Thinking Skills

- **Understanding**
- **Fluency**
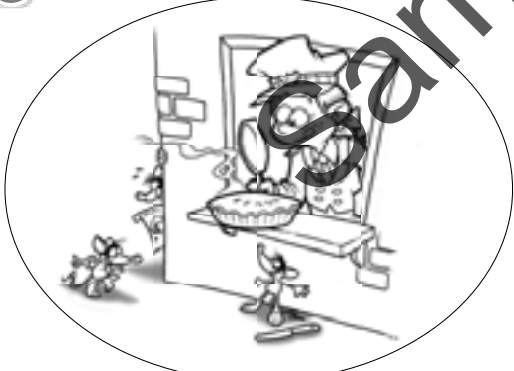- **Problem Solving**
- **Reasoning**

Teaching Suggestions

- This test can be administered to each student individually or it can be discussed and completed as a class group.
- Discuss the picture. 'What happened in the first and second picture?' 'What do you think will happen next?' 'How do you think the footprint was made?' Encourage students to come up with their own questions about the pictures, based on number, length, time or position.
- Consider each question in turn. Make conclusions after all questions have been asked.

Proficiencies Tested

- **Understanding** and **Fluency**: shape, estimation, height.
- **Problem Solving** and **Reasoning**: students explain what the mice did and how they carried out their plan. Students are asked to predict why the mice would take only part of the pie and what the police officer thinks. Students are asked to make up a question of their own.

Sample pages

2 Thinking Skills

1. What were the mice planning to do?
2. Explain how the mice carried out their plan.
3. Why would the mice take only a part of the pie?
4. How do you think the stilts could be made?
5. Estimate the height of the stilts.
6. What could they make with the paper?
7. Does the police officer think the mice took the pie? Why or why not?
8. Make up a maths question about these pictures.

1

1A Addition Combinations to 10

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

● Solve simple addition and subtraction problems using a range of efficient mental and written strategies.

Teaching Suggestions

● Note that in the Concept box, the unit used is money and so the dollar sign is included in the answer. The writing of the unit used should also be encouraged in Question 2, e.g. 6 lollies, 5 pears.

● Ask students to use counters or coins (**BLM 9**, p. 182) to model problems.

● Discuss the number stories that could match collections of objects, e.g. 'I had 4 pencils. John gave me 3 more. I now have 7'. More simply we could write, '4 pencils and 3 pencils makes 7 pencils'. The equivalent number sentence is $3 + 4 = 7$.

● Use numeral and symbol cards (**BLM 1**, p. 174), to record the problems in horizontal and vertical form.

● Make constant references to combinations to 10 in addition webs (**BLM 19**, p. 192) until mastery is achieved.

Activity

● Ask students to model their addition stories using concrete materials.

● Encourage students to tell a number story using the number sentence they have made.

● Ask students to draw the addition story and write the number sentence underneath.

Extension Work

● Ask students to write number stories for the sums in Question 1, e.g. '1 pen and 6 pens makes 7 pens'.

● Have students represent a number story using an egg carton and counters and record this in a class number storybook, e.g. 4 and 3 makes 7.
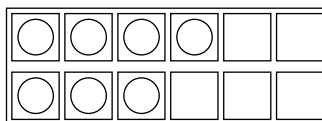
● Ask students to write the number sentence, e.g. $4 + 3 = 7$.

Language

plus, and, join, add, equals, is equal to, same as, total, gives, number story, number sentence, numeral, symbol

Resources

● various concrete materials, e.g. coins, counters, pencils
● class number storybook
● egg cartons
● numeral and symbol cards (**BLM 1**, p. 174)
● addition webs (**BLM 19**, p.192)

Cross-reference

Evaluation

Is the student able to do the following?

● compute simple addition calculations
● model addition
● apply a range of mental strategies and recording methods for addition

---

Answers

1
a 7   b 4   c 7   d 4   e 9
f 8   g 9   h 9   i 7   j 5
k 9   l 6   m 7   n 9   o 7

2 a 4 lollies + 2 lollies equals 6 lollies.
b 3 pears + 2 pears equals 5 pears.

Activity
Answers will vary.

1B Subtraction to 10

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

● Solve simple addition and subtraction problems using a range of efficient mental and written strategies.

Teaching Suggestions

● Have students model subtraction problems with concrete materials, e.g. counters, buttons. Use numeral and symbol cards (**BLM 1**, p. 174) to show the number sentence.

● Discuss horizontal and vertical forms of recording. Have students rearrange the cards from the horizontal form to get the vertical. Craft sticks could be used for the horizontal lines.

● Remind students that '−' is the subtraction sign.

● Discuss various words for the subtraction sign (−), e.g. 'subtract', 'minus', 'take away'.

● Emphasise to students that in the vertical form the bigger number is written first and the smaller number is taken away from it.

Extension Work

● Encourage students to make up problems of their own using concrete materials. Ask them to use numeral and symbol cards (**BLM 1**, p. 174) to record in the vertical form. Have students rearrange the cards to get the horizontal form.

Language

different, difference, what's the difference, more, how many more, remove, take away, took out, leaves, left, what's left, how many left, is equal to, equals

Resources

● various concrete materials, e.g. buttons, counters, place-value ones

● craft sticks

● class book for subtraction stories

● numeral and symbol cards (**BLM 1**, p. 174)

Cross-reference

See also: pp. 30, 42, 43, 44, 50, 51
Year 1 p. 118
Year 3 p. 3

Evaluation

Is the student able to do the following?

● compute simple subtraction calculations

● model subtraction

● apply a range of mental strategies and recording methods for subtraction

Answers

1 a 2 b 5 c 3 d 3 e 4 f 2 g 3 h 6 i 6

2 a 2 b 6 c 7 d 1 e 3 f 1 g 5 h 2 i 4 j 4 k 3

3 a 4 pegs b 6 bugs c 7 cats d 5 bears

4

1C One Half

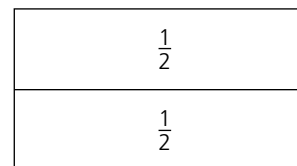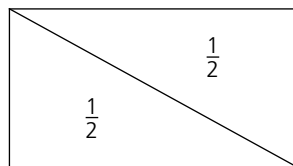**Content strand**: Number and Algebra

Sub-strand: Fractions and decimals

Content description:

● Recognise and interpret common uses of halves, quarters and eighths of shapes and collections.

Teaching Suggestions

● Provide frequent opportunities for students to cut objects and shapes into halves and label one half in a variety of ways.

● Use fraction language in a variety of everyday contexts, e.g. 'Your half of the table is tidy', 'He ate half an apple'.

● Ensure that students recognise that cutting into two is not necessarily the same as cutting into halves.

● Revise the use of fraction notation for one half, i.e. $\frac{1}{2}$.

● Discuss the concept of one half as one out of two equal parts.

● Have students work in groups to find different ways to fold a variety of paper shapes into halves.

Activity

● This activity will check the understanding of one half as 'one out of two equal parts'.

● Emphasise that the word 'half' and '$\frac{1}{2}$' mean the same, i.e. one of two equal parts.

Extension Work

● Have students model halves and use fraction notation to label each model, as below.

Language

fraction, half, halves, equal, equal parts, one out of two equal parts, divide in two, cut in half, whole

Resources

● various objects to model one half, including coloured paper squares, fruit, Plasticine, slices of bread, string

Cross-reference

See also: pp. 12, 32, 33, 48, 49, 64

Year 1 p. 76

Year 3 p. 10

Evaluation

Is the student able to do the following?

● model and describe a half of a whole object

● use fraction notation $\frac{1}{2}$

Answers

❶ One half of each object will be coloured.

❷ Each object will be divided into halves. One half of each will be coloured.

❸ **a** Three balloons will be coloured.

b Half of each shape will be coloured.

1D Parallel Lines

Content strand: Measurement and Geometry

Sub-strand: Shape

Content description:

● Describe and draw two-dimensional shapes, with and without digital technologies.

Teaching Suggestions

● Have students use their hands to make curved, straight, crossed, up and down, sloping, wavy, zigzag, crossed and broken lines in the air.

● Introduce 'parallel lines'. They are lines in the same flat surface (plane) that do not meet. They go in the same direction.

● Discuss the picture, identifying the sets of parallel lines and other types of lines.

● Ensure that each student has a red pencil.

● Discuss the shapes that can be seen in the picture, e.g. oval, circle, rectangle, triangle.

● Discuss shapes in the picture that also contain parallel lines, i.e. rectangles, squares and 'squashed' rectangles (parallelograms).

● For further work on lines, see **BLW 11** Lines, p. 213, and **BLW 12** Straight and Curved Lines, p. 214.

Extension Work

● Ask students to find examples of parallel lines in the environment. A class chart could be made.

● Vertical and horizontal lines could be introduced.

● Students could practise ruling straight lines on paper.

Language

curved, straight, zigzag, up and down, across, wavy, crossed, broken, sloping, vertical, horizontal, ruler, crossing, joining, left, right, parallel lines, same direction, oval, circle, rectangle

Resources

● red pencils, rulers

● magazines, pictures

● glue, paper, scissors

● **BLW 11** Lines, p. 213

● **BLW 12** Straight and Curved Lines, p. 214

Cross-reference

See also: pp. 20, 36, 53, 84, 109, 140
Year 1 p. 105
Year 3 p. 124

Evaluation

Is the student able to do the following?

● recognise and describe different types of lines

● name circles, squares, triangles and rectangles presented in different orientations within pictures and the environment

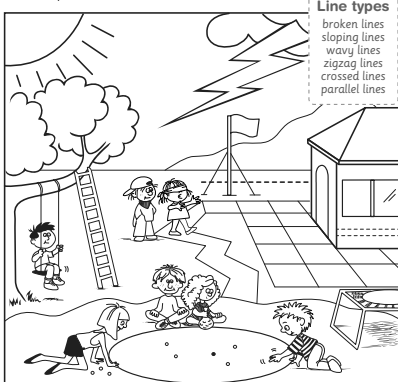● recognise parallel lines within pictures and the environment

Answers

❶ The parallel lines in the picture will be coloured red.

❷ The names of the shapes in the picture will be listed, e.g. square, oval, circle, triangle, rectangle. (Parallelograms and trapeziums need not be listed.)

2A Ordinal Numbers

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

● Recognise, model, represent and order numbers to at least 1 000.

Content strand: Measurement and Geometry

Sub-strand: Using units of measurement

Content description:

● Use a calendar to identify the date and determine the number of days in each month.

Teaching Suggestions

● Ask Questions 1 to 10 on **ID Card 1**, p. 170.

● Revise ordinal numbers. Practise counting, using ordinal numbers, from various starting points.

● Have students order two or more numbers, e.g. 15 comes before 16, 25 comes after 24.

● Have students rank everyday events in order, e.g. 'Rory was the third person to leave the classroom'.

● Discuss the relationship between ordinal numbers and counting numbers, e.g. seventeen and seventeenth (17 and 17th).

● Provide ordinal number labels to 31st and have students use the labels to show order in everyday events.

● Examine a calendar and use ordinal numbers to read the dates, e.g. 27th April.

Extension Work

● Ask students to use a blank calendar (**BLM 13**, p. 186) to make a calendar for the current month.

● Read the dates of various days and events for the month, e.g. the first weekend, sport days.

● *Concentration*: Have students match ordinal numbers to counting numbers.

Language

number, ordinal number, place, position, calendar, date, first, second … thirty-first

Resources

● **ID Card 1**, p. 171

● calendars (**BLM 13**, p. 186)

Cross-reference

See also: pp. 112, 113
Year 1 p. 126
Year 3 p. 106

Evaluation

Is the student able to do the following?

● read and use the ordinal numbers to at least thirty-first

Answers

❶ **a** 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th
  b The 3rd is coloured green. **c** The 6th is coloured red.
  d The 2nd is coloured blue. **e** The 10th is coloured purple.
  f The 4th is coloured orange. **g** The 1st is coloured pink.

❷ **a** 7th **b** 5th **c** 3rd **d** 1st

❸ **a** 21st is red
  b 2nd is green
  c 19th is blue
  d 26th is yellow
  e 28th is purple
  f 3rd is orange

❹ **a** 25th February **b** 6th February
  c 3rd February **d** 26th February

2B Position Words

Content strand: Measurement and Geometry

Sub-strand: Location and transformation

Content description:

● Interpret simple maps of familiar locations and identify the relative positions of key features.

Teaching Suggestions

● Play 'Simon Says', emphasising position words.
● Describe the position of objects in models and pictures.
● *Where Has the Leprechaun Hidden His Gold?*: A student decides on a hiding place and the other students try to guess where it is, using position words.
● Discuss the list of position words at the top of the page.
● Discuss the answers as several may be acceptable.
● Discuss the second picture and invite students to choose something and describe its position. Ask for alternative answers.
● Ask students to draw objects on the first picture, giving instructions using position words.

Extension Work

● Have students describe the position of features in large photographs and pictures. On cards, write the positional sentences used.
● Use prepared position word cards and put them into a pile. Ask a student to choose the top card and then use that word in a sentence.

Language

See the list at the top of the Student Book page.

Resources

● any classroom objects that can be arranged to discuss location, e.g. models, photographs, pictures, toys
● prepared position word cards
● cardboard, coloured pencils

Cross-reference

See also: pp. 52, 97, 117, 124, 125
Year 1 p. 45
Year 3 p. 136

Evaluation

Is the student able to do the following?

● show the position of objects using models and drawings
● describe the position of objects using language that includes 'left' and 'right'

Answers

❶ Answers will vary, and may include:
   a behind, under
   b between, far, high
   c in front of, close to
   d beside, low
   e close to, right
   f between, next to

❷ Answers will vary.

2C Revision of Time

Content strand: Measurement and Geometry

Sub-strand: Using units of measurement

Content description:

● Tell time to the quarter-hour, using the language of 'past' and 'to'.

Teaching Suggestions

● Brainstorm time words and phrases, e.g. 'morning', 'afternoon', 'dawn', 'dusk', 'evening', 'twilight', 'wait a minute', 'in a tick'.

● Revise the two types of clocks, i.e. analogue and digital. Discuss their differences.

● Emphasise the position of the long and short hands on an analogue clock on the hour and half hour.

● Provide students with frequent opportunities to read and record analogue and digital time on the hour and half hour.

● Relate hour and half-hour time to everyday activities, matching displays with specific events, e.g. recess is at 11:00 and footy training is at half past 4, etc.

● Encourage students to use various strategies to estimate one minute. Use a stopwatch to demonstrate the duration of one minute.

● Discuss the various ways of saying half past three, e.g. 3:30.

Fun Spot

● Emphasise that the two zeros go after the two dots and the number goes before the two dots.

Extension Work

● Using digital time, make a timetable for a normal school day, e.g. 'At 7:00 I get up ...'

Language

morning, afternoon, dawn, dusk, evening, twilight, wait a minute, in a tick, analogue time, digital time, o'clock, half past, 6:30, minute hand, hour hand, minute, hour, second, stopwatch

Resources

● real analogue and digital clocks
● stopwatch

Cross-reference

See also: pp. 24, 25, 56, 68
Year 1 p. 100
Year 3 p. 88

Evaluation

Is the student able to do the following?

● tell the time on the hour and half hour on analogue and digital clocks

Answers

❶ **a** 7, 7:30   **b** 8, 8:00
c 6, 6:30   **d** Answers will vary.

❷ **a** 11:30   **b** 2:30

❸ **a** Answers will vary.   **b** 60 seconds in 1 minute

2D Ordering Capacities

Content strand: Measurement and Geometry

Sub-strand: Using units of measurement

Content description:

● Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units.

Teaching Suggestions

● The Activity could be completed in small groups. Discuss the results.

● Have students compare and order the capacities of two containers by filling each and counting the number of informal units used.

● Discuss how tally marks are formed and their usefulness for counting.

● Use tally marks as a strategy for counting the number of informal units used to fill the containers.

● Have students use an informal calibrated measure to compare and order the capacities of three containers.

● Encourage students to estimate before measuring with informal units.

Extension Work

● Provide students with same-sized sheets of thin cardboard.

● In groups, students construct containers to hold rice.

● Discuss the different shapes and the capacities of the containers made.

Language

capacity, fill, full, space, pour, pack, stack, holds more, holds less, unit of measure, estimate, check, measure, calibrated measure

Resources

● various containers of different sizes, e.g. bottles, boxes, buckets, cups, jugs, plastic bottles, saucepans

● rice, sand, water

● Centicubes, place-value ones

● chalk

● same-sized sheets of thin cardboard

Cross-reference

See also: p. 137

Year 1 p. 113

Year 3 p. 98

Evaluation

Is the student able to do the following?

● compare and order the capacities of two or more containers

● record measurements by referring to the number and type of informal unit used

Answers

❶ Answers will vary.

❷ Answers will vary.

❸ **a** saucepan

b box

c bottle

d box

e bottle, saucepan, box

34C Informal Units of Length

Content strand: Measurement and Geometry

Sub-strand: Using units of measurement

Content description:

● Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units.

Teaching Suggestions

● Give practical activities around the classroom and the playground in measuring distances using informal units, e.g. 'How many book lengths from your desk to the door?'

● Give experiences where students measure the length or width of items using any object as a unit. Emphasise that units must be placed end-to-end with no gaps or overlaps between each unit.

● Discuss choices and suitability of different units, e.g. 'Which is more suitable to measure the length of a blackboard: a paintbrush or a paperclip?'

● Have students complete the Student Book page activities. Ensure students estimate (guess) first, then check.

● Cut out footprints on cardboard (ensure they are all the same size). Use them as a unit to measure items in the room.

● Discuss the need for a formal unit of length. 'Why would we want one?' 'What use would it be?' 'What units of length do you know?' 'Who has heard of the metre?' 'Who has heard of the centimetre?' 'How big are these units?'

Extension Work

● Discuss the disadvantages of informal units of measure.

● Use string to compare the circumferences of cylindrical objects.

Language

units, as long as, distance, equal lengths

Resources

● various classroom objects, e.g. blocks, craft sticks, paperclips, pencils

● straws

● cardboard

Cross-reference

See also: pp. 21, 137

Year 1 p. 89

Year 3 p. 92

Evaluation

Is the student able to do the following?

● show an understanding of the concept of length through practical experiences

Answers

❶ Answers will vary.

❷ Answers will vary.

❸ Answers will vary.

34D Comparing Objects

Content strand: Measurement and Geometry

Sub-strand: Using units of measurement

Content description:

● Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units.

Teaching Suggestions

● On this page, objects are compared using more than one attribute.

● Review the students' previous knowledge of length, area, volume, capacity and mass.

● Provide opportunities for students to compare three or more objects according to length, area, volume, capacity and mass. Where necessary, encourage students to heft and use informal units to compare items.

● Give students place-value blocks to compare the length of objects on the page. Discuss how these could be used.

● Have students compare the capacity of two containers by filling one with sand, then pouring this sand into the other container.

● Have students calibrate a container using 'cups' as an informal unit. Students could fill the container by adding cups of water and marking the new level each time.

Extension Work

● Ask students to choose four items and write mathematical questions that could be asked to compare the objects.

● Students could compare the volume of objects by submerging them in water and comparing the water levels.

Language

length, area, volume, capacity, tallest, shortest, heaviest, lightest, widest, narrowest, takes up most/least space, largest, smallest, holds most, holds least, heft

Resources

● various classroom objects for comparison, e.g. containers of different sizes, rocks

● place-value blocks

Cross-reference

See also: pp. 16, 17, 76, 77
Year 1 p. 124
Year 3 p. 100

Evaluation

Is the student able to do the following?
● compare a number of attributes for two or more objects

Sample pages

Answers

Answers may vary.

❶ **a** 2   **b** 3   **c** 2
   d 3   **e** 3   **f** 3
   g 2
   h 1

❷ Answers will vary, and may include
   a 3   **b** 1
   c 3   **d** 1
   e 3   **f** 2
   g 3   **h** 1

❸ Answers will vary.

35A Using a Calculator

Content strand: Number and Algebra

Sub-strand: Number and place value

Content description:

● Recognise and represent division as grouping into equal sets and solve simple problems using these representations.

Teaching Suggestions

● 35A Using a Calculator (p. 138) and 35B The Calculator (p. 139) could be treated in the same lesson, as they both deal with the calculator.

● This page includes a mixture of problems involving division by sharing and division by repeated subtraction.

● Encourage the students to read each question carefully to discover what needs to be found. They could draw a picture to help them.

● Review the use of the calculator to ensure students are familiar with the keys, especially the use of division.

● Explain that for each number sentence the division symbol and the equals sign will need to be placed in a box of their own.

● Review the link between multiplication and division. Provide students with several opportunities to see how simple arrays can be used to write different number sentences.

● Provide struggling students with easier problems, so they can use concrete materials to act out each problem.

ICT

● Ask students to choose the number of clowns that would fit into a car. Then ask them to choose the number of cars in part a and part b. They have then made up their own number story. The numbers chosen should be high enough to warrant the use of a calculator. Note: If 8 clowns can fit into 1 car, then 15 × 8 clowns can fit into 15 cars.

Extension Work

● Ask students to write a number sentence for Questions 1–4 of 34A Problem Solving (p. 134).

● Have students create their own arrays using 1 cm grid paper (**BLM 14**, p. 187).

Language

calculator, number sentence, number story, multiplication, groups of, rows of, division, sharing, repeated subtraction

Resources

● calculators

● various concrete materials

● 1 cm grid paper (**BLM 14**, p. 187)

Cross-reference

See also: pp. 82, 83, 98, 99, 134, 139
Year 1 p. 123
Year 3 p. 40

Evaluation

Is the student able to do the following?

● use a calculator to find the answer

● Is the student able to write the correct number sentence to match a number story

Answers

1
  a $3 \times 28 = 84$ There are 84 balls.
  b $108 \div 3 = 36$ There are 36 cans.
  c $90 \div 15 = 6$ There are 6 in each packet.
  d $128 \div 8 = 16$ There are 16 in each packet.
  e $125 \div 5 = 25$ There are 25 bags.
  f $114 \div 19 = 6$ There are 6 in each bag.

2 Answers will vary.