Life on the Murray River

Activity 1

View the 'Life on the Murray River' VR tour at www.lsv.com.au/vr

LEVELS 7 & 8

Key Learning

During this activity, students will investigate how life on the Murray has changed throughout history and make some predictions about what it might look like in the future.

Resources

- Smartboard
- Computer access for students
- Appendix A: *Murray River Today*
- Appendix B: *Looking Forward*

Engage

Show students Appendix A: *Murray River Today* on the smartboard. Discuss as a group:

- Who uses the Murray River today?
- In what ways is the river used?
- How would you describe our relationship with the river?
- What hazards do we need to consider when we are working/playing/living near the river?

Instruct students to draw a Venn diagram in their workbooks titled THEN & NOW. Give them some time to make notes in the NOW section about our relationship with the river and how we use it today

Explore

- Students can now explore People of the Murray River and add to their THEN & NOW any information they find about the role the river played in the lives of Aboriginal and Torres Strait Islander people pre-colonisation. Encourage them to think about whether there are any aspects of the relationship that remain relevant today (e.g. Fishing, swimming etc.).

Curriculum

History – Historical Concepts and Skills
Chronology
Levels 7 & 8

- Sequence significant events in chronological order to analyse the causes and effects and identify continuities and changes (VCHHC097)
- Describe and explain the broad patterns of change over the period from the Ancient to the Modern World (VCHHC098)

History – Historical Knowledge
Aboriginal and Torres Strait Islander peoples and cultures
Levels 7 & 8

- How physical or geographical features influenced the development of Aboriginal and Torres Strait Islander peoples' communities, foundational stories and land management practices (VCHHK105)

Geography – Geographical Knowledge
Water in the world
Levels 7 & 8

- The spiritual, economic, cultural and aesthetic value of water for people, including Aboriginal and Torres Strait Islander peoples and peoples of the Asia region, that influence the significance of places (VCGGK109)

Explain

Discuss as a group:

- Are there any similarities between the relationship we have with the river today and that of people in the past?
- In what ways has it changed?
- What might this relationship look like in another 200 years?

Elaborate

- Give each student a copy of Appendix C: *Looking Forward*. Students need to add to the image according to what they predict the Murray River will look like in the future. They should think about the way it might be used and cared for and incorporate this into their image.

Evaluate

- In pairs, students share their images, explaining their predictions and the reasons for their choice. Each student should respond to their partner with feedback; one thing they thought was interesting, and one thing that could be improved.

References

Discover Murray River, 1998-2018. *People of the Murray River*, http://www.murrayriver.com.au/about-the-murray/murray-river-aboriginals/ [viewed 06 July 2021].

Appendix A
Murray River Today

water safety education
life saving victoria

Appendix B
Looking Forward

water safety education
life saving victoria

Life on the Murray River

Activity 2

View the 'Life on the Murray River' VR tour at www.lsv.com.au/vr

LEVELS 7 & 8

Key Learning

During this activity, students will learn about the water cycle within the Murray-Darling Basin and investigate some of the issues that threaten the health of the river. Students will analyse and interpret river data, including water levels, flow rates and salinity levels.

Resources

- Computer access for students
- Smartboard or projector

Engage

- Watch The Water Cycle in the Murray-Darling Basin together as a whole class.

Explore

- Have students complete a PMI chart in their workbooks. They will need to divide their page into three sections: Plus, Minus and Interesting.
- Students will fill in their chart with facts and ideas from the video. Share some of these as a class and collate students' ideas on a large PMI chart on the board.
- Look at the Minus section and ask students what they think are the main threats to the health of the river.

Curriculum

Geography – Geographical Knowledge

Water in the world

Levels 7 & 8

- Ways that flows of water connect places as they move through the environment and the ways this affects places (VCGGK106)
- The quantity and variability of Australia's water resources compared with those in other continents and how water balance can be used to explain these differences (VCGGK107)

Geography – Geographical Concepts and Skills

Data and information

Levels 7 & 8

- 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 (VCGGC104)

Explain

- Look at the Map of Topographic Drainage Divisions and River Regions from the Bureau of Meteorology. Encourage students to make observations and draw conclusions using the information presented by asking:
- Can you locate the Murray-Darling Basin? Can you identify any of the other regions?
- Which of these regions do you think would get the most/least rain? Why?
- What role does topography play in defining these water catchment areas? For example, what significant geological feature separates the Murray-Darling Basin from the South East Coast? *Answer: The Great Dividing Range – Water runs off to the east and west into the two different catchment areas*.
- Looking at the other regions, can you explain any of these drainage areas based on the geographical features of the area? For example, water drains into Lake Eyre as it is the lowest natural point in on the mainland of Australia.

Elaborate

- With a partner, students will need to access the River Data website. They need to choose one location along the river and look at the graphs showing the various measurements over time (e.g. Water level, flow rates, salinity etc.). By comparing these graphs, students need to make some statements about what might have happened at certain points in time.
- For example:

  At Tocumwal on the 24th of August, 2017 the water level rose to 4.359m. Flow rates were also much higher on this day. This might have contributed to the drop in salinity that occurred over the following week.

Evaluate

- Each pair of students can now present their observations to the class. Encourage students to ask questions and discuss the observations made. Ask students to identify different times when it might not have been safe to swim in the river based on the data they have seen and ask them to explain why. Discuss the importance of checking the conditions, such as rainfall and currents, before entering the water.

References

Bureau of Meteorology. *Australian Hydrological Geospatial Fabric* (Geofabric), http://www.bom.gov.au/water/geofabric/documents/BOM002_Map_Poster_A3_Web.pdf [viewed 12 July 2018]

Murray-Darling Basin Authority. *River Murray Data*, https://riverdata.mdba.gov.au/system-view [viewed 12 July 2018]

FUSE, 2017. *The Water Cycle in the Murray-Darling Basin*. [online video] Available at: https://fuse.education.vic.gov.au/Resource/LandingPage?ObjectId=d726e7cf-bab2-4ac8-be41-99f5cfa434c7 [Accessed 12 July 2018]

Life on the Murray River

Activity 3

View the 'Life on the Murray River' VR tour at www.lsv.com.au/vr

LEVELS 7 & 8

Key Learning

During this lesson, students will investigate the animals and organisms that rely on the river red gum and create a food web to show how they depend on each other for survival.

Resources

- Smartboard
- Computer access for students
- Small pieces of cardboard or Post-it notes
- Appendix A: *T-Chart*

Engage

- Look at the photos of river red gums on the Smartboard or projector.
- Tell students:

  The River Red Gum is a type of Eucalypt that can live for over 500 years. They grow along rivers and lakes. River Red Gums make the perfect habitat for many different animals, and older trees can have up to 300 hollows in their trunks that provide shelter for many types of animals.
- Ask students what creatures and organisms might live on or in these trees. Write each of their suggestions on a separate piece of card or Post-it note.
- Display these on the board or arrange them on the floor where all of the students can see them. Now ask students to think about what each of these creatures might eat and which would be at the top/bottom of the food chain.
- Rearrange the cards into a food chain.

Curriculum

Science – Science Understanding

Biological sciences

Levels 5 & 6

- Living things have structural features and adaptations that help them to survive in their environment (VCSSU074)
- The growth and survival of living things are affected by the physical conditions of their environment (VCSSU075)

Explore

- Students now need to do some research to find out which creatures and organisms make their home in river red gums and what these animals eat. They need to sort the information they collect into Appendix A: *T-Chart*.

Explain

- Model and explain how a food web works using the Antarctic Food Web Game on the Smartboard.

Elaborate

- Students can now create a food web using the information they have gathered in their T-Chart. This could be done on paper or using a computer application such as Canva (if students have email addresses they can start a free account), otherwise Microsoft Word or PowerPoint could be used.

Evaluate

- In pairs, students can compare their food webs. Then together as a whole group, ask students to explain any similarities/differences. Discuss the importance of the river red gum to environment.

References

NSW National Parks and Wildlife Service. River Red Gum, https://www.nationalparks.nsw.gov.au/plants-andanimals/river-red-gum [viewed 16 July 2018]

PBS Learning Media. Antarctic Food Web Game https://www.pbslearningmedia.org/resource/lsps07.sci.life.eco.oceanfoodweb/antarctic-food-webgame/#.W0iWAtIzbIU [viewed 13 July 2018]

Canva. https://www.canva.com/ [viewed 14 July 2018]

Appendix A
T-Chart

List as many creatures as you can that make their home in or on the River Red Gum, then find out what they eat to survive.

Animal	What does it eat?

Life on the Murray River

Activity 4

View the 'Life on the Murray River' VR tour at www.lsv.com.au/vr

LEVELS 7 & 8

Key Learning

During this lesson, students will demonstrate their understanding of how a lock works. They will calculate a lock's capacity using its dimensions.

Resources

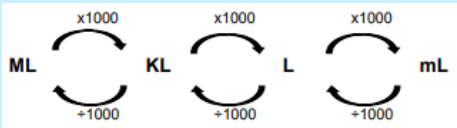
- Isometric Paper

Engage

- In their books, students need to draw a series of diagrams to show how a lock works. Remind them to make it as detailed as possible and to include labels. Invite some students to share their diagrams with the class.

Explore

- Ask students to estimate how much water they think the lock at Mildura might hold. They should write their estimate on a piece of paper and keep this for later.
- Now ask:
- What is this measurement called? What units of measurement would we use?
  Answer: Capacity, millilitres (mL), litres (L), kilolitres (KL), megalitres (ML)



- What information will we need to calculate the capacity of the lock?
  Answer: We need its dimensions (length, width and height)

Curriculum

Mathematics – Measurement and Geometry

Using units of measurement

Levels 7

- Calculate volumes of rectangular prisms (VCMMG259)

Level 8

- Choose appropriate units of measurement for area and volume and convert from one unit to another (VCMMG286)
- Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (VCMMG289)

Explain

Ask students:

- What is the difference between volume and capacity?
- *Answer: Volume is the space taken up by an object and is measured in cubic units (eg. cm3 , m3). Capacity is how much a container can hold and measurements depend on what it holds (eg. for liquid: L, mL etc.)*

Demonstrate how to calculate capacity:

- e.g. A container is 8cm long, 5cm wide and 3cm high
- Step 1: Calculate its volume Volume = L x W x H = 8cm x 5cm x 3cm = $120cm^3$
- Step 2: Convert to capacity $1cm^3$ = 1mL $120cm^3$ = 120mL

Give students the dimensions of the lock at Mildura (61.5m long, 17.1m wide and 7.6m deep) and ask them to calculate capacity (they may use a calculator). Hint: $1m^3$ = 1000L. Ask students to look again at their estimate and see who was closest.

Elaborate

- Explain to students that they are being asked to design a lock. The total capacity needs to be 8 megalitres. Using the isometric paper they need to draw as many different models as they can, labelling the dimensions of each.

Evaluate

Discuss as a whole class:

- Describe the hazards around locks.
- Given how much water is flowing in and out of a lock, how could this affect conditions downstream?
- What can you do to make sure you stay safe around weirs and locks?

References

Goulburn Murray Water. *Mildura Weir and Lock 11*, https://www.gmwater.com.au/downloads/gmw/Storages/12-05-2015-TATDOC-3964403-v1- FACT_SHEET_MILDURA_WEIR_AND_LOCK_11_MAY_2015.pdf [viewed 15 July 2018]