Unit 1
Place value

Three daily lessons

National **Numeracy** *Strategy*

Year 4
Summer term

Unit Objectives
Year 4

• Read and write the vocabulary of comparing and ordering numbers. **Use symbols correctly, including less than (<), greater than (>), equals (=).**	Page 8
• Give one or more numbers lying between two given numbers and order a set of whole numbers less than 10 000.	Page 8
• **Round any positive integer less than 1000 to the nearest 10 or 100.**	**Pages 10–12**
• Multiply or divide any integer up to 1000 by 10 (whole number answers), and understand the effect.	Page 6
• Begin to multiply whole numbers by 100.	Page 6

Link Objectives

Year 3

- Recognise three-digit multiples of 100.
- Read and begin to write the vocabulary of comparing and ordering numbers, including ordinal numbers to at least 100. Compare two given three-digit numbers, say which is more or less, and give a number which lies between them.
- **Order whole numbers to at least 1000.**
- Round any two-digit number to the nearest 10 and any three-digit number to the nearest 100.

Year 5

- **Multiply and divide any positive integer up to 10 000 by 10 or 100 and understand the effect.**
- Use the vocabulary of comparing and ordering numbers, including symbols such as <, >, =. Give one or more numbers lying between two given numbers. Order a set of integers less than 1 million.
- Round any integer up to 10 000 to the nearest 10, 100, and 1000.

(Key objectives in bold)

This Unit Plan is designed to guide your teaching.

You will need to adapt it to meet the needs of your class.

Resources needed to teach this unit:

- Resource sheet 1.1
- Resource sheet 1.2
- Activity sheet 1.1
- Whiteboards

department for education and skills

Planning sheet	Day One (page 1 of 2)	Unit 1 *Place value*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Multiply and divide any integer up to 1000 by 10 and understand the effect. VOCABULARY digit place (value) RESOURCES Resource sheet 1.1 Whiteboards and pens	• Ask the class to count in tens from zero to about 200. Link to multiplication and division by 10, e.g. What is 8×10?… 3×10?… 12×10?… 17×10? How many 10s make 90?… 150? etc. Record as facts on the board, e.g. $8 \times 10 = 80$… $150 \div 10 = 15$, etc. • Remind the class that they have learned about multiplying and dividing other numbers by 10 in previous work. Display enlarged place value chart, Resource sheet 1.1. Remind the children that the numbers on each row are ten times larger than those on the row above and ten times smaller than those on the row below. What is 10 times bigger than 40? What is 10 times smaller than 700? Record answers on the board as: $40 \times 10 = 400$; $700 \div 10 = 70$. Ask similar questions and ensure that the children use multiplication and division in their responses. Make reference to the chart, emphasising the relationships between the numbers. • Ask the children to show answers to questions such as the following on whiteboards: 60×10; $60 \div 10$; 400×10; $4000 \div 10$; 300×10 etc. **Q** What happens to the digits when we multiply a number by 10?

Main Teaching

Objectives and Vocabulary	Teaching Activities
Begin to multiply by 100. VOCABULARY digits place holders	• Ask the children to count in hundreds from 0 to 1000. Ask questions such as: What is 3×100?, 5×100? etc. and record as facts on the board, e.g. $3 \times 100 = 300$. Link to the place value chart used in the oral session (Resource sheet 1.1). Show on the chart that multiplying by 100 is the same as multiplying by 10 twice, e.g. $3 \times 100 = 3 \times 10 \times 10$. **Q** What happens to the digits when we multiply a number by 100? Establish that the digits move two places to the left and that zeros (called place holders) fill the gaps. • Demonstrate multiplying other numbers on the place value chart by 100, e.g. 30×100. Emphasise how the chart shows the movement of the digits, i.e. that the digits on one row move one place to the left on the row beneath ($\times 10$), and two places on two rows beneath ($\times 100$). • Ask the children to show answers to examples such as the following on whiteboards: 20×100; 9×100; 50×100, etc. Record as facts on the board and emphasise the movement of the digits. Relate to the place value chart, reminding the children that $\times 100$ is the same as $\times 10 \times 10$. What is 20×100? What is 4×100? Record $20 \times 100 = 2000$, $4 \times 100 = 400$ on the board. So what is 24×100? Record $24 \times 100 = 2400$ and focus on the movement of the digits. • Develop to examples to be worked out in one step, such as 15×100, 34×100, 82×100, etc. Record as facts on the board and focus on the movement of the digits. Ask the children to show answers to similar questions on whiteboards. Discuss answers and clarify any difficulties if needed. • Set the children a few mixed examples to record in their books, e.g. 137×10, 40×100, 53×100, 730×10, $680 \div 10$, 96×100, etc. • Write a problem on the board such as: A supermarket has 100 boxes of lemonade cans. There are 20 cans in each box. How many cans of lemonade does it have altogether? **Q** What calculation do we need to answer this question? Use apparatus/drawings to help the children imagine what the question means. Establish that it is 20×100 and write it on the board. What is 20×100?

Plenary

Teaching Activities/Focus Questions

- Discuss the answers to the problems and the strategies used to solve them.
- Discuss problems involving money and measures, e.g. a tin of dog food costs 42p. How much do 10 tins cost?

  Q What calculation is needed?
  Q How can we express the answer?

  Establish that $42 \times 10 = 420$, which means 420p in relation to the question and can be better expressed as £4.20.
- Repeat with questions such as:

  Tom's stride measures 75 cm. How far does he walk in 100 strides?

  2 kg of flour is used to make 10 pies. How much flour is needed for one pie?

  A school bought 100 new pens. Each pen cost 45p. How much did it spend?

  Each time, establish the calculation which is needed and how the answer can be expressed in relation to the question.

Planning sheet	Day One (page 2 of 2)	Unit 1 *Place value*	Term: *Summer*	Year Group: *4*

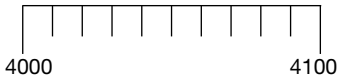
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
	Establish that the digits move one place left and that zeros (called place holders) are used to fill in the gaps. **Q** What happens when we divide by 10? Establish that the digits move one place to the right and replace the next zero. • Develop to questions such as 65 × 10, 134 × 10, 170 ÷ 10, 240 ÷ 10. Record on the board and focus on the movement of the digits. Ask the children to write answers to similar questions on whiteboards.		What does the answer refer to in the question? Agree that 20 x 100 = 2000 and this means that the supermarket has 2000 cans altogether. • Repeat with a problem involving division such as: Apples are packed in bags of 10. How many bags can be filled with 260 apples? Establish the calculation which is needed and how the answer relates to the question. • Set problems such as the following for the children to answer: There are 15 boxes of lollies with 100 lollies in each pack. How many lollies are there altogether? Pencils are packed in boxes of 10. How many boxes are needed for 750 pencils?	**By the end of the lesson the children should be able to:** • **Multiply and divide numbers up to 1000 by 10;** • **Multiply two-digit numbers by 100;** • **Understand how the digits move when using the above and how zero is used as a place holder.** (Refer to supplement of examples, section 6, page 6.)

Planning sheet	Day Two	Unit 1 *Place value*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Use the vocabulary of comparing and ordering numbers. VOCABULARY less than greater than between RESOURCES Whiteboards	• Write a four-digit number on the board, e.g. 3706 and ask the class to read it aloud. What number is 300 less than 3706? Record as: 3706 3406 on the board (with a large space between). What numbers lie between these two numbers? Ask the children to record an appropriate number on the whiteboards. Discuss some of the suggestions and write one of the numbers between the other two on the board. • Repeat using pairs of numbers with intervals of 10s, 100s and 1000s, e.g. ask for the number which is 2000 greater than 5873, write the two numbers on the board and ask for numbers between.

Main Teaching

Objectives and Vocabulary	Teaching Activities
Use vocabulary of comparing and ordering numbers and the symbols > < and = correctly. Give a number lying between two given numbers and order a set of whole numbers less than 10 000. VOCABULARY equals fewer than/more than smallest/largest before/after half way between order RESOURCES Activity sheet 1.1	• Draw a number line on the board and label the ends as shown:  Discuss the intervals and establish which numbers each of the marked divisions represent, then focus on the mid-point. Which number is half way between 4000 and 4100? Mark 4050 on the line. • Ask the children to give numbers that would fit between the marks. List five or six of them. **Q** How do you know this number lies between? Discuss how to order the numbers, referring to smallest/largest, greater/less than, fewer/more than, between, mid-point, multiples of 10, etc. • Draw a line with 10 divisions and ends labelled 4000 and 5000. Which number is half way between 4000 and 5000? Discuss strategies used to find the answer. Label the mid-point 4500 and establish the value of the other marks on the line. Ask the children to suggest numbers which would fit between the marks. List several on the board and ask the children to write them from smallest to largest.
	• Remind the children of the symbols for greater than (>) and less than (<). Write □ > 4500 on the board. Which of the numbers in our list would fit in the box? Record one of the suggestions in the box, emphasising that it is greater than 4500. Repeat with □ < 4500. • Write 4200 < □ < 4500 on the board. Discuss the meaning and ask for numbers which could be placed on the box. Record one of the suggestions, emphasising that it is between 4200 and 4500. Repeat with 4800 > □ > 4500. • Set examples such as 4050 > □ > 4020, 6100 < □ < 6400 etc. for the children to complete. Take feedback and clarify any difficulties. Ask the children to give the smallest and largest possible numbers in each case. • Relate the previous questions to contexts, e.g. a car cost between £6100 and £6400. How much might it have cost? What is the least/most it could have cost in whole pounds? • Ask the children to complete Activity sheet 1.1, comparing and ordering numbers.

Plenary

Teaching Activities/Focus Questions
• Write on the board □ > 4953, □ < 4953, □ = 4953. Ask the children to give numbers that could be placed in each box. **Q** How many possible numbers are there for each box? Ask the children to explain their reasoning and establish that the equals sign can have only one possible answer. • Play 'Guess my Number'. Explain that you are thinking of a number which the children must identify by asking questions such as: Is it greater/bigger/ more than? Is it fewer/smaller/ less than? Does it lie between? Explain that you are only allowed to answer yes or no and that they can ask up to ten questions. Keep a record of the facts that have been established by recording with symbols on the board, e.g. 50 > □ > 10 to indicate that the number is between 50 and 10. After ten guesses work through the recorded facts and get the children to read and explain them. HOMEWORK – Choose any three digits. Write all the possible three-digit, two-digit and single-digit numbers which can be made using your three digits. Write them in order, smallest to largest. Write statements using the symbols < and > with some of the numbers generated. **By the end of the lesson the children should be able to:** • **Use the vocabulary of comparing and ordering numbers;** • **Understand the symbols <, >, and =;** • **Give a number lying between two given numbers.** (Refer to supplement of examples, section 6, page 8.)

Planning sheet	Day Three	Unit 1 *Place value*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary

Add two or three two-digit multiples of 10.

VOCABULARY
multiple
total

RESOURCES
Resource sheet 1.2

Teaching Activities

- Use the number grid on Resource sheet 1.2, either enlarged or as an OHT.

> **Q** Which pairs of numbers on the grid have a total of 100? 120? 150?

Discuss the strategies the children used to find each number.

Extend to the addition of three numbers.

> **Q** Can you find two numbers which have a total greater than 200, 260, 300?
> **Q** Can you find three numbers with a total less than 120, 100, 80?

Set a variety of questions and compare methods used to answer them.

Main Teaching

Objectives and Vocabulary

Round any positive integer less than 1000 to the nearest 10 or 100. Estimate calculations by approximating.

VOCABULARY
round
approximate
estimate
calculate

RESOURCES
Whiteboards

Teaching Activities

- Remind the children how to round two-digit numbers to the nearest 10 and three-digit numbers to the nearest 100.

> **Q** Which whole numbers between 80 and 90 would you round to 90?

Agree that the key number is 85 and that 85 rounds to 90.

> **Q** Which whole numbers between 300 and 400 would you round to the nearest 100?

Agree that numbers between 300 and 349 (inclusive) round to 300. Record $300 < \square < 350$ and remind the children that numbers between, but not including, the given numbers can be placed in the box. Establish that 350 rounds to 400.

- Write 358 on the board. Establish that this rounds to the nearest 100. Explain that three-digit numbers such as this can also be rounded to the nearest 10, using the rules for two-digit numbers, so 358 is 360 to the nearest 10 because 58 rounds up to 60. Provide examples of other three-digit numbers for the children to round to the nearest 100 and the nearest 10 on their whiteboards. Include numbers which round up to the nearest 10, but down to the nearest 100, and vice versa,

  e.g. 428 → 430 to the nearest 10
  → 400 to the nearest 100

  725 → 750 to the nearest 10
  → 800 to the nearest 100

- Ask the children to use the three-digit numbers they made from their homework. Ask them to round each to the nearest 10 and the nearest 100. Ask for some examples.

- Use a kilometre chart such as:

Hastings	92 km
Brighton	67 km
Central London	13 km
Coventry	209 km
Birmingham	172 km

Ask questions involving rounding, e.g. How far is: Hastings to the nearest 10 km? Coventry to the nearest 10 km? 100 km? Establish that the answers are approximations.

> **Q** Why might we round distances up or down?

Establish that long distances are commonly approximated, particularly when reading from a map or estimating journey times.

- Explain that approximation is also useful when estimating answers to calculations. Work through $172 + 39$ on the board, rounding to $170 + 40 = 210$. Explain that this is an approximate answer. Repeat with other calculations to the nearest 10 or 100, e.g. $63 + 28$, $783 - 228$, 53×9, $58 \div 9$, asking the children to suggest numbers and strategies to be used. Tell the children that approximation can be helpful when checking answers.

- Return to Resource sheet 1.2. Point to a number on the grid, e.g. 110.

  What numbers will round to 110?

  Repeat, and set conditions, e.g. point to 40.

  What number ending in 5 rounds to this number?

Plenary

Teaching Activities/Focus Questions

- Write up: $600 + 200$; $700 + 300$; $600 + 300$; $700 + 200$.

  Which of these is the closest approximation for $608 + 297$?

- Establish that the numbers are 600 and 300 when rounded to the nearest 100, so $600 + 300$ is the closest approximation.

> **Q** Which other numbers would round to $600 + 300$?

What approximation could be used if the numbers were rounded to the nearest 10?

Discuss and establish $610 + 300$ as the best approximation.

- Write up $350 - 110$; $300 - 100$; $400 - 100$; $320 - 120$; $400 - 200$.

  Which of these is the best approximation for $324 - 116$?

  Ask the children to justify their choice.

> **Q** Which other pairs of numbers which would round to $320 - 120$?

- Write up 19×20; 20×10; 19×10.

  Which is the best approximation for 19×12?

  Discuss suggestions and reasoning.

By the end of the lesson the children should be able to:

- **Round any whole number less than 1000 to the nearest 10 or 100;**
- **Estimate calculations by approximating.**

(Refer to supplement of examples, section 6, page 12.)

1	2	3	4	5	6	7	8	9
10	20	30	40	50	60	70	80	90
100	200	300	400	500	600	700	800	900
1000	2000	3000	4000	5000	6000	7000	8000	9000

70	180	150	60	400
290	200	90	150	160
80	100	30	40	250
170	190	110	10	130
210	140	260	120	500
300	50	600	700	800

1. Write these numbers in order, starting with the smallest:

   3762 2376 3672 3627 2726

   _____

2. Write the number that is half way between:

   730 and 750 ☐

   2000 and 2100 ☐

   4560 and 4580 ☐

3. Write a number in each box to make these statements true:

   2748 < ☐ 3260 > ☐

   ☐ < 4270 ☐ > 4903

   2450 < ☐ < 2650 6280 > ☐ > 6180 ☐

4. 7495 < ☐ <7505

   What is the smallest number that could go in the box?
   What is the largest number that could go in the box?
   Which number is half way between the given numbers?

5. Place each digit 9, 7, 5, 3, 2 in the boxes to make these statements true:

   ☐ + ☐ < ☐☐ , ☐☐ − ☐ > ☐☐

   ☐ × ☐ > ☐☐ , ☐ × ☐ < ☐☐

   ☐ × ☐ = ☐☐ , ☐ × ☐ > ☐ + ☐ + ☐

   ☐ × ☐ + ☐ < ☐ + ☐