

Where's the WiFi?

Purpose:

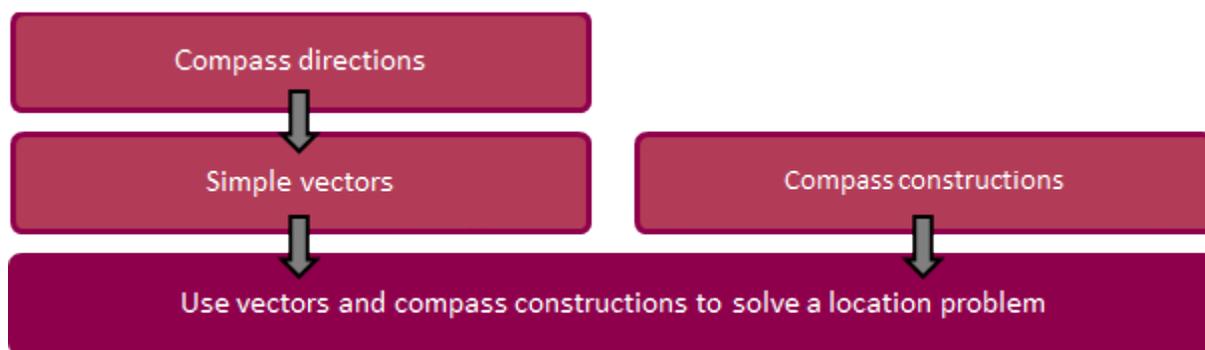
The purpose of this activity is to engage students in using compass directions and compass constructions to solve a location problem.

Achievement Objectives:

GM4-7: Communicate and interpret locations and directions, using compass directions, distances, and grid references.

Description of mathematics:

The background knowledge and skills that need to be established before and/or during this activity are outlined in the diagram below:



Compass directions

Draw an arrow showing the direction NW (Northwest)

Simple vectors

The treasure is 20 m SE of the pirate. Show this as a vector.

Compass constructions

The treasure is anywhere within 10 m of where a pirate is standing. Show this on a scale diagram (where 1cm represents 1 m).

Use vectors and compass constructions to solve a location problem

Use a map of the North Island to find the town that is closest to being halfway between Auckland and Wellington and is closest to State Highway 1.

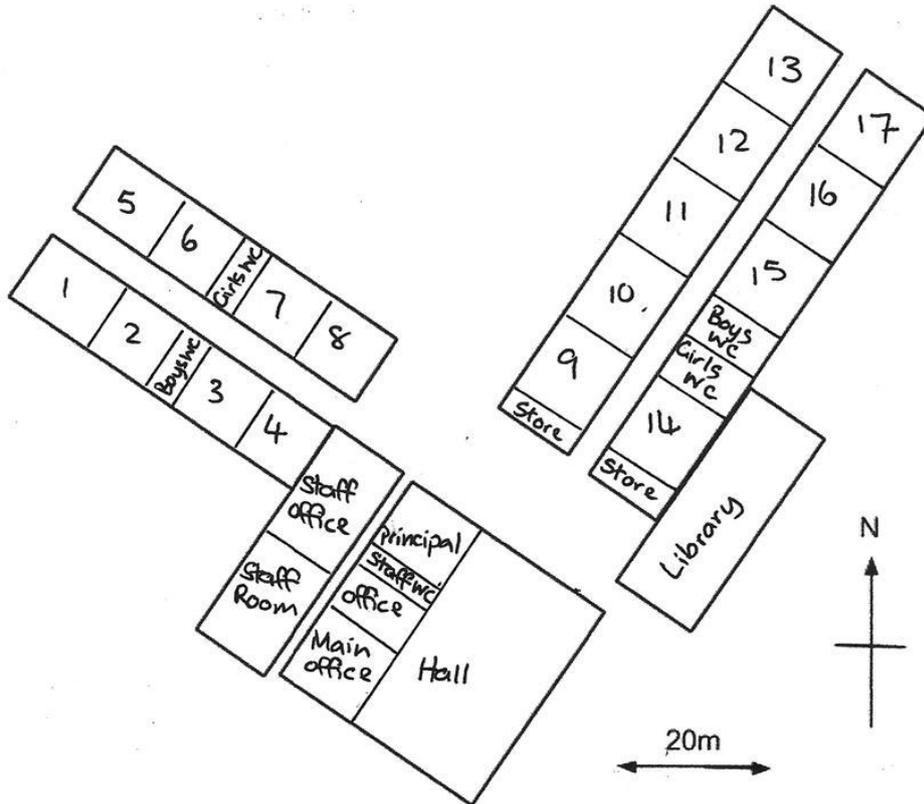
To solve this problem, the students may locate the positions given with a combination of calculations and measurements. The guidance given should be chosen in sympathy with their skills and preferred method of solution.

Activity:

Arthur, Betty and Charlotte are all at school, in different rooms, successfully using their friend Darren's WiFi hotspot from his phone.

Arthur and Betty can connect within 50m of Darren's phone, but Charlotte's phone can manage 80m.

The map of the school, below, shows where Arthur, Betty and Charlotte are at the moment.



Darren is due East of Arthur who is in room 3.

Betty is in room 13 and Charlotte, in room 11 is Northeast of Darren.

Where is Darren?

The procedural approach

The student is able to use compass directions and compass constructions to solve a problem.

Prompts from the teacher could be:

1. Mark, on the map, where Arthur is.
2. Use the range of Arthur's phone and the scale of the map to mark out a region where Darren may be.
3. Mark, on the map, where Betty is.
4. Use the range of Betty's phone and the scale of the map to mark out a region where Darren may be.
5. Mark, on the map, where Charlotte is.
6. Use the range of Charlotte's phone and the scale of the map to mark out a region where Darren may be.
7. Use the clue of where Darren is relative to Arthur to draw a line along which Darren might be.
8. Use the clue of where Darren is relative to Charlotte to draw a line along which Darren might be.
9. Locate Darren.

