White Rose Maths

Summer - Block 2

Time

Year 3

Overview

Small Steps

1. Months and years
2. Hours in a day
3. Telling the time to 5 minutes
4. Telling the time to the minute
5. Using a.m. and p.m.
6. 24-hour clock
7. Finding the duration
8. Comparing durations
9. Start and end times
10. Measuring time in seconds

NC Objectives

Tell and write the time from an analogue clock, including using Roman numerals from I to XII and 12-hour and 24-hour clocks.

Estimate and read time with increasing accuracy to the nearest minute.

Record and compare time in terms of seconds, minutes and hours.

Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.

Know the number of seconds in a minute and the number of days in each month, year and leap year.

Compare durations of events [for example to calculate the time taken by particular events or tasks].

Months and Years

Notes and Guidance

Children look at the concept of years and months. They are introduced to leap years and how they are different from a non-leap year.

Children should explore years using calendars to investigate the number of days in each month. Rhymes and songs are helpful for children to remember the number of days in each month.

Mathematical Talk

When is your birthday? What other significant dates are there during the year? Are they the same every year?

Which month comes before _____?
Which month comes after _____?

Which month changes when there is a leap year? Are there any other months that change length? Is this year a leap year? When will the next one be? When was the last one?

Varied Fluency

- Children should spend time exploring a real calendar. They sort the months into groups, by the number of days in each month, for both a year and a leap year. Children can use the groups to compare - what is the same and what is different?

- Use the numbers to fill in the gaps in the sentences.

There are _____ days in a year.
There are _____ months in a year.
There are _____ days in a leap year.
There are _____ days in a week.
Leap years happen every _____ years.

7 365 4 366 12

- Put these dates in order from earliest to latest in a year.

3rd March | 2nd March | January 31st | 1st December

Earliest ——— Latest

Months and Years

Reasoning and Problem Solving

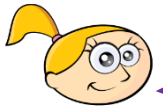
4 children describe their birthdays.

My birthday is the first day of the second month.

Mo

I was born on the 15th of June.

Teddy



I was born on the last day of the year!

Eva

I was born two days before Mo.

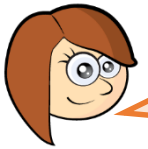
Dora

Can you work out their birthdays and order them from earliest to latest in the year?

Dora – 30th Jan
Mo - 1st Feb
Teddy - 15th June
Eva - 31st Dec

Whitney asks Rosie and Jack a question.

Some months have 31 days, some months have 30 days. How many months have 28 days?



Only February has 28 days.

Rosie

Every month has 28 days.

Jack

Who do you agree with? Explain your thinking.

They are correct for different reasons. Rosie is correct because only February has exactly 28 days, but Jack is correct because every month has at least 28 days.

Hours in a Day

Notes and Guidance

Children recap the number of hours in a day and are introduced to language such as 'noon', 'midday', 'midnight'. They do not need to know the difference between a.m. or p.m. at this point.

Other facts such as days in a week/month are also reviewed. Attention should be drawn to the difference between a school week and a calendar week and between day-time and a day.

Mathematical Talk

What time does the day start? How many hours are there in a day?

How many hours do you spend at school in a day? When does school start and finish?

Why does a clock show 11 o'clock twice in a day?

Does the weekend and the school week split a whole week in half?

Varied Fluency

Fill in the gaps in the sentence stems.

There are _____ days in a whole week.
There are _____ days in a school week.
There are _____ hours in a day.
There are _____ hours in a school day.

Put the times/events into the correct place on the diagram.

Morning	Afternoon	Evening	Night

Breakfast	Midnight	Midday	Go to school
Supper	Bedtime	Assembly	Brushing teeth

Complete the statements.

1 day	=	24 hours	____ days	=	120 hours
2 days	=	____ hours	____ days	=	60 hours
____ days	=	240 hours	20 days	=	____ hours

Hours in a Day

Reasoning and Problem Solving

Mo

I get up at 7 o'clock in the morning and go to bed at 7 o'clock at night. This means I have been awake for a full day.

Do you agree with Mo?
Explain your answer.

Children should state that they do not agree with Mo because there are 24 hours in a full day.
Mo has only been up for 12 hours which is half a day.
A full day would be 7am to 7am.

Su	Mo	Tu	We	Th	Fr	Sa
	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			

In this month, there are no school holidays.

Teddy

In this month we have to come to school for 31 days.

Do you agree with Teddy?
Explain your thinking.
Which month could it be?

Teddy is not correct, as the children only have to come to school for 23 days if there are no holidays. Children should discuss the fact they do not come to school on a Saturday or Sunday.
It is most likely to be March if there are no holidays at all. It is a good opportunity to look at your school calendar with the children.

Telling the Time (1)

Notes and Guidance

Children tell the time to the nearest 5 minutes on an analogue clock. They focus on the language of "past" and "to", and will recognise and use Roman numerals on a clock face.

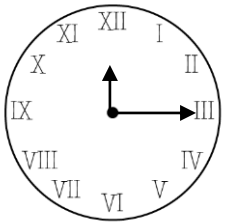
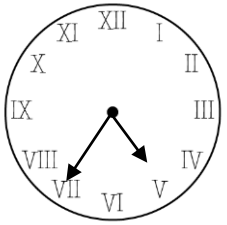
Attention should be drawn to the differences between the minute hand and the hour hand. This is especially important for times that are close to the next hour, for example, 5 minutes to 12

Mathematical Talk

Which of the hands is the minute hand and which is the hour hand?
Is the minute hand past or to the hour?
How many minutes past/to the hour is the minute hand?
If the minute hand is pointing at the 6, how many minutes have passed in this hour?
What do you notice about the clocks?
Which Roman numeral represents the number ____?
Do we ever say "45 minutes to" the hour?

Varied Fluency

- Give each child a clock with moveable hands.
Children represent different times to the nearest 5 minutes on their own clock.
Discuss whether the minute hand is past or to the hour in different times.

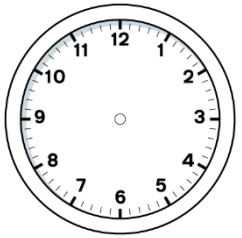
-  

What time is shown on each clock?

_____ minutes past _____ _____ minutes to _____

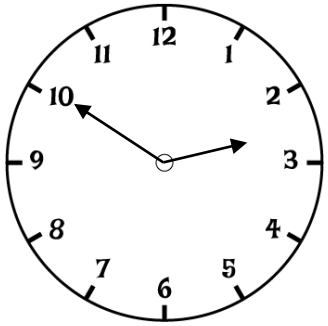
- Draw the hands on the clock to show the time:

25 minutes to 6



Telling the Time (1)

Reasoning and Problem Solving



The clock shows ten minutes to 3

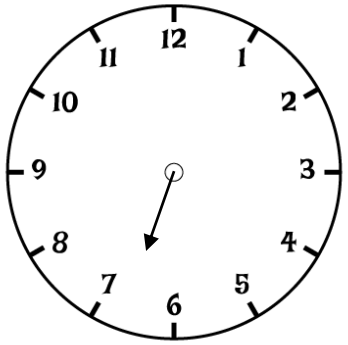
Dora

The hour hand is not quite pointing to the 3, so it must be ten to 2

Amir

Who do you agree with?
Explain your thinking.

Dora is correct because it is not 3 o'clock yet, the hour hand will not be exactly on the 3



This clock has lost its minute hand.

What time could it be?
Justify your answer.

The time is around half past six. Children may suggest it could be between twenty five to and quarter to seven.

Telling the Time (2)

Notes and Guidance

Children tell time to the nearest minute using an analogue clock. They use the terms 'past' and 'to'.

When telling time 'to' the next hour, children may need to count on to find how many minutes are left in the hour.

Mathematical Talk

Which hand is the minute hand? Which hand is the hour hand?

How many minutes is it past the hour?

How many minutes is it to the next hour?

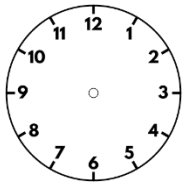
When are the minutes to an hour and the minutes past an hour the same?

If the hour hand is between ____ and ____, which hour is the time referring to?

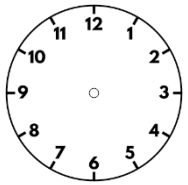
Varied Fluency

- Show children various times to the nearest minute for them to read.
  Give each child a clock with moveable hands.
  Children represent different times to the nearest minute on their own clock.
  Discuss whether the minute hand is past or to the hour in different times.

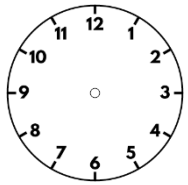
- Draw the hands on the clock from the following times.



Four minutes to 4



24 minutes to 8



24 minutes past 8

- Dora is telling the time from an analogue clock.

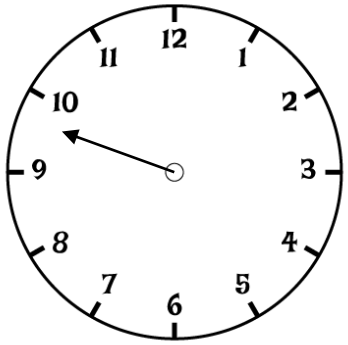
The hour hand is pointing to XI
the minute hand is pointing to XII

What time is it?

Telling the Time (2)

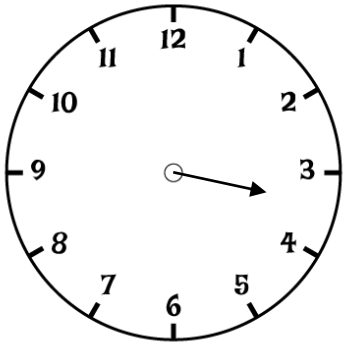
Reasoning and Problem Solving

This clock has lost its hour hand.
What time could it be?



The minute hand is at about 12 minutes to the hour. The time could be 12 minutes to any hour.

This clock has lost its minute hand.
What time could it be?



The hour hand is past the 3 and has not yet reached the 4
The hand is closer to the three and therefore the children should recognise that the time has not passed half past 3
You could accept any answers between quarter past to half past 3

Using a.m. and p.m.

Notes and Guidance

Children use 'morning', 'afternoon', 'a.m.' and 'p.m.' to describe the time of day.

Children continue using analogue clocks and will be introduced to digital time for the first time.

Mathematical Talk

What time of the day does ____ happen?
Is _____ earlier or later than _____?
How do you know whether a time is in the morning or afternoon?
What times could be a.m.?
What times could be p.m.?
What is the difference between analogue and digital?
What would the time look like on an analogue clock?
How can we change analogue to digital?

Varied Fluency

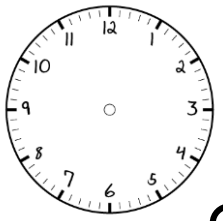
- Using a visual timetable, sort the events into morning and afternoon.
  Create sentences to describe when events take place.
  For example: Maths is in the morning. Guided Reading is in the afternoon.

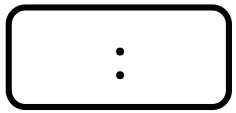
- Sort the times from latest to earliest.

5:30 p.m.	9:45 a.m.	9:45 p.m.	10:23 a.m.
7:31 a.m.	10:13 p.m.	8:30 a.m.	6:32 a.m.
12:24 a.m.	8:55 p.m.	2:11 a.m.	7:40 a.m.

- Show the times on both analogue and digital clocks.

  - Guided reading at 10:00 a.m.
  - Home time at 3:30 p.m.
  - Lunchtime at 12:00 p.m.





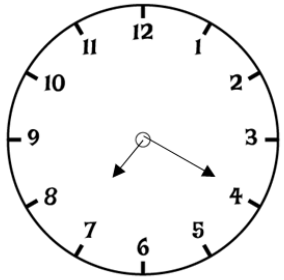
Using a.m. and p.m.

Reasoning and Problem Solving

The board shows the times of trains arriving and leaving the train station.

	Arrives	Leaves
London	5:50 a.m.	6:00 a.m.
Edinburgh	8:00 a.m.	8:20 a.m.
Manchester	2:33 p.m.	2:45 p.m.
Leeds	7:31 p.m.	7:35 p.m.

Ron's watch shows the time he arrives at the station.



Which train could he be catching?
Explain how you know.

Ron could be catching the train to Edinburgh or Leeds.
Children should explain that analogue clocks give no indication to a.m. or p.m. and since it is 20 past 7, Ron could be catching the 8:20 a.m. train or the 7:35 p.m. train.

Dora

I slept from 8 p.m. to 8 a.m.

Teddy

I slept from 8 a.m. to 8 p.m.

Who is more likely to be correct?
Explain how you know.

Dora is more likely to be correct, because if she sleeps 8 p.m. to 8 a.m., she would be sleeping through the night, and wake up in the morning.
Teddy is likely to be incorrect, because he would be sleeping all day and waking up at 8 p.m. (in the evening)

24-hour Clock

Notes and Guidance

Children are introduced to telling the time on a 24-hour digital clock for the first time.

Children spend time looking at analogue and digital clocks at various times throughout the day, in order to compare what is the same and what is different.

Mathematical Talk

Using the 12-hour clock, is the time an a.m. or a p.m. time?

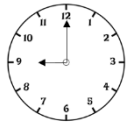
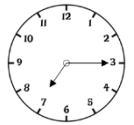
What will the number representing the hour be in 24-hour clock time? How do you know if it will be less than 12 or more than 12?

What will the minutes be in 24-hour time? Where can you count from? When does the number of minutes become 0 again on a 24-hour clock display?

Varied Fluency

- Create a diary using pictures to show your day from waking up to going to bed. Label these events using both 12-hour clock and 24-hour clock times.

- Match the times to the clocks showing the same time.

9 o'clock in the morning		19 : 15
Half past 3 in the afternoon		09 : 00
Quarter past 7 in the evening		15 : 30

- Complete the times.

13 : 45	Quarter to two in the _____	__ : 45	Quarter past three in the afternoon
11 : 20	Twenty past eleven in the _____	17 : __	Twenty-five to six in the evening
15 : 50	Ten to four in the _____	__ : __	Twenty to 9 in the morning

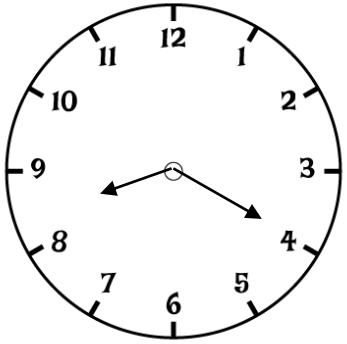
24-hour Clock

Reasoning and Problem Solving

Eva says the clocks are showing the same time of day.

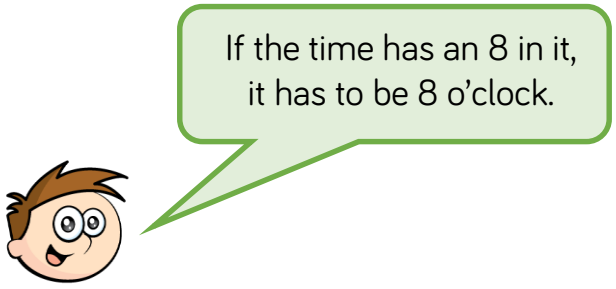
Is she correct?
Explain how you know.

8:20



Eva could be correct. The clocks are both showing twenty past 8. However, children should recognise that the analogue clock does not show whether the time is a.m. or p.m., so this could be showing 8.20 a.m. or 8.20 p.m.

Is Teddy correct?
Prove it.



Teddy

Teddy is not correct.
Children should give examples to show this is incorrect. For example: 18:00, 8:30, 10:38 etc.

Finding the Duration

Notes and Guidance

Children find the durations of events using both analogue and digital clocks. They should be given opportunities to practically work out durations of time using clocks with moveable hands. Number lines are also a useful model.

Children explore the most efficient ways of breaking the time down in order to work out the duration. For example: half hours, quarter of an hour and five minutes.

Mathematical Talk

When did ____ start, and when did it finish?

How many hours/minutes is a full turn of the minute hand around the clock?

Do we need to count each individual minute?

How else could you break down the duration to make it easier to count?

Varied Fluency

- Calculate the duration of the TV programmes.

TV Programme	Start Time	Finish Time	Duration
Pals	06:30	07:30	
Dennis the explorer	15:15	18:15	
The football show	12:00	14:00	
An adventure	10:40	12:40	

- Use an individual clock to work out the time spent running then complete the sentences.
  Rosie started running at 7:20 a.m. and stopped at 8:45 a.m.
  Rosie ran for _____ minutes.
  Tommy started running at 09:10 and stopped at 09:55
  Tommy ran for _____ minutes.

- Amir gets on a bus at 15:23
  It arrives at 16:22
  How long was the bus journey?
  How many ways can you find to work out the answer?

Finding the Duration

Reasoning and Problem Solving

Eva starts playing her piano at 11:30

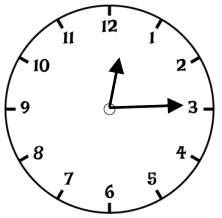
She plays for 45 minutes before having a half an hour break.

She then plays for another 15 minutes.

What time did she finish?

Eva finishes at 13:00 or 1 o'clock

Lunchtime begins at:



Lunchtime ends at:

1:10

Teddy and Rosie are working out how long lunchtime lasts for.

Teddy

I did three quarters of an hour then added 10

I did 1 hour take away 5 minutes

Rosie

Whose method is correct?

Both children's methods are correct.

Teddy has found the duration by 15 + 15 + 15 + 10 = 55 minutes.

Rosie has found the duration by noticing that one hour after the start of lunch it will be 1:15, so she needs to take 5 minutes from 1 hour to also give 55 minutes.

Comparing the Duration

Notes and Guidance

Children compare durations of time using analogue and digital clocks. They could use empty number lines to model the situations as these will assist with bridging over hours.

They use their knowledge of addition and subtraction, and that there are 60 minutes in an hour, to compare the length of time taken by particular events or tasks.

Mathematical Talk

Which is the longest amount of time?

Which is the shortest amount of time?

Is _____ longer or shorter than _____?

How much longer was _____?

How much shorter was _____?

Varied Fluency

- Use your class daily timetable to answer these questions.
  Which is the longest lesson?
  Which is the shortest lesson?
  How much longer is _____ than _____?

- Use the symbols <, > and = to compare the following durations.

  2:00 p.m. – 6:00 p.m. ◯ 08:00 a.m. – 12:00 p.m.

  07:30 a.m. – 09:30 a.m. ◯ 11:40 a.m. – 02:40 p.m.

  03:30 a.m. – 05:00 p.m. ◯ 03:30 p.m. – 05:00 a.m.

- Complete the sentence about the duration of the train journeys.

Destination	Train departs	Train arrives
London	08:45	11:35
Leeds	10:05	10:33
Manchester	13:10	14:20

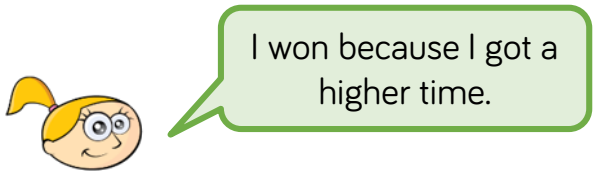
The journey to London is _____ than the journey to Manchester.

Which journey takes the least amount of time?

Comparing the Duration

Reasoning and Problem Solving

Eva and Mo are having a race.
It takes Eva 3 and a half minutes to complete the race.
It takes Mo 3 minutes and 15 seconds.

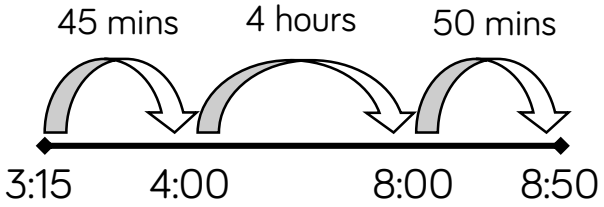


Is Eva correct?
Explain how you know.

Eva is incorrect.
Eva took longer to finish the race therefore she finished after Mo.
The winner of a race is the person who finishes in the shortest amount of time.

Jack's school starts at ten to 9 and finishes at quarter past 3

He uses the number line to calculate how long the school day is.



Jack works out the school day is 5 hours and 35 minutes long.
Jack is incorrect.

Explain his mistake.

Jack has worked out the time from 3:15 p.m. until ten to 9 in the evening. He should start at 8:50 a.m. and work through noon to 3:15 p.m.

Start and End Times

Notes and Guidance

Children find start and end times to the nearest minute using both analogue and digital times.

They could use real clocks with moveable hands whilst learning how to add and subtract times, and then move to number lines to help calculate start and end times.

Part-whole models could also be used to split longer intervals.

Mathematical Talk

Which hand do you need to move?

Do you need to move the hand clockwise or anti-clockwise?

What time should the number line start at?

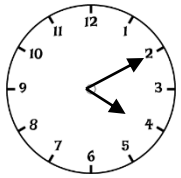
Will you jump forwards or backwards?

How many intervals will you break the duration into?

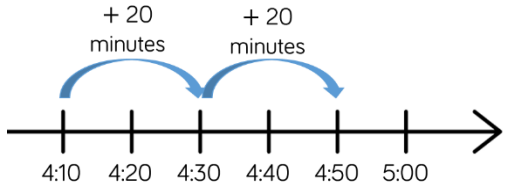
Would a part-whole model help?

Varied Fluency

- Practice finding start/end times by moving hands on a clock. For example, If playtime starts at five past ten and lasts for 20 minutes, what time will playtime end?
  A fifty minute maths lesson finishes at 10.15. What time does the lesson start?

- 
  A 40 minute TV programme starts at the time shown. What time does it finish?

  We can use a number line to work out the end time.

  Use this method to work out:
  - The end time of a 25 minute lesson starting at 2.15 p.m.
  - The start time if a 1 hour 10 minute journey ended at 4 o'clock.

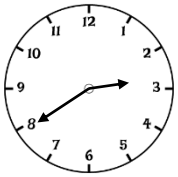
- Which activity ends the latest?

  Gymnastics starts at 15:30 and lasts 1 hour 15 minutes.

  Football starts at 16:05 and lasts 45 minutes.

Start and End Times

Reasoning and Problem Solving



School ends in 45 minutes.
What time will it be?

Amir says,

It's 20 minutes to 3 o'clock, so school finishes at 3:25 p.m.

Whitney says,

School ends at 2:85

Who do you agree with?
Explain why.

I agree with Amir, because Whitney has not remembered that there are 60 minutes in an hour and has added 45 minutes to 2:40
Children may use a number line to prove Amir is correct.

Tommy is halfway through watching his favourite TV programme. He looks at his watch and it shows this time.

15:45

The show is less than 1 hour long.

What could the start and end time be?

How many different start and end times can you find?

Possible answers include:

Start at 15.20 and end at 16.10
Start at 15.25 and end at 16.05
Start at 15.30 and end at 16.00
Start at 15.35 and end at 15.55
Start at 15.40 and end at 15.50

Measuring Time in Seconds

Notes and Guidance

Children measure and compare durations of time in seconds. It is important for children to have a realistic sense of what time in seconds feels like, as they often count in seconds too quickly. They could use a stopwatch to compare, for example, counting to 10 seconds in their heads with the actual timed duration. They recognise that there are 60 seconds in one minute and use this to write durations of time in different ways e.g. 80 seconds is the same as 1 minute and 20 seconds.

Mathematical Talk

What can we use to measure time in seconds accurately?

Can you suggest a task that lasts _____ seconds?

Which task took the longest/shortest time to complete?

How many seconds are there in 1 minute?

If a task takes longer than 60 seconds, how else could we record the duration of time?

How could we work out how many seconds there are in _____ minutes?

Varied Fluency

- Children use a stopwatch to find the length of time it takes, in seconds, to complete different tasks. For example, run across the hall/playground, do 10 star jumps, write their name. How long did each task take?
  Order the tasks based on the time they took to complete.

- Match the times in words to the times shown on the stopwatches.

Two minutes five seconds	00:01:50
10 seconds less than 2 minutes	00:02:30
Two minutes 50 seconds	00:02:05
150 seconds	00:02:50

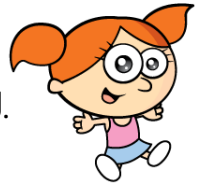
- Complete the table.

Time in minutes	Time in seconds
2 minutes	
	100 seconds
3 minutes 20 seconds	

Measuring Time in Seconds

Reasoning and Problem Solving

Alex takes 153 seconds to skip around the playground.



Jack takes 2 minutes 23 seconds.

Who is the quickest?
Explain how you know.

Jack is quickest.
If we convert 2 minutes 23 seconds into seconds it is $120 + 23 = 143$ seconds.
So Jack was 10 seconds quicker than Alex.

True or False?

- 3 minutes 5 seconds < 190 seconds
- 4 minutes = 204 seconds
- 170 seconds > 2 minutes 50 seconds

- TRUE
- FALSE

4 minutes is equal to 240 seconds

- FALSE

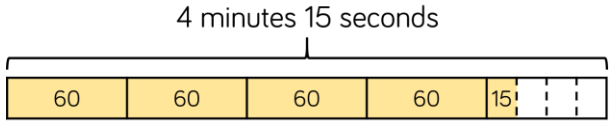
170 seconds is equal to 2 minutes 50 seconds

Dora works out how many seconds there are in 4 minutes 15 seconds.

She says,

That's easy, it is 415 seconds.

Dexter uses a bar model to help him.



Each minute has 60 seconds. So it's 4 lots of 60 plus 15.

Who is correct?

Dora thinks there are 100 seconds in 1 minute, but there are 60.
Dexter is correct
$60 \times 4 = 240$
$240 + 15 = 255$ seconds.