Adding Decimals by Regrouping

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

GOAL

Solve problems by adding decimals.

For an Earth Day project, Jay measured the masses of the newspapers and flyers his family received in two weeks.

Masses of Newspapers and Flyers

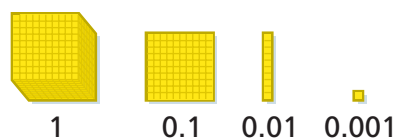|	Week 1	Week 2
Newspapers (kg)	1.469	1.098
Flyers (kg)	1.610	0.978

Did Jay's family receive a greater mass of newspaper or flyers in two weeks?
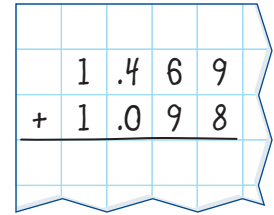
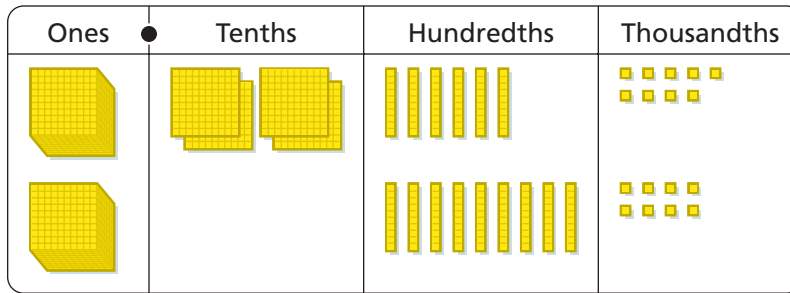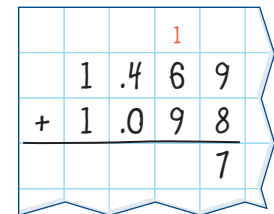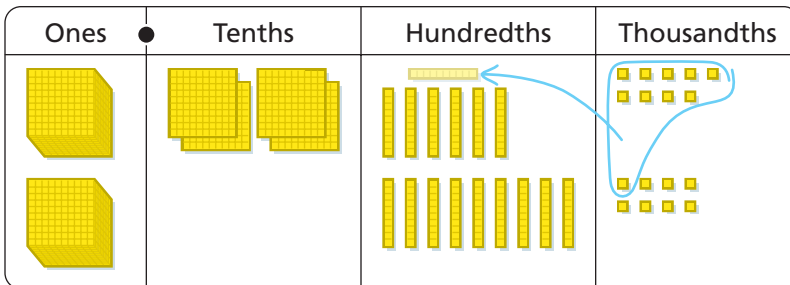## Jay's Addition

I estimate that the total mass of the newspapers in two weeks is close to 2.5 kg.
I'll use blocks to represent each decimal amount.

1   0.1   0.01   0.001

Step 1 I'll model 1.469 kg and 1.098 kg.

Ones ●	Tenths	Hundredths	Thousandths

```
    1 . 4  6  9
+   1 . 0  9  8
```

Step 2 I'll add the thousandths and regroup.

Ones ●	Tenths	Hundredths	Thousandths

```
            1
    1 . 4  6  9
+   1 . 0  9  8
            7
```

A. Why did Jay write a 1 and a 7 where he did in Step 2?

B. Copy and complete Jay's addition. How many kilograms of newspapers did Jay's family receive in two weeks?

C. Calculate the total mass of the flyers that Jay's family received in two weeks. Show that your answer is reasonable.

D. Did Jay's family receive a greater mass of newspapers or flyers?

Reflecting

E. How do you think Jay estimated that the total mass of the newspapers was close to 2.5 kg?

F. How did you decide whether or not to regroup when you added in Part C?

Checking

1. Maya measured the masses of the flyers and newspapers her family received in two weeks.

Masses of Newspapers and Flyers

	Week 1	Week 2
Newspapers (kg)	1.769	1.898
Flyers (kg)	2.210	1.478

a) Did Maya's family receive a greater mass of flyers or newspapers? Show your work.

b) Did you solve the problem by calculating or estimating? Explain.

Practising

2. Calculate.

a) $4.55 + 0.77$

b) $1.5 + 4.67$

c) $0.965 + 0.378$

d) $2.769 + 1.569$

3. This chart shows the team results for four events.

Team Results of Athletic Events

Event	vault	uneven bars	balance beam	floor exercise
Score	38.461	37.986	37.236	36.877

a) Calculate the total team score. Show your work.

b) How do you know your answer is reasonable?

4. Linda calculated $3.48 + 2.87$ as shown below.

$3.48 + 2.87 = ?$
$3.48 + 2 = 5.48$
$5.48 + 0.8 = 6.28$
$6.28 + 0.07 = 6.35$

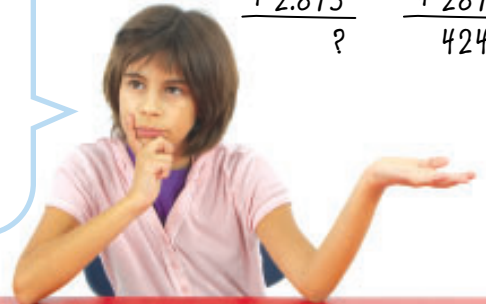Show how Linda would calculate each sum.

a) $4.65 + 2.8$

b) $5.655 + 2.355$

5. One package of salmon has a mass of 0.325 kg. Another package of salmon has a mass of 0.489 kg.
   a) Calculate the total mass of the salmon.
   b) How do you know that your answer is reasonable?

6. Gabe calculated 1.56 + 4.0 + 5.189 by arranging the digits in columns.

$$
\begin{array}{r}
1.56 \\
4.0 \\
+\ 5.189 \\
\hline
5.385
\end{array}
$$

   a) How do you know Gabe's answer is not reasonable?
   b) Calculate to correct his error.
   c) Why is it important to keep track of the place values of the digits when adding decimals?

7.

> When I add decimal thousandths, I add the numbers like whole numbers and then estimate to place the decimal point.

$$
\begin{array}{r}
1.368 \\
+\ 2.875 \\
\hline
?
\end{array}
\qquad
\begin{array}{r}
1368 \\
+\ 2875 \\
\hline
4243
\end{array}
$$

How can Justine estimate where to place the decimal point?

8. Estimate to place the decimal point in each sum. Show your work for one answer.
   a) 0.49 + 5.55 = 604
   b) 1.775 + 4.899 = 6674
   c) 150.97 + 8.997 = 159967
   d) 0.678 + 0.876 = 1554

9. Create a problem that can be solved by adding two numbers with three decimal places. Solve your problem.

10. What are two ways to calculate 4.9 + 4.56?