

Going Global

You need

- ★ Mina's map (see copymaster)
- ★ a compass
- ★ a ball of string
- ★ 6 multilink cubes
- ★ 3 chairs
- ★ a classmate

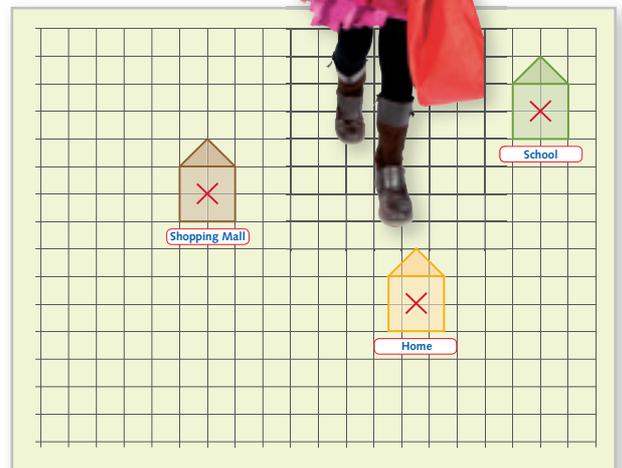
TECHNOLOGY

Often, technological advances in one area lead to innovations in another. For example, developments in space and satellite technology have led to the development of systems that can locate people or places with incredible accuracy.

Activity One

Mina often goes to a swimming pool that is 1 kilometre (km) away from her home. The pool is 2 km from the shopping mall and 3 km from her school.

- Using the scale on your copy of Mina's map, draw a circle with a radius of 1 km, with its centre at Mina's home. All points that are 1 km from her home are found on this circle.
 - Draw in all the points that are 2 km from the shopping mall and 3 km from her school.
 - Find the location of the swimming pool. Discuss with a classmate why you needed all three measurements to find the pool.



- A Global Positioning System (GPS) receiver uses a similar method to work out its own location. The receiver picks up signals sent from at least three orbiting GPS satellites. The receiver then uses this information to calculate its own co-ordinates. This process is called trilateration.

- With a classmate, spread out 3 chairs. Place 6 multilink cubes randomly inside the area formed by the chairs. Tie a long piece of string to one leg of each chair.
- Choose one of the cubes. Without your classmate watching, lay the string from each chair in a straight line to that cube. Cut each string so that it only just reaches the cube. Then bundle each string loosely at the foot of the chair it is tied to.
- Your classmate uses the strings to work out which cube you chose.
- Swap roles and repeat the challenge.

Now I've got a better idea of how GPS devices work!



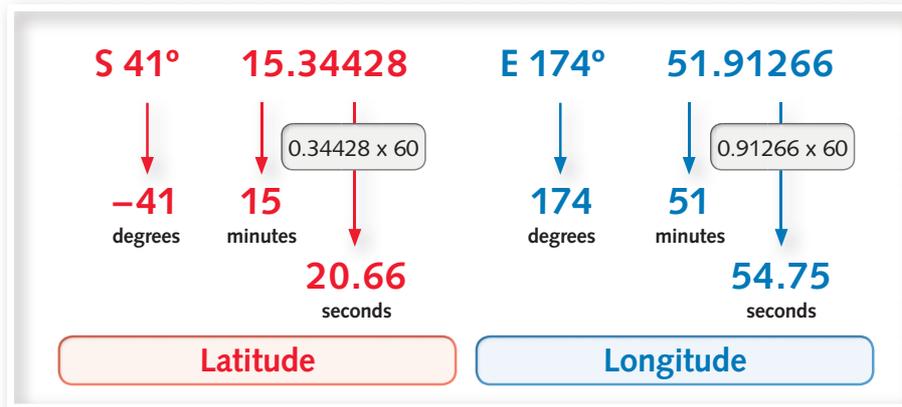
Activity Two

GPS receivers are used in a worldwide treasure-hunting game called geocaching. People hide small containers called geocaches and put the co-ordinates of the hiding place online. Mina and her family decide to try to find a geocache.

1. Mina gets these geocache co-ordinates from a geocache website:

S 41° 15.34428 E 174° 51.91266

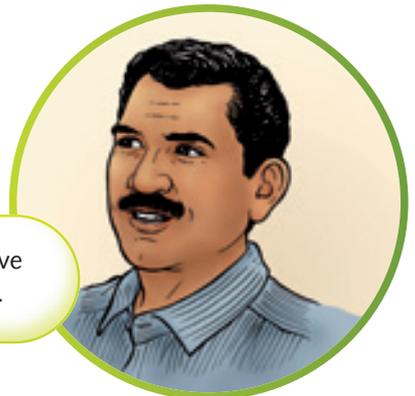
She finds out that co-ordinates can be written in different ways.



These don't look like the co-ordinates that we used in maths!



15 is the minutes, so I multiply 0.34428 by 60 to get the seconds.



South and west co-ordinates are negative (e.g., S 41° is -41°, and W 24° is -24°).

Convert these geocache co-ordinates into degrees, minutes, and seconds:

- a. **S 3° 3.9165 E 37° 21.5445**

	Degrees	Minutes	Seconds
Latitude	<input type="text"/>	<input type="text"/>	<input type="text"/>
Longitude	<input type="text"/>	<input type="text"/>	<input type="text"/>

- b. **N 29° 58.509 W 31° 8.26**

	Degrees	Minutes	Seconds
Latitude	<input type="text"/>	<input type="text"/>	<input type="text"/>
Longitude	<input type="text"/>	<input type="text"/>	<input type="text"/>

2. Use the Internet to find out where the geocache is hidden.

Focus

Describing locations using co-ordinates