<p>You need to decide on the format of the field report. Possibilities include a written report or a report using ICT such as ARCGIS StoryMaps. You need to be familiar with whatever format you use. It can be helpful to show students the finished product from a field trip undertaken by another year level. StoryMaps are a wonderful way to present information but they can also run into technical difficulties. This can make them quite time consuming to produce. There is a wonderful guide to StoryMaps in Interaction 49/4. The full reference is given under resources.</p> <p>The activities in the lesson plan may need to be adapted for your group depending on your field trip. You should, however, try to include each of the 5 sections. These are modified from the VCE Study Design and provide a useful framework. You will need to process together any data you need to share as a class such as the survey results. Google Docs or OneNote Collaboration Space are quick and easy ways of doing this. You may also like to allow students to share photographs.</p>	<p>Field report</p>	<p>Students with learning difficulties may struggle to process all of this data under a time restriction. You may choose to adapt the task to their specific needs, for example, leaving out the need to create a plan for Apex Adventure Island. Differentiation is also possible depending on technical skills. Some students may flourish with StoryMaps, for example, while others would be better with a written report.</p>	<p>Presenting a field report using ArcGIS Storymaps: Claire Andrewartha, <i>A practical example: Teaching digital and spatial technology with ArcGIS StoryMaps</i>. Interaction Volume 49, Number 4 (December 2021). This includes both a worked example and a user guide.</p> <p>https://five.epicollect.net/</p> <p>VCE Study Design</p> <p>‘An Investigation into Water Quality in the Sunraysia Region - Fieldwork Excursion - Introduction to Geography’ in GTAV’s <i>Interaction</i> journal June 2023</p>