

# Chilly Heights

You need  a calculator

## Activity

Jonathan and Penny have taken leave from work to climb Aoraki (Mount Cook). Use the information below to help you work out the temperatures at different parts of their climb.

	Altitude (height above sea level)
Mount Cook Village	700 metres
Plateau Hut	2 200 metres
Top of Linda Glacier	3 100 metres
Summit Rocks	3 400 metres
Aoraki summit	3 754 metres

Air Temperature	7	4	1	-1	-4	-7	-10
Wind speed	Wind chill temperature (in°C)						
20 km/h	4	0	-4	-6	-10	-14	-8
40 km/h	2	-2	-6	-9	-13	-17	-21
60 km/h	1	-3	-7	-10	-14	-18	-23
80 km/h	0	-4	-8	-11	-15	-20	-24



Jonathan and Penny leave Plateau Hut at 2 a.m. There is no wind, and the temperature is  $-4^{\circ}\text{C}$ . The forecast is for a clear, cloudless day.



1. By 6 a.m., they have climbed the Linda Glacier. There is still no wind, but the temperature has dropped by about  $1^{\circ}\text{C}$  for every 150 metres climbed. What is the temperature now?
2. By 8 a.m., the climbers have reached the Summit Rocks, and the sun is slowly warming things up. Penny pulls a thermometer out of the top of her pack, and it reads  $-7^{\circ}\text{C}$ , but a 20 kilometre per hour wind has come up. What does the temperature feel like, taking into account the wind chill factor?
3. At 10 a.m., they are at the summit of Aoraki. Penny's thermometer reads  $-4^{\circ}\text{C}$ , but the wind has picked up to 40 kilometres per hour. What is the temperature that the climbers feel?



4.

On the way down, Jonathan phones his sister, who is staying at Mt Cook Village.

We made it to the top, Maria!  
It was  $-4^{\circ}\text{C}$  up there.



It's much warmer down here!



What was the temperature at Mt Cook Village at 10 a.m.?  
Remember that the temperature drops by about  $1^{\circ}\text{C}$  for every 150 metres of height climbed.



5. By 12 noon, Penny and Jonathan have climbed back down to the Summit Rocks and the sun is beating down. Penny's thermometer reads  $4^{\circ}\text{C}$ , but the wind has picked up to a dangerous 80 kilometres per hour. They decide to have lunch in a sheltered spot between two rocks, where there is no wind. How much warmer does it feel out of the wind than in it?
6. When the climbers get back to the Linda Glacier, Penny's thermometer reads  $7^{\circ}\text{C}$  and the wind has dropped to 20 kilometres per hour. What temperature do the climbers feel now?

