Spring Block 2 Decimals A



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Small steps

Step 1	Decimals up to 2 decimal places
Step 2	Decimals up to 3 decimal places
Step 3	Place value – integers and decimals
Step 4	Order and compare decimals (same number of decimal places)
Step 5	Order and compare any decimals with up to 3 decimal places
Step 6	Round to the nearest whole number
Step 7	Round to 1 decimal place
Step 8	Round to 2 decimal places



Decimals up to 2 decimal places



Notes and guidance

In this small step, children revisit learning from lower Key Stage 2, exploring tenths and hundredths as decimals.

Using a hundred piece of base 10 as 1 whole, a ten piece as a tenth and a one piece as a hundredth shows children that they can exchange, for example, 10 tenths for 1 whole, or 10 hundredths for 1 tenth. A hundred square where each part represents 1 hundredth, or 0.01, can also help children to see the relationship between a hundredth, a tenth and a whole. Year 5 children may benefit from spending longer exploring decimal numbers using concrete and pictorial representations.

Children make decimal numbers using place value counters in a place value chart and read and write the numbers, as well as working out the value of each digit in the number. They also explore partitioning decimal numbers in a variety of ways.

Things to look out for

- When reading or writing a number, children may say "one point thirty-five" instead of "one point three five".
- When there are hundredths but no tenths in a number, children may forget to include the zero placeholder in the tenths column.

Key questions

- How can you represent this number on a place value chart?
- What is the value of the digit _____ in the number _____?
- Can you partition the decimal number _____ in different ways?

Possible sentence stems

- _____ tenths/hundredths are equivalent
 - to ______ wholes/tenths.
- The value of the digit _____ in the number _____ is _____

Single age small step links

- Decimals up to 2 decimal places (Y5)
- Place value within 1 (Y6)

- Read, write, order and compare numbers with up to 3 decimal places (Y5)
- Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places (Y6)

Decimals up to 2 decimal places

Key learning

• Kay shares 1 whole into 10 equal parts.

1 whole

Use the bar model to complete the sentences.

- One part is worth _____ tenth, which is written as _____
- Seven parts are worth _____ tenths, which is written as _____
- Eva uses a hundred square to represent 1 whole.

Each part represents 0.01

Use the hundred square to complete the sentences.

- One part is worth _____ hundredth, which is written as _____
- Five parts are worth _____ hundredths, which is written as _____
- The whole square is worth _____ hundredths, which is written as _____

• Sam uses place value counters to make the number 2.43



Use place value counters to make the numbers.

• Complete the sentence to describe the underlined digit in each number.



The value of the digit _____ in the number _____ is _____

- Fill in the missing numbers.
 - 0.57 = _____ + 0.07 = _____ tenths and _____ hundredths
 - 0.57 = _____ + 0.17 = _____ tenths and 17 hundredths

How many other ways can you partition 0.57?

Decimals up to 2 decimal places

Reasoning and problem solving



Brett adds five counters to the place value chart.

What number could Brett have made?

What is the greatest number that Brett could have made?

What is the smallest number that Brett could have made?



5

0.05





Decimals up to 3 decimal places



Notes and guidance

In this small step, children build on the previous step to explore numbers with 3 decimal places.

For Year 5 children, this will be the first time they have experienced thousandths, so spend time exploring thousandths practically. Exchanging place value decimal counters from 1 down to 0.001 helps them to understand the relationship between the different decimals.

Year 6 children can spend more time working abstractly on skills such as flexible partitioning.

Make links to the learning in the previous step. For example, there are 10 thousandths in 1 hundredth, just as there are 10 hundredths in 1 tenth. In this step, all numbers are within 1 to allow children to focus on the value of each decimal place. In the next step, they explore numbers greater than 1 with up to 3 decimal places.

Key questions

- How can you represent the number on a place value chart?
- Can you partition the number _____ in different ways?

Possible sentence stems

- _____ tenths/hundredths/thousandths are equivalent
 - to _____ ones/tenths/hundredths.
- The value of the digit _____ in the number _____ is _____

Single age small step links

- Thousandths on a place value chart (Y5)
- Place value within 1 (Y6)
- Thousandths as decimals (Y5)

Things to look out for

- Children may confuse the words "thousandth" and "thousand".
- Children may think that 2 thousandths is greater than 1 hundredth.

- Read, write, order and compare numbers with up to 3 decimal places (Y5)
- Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places (Y6)

Decimals up to 3 decimal places

Key learning

• Tom shares one hundredth into 10 equal parts. 1 hundredth

Use the bar model to complete the sentences.

- One part is worth _____ thousandth, which is written as _____
- Five parts are worth _____ thousandths, which is written as _____
- There are _____ thousandths in one hundredth.
- Dani uses place value counters to split 1, 0.1 and 0.01 into parts.



Use Dani's place value counters to complete the sentences.

- is one-tenth the size of _____
- is 10 times the size of _____

How many ways can you complete the sentences?

• Huan has made a number on a place value chart.



• Complete the sentences to describe Huan's number.

There are _____ ones, _____ tenths, _____ hundredths

and _____ thousandths.

The number is _____

- Huan removes two counters from the place value chart. What could Huan's number be now?
- Complete the number sentences.
 - ▶ 0.5 + 0.06 + 0.009 = _____
 - = 0.007 + 0.02 + 0.9
- Aisha has partitioned 0.254

0.254 = 0.1 + 0.15 + 0.004

Use a place value chart to partition 0.254 a different way.

Compare answers with a partner.

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Decimals up to 3 decimal places

Reasoning and problem solving





Place value – integers and decimals

Notes and guidance

In this small step, children continue to explore numbers with 3 decimal places, now extending to numbers greater than 1

As in the previous step, children use counters and place value charts to represent numbers greater than 1 with up to 3 decimal places and identify the value of the digits in a decimal number. Year 6 children move on to partitioning decimal numbers in a range of ways, while Year 5 children continue to develop their understanding of thousandths. They describe the difference between integer and decimal parts of numbers, for example recognising 3 tens and 3 tenths.

Ensure that children understand the relationship between the different place value columns, for example tenths are 10 times the size of hundredths and one-tenth the size of ones ($0.01 \times 10 = 0.1$, $1 \div 10 = 0.1$). Number lines, bead strings and Gattegno charts are helpful representations for exploring these relationships.

Things to look out for

- Children may confuse the words "thousand" and "thousandth", "hundred" and "hundredth", and "ten" and "tenth".
- Children may use the incorrect number of placeholders, and so write the incorrect number.

Key questions

- How many tenths/hundredths/thousandths are there in 1 whole/tenth/hundredth?
- What digit is in the _____ column?
- What is the value of the digit _____ in the number _____?

Possible sentence stems

There are _____ ones, _____ tenths, _____ hundredths and _____ thousandths.
 The number is ______

Single age small step links

• N/A

 Place value – integers and decimals (Y6)

- Read, write, order and compare numbers with up to 3 decimal places (Y5)
- Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places (Y6)



Place value – integers and decimals

Key learning

• Use the words to complete the sentences in as many ways as possible.



- _____ are one-tenth the size of ______
- _____ are one-hundredth the size of _____
- _____ are 1,000 times the size of _____
- _____ are one-thousandth the size of _____
- Complete the sentences to describe the number.



There are _____ ones, _____ tenths, _____ hundredths and _____ thousandths.

The number is _____

• Use a place value chart and plain counters to represent the numbers.



• What is the value of the 6 in each number?

3.67 17.893 31.5 2.03	5.405
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• What decimal numbers are the arrows pointing to?



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Place value – integers and decimals

Reasoning and problem solving

What n	umber	is show	vn in th	e Gatte	egno ch	nart?			O Tth
10	20	30	40	50	60	70	80	90	
1	2	3	4	5	6	7	8	9	Use five plain counter
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	What is the value of e
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	your number? How many ways can
0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	
				- 	<u>.</u>	1	I	I]	Is the statement alwa

Decrease the number shown by 0.2

Increase the number shown by 1.003

Challenge a partner to find other increases and decreases of the number.



12.436 12.236 13.439 Hth Thth

s to make a

ach digit in

you partition it?

multiple possible answers

ys true, sometimes true or never true?

A number greater than 1 with 3 decimal places is greater than a number greater than 1 with only 1 decimal place.

sometimes true

Explain your answer.

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Order and compare decimals (same number of decimal places)

Notes and guidance

In lower Key Stage 2, children ordered and compared decimal numbers with up to 2 decimal places. In this small step, that learning is extended to include numbers with 3 decimal places. For this step, the number of decimal places in each number will be the same.

Representations such as place value charts and counters and number lines can be used to support children's understanding.

To begin with, the numbers will have different digits in the column with the greatest value. Children identify the column with the greatest value in each number and identify which number has the greater digit in this column. They can then order numbers in a similar way. They progress to two numbers with the same digit in the column with the greatest value so that they use the next column (or the next) to determine which number has the greater value. Year 6 children should be exposed to more of these questions and be given plenty of opportunities to explain their reasoning.

Things to look out for

• Children may not appreciate that they must start with the column with the greatest value, leading to misconceptions such as thinking that 0.299 is greater than 0.312

Key questions

- Which column in the place value chart do you need to look at first?
- How can you compare two numbers that have the same number of tenths/hundredths?

Possible sentence stems

- To compare _____ and ____, I need to first look at the _____ column.
- If the digits in the _____ column are the same, I need to look at the _____ column.

Single age small step links

- Order and compare decimals (same number of decimal places) (Y5)
- N/A

- Read, write, order and compare numbers with up to 3 decimal places (Y5)
- Solve problems involving numbers up to 3 decimal places (Y5)

Order and compare decimals (same number of decimal places)

Key learning

• Which is the greater number, 0.3 or 0.9?

How do you know?

Which is the greater number, 0.37 or 0.97?

How do you know?

• Make the numbers 0.256 and 0.247 on a place value chart. How does your place value chart show that 0.256 is greater than 0.247?

Talk about it with a partner.

• Write >, < or = to compare the numbers.

Use a place value chart and counters to help you.



• Write the numbers in ascending order.



• Filip is using a number line to order some numbers.



Draw arrows to show the positions of the other numbers. Write the numbers in ascending order.

• Write the numbers in ascending order.



• The numbers are in descending order.



What could the two missing numbers be?

How many different answers can you find?

Order and compare decimals (same number of decimal places)

Reasoning and problem solving



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Order and compare any decimals with up to 3 decimal places

Notes and guidance

In this small step, children compare decimal numbers that have a different number of decimal places.

A common misconception with this learning is thinking that numbers with more decimal places are greater, for example 0.365 > 0.41. Using place value counters on a place value chart to represent numbers will support children to recognise that 0.41 has more tenths than 0.365 – it does not matter that it has fewer decimal places.

Ensure children recognise that they need to start comparing numbers from the place value column that has the greatest value, and that if this is the same, they need to look at the next column. Year 5 children should continue to use place value counters on a place value chart, before moving on to comparing numerals in a place value chart.

When ordering sets of numbers, encourage children to work systematically through the list, starting by comparing the place value column that has the greatest value, then working their way down.

Things to look out for

• Children may read 1.234 as "one point two hundred and thirty-four" and therefore assume it is greater than 1.3

Key questions

- What are the digits in each number worth?
- Which place value column in the chart has the greatest value? Which has the next greatest value?

Possible sentence stems

- _____ is greater/smaller than _____ because ...
- _____ tenths/hundredths/thousandths are greater than
 _____ tenths/hundredths/thousandths, so _____ is greater
 than _____

Single age small step links

- Order and compare any decimals with up to 3 decimal places (Y5)
- N/A

- Read, write, order and compare numbers with up to 3 decimal places (Y5)
- Solve problems involving numbers up to 3 decimal places (Y5)

Order and compare any decimals with up to 3 decimal places

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Key learning

• Esther makes the numbers 0.52 and 0.245 on place value charts.



0	Tth	Hth	Thth
	0.1 0.1	0.01 0.01	0.001 0.001
•		0.01 0.01	0.001 0.001
			0.001

Which number is greater? How do you know?

• Scott makes the numbers 0.15 and 0.105





What is the same and what is different about the numbers? Which number is greater? How do you know?

0

• Write >, < or = to compare the numbers.

Use a place value chart and counters to help you.



• Ron writes the numbers 4.205 and 4.21 in place value charts.

0	Tth	Hth	Thth
4	2	0	5
0	Tth	Hth	Thth

Which of the numbers is greater? How do you know? Which place value column did you need to compare?

- Nijah and Scott go for a run.
 - Nijah runs 3.251 miles.
 - Scott runs 3.45 miles.

Who runs further?

• Write the lengths in descending order.



Order and compare any decimals with up to 3 decimal places

Reasoning and problem solving



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Round to the nearest whole number

Notes and guidance

In previous years, children have rounded numbers with 1 decimal place to the nearest whole number. In this small step, they extend this to include rounding numbers with 1 and 2 decimal places to the nearest whole number.

Begin by recapping what whole numbers are and which integers are either side of a decimal number. Number lines and place value counters on place value charts are useful representations to support this understanding. Children need to decide whether the number is greater or smaller than the halfway point between the integers. When the number is exactly halfway between two whole numbers, explain that the convention is to round to the greater of the two, for example 6.5 rounds to 7

Things to look out for

- Children may see 6.15 as "six point fifteen" and round to 7 because 15 is greater than 5
- Children may not think of zero as a whole number.
- The words "round down" can result in children rounding incorrectly, for example rounding 7.2 to 6 rather than 7

Key questions

- Which integers (whole numbers) lie either side of the decimal number?
- Where does the decimal _____ belong on this number line?
- Which whole number is the decimal _____ closer to? How do you know?

Possible sentence stems

- _____ is closer to _____ than _____
- _____ rounded to the nearest whole number is ______

Single age small step links

- Round to the nearest whole number (Y5)
- Round decimals (Y6)

National Curriculum links

- Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place (Y5)
- Solve problems which require answers to be rounded to specified degrees of accuracy (Y6)

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Round to the nearest whole number

Key learning

• Brett has used a number line to find that 3 and 4 are the integers that 3.3 lies between.



Use a number line to find the integers that each decimal lies between.



• Alex uses place value counters to make the number 4.8



Use Alex's method to decide what integer each number is closest to.



• Annie is rounding 5.6 to the nearest whole number using a number line.



5.6 rounded to the nearest whole number is 6

- Use the number line to round 5.2, 5.9 and 5.4 to the nearest whole number.
- Which integer does 5.5 round to? How do you know?
- The number line shows that 6.37 is less than 6.5, so it rounds to 6 to the nearest whole number.



Use a number line to round the numbers to the nearest whole number.



Round to the nearest whole number

Reasoning and problem solving



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Round to 1 decimal place



Notes and guidance

In this small step, children build on the previous step by rounding to 1 decimal place.

Children need to identify which numbers with 1 decimal place are either side of a number with 2 decimal places and then work out which number with 1 decimal place is closer. Children in Year 5 may be more reliant on number lines, as with the previous step. When rounding to 1 decimal place, if the digit in the hundredths column is 5, children learn that the number rounds to the greater of the two numbers with 1 decimal place. It is important that they understand that integers, including zero, can also be written as numbers with 1 decimal place, for example 3 = 3.0

Year 6 children should be challenged to round numbers with 3 decimal places to 1 decimal place.

Key questions

- How can you work out what numbers with 1 decimal place are either side of a number with two decimal places?
- Which number with 1 decimal place is your number closer to? How do you know?

Possible sentence stems

• The numbers with 1 decimal place either side of _____ are

_____ and _____

_____ is closer to _____ than _____

_____ rounded to one 1 decimal place is _____

Single age small step links

- Round to 1 decimal place (Y5)
- Round decimals (Y6)

Things to look out for

• The phrase "round down" can lead children to round too low, for example rounding 6.91 down to 6.8 rather than 6.9

- Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place (Y5)
- Solve problems which require answers to be rounded to specified degrees of accuracy (Y6)

Round to 1 decimal place



Key learning

• Dexter is using a number line to find which numbers with 1 decimal place lie either side of 8.34



Use a number line to find the numbers with 1 decimal place that lie either side of each number.



• The place value counters show the number 2.64



- How can you use the place value counters to show that 2.64 rounds to 2.6 to 1 decimal place?
- Use place value counters to round the numbers to 1 decimal place.



• Whitney draws a number line to help her round 4.53 to 1 decimal place.



Talk to a partner about how Whitney's number line can help her to round 4.53 to 1 decimal place.

Draw number lines that will help you to round the numbers to 1 decimal place.



• Complete the table.

Number	Rounded to the nearest whole number	Rounded to 1 decimal place
4.56		
10.08		
5.21		
0.24		

Round to 1 decimal place





Round to 2 decimal places



Notes and guidance

In this small step, children round numbers with up to 3 decimal places to the nearest hundredth.

Spend some time looking at decimal numbers with 3 decimal places, particularly as Year 5 children may need to consolidate their understanding of thousandths. Make connections to previous learning, where they rounded numbers to the nearest whole number and the nearest tenth.

Children need to be able to identify the multiples of 0.01 before and after any number with up to 3 decimal places. They can then explore which multiple is closer, to help decide what the number should be rounded to. As with all rounding, the use of number lines can support this process.

Children should recognise that when asked to round to a degree of accuracy, they need to look at the place value column to the right. If the digit is 0 to 4, they round to the previous multiple and if it is 5 to 9, they round to the next multiple.

Things to look out for

- Children may confuse thousandths with thousands.
- The words "round down" can result in children rounding incorrectly, for example rounding 1.234 to 1.22 instead of 1.23

Key questions

- How can you work out what numbers with 2 decimal places are either side of the number?
- Which number with 2 decimal places is the number closer to?
- What is the same/different about rounding to 1 decimal place and to 2 decimal places?

Possible sentence stems

• The numbers with 2 decimal places either side of _____ are

_____ and _____

_____ is closer to _____ than _____

Single age small step links

• N/A

• Round decimals (Y6)

- Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place (Y5)
- Solve problems which require answers to be rounded to specified degrees of accuracy (Y6)

Round to 2 decimal places



Key learning

• Dani makes the number 2.364 on a place value chart.



What does Dani need to add to the number to make 2.37? What does she need to subtract from the number to make 2.36? Is 2.364 closer to 2.36 or 2.37?

Explain how you know.

• Use place value counters to make the numbers.



Complete the sentences for each number.

The previous hundredth is _____

The next hundredth is _____

_____ is closer to _____ than _____

_____ rounded to the nearest hundredth is _____

• Huan uses a number line to find that 6.267 rounded to 2 decimal places is 6.27



Use Huan's method to round the numbers to 2 decimal places.



• Complete the sentences.

5.237 rounded to the nearest whole number is _____

5.237 rounded to the nearest tenth is _____

5.237 rounded to the nearest hundredth is _____

• Round the numbers to the nearest hundredth, tenth and whole number.



Round to 2 decimal places



Reasoning and problem solving

