

Life on the Murray River

LEVELS 7 & 8

Activity 4

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



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

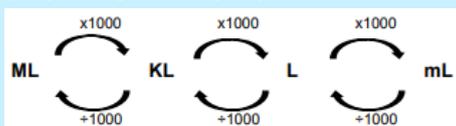
- In their books, students need to draw a series of diagrams to show how a lock works. Remind them to make it as detailed as possible and to include labels. Invite some students to share their diagrams with the class.



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 $\text{Volume} = \text{L} \times \text{W} \times \text{H} = 8\text{cm} \times 5\text{cm} \times 3\text{cm} = 120\text{cm}^3$
- Step 2: Convert to capacity $1\text{cm}^3 = 1\text{mL}$ $120\text{cm}^3 = 120\text{mL}$

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: $1\text{m}^3 = 1000\text{L}$. 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.g-mwater.com.au/downloads/gmw/Storages/12-05-2015-TATDOC-3964403-v1-FACT_SHEET_MILDURA_WEIR_AND_LOCK_11_MAY_2015.pdf [viewed 15 July 2021]