Chapter 3
Lesson 7

Subtracting Decimals by Regrouping

You will need
- base ten blocks
- a decimal place value chart

GOAL

Regroup to solve subtraction problems.

My Mass

Age (months)	Mass (kg)
Birth	2.879
3	5.305
6	6.875
9	8.164
12	9.431

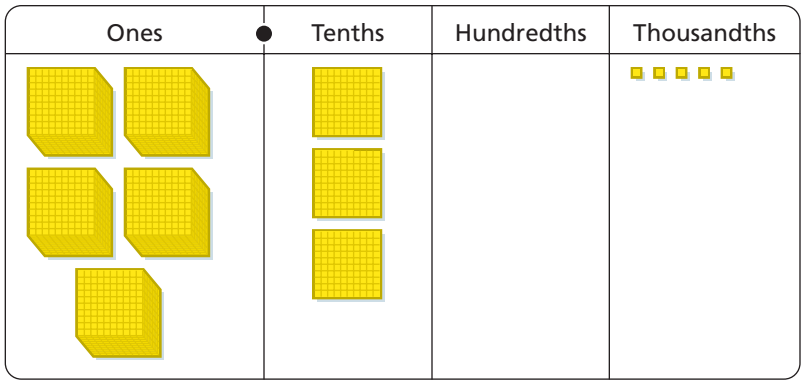
Brandon is preparing a report on the changes in the masses of babies in their first year. He made a chart to show his own growth.

In which period did Brandon have the greatest change in mass?

Brandon's Solution

To figure out the change in my mass from birth to three months, I'll calculate 5.305 − 2.879.
I estimate that I gained between 2 kg and 3 kg.

- **Step 1** I'll model 5.305 kg, my mass at three months.

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  5 .3 0 5
- 2 .8 7 9
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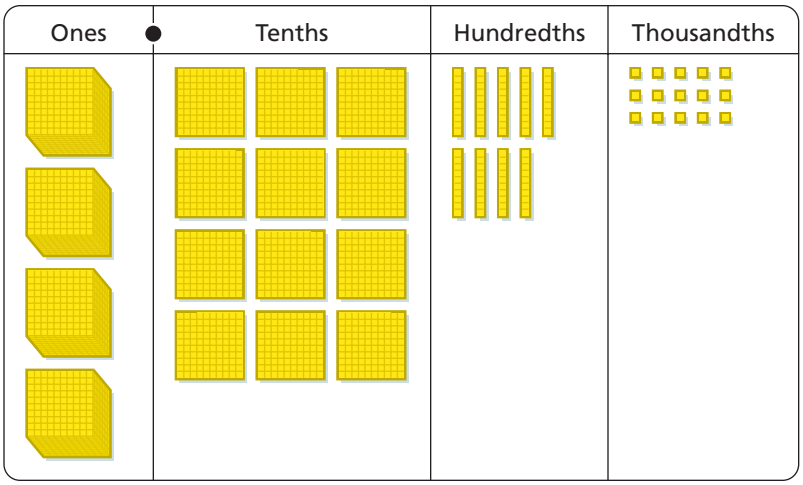
- **Step 2** When I regroup 5.305, my blocks look like this. Now I can subtract.



	4	12	9	15
	~~5~~	~~.3~~	~~0~~	~~5~~
−	2	.8	7	9

A. Copy and complete Brandon's solution. How much mass did he gain in his first three months?

B. How do you know that your answer for Part A is reasonable?

C. Calculate Brandon's change in mass for the other three-month periods. Show your work.

D. Use addition to check one of your answers for Part C.

E. In which three-month period did Brandon have the greatest change in mass?

Reflecting

F. Explain how Brandon regrouped 5.305 to get 4 ones, 12 tenths, 9 hundredths, and 15 thousandths.

G. Why do you think Brandon regrouped 5.305 before subtracting?

Checking

1. Charlene recorded her baby brother's mass at birth and after 12 months.

Baby's Mass by Age

Age (months)	Birth	12
Mass (kg)	3.567	12.035

a) How much mass did he gain?

b) Use estimation to show that your calculation is reasonable.

c) Use addition to show that your calculation is correct.

Practising

2. Sketch a model for each subtraction. Regroup and subtract.

a) 4.12 − 1.285

b) 1.473 − 0.98

3. Calculate.

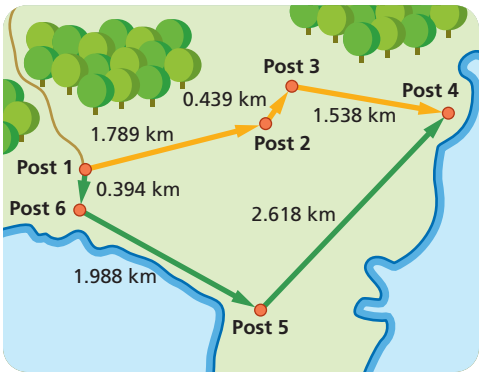
a) 4.0 − 1.4

b) 6.05 − 2.38

c) 3 − 0.537

d) 6.051 − 0.9

4. Benjamin is at post 1 on the park map. He wants to go fishing at post 4. Calculate the difference in distance between the orange and green routes.



5. Lori-Ann Muenzer, from Edmonton, won a gold medal at the 2004 Olympics in Athens. Her times for her two races were 12.126 seconds and 12.140 seconds.

a) Estimate the difference in her times for the two races.

b) Calculate the difference in her times for the two races.

6. Estimate to place the decimal point in each difference. Show your work for one answer.

a) $10.5 - 6.77 = 373$

b) $45.67 - 28.77 = 1690$

c) $3.486 - 0.197 = 3289$

d) $10 - 4.876 = 5124$

7. A 10 km fence is being built to protect wildlife from highway traffic. So far, 3.452 km of the fence has been built. How much more fence needs to be built?

My Reaction Time

Hand	Reaction time (s)
Right hand	0.392
Left hand	0.429

8. Ami measured her reaction times in thousandths of a second, on a website.

a) How much faster is her right hand than her left hand?

b) Explain how you know that your calculation is reasonable.

9. Maddy subtracted a decimal number from a whole number. Her answer was 0.475. List three pairs of numbers that she might have subtracted.

10. Why is it useful to know more than one way to subtract decimals? Use the example $6 - 1.75$ to explain.