

Copyright © 2009 3P Learning. All rights reserved.

First edition printed 2009 in Australia.

A catalogue record for this book is available from 3P Learning Ltd.

ISBN 978-1-921860-86-7

Ownership of content The materials in this resource, including without limitation all information, text, graphics, advertisements, names, logos and trade marks (Content) are protected by copyright, trade mark and other intellectual property laws unless expressly indicated otherwise.

You must not modify, copy, reproduce, republish or distribute this Content in any way except as expressly provided for in these General Conditions or with our express prior written consent.

Copyright Copyright in this resource is owned or licensed by us. Other than for the purposes of, and subject to the conditions prescribed under, the Copyright Act 1968 (Cth) and similar legislation which applies in your location, and except as expressly authorised by these General Conditions, you may not in any form or by any means: adapt, reproduce, store, distribute, print, display, perform, publish or create derivative works from any part of this resource; or commercialise any information, products or services obtained from any part of this resource.

Where copyright legislation in a location includes a remunerated scheme to permit educational institutions to copy or print any part of the resource, we will claim for remuneration under that scheme where worksheets are printed or photocopied by teachers for use by students, and where teachers direct students to print or photocopy worksheets for use by students at school. A worksheet is a page of learning, designed for a student to write on using an ink pen or pencil. This may lead to an increase in the fees for educational institutions to participate in the relevant scheme.

Published 3P Learning Ltd

For more copies of this book, contact us at: www.3plearning.com/contact

Designed 3P Learning Ltd

Although every precaution has been taken in the preparation of this book, the publisher and authors assume no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of this information contained herein.

Series F – Time

Contents

iobic I – iv	Neasuring time (pp. 1–8)	Date completed
	time relationships	
	reading analogue clocks	
	am and pm notation	
	• 24 hour time	/ /
	time relationship challenges	
	• camping trip – solve	/ /
	• 24 hour time dominoes – apply	/ /
	 lucky numbers – apply mayhem at max madness – solve 	
Tonic 2 T	imetables (pp. 15–20)	
Topic 5 – T	• reading timetables	/ /
	working out travel time	
		, ,
	• what's on the box? – solve	

Series Authors:

Rachel Flenley Nicola Herringer

Copyright © 3P Learning

Measuring time – time relationships

Connect these time facts:

- 1 minute24 hours1 year10 years1 hour365 days1 decade100 years1 day60 seconds1 century12 months
 - 1 year 60 minutes

1 How many minutes are there in the following hours?

- a 2 hours = minutes
- **b** $\frac{1}{4}$ hour = minutes
- $c = \frac{1}{2} \text{ hour } = \boxed{\text{minutes}}$
- d $\frac{3}{4}$ hour = minutes
- e 4 hours = minutes
- **f** 6 hours = minutes

2 How many seconds are there in the following times? You may use a calculator.

I need to remember to change hours to minutes first. Then I can convert to seconds.



- **b** 5 minutes = seconds
- c 1 hour = seconds
- d $\frac{1}{2}$ hour = seconds
- e $\frac{1}{2}$ minute = seconds
- $f = \frac{1}{4} \text{ hour} = \boxed{}$ seconds

3 Use the information in the top box to work out these time facts:

- a 1 decade = months
- **b** 1 century = years
- c 2 weeks = days
- **d** $\frac{1}{2}$ century = years
- e 1 week = hours
- f 2 years = days

4 What time unit would you use to measure each of the following?

Time to hard boil an egg

One millennium

One leap year

Length of a soccer match



Measuring time – reading analogue clocks

1 Draw a line from each clock to its matching time in words:



quarter to 8

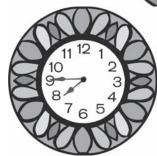
half past 2



25 minutes to 5

25 minutes after 3





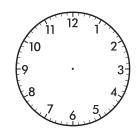
2 Draw the hands on these clocks:



a 20 minutes past 6



b quarter to 7

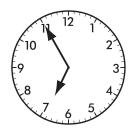


c 16 minutes past 4



d 25 minutes to 9

Using 'to', 'past' or 'after', write the time displayed on each clock:



a





C



d



Measuring time – am and pm notation

We use am and pm with digital time.

am → The part of the day between 12 midnight and 12 noon.

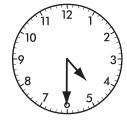
pm → The part of the day between 12 noon and 12 midnight.

Express these times in digital form using am or pm:



morning





afternoon





evening





morning





morning





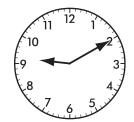
evening





afternoon





morning

h :	h	:

Draw hands on these analogue clocks to match the digital times:



8:40 am



b 5:15 pm



10:30 am

C



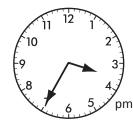
d 12:20 pm

Put these times in order from earliest to latest. Express the times in digital form:



quarter after 5 in the evening

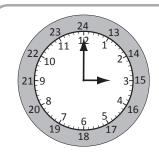
11:10 am



1	:
2	:

SERIES

Measuring time – 24 hour time

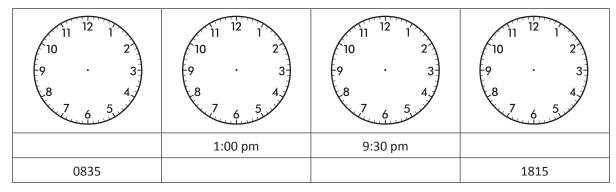


Time can be measured using 12 hour time, using am/pm, or 24 hour time.



REMEMBER

1 Complete the table with the correct analogue, digital and 24 hour times.



11 12 1 10 2 9 3 8 4 7 6 5	11 12 1 10 2 9 3 8 4 7 6 5	11 12 1 10 2 9 3 8 4 7 6 5	11 12 1 10 2 9 3 8 4 7 6 5
2:22 pm	1:18 am		
		2000	2104

Convert these 24 hour times to digital times:

3 Convert these digital times into 24 hour time:

It is 1700 and your favourite TV show is due to start in half an hour. Show the starting time in digital form:





Measuring time – 24 hour time

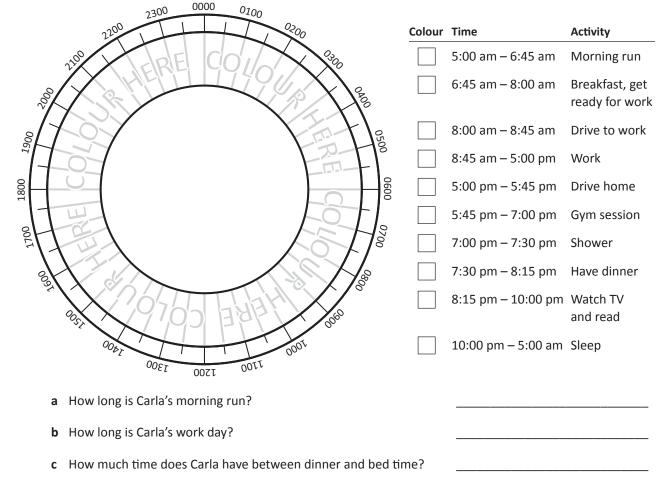
DVD recorders use 24 hour time to record programs.

Minh wants to record some programs on her DVD. Enter the start and finish times of each program in 24 hour time. How long is each show?

Channel 4			
9:00 am Science Show			
10:00 am Behind the News			
11:00 am	Weather Report		
12:00 pm Midday News			
1:30 pm My Name is Greg			
2:30 pm Movie: Slink!			
4:00 pm 4 pm News			
5:00 pm	Smartline		
6:00 pm	Current Affairs		
8:00 pm	Movie: Duck Island		
9:45 pm Late News			

Program	Start	Finish	Length
Science Show	0900	1000	1 hour
Behind the News			
Movie: Slink!			
4 pm News			
Smartline			
Movie: Duck Island			

Carla is training for a marathon. Complete the chart below to show how she spends her day. Colour each of the segments in the chart using a different colour to show the duration of each activity below.





Measuring time – time relationship challenges



How long does it take to make a loaf of bread?

Read this recipe carefully and work out how long it will take to make the bread.

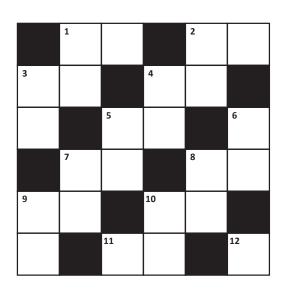
Method for making a loaf of bread:

- 1. Make the dough by adding yeast mixture to the flour. This will take 3 minutes.
- 2. Knead on a lightly floured surface for 10 minutes.
- 3. Place the dough in a covered bowl and let it rise in a warm place for about $1\frac{1}{4}$ hours.
- 4. Shape dough into 2 balls, cover and let it rest for 8 minutes.
- 5. Shape dough into 2 loaves and let rise until doubled in size (1 hour).
- 6. Preheat oven to 200°C for 15 minutes.
- 7. Bake in the preheated oven for 35 minutes or until the top is golden.



Total amount of time needed to make the bread:

Use what you know about time relationships to complete this cross number puzzle. You may use a calculator.



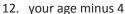
- years in five decades
- days in a 2 weeks

Down

- hours in $\frac{1}{2}$ a week
- seconds in $\frac{1}{3}$ of a minute
- days in September plus 9 days of October
- hours in 3 days
- minutes in $\frac{3}{4}$ hour
- seconds in $\frac{1}{6}$ of a minute
- months in 6 years
- 10. hours in 2 days

Across

- years in half a century 1.
- minutes in $\frac{1}{4}$ of an hour
- 3. minutes in 1 hour + 20 minutes
- 4. hours in 1 day
- 5. days in April
- 7. hours in 2 days plus 1 hour
- 8. hours in half a day
- 9. minutes in $1\frac{1}{4}$ hours
- 10. minutes in $\frac{2}{3}$ of an hour
- 11. hours in 4 days and 2 hours









Last weekend, Akhil and three of his friends went on a camping trip.
Each person brought different snacks.
Each person had different travel times.
Each person had a preferred nickname.





Read the clues in order to determine each person's nickname, the amount of time that it took each to arrive, and the snacks each person brought.

- The four nicknames are: Bug, Hank, Tops and Haz (the four friends' names are written in the table).
- The four snacks are: raisins, trail mix, water, and peanuts.
- The four travel times are: 15 minutes, 10 minutes, 20 minutes and 5 minutes.

Clues

- 1. Houman brought the trail mix and had the longest drive. His drive was 20 minutes.
- 2. Akhil, whose nickname is Bug, did not bring water or raisins.
- 3. Sean arrived before the person who brought the trail mix and after the one who brought the raisins.
- 4. Dan only needed to drive for five minutes. His was the shortest drive.
- 5. The order of arrival is: the one who brought raisins, the one whose nickname is Tops, Akhil, and the person whose nickname is Haz.

Name	Nickname	Time	Snack
Akhil			
Houman			
Sean			
Dan			



This is a game for 2 players. You will need a copy of this page, a pencil and some paper.





Cut out the cards below and choose one player to be the caller. The other 2 players must write down six digital pm times but only o'clock and half past times. The caller must shuffle the cards well and read out the 24 hour times.

The first player to cross all 6 times is the winner.

Swap roles and play again until everyone has had a turn at being the caller.

(1500)	(1700)	(1300)	(1400)
(1430)	(2030)	(2100)	(1330)
(2000)	(1730)	(1830)	(2230)
(1900)	(2130)	(1830)	(1930)
(1500)	(2200)	(2330)	(2300)

Calculating time – elapsed time

Elapsed time is the difference between 2 different times.

To work out the difference between 2 times first you count the hours then you count the minutes.

1:55 to 6:10





1:55 to 5:55 = 4 hours

5:55 to 6:10 = 15 minutes

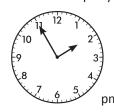
Total elapsed time is 4 hours and 15 minutes.

- How much time is there between:
 - **a** Three in the afternoon and eleven that evening?
 - 6 am and 1 pm?
 - **c** One in the morning and ten in the same morning?
 - **d** Seven in the morning until 12:30 pm?

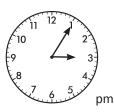


THINK

- Work out the time elapsed.
 - a Linh arrived at a party at:



She left at:



She was at the party for:



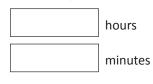
b The bus left at:



It arrived at:



The bus trip took:



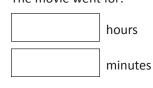
c The movie started at:



It finished at:



The movie went for:

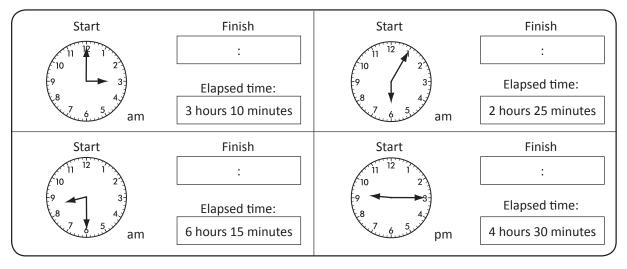


Calculating time – elapsed time

Work out the elapsed time.

Start	Finish	Start	Finish
9:15 am	11 12 1	7:30 am	11 12 1
Elapsed time:	8 4 4 am	Elapsed time	9 3 8 4 7 6 5 am
Start	Finish	Start	Finish
4:00 pm	11 12 1	2:00 am	11 12 1
Elapsed time	8 4 4 am	Elapsed time	8 7 6 5 pm

4 Work out the finish time.



Being able to count forward in intervals is an important skill. Finish each time trail:

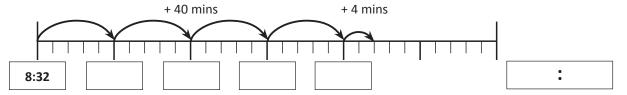
- **a** Count on in 15 minutes 9:30 10:00 10:15
- **b** Count on in 10 minutes 7:42 7:52 8:22
- **c** Count on in 15 minutes 6:47 7:32 8:02
- d Count on in 10 minutes 2:53

Calculating time – elapsed time

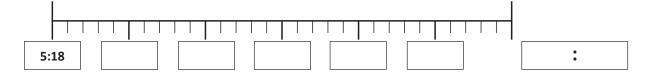
A time line can help us with more difficult elapsed time problems. Question: A party started at 12:48 pm and went for 1 hour and 30 minutes. What time did it finish? Steps: 1. First count on in hours in your head and write that answer in the first box in the time line. 2. Use the time line to count on in minutes. Each small marker represents 2 minutes. Each large marker represents 10 minutes. + 30 mins REMEMBER 2:18 1:48 1:58 2:08 Answer: 2:18 pm

Use the time line for each elapsed time problem:

a Abdul played the clarinet from 7:32 pm for 1 hour and 44 minutes. What time did he finish?



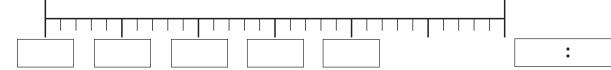
b Ali took 3 hours and 52 minutes to wash 12 cars. If she started at 2:18 pm, what time did she finish?



c Sarah drove to her friend Nick's house. She left her house at 4:36 pm and the drive took 2 hours and 18 minutes. What time did she arrive?



d In order to buy and prepare all the food for the party, Max worked solidly from 2:18 pm for 3 hours and 46 minutes. What time did he stop?



Time

Calculating time – using a stopwatch

The time on this stopwatch is read as: 52 minutes, 38 seconds and 42 hundredths of a second



For these questions you will need a stopwatch.
Estimate and measure how long it takes to do the following activities down to hundredths of a second.
Write the time as accurately as possible.

Activity	Estimate	Time
Run 200 metres		
Recite the 6 times table		
Eat an apple		
Count to 150		
Write the alphabet 3 times		
Walk to the office		
Write your name neatly 5 times		

2 What do these times mean on a stopwatch?

Stopwatch display	Minutes	Seconds	Hundredths of a second
3:51:22			
2:45:79			
1:58:87			
5:45:78			

3 Order these times from fastest to slowest:

1:38:42	1:36:65	1:56:89	1:56:99





For this game you will need: a group of 6 players, a die and, a stopwatch. You will also need a copy of this sheet per group.





The aim of this game is to find out which the fastest. Your first lucky number will be 1, then 2, and so on until all the numbers have been played.

Players sit in a circle. One player stands outside the group timing how long it takes to roll each number on the die with a stopwatch. Start anywhere in circle, pass the die around until a player rolls the lucky number on the die.



The player who rolls the lucky number becomes the timer and the timer joins the circle.

After you have played with all 6 numbers (1 to 6), order the numbers in the table according to how quickly they came up.

This first row in this table shows how you need to record the times.

Number on die	Minutes	Seconds	Hundredths of a second	Ranking fastest to slowest
1	1	34	38	
2				
3				
4				
5				
6				



Compare your table with other groups. Did anyone have a similar ranking of 'lucky' numbers?



"It's mayhem!" moaned Sergeant Nixon as he fought his way backstage through the angry crowds. 100000 fans had travelled from far and wide to see their idol Max Madness in concert, and they were growing increasingly restless as time ticked on with no Max in sight.

Little did the fans know that Max Madness might not appear at all – his golden electric maximum voltage guitar had been stolen and Max was storming around his dressing room, and refused to go on stage until it was safely back in his possession.

"I've had it with me all day," he spat. "The only time it was out of my sight was when I was getting a massage between 5:00 and 6:00 pm!"

"We'll get it back, Sir," stated Sergeant Nixon stoutly. "No one will get away with that on my watch. This show will go on."

He rounded up 3 likely suspects, all avid fans, who had been found lurking around backstage. All 3 had caught the train to the stadium. And of course, all 3 swore black and blue that they were innocent.

Tina Sparkles, Max's self-appointed number 1 fan, protested, "Well it couldn't have been me! I was getting a spray tan and my nails done at 3 pm. That took 2 hours. It takes time to look good, you know.

Rod Raver, a wanna be rock star, stated desperately, "I was with my mates rehearsing. We started at 3:55 and jammed for $2\frac{1}{2}$ hours. Once Max hears how good I am, he'll want me in his band."

Paparazzi Pete claimed, "Nah, not me, mate. I was filming an event on the other side of town. I got there at 4:15 and worked for an hour until it was time to come here."



One of these suspects arrived at the stadium in time to nick the guitar. Use the train timetable to see whose alibi just doesn't hold up.

Train Timetable				
Departs City	Arrives Rock and Roll Stadium			
3:10 pm	3:40 pm			
4:00 pm	4:30 pm			
4:40 pm	5:10 pm			
5:10 pm	5:40 pm			
5:40 pm	6:10 pm			
6:00 pm	6:30 pm			

Answer: ______. Have you and Sergeant Nixon saved the day?



Timetables – reading timetables

Timetables are often used to schedule public transport and can be set up either using digital or 24 hour time.

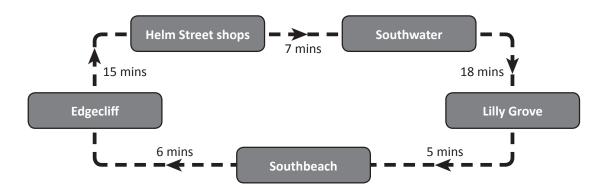
Burwood to W	/ynyard							
Burwood	1720	1727	1750	1917	2026	2132	2239	2343
Croydon			1800	1927	2036		2249	
Ashfield	1735	1742	1805	1932	2041	2146	2254	2358
Summer Hill			1812	1939	2048	2153	2301	
Lewisham	1748	1755	1818	1945	2054	2158	2307	0011
Petersham	1753	1800	1823	1948	2057	2101	2310	0009
Stanmore			1829	1954	2103	2007	2316	
Newtown			1836	2000	2110		2323	
Redfern	1811	1818	1841	2005	2114	2017	2327	0024
Central		1821	1844	2008	2118	2020	2330	0027
Town Hall			1848	2012	2122	2024	2334	0031
Wynyard	1823	1830	1853	2017	2126	2028	2338	0036

1	Use the timetable to answer the questions below:
	The same state of the same sta

а	What time does the 7:17 pm train from Burwood arrive at Petersham?	
b	What time does the quarter to eight train from Lewisham arrive at Town Hall?	
С	Can I catch the 5:35 pm from Ashfield if I want to get off at Stanmore?	
d	Which stations does the last train from Burwood miss?	
е	At what time does the 8:36 pm Croydon train leave Newtown?	
f	Omar arrives at Redfern station at ten to six in the evening. How long does he have to wait for the next train?	minute

Timetables – reading timetables

2 This diagram shows the route of a shuttle bus and the length of time between stops.



- **a** If you leave Edgecliff at 7:55 am, what time can you expect to be at Lilly Grove?
- **b** What time did you get on the bus at Southbeach if it is 5:00 pm when you get off at Helm Street shops?

The timetable below is from a fitness club.

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8:30 am	Boxing	Yoga	Cardio	Cardio	Squash	Pilates	Pilates
9:30 am	Pilates	Squash	Yoga	Weights	Cardio	Squash	Weights
10:30 am	Cardio	Pilates	Pilates	Squash	Pilates	Cardio	Squash
4:30 pm	Yoga	Boxing	Squash	Pilates	Boxing	Weights	Cardio
5:30 pm	Squash	Weights	Boxing	Boxing	Weights	Yoga	Yoga

Fill in the blank in each person's statement:

- a Paula says to her friend:
 - "I can meet you on Monday but we have to finish by ______ as it takes me 30 minutes to drive to my yoga class."
- **b** Linh says to her friend:
 - "I can meet you at _____ after my squash game on Sunday. My game takes 45 minutes and then the drive will take me 10 minutes maximum."
- **c** Michael says to his friend:
 - "I'll meet you for dinner after my boxing training that goes for $1\frac{1}{2}$ hours on Thursday night. It will take me 10 minutes to shower and 20 minutes to drive there so I will meet you at _____."



Timetables – working out travel time

Quite often when we use public transport we need to be able to work out how we are going to use more than one mode of transport. We do this by working backwards. Look at this question based on the timetables below:

We can see that Carlsford is the connecting point between the train and the bus.
To get to Fisherman's Wharf by 1:30 pm, he needs to catch the 12:20 pm bus from Carlsford.
To catch the 12:20 pm bus at Carlsford, he needs to catch the 12:05 pm train from Trinian Street and change to the bus platform.

Ben is at Trinian Street and wants to meet his friend at Fisherman's Wharf at 1:30 pm.

Train	Bus
Catch the 12:05 pm from Trinian Street. Change at Carlsford and wait 2 minutes.	Catch the 12:20 pm from Carlsford. Arrive at Fisherman's Wharf 1:12 pm.

Train				
Knightscove	10:16 am	11:16 am	12:16 pm	1:16 pm
Fig Tree Park	10:21 am	11:21 am	12:21 pm	1:21 pm
Trinian Street	11:05 am	12:05 pm	1:05 pm	2:05 pm
Carlsford	11:15 am	12:18 pm	1:16 pm	2:17 pm

Bus				
Carlsford	11:20 am	12:20 pm	1:20 pm	2:20 pm
Nottsville	11:50 am	12:50 pm	1:50 pm	2:50 pm
Fisherman's Wharf	12:12 pm	1:12 pm	2:12 pm	3:12 pm
Slamton	12:32 pm	2:32 pm	3:32 pm	4:32 pm

- Give each person the travel details they need to arrive at their destination on time. Remember to work backwards and to find the connecting point.
 - **a** Akhil is at Trinian Street and wants to go shopping at Nottsville. He would like to get there at 3 pm.

Train	Bus



b Masuka is at Knightscove and needs to get to Fisherman's Wharf for his 12:30 pm shift at the fish and chips shop.

Train	Bus



c Mish is at Fig Tree Park and wants to meet her friend at Slamton at 3:40 pm.

Train	Bus





Five friends like five different TV shows: a cartoon, a crime show, a reality show, football and a sitcom. They all air on different channels (2, 7, 9, 10, 12) and on different nights of the week. Your job is to match the friend with their favourite show.



Read the clues below and use the information to eliminate possibilities. Show your choices on the grid below. You may want to use the grid on the following page to help you arrange your thoughts.

- 1. Luke's favourite show airs on the weekend. He doesn't watch crime shows and thinks sitcoms are a waste of time.
- 2. The sitcom airs on Tuesday evening on Channel 12.
- 3. The cartoon is on Channel 10.
- 4. Hung's show is on the lowest numbered channel on the first day of the school week. He can't stand reality TV.
- 5. No one's favourite show is on Sunday or Friday.
- 6. Macey hates sports. Her favourite show is Hung's least favourite show and airs 2 days after Jamie's.
- 7. The crime show airs on Channel 2.
- 8. Britt's favourite show airs on Wednesdays on Channel 10.
- 9. Jamie's show airs on Channel 12, one day before Britt's favourite show.
- 10. Football airs on Saturday on Channel 7.

Name	Show	Night	Channel
Luke			
Macey			
Jamie			
Hung			
Britt			



Puzzle Grid

	Luke	Macey	Jamie	Hung	Britt
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					
Sport					
Reality					
Crime					
Cartoon					
Sitcom					
Channel 2					
Channel 7					
Channel 9					
Channel 10					
Channel 12					

Circus school solve



You have been given the task of writing the school year-end program for the Circus School Royale.



Use trial and error to work out which activities fit within the 8 session times exactly to create a daily program. Start by looking at how much time there is between breaks, then decide on the best way to order the activities.

The time between breaks must equal the combined time of the activities you choose.

Allow 5 minutes after breaks for everyone to get to the next session.

Start times for the sessions after breaks are written in.

Order of activities may vary.

Activity	Duration
Clown school	1 hour
Acrobatics	$1\frac{1}{2}$ hours
Flying trapeze	40 minutes
Balloon animals	45 minutes
Fire juggling	35 minutes
Unicycling	55 minutes
Magic tricks	50 minutes
Face painting	25 minutes

Session	Time	Activity
1	9:00	
2		
	11:30 – 12:10	Recess
3	12:15	
4		
	1:30 – 2:30	Lunch
5	2:35	
6		
7		
	4:35 – 5:00	Break
8	5:05	
	6:00	Home



