

1:01 Fractions

Content strand: Number and Algebra

Sub-strand: Fractions and decimals

Content description:

- Investigate equivalent fractions used in contexts.

Teaching Suggestions

- Have students answer Questions 9 to 12 on ID Card 1, p. 187.
- Make fraction cards to demonstrate simple fractions in halves, quarters, eighths, thirds, sixths and twelfths.
- Revise these terms:
 - *denominator*, the bottom number of a fraction that represents the number of equal parts into which the whole has been divided
 - *numerator*, the top number of a fraction that represents the number of equal fraction parts.
- Provide frequent opportunities for students to find fractions of wholes and groups in everyday contexts, e.g. '1/8 of the cake has been eaten'.

Extension Work

- Have students use clothes pegs to order fraction cards along a string line from zero to one.
- Have students complete **BLW 7** Comparing Fractions, p. 231.

Language

fraction, numerator, denominator, whole, group, half, quarter, eighth, third, sixth, twelfth

Resources

- fraction cards
- clothes pegs
- prepared fraction cards
- string
- ID Card 1, p. 187
- hundred chart (BLM 11, p. 203)
- **BLW 7** Comparing Fractions, p. 231
- IWB DVD 4

Cross-reference

See also: pp. 2, 3, 10, 11, 12, 18
Year 3 p. 21
Year 5 p. 7

Evaluation

Is the student able to do the following?

- model, compare and represent commonly used fractions

1:01 Fractions

Numerator → 5 is 5 of 12 equal parts. 5 parts have been coloured.
Denominator → 12

7 parts have not been coloured.

1 What part of each shape has been coloured?

a b c d

e f g h

2 What part of each shape above has not been coloured?

a b c d e f g h

3 Colour part of each shape to match the given fraction.

a $\frac{4}{12}$ b $\frac{1}{3}$ c $\frac{1}{3}$ d $\frac{4}{12}$

e $\frac{9}{12}$ f $\frac{5}{6}$ g $\frac{6}{12}$ h $\frac{10}{12}$

4 What part of each group has been coloured?

a b c

d e f

The part coloured is $\frac{5}{10}$.

5 What part of each group above has not been coloured?

a b c d e f

Fractions and decimals. Investigate equivalent fractions used in contexts.

Answers

- 1** a $\frac{1}{12}$ b $\frac{2}{3}$ c $\frac{2}{6}$ d $\frac{3}{12}$
e $\frac{7}{12}$ f $\frac{5}{12}$ g $\frac{3}{6}$ h $\frac{11}{12}$
- 2** a $\frac{11}{12}$ b $\frac{1}{3}$ c $\frac{4}{6}$ d $\frac{9}{12}$ e $\frac{5}{12}$
f $\frac{7}{12}$ g $\frac{3}{6}$ h $\frac{1}{12}$
- 3** a b c d
- e f g h
- 4** a $\frac{5}{6}$ b $\frac{3}{12}$ c $\frac{5}{12}$
d $\frac{11}{12}$ e $\frac{2}{6}$ f $\frac{9}{12}$
- 5** a $\frac{1}{6}$ b $\frac{9}{12}$ c $\frac{7}{12}$ d $\frac{1}{12}$ e $\frac{4}{6}$ f $\frac{3}{12}$

1:02 Hundredths

Content strand: Number and Algebra

Sub-strand: Fractions and decimals

Content description:

- Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation.

Teaching Suggestions

- Discuss the Concept box. Use place-value materials and 1 cm grid paper (BLM 24, p. 216) to demonstrate 5 out of 100 ($\frac{5}{100}$), 35 out of 100 ($\frac{35}{100}$), etc.
- Emphasise the fraction $\frac{35}{100}$ means '35 out of 100 equal parts'.
- Emphasise the point in the Concept box, i.e. 100 hundredths equals 1 whole or $\frac{100}{100} = 1$ whole.
- Use labels to name the fractions in as many different ways as possible (BLM 6, p. 198).
- Relate the use of hundredths to the use of fifths and tenths.
- Use the example questions on the IWB DVD.

Activity

- Encourage students to estimate before counting the squares. Remind students that at this stage it doesn't really matter if their estimates are wrong. The more practice they have, the better their estimation skills will become.

Extension Work

- Ask what part of each hundred square in Question 1 has not been coloured.
- Remind students that in Question 1, the total of the coloured part and the part not coloured has to equal 100. This is because the shape is made up of 100 equal square parts.

Language

whole, fraction, hundredth, 35 out of 100, $\frac{35}{100}$, numerator, denominator, one hundredth, two hundredths... one hundred hundredths

Resources

- place-value materials
- fraction labels (BLM 6, p. 198)
- 1 cm grid paper (BLM 24, p. 216)
- IWB DVD 4

Cross-reference

See also: pp. 3, 20, 21, 22
Year 5 p. 4

Evaluation

Is the student able to do the following?

- model, compare and represent fractions with a denominator of 100

1:02 Hundredths

One hundred hundredths = 1 whole
 $\frac{100}{100} = 1$ whole

1 What part of each hundred square has been coloured?

a b c d

e f g h

2 Colour part of each hundred square to match the given fraction.

a $\frac{10}{100}$ b $\frac{16}{100}$ c $\frac{32}{100}$ d $\frac{48}{100}$

3 Estimate what part of this hundred square has been covered. Check by counting. Do this for pictures of your own, drawn on hundred squares.

2 Fractions and decimals: Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation.

Answers

- 1 a $\frac{10}{100}$ b $\frac{16}{100}$ c $\frac{32}{100}$ d $\frac{48}{100}$
e $\frac{57}{100}$ f $\frac{69}{100}$ g $\frac{83}{100}$ h $\frac{91}{100}$

2 a b
c d

Activity

Estimates will vary.

$\frac{30}{100}$ has been covered.

Pictures will vary.

1:03 Decimals

Content strand: Number and Algebra

Sub-strand: Fractions and decimals

Content description:

- Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation.

Teaching Suggestions

- Discuss the Concept box, i.e. the equivalence of 37 out of 100 to 0.37 and $\frac{37}{100}$. They can be used freely as alternatives when naming a fraction.
- Discuss the use of the decimal point and its position above the line (although there is a tendency in printing to place it on the line).
- Discuss the use of the zero as a place holder before the decimal point. (It indicates that there are no whole numbers being used.)
- Use fraction labels (BLM 6, p. 198) to name the fractions in as many ways as possible. Display on a chart.

Extension Work

- Have students use place-value materials to model each fraction shown in Question 4.
- Ask students to name each fraction using different labels shown in Question 4.

Language

whole, fraction, tenth, hundredth, 37 out of 100, $\frac{37}{100}$, 0.37, decimal, numerator, denominator, one hundredth, two hundredths ... one hundred hundredths, place-value blocks

Resources

- place-value materials
- fraction labels (BLM 6, p. 198)
- IWB DVD 4

Cross-reference

See also: pp. 2, 20, 21
Year 5 p. 4

Evaluation

Is the student able to do the following?

- model, compare and represent fractions with a denominator of 100
- model, compare and represent decimals to two decimal places

1:03 Decimals

We can write fractions as decimals.

That says 'thirty point three seven.'
37 out of 100

0.37

That also says 'zero point three seven.'
37 out of 100

Decimal point

1 How many turtles are inside the box?

2 What part of the group of turtles:

a is ? out of 100 100 0-

b is ? out of 100 100 0-

c is ? out of 100 100 0-

3 What part of the group of turtles is ? 0-

4 Write the decimal and fraction shown on each hundred square.

a b c d

e f g h

Fractions and decimals: Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation.

Answers

- 1 100
- 2 a 16 out of 100 $\frac{16}{100}$ 0.16
- b 27 out of 100 $\frac{27}{100}$ 0.27
- c 18 out of 100 $\frac{18}{100}$ 0.18
- 3 0.39
- 4 a 0.36, $\frac{36}{100}$ b 0.79, $\frac{79}{100}$ c 0.57, $\frac{57}{100}$ d 0.85, $\frac{85}{100}$
- e 0.27, $\frac{27}{100}$ f 0.18, $\frac{18}{100}$ g 0.62, $\frac{62}{100}$ h 0.44, $\frac{44}{100}$

1:05 Numbers to 9999

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

- Recognise, represent and order numbers to at least tens of thousands.

Teaching Suggestions

- Give plenty of practice in counting forwards or backwards from any 4-digit number. Count by ones, twos, tens, etc., on and off the decade, e.g. 1347, 1357, 1367, ...
- *Buzz*: Each student in turn counts on from a given number. Players are 'buzzed' on the hundreds and for any errors.
- Give plenty of practice in reading and writing numerals in words using numeral cards (BLM 1, p. 193).
- Revise the use of the term 'digit' and count the number of digits used to make various numbers.

Extension Work

- Order the numbers in Question 5 into ascending and then descending order.

Language

units, ones, tens, hundreds, thousands, zero, place value, digit, column, more than, less than, larger, smaller, number pattern

Resources

- numeral cards (BLM 1, p. 193)
- IWB DVD 4

Cross-reference

See also: pp. 4, 6, 7, 8, 9

Year 3 p. 34

Year 5 p. 1

Evaluation

Is the student able to do the following?

- use place value to read, represent and order numbers up to four digits
- count forwards and backwards by tens or hundreds, on and off the decade

1:05 Numbers to 9999

1 What number is:

a 2 more than 1000? b 5 more than 1000?

c 7 more than 1020? d 1 less than 1000?

e 10 less than 1030? f 3 less than 1020?

2 Complete these number patterns.

a 1005, 1006, 1007, , b 3002, 3004, 3006, ,

c 5010, 5015, 5020, , d 990, 1000, 1010, ,

e 1020, 1019, 1018, , f 7030, 7020, 7010, ,

3 Write these numbers

a one thousand and sixteen b one thousand and twenty

c one thousand and twenty-seven d five thousand and ten

e eight thousand and eighteen f two thousand and twelve

g seven thousand and twenty-four h six thousand and one

i nine thousand four hundred and thirty-six

j four thousand nine hundred and sixty-five

k three thousand six hundred and eighty-nine

4 Write in words:

a 4023

b 9030

c 7500

d 2901

5 Draw a line to join each numeral and its name.

a 1007	one thousand and four	b 1003	one thousand and thirteen
1017	one thousand and seventeen	1013	one thousand and five
1004	one thousand and seven	1005	one thousand and three

Number and place value: Recognise, represent and order numbers to at least tens of thousands.

Answers

- 1 a 1002 b 1005
c 1027 d 999
e 1020 f 1017
- 2 a 1008, 1009 b 3008, 3010 c 5025, 5030
d 1020, 1030 e 1017, 1016 f 7000, 6990
- 3 a 1016 b 1020 c 1027 d 5010
e 8018 f 2012 g 7024 h 6001
i 9436 j 4965 k 3689
- 4 a four thousand and twenty-three
b nine thousand and thirty
c seven thousand and five hundred
d two thousand nine hundred and one
- 5 a 1007 ~~one thousand and four~~
1017 ~~one thousand and seventeen~~
1004 ~~one thousand and seven~~
b 1003 ~~one thousand and thirteen~~
1013 ~~one thousand and five~~
1005 ~~one thousand and three~~

1:06 Solving Problems with Place Value

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

- Recognise, represent and order numbers to at least tens of thousands.

Teaching Suggestions

- Use numeral expanders (BLM 3, p. 195) to demonstrate the number of thousands, hundreds, tens and ones in a number.
- Make a connection between numeral expanders and place-value blocks. Ask students to model specific numbers.
- Note that each place-value column is ten times bigger than the column to the right of it. Discuss why this must be so. Discuss this relationship e.g. 10 ones equals 1 ten, 10 tens equals 100, etc. Ask: 'Would this pattern continue?'
- Allow time for students to practise reading and writing numerals in words.
- We have a number system based on ten because we have two hands with five fingers on each. What if we had only one hand? Place-value columns would then be: 1, 5, 25 (5×5), 125 ($5 \times 5 \times 5$). Discuss this with students and encourage students to ask other 'What if?' questions.
- Use the example questions on the IWB DVD.

ICT

- This activity assists in the teaching and learning of place value. By 'wiping out' a digit on a calculator, the student demonstrates a clear understanding of place value.

Extension Work

- Have students work in pairs. Instruct one student to say a 5-digit number and then ask the other student to write down the number with the digits reversed. Students have to see who will be the first to work out the difference between the two numbers.

Language

place-value blocks, numeral expander, thousands, hundreds, tens, ones, place value, compared to, larger

Resources

- place-value blocks
- numeral expanders (BLM 3, p. 195)
- IWB DVD 4

Cross-reference

See also: pp. 4, 7, 8, 9, 16, 17
Year 3 p. 26
Year 5 p. 1

Evaluation

Is the student able to do the following?

- use place value to read, represent and order numbers up to five digits

1:06 Solving Problems with Place Value

1. How many times as big is the number shown in:

- A, compared to the one shown in B?
- B, compared to the one shown in C?
- C, compared to the one shown in D?
- A, compared to the one shown in C?
- B, compared to the one shown in D?
- A, compared to the one shown in D?

2. Which number is larger:

- A: $60\,000 + 7\,000 + 600 + 80 + 1$ or B: $60\,000 + 900 + 90 + 9?$
- C: $80\,000 + 1\,000 + 200 + 40 + 9$ or D: $80\,000 + 2\,000 + 100 + 60 + 2?$
- E: $20\,000 + 5\,000 + 700 + 10 + 8$ or F: $20\,000 + 5\,000 + 800 + 80 + 1?$
- G: $50\,000 + 3\,000 + 900 + 90 + 2$ or H: $50\,000 + 9\,000 + 700 + 90 + 2?$

3. A 74186 B 79146 C 60715 D 40207 E 97364 F 98170

- Which number has a 7 that stands for 7000?
- Which numbers contain 6s that have the same value?
- Which numbers contain 9s that have the same value?
- Which numbers contain 7s that have the same value?
- How many times as big is the 7 in B compared to the 7 in E?

Wipe Out a Digit

- A student enters any 5-digit number into a calculator.
- A partner selects any digit to be 'wiped out', i.e. changed to zero.
- Only one operation can be entered into the calculator to wipe out a digit.
- Take turns and score one point for each successful wipe out.

6 Number and place value: Recognise, represent and order numbers to at least tens of thousands.

Answers

- 1 a 10 b 10 c 10
d 100 e 100 f 1000
- 2 a A b D c F d H
- 3 a E b A and B c E and F d A and B
e 10 times as big

ICT

Answers will vary.

1:07 Place Value to 10 000

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

- Recognise, represent and order numbers to at least tens of thousands.
- Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems.

Teaching Suggestions

- Use numeral expanders (BLM 3, p. 195) to demonstrate the number of thousands, hundreds, tens and ones in a number.
- Give students constant practice in reading and writing numbers with up to four digits.
- Revise the use of the zero as a place holder.
- Provide students with frequent opportunities to count forwards and backwards from any 4-digit number by tens or hundreds.
- Use the example questions on the IWB DVD.

Extension Work

- Have students record a given 5-digit number in as many different ways as possible.
- Have students work in small groups of 3 or 4. Students take turns to say a 5-digit number. The other students have to write down the number without showing the group. Later, students reveal the number and discuss the results.

Language

units, ones, tens, hundreds, thousands, zero, place value, digit, column, numeral, numeral expander

Resources

- calculators
- numeral expanders (BLM 3, p. 195)
- IWB DVD 4

Cross-reference

See also: pp. 4, 5, 8, 9
Year 3 p. 34
Year 5 p. 1

Evaluation

Is the student able to do the following?

- use place value to read, represent and order numbers up to four digits

1:07 Place Value to 10000

1430 is 1 thousand, 4 hundreds, 3 tens or 143 tens.

1 Complete the numeral expanders.

a 1578 b 2365

c 3490 d 4206

2 How many hundreds in each number?

a 1760 b 1934 c 1503 d 2641
e 3981 f 6275 g 9634 h 7190

3 How many tens in each number?

a 1623 b 1470 c 2194 d 3478 e 5384 f 7360 g 4576 h 8257

4

a 300 = tens b 800 = tens
c 3000 = tens d 7000 = tens
e 23 hundreds = thousands + hundreds
f 10000 = ten thousand

Number and place value. Recognise, represent and order numbers to at least tens of thousands. Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems.

Answers

1

a 1578 b 2365

c 3490 d 4206

2

a 17 b 19 c 15 d 26
e 39 f 62 g 96 h 71

3

a 162 b 147 c 219 d 347
e 538 f 736 g 457 h 825

4

a 30 tens b 80 tens
c 300 tens d 700 tens
e 2 thousands + 3 hundreds
f ten thousand

1:08 Rounding Off

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

- Recognise, represent and order numbers to at least tens of thousands.
- Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems.

Teaching Suggestions

- Revise the method of rounding off:
 - Digits 5 and up are rounded off upwards while digits below 5 are rounded off downwards.
 - To round off to hundreds, first look at the tens digit.
 - To round off to thousands, look at the hundreds digit.
- Provide frequent opportunities for students to estimate answers by rounding off. Calculators provide a quick and easy method of rounding off and checking estimates.
- Play the game on the IWB DVD.

Extension Work

- Have students complete BLW 5 Problem Solving 1, p. 229.

Language

round off, place value, numeral, digits, thousands, hundreds, tens, units, nearest ten, nearest hundred, nearest thousand, Hindu-Arabic numeral

Resources

- calculators
- numeral expanders (BLM 3, p. 195)
- place-value cards (BLM 4, p. 196)
- BLW 5 Problem Solving 1, p. 229
- IWB DVD 4

Cross-reference

See also: pp. 31, 60, 61

Year 3 p. 83

Year 5 p. 31

Evaluation

Is the student able to do the following?

- read, write and order numbers using place value
- identify differences between Hindu-Arabic numerals and Roman numerals

Answers

- 1 a 3700 b 4200 c 1400 d 9300
 e 6500 f 6700 g 9000 h 5900
- 2 a 32000 b 83000 c 11000 d 57000
 e 23000 f 52000 g 47000 h 69000
- 3 a $\textcircled{2694}$ 2781 2639
 $\textcircled{2721}$ $\textcircled{2675}$ 2642
 2765 $\textcircled{2748}$ $\textcircled{2683}$
- b 53640 $\textcircled{52967}$ $\textcircled{52849}$
 $\textcircled{52621}$ 52076 $\textcircled{53297}$
 53599 $\textcircled{53346}$ 52374
- 4 a true b false c false d true

- 5 a

1	Thousands	4	Hundreds	3	Tens	0	Ones
1	4	Hundreds	3	Tens	0	Ones	
1	4	3	Tens	0	Ones		
- b

2	Thousands	3	Hundreds	1	Tens	8	Ones
2	3	Hundreds	1	Tens	8	Ones	
2	3	1	Tens	8	Ones		

1:08 Rounding Off

This rounds off to 4600. Round off to hundreds. This rounds off to 96000. Round off to thousands.

4 and below round down. 4567 Round off to thousands. 96834 5 and above round up.

1 Round off these numbers to the nearest hundred.

a 3674 b 4237 c 1396 d 9271
 e 6549 f 6704 g 8962 h 5854

2 Round off these numbers to the nearest thousand.

a 31569 b 82738 c 10846 d 57249
 e 23496 f 52301 g 46972 h 69347

3 a Circle numbers that round off to 2700. b Circle numbers that round off to 53000.

2694 2781 2639 53640 52967 52849
 2721 2675 2642 52621 52076 53297
 2765 2748 2683 53599 53346 52374

4 Answer true or false for each statement.

a 4639 rounds off to 4600. b 1854 rounds off to 1800.
 c 6341 rounds off to 6400. d 9782 rounds off to 9800.

5 Complete these numeral expanders.

a

Thousands	Hundreds	Tens	Ones

b

Thousands	Hundreds	Tens	Ones

8 Number and place value. Recognise, represent and order numbers to at least tens of thousands. Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems.

1:09 Expanded Notation

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

- Recognise, represent and order numbers to at least tens of thousands.

Teaching Suggestions

- Use an abacus to revise expanded notation, e.g. 9468 in expanded notation is $9\,000 + 400 + 60 + 8$.
- Use numeral expanders (BLM 3, p. 195) to revise place value, e.g. the value of the nine in 9468 is 9 thousands (9000).
- Provide frequent opportunities for students to read and write numbers of any size.
- Provide students with frequent opportunities to start at a nominated point and practise counting larger numbers.
- Ask students to state the number before and after a given 4-digit number.
- Ask students to write the largest possible number and the smallest possible number using specified four or five digits.

Activity

- In this activity students use place-value blocks to consolidate their knowledge about the composition of numbers. If there are not enough place-value blocks, make multiple copies of the place-value stencil (BLM 4, p. 196) to supplement the resources available.

Extension Work

- Students could play a game in which they make the largest (or smallest) possible numeral from four digits drawn at random (using numbered cards or playing cards).
- Use the example questions on the IWB DVD.

Language

expanded notation, place value, numeral, numeral expander, digits, thousands, hundreds, tens, units

Resources

- abacuses
- numbered cards
- playing cards
- numeral expanders (BLM 3, p. 195)
- place-value cards (BLM 4, p. 196)
- IWB DVD 4

Cross-reference

See also: pp. 4, 5, 6, 7, 8, 16, 17, 24, 25
Year 3 p. 34
Year 5 p. 1

Evaluation

Is the student able to do the following?

- read, write and order numbers using place value
- record numbers in expanded notation

1:09 Expanded Notation

Thousands	Hundreds	Tens	Units
3	9	6	8
3000	+ 900	+ 60	+ 8

1 Write the numeral for:

a $2000 + 700 + 40 + 9$ b $7000 + 100 + 20 + 4$

c $4000 + 500 + 90 + 2$ d $6000 + 400 + 30 + 2$

e $30000 + 6000 + 800 + 30 + 6$ f $80000 + 3000 + 500 + 70 + 5$

g $10000 + 2000 + 500 + 70$ h $50000 + 700 + 40 + 6$

2 Write these numerals in expanded form.

a 4286 b 9317

c 3752 d 6489

e 71423 f 29460

3 Write the numeral for the number shown on each abacus.

a b c d

e f g h

4 Write the value for each coloured digit in these numbers.

a 93674 b 31862 c 75437 d 49528

e 14762 f 52106 g 87315 h 68941

With a partner, use place-value blocks to demonstrate these numbers.

• 3681 • 1579 • 2532 • 2436 • 3659

• 1234 • 5215 • 4051 • 5478 • 1110

Answers

- 1 a 2749 b 7124 c 4592 d 6432
e 36836 f 83575 g 12570 h 50746
- 2 a $4000 + 200 + 80 + 6$ b $9000 + 300 + 10 + 7$
c $3000 + 700 + 50 + 2$ d $6000 + 400 + 80 + 9$
e $70000 + 1000 + 400 + 20 + 3$
f $20000 + 9000 + 400 + 60$
- 3 a 5774 b 6347 c 9875 d 8483
e 4657 f 3473 g 7498 h 8758
- 4 a 7 tens (70) b 2 units (2)
c 5 thousands (5000) d 5 hundreds (500)
e 4 thousands (4000) f 1 hundred (100)
g 3 hundreds (300) h 4 tens (40)

Activity

Answers will vary.

1:31 Rounding Off

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

- Recognise, represent and order numbers to at least tens of thousands.

Teaching Suggestions

- Provide frequent opportunities for students to read, write and record large numbers.
- Use place-value cards (BLM 4, p. 196) and numeral expanders (BLM 3, p. 195) to revise place value and expanded notation.
- Revise rounding off to the nearest thousand, hundred, ten and unit.
- Revise the use of the zero as a place holder, e.g. 70459 in expanded notation is written as $70\,000 + 400 + 50 + 9$. Here, there are zero thousands in the numeral.

Extension Work

- Ask students to look through various newspapers, magazines, catalogues or advertising pamphlets. Write down some of the numbers used. Round these numbers off to the nearest 100, 1000, 10000 or 100000.

Language

numeral, digit, zero, place value, expanded notation, rounding off, hundred thousands, ten thousands, thousands, hundreds, units

Resources

- place-value chart
- numeral expanders (BLM 3, p. 195)
- place-value cards (BLM 4, p. 196)
- IWB DVD 4

Cross-reference

See also: pp. 8, 60, 61, 85

Year 3 p. 83

Year 5 p. 31

Evaluation

Is the student able to do the following?

- read, write and order numbers using place value
- record numbers in expanded notation

1:31 Rounding Off

1 Round off each number to the nearest thousand.

a 134 691 b 458 216 c 679 531
 d 263 124 e 916 527 f 142 747
 g 795 438 h 381 963 i 822 542

2 Round off each number to the nearest ten thousand.

a 252 190 b 976 824 c 534 630
 d 787 531 e 143 739 f 365 498




3 Write the numeral for:

a $60\,000 + 4\,000 + 500 + 20 + 7$ b $30\,000 + 9\,000 + 200 + 70 + 8$
 c $40\,000 + 8\,000 + 900 + 80 + 1$ d $90\,000 + 8\,000 + 300 + 50 + 6$
 e $70\,000 + 1\,000 + 60 + 4$ f $50\,000 + 700 + 60 + 1$

4 Use expanded notation to write:

a 83 162 b 35 275
 c 46 913 d 78 548
 e 92 301 f 60 825

5 Write the numeral for:

a  b  c 

6 Write the value for each coloured digit.

a 645 231 b 723 469 c 472 975 d 157 906
 e 379 406 f 391 973 g 248 619 h 706 421
 i 532 721 j 289 578 k 932 671 l 812 679

Number and place value. Recognise, represent and order numbers to at least tens of thousands.

31

Answers

- 1 a 135 000 b 458 000 c 680 000
 d 263 000 e 917 000 f 543 000
 g 795 000 h 382 000 i 828 000
- 2 a 250 000 b 980 000 c 530 000
 d 790 000 e 140 000 f 370 000
- 3 a 64 527 b 39 278
 c 48 981 d 98 356
 e 71 064 f 50 761
- 4 a $80\,000 + 3\,000 + 100 + 60 + 2$
 b $30\,000 + 5\,000 + 200 + 70 + 5$
 c $40\,000 + 6\,000 + 900 + 10 + 3$
 d $70\,000 + 8\,000 + 500 + 40 + 8$
 e $90\,000 + 2\,000 + 300 + 1$
 f $60\,000 + 800 + 20 + 5$
- 5 a 758 497 b 438 327 c 143 927
- 6 a 2 hundreds (200) b 6 tens (60)
 c 4 hundred thousands (400 000)
 d 5 ten thousands (50 000) e 3 hundred thousands (300 000)
 f 9 ten thousands (90 000) g 8 thousands (8 000)
 h 7 hundred thousands (700 000)
 i 3 ten thousands (30 000) j 9 thousands (9 000)
 k 6 hundreds (600) l 8 hundred thousands (800 000)

1:32 Fractions

Content strand: Number and Algebra

Sub-strand: Fractions and decimals

Content description:

- Count by quarters, halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line.

Teaching Suggestions

- 1:32 (p. 32) and 1:33 (p. 33) could be covered in the same lesson, as they both deal with the concept of fractions.
- Revise the following terms:
 - mixed number*: consists of a whole number and a fractional part.
 - improper fraction*: the numerator is bigger than the denominator.
- Use concrete materials and number lines to demonstrate mixed numbers and improper fractions, e.g. $1\frac{2}{3}$ is the same as $\frac{5}{3}$.
- Provide frequent opportunities for students to rename mixed numbers as improper fractions.
- Have students count by halves, quarters and thirds up to 3.

Extension Work

- Have students use clothes pegs to order fraction cards for quarters (including improper fractions) from zero to three along a string line.
- Ask students to peg equivalent mixed numeral cards along the same line.

Language

fraction, numerator, denominator, add, addition, subtract, minus, subtraction, improper fraction, mixed numeral

Resources

- concrete materials, e.g. Lego, Unifix cubes
- prepared fraction cards, mixed numeral cards
- pegs
- string
- number lines (BLM 19, p. 211)
- IWB DVD 4

Cross-reference

See also: pp. 12, 13, 14, 15, 18, 19, 21, 33
Year 3 p. 21
Year 5 p. 4

Evaluation

Is the student able to do the following?

- model, compare and represent commonly used fractions
- express an improper fraction as a mixed numeral and vice versa
- count by halves, quarters and thirds up to 3

1:32 Fractions

1 Write an equivalent fraction.

a $\frac{2}{3}$ b $\frac{3}{2}$ c $\frac{4}{3}$ d $\frac{5}{2}$

2 Write the improper fraction and mixed number for each part.

a or b or c or

d or e or f or

g or

3 Write the mixed number.

a $\frac{7}{3}$ b $\frac{8}{3}$ c $\frac{13}{3}$ d $\frac{11}{3}$

e $\frac{6}{3}$ f $\frac{10}{3}$ g $\frac{14}{3}$ h $\frac{12}{3}$

4 Write the improper fraction.

a $1\frac{1}{2}$ b $2\frac{1}{2}$ c $3\frac{1}{2}$ d $1\frac{4}{5}$

e $2\frac{2}{3}$ f $2\frac{2}{3}$ g $4\frac{2}{3}$ h $2\frac{2}{3}$

These have the same value.

32 Fractions and decimals. Count by quarters, halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line.

Answers

- 1 a $\frac{2}{2} = 1$ b $\frac{3}{2} = 1\frac{1}{2}$ c $\frac{4}{2} = 2$ d $\frac{5}{2} = 2\frac{1}{2}$
- 2 a $\frac{3}{2}$ or $1\frac{1}{2}$ b $\frac{7}{2}$ or $3\frac{1}{2}$ c $\frac{19}{2}$ or $9\frac{1}{2}$
- d $\frac{11}{4}$ or $2\frac{3}{4}$ e $\frac{17}{4}$ or $4\frac{1}{4}$ f $\frac{31}{4}$ or $7\frac{3}{4}$
- g $\frac{33}{2}$ or $16\frac{1}{2}$
- 3 a $1\frac{2}{5}$ b $1\frac{4}{5}$ c $2\frac{3}{5}$ d $2\frac{1}{5}$
- e $1\frac{3}{5}$ f $2\frac{2}{5}$ g $2\frac{4}{5}$ h $3\frac{2}{5}$
- 4 a $\frac{6}{5}$ b $\frac{11}{5}$ c $\frac{17}{5}$ d $\frac{9}{5}$
- e $\frac{11}{4}$ f $\frac{17}{6}$ g $\frac{14}{3}$ h $\frac{21}{8}$

1:33 Fraction Patterns

Content strand: Number and Algebra

Sub-strand: Fractions and decimals

Content description:

- Count by quarters, halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line.

Teaching Suggestions

- Discuss various fraction patterns and have students verbalise the pattern. A fraction wall could be useful for students.
- Ask students to practise counting fractions forwards and backwards from various starting points.
- Revise appropriate vocabulary, e.g. halves, thirds, quarters, fifths, sixths, eighths, mixed number and improper fraction.
- Ask students to draw a shape and then divide it into suggested fractions (e.g. thirds). Invite them to explain their answers.
- Discuss the fact that $\frac{4}{4}$, $\frac{6}{6}$, $\frac{8}{8}$ etc. each equal one whole (1).
- When attempting Question 1, have students trace the dotted arrows. Ensure they start at the correct place on the number line by looking carefully at the arrowhead and determining the direction. This may assist students in finding the rule.

Extension Work

- Ask students to make up a fraction wall of their own, using grid paper (BLM 24, p. 216) and labelling each fraction part appropriately.

Language

fractions, pattern, halves, quarters, thirds, fifths, sixths, eighths, mixed numeral, improper fraction, forwards, backwards, one (1) whole

Resources

- fraction wall
- 1 cm grid paper (BLM 24, p. 216)
- BLW 8 Equivalent Fractions, p. 232
- IWB DVD 4

Cross-reference

See also: pp. 13, 14, 15, 18, 19, 21, 32
Year 3 p. 21
Year 5 p. 4

Evaluation

Is the student able to do the following?

- count by halves, thirds, quarters, fifths, sixths and eighths
- locate, read and write fractions on a number line

1:33 Fraction Patterns

The rule is Add $\frac{1}{2}$. That's all. Rule: Add $\frac{1}{2}$.

1 Complete each number line and write the rule.

a Rule: _____

b Rule: _____

c Rule: _____

d Rule: _____

e Rule: _____

f Rule: _____

Be careful!

Fractions and decimals: Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line.

Answers

- 1 a $\frac{2}{2}$ or 1, $\frac{3}{2}$ or $1\frac{1}{2}$. Rule: Add $\frac{1}{2}$ b $\frac{3}{4}$, $\frac{4}{4}$ or 1. Rule: Add $\frac{1}{4}$
- c $\frac{2}{3}$, $1\frac{2}{3}$, 2, $2\frac{1}{3}$, $2\frac{2}{3}$, $3\frac{1}{3}$. Rule: Add $\frac{1}{3}$
- d $\frac{1}{8}$, $\frac{2}{8}$ or $\frac{1}{4}$, $\frac{3}{8}$, $\frac{4}{8}$ or $\frac{1}{2}$, $\frac{5}{8}$, $\frac{6}{8}$ or $\frac{3}{4}$, $\frac{7}{8}$.
Rule: Subtract $\frac{1}{8}$
- e $\frac{2}{5}$, $\frac{5}{5}$ or 1, $\frac{7}{5}$ or $1\frac{2}{5}$, $\frac{8}{5}$ or $1\frac{3}{5}$, $\frac{9}{5}$ or $1\frac{4}{5}$, $\frac{10}{5}$ or $1\frac{5}{5}$ or 2.
Rule: Add $\frac{1}{5}$
- f $\frac{1}{6}$, $\frac{2}{6}$ or $\frac{1}{3}$, $\frac{3}{6}$ or $\frac{1}{2}$, $\frac{4}{6}$ or $\frac{2}{3}$, $\frac{5}{6}$, $\frac{6}{6}$ or 1, $1\frac{1}{6}$.
Rule: Subtract $\frac{1}{6}$

1:34 One Million

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

- Recognise, represent and order numbers to at least tens of thousands.

Teaching Suggestions

- Provide frequent opportunities for students to read, write and record large numbers to 1 000 000.
- Use arrow cards, place-value cards (BLM 4, p. 196) and numeral expanders (BLM 3, p. 195) to revise place value and expanded notation, e.g. 694 265 is written as $600\,000 + 90\,000 + 4\,000 + 200 + 60 + 5$.
- Remind students of the importance of using zero as a place holder.
- To assist in reading large numbers, leave a space between the 'millions' and 'hundreds of thousands' as well as the 'thousands' and 'hundreds' digits. Note that printer conventions often omit these spaces. Sometimes commas may be used instead of spaces.
- Use the example questions on the IWB DVD.

Language

numeral, digit, zero, place value, expanded notation, hundred thousands, ten thousands, thousands, hundreds, units

Resources

- any classroom object that can be counted, e.g. counters, place-value ones
- arrow cards
- place-value chart
- numeral expanders (BLM 3, p. 195)
- place-value cards (BLM 4, p. 196)
- IWB DVD 4

Cross-reference

See also: pp. 24, 25, 28, 29, 30, 31
Year 3 p. 34
Year 5 p. 1

Evaluation

Is the student able to do the following?

- read, write and order numbers using place value
- record numbers in expanded notation

1:34 One Million

We could use commas instead of spaces.

$999\,999 + 1 = 1\,000\,000$
 $= 1,000,000$

Millions	Hund Thous	Ten Thous	Thous	Hund	Tens	Ones
9	9	9	9	9	9	9

● One million is written with 6 zeros.

1 0 0 0 0 0 0

● 1 000 000 = 10 hundred thousands.

1 Read these numbers aloud and write them on the place-value chart below.

- six hundred and twenty-eight thousand four hundred and seventy-two
- nine hundred and sixty-five thousand seven hundred and twenty-three
- four hundred and eighty thousand nine hundred and thirty-five
- eight hundred and forty-nine thousand six hundred and seventy
- three hundred and sixteen thousand nine hundred and two
- one million

	Millions	Hund Thous	Ten Thous	Thous	Hund	Tens	Ones
a							
b							
c							
d							
e							
f							

2 Complete the numeral expanders for the number 935 216.

Place value helps us describe large numbers.

Answers

1

	Millions	H Thous	T Thous	Thous	Hunds	Tens	Ones
a	0	6	2	8	4	7	2
b	0	9	6	5	7	2	3
c	0	4	8	0	9	3	5
d	0	8	4	9	6	7	0
e	0	3	1	6	9	0	2
f	1	0	0	0	0	0	0

2

9 3 5 2 1 6

9 3 5 2 1 6

9 3 5 2 1 6

9 3 5 2 1 6

9 3 5 2 1 6

9 3 5 2 1 6