Summer Block 3

Time

Small steps

Step 1	Years, months, weeks and days
Step 2	Hours, minutes and seconds
Step 3	Convert between analogue and digital times
Step 4	Convert to the 24-hour clock
Step 5	Convert from the 24-hour clock

Years, months, weeks and days

Notes and guidance

In this small step, children recap the relationships between a year, a month, a week and a day from Year 3

Children should explore how a year can be represented on a calendar, which shows the number of days in each month. As a class, to help them to remember this key knowledge, practise rhymes, songs or other memory strategies about the numbers of days in each month.

Children use multiplicative reasoning and related number facts to convert and compare the different units of time. By the end of this step, they will recognise how often a leap year occurs and be able to calculate future leap years. They should recognise that there are approximately 4 weeks in a month, although most months are slightly longer than this.

Things to look out for

- Children may think that there are always exactly 4 weeks in a month.
- Children may need to revisit the number of days in each month regularly before these facts are secure.
- When converting units of time, children may rely on additive reasoning, rather than multiplicative reasoning.

Key questions

- How many days are there in a week?
- How many days are there in the month of _____?
- How many days/weeks/months are there in a year?
- What do you need to do to convert _____ to _____?
- How are leap years different from ordinary years?

  How often is there a leap year?

Possible sentence stems

- There are _____ days in the month of _____
- There are _____ days in a week, so in _____ weeks there are _____ × _____ = _____ days.
- There are _____ months in a year.
- There are _____ days in a year/leap year.

National Curriculum links

- Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days

Years, months, weeks and days

Key learning

- Complete the sentences.

  There are _____ days in a week.

  There are _____ months in a year.

  There are _____ days in an ordinary year.

  There are _____ days in a leap year.

  Leap years happen every _____ years.

- Write <, > or = to complete the statements.

  14 days ◯ 2 weeks

  14 days ◯ 1 month

  14 weeks ◯ 2 months

  36 weeks ◯ 6 months

  12 months ◯ 1 year

  3 years ◯ 30 months

- Tommy uses a number track to count in leap years.
  - Complete the number track.

2016	2020						

  - How many days will there be in 2060?

- Complete the tables.

Days	Weeks
	1
	5
	10
	20
	80

Years	Months
	12
2	
	6
	48
10	

- Here is a calendar from January 2022

January						
M	T	W	Th	F	Sa	Su
					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						

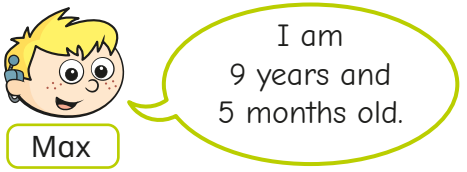
  - Annie's birthday was on the second Saturday of January.
  - Dexter's birthday was on the final Friday of January.
  - Whitney's birthday was 4 days after Annie's birthday.

  When is each child's birthday?

Years, months, weeks and days

Reasoning and problem solving

Max and Kim are talking about their ages.



What is the total of their ages?

19 years and 2 months

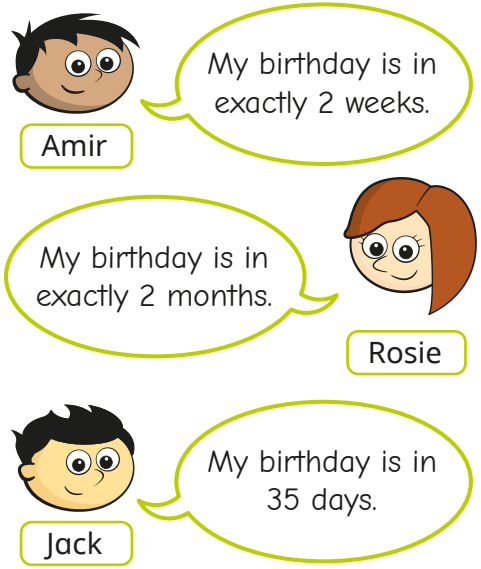
Is the statement always true, sometimes true or never true?

There are 730 days in two consecutive years.

Explain your answer.

sometimes true

Amir, Rosie and Jack are talking about their birthdays.



If today is 8 June, what is the date of each child's birthday?

How many days are there between Jack and Rosie's birthdays?

Amir: 22 June

Rosie: 8 August

Jack: 13 July

26 days

Hours, minutes and seconds

Notes and guidance

In this small step, children recap the number of seconds in a minute and minutes in an hour, building on their learning from Year 3

Children use multiplicative reasoning and related number facts to convert and compare times recorded in hours, minutes and seconds. A secure understanding of the 6 times-table will help children find related number facts linked to time, for example 36 ÷ 6 = 6 and 360 ÷ 60 = 6, so 360 seconds is equivalent to 6 minutes and 360 minutes is equivalent to 6 hours.

Paired work involving one child counting an agreed duration in their head while a partner uses a stopwatch to record the actual time can help children to develop an appreciation of how long seconds and minutes last. Additionally, they could record the length of time it takes in seconds to complete a task, such as running across the playground or writing their name.

Things to look out for

- When converting units of time, children may rely on additive reasoning, rather than multiplicative reasoning.
- Children are familiar with the base 10 number system, so they may assume that there are 100 seconds in a minute or 100 minutes in an hour.

Key questions

- What activity lasts approximately one second/minute/hour?
- How many seconds/minutes/hours do you think it takes you to _____?
- How many minutes are there in _____ hour(s)?
- How many seconds are there in _____ minute(s)?
- If you know that 1 minute is equal to 60 seconds, how many seconds is 3 minutes equal to?

Possible sentence stems

- 1 day = _____ hours, so in _____ days there are _____ × _____ = _____ hours.
- 1 hour = _____ minutes, so in _____ hours there are _____ × _____ = _____ minutes.
- 1 minute = _____ seconds, so in _____ minutes there are _____ × _____ = _____ seconds.

National Curriculum links

- Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days

Hours, minutes and seconds

Key learning

- Sort the activities into the table, to show approximately how long each one takes to complete.

brush your teeth | run around the playground | blink | write your name | watch a TV show | clap | tie your shoelaces | get dressed

Less than 5 seconds	Less than 1 minute	Less than 5 minutes	Less than 1 hour

Write another activity in each column.

- Write <, > or = to complete the statements.

30 seconds ◯ 1 minute

300 seconds ◯ 1 minute

30 seconds ◯ $\frac{1}{2}$ minute

30 minutes ◯ 1 hour

300 minutes ◯ 1 hour

30 minutes ◯ $\frac{1}{2}$ hour

- Complete the tables.

Minutes	Seconds
1	
2	
	240
10	

Hours	Minutes
	60
2	
5	
7	

- The time is 20 minutes past 5 in the evening.

Draw digital clocks to show what time it will be:

5 minutes later | $\frac{1}{2}$ hour later | 120 seconds later | 20 minutes later

- Which lasts longer, $\frac{1}{4}$ of an hour or 600 seconds?

Explain how you know.

Hours, minutes and seconds

Reasoning and problem solving

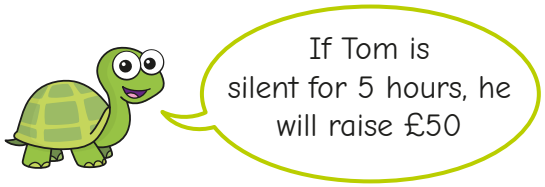
Which is the odd one out and why?

30 hours	30 seconds
30 minutes	12 hours

Is there more than one possible answer?

possible answers:
12 hours – different number
30 hours – only one that is not half of another time unit

Tom is sponsored 10p for every minute of silence.



Do you agree with Tiny?

Explain your answer.

No

Five children run a timed race.

Here are their times.

Name	Time
Dani	114 seconds
Scott	199 seconds
Huan	100 seconds
Aisha	202 seconds
Brett	119 seconds

Whose time is closest to 2 minutes?

Who finished the race in 1st place?

What is the difference between the fastest time and the slowest time?

Give your answer in seconds and in minutes and seconds.

Brett

Huan

102 seconds

1 minute and 42 seconds

Convert between analogue and digital times

Notes and guidance

In this small step, children convert between analogue and 12-hour digital times, reinforcing and building on their learning in Year 3

Discuss with children the importance of knowing whether a time is taking place in the morning or the afternoon and how an analogue clock does not usually show am or pm. Towards the end of this step, children calculate durations of time represented on analogue and 12-hour digital clocks. Use of a blank number line can support finding durations of time or to help children find the start and end times of an activity.

In the next step, children are introduced to the 24-hour digital clock and the concept of am and pm is explored further.

Things to look out for

- Children may confuse am and pm, for example thinking that 1 am should be 1 pm because it is "late".
- Children may need support to understand that times occur twice each day.
- Children may attempt to calculate durations using column subtraction, by taking away the start time from the end time, which will lead to inaccuracies when hours are crossed.

Key questions

- Why is it important to know whether a time is am or pm?
- Does an analogue clock show whether it is am or pm?
- How do you show an analogue time as a 12-hour digital time?
- How will you find the start/end time of the activity?
- How can you use a number line to work out the duration of the activity?
- Do you find it easier to work out how long it is between times using an analogue or a digital clock? Why?

Possible sentence stems

- _____ minutes past _____ is the same as _____ minutes to _____
- 60 – _____ = _____, so the time is _____ minutes to _____
- The time is after/before noon/midnight, so it is _____ am/pm.

National Curriculum links

- Read, write and convert time between analogue and digital 12- and 24-hour clocks

Convert between analogue and digital times

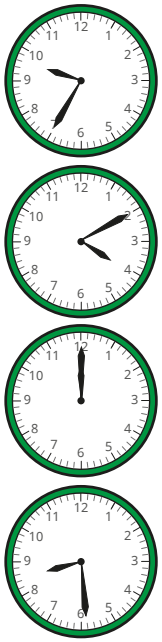
Key learning

- What is the same and what is different about the times?

20 minutes to 9

8:40am

- Match the analogue and digital times.



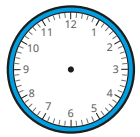
12:00

4:10

8:29

9:35

- Complete the clocks so that the analogue clocks and digital clocks show the same time.



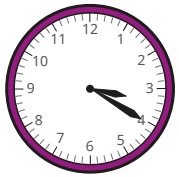
3:35

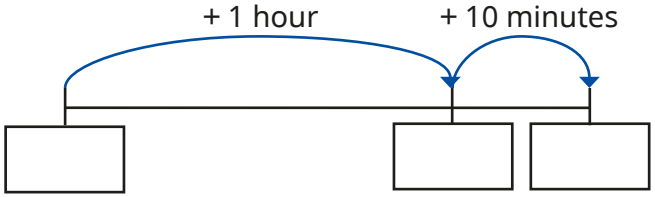
:

10:20

:

- Nijah leaves school at the time shown.

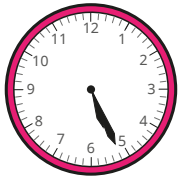




She arrives home 1 hour and 10 minutes later.

Use the number line to help work out what time it will be when she arrives home, on a 12-hour digital clock.

- Esther gets on a train at this time in the evening.



She gets off the train at this time.

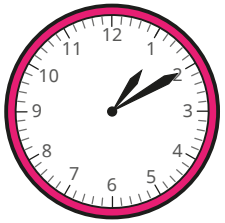
6:59pm

How long was her journey?

Convert between analogue and digital times

Reasoning and problem solving

Tiny converts the analogue time to a 12-hour digital time.



10 : 01

Explain Tiny's mistake.

The minutes and the hour are in the incorrect places.

The time should be 1:10

This time is palindromic.

12 : 21

This means that the digits can be read the same way both forwards and backwards.

Write five other times that are palindromic on a 12-hour digital clock.

multiple possible answers, e.g.

4:04, 6:16, 10:01

On a 12-hour digital clock, how many times will the digit 8 be shown between 2:00 and 3:00?

On a 12-hour digital clock, how many times will the digit 4 be shown between 2:00 and 3:00?

Explain the difference.

6

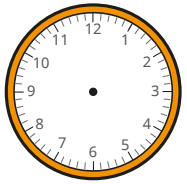
15

Amir looks at a 12-hour digital clock.

The time shows 2:58 pm.

If Amir keeps looking at the clock until the digits are all odd, what time will it be?

Draw hands on the analogue clock to show what time it is.



Convert to the 24-hour clock

Notes and guidance

In this small step, children are introduced to writing 24-hour clock times for the first time.

Children recap the concept of am and pm from Year 3 to support them when converting to the 24-hour clock. They recognise that to convert pm times between 1 pm and 11:59 pm into 24-hour clock times, they add 12 hours to the time. They also learn that 24-hour clock times are always shown with four digits, so if the hour only has one digit, then a zero is placed at the start, for example 09:45

Encourage children to identify what is the same and what is different about 12-hour and 24-hour digital clocks displaying the same time. Using clocks, watches, smartphones and computers can help with this.

Things to look out for

- Children may think that 10 hours are added to pm times rather than 12, for example thinking that 6 pm is 16:00
- Children may not place a zero at the beginning of am times where the hour has 1 digit, such as 06:38
- Children may also add 12 hours to am times.
- Children may write midnight as 24:00

Key questions

- How many hours are there between noon and midnight?
- Is _____ earlier or later than _____?
- What is the same/different about 5 am on a 24-hour digital clock and on a 12-hour digital clock?
- What is the same/different about 5 pm on a 24-hour digital clock and on a 12-hour digital clock?
- Do you always need to add 12 to the hours to convert a time to the 24-hour clock? Why/why not?
- How many digits does a time on a 24-hour clock have?

Possible sentence stems

- To convert to the 24-hour digital clock, I add _____ to the hours if the time is between _____ and _____
- A 24-hour clock time should always have _____ digits.

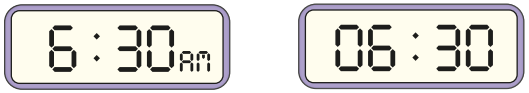
National Curriculum links

- Read, write and convert time between analogue and digital 12- and 24-hour clocks

Convert to the 24-hour clock

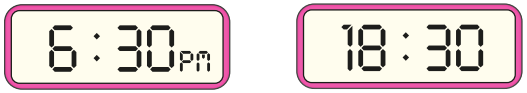
Key learning

- Both clocks show half past 6 in the morning.



What is the same about the clocks? What is different?

- Both clocks show half past 6 in the evening.



What is the same about the clocks? What is different?

- Sort the times into the table.

am	pm

- Match the 12-hour clock times to the 24-hour clock times.

7:30 am	19:30
7:30 pm	21:30
9:30 am	09:30
9:30 pm	11:30
11:30 am	07:30

- Write 24-hour clock times to complete the sentences.
  - _____ is 25 minutes to 8 in the morning.
  - _____ is 10 minutes past 3 in the afternoon.
  - Quarter to 10 in the evening is _____

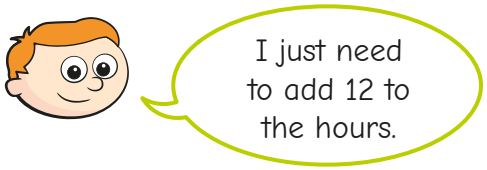
- Write the times as 24-hour clock times.
  - 11:38 am
  - 12:38 am
  - 1:38 am
  - 11:38 pm
  - 12:38 pm
  - 1:38 pm

What do you notice?

Convert to the 24-hour clock

Reasoning and problem solving

Ron is converting to 24-hour clock times.



Here are Ron's answers.

12-hour time	24-hour time
1:45 pm	13:45
10:17 am	22:17
8:39 pm	20:39
5:09 am	17:09

Do you agree with Ron?

Explain your answer.

No

Dora has converted 12-hour clock times to 24-hour clock times.

12-hour time	24-hour time
10:00 pm	22:00
11:00 pm	23:00
12:00 midnight	24:00

What mistake has Dora made?

12:00 midnight should be written as 00:00

Which time is the odd one out?

midnight	12:00	00:00

Explain your answer.

Is there more than one possible answer?

possible answers:
Midnight, as it is written in words.
12:00 because it refers to 12 noon and the other two refer to midnight.

Convert from the 24-hour clock

Notes and guidance

Building on the previous step, in this small step children reinforce their understanding of the 24-hour clock format by converting to 12-hour clock times and representing them on analogue clocks.

Children use the knowledge that there are 24 hours in a day and that a new day starts at midnight, 00:00, to help them to understand why they subtract 12 hours to convert a time after 1 pm from a 24-hour clock time to a 12-hour clock time. Discuss with children whether a 24-hour time is before or after noon and what changes need to be made.

Children could consider an event they do during the day, such as brushing teeth/eating lunch, and then convert the 24-hour clock time into the 12-hour clock time.

Things to look out for

- Children may omit am/pm when making conversions.
- Children may subtract 12 hours from times between 12:00 and 13:00, which will lead to incorrect conversions, for example 12:43 to 0:43 pm.
- Children may subtract 10 instead of 12

Key questions

- What is the same/different about 5 am/5 pm on a 24-hour digital clock and a 12-hour digital clock?
- How do you know if a 24-hour clock time is before or after noon?
- How do you convert _____ to a 12-hour clock time?
- Do you always subtract 12 hours to convert from a 24-hour clock time?
- Why is it important to remember to write am or pm when you have converted to a 12-hour clock time?

Possible sentence stems

- To convert from a 24-hour clock time, I subtract _____ from the hours if the time is _____ 13:00
- When I convert a 24-hour clock time before/after noon, I write _____ after the time.

National Curriculum links

- Read, write and convert time between analogue and digital 12- and 24-hour clocks

Convert from the 24-hour clock

Key learning

- The times have been converted from 24-hour clock times to 12-hour clock times.

00:05	12:05 am
03:05	3:05 am
12:05	12:05 pm
15:05	3:05 pm

What do you notice?

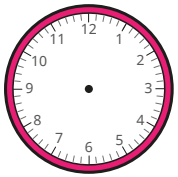
- Match the 24-hour clock times to the 12-hour clock times.

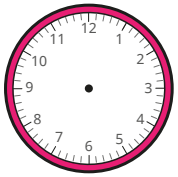
00:28	11:28 pm
12:28	1:38 pm
11:28	12:28 pm
01:28	1:28 am
23:28	12:28 am
13:38	11:28 am

- Complete the sentences.
  - 10:35 is 25 minutes to 11 in the _____
  - 13:11 is 11 minutes past _____ in the _____
  - 19:45 is quarter to 8 in the _____
  - 04:30 is half past _____ in the _____

- Convert each 24-hour clock time to 12-hour clock time.

  Draw your answer on both clocks.

13:45  :

16:38  :

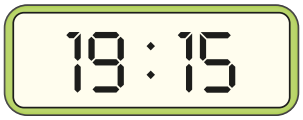
- Convert the 24-hour clock times to 12-hour clock times.
  - 06:17
  - 12:43
  - 08:52
  - 20:14
  - 18:17
  - 00:43
  - 22:01
  - 10:29

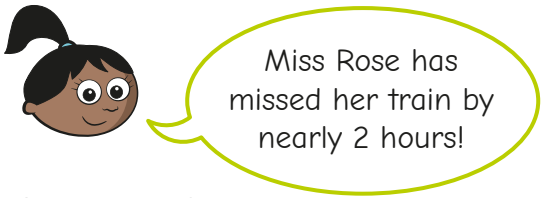
Convert from the 24-hour clock

Reasoning and problem solving

Miss Rose's train leaves at 25 minutes past 7 in the evening.

When she arrives at the station to catch her train, her watch shows this time.





Is Sam correct?

Explain your answer.

Miss Rose's train journey lasts 1 hour and 42 minutes.

What time does she arrive?

Write your answer as a 12-hour clock time.

No

9:07 pm

Tiny converts the 24-hour clock times into 12-hour clock times.

24-hour time	12-hour time
12:45	12:45 am
10:45	10:45 am
09:45	9:45 am
17:45	7:45 pm

Do you agree with Tiny?

Explain your answer.

No

Scott looks at the 24-hour time on his phone.

The hours and the minutes each have the same digits in the same order.

What time could his phone be showing?

Write the 24-hour clock time and the 12-hour clock time.

multiple possible answers, e.g.

01:01, 1:01 am
12:12, 12:12 pm
23:23, 11:23 pm