

## Water around the world

Adapted from *Watersense Teacher Resource File* (2007) reproduced courtesy of Brisbane City Council.

### » Lesson overview

In this lesson, students explore the global distribution of water and calculate the proportion of fresh water on the planet. They represent the distribution of types of water as a pie graph.

### » Lesson objectives

In this lesson, students:

- explore how water is distributed globally in a variety of forms
- calculate the volume of fresh water as a percentage of the total global volume of water.

### » Equipment

#### For the class

- 10 L bucket of water (use translucent bucket if possible)
- 1 L bottle, graduated
- four plastic cups (translucent if possible)
- eye-dropper
- permanent marker
- enlarged copy or overhead transparency of 'Global distribution of water' (Resource 2)

#### For each student

- copies of 'Global distribution of water' (Resource 2)
- three different coloured pencils.
- student journal

### » Preparation

- Gather a globe or pictures of earth viewed from space, and pictures of other planets.

### » Lesson steps

1. Show pictures of earth and other planets viewed from space. Ask students to compare the earth with the other planets and to share the first things they notice about the earth (clouds, blue and lots of water). Explain that the first time humankind saw pictures such as these was when humans first went into space. earth was then dubbed the blue planet. Ask students what causes the blue colour of earth when viewed from outer space.
2. Students then brainstorm as many water sources as they can think of (oceans, rivers, lakes, dams, groundwater, icebergs, clouds, etc.) and together categorise the sources as salt or fresh water. Ask how many sources would be drinkable. Explain that even though our planet has lots of water, not all of it is suitable for drinking.
3. Hold up a bucket of water and explain that you are going to demonstrate how much of the world's water is salt water, frozen, and fresh water. If all of the world's water filled one bucket (10 L), ask students to predict how many millilitres of water would be:
  - a. salt water
  - b. frozen fresh water in glaciers and polar ice caps
  - c. liquid fresh water on the surface
  - d. groundwater.

Students use colour coding to record their predictions in the left column of the table on the resource sheet 'Global distribution of water' (Resource 2).

4. Take enough water out of the bucket to fill two glasses: one to 200 mL and the other to 100 mL. Set these aside. Now hold up the bucket and explain that the 9700 mL of water remaining in the bucket is salt water. Hold up the 200 mL glass of water and explain that this much of the world's water is frozen. Hold up the 100 mL glass of water and explain that this represents fresh water found in rivers, creeks and underground.
5. Ask students to record the actual number of millilitres of the three types of water found on earth in the right column of the table on the Resource 2 work sheet. Highlight the fact that most of the water on the planet is not fresh water, which has traditionally been the source of water supply in Australia and overseas. The 1% of fresh water available for humans is very precious.
6. Discuss students' reactions to this activity. Ask them to record their ideas about this activity in their journal.
7. Begin a classroom collection and water board of pictures showing how water is used. Set aside a specific section of classroom wall space and allow additions to be made throughout this unit of work.
8. Begin a 'Drinkable water' word wall of vocabulary for this unit.

**A student journal is a record of the student's ideas, observations and experiences. It can include text, diagrams, drawings and images. The journal is a 'thinking diary' that should be dated and written in chronological order. Make sure that students use full sentences in their journals.**

### » Curriculum links

#### English

Share with students the book *Water ... the Amazing Journey* by Caren Trafford; illustrated by Megan Eriksson.

#### Maths

Find out how much water there is in the world. Use the internet to find the actual amount of fresh water available on each continent in the world. Visit <[www.worldwater.org](http://www.worldwater.org)>. Graph the information and label the graph 'Water available in the world'.

#### The Arts

Students could design a title page for their journal for this unit.

# Resource 2

## Global distribution of water



More than 70% of the earth's surface is water.

Imagine that the 1260 million trillion litres of earth's water filled this 10 L (10 000 mL) bucket.

PREDICT the amount of each type of water found on earth as a millilitre value (%)

10 000 mL

9 000 mL

8 000 mL

7 000 mL

6 000 mL

5 000 mL

4 000 mL

3 000 mL

2 000 mL

1 000 mL

Colour code your answers

Green—salt water

Yellow—fresh water in glaciers and polar ice caps

Blue—fresh surface and groundwater

Record the ACTUAL amount of each type of water on earth as a millilitre value (%)

10 000 mL

9 000 mL

8 000 mL

7 000 mL

6 000 mL

5 000 mL

4 000 mL

3 000 mL

2 000 mL

1 000 mL

Calculate the percentage of the three types of water available in the world, and illustrate this with a pie chart graph by following the steps below. (Note that this activity is simplified and that not all fresh water on earth is available for human use.)

- Convert the volume of each type of water to a decimal fraction of the earth's total water by dividing the volume of each type of water by 10 000 mL. (For example, to calculate the decimal fraction of salt water, divide 9 700 by 10 000).

Decimal fraction of salt water = \_\_\_\_\_

Decimal fraction of ice caps/glaciers = \_\_\_\_\_

Decimal fraction of rivers/creeks/groundwater = \_\_\_\_\_

## Resource 2 (continued)

2. Multiply these values by 360 (the number of degrees in a circle). This will give you the proportion of the whole circle that represents that type of water. Round the values to the nearest whole degree. (For example,  $0.02 \times 360 = 7.2^\circ$ . Round the answer down to  $7^\circ$ .)

Number of degrees for salt water = \_\_\_\_\_

Number of degrees for ice caps/glaciers = \_\_\_\_\_

Number of degrees for rivers/creeks/groundwater = \_\_\_\_\_

3. Using a different coloured pencil for each type of water, colour the number of segments of the circle below that represent the proportion of earth's total water for each type of water.

Start from the line at A. (Hint: Each small segment is equivalent to  $5^\circ$ . You might have to estimate the proportion of a segment.)

