Week 11, Day 4

Calculate time intervals using the 24-hour clock.
Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. If possible, watch the PowerPoint presentation with a teacher or another grown-up.

OR start by carefully reading through the Learning Reminders.

2. Tackle the questions on the Practice Sheet. There might be a choice of either Mild (easier) or Hot (harder)!
   Check the answers.

3. Finding it tricky? That’s OK… have a go with a grown-up at A Bit Stuck?

4. Think you’ve cracked it? Whizzed through the Practice Sheets? Have a go at the Investigation…
Calculate time intervals using the 24-hour clock.

This is a 24-hour digital clock.

Hours

Minutes

It is equivalent to 4:30pm.

Remember to change a pm time to a 24-hour clock time add 12 to the hours. 7:45pm is the same as 19:45.
Calculate time intervals using the 24-hour clock.

We can count up on a number line to calculate time intervals.

But remember that we are counting up to 60 to reach the next hour, not 100...

A school science lesson starts at 10:45 and ends at 11:35. How long does it last?

15 mins + 35 mins = 50 mins
Calculate time intervals using the 24-hour clock.

A singing lesson starts at 13:50 and ends at 14:40. How long does it last?

10 mins + 40 mins = 50 mins
Simon and Lizzie are decorating two rooms. This is how long each task takes:

**Living room**
- Organising workspace: 20 minutes
- Cleaning and preparing the walls: 55 minutes
- Painting the first coat: 1 hour 32 minutes
- Painting the second coat: 1 hour 47 minutes

**Dining room**
- Organising workspace: 18 minutes
- Cleaning and preparing the walls: 49 minutes
- Painting the first coat: 1 hour 21 minutes
- Painting the second coat: 1 hour 38 minutes

Simon and Lizzie start the living room at 9.30 am on Saturday.
1. First they organise their workspace and prepare the walls. What time do they take a coffee break?
2. At 11:15 am they start painting the first coat. What time will they finish it and have lunch?

Simon and Lizzie start the dining room at 10:22 am on Sunday.
3. First they organise their workspace and prepare the walls. What time do they take a coffee break?
4. After a half-hour break they start painting the first coat. What time will they finish it and have lunch?
5. Lunch takes 1 hour 7 minutes. What time do they start work on the second coat?
6. What time will they finish painting the dining room?
Simon and Lizzie are decorating two rooms. This is how long each task takes:

**Living room**
- Organising workspace: 20 minutes
- Cleaning and preparing the walls: 55 minutes
- Painting the first coat: 1 hour 32 minutes
- Painting the second coat: 1 hour 47 minutes

**Dining room**
- Organising workspace: 18 minutes
- Cleaning and preparing the walls: 49 minutes
- Painting the first coat: 1 hour 21 minutes
- Painting the second coat: 1 hour 38 minutes

Simon and Lizzie start the living room at 9.30 am on Saturday.
1. First they organise their workspace and prepare the walls. What time do they take a coffee break?
2. At 11:15 am they start painting the first coat. What time will they finish it and have lunch?
3. They start work on the second coat at 1:58 pm. What time will they finish painting the living room?

Simon and Lizzie start the dining room at 10:22 am on Sunday.
4. First they organise their workspace and prepare the walls. What time do they take a coffee break?
5. After a half-hour break they start painting the first coat. What time will they finish it and have lunch?
6. Lunch takes 1 hour 7 minutes. What time do they start work on the second coat?
7. What time will they finish painting the dining room?
8. Simon and Lizzie have a cup of tea for 10 minutes when they finish. Then they want to go out at 4.30 pm. How long will they have to get ready?

**Challenge**
Simon and Lizzie want to get the two jobs done in one weekend. They need to finish by 4:30 pm on Sunday. Write a different timetable for when they will do each task and when they will take coffee, lunch or tea breaks.
**Busy weekend (mild)**
1. Simon and Lizzie take a coffee break at 10.45am.
2. They will finish the first coat and have lunch at 12.47pm.
3. Simon and Lizzie take a coffee break at 11.29am.
4. They will finish the first coat and have lunch at 1.20pm.
5. They start work on the second coat at 2.27pm.
6. They will finish painting the living room at 4.05pm.

**Busy weekend (hot)**
1. Simon and Lizzie take a coffee break at 10.45am.
2. They will finish the first coat and have lunch at 12.47pm.
3. They will finish painting the living room at 3.45pm.
4. Simon and Lizzie take a coffee break at 11.29am.
5. They will finish the first coat and have lunch at 1.20pm.
6. They start work on the second coat at 2.27pm.
7. They will finish painting the living room at 4.05pm.
8. Simon and Lizzie will have 15 minutes to get ready.

**Challenge**
Simon and Lizzie want to get the two jobs done in one weekend. They need to finish by 4.30 pm on Sunday. Write a different timetable for when they will do each task and when they will take coffee, lunch or tea breaks.

<table>
<thead>
<tr>
<th>e.g. Saturday</th>
<th>10:00am</th>
<th>Organise workspace in the living room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:20am</td>
<td>Prepare the walls in the living room</td>
<td></td>
</tr>
<tr>
<td>11:15am</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>11:30am</td>
<td>Start first coat of paint</td>
<td></td>
</tr>
<tr>
<td>1:02pm</td>
<td>Finish first coat of paint and have lunch</td>
<td></td>
</tr>
<tr>
<td>2:00pm</td>
<td>Start second coat of paint</td>
<td></td>
</tr>
<tr>
<td>3:47pm</td>
<td>Living room is finished and time for a cuppa</td>
<td></td>
</tr>
<tr>
<td>Sunday</td>
<td>9:00am</td>
<td>Organise workspace in the dining room</td>
</tr>
<tr>
<td>9:18am</td>
<td>Prepare the walls in the dining room</td>
<td></td>
</tr>
<tr>
<td>10:07am</td>
<td>Coffee break and get lunch cooking</td>
<td></td>
</tr>
<tr>
<td>11:15am</td>
<td>Start first coat of paint</td>
<td></td>
</tr>
<tr>
<td>12:36pm</td>
<td>Finish first coat and have some lunch</td>
<td></td>
</tr>
<tr>
<td>1:15pm</td>
<td>Start second coat of paint</td>
<td></td>
</tr>
<tr>
<td>2:53pm</td>
<td>Living room is finished and time for a cuppa</td>
<td></td>
</tr>
</tbody>
</table>

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A Bit Stuck?
Matching 12 and 24 hour clock times

Cut out the 12-hour and 24-hour times and stick the matching times together.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12:25</td>
<td>3:10 pm</td>
<td>10:45</td>
<td>19:30</td>
<td>9:35 am</td>
<td>15:10</td>
</tr>
<tr>
<td>10:45 am</td>
<td>7:30 pm</td>
<td>12:25 pm</td>
<td>5:50 am</td>
<td>05:50</td>
<td>09:35</td>
</tr>
</tbody>
</table>

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Matching 12 and 24 hour times

12:25 = 12:25 pm
19:30 = 7:30 pm
05:50 = 5:50 am
07:20 = 7:20 am
16:55 = 4:55 pm
00:15 = 12:15 am
Investigation
Hogwarts timetable

<table>
<thead>
<tr>
<th>Route number</th>
<th>71</th>
<th>97</th>
<th>53</th>
<th>35</th>
<th>61</th>
<th>47</th>
<th>67</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagon Alley</td>
<td>07:45</td>
<td>08:45</td>
<td>09:00</td>
<td>14:15</td>
<td>15:00</td>
<td>15:50</td>
<td>19:35</td>
</tr>
<tr>
<td>Kings Cross</td>
<td>08:02</td>
<td>09:02</td>
<td>09:17</td>
<td>14:45</td>
<td>15:17</td>
<td>16:07</td>
<td>19:52</td>
</tr>
<tr>
<td>Little Whinging</td>
<td>09:15</td>
<td>10:15</td>
<td>-----</td>
<td>16:37</td>
<td>-----</td>
<td>17:20</td>
<td>-----</td>
</tr>
<tr>
<td>Ottery St Catchpole</td>
<td>12:45</td>
<td>13:50</td>
<td>-----</td>
<td>20:21</td>
<td>-----</td>
<td>20:50</td>
<td>-----</td>
</tr>
<tr>
<td>Gretna Green</td>
<td>18:50</td>
<td>-----</td>
<td>15:33</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>05:02</td>
</tr>
<tr>
<td>Hogsmeade</td>
<td>21:07</td>
<td>-----</td>
<td>18:34</td>
<td>-----</td>
<td>00:04</td>
<td>-----</td>
<td>07:45</td>
</tr>
</tbody>
</table>

Part A
Write out Route 71 and Route 67 in 12-hour (am/pm) clock times.

Part B
Use the information in the timetable to answer these questions:

1. How long does Route 47 take from Kings Cross to Little Whinging?
2. How long does Route 71 take from Gretna Green to Hogwarts?
3. How long does Route 61 take from Hogwarts to Hogsmeade?
4. How long does Route 35 take from Little Whinging to Ottery St Catchpole?

Part C
1. Which is the fastest train from Gretna Green to Hogsmeade?
2. Which is the fastest train from Kings Cross to Ottery St Catchpole?

Challenge
Four trains travel all the way from Diagon Alley to Hogsmeade. What are the quickest and the slowest times for this journey?
Investigation
Answers

Hogwarts timetable

Part A
Write out Route 71 and Route 67 in 12-hour (am/pm) clock times.

<table>
<thead>
<tr>
<th>Route 71</th>
<th>Route 67</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagon Alley</td>
<td>Diagon Alley</td>
</tr>
<tr>
<td>7:45am</td>
<td>7:35pm</td>
</tr>
<tr>
<td>Kings Cross</td>
<td>Kings Cross</td>
</tr>
<tr>
<td>8:02am</td>
<td>7:52pm</td>
</tr>
<tr>
<td>Little Whinging</td>
<td>Little Whinging</td>
</tr>
<tr>
<td>9:15am</td>
<td>7:45am</td>
</tr>
<tr>
<td>Ottery St Catchpole</td>
<td>Ottery St Catchpole</td>
</tr>
<tr>
<td>12:45pm</td>
<td>5:02am</td>
</tr>
<tr>
<td>Gretma Green</td>
<td>Gretma Green</td>
</tr>
<tr>
<td>6:50pm</td>
<td>7:36am</td>
</tr>
<tr>
<td>Hogwarts</td>
<td>Hogwarts</td>
</tr>
<tr>
<td>8:58pm</td>
<td>7:36pm</td>
</tr>
<tr>
<td>Hogsmeade</td>
<td>Hogsmeade</td>
</tr>
<tr>
<td>9:07pm</td>
<td>7:45am</td>
</tr>
</tbody>
</table>

Part B
Use the information in the timetable to answer these questions:
1. How long does Route 47 take from Kings Cross to Little Whinging? 1 hour 13 mins
2. How long does Route 71 take from Gretna Green to Hogwarts? 2 hours 8 mins
3. How long does Route 61 take from Hogwarts to Hogsmeade? 9 minutes
4. How long does Route 35 take from Little Whinging to Ottery St Catchpole? 3 hours 44 mins

Part C
1. Which is the fastest train from Gretna Green to Hogsmeade? Route 71
2. Which is the fastest train from Kings Cross to Ottery St Catchpole? Route 71 and Route 47 are both same time at 4 hours 43 minutes

Challenge

Four trains travel all the way from Diagon Alley to Hogsmeade. What are the quickest and the slowest times for this journey?

Quickest is 9 hours 4 minutes (route 61)
Slowest is 13 hours 22 minutes (route 71)

- Route 71 7:45 to 21:07 takes 13 hours 22 minutes
- Route 53 9:00 to 18:34 takes 9 hours 34 minutes
- Route 61 15:00 to 00:04 takes 9 hours 4 minutes
- Route 67 19:35 to 07:45 takes 12 hours 10 mins

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