

# Task: Estimates

Approach: Team

Year: 4 & 8

Focus: Measurement sense; selecting and using devices; number strategy; estimation

Resources: 2 cards, 2 calculators, 2 x 250ml marked cups, 2 pair answer sheets, 2 stopwatches, 2 story books, 2 balls

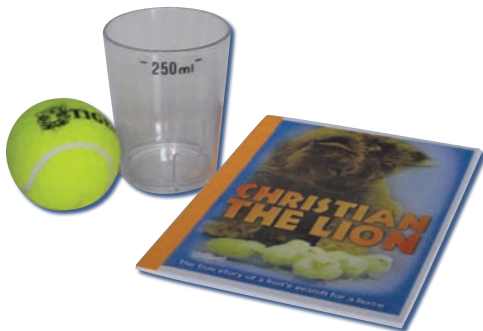
## Questions / instructions:

In this activity you will be working in pairs to estimate the measurements of three different things. You don't need to try to work out the exact measurement, just a good estimate. You can only work in this room to do this activity. [Student 1] and [Student 2] can work together, [Student 3] and [Student 4] can work together. Here are some things to help you work out your estimates.

### Hand each pair a calculator and stopwatch.

With your partner talk about how to do each estimate then write down how you would do it on the answer sheet. After that have a go at using your idea to estimate the measurement.

### Hand each pair an answer sheet, a card, a ball, a 250 ml marked cup and a story book.



[Card showed three problems, same as table below.  
Year 4 book: Mock-up of book constructed with pages 1 – 31 plus cover only. Bourke, A. & Rendell, J. (2009). *Christian The Lion*, London.: Red Fox, Random House.  
Year 8 book: Johnston, P. (2007). *Dead Dan's Dee*. Dunedin, N.Z.: Longacre Press, Random House.]

Problem	A Way to Estimate This	Estimate
The time it would take one of you to bounce a ball 100 times.		
The number of words in the story book.		
The amount one of you would drink in a week		

Here are the three things to estimate and your answer sheet. You have up to 15 minutes to work on this activity.

**Allow up to 15 minutes. Remind students when five minutes is left.**

**Bring students back to the team table.**

Now it is time to report back. [Student 1] and [Student 2] can report back first then [Student 3] and [Student 4].

Let's start with –

### **The time it would take one of you to bounce a ball 100 times.**

1. What did you do to estimate this answer?
2. What was your estimate?

#### **STUDENTS 1 & 2:**

**Students did estimate:** yes 39 79

**Estimation method:**  
attempted to bounce ball by some fraction of 100 and measured time taken, then multiplied by appropriate ratio for 100 bounces 14 70

**Validity:**  
(time measured  $\times$  100  $\div$  number of bounces measured)  
estimate was in the likely range (40 - 120 secs) 60 73

#### **STUDENTS 3 & 4:**

**Students did estimate:** yes 36 73

**Estimation method:**  
attempted to bounce ball by some fraction of 100 and measured time taken, then multiplied by appropriate ratio for 100 bounces 15 66

**Validity:**  
(time measured  $\times$  100  $\div$  number of bounces measured)  
estimate was in the likely range (40 - 120 secs) 55 80

### **The number of words in the story book.**

3. What did you do to estimate this answer?
4. What was your estimate?

#### **STUDENTS 1 & 2:**

**Estimation method:**  
Figured out words per page by working out words per line, then multiplying by number of lines:  
counted number of lines and number of words per line and multiplying counting words on a whole page 3 21  
32 53

Used estimate of words on a page and multiplied by number of pages:  
yes, and considered part pages (Y4 = 27/28 pages, Y8 = 153 pages) 5 4  
yes, but treated all pages the same (Y4 = 31 pages, Y8 = 162/170 pages) 17 40  
yes, counted pages but distinction between part and whole pages unclear 14 39

**Validity:** estimated total was in the likely range (Y4 = 3000 – 5500 words / Y8 = 30 000 – 55 000) 20 63

% responses  
y4 y8

39 79

14 70

60 73

36 73

15 66

55 80

3 21

32 53

5 4

17 40

14 39

20 63

	% responses			% responses	
	y4	y8		y4	y8
<b>STUDENTS 3 &amp; 4:</b>					
<b>Estimation method:</b>					
Figured out words per page by working out words per line, then multiplying by number of lines:					
counted number of lines and number of words per line and multiplying	4	28			
counting words on a whole page	31	44			
Used estimate of words on a page and multiplied by number of pages:					
yes, and considered part pages (Y4 = 27/28 pages, Y8 = 153 pages)	3	5			
yes, but treated all pages the same (Y4 = 31 pages, Y8 = 162/170 pages)	23	36			
yes, counted pages but distinction between part and whole pages unclear	14	45			
<b>Validity:</b> estimated total was in the likely range (Y4 = 3000 – 5500 words / Y8 = 30 000 – 55 000)	21	56			
<b>The amount one of you would drink in a week.</b>					
5. What did you do to estimate this answer?			7. Are any of your estimates similar?		
6. What was your estimate?			8. Why is that so?		
			<b>Discussion:</b>	strong	2 6
				moderate	19 50
				weak	79 44
			9. What things do you think you did well in this activity?	not marked here	• •
			10. If you did this activity again, what would you do differently?	not marked here	• •
			<i>PROMPT (Year 4 only): Does anyone else want to say anything?</i>		
<b>STUDENTS 1 &amp; 2:</b>					
<b>Students did estimate:</b>					
yes, as number of cups/glasses	36	58			
yes, as ml or litres	14	26			
<b>Multiplied by seven:</b> yes	40	85			
no, took weeks as 5 days	2	3			
<b>Validity:</b> estimated total in the range of 7L - 18L (28 - 72 cups)	23	57			
<b>STUDENTS 3 &amp; 4:</b>					
<b>Students did estimate:</b>					
yes, as number of cups/glasses	33	63			
yes, as ml or litres	15	22			
<b>Multiplied by seven:</b> yes	39	81			
no, took weeks as 5 days	5	2			
<b>Validity:</b> estimated total in the range of 7L - 18L (28 - 72 cups)	26	80			
			<b>Total Score:</b>	21–30	5 40
				16–20	11 38
				11–15	15 13
				6–10	32 4
				0–5	37 5

**Commentary:**

This team task has been released immediately because it appears that the task could be improved if more highly structured. The general approach appears to be worthwhile, but many teams recorded insufficient information to allow full evaluation of their efforts. Because it is a team task, the usual subgroup graphs are not possible.