

1

In the warehouse – *DIY 4 All*

<p>Coverage</p> <p>This unit is about working with numbers up to 1000; counting, reading writing ordering, comparing, adding, subtracting, multiplying and dividing numbers. Learners also have to be encouraged to estimate answers to calculations and to approximate numbers to the nearest 10 and the nearest 100. Learners have to be familiar with the use of +, −, ×, ÷, and = in practical situations for solving problems. They need to be aware of the units used for measuring long distances such as the distance between towns and to understand the time it would take to walk one mile. 2-D and 3-D shapes, line symmetry, length and right angles are also explored.</p>	<p>Skills</p> <p>N1/E3.1 count, read, write, order and compare numbers up to 1000</p> <p>N1/E3.2 add and subtract using three-digit whole numbers</p> <p>N1/3.4 multiply two-digit whole numbers by single-digit whole numbers</p> <p>N1/E3.6 divide two-digit whole numbers by single-digit whole numbers and interpret remainders</p> <p>N1/3.7 approximate by rounding numbers less than 1000 to the nearest 10 or 100</p> <p>N1/E3.8 estimate answers to calculations</p> <p>N1/E3.9 use and interpret + − × ÷ and = in practical situations for solving problems</p> <p>MSS1/E3.4 read and interpret distance in everyday situations</p> <p>MSS2/E3.1 sort 2D and 3D shapes to solve practical problems using properties (e.g. lines of symmetry, side length, angles)</p>
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Resources needed for effective teaching of this unit:

Demonstration	Small group	Pair	Individual
<p>Large 0–9 number cards</p> <p>Metre rule</p> <p>Cuisenaire rods</p> <p>Multilink cubes</p> <p>2-D and 3-D mathematical shapes and models</p> <p>A variety of everyday containers, e.g. cereal packets, tins of various sizes</p>	<p>Variety of 2-D and 3-D shapes for sorting by number of right angles, lengths of side, lines of symmetry etc.</p>	<p>0 to 9 number cards</p> <p>Variety of paper cut-outs for folding to show lines of symmetry</p>	<p>Calculators</p> <p>Rulers</p> <p>Squared paper</p> <p>Access to computers with drawing packages, spreadsheets and Internet desirable</p> <p>Small cards</p> <p>Self-adhesive notes (e.g. Post-it notes)</p>

Reminder

In the links H means Help, E means Extension and M means Mini-project.

Remember

Throughout the unit, be aware of the reading needs of learners.

You may need to read out and/or interpret parts of the text.

Words in **highlighted** in **bold** will need particular clarification.

Context

Discuss the DIY scenario in a group.

Be sensitive to the fact that not all learners will have personal experience of DIY, however, most will have seen home-improvement programmes on TV.

Stimulus questions

- Do you ever do any DIY?
- Have you been to a big DIY shop?
- Do you ever have to pack or stack things?
- Have you planned a journey and thought about the distance?
- What maths skills do you think you might need for these tasks?

Have a general discussion, allowing students to share experience and knowledge.

Page 2 Getting things in the right order

Introduction to activity 1

- Discuss three-digit numbers, hundreds, tens and units and how you know which numbers are smaller and which are larger.
- Investigate how many numbers can be made from three given digits. Large 0–9 number cards could be used to demonstrate different combinations of numbers, with learners holding the cards and moving about to form different numbers. This is particularly useful to demonstrate place value and the use of the digit 0.
- Use the Cuisinaire rods, place-value board and moveable ‘units, tens and hundreds’ rods.

Activity 1

- Discuss why order is useful. Introduce **ascending order**.
- Items could be written on individual pieces of card or self-adhesive notes to aid sorting.

Page 3 In sequence

Introduction to activity 2

- Discuss where numbers are used in order or in sequence.

Activity 2

- Practise continuing simple sequences, in both **ascending** and **descending** order. For example:
2, 4, 6, 8, 10 ...
20, 17, 14, 11 ...
100, 90, 80, 70 ...
- Look for patterns and establish rules.

Page 4 Address the order

Introduction to activity 3

- Talk about examples of items arranged in order – names on the register or in the telephone directory, chapters in a book, page numbers in a magazine or newspaper, aisle numbers in the supermarket.

Activity 3

- Discuss addresses and house, flat or room numbers.
- Learners sort the *DIY 4 All* order forms into ascending order.

Page 5

Odds and evens

Introduction to activity 4

- Ask learners how the postal workers know which house or shop is which. Introduce odd and even numbers. Talk about the patterns and establish a rule for identifying even numbers and a rule for identifying odd numbers. Revise Entry 2 Unit 1 if necessary.
- Discuss how in most roads the odd numbers are on one side and the even numbers on the other.
- Use Cuisenaire rods or Multilink cubes to show patterns where required.

Activity 4

- Learners sort street numbers into ascending odd numbers followed by descending even numbers.

LINKS: H1, H2, H3, E1, M1

Pages 6 and 7

Paying by cheque

Introduction to activity 5

- Demonstrate how numbers are written both in digits and in words. Use examples involving amounts of money.
- Discuss the idea that the amount of a cheque is written in both words and numbers to act as a security check.
- Talk about printed cheques. Cheques printed at the pay desk should be checked to see that the amount etc. is correct. Sometimes on printed cheques the print is not in the correct place.

Activity 5

- Learners practise writing the amounts on cheques in words and numbers and identify errors.

LINKS: H4

Page 8

Approximately

Introduction to activity 6

- Ask learners to make up a sentence containing the word approximately. Discuss the results. Why and when is an approximation or estimation useful?
- Introduce **round** numbers. We often round times, distances and amounts of money when absolute accuracy is not important, e.g. quantities needed for a party or buffet, or seats needed in a classroom.
- Learners only need to be able to round whole numbers to the nearest 10 or 100 at this stage. They will find it easier to deal with tens and units first by covering the hundreds column with a finger. Use clearly marked columns or squared paper.
- A metre rule (marked in cm) can be used to illustrate approximation in stages: 89 is seen to be closer to 90 than to 80.
- Remind learners that 5 is rounded up.

Activity 6

- Learners practise rounding amounts of DIY stock to the nearest 10.

Activity 7

- Learners practise rounding amounts of DIY stock to the nearest 100.

LINKS: H5

Pages 10 and 11

Adding to the stock

Introduction to activity 8

- Share methods for mental and written addition.
- Check page 25 of the Adult Numeracy Core Curriculum for some strategies. Encourage learners to work together and to discuss their own strategies.

Activity 8

- Ask learners to work individually or in pairs to add deliveries to existing stock.

Introduction to activity 9

- Ask learners to explain how they know if their answers to calculations are correct.
- Use calculations based on estimating (rather than guessing) the answers. Encourage learners to use rounding to make approximate calculations.

Activity 9

- Learners work with a partner to estimate and calculate additions.
- Further practice in estimation can be gained by approximating checks on activity 8.

LINKS: H6 (questions 126)

Page 12 Taking stock away

Introduction to activity 10

- Share methods for mental and written subtraction. Check page 25 of the Adult Numeracy Core Curriculum. For some strategies, encourage learners to work together and to discuss their own strategies.
- Go through examples. Remind learners that $347 = 200 + 140 + 7$.
- Discuss different ways of breaking down numbers so that the subtraction can be done.
- Work through several examples as a group.

Activity 10

- Learners work on subtracting orders from existing stock. Encourage them to check answers using rounding, estimation and approximation.

LINKS: H6 (questions 7212)

Page 13 How many in a case?

Introduction to activity 11

- Some learners may need a tables square or a calculator to check answers. See *Access for All* for strategies for different learners.
- Introduce the word multiple and give some examples.
- Discuss and practise simple examples of multiples – times tables.
- Learners should understand multiplication as repeated addition. (Use objects or coins to demonstrate.)
- Highlight multiples of 2, 5, 10 in turn on a number square. Look for patterns, and establish 'rules' for multiples of 2, 5, 10. Does the rule hold for three-digit numbers? Use a calculator to check.

Activity 11

- Learners fill in the gaps in lists of multiples.
- Talk about the patterns and rules together once they have completed the activity.

LINKS: H7, E3, E4, M1

Pages 14 and 15 Paint stocks

Introduction to activity 12

- Squared paper may be useful for practising written calculations.
- Encourage learners to share written methods of calculation. For different written methods, refer to the Adult Numeracy Core Curriculum, page 35.

Activity 12

- Learners calculate paint stocks using multiplication.

Introduction to activity 13

- Encourage learners to check their calculations.
- Encourage collaboration and sharing of strategies. Discuss rounding and approximation as a method of checking.

Activity 13

- Ask learners to work in pairs to multiply and use methods of checking.

LINKS: H8, E2, E3, E4

Page 16 Packing up

Introduction to activity 14

- Learners should understand division as repeated subtraction (use objects or coins to demonstrate) and that it is the inverse of multiplication (use a calculator to investigate). Encourage learners to use division not repeated subtraction.
- Use practical examples of the need for division e.g. the number of cars needed to transport a group of people.
- Share written methods of division. Learners may have their own non-standard methods.
- Discuss direction and which way to start when reading the question.
- It is important at this stage to encourage learners to interpret remainders.
- Difficulty may be encountered when using a calculator and getting decimal remainders. Demonstrate that whole-number remainders can be found by first multiplying the whole number and then taking the result away from the number you started with e.g. $32 \div 5 = 6.4$; $5 \times 6 = 30$, $32 - 30 = 2$.

Activity 14

- Learners calculate how many complete boxes of tiles are required for orders and interpret the remainders as extra tiles.

LINKS: H8, E2

Page 17 How far?

Introduction to activity 15

- Discuss the distance from home to work or home to the training centre. Discuss how long distances are measured, e.g. refer to signposts in the UK (miles) and in other countries (kilometres).
- Discuss how far learners walk to the shops, work, bus stop, etc., and how long it takes. How far can they walk in 15 minutes or half an hour? When would they walk or cycle or catch a bus?
- Provide distances in miles from where you are to nearby towns and cities. Rank them in order of distance from your centre. Use the AA (Automobile Association) website www.theaa.com to find distances between places.
- Remind learners how to order numbers.

Activity 15

- Learners rank distances of towns from Birmingham.

Activity 16

- Learners calculate delivery costs.

LINKS: M3

Pages 18 and 19 Mathematical shapes

Introduction to activity 17

- Discuss testing for line symmetry – by folding or using a mirror.
- For learners who have difficulty visualising line symmetry, provide paper or card and scissors so that they can cut out the shapes and fold along lines of symmetry. See Access for All for other methods.

- Encourage learners to look around at the different shapes in the room. Introduce right angles, symmetry and side length in the context of everyday objects. Provide a variety of everyday objects, e.g. cereal packets, tins of beans, tubes of Smarties, Toblerone bars, Pyramints etc. to observe and discuss.
- Learners need to recognise that a straight line is equivalent to two right angles.

Activity 17

- Learners work together to sort shapes into those with right angles and those without.

Activity 18

- Learners work individually to draw lines of symmetry on diagrams of everyday shapes.

Activity 19

- Learners work individually to draw shapes to show how shelves can be stocked.

Activity 20

- Provide 3-D shapes for learners to experiment with designs before sketching their displays.
- Learners complete the activity individually or in pairs.

LINKS: H9, E5, M2

Page 20 and 21 Help

H1

- Learners could use 0–9 number cards, rearranging them physically to make different three-digit numbers. This is also a useful technique for teaching the value of 0 and how its position can change a number e.g. 350, 530, 305, 503, 35, 53.

H2

- Remind learners how to arrange numbers in ascending order.

- Some learners may find separate card or self-adhesive notes useful.

H3

- Encourage learners to cover up the hundreds and tens digits so that they can concentrate on the units to help decide whether a number is even or odd.

H4

- Have a checklist of numbers from 100 to 1000, in figures and in words, for learners to use.
- Learners often have difficulty with numbers that include 0 e.g. 906, 207. Split the number into hundreds, tens and units then cover up the hundreds to focus on the tens and units digits.

H5

- When rounding to the nearest 10, cover up the hundreds and tens to focus on the units.
- When rounding to the nearest 100, cover up the hundreds to focus on the tens and units digits. Is it 49 or below, or 50 or above?

H6

- Check the learners' written methods. Be aware that there are different ways of recording written calculations.
- Ask learners what type of error has been made.
- Discuss checking using approximate numbers, rounded to the nearest 100.

H7

- Revise the meaning of multiples and how to find them.
- Using a calculator should make these multiples possible for learners.
- Encourage learners to look for patterns and continue, rather than having to calculate **all** the multiples.

H8

- Check learners' written methods. Be aware that there are different ways of recording written calculations. Encourage learners to use division methods rather than repeated subtraction.

H9

- Provide paper cut-outs or tracing paper to help learners visualise mirror lines.

Page 22 Extension

E1

- Suggest learners use number cards 0, 2, 5 and 7 to find possible arrangements of three digits.

E2

- Ensure learners put just one digit in each square of the grid.

E3 and E4

- Ensure learners understand that the **numbers** move to the left: from units to tens, and from tens to hundreds position. (Beware of rules expressed as 'add a zero, add two zeroes etc. This may hide a lack of understanding of place value. It is better to look at the position of the digits.)

E5

- Access to a computer with a drawing package is required for this activity.

Page 23 Mini-projects

M1

- Provide learners with a 100 square.

M2

- If possible, organise a visit to a large supermarket or DIY shop to observe how stock is organised and displayed.

M3

- Have some maps available showing distances between towns.
- Ensure learners are aware that distances may be in miles or kilometres.
- The AA website www.theaa.com can be used.

M4

- Access to the Internet is required.

Page 24 Check it

Use these questions to assess how the learners have coped with the skills in this unit. Ask learners to indicate the areas in which they would like help.

Page 25 *How am I doing?*

Learners should complete this individually or with teacher support.