Measurement and Geometry: Converting Time Units: Smaller Units to Larger

Australian Curriculum

This lesson plan could be used to support the teaching and learning of the following Content Descriptions from the Australian Curriculum.

Y5: Measurement and Geometry, Using Units of Measurement

Compare 12- and 24-hour time systems and convert between them (ACMMG110)

Child-Friendly Aim: To read, write, and convert between standard units of time.	Success Criteria: I can convert from a smaller unit of time to a larger unit using division.	Resources: Lesson Pack Individual whiteboards and pens – class set
Key/New Words: Convert, time, days, hours, minutes, seconds, multiples, remainder.	I can use lists of multiples to help me divide. I can write remainders as mixed-unit measurements.	Preparation: Differentiated Smaller Units to Larger Activity Sheets - one per child
		Smaller Units to Larger Challenge Sheet – as required

Prior Learning: It will be helpful if children have learnt how to convert from larger time units to smaller.

Learning Sequence

	Match It: Children match equivalent time units, matching larger time units to smaller, as shown on the Lesson Presentation.							
	Converting from Smaller Units to Larger Units: Children are reminded that they multiply by 60 or 24 to convert from larger units to smaller. They relate this to the inverse operation, converting from smaller units to larger units by dividing by 24 and 60. They complete charts which show multiples of 24 and 60 to help with division. The Lesson Presentation models how to use these charts to answer conversion questions, including those with remainders, supported by bar models and using the inverse operation to check answers. Children use lists of multiples to convert smaller time units to larger (for example 96 hours = 4 days), including where there is a remainder and the answer is written in a mixed-unit measurement (for example 400 seconds = 6 minutes 40 seconds). Can children convert between standard units of time?							
	Your Turn: Children work in pairs to answer the conversion questions, including those with mixed-measurement answers, on the Lesson Presentation. The lists of multiples of 24 and 60 are provided for children to use. Answers appear on separate clicks.							
	Converting Time Units - Smaller to Larger: Children complete the differentiated Smaller Units to LargerActivity Sheets, converting from smaller time units to larger units.Image: Lists of multiples of 24 and 60 are provided for support, and children are reminded which to use for which conversion. They convert between units where the answers are whole units. They solve a simple word problem where conversion of time units is required.Lists of multiples of 24 and 60 are provided for support. Children convert between units where the answers are either whole or mixed units. They 'mark' a homework sheet and solve a word problem where conversion of time units is required.Children convert between 							
Read-a-thon: Children complete a problem involving conversion of time units. Two characters make statements about the information given (times written in different units). Children decide which character (or neither) is correct.								
E								

Explore it

Timeit: Children time a variety of events using hours and minutes, minutes, seconds and minutes and seconds. They record the events in order of duration.

Writeit: Children write their own time problems, similar to the problem at the end of the lesson, where they need to use conversion of time units to answer the question. They give their problems to other children to solve and agree on the correct answers.

Mathematics

Measurement and Geometry

Mathematics | Year 5 | Measurement and Geometry | Converting Time Units | Smaller Units to Larger | Lesson 2 of 3



Aim

• To read, write, and convert between standard units of time.

Success Criteria

- I can convert from a smaller unit of time to a larger unit using division.
- I can use lists of multiples to help me divide.
- I can write remainders as mixed-unit measurements.

Match It



Match the time measurements at the top of the screen to their equivalent at the bottom:





To convert from larger units to smaller units (e.g. hours to minutes), we multiply by 60 or 24.

What operation do you think we need to use to convert from smaller units to larger units (e.g. minutes to hours)?

We need to divide by 60 or by 24 (the inverse).

What methods could we use to do this?

counting up using lists of multiples dividing in stages using factor pairs a written method of division

Here are some ideas. Did you think of any others?

Which method do you think would be most useful?

You could use any of these methods but today we will use lists of multiples to help us divide easily.

Here are all the multiples of 24 up to 10×24 .

What do you notice about the multiples of 24? Are they similar to any times tables you know?

Multiples of 24						
1 × 24	24					
2 × 24	48					
3 × 24	72					
4 × 24	96					
5 x 24	120					
6 × 24	144					
7 × 24	168					
8 × 24	192					
9 × 24	216					
10 × 24	240					

Can you complete the list of multiples of 60?

Hint: what times table could you use to help you?



Multiples of 60							
60	1 × 60						
120	2 × 60						
180	3 × 60						
240	4 × 60						
300	5 × 60						
360	6 × 60						
420	7 × 60						
480	8 × 60						
540	9 × 60						
600	10 × 60						

600 seconds =

10 minutes

Which list of multiples do we need to help us with this conversion?

To convert seconds to minutes, we need to divide by 60. We can use our list of multiples of 60 to help us.

 $600 \text{ seconds} = 10 \times 60 \text{ seconds}$

600 seconds = 10 × 1 minute

600 seconds = 10 minutes

		Multipl	es of 60					
	1:	x 60	60	N.				
	2	× 60	120					
	3	× 60	180					
	4	× 60	240					
	5 × 60		300					
	6	x 60	360					
	7 × 60		420	100				
	8 × 60		480					
	9	× 60	540					
×	60	600) 00					

10

			600 s	econds				
seconds to minutes: divide	e by 60	o0 secs (1 min)	mir tíftescto (1 min)	hounesseds/id (1 min)	e b ap (secs (1 min)	60 lseæ rs (1 min)	t o áleigs csdiv (1 min)	/id 60 5 5e2≤ 4 (1 min)
	1	175	X				4	11



Which list of multiples do we need to help us with this conversion?

There are 24 hours in a day, so we need our list of multiples of 24.

144 hours = 6 × 24 hours

144 hours = 6 × 1 day

144 hours = 6 days

	Multiples of 24						
	1	× 24		24	N.		
	2	× 24		48			
	3	× 24		72			
	4	× 24		96	目		
	5	× 24	1	20			
6 × 24		144	•	44			
	7 × 24		1	68	5		
	8 × 24		192				
	9 × 24			216			
	10	× 24	2	240			



1/15 minutos =	hours minutes		Multip	les of 60				
			1 × 60	60				
Which list of multiple	s do we need to help us	2 ×	60 12	0 20				
with this conversion?	3 × 60	180						
There are 60 minutes in an h	4 × 60	240						
list of multiples of 60.	5 × 60	300						
145 is not a multiple of 60, so	6 × 60	360						
without leaving a remainder.	7 × 60	420						
We can calculate the remained	8 × 60	480	2					
(the highest possible multiple	of 60) from 145.		9 × 60	540				
145 – 120 = 25			10 × 60	600				
145 minutes 25 minutes								
seconds to 60 minutes vide by 60	minutes to hours: divide by 60	hours t	o daus: divide t	<u>111 24</u>				

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(1 hour)

145 minutes =

s =

minutes

How can we write the answer to this conversion?

hours

Because we have a remainder, we have to write the answer in mixed units.

We add up the number of hours, then write the remainder in minutes.



minutes to hours: divide by 60



145 minutes =

2 hours

25 minutes

How can we check our answer?

We can convert our answer back into minutes to check it's right.

2 hours = 2×60 minutes = 120 minutes

120 minutes + 25 minutes = 145 minutes

2 hours 25 minutes = 145 minutes

minutes to hours: divide by 60

785 minutes

5 minutes

Which list of multiples do we need to help us with this conversion?

There are 60 minutes in an hour, so we need our list of multiples of 60.

Wataisisatgeerthantbertargestrestitiste of 60 in our list.

When this happens, we can add on further multiples to extend the list and find the largest possible multiple.

 $(10 \times 60) + (3 \times 60) = 13 \times 60 = 780$

785 minutes = 13 hours 5 minutes

	1:	x 60		60	x
	2 × 60		120		
3 × 6	60 180)	80	
	4	× 60	2	240	目
	5	× 60	300		
	6	× 60	(· ·)	360	
	7	× 60	Z	¥20	1
	8	× 60	480		
	9	9 × 60 540			
10 ×	60	600)	00	



785 minutes = **13** hours

5 minutes



Your Turn



e the lists of multiples to help you culate these conversions. Draw bar dels to help if needed. Remember to rk backwards to check your answers.



Multiples	Multiples of 24		Multiples	of 60
1 × 24	24		1 × 60	60
2 × 24	48		2 × 60	120
3 x 24	72		3 × 60	180
4 × 24	96		4 × 60	240
5 x 24	120		5 × 60	300
6 x 24	144		6 × 60	360
7 × 24	168		7 × 60	420
8 × 24	192		8 × 60	480
9 x 24	216		9 × 60	540
10 × 24	240		10 × 60	60 <mark>0</mark>

seconds to minutes: divide by 60 minutes to hours: divide by 60 ho

hours to days: divide by 24

Converting Time Units -Smaller to Larger





Read-a-thon



In a read-a-thon at school, Jas recorded the time she read for in minutes. Lia recorded her time in hours and minutes.



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Aim: To read, write, and convert between standard units of time.					Date:				
	Delivered By:			Support:					
Success Criteria	Me	Friend	Teacher	т	PPA	S	I	AL	GP
I can convert from a smaller unit of time to a larger unit using division.				Notes	/Eviden	ce			
I can use lists of multiples to help me divide.									
I can write remainders as mixed-unit measurements.									
Next Steps									
J									
J									

т	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
s	Supply	GP	Guided Practice

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Converting Time Units – Smaller to Larger

To read, write, and convert between standard units of time.

Multiples of 24		
1 × 24	24	
2 × 24	48	
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Multiples of 60		
1 × 60	60	
2 × 60	120	
3 × 60	180	
4 × 60	240	
5 × 60	300	
6 × 60	360	
7 × 60	420	
8 × 60	480	
9 × 60	540	
10 × 60	600	

1. Convert days to hours by dividing by 24.

a) 96 hours	days
b) 288 hours	days

2. Convert days to hours by dividing by 60.

a) 600 seconds	minutes
b) 120 seconds	minutes

c) 192 hours	days
d) 264 hours	days

c) 720 seconds	minutes
d) 660 seconds	minutes

Converting Time Units – Smaller to Larger

3. Convert minutes to hours. Which list of multiples will you need to use?

a) 60 minutes	hours	c) 240 minutes	hours
b) 180 minutes	hours	d) 300 minutes	hours

4. These conversions are mixed up, so look at each one carefully!

a) 216 hours	days	d) 420 minutes	hours
b) 360 minutes	hours	e) 300 seconds	minutes
c) 600 seconds	minutes	f) 168 hours	days

5. On Monday, Billie did homework for 1 hour 25 minutes. On Tuesday, she did homework for 75 minutes. She said she had worked longer on Monday than Tuesday. Was she right? Show how you know.

Converting Time Units – Smaller to Larger **Answers**

1.				
	a) 96 hours	4 days	c) 192 hours	8 days
	b) 288 hours	12 days	d) 264 hours	11 days
2.	·			
	a) 600 seconds	10 minutes	c) 720 seconds	12 minutes
	b) 120 seconds	2 minutes	d) 660 seconds	11 minutes
3.				
	a) 60 minutes	1 hour	c) 240 minutes	4 hours
	b) 180 minutes	3 hours	d) 300 minutes	5 hours
4.				
	a) 216 hours	9 days	d) 420 minutes	7 hours
	b) 360 minutes	6 hours	e) 300 seconds	5 minutes

5. Billie was right. Children's responses should show that on Monday she completed 85 minutes worth of homework; or that on Tuesday, she completed 1 hour 15 minutes.

10 minutes

c) 600 seconds

f) 168 hours

7 days

Converting Time Units – Smaller to Larger

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1 × 24	24	
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3 × 24	72	
4 × 24	96	
5 × 24	120	
6 × 24	144	
7 × 24	168	
8 × 24	192	
9 × 24	216	
10 × 24	240	

Multiples of 60		
1 × 60	60	
2 × 60	120	
3 × 60	180	
4 × 60	240	
5 × 60	300	
6 × 60	360	
7 × 60	420	
8 × 60	480	
9 × 60	540	
10 × 60	600	

1. Convert these times to the unit shown:

α)	120 hours	days
b)	360 minutes	hours
c)	660 seconds	minutes
d)	144 hours	days
e)	420 minutes	hours
f)	120 seconds	minutes
g)	288 hours	days

2. Convert the following. Use a bar model to help you if needed. Check that your answers are correct.

			Check
α)	50 hours	days hours	
b)	190 minutes	hours minutes	
c)	425 seconds	minutes seconds	
d)	116 hours	days hours	
e)	684 minutes	hours minutes	

3. Here is a page of Harvinder's homework. He thinks he will get at least 4 correct out of 6. Mark his work!

Question		Answer
1)	300 minutes	5 hours
2)	192 hours	7 days
3)	240 seconds	4 minutes
4)	125 hours	5 days 2 hours
5)	315 minutes	5 hours 15 minutes
6)	130 seconds	2 minutes 10 seconds

Did Harvinder achieve his target? _____

4. Gina's big brother is revising for exams. He has counted how long he spent revising in the week. Here are the times he revised during a school week. His teacher says he should aim to revise for at least 5 hours across the week. Has he achieved this?

Monday	Tuesday	Wednesday	Thursday	Friday
1 hour 40 minutes	45 minutes	1 hour 10 minutes	25 minutes	55 minutes

Converting Time Units – Smaller to Larger **Answers**

•	1	
	I	•

5 days	120 hours	α)
6 hours	360 minutes	b)
11 minutes	660 seconds	c)
6 days	144 hours	d)
7 hours	420 minutes	e)
2 minutes	120 seconds	f)
12 days	288 hours	g)

_	
^	

α)	50 hours	2 days 2 hours	
b)	190 minutes	3 hours 10 minutes	Checks show correct
c)	425 seconds	7 minutes 5 seconds	answers, e.g.
d)	116 hours	4 days 20 hours	α) 2 × 24 = 48 + 2 = 50
e)	684 minutes	11 hours 24 minutes	

3.

_			
	Answer	Question	
] 🗸	5 hours	300 minutes	1)
$ \times$	7 days	192 hours	2)
\	4 minutes	240 seconds	3)
 ×	5 days 2 hours	125 hours	4)
\	5 hours 15 minutes	315 minutes	5)
\	2 minutes 10 seconds	130 seconds	6)

Did Harvinder achieve his target?

4. No, he did not achieve the revision target as he only studied for 4 hours and 55 minutes.

Yes

Converting Time Units – Smaller to Larger

To read, write, and convert between standard units of time.

1. Convert these times to the unit shown:

α)	168 hours	days
b)	180 minutes	hours
c)	540 seconds	minutes
d)	216 hours	days
e)	480 minutes	hours
f)	720 seconds	minutes
g)	312 hours	days

2. Convert the following. Use a bar model to help you if needed. Check that your answers are correct.

			Check
α)	90 hours	days hours	
b)	119 minutes	hours minutes	
c)	489 seconds	minutes seconds	
d)	209 hours	days hours	
e)	466 minutes	hours minutes	

3. Here is a page of Paula's homework. Mark her work! If she makes any mistakes, show her how she could have achieved the correct answer.

	Question	Answer	Correction
1)	420 minutes	8 hours	
2)	264 hours	11 days	
3)	780 seconds	13 minutes	
4)	278 hours	11 days 10 hours	
5)	594 seconds	9 minutes 54 seconds	
6)	756 seconds	11 minutes 36 seconds	

4. An athlete trains on 5 days each week. He aims to train for a minimum of 400 minutes in total. Here is what he completed in the first four days. How long does he need to train for on the last day to ensure he achieves his target? Complete the table, writing your answer in hours and minutes.

Day 1	Day 2	Day 3	Day 4	Day 5
75 minutes	1 hour 20 minutes	35 minutes	1 hour 5 minutes	

Converting Time Units – Smaller to Larger **Answers**

7 days	168 hours	α)
3 hours	180 minutes	b)
9 minutes	540 seconds	c)
9 days	216 hours	d)
8 hours	480 minutes	e)
12 minutes	720 seconds	f)
13 days	312 hours	g)

2.

α)	90 hours	3 days 18 hours	
b)	119 minutes	1 hour 59 minutes	Checks show correct
c)	489 seconds	8 minutes 9 seconds	answers, e.g.
d)	209 hours	8 days 17 hours	a) 3 × 24 = 72 + 18 = 90
e)	466 minutes	7 hours 46 minutes	

. [Question		Question Answer		Correction	
	1)	420 minutes	8 hours	X	7 × 60 = 420 so the answer should be 7 hours.	
	2)	264 hours	11 days	\checkmark		
Ī	3)	780 seconds	13 minutes	\checkmark		
-	4)	278 hours	11 days 10 hours	X	11 × 24 = 264 278 – 264 = 14 so the answer should be 11 days 14 hours.	
	5)	594 seconds	9 minutes 54 seconds	\checkmark		
	6)	756 seconds	11 minutes 36 seconds	×	12 × 60 = 720 756 – 720 = 36 so the answer should be 12 minutes 36 seconds.	

4.

Day 1	Day 2	Day 3	Day 4	Day 5
75 minutes	1 hour 20 minutes	35 minutes	1 hour 5 minutes	2 hours 25 minutes

What's the Date?

- 1. Today is 3rd October; the time is 8:00 p.m. It is my birthday in 1350 hours. What date is my birthday?
- 2. It is one minute after midnight and the date is 21st November. We are getting our new puppy in 30 000 minutes from now. What date will this be?
- 3. My family are coming to visit from England in 540 000 seconds! Today it is 1st December; it is 11 a.m. What date are my family due to arrive?



What's the Date? **Answers**

- 1. 29th November
- 2. 11th December
- 3. 7th December

Measurement and Geometry | Smaller Units to Larger

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