How High's the Water Now, Mum?

You need ★ classmates

Activity

Talei goes to a school in the Waikato. She and her classmates are trying to discover why their river floods. They come across a useful diagram (see next page).

> Water is a valuable resource. But can you still call it a resource when too much causes problems?

> The volume of water that travels along a river system is measured in cubic metres per second (cumecs). The normal flow of the Waikato River is 200 cumecs; during floods, it can increase to over 1 000 cumecs.

> It says here that 1 cubic metre is about the same as 5 full bathtubs!

1. The classmates all have ideas on what the diagram is telling them …

i.
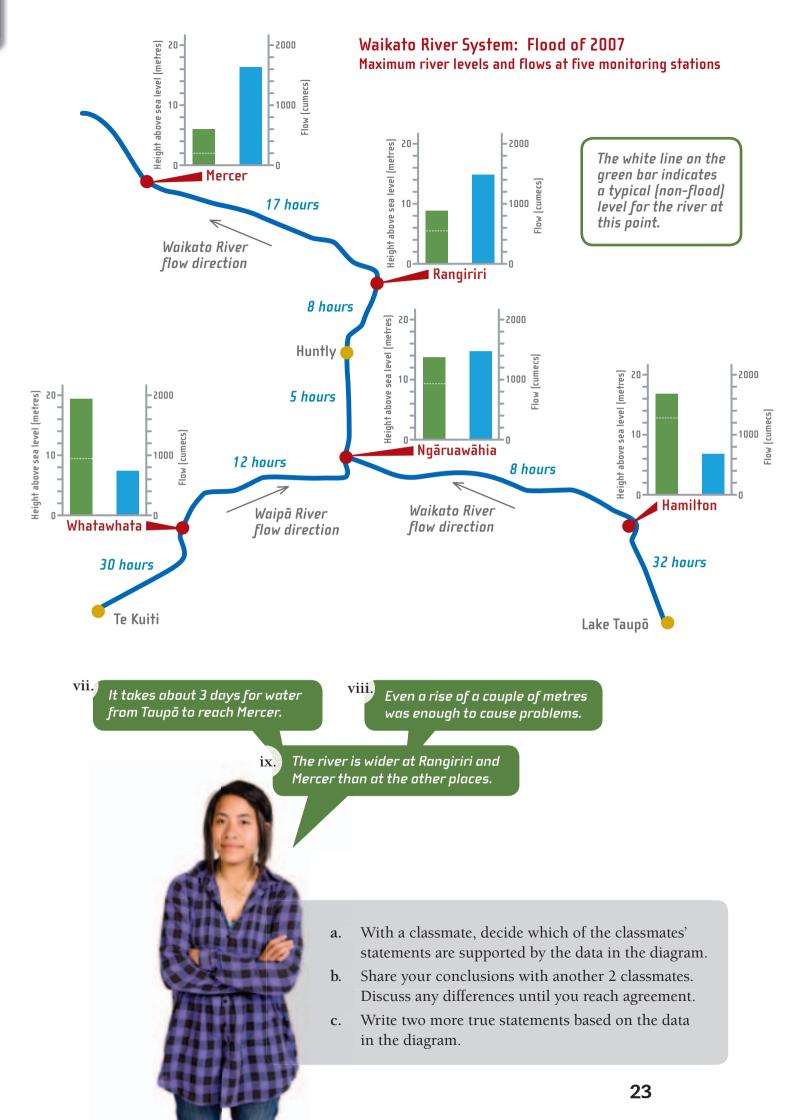> At Whatawhata, the river was about twice its usual height.

ii.
> After Ngāruawāhia, the river's flow was greater than its height.

iii.
> When the Waipā joined the Waikato, the volume of water doubled.
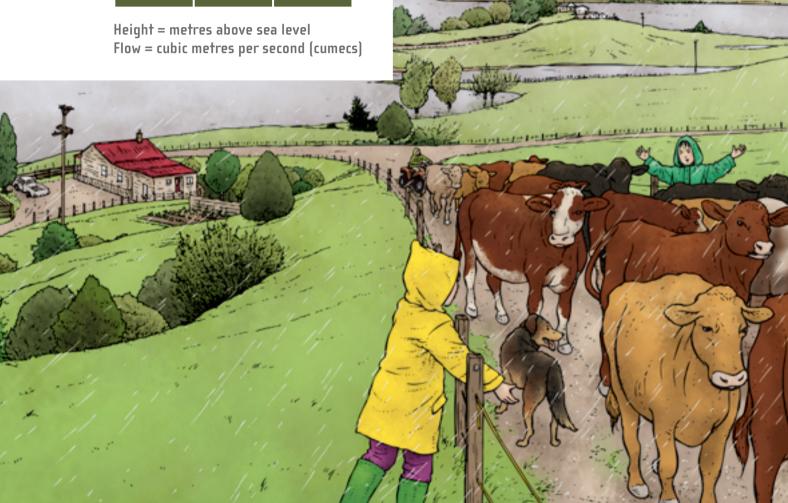
iv.
> The worst flooding was at Whatawhata.

v.
> The river is much shallower at Mercer than at the other places.

vi.
> There can't have been much rain north of Ngāruawāhia.

Waikato River System: Flood of 2007
Maximum river levels and flows at five monitoring stations

Mercer

Rangiriri

The white line on the green bar indicates a typical (non-flood) level for the river at this point.

17 hours

Waikato River flow direction

8 hours

Huntly

5 hours

Ngāruawāhia

12 hours

Waipā River flow direction

8 hours

Waikato River flow direction

Hamilton

Whatawhata

30 hours

32 hours

Te Kuiti

Lake Taupō

Height above sea level (metres) — *Flow (cumecs)*

vii. *It takes about 3 days for water from Taupō to reach Mercer.*

viii. *Even a rise of a couple of metres was enough to cause problems.*

ix. *The river is wider at Rangiriri and Mercer than at the other places.*

a. With a classmate, decide which of the classmates' statements are supported by the data in the diagram.

b. Share your conclusions with another 2 classmates. Discuss any differences until you reach agreement.

c. Write two more true statements based on the data in the diagram.

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2. Luke and his family live on a farm near the riverbank at Mercer.
Their farmhouse is 6.0 metres above sea level.

Recorded Flood Peaks – Mercer		
Year	Height	Flow
1907	6.76	1 700
1958	5.74	1 260
1995	5.23	1 213
1998	5.03	1 134
2007	6.06	1 650

Height = metres above sea level
Flow = cubic metres per second (cumecs)

a. How many of the recorded floods would have reached Luke's house?

b. If the Waikato flows at a rate of 1500 cumecs, will Luke's house be in danger of being flooded? Explain your reasoning.

3. How long after a flood surge warning in Ngāruawāhia does Luke's father have to move his stock to higher ground?

Focus   Interpreting graphs and estimating values