Maritime problems

Convert between units of capacity to solve problems using decimal notation

Challenge 1

Each goldfish needs a minimum of 9 litres of water.

1 How many goldfish can be kept in the tanks at the marine centre with these capacities:

a 90 litres **b** 135 litres **c** 180 litres **d** 216 litres

2 What is the capacity in litres for the tank that the marine centre will need for:

a 12 goldfish? **b** 25 goldfish?

3 The water level in a tank for 10 goldfish has fallen to 87·25 litres. How many litres of water must be added to the tank to bring it up to the minimum capacity for the goldfish?

Challenge 2

1 Andy sells motor boat fuels and refuels boats. He writes each sale in his record book. Copy and complete Andy's entry.

Boat	Meter reading at fuel pump (*l*)		Fuel sold (*l*)
	Before sale	After sale	
Sea Wind	6658	6756	98
Sea Breeze	6756	6930	
Sea Eagle	6930		158
Sea Sprite		7225	137
Sea Hawk		7391	166

2 Water is leaking from a tap at the marine centre at the rate of 5 ml per second.

a If a 1 litre jug is placed under the tap, how many seconds will it take to fill the jug?

b If the tap continues to leak at the same water-flow rate, how much water will be lost:

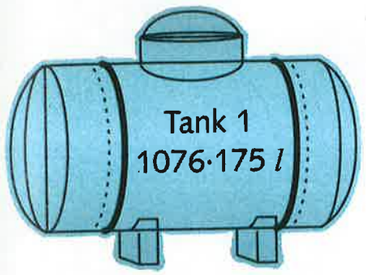
i in one hour? **ii** in one day?

3 The drinks machine at the marine centre cafe mixes 200 ml of syrup with 800 ml of water.

a How many litres of water are needed to mix with 4500 ml of syrup?

b How many litres of syrup are needed to mix with 64 litres of water?

4 The Sea Queen has two fuel tanks.



a How many litres of fuel altogether are in the Sea Queen's tanks?

b How much more fuel is in Tank 1 than in Tank 2?

c The Sea Queen draws alongside to refuel. It needs 4500 litres altogether for the day's trip to the island. How many litres of fuel are added to Tank 1 and Tank 2 so that each tank holds the same amount?

Challenge 3

Tanya is a marine biologist. She filled ten 500 ml bottles with samples of sea water. She capped the ten bottles and placed them in a rack made up of 25 sections so that no line (horizontal, vertical or diagonal) had more than 1 litre of liquid.

Use 1 cm squared paper to mark off a 5 × 5 square grid. Draw circles in the grid to show how Tanya could have placed her ten bottles in the rack. Write a statement explaining your reasoning.

You will need:
- 1 cm squared paper
- ruler