

3

At the leisure centre

My name is Karen. I manage a leisure centre with my partner, Thorsten. We enjoy our jobs and the people we meet. We have two children called Andreas and Frieda.

We use a lot of maths in our work. We have to make appointments and work out costs. We have to use a calculator correctly.

Our two children, aged four and two, attend the centre's crèche. They like coming to work with us and have a great time there, meeting other children and playing games.



Talk about it

Have you ever visited a leisure centre?

Have you seen any programmes on the TV about leisure centres?

What type of work would a manager at a leisure centre do?

What type of work would a receptionist at a leisure centre do?

What maths skills would a manager of a leisure centre need for his or her job?

What maths skills would a receptionist at a leisure centre need for his or her job?

What other maths skills would be needed in a leisure centre?

These are the skills you will practise in this unit.

Which are the most useful for you? Tick the boxes.

- ☐ Using analogue and digital clocks to tell the **time**
- ☐ Using a calendar to tell the **date**
- ☐ Reading, writing and understanding common **fractions**
- ☐ Recognising and using **equivalent fractions**

Skill code

MSS1/E3.3

MSS1/E3.3

N2/E3.1

N2/E3.2

Booking the squash courts

We are planning the bookings for the squash courts.
Here is a diary of bookings for two of the squash courts.
The times shown are the start times for the session.



Morning

	Court 1	Court 2
8:00	Nicola Irvin	Peter Ashe
9:00	David Tenor	
10:00		
11:00	Jane LaCroix	Freddie Dias

Afternoon

	Court 1	Court 2
12:00		Mick Clements
1:00	Mary Gonzales	Kelly Andrew
2:00	Salima Shah	
3:00		
4:00	Zulfar Keskina	
5:00		Kirsten Buttner

Find the name Peter Ashe in the table.

His court is booked at 8:00 in the morning.

This is written 8:00 am and we say 'eight a-m.'

Now find the name Kelly Andrew.

She is booked at 1:00 in the afternoon.

This is written 1:00 pm and we say 'one p-m.'

Tip

- am is used for any time before midday (noon).
- pm is used for any time after midday (noon).



Activity 1

1 Write down the written and spoken times booked for the following players.

The first one has been completed for you.

a Jane LaCroix

Written time is

11:00 am

Spoken time is

'eleven a-m'

b Mick Clements

Written time is

Spoken time is

c Salima Shah

Written time is

Spoken time is

d David Tenor

Written time is

Spoken time is

2 Use the table to match these clocks to one of the booked players.

a  Player

b  Player

c  Player

d  Player

Karen arrives at work at seven twenty in the morning.

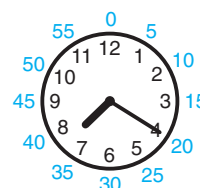
We say 'seven twenty am' and write 7:20 am. The clock face shows



The minute hand tells us how many minutes after the hour.

Karen finishes work at three forty in the afternoon.

We say 'three forty pm' and write 3:40 pm.







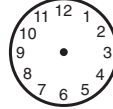

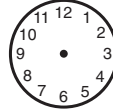
3 Complete the clock face to show this time.



Activity 2

Complete the following table using the information given.

The first row has been done for you.

Written time	Spoken time	Digital clock	Analogue clock
8:50 am	'eight fifty a-m'		
	'three ten p-m'	<input type="text"/>	
			
	'six forty p-m'	<input type="text"/>	
11:55 pm		<input type="text"/>	



Review

Do you need more practice in using time?

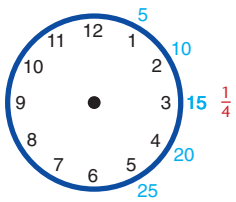
Yes ☐

No ☐

For more work on this, go to H1 (page 12).

This work links to mini-project M1 (page 15).

Starting and finishing times



The minute hand tells us how many minutes there are **past** the hour.

A member of staff notes the arrival and departure times of some of the customers as follows.

	Start	Finish
Nicola Irvin	8:05	8:45
David Tenor	9:10	9:55
Jane LaCroix	11:20	11:50
Mary Gonzales	1:10	1:55
Salima Shah	2:05	2:45
Zulfar Keskina	4:15	4:55

Find the name David Tenor in the table.

He starts at 9:10 in the morning.

This is written 9:10 am. We can say 'nine ten a-m', but it is more usual to say 'ten past nine'.

Find the name Salima Shah.

She starts at 2:05 in the afternoon.

This is written 2:05 pm.

We usually say 'five past two'.

Remember

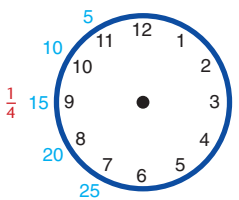
- When it is 15 minutes **past** the hour, we usually say it is 'a quarter past'.
- When it is 15 minutes **to** the hour, we usually say it is 'a quarter to'.



Activity 3

Write down the written and spoken starting times for the following players.

1 Nicola Irvin	Written time is	<input type="text"/>	Spoken time is	<input type="text"/>
2 Jane LaCroix	Written time is	<input type="text"/>	Spoken time is	<input type="text"/>
3 Salima Shah	Written time is	<input type="text"/>	Spoken time is	<input type="text"/>
4 Zulfar Keskina	Written time is	<input type="text"/>	Spoken time is	<input type="text"/>



The minute hand can also tell us how many minutes there are **before** the hour.

David Tenor finishes at 9:55 in the morning.

This is written 9:55 am and we say 'five to ten'.

Activity 4

Salima Shah finishes at 2:45 pm. We say

1 Write down the written and spoken **finishing times** for the following players.

a Salima Shah	Written time is	<input type="text"/>	Spoken time is	<input type="text"/>
b Zulfar Keskina	Written time is	<input type="text"/>	Spoken time is	<input type="text"/>
c Nicola Irvin	Written time is	<input type="text"/>	Spoken time is	<input type="text"/>
d Jane LaCroix	Written time is	<input type="text"/>	Spoken time is	<input type="text"/>

2 The following week, two of the players came again but at different times.

Write down the written and spoken times for each player.

	Start	Finish
Mary Gonzales	8:15	9:40
Salima Shah	3:40	4:25

a Mary Gonzales

Start time	Written	<input type="text"/>	Spoken	<input type="text"/>
Finish time	Written	<input type="text"/>	Spoken	<input type="text"/>

b Salima Shah

Start time	Written	<input type="text"/>	Spoken	<input type="text"/>
Finish time	Written	<input type="text"/>	Spoken	<input type="text"/>



Review

Do you need more practice in using time?

Yes ☐

No ☐

For more work on this, go to H1 (page 12).

This work links to mini-project M2 (page 15).

Booking the main hall

Thorsten is planning the bookings for the main hall.

Here is a diary of bookings for the week. The times are divided into morning, afternoon and evening sessions.



June / July 2003	Sun 29 June	Mon 30 June	Tue 1 July	Wed 2 July	Thu 3 July	Fri 4 July	Sat 5 July
Morning	Senior football	Yoga		Yoga			Junior football
Afternoon	Tea dance		Aerobics		Step aerobics	Ballet	
Evening		Tap dancing	Karate club	Karate club	Drama club	Judo	

Remember

- Dates can be written in a number of ways.
- Sunday 29 June 2003 can be written
Date Month Year
29 / 6 / 03

Use the table to find the entry for the junior football club.

The table shows you that the club meets on Saturday 5 July 2003

This can be written as 5 / 7 / 03

Activity 5

- Write down the following dates using the day/month/year notation.
 - Monday 30 June 2003
 - Tuesday 1 July 2003
 - Wednesday 2 July 2003
- Add the following entries to the booking form.
 - Line dancing on the evening of 29/6/03
 - Relaxation class on the morning of 3/7/03

Here is a calendar for the month of July 2003.

July 2003						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

You can use the calendar to provide lots of useful information.

- The first day of July is a Tuesday.
- The last Saturday in July is 26 July.
- The second day of July is a Wednesday.
- There are four Mondays in July.
- The first Saturday in July is 5 July.

Activity 6

- 1 Use the calendar to find out how many days there are in July.
- 2 Use the calendar to find out how many Tuesdays there are in July in 2003.

Activity 7

Use the calendar to answer the following questions

- 1 What day is 13 July 2003?
- 2 What day is 17/7/03?
- 3 What is the date of the first Friday in the month?
- 4 What is the date of the last Friday in the month?
- 5 The gym club meets every second Wednesday of the month. What is the date of their July meeting?
- 6 The tea dances take place every Sunday afternoon. What is the date of the third tea dance in July?



Review

Do you need more practice in using time and calendars?

Yes ☐ No ☐

For more work on this go to H2 (pages 12–13) or E1 (page 14).

This work links to mini-projects M3 and M4 (page 15).

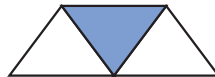
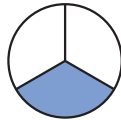
In the crèche

Andreas and Frieda are playing in the crèche.



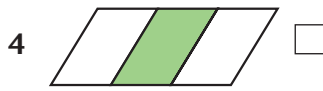
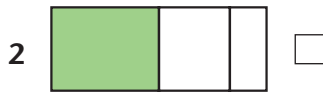
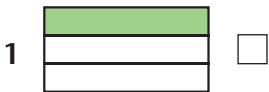
They are practising filling in shapes carefully, without going over the lines.

Each of these shapes is divided into three **equal parts**. One out of three, or one-third, is coloured. This is written as $\frac{1}{3}$.



Activity 8

Tick the shapes where $\frac{1}{3}$ of the shape is coloured.



Each of these shapes is divided into five equal parts. One out of five, or one-fifth, is coloured. This is written as $\frac{1}{5}$.




Activity 9

Tick the shapes where $\frac{1}{5}$ of the shape is coloured.



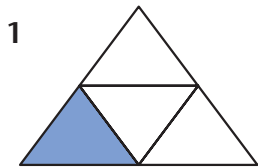
Tip

The number on the bottom of the fraction tells us how many equal parts the picture is divided into.

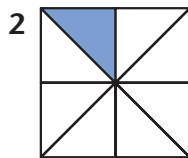
This shape is divided into five equal parts. One part is shaded. The fraction is $\frac{1}{5}$ .

Activity 10

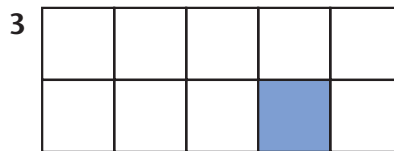
For each of the following, write down the fraction that is coloured.



Fraction coloured



Fraction coloured



Fraction coloured

This shape is divided into five equal parts.
Two of the parts are coloured. The fraction is $\frac{2}{5}$.



$\frac{2}{5}$ ← the number of parts coloured
5 ← the total number of equal parts

Tip

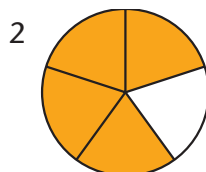
The number on the top of the fraction tells you how many parts are coloured.

Activity 11

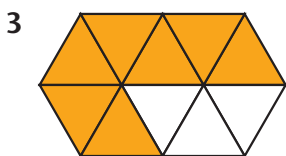
For each of the following write down the fraction that is coloured.



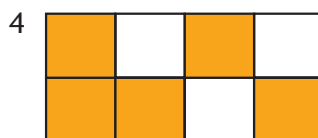
Fraction coloured



Fraction coloured



Fraction coloured



Fraction coloured



Review

Do you need more practice with fractions?

Yes ☐

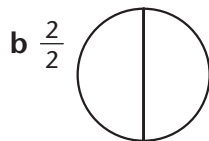
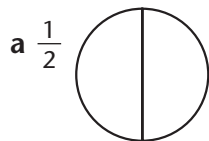
No ☐

For more work on this, go to H3 and H4 (page 13) or E2 (page 14).

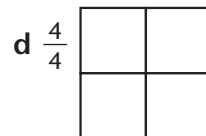
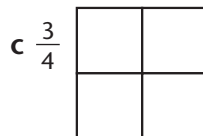
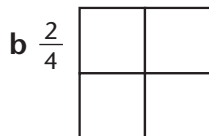
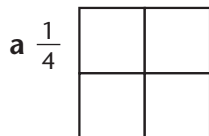
Fair shares

Activity 12

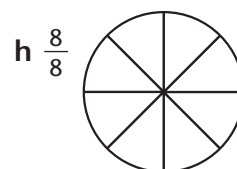
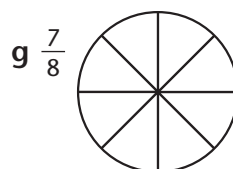
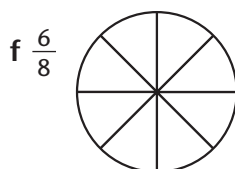
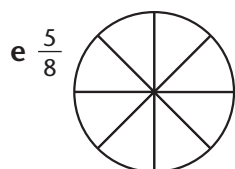
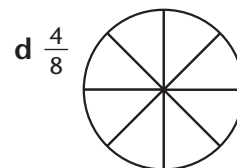
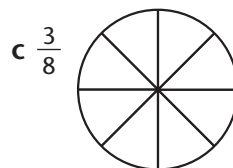
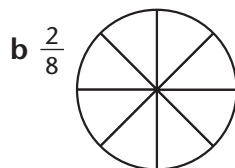
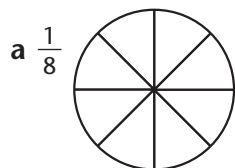
1 On these shapes shade



2 On these shapes shade



3 On these shapes shade



4 What do you notice about the shapes shaded as $\frac{2}{2}$, $\frac{4}{4}$ and $\frac{8}{8}$?

5 What do you notice about the shapes shaded as $\frac{1}{2}$, $\frac{2}{4}$ and $\frac{4}{8}$?



Activity 13

Andreas and Frieda share a bar of chocolate. Andreas says they should each have $\frac{1}{2}$.



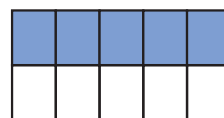
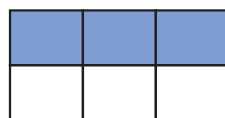
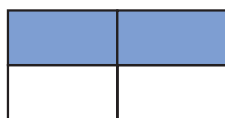
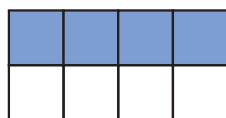
One of the carers says they should each have $\frac{4}{8}$. Who is right?



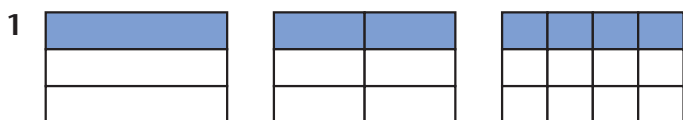
Of course, they are both right because $\frac{1}{2}$ and $\frac{4}{8}$ are the same amount.

The fractions $\frac{1}{2}$ and $\frac{4}{8}$ are the same. They are called **equivalent fractions**.

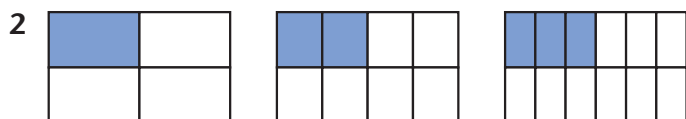
Here are some other fractions that are equivalent to $\frac{1}{2}$ and $\frac{4}{8}$.



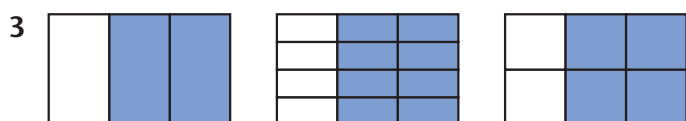
You can see from the diagrams that the same amount is shaded each time. All these fractions are equivalent.



Use these diagrams to find some fractions that are equivalent to $\frac{1}{3}$.



Use these diagrams to find some fractions that are equivalent to $\frac{1}{4}$.



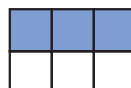
Use these diagrams to find some fractions that are equivalent to $\frac{2}{3}$.

4 Circle two fractions that are equivalent. Draw diagrams to help.

- a $\frac{3}{4}$ $\frac{2}{3}$ $\frac{4}{8}$ $\frac{5}{7}$ $\frac{4}{6}$
- b $\frac{2}{10}$ $\frac{9}{11}$ $\frac{2}{9}$ $\frac{5}{6}$ $\frac{1}{5}$
- c $\frac{3}{4}$ $\frac{2}{5}$ $\frac{6}{15}$ $\frac{3}{7}$ $\frac{7}{20}$

Activity 14

Here is one way to shade exactly one half of the shape.

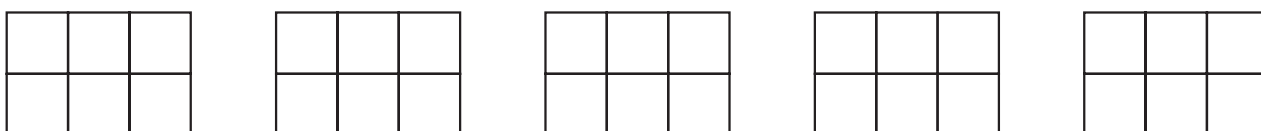


Here is another way to shade exactly one half.



How many other ways can you find to shade exactly one half of the shape?

Some blank shapes are provided to help you.



Review

Do you need more practice in equivalent fractions?

Yes ☐ No ☐

For more work on this, go to H3 (page 13) or E2 (page 14).

Activity H1

Here is a diary of bookings for two of the badminton courts.

Morning

	Court 1	Court 2
8:00	David Horan	
9:00		Maria Rose
10:00	Richard Young	Pravin Lal
11:00		Jenny Penn

Afternoon

	Court 1	Court 2
12:00	Jimmy Perfet	Jane Chan
1:00		
2:00	Arturo Odez	
3:00	Nathan Merkis	Danny Merkis
4:00	David Murphy	

1 Write down the written and spoken booked times for the following players.

a David Horan

Written time is

Spoken time is

c Arturo Odez

Written time is

Spoken time is

b Jenny Penn

Written time is


Spoken time is

d David Murphy


Written time is

Spoken time is

2 Use the table to match these clocks to one of the booked players.

a  Player

b  Player

c  Player

d  Player

Activity H2

Here is a calendar for the month of September 2003.

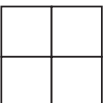



September 2003						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				



- 1 Write down the following dates using a different format.
- a Monday 29 September 2003
 - b Saturday 13 September 2003
 - c 2/9/03
 - d 30/9/03
- 2 Use the calendar to answer the following questions.
- a How many days are there in September?
 - b What day is 1 September 2003?
 - c What day is 25 September 2003?
 - d What day is 17/9/03?
 - e What day is 30/09/03?
 - f What is the date of the first Friday in the month?
 - g What is the date of the second Tuesday in the month?
 - h How many Mondays are there in September 2003?

Activity H3

Shade the following fractions on the shapes.

- 1 Shade $\frac{1}{4}$.  2 Shade $\frac{3}{4}$.  3 Shade $\frac{1}{5}$.  4 Shade $\frac{2}{5}$. 

Activity H4

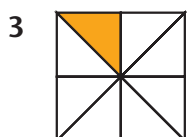
For each of the following, write down the fraction that is coloured.



Fraction coloured



Fraction coloured



Fraction coloured



Fraction coloured



Extension



Activity E1

Here is a calendar for the month of September 2003.

September 2003						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Use the calendar to answer the following questions

- How many Tuesdays are there in September 2003?
- What day is 31 August 2003?
- What day is 9/9/03?
- What is the date of the last Wednesday in the month?
- What day is 1 October 2003?
- What is the date of the first Monday in October 2003?



Activity E2

- Place the following fractions in order from smallest to largest.

You may wish to draw diagrams to help you.

a $\frac{4}{7}$ $\frac{1}{7}$ $\frac{6}{7}$ $\frac{3}{7}$ $\frac{2}{7}$

b $\frac{7}{8}$ $\frac{2}{8}$ $\frac{5}{8}$ $\frac{4}{8}$ $\frac{3}{8}$

- What is another fraction for

a $\frac{2}{8}$? b $\frac{4}{8}$?

- Write these fractions in order from smallest to largest. $\frac{2}{3}$ $\frac{1}{3}$ $\frac{4}{9}$ $\frac{2}{9}$ $\frac{8}{9}$
(You will need to change $\frac{2}{3}$ and $\frac{1}{3}$ to ninths first.)

.....



Mini-projects



Activity M1

Time across the world is based on Greenwich Mean Time (GMT).

Use an atlas, the library or the Internet to find out about GMT.



Activity M2

When it is midday here, find out what time it is in the following places.

Athens in Greece

Cape Town in South Africa

Delhi in India

Hong Kong in China

Madrid in Spain

New York in the USA

Paris in France

Sydney in Australia

Tokyo in Japan



Activity M3

What day of the week is your birthday this year?

What day of the week is your birthday next year?

What day of the week was your birthday last year?

Can you see any patterns in your birthday days?



Activity M4

2 February 2002 was a very special date.

Why?

Because 2 February 2002 can be written 2/2/02 or as 02/02/02.



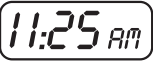
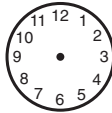
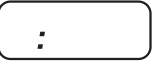


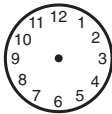


What other dates this century have a similar pattern?

Can you find all of them?

What other patterns can you find in dates?

Activity C1

Complete the following table using the information given. The first row has been done for you.

Written time	Spoken time	Digital clock	Analogue clock
7:40 am	'seven forty a-m'		
11:25 am			
	'five twenty p-m'		
			
	'eight forty p-m'		

Activity C2

Write down the following dates using the long (word) form.

- The Manchester Commonwealth Games started on 25/7/02.

.....

- The Second World War ended on 2/9/45.

.....

- The first person landed on the moon on 20/07/69.

.....

- Europe's single currency was first introduced on 1/1/99.

.....

- Orville Wright became the first person to fly on 17/12/03.

.....



Activity C3

Here is a calendar for the month of November 2003.

November 2003						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Use the calendar to answer the following questions.

- 1 What day is 12 November 2003?
- 2 What day is 25/11/03?
- 3 What is the date of the last Saturday in the month?

Activity C4

For each of the following write down the fraction that is coloured.



Fraction coloured



Fraction coloured



Fraction coloured

How am I doing?

Now look back at the skills listed on page 1.

Then complete the sentences below.

I am confident with

.....

I need more practice with

.....

Date



Answers

Activity 1

- 1 a 11:00 am 'eleven a-m'.
b 12:00 'twelve noon'.
c 2:00 pm 'two p-m'.
d 9:00 am 'nine a-m'.
- 2 a Kirsten Buttner
b Freddie Dias or Jane LaCroix
c Nicola Irvin or Peter Asher
d Zulfar Keskina



Activity 2

Written time	Spoken time	Digital clock	Analogue clock
8:50 am	'eight fifty a-m'	8:50 AM	
3:10 pm	'three ten p-m'	3:10 PM	
11:35 am	'eleven thirty-five a-m'	11:35 AM	
6:40 pm	'six forty p-m'	6:40 PM	
11:55 am	'eleven fifty-five p-m'	11:55 PM	

Activity 3

- 1 8:05 am 'Five past eight'
- 2 11:20 am 'Twenty past eleven'
- 3 2:05 pm 'Five past two'
- 4 4:15 pm 'Quarter past four'

We say Salima Shah finishes at 'quarter to three'.

Activity 4

- 1 a 2:45 pm 'Quarter to three'
b 4:55 pm 'Five to five'
c 8:45 am 'Quarter to nine'
d 11:50 am 'Ten to eleven'
 - 2 a Start time 8:15 am 'quarter past eight'
Finish time 9:40 am 'twenty to ten'
b Start time 3:40 pm 'twenty to four'
Finish time 4:25 pm 'twenty-five past four'
- We don't use/say 'am' or 'pm' if we use 'to' or 'past'.

Activity 5

- 1 a 30/6/03
b 1/7/03
c 2/7/03

2

June / July 2003	Sun 29 June	Mon 30 June	Tue 1 July	Wed 2 July	Thu 3 July	Fri 4 July	Sat 5 July
Morning	Senior football	Yoga		Yoga	Relaxation		Junior football
Afternoon	Tea dance		Aerobics		Step aerobics	Ballet	
Evening	Line dancing	Tap dancing	Karate club	Karate club	Drama club	Judo	

Activity 6

- 1 31 days in July
- 2 5 Tuesdays in July

Activity 7

- 1 Sunday
- 2 Thursday
- 3 4/7/03 or 4 July 2003
- 4 25/7/03 or 25 July 2003
- 5 9/7/03 or 9 July 2003
- 6 20/7/03 or 20 July 2003

Activity 8

Shapes 1 and 4

Activity 9

Shapes 1 and 2

Activity 10

- 1 $\frac{1}{4}$ 2 $\frac{1}{8}$ 3 $\frac{1}{10}$

Activity 11

- 1 $\frac{2}{3}$ 2 $\frac{4}{5}$ 3 $\frac{7}{10}$ 4 $\frac{5}{8}$

Activity 12

Check your answers to Questions 1–3 with your teacher.

- 4 They are all completely shaded.
- 5 They have half the shape shaded.



Activity 13

- 1 $\frac{1}{3} = \frac{2}{6} = \frac{4}{12}$
- 2 $\frac{1}{4} = \frac{2}{8} = \frac{3}{12}$
- 3 $\frac{2}{3} = \frac{8}{12} = \frac{4}{6}$
- 4 a $\frac{2}{3}$ and $\frac{4}{6}$
b $\frac{2}{10}$ and $\frac{1}{5}$
c $\frac{2}{5}$ and $\frac{6}{15}$

Activity 14

Check your answers with your teacher.

Help

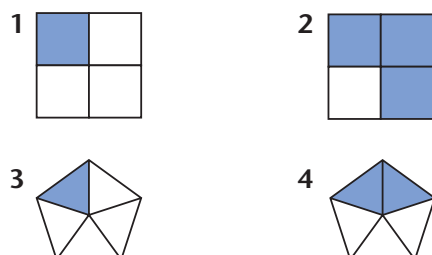
Activity H1

- 1 a 8:00 am 'eight a-m'
b 11:00 am 'eleven a-m'
c 2:00 pm 'two p-m'
d 4:00 pm 'four p-m'
- 2 a Nathan Merkis or Danny Merkis
b Richard Young or Pravin Lal
c Maria Rose
d Jimmy Perfet or Jane Chan

Activity H2

- 1 a 29/9/03
b 13/9/03
c (Tuesday) 2 September 2003
d (Tuesday) 30 September 2003
- 2 a 30
b Monday
c Thursday
d Wednesday
- e Tuesday
f 5/9/03 or 5 September 2003
g 9/9/03 or 9 September 2003
h 5

Activity H3



Activity H4

- 1 $\frac{1}{5}$ 2 $\frac{2}{5}$ 3 $\frac{1}{8}$ 4 $\frac{3}{8}$

Extension

Activity E1

- 1 5 4 24/9/03 or 24 September 2003
- 2 Sunday 5 Wednesday
- 3 Tuesday 6 6/10/03 or 6 October 2003

Activity E2

- 1 a $\frac{1}{7}, \frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{6}{7}$ b $\frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{7}{8}$
- 2 a $\frac{1}{4}$ b $\frac{1}{2}$
- 3 $\frac{2}{9}, \frac{1}{3} (\frac{3}{9}), \frac{4}{9}, \frac{2}{3} (\frac{6}{9}), \frac{8}{9}$

Mini-projects

Check your answers with your teacher.

Check it

Activity C1

Written time	Spoken time	Digital clock	Analogue clock
7:40 am	'seven forty a-m'	7:40 AM	
11:25 am	'eleven twenty-five a-m'	11:25 AM	
5:20 pm	'five twenty p-m'	5:20 PM	
11:50 am	'eleven fifty a-m'	11:50 AM	
8:40 pm	'eight forty p-m'	8:40 PM	

Activity C2

- 1 25 July 2002
- 2 2 September 1945
- 3 20 July 1969
- 4 1 January 1999
- 5 17 December 1903. Be careful, the answer isn't 2003!

Activity C3

- 1 Wednesday
- 2 Tuesday
- 3 29/11/03 or 29 November 2003

Activity C4

- 1 $\frac{2}{5}$ 2 $\frac{5}{6}$ 3 $\frac{3}{9}$