

## Summer Term 1 Overview Year 4 – Measurement - Time

### Summer Term 1 Book – The Ironman

Topic - Measurement: Time		Guide Time = 2 weeks
<b>Assessment:</b>	White Rose Maths Hub end of block assessments End of term assessments – NFER assessments Teacher assessment judgements based on AfL	<b>Very Important Points (VIPs):</b> <ul style="list-style-type: none"> <li>• There are 60 seconds in 1 minute.</li> <li>• There are 60 minutes in 1 hour.</li> <li>• To convert between seconds and minutes; and minutes and hours, you can use multiplication and division skills.</li> <li>• There are 7 days in a week.</li> <li>• There are 52 weeks in a year.</li> <li>• There are 12 months in a year.</li> <li>• There are 365 days in a year, but 366 days in a leap year.</li> <li>• A leap year takes place every 4 years.</li> <li>• Time is represented digitally using 4 digits. E.G. 09:30 A.M.</li> <li>• A.M is used for time before 12pm.</li> <li>• P.M is used for time after 12pm.</li> <li>• On a 24-hour digital clock, after midday the hours are not repeated. They continue to increase from 12 -23.</li> <li>• 12 is the only hour that is repeated twice in a 24-hour clock.</li> </ul> <b>Fat Question:</b>  How have changes in technology influenced the way we tell the time?
<b>Links to prior learning (sequencing) and canon book</b>	Children will have been first introduced to time in KS1 where they learnt to read the time (o'clock, half past, quarter past, quarter to) using a clockface. Children will also understand the value of the minute and hour hand. This will then have been built upon in Year 3, where children were introduced to telling the time in five minute intervals (past and to the hour). In Year 3, children will have learnt to tell the time with increasing accuracy to the nearest minute, using an analogue clock as well as 12- and 24-hour clocks. Children are expected to know how many seconds are in a minute, as well as the number of days in each month, year and leap year. Children will also have been introduced to using arithmetic skills to compare the durations of events. Understanding the concept of time and seasons will help the children empathise with the journey the Iron Man takes and add to the suspense of the novel.	
<b>Links to other learning (cross fertilisation)</b>	<p>In Computing, children will learn the value of the 24-hour digital clock and how this can be used universally in businesses and across the world.</p> <p>In DT, the children will be designing and creating an Ironman robot. They will use their knowledge of time to select materials most appropriate for the duration of the lesson sequence.</p> <p>In History, children will be looking at the topic of Anglo-Saxons. They can compare how technology has impacted the way we tell the time in comparison to this era.</p> <p>In PSHE, children will be learning about roles and responsibilities. This links to time by highlighting the importance of time management</p>	

	<p>and understanding how deadlines and schedules within the school day/ homework/ weekly routines can be met using time.</p>	
<p><b>Links to future learning</b></p>	<p>The skills taught this half term will form the basis of all future learning on money as the children move up through the school. Children are able to develop and build-upon prior learning, which they can apply across all aspects of the school curriculum and in weekly arithmetic tests, termly assessments or to help them prepare for the following year. In upper key stage 2, children will solidfy their learning on time by answering complex problems involving converting between units of time.</p> <p><u>Thematic questions:</u>  <u>The World Beyond Us:</u>      Are the concepts of time the same in space as it is on Earth?  <u>Modern Britain:</u>      Would the world be different if we only had digital clocks?  <u>Healthy Bodies, Healthy Minds:</u>      Do the seasons and varying lengths of each month impact our mental health?      How can we use time in sporting events to measure our fitness?  <u>The World Around Us:</u>      Why can't it be the same time everywhere in the world at once?  <u>Culture:</u>      At what time of year are most religious and cultural celebrations celebrated?  <u>Technology in Action:</u>      If watches and clock faces didn't exist, what other technology can we use to tell the time?</p>	
<p><b>Character/Wider Development ('50 things', cultural capital, skills)</b></p>	<p><b>As part of our 50 things:</b></p> <ul style="list-style-type: none"> <li>- Children will use the months of the year to categorise the nature, wildlife and trees around them to demonstrate the relationship between time and the world around us.</li> </ul>	

## OVERVIEW OF TEACHING SEQUENCE

Key Facts Learning	Learning Focus or Key Question	Learning Outcomes (NC)	Key Words/ Vocabulary	Greater Depth/SEND	Misconceptions	Activities and Resources
<p><b>Hours, minutes and seconds.</b></p> <p>(2 lessons split into varied fluency and problem solving)</p>	<p>LO: To understand hours, minutes and seconds.</p>	<p>To convert between different units of measure (Hours to minute, seconds to minute, minute to hours). Solve problems including converting from minutes to seconds; hours to minutes.</p>	<p>Hours Minutes Seconds Multiply Divide Time Clock Clock face Minute hand Hour hand Second hand Inverse Convert</p>	<p><b>GD:</b> Children to complete challenges linked to reasoning and problem solving showing clear understanding. Clearly showing their conversion methods using multiplication and division skills with written feedback on why and how they have got to an answer.</p> <p>Explain reasoning for conversions and reasoning for using inverse operations.</p> <p>Use real life examples and tools (eg: a clock) to model complex ideas to encourage deeper thinking. Used during varied fluency lesson to deepen understanding of hours, minutes and seconds.</p> <p>During varied fluency lesson, explanations can be developed by showing/ explaining the conversion process for peers in the class.</p>	<p><b>Children may think that:</b></p> <p>There are 100 seconds = 1 minute and there are 100 minutes = 1 hour.</p> <p>Time can only be measured in either seconds, minutes or hours, rather than understanding that for more accurate time measurement, more than one unit is used at once.</p> <p>You can't use multiplication and division to help with conversions.</p> <p>Larger numbers equate to a longer</p>	<p>Children will recap the number of minutes in an hour and seconds in a minute which was previously learnt in Year 3.</p> <p>Children will use these time VIPs to convert between seconds, minutes and hours, using related multiplication and division calculations to do this.</p> <p>Children will recognise the concept of time by estimating the length of real life events and selecting an appropriate unit of measurement.</p> <p>Children will use comparison symbols to represent their understanding of hours, minutes and seconds. E.G.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Write &lt;, &gt; or = to complete the statements.</p> <p>5 minutes <input type="text"/> 5 seconds      <math>\frac{1}{2}</math> hour <input type="text"/> 60 minutes</p> <p>5 minutes <input type="text"/> 50 seconds      <math>\frac{1}{2}</math> hour <input type="text"/> 6 minutes</p> </div> <p>Children will answer reasoning and problem solving questions to find the difference between amounts in different units of time measurement, as well as solving two-step problems using time conversion.</p>

				<p>Provide opportunities to investigate the relationships with conversions between the units of time.</p> <p><b>SEND:</b> Focus on the understanding of how long a second, minute and hour is using real-life experiences and concepts to understand the length of time.</p> <p>Using a range of pre-teaching activities will support children's understanding of key concepts.</p> <p>Pictorial and physical manipulatives could be used to further support children's understanding of the time, understanding how minutes, hours and seconds are represented..</p> <p>Access to 'helpful' peers and clear modelling from adults are vital in ensuring children gain a secure understanding.</p> <p>Children to complete varied fluency questions focusing on understanding the value of minutes, seconds and hours before progressing onto converting them once they are secure.</p>	<p>period of time (eg: 60 seconds vs. 2 minutes). The minute and hour hand are the same; misunderstanding how to read the time.</p> <p>Related calculations can't be used to simplify the conversion process.</p>	<p><b>Resources:</b> White Rose Maths Premium Resources - <a href="https://resources.whiterosemaths.com/resources/year-4/summer-block-3-time/">https://resources.whiterosemaths.com/resources/year-4/summer-block-3-time/</a> Third Space Learning <a href="https://mathshub.thirdspacelearning.com/resources?schoolyears=y4&amp;categories=measurement">https://mathshub.thirdspacelearning.com/resources?schoolyears=y4&amp;categories=measurement</a></p> <p><b>Mathematical questions:</b> What activities might last one hour/minute/second?  How many minutes are there in an hour?  How can we use a clock face to check? How are the minutes, hours and seconds counted?  How many seconds are in a minute? How can we check this?</p> <p><b>Deepen the moments:</b>  Jack is doing a sponsored cycle. He thinks that if he cycles for 3 hours at 10p a minute, he will raise £30.  Do you agree with Jack? Explain why you agree/disagree.  Dora says 'To convert hours to minutes, I multiply the number of hours by 60.' Is she correct? Explain why.</p>
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				Partially worked examples are used during input/modelling by teacher to focus learning on the objective rather than multiplication/division skills.		
<b>Years, months, weeks and days.</b>  (2 lessons split into varied fluency and problem solving)	LO: To understand years, months, weeks and days.	Convert between different units of measure (Years, months, weeks, days). Solve problems involving converting from years to months; weeks to days.	Years Months Weeks Days Multiply Divide Inverse Convert Seasons	<p><b>GD:</b>          Children to complete challenges linked to reasoning and problem solving showing clear understanding. Clearly showing their conversion methods using multiplication and division skills with written feedback on why and how they have got to an answer.</p> <p>Explain reasoning for conversions and reasoning for using inverse operations.</p> <p>Use real life examples to model complex ideas to encourage deeper thinking. Used during varied fluency lesson to deepen understanding of days, weeks, months and years.</p> <p>During varied fluency lesson, explanations can be developed by showing/ explaining the conversion process for peers in the class.</p> <p>Provide opportunities to investigate the relationships</p>	<p><b>Children may think that:</b></p> <p>Every month is the same number of days.</p> <p>Every year has the same number of days.</p> <p>The conversion is the same for both days to weeks as it is from weeks to months.</p> <p>Children may misunderstand the concept of a leap year (the fact it only occurs every 4 years) and the month it occurs within.</p> <p>Children may misunderstand which mathematical operation to use to convert the units</p>	<p>Children will be reintroduced to the value of days, weeks, months and years. They will be then able to relate these time concepts to real life examples to demonstrate understanding of which is the longest and which is the shortest.</p> <p>Children will then be introduced to the conversion between days and weeks and months and years, using inverse skills of the mathematical four operations to calculate these conversions.</p> <p>Once varied fluency skills have been mastered, children will move onto answering conversion questions between the amounts within reasoning and problem solving questions.</p> <p><b>Resources:</b>          White Rose Maths Premium Resources – <a href="https://resources.whiterosemaths.com/resources/year-4/summer-block-3-time/">https://resources.whiterosemaths.com/resources/year-4/summer-block-3-time/</a>          Third Space Learning <a href="https://mathshub.thirdspacelearning.com/resources?schoolyears=y4&amp;categories=measurement">https://mathshub.thirdspacelearning.com/resources?schoolyears=y4&amp;categories=measurement</a></p> <p><b>Mathematical questions:</b>          How many days are there in a week? How many days are there in each month? How many weeks in a year?           How many days are there in _____ weeks?</p>

				<p>with conversions between the units of time.</p> <p><b>SEND:</b> Focus on the understanding the length of a day, week, month and year using real-life experiences and concepts to understand the length of time.</p> <p>Using a range of pre-teaching activities will support children's understanding of key concepts.</p> <p>Pictorial and physical manipulatives could be used to further support children's understanding of the time (eg: calendar/diary/ the school week) to support their understanding of the time units of measurement.</p> <p>Access to 'helpful' peers and clear modelling from adults are vital in ensuring children gain a secure understanding.</p> <p>Children to complete varied fluency questions focusing on understanding the value of days, weeks, months and years before progressing onto converting them once they are secure.</p>	<p>of time measurement.</p>	<p>What calculation do we need to do to convert days to weeks/weeks to days? How many months/weeks/days are there in _____ years?</p> <p><b>Deepen the moments:</b></p> <p>Jane is 7 years and 8 months old. Bob is 97 months old. Who is the oldest?</p> <p>Always, sometimes, never? There are 760 days in 2 years.</p>
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				Partially worked examples are used during input/modelling by teacher to focus learning on the objective rather than multiplication/division skills.		
<b>Analogue to digital – 12 hour</b>  (2 lessons split into varied fluency and problem solving)	LO: To read, write and convert between analogue and digital times up to 12 hours.	Read, write and convert time between analogue and digital 12- and 24-hour clocks.	Second Minute Hour Convert Analogue Digital A.M P.M Earliest Latest	<p><b>GD:</b>          Children to complete challenges linked to reasoning and problem solving showing clear understanding. Clearly showing their conversion methods using multiplication and division skills with written feedback on why and how they have got to an answer.</p> <p>Use real life examples to model complex ideas to encourage deeper thinking. Used during varied fluency lesson to deepen understanding of converting between analogue and digital times up to 12 hours.</p> <p>During varied fluency lesson, explanations can be developed by showing/ explaining the process of finding the answer to peers in the class.</p> <p>Provide opportunities to investigate the relationships with conversions between the units of time.</p> <p><b>SEND:</b></p>	<p><b>Children may think that:</b></p> <p>Time is recorded the same using digital and analogue.</p> <p>The digital time does not have to be written in a 4-digit format (EG: 09:30 and 9:30).</p> <p>Children may not understand the value of A.M and P.M.</p> <p>How many minutes 'to' the house is also used to determine the digital time.</p>	<p>Children will use their knowledge of analogue clocks to be able to read the time on a digital clock. Children will then understand that how many minutes 'past' the hour determines the time, in minutes, on a digital clock. The use of A.M. and P.M. will then be used to write the time digitally.</p> <p>The conversion between analogue and digital clocks will be used to convert times between to the two means of measurement up to 12 hours. This will enable to children to solve problems relating to differences in times, as well as reasoning questions involving spotting the mistakes.</p> <p><b>Resources:</b>          White Rose Maths Premium Resources – <a href="https://resources.whiterosemaths.com/resources/year-4/summer-block-3-time/">https://resources.whiterosemaths.com/resources/year-4/summer-block-3-time/</a></p> <p>Third Space Learning  <a href="https://mathshub.thirdspacelearning.com/resources?schoolyears=y4&amp;categories=measurement">https://mathshub.thirdspacelearning.com/resources?schoolyears=y4&amp;categories=measurement</a></p> <p><b>Mathematical questions:</b>          What time is the analogue clock showing?           How many minutes is it past the hour?           How can you count the minutes efficiently?           How do we record each time in digital format?</p>

			<p>Focus on the understanding of reading an analogue and digital clock and the relationship between them. Developing on from this, looking at similarities between them to encourage awareness of the relationship between the time representations.</p> <p>Using a range of pre-teaching activities will support children's understanding of key concepts.</p> <p>Pictorial and physical manipulatives could be used to further support children's understanding of the time (eg: analogue and digital clock in person) to support their understanding of the time units of measurement.</p> <p>Access to 'helpful' peers and clear modelling from adults are vital in ensuring children gain a secure understanding.</p> <p>Children to complete varied fluency questions focusing on understanding the value displayed digitally and understanding how to write this themselves before progressing onto converting them.</p>	<p>What does a.m./p.m. mean?</p> <p>Can you order the activities starting with the earliest?</p> <p>What would the time look like on Alfie's digital watch when he left home?</p> <p><b>Deepen the moments:</b> Sally has written the digital time for half past 9 below. What has she done wrong? Explain your answer, writing the correct digital time as part of your answer.</p> <p style="text-align: center;">9:30</p> <p>On a 12 hour digital clock, how many times will the time be read the same forwards and backwards?</p> <div style="border: 2px solid green; border-radius: 10px; padding: 5px; display: inline-block; margin: 10px auto;">12 : 21</div>
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				Partially worked examples are used during input/modelling by teacher to focus learning on the objective rather than the formatting of writing the digital amount and multiplication/division skills necessary for conversions.		
<b>Analogue to digital (24 hour)</b>  (2 lessons split into varied fluency and problem solving)	LO: To read, write and convert between analogue and digital time up to 24 hours.	Read, write and convert time between analogue and digital 12- and 24-hour clocks	Second Minute Hour Convert Analogue Digital A.M P.M Earliest Latest	<p><b>GD:</b>          Children to complete challenges linked to reasoning and problem solving showing clear understanding. Clearly showing their conversion methods using multiplication and division skills with written feedback on why and how they have got to an answer.</p> <p>Use real life examples to model complex ideas to encourage deeper thinking. Used during varied fluency lesson to deepen understanding of converting between analogue and digital times up to 12 hours.</p> <p>During varied fluency lesson, explanations can be developed by showing/ explaining the process of finding the answer to peers in the class.</p> <p>Provide opportunities to investigate the relationships</p>	<p><b>Children may think that:</b></p> <p>That numbers only go up to 12 on a 24-clock. E.G. there are 2 1 o'clock's.</p> <p>The digital time does not have to be written in a 4-digit format (EG: 09:30 and 9:30).</p> <p>Children may not understand the value of A.M and P.M is not as relevant on a 24 clock.</p> <p>How many minutes 'to' the house is also used to determine the digital time.</p>	<p>Children will be familiarised with a 24-hour clock and how it compares to an analogue clock. It is important to focus on what happens when the clock hits 1 o'clock in the afternoon on a digital clock, moving onto representing it in a 4-digit digital format.</p> <p>Children will move onto using a number line to explore what happens after midday on a 12- and 24- hour clock. Once this is mastered, children will be able to convert between analogue and digital times within 24 hours. It can be discussed where 24-hour digital clocks may be used and the benefits/drawbacks of using them, building this into reasoning and problem solving questions.</p> <p><b>Resources:</b>          White Rose Maths Premium Resources - <a href="https://resources.whiterosemaths.com/resources/year-4/summer-block-3-time/">https://resources.whiterosemaths.com/resources/year-4/summer-block-3-time/</a>          Third Space Learning <a href="https://mathshub.thirdspacelearning.com/resources?schoolyears=y4&amp;categories=measurement">https://mathshub.thirdspacelearning.com/resources?schoolyears=y4&amp;categories=measurement</a></p> <p><b>Mathematical questions:</b>          What do you notice about the time 1 o'clock in the afternoon on a 24 hour digital clock?</p>

with conversions between the units of time.

**SEND:**

Focus on the understanding of reading an analogue and digital clock and the relationship between them. Developing on from this, looking at similarities between them to encourage awareness of the relationship between the time representations.

Using a range of pre-teaching activities will support children's understanding of key concepts.

Pictorial and physical manipulatives could be used to further support children's understanding of the time (eg: analogue and digital clock in person) to support their understanding of the time units of measurement.

Access to 'helpful' peers and clear modelling from adults are vital in ensuring children gain a secure understanding.

Children to complete varied fluency questions focusing on understanding the value displayed digitally and understanding how to write this themselves before

How will the time be shown for 3 o'clock in the morning/afternoon? How do you know?

What time is the analogue clock showing?

Why is it important to know if it is a.m. or p.m.?

What time does she leave school on a 24 digital clock?

**Deepen the moment:**

Jack says,



To change any time after midday from 12 hours to 24 hours digital time just add 12 to the hours

Will this always be true? Are there any examples where this isn't the case?

				<p>progressing onto converting them.</p> <p>Partially worked examples are used during input/modelling by teacher to focus learning on the objective rather than the formatting of writing the digital amount and multiplication/division skills necessary for conversions.</p>		
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**Context (big picture learning)**

Mathematics is an important, creative discipline that helps us to understand and change the world. We want all of our children within the Pontefrac Academies Trust to experience all that mathematics has to offer and to develop a sense of curiosity about the subject with a clear understanding. As they grow throughout primary education, we want them to feel a sense of pride and achievement within this core subject: a subject that will impact their daily lives.

A key aspect of this will be the positive attitude we have and will pass onto the children, as they learn important mathematical concepts during their mathematics learning journey. We include VIPs (Very Important Points) to help children know their learning outcomes and retain and repeat important this knowledge over time.

Mistakes and misconceptions are a key part of the successes during their learning journey, as these moments help to show resilience, perseverance and commitment to learning mathematical concepts. At our school, the majority of children will be taught the content from their year group only. All children will have the opportunity to progress, build on prior knowledge, and have access to reasoning and problem solving questions. These questions help to secure and deepen their thinking and learning with mathematics. Another key factor is cross fertilization at every opportunity. As a whole, the children will spend their time learning, applying and mastering key skills that they will need throughout their life. In year 4, they will build on their mathematical knowledge, which they can take forward with them as they move into year 5 and beyond.

## Year 4 Knowledge Organiser: Time

### VIPs

- There are 60 seconds in 1 minute.
- There are 60 minutes in 1 hour.
- To convert between seconds and minutes; and minutes and hours, you can use multiplication and division skills.
- There are 7 days in a week.
- There are 52 weeks in a year.
- There are 12 months in a year.
- There are 365 days in a year, but 366 days in a leap year.
- A leap year takes place every 4 years.
- Time is represented digitally using 4 digits. E.G. 09:30 A.M.
- A.M is used for time before 12pm.
- P.M is used for time after 12pm.
- On a 24-hour digital clock, after midday the hours are not repeated. They continue to increase from 12 -23.
- 12 is the only hour that is repeated twice in a 24-hour clock.

### Intent

We will be able to build on our prior knowledge of time from KS1 and Year 3 to understand units of time such as second, minutes and hours, as well as days, weeks, months and years. We will be able to convert between these units of measurements in order to compare amounts and answer reasoning and problem solving questions involving time. It is important we learn about time to provide life-long skills when reading the time in everyday life.



There are **7 days** in a week.

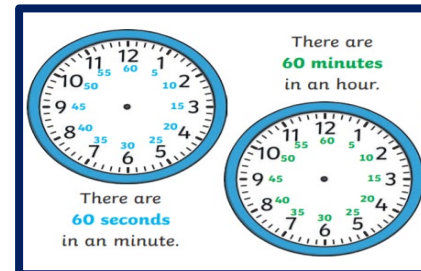
There are **24 hours** in a day.

There are **12 months** in a year.

	01:00	1 a.m.	1 o'clock			13:00	1 p.m.	1 o'clock	
	02:00	2 a.m.	2 o'clock			14:00	2 p.m.	2 o'clock	
	03:00	3 a.m.	3 o'clock			15:00	3 p.m.	3 o'clock	
	04:00	4 a.m.	4 o'clock			16:00	4 p.m.	4 o'clock	
	05:00	5 a.m.	5 o'clock			17:00	5 p.m.	5 o'clock	
	06:00	6 a.m.	6 o'clock			18:00	6 p.m.	6 o'clock	
	07:00	7 a.m.	7 o'clock			19:00	7 p.m.	7 o'clock	
	08:00	8 a.m.	8 o'clock			20:00	8 p.m.	8 o'clock	
	09:00	9 a.m.	9 o'clock			21:00	9 p.m.	9 o'clock	
	10:00	10 a.m.	10 o'clock			22:00	10 p.m.	10 o'clock	
	11:00	11 a.m.	11 o'clock			23:00	11 p.m.	11 o'clock	
	12:00	12 p.m.	12 o'clock			00:00	12 a.m.	12 o'clock	

### Fat Question

How have changes in technology influenced the way we tell the time?



There are **60 minutes** in an hour.

There are **60 seconds** in a minute.

### Key vocabulary

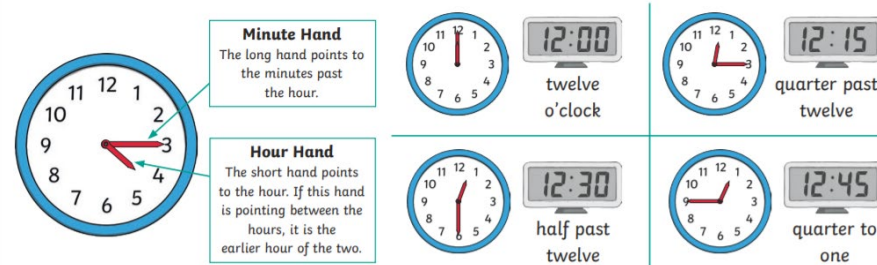
Hours  
 Minutes  
 Seconds  
 Month  
 Year  
 Day  
 Week  
 Multiply  
 Divide

Four Operations – addition, subtraction, multiplication and division.

12-hour time  
 24-hour time  
 Clock  
 Clock face  
 Minute hand  
 Hour hand  
 Second hand

Inverse  
 Convert  
 Analogue  
 Digital  
 Equivalent  
 O'clock  
 Midday  
 Midnight  
 Roman Numerals

### Analogue and Digital Clocks



**Minute Hand**  
 The long hand points to the minutes past the hour.

**Hour Hand**  
 The short hand points to the hour. If this hand is pointing between the hours, it is the earlier hour of the two.

12:00 twelve o'clock

12:15 quarter past twelve

12:30 half past twelve

12:45 quarter to one