

Task: Which Direction?



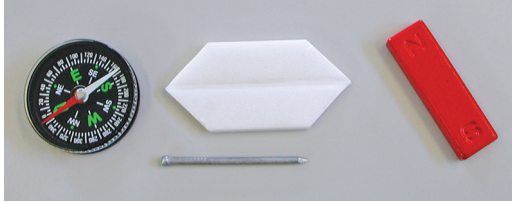
Year: 8

Approach: One to one

Focus: Magnetic north

Resources: Magnet (Note: always keep the magnet at a distance from compass), compass, nail, bowl of water, polystyrene raft

Questions / instructions:



This activity is about compasses.

Give student compass.

1. What is a compass used for?

compass is used to find direction

Have a good look at this compass. Turn the compass around and watch the needle as you turn it.

2. What do you notice about the direction the compass needle is pointing?

the needle pointed in the same direction all of the time

that direction was approximately north-south

If student doesn't know say the compass always points north-south. Help set the compass so it points north-south.

3. Why does the compass needle always point north-south?

Explanation:

[Needle is a magnet, and the earth is a magnet (has a magnetic field), so the needle lines up with the earth's magnetic field.]

all three points

identified magnetic nature of needle and earth

general idea that it involved magnet(s)

Remove the compass.

Hand student nail and magnet.

You can try to make a simple compass. First you will need to stroke the nail longways with an end of the magnet. Stroke the nail 10 times in one direction with the magnet. Stroke it slowly and firmly.

Allow time.

Subgroup Analyses:

Year 8

Score Range

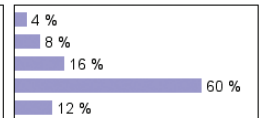
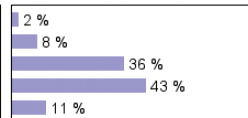
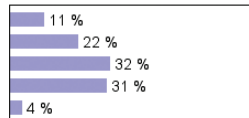
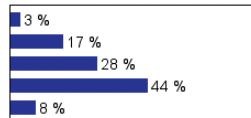
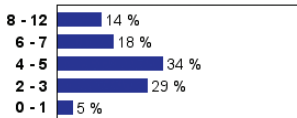
Boys

Girls

Pakeha

Māori

Pasifika



Commentary:

This was one of the few tasks on which boys and girls performed significantly differently. Here, boys scored markedly higher than girls. The results showed quite limited understanding of magnetism among year 8 students.

% responses
y8



% responses
y8

Show student raft and bowl of water.

4. If you place this nail on the raft to float in the water what do you think will happen?

the nail will turn to a particular direction/point north-south

Help student place nail on raft.

Place compass in front of student.

5. What do you notice about the way the nail is pointing?

nail pointed in the same direction all of the time that direction was approximately north-south

6. Why is the nail pointing in that direction?

nail now a magnet/magnetic nail attracted to the earth's magnetic field

7. What does this tell you about the needle on a compass?

the compass needle must be a magnet

91

49

46

2

6

16

41

29

63

23

10

33

Total score: 8-12

9

6-7

18

4-5

31

2-3

36

0-1

6