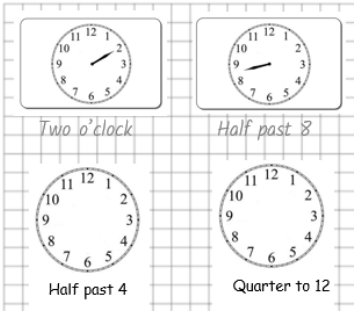
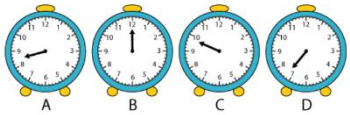
Planning Overview
Year 3 Measures – Time

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].

Objective	Teaching and learning
Introduction to time	Most Year 2 children should be able to tell the time on an analogue clock to the nearest 15 minutes (Y2 TAF requirement) and they will have covered telling the time to the nearest 5 minutes (NC objective). Prior to the unit, recap this learning regularly e.g. talk about how it's a quarter past 9 and we are going to assembly, its 12 o'clock so we are going to lunch. We have PE at half past one on Tuesdays. Although children are not taught digital time before Year 3, they are more likely to use this in their daily lives. Display a visual timetable in class with digital and analogue times next to things that are happening that day. Do children understand vocabulary related to time – before and after, next, later than, earlier than, tomorrow, yesterday? Include these in daily talk.
Recap telling and writing the time to the nearest 15 minutes on an analogue clock (Y2 TAF statement for ARE)	You may want to refer back to Year 2 plans for more detail in how to build up to this for some children. It is helpful to consider the 2 hands separately when learning to tell the time on an analogue clock. Start by looking at the hour hand. What would it mean if the hand was pointing straight to a number? We would read the time as being exactly at that hour. What if the hour hand was halfway between 7 and 8? It has gone past the 7 and is on the way to 8 so it is half past 8. How would we show quarter past and quarter to? Practise recording times in words to match a given picture and drawing the hour hand to match times given in words. Use a mixture of o'clock, half past, quarter past and quarter to with just the hour hand. 

	Apply to the first half of Two clocks problem from NRich **Two Clocks** Age 7 to 11 ★★ This problem could be worked on in a group of about four. For more details about how you might go about doing this, please read the Teachers' Notes. Sam and Julie are friends. Both of them have rather odd clocks at home. In Sam's bedroom there is an old alarm clock which his Dad had thrown out because it had lost its minute hand. Although it has only its small hand, Sam can still tell the time using it. He can tell the hour, such as midday. He can tell when it is time to get up, time to go to school and time to turn his light out at night.  A B C D Which clock is showing it is midday? At what time does Sam get up? At what time does Sam go to school? At what time is Sam supposed to turn out his light? Now look at just the minute hand on the clock. It moves the whole way around the clock in 1 hour and we measure the times we have looked at so far using fractions of a full turn. Children could try to record on clocks as we did for the hour hand. Have we got more or less information with this hand? What more do we need to know? Finally put both hands on the clock together and make sure children are very confident positioning both the hour hand and the minute hand. The hour hand leads the way (position this first) and the minute hand adds specific detail.
Tell and write the time to the **nearest minute** for times **past the hour** on an analogue and 12-hour digital clock.	Why is the minute hand called that? How far does it move in 1 hour? How far does it move in one minute? How many minutes are in 1 hour? Look at a clock that shows the individual minutes as a separate number track around the edge.  Remind children how the track is split into chunks of 5 so that they can count in 5s to find 5 past, 10 past etc. Count in 5s all the way around to 60. Use just the minute hand on the clock. Recap pointing to 5 past, 20 past etc. Do children remember how to apply their 5 times table facts? Where do you think the minute hand will be for 1 minute past? 2 minutes past? 12 minutes past? 23 minutes past? Do we need to count all the way from 0 for 12 or 23 minutes past? In pairs children can set their clock then challenge a partner to show the same time past the hour to the nearest minute. How quick can they show it?

	Watch stop the clock from Mathsticks.  Stop the clock at random points. Can children estimate what time it is? Remember to look at the hour hand first then the minute hand for more detail. Introduce the children to digital clocks. They are probably already familiar with these from PCs, digital watches etc. Look at 7:00 – this is zero minutes past 7. Relate this to the o'clock position on an analogue clock – the hand is straight up because the minute hand has travelled zero minutes past the o'clock position. Look at half past 7. How many minutes has the minute hand travelled? We show this as 7:30 (30 minutes past the hour). Notice we don't use fractions on digital clocks. There are 60 mins in an hour and half of 60 is 30. 30 minutes is halfway through that hour. Now look at all the increments of 5 minutes between 7 o'clock and half past 7 on both clocks. Show how we always write 7: and then the number of minutes. Pay attention to zero as a place holder for 7:05. Acknowledge at 15 mins past the hour we call this quarter past but it is 7:15 on the digital clock. Finally look at times past to the nearest minute on both types of clock. Children to complete fluency questions - recording and comparing times on both types of clock to the nearest minute. Only look at times past the hour for now. Make sure children don't forget the careful positioning of the hour hand on the analogue clocks now that there is more to think about.
Tell and write the time to the **nearest minute** for times to **the hour** on an analogue and 12-hour digital clock.	Look at a familiar analogue clock again. How do we say the time when the minute hand is pointing at 11? 8? Recap that we count in 5s anti-clockwise for these times and say 5 to and 20 to.  How do you think you would say the time when the minute hand is pointing to the little dash just before the 12? 1 minute to. Practise telling the time to the hour to the nearest minute on an analogue clock. Watch 'Stop the clock' from Mathsticks again and stop the clock at various times to the hour. Estimate what time the clock is showing to the nearest minute. You could print out some of these to record estimation skills.

Now look again at the digital clock. Recap how we write 2:00 2:05 2:20 always showing the minutes past as a 2-digit number with zero as the first digit if needed as a place holder. This time continue around the clock to show 2:35, 2:40 etc. With digital clocks every time is given in minutes past the hour. How do we show the time 2:40 on an analogue clock? How do we say that time/record it in words? Recap that it is 20 to 3. So 2:40 is equivalent to 20 to 3.

Children could make a list of equivalent times: What do they notice about the red digits going across? What about the black digits? Why does this happen?

25 to 3 2:35
20 to 3 2:40
¼ to 3 2:45
10 to 3 2:50
5 to 3 2:55
1 to 3 2:59

This needs to be built on over the next few weeks in class discussions 'It's 35 mins past 11 – how many minutes to 12 would that be?'

Mastery with Greater Depth

These clocks have only one hand, but can you suggest a time that each could be showing?

A B C

Explain your reasoning.

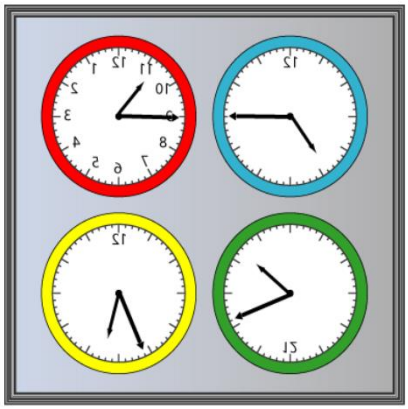
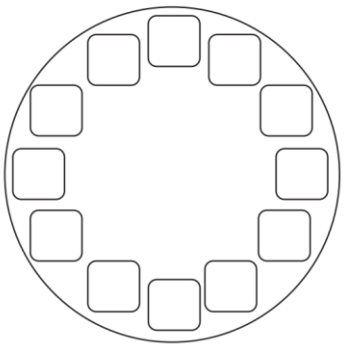
What Is the Time?

Age 5 to 11 ★

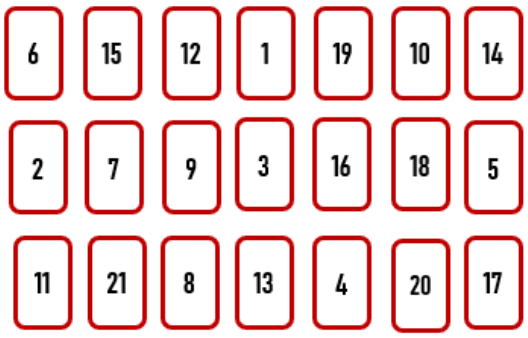
Can you put the times on these clocks in order?

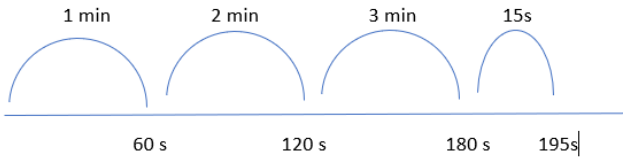
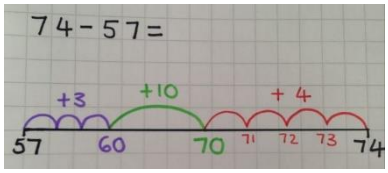
You can get a copy of these clock times which can be printed out and cut into separate cards.

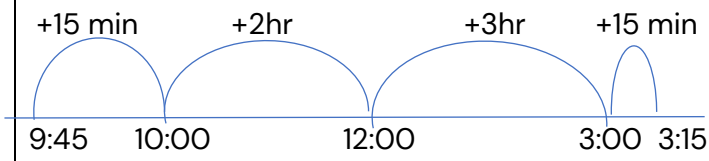
The same times - in words - are on this sheet.

	Clocks **Age 7 to 11** ★ These clocks have been reflected in a mirror. What times do they say? 
Tell and write the time from an analogue clock, including using Roman numerals from I to XII	Ask children to draw a clock face. Can they accurately locate the 6, 3, 9 and 12 on the clock? Can they use this to accurately estimate where the other numbers go? If children can do this, then explore clocks with roman numerals instead of Arabic numbers on the clock face.  **First4Maths – Digging Deeper** **SETTING THE SCENE** Our school clock was abducted by aliens and all of the numbers were replaced with symbols. The aliens have left us clues to try and put it back together. 

	<table><tr><td>When it is 20 past 3, the hour hand is in between ∂ and △</td><td>At noon both hands point to ♠</td><td>255 minutes after 5:50, one hand is on ♣</td></tr><tr><td>When it is 600 seconds past 6, one hand points to and the other points to ✖ □</td><td>5 hours past midnight, the hour hand points to ★</td><td>45 minutes after 4:20am, the minute hand is on ∅</td></tr><tr><td>There are ◊ hours between 10:00 and 21:00</td><td>At 15:30, the hour hand is just past △</td><td>2 hours before 20:30, the minute hand is □</td></tr></table> Ask children which clues are the best to start with. Which clues only give one possibility? Which clues can you solve the quickest?
Use and understand vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight	Look at a digital clock time showing 10:00am and 10:00pm. Ask the children what is the same and what's different about these times? Can they spot that one is an am time and one is pm? Tell the children that am is the morning and pm is the afternoon. Can they suggest what they might be doing at 10am and then what they might be doing at 10pm? Split a clock into 12 sections like a pie chart. Starting at the current time (e.g. 11am), children to shade in sections and label them with what they will be doing e.g. lunchtime, lesson time, relaxing at home, eating dinner, watching TV, sleeping. Have we got all the way back to 11am tomorrow? Why not? Because we have got to 11pm. Complete the shading activity for the second 12-hour period on a second clock. Children could then transfer their ideas onto a bar chart for am times and a bar chart for pm times. What time will each chart start at? Which starts at noon? Which starts at midnight?
Tell and write the time from a 24-hour digital clock	 Show children on a digital clock that can be adjusted from 12 hour to 24 hour that 5pm can become 17:00. Can the children see what has happened? Can they see that the pm has disappeared? Images taken from Topmarks Teaching Clock (https://www.topmarks.co.uk/time/teaching-clock)

	On an analogue clock set at midnight start counting hours and continue the count past midday (1 o'clock, 2 o'clock, 3 o'clock, etc) What did 7pm become? It became 19 o'clock but we don't say or write 19 o'clock. We read/write that time either as 7pm or as the digital time 19:00. Can the children work out a simple calculation they could do to move from 12-hour times to 24-hour times?  **The Time Is ...** Age 7 to 11 ★★ Can you put these 12 mixed-up times in order? You could arrange them in a circle.  12.17 9.37 11.04 7.49 5.02 2.56 You can download a copy of the times on this sheet which can be printed out. If you feel happy to try the same thing with a 24-hour digital clock, try these 12 times. They are on this sheet.  20.59 13.13 22.29 00.17 15.58 18.42
Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours;	 Take a set of digit cards 1-21 and spread them out into 3 rows of 7 but in a random number order. Children take turns doing one of the challenges below, timing the person doing the challenge with a stopwatch and recording the time taken in seconds. • Tap the numbers in order – forwards or backwards • Tap the multiples of 3 in order – forwards or backward • Tap the odd or even numbers in order forwards or backwards

	To make it harder children could do it with the hand they don't usually use for writing. Give the children a sheet of longer tasks to perform where the time taken will be over a minute. Ask the children to record the stopwatch time but to convert this to seconds and record that time too. Children may need to be taught an appropriate method, such as using a number line or applying known facts Converting 3 minutes and 15 seconds to seconds  4 minutes = 60x 4 = 240 seconds 6x4=24 Repeat the learning with information about how many hours it takes to complete some tasks. Can the children express this in minutes?
Compare durations of events [for example to calculate the time taken by particular events or tasks].	Investigate how long it takes each child to write their full name 5 times. Take a sample of this data. Ask the children who took the shortest length of time, who took the longest. Why might this have been the case? Look at the longest and shortest times. Discuss appropriate methods for calculating the difference between those two times. Which is the best method? Counting on to find the difference is one of the strategies that the children covered during the addition and subtraction unit.  Repeat the learning with longer increments of time, e.g. data from sports day or a PE lesson. Ask the children to collect some data regarding start and end times for their journey to school. e.g. Mrs Brown leaves home at 7.40 and gets to school at 8.10. Ted leaves home at 7.58 and gets to school at 8.24. Whose journey takes longer? Teach the children how to use a number line to find the duration of an event. Beginning of the number line is the start time, the end of the number line is the finish time. Encourage jumps to get to full hours first.

	 There are 3 types of duration problem that children will encounter with time. A – Given start and end time, count on to find the duration B – Given start time and duration, count on to find the end time C – Given end time and duration, count back to find the start time. Children will count on for A and B but count back for C. Give the children time to practise each type of problem separately and then give them a range to sort and solve e.g. A – The pizza goes into the oven at 4:45pm and comes out at 5:10pm. How long was it in the oven for? B – A pizza goes into the oven at 5:55pm and needs to cook for 20 minutes. What time should we take it out of the oven? C – The children would like to eat their pizza at 7:05pm, it needs to cook for 20 minute, what time should we put it into the oven?
Know the number of seconds in a minute and the number of days in each month, year and leap year	Look at a clock with a second hand that ticks. Get the children to try counting the number of ticks from the o'clock position to the o'clock position. Discuss their findings. Is this always going to be the case? Are there a standard number of seconds in an hour? Why? How many times will the second hand tick around the clock for 2 minutes? 10 minutes? Complete a fact sheet – If I know that 60 seconds is 1 minute, what else do I know? True or false – 100 seconds is the same as a minute? How does this relate to the number of minutes in an hour? How many hours are in a day? Discuss with the children how many days there are in a month (children may say 30 as a misconception because it is not true for all months). Using a calendar and investigate 'Always, sometimes, never' months of the year have 30 days. Can children sort the months into 28 (29), 30 and 31 days?

	Teach the children the 'knuckle trick' for recalling the length of each month – each raised knuckle represents a longer month and the indent between each knuckle represents a shorter month  Using their calendars can they establish how many days are in a standard year and a leap year. During which month was the difference in a leap year? Explain the concept that each year is 365 and a quarter days long. Can they work out how often we get a leap year based on that information.
Substantial problems	**How Many Times?** **Age 7 to 11** ★ On a digital 24 hour clock, at certain times, all the digits are consecutive (in counting order). You can count forwards or backwards. For example, 1:23 or 5:43. How many times like this are there between midnight and 7:00? How many are there between 7:00 and midday? How many are there between midday and midnight? **Approaching Midnight** Here's a strategy game with lots to explore. Can you find out enough to guarantee a win, no matter what the settings? This game is part of our creativity project, which you can read more about here. **Approaching Midnight Jump Straight In** live **Age 7 to 14** If you'd like to explore the game freely, without any nudges from us, choose this version. **Approaching Midnight Get Started** live **Age 7 to 14** Like a bit of help getting into the game? Then have a look at this. **Approaching Midnight What Next?** live **Age 7 to 14** Want some suggestions about where to go next with the game? **Approaching Midnight Taking it Further** live **Age 7 to 14** Here we offer some suggestions about how you could take the Approaching Midnight game further. **Approaching Midnight the Ultimate** live **Age 7 to 14** Want a serious challenge? Have a look at these ideas for changing the Approaching Midnight game. Play Approaching midnight game on NRICH. Adjust the settings as appropriate.