Chapter 9

Lesson 4

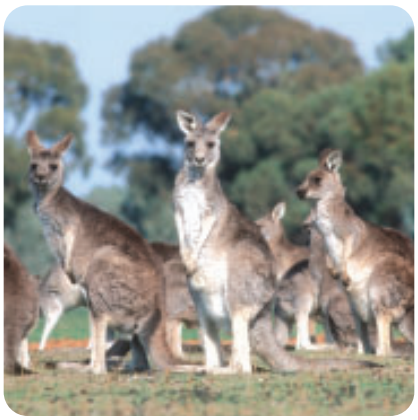
Estimating Quotients

GOAL

Use personal strategies to estimate quotients.

Some groups of animals have special names. Here are 3 examples:

A pod of dolphins



A mob of kangaroos

A rookery of penguins

A mob of 114 kangaroos split into equal groups and hopped off in 4 different directions.

About how many kangaroos hopped off in each direction?

René's Strategy

The number of kangaroos is close to 120.
I'll divide 12 tens by 4.

Tai's Strategy

The number of kangaroos is close to 100.
I'll divide 100 by 4.

A. Complete René's estimate. Is it high or low? Explain how you know.

B. Complete Tai's estimate. Is it high or low? Explain how you know.

C. Which estimate is closer to the actual value? Explain how you can tell, even if you don't know the actual value.

D. About how many kangaroos hopped off in each direction?

Reflecting

E. René used 120 kangaroos and Tai used 100 kangaroos to estimate. Why were both of these numbers good choices?

F. How are René's and Tai's estimation strategies the same? How are they different?

Checking

1. A rookery of 278 penguins was formed when 4 smaller rookeries came together. The 4 smaller rookeries were almost equal.

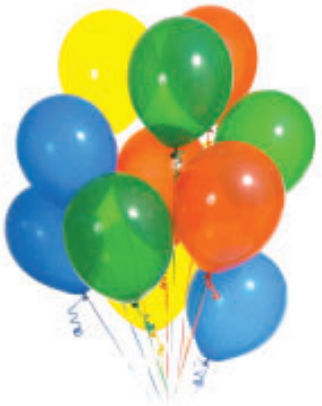
a) What number close to 278 could you use to estimate 278 ÷ 4? Why?

b) About how many penguins were in each smaller rookery?

Practising

2. A large pod of 132 dolphins was formed when 9 smaller pods of dolphins came together. The smaller pods were almost equal. About how many dolphins were in each smaller pod? Explain your estimation strategy.

3. Estimate each quotient. Show your work for two of your estimates.



a) 316 ÷ 3
b) 316 ÷ 5
c) 712 ÷ 9
d) 413 ÷ 8
e) 149 ÷ 8
f) 317 ÷ 4

4. 265 children are expected to attend the school fair. About how many packs of 8 balloons should be purchased so that every child can take home 1 balloon?

5. The quotient of each expression below is about 50. What is one possible value for each missing digit?

a) 287 ÷ ☐
b) 392 ÷ ☐
c) 223 ÷ ☐
d) ☐26 ÷ 8
e) 4☐3 ÷ 9
f) 36☐ ÷ 7

6. The cost of six pairs of jeans is about $250. The cost of four sweaters is about $125. Which costs more, a pair of jeans or a sweater? Show your work.

7. Alyson says that she estimates a quotient by using the place value of the first digit of the **dividend**. For example, to estimate 287 ÷ 8, she thinks 200 ÷ 8.

a) When would Alyson's strategy make sense?
b) When would you not use Alyson's strategy?

8. Explain how you know that 448 ÷ 9 is about 10 more than 358 ÷ 9.

9. Describe a situation in which you might want to estimate 512 ÷ 7.

10. Estimate 422 ÷ 5 using more than one strategy.