Unlock the Problem

The analog clock below has an hour hand, a minute hand, and a second hand to measure time. The time is 4:30:12.

There are 60 seconds in a minute and 60 minutes in an hour. The clocks show how far the hands move for each length of time.

Example 1

How does the size of an hour compare to the size of a second?

There are _____ minutes in an hour.

There are _____ seconds in a minute.

60 minutes × _____ = _____ seconds

There are _____ seconds in an hour.

So, 1 hour is _____ times as long as 1 second.
Example 2 Compare measures.

Larissa spent 2 hours on her science project. Cliff spent 200 minutes on his science project. Who spent more time?

**STEP 1** Make a table that relates hours and minutes.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

2 hours is _____ than 200 minutes.

So, _____ spent more time than __________ on the science project.

Activity Compare the length of a week to the length of a day.

Materials ■ color pencils

The number line below shows the relationship between days and weeks.

**STEP 1** Use a color pencil to shade 1 week on the number line.

- **Weeks:** 0, 1
- **Days:** 0, 1, 2, 3, 4, 5, 6, 7

2 hours is ___ than 200 minutes.

So, _____ spent more time than __________ on the science project.

**STEP 2** Compare 2 hours and 200 minutes.

Think: Write each measure in minutes and compare using <, >, or =.

2 hours 200 minutes

So, 1 week is _____ times as long as 1 day.
1. Compare the length of a year to the length of a month. Use a model to help.

<table>
<thead>
<tr>
<th>Years</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Months</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

1 year is _____ times as long as _____ month.

Complete.

2. 2 minutes = ____ seconds

3. 4 years = ____ months

On Your Own

Complete.

4. 3 minutes = ____ seconds

5. 4 hours = ____ minutes

Use Symbols  Algebra  Compare using >, <, or =.

6. 3 years  35 months

7. 2 days  40 hours

Problem Solving • Applications

8. **GO DEEPER** Damien has lived in the apartment building for 5 years. Ken has lived there for 250 weeks. Who has lived in the building longer? Explain. Make a table to help.

<table>
<thead>
<tr>
<th>Years</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

9. **THINK SMARTER** How many hours are in a week? Explain.
10. **Communicate** Explain how you know that 9 minutes is less than 600 seconds.

11. **Think Smarter** Draw lines to match equivalent time intervals. Some intervals might not have a match.

<table>
<thead>
<tr>
<th>1 hour</th>
<th>2 hours</th>
<th>5 hours</th>
<th>12 hours</th>
<th>48 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 days</th>
<th>120 minutes</th>
<th>4 days</th>
<th>3,600 seconds</th>
<th>300 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

12. How many days are there in 4 years, if the fourth year is a leap year? Explain. Make a table to help.

<table>
<thead>
<tr>
<th>Years</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

13. Parker was born on February 29, 2008. The second time he is able to celebrate on his actual birthday is in 2016. How many days old will Parker be on February 29, 2016?
Complete.
1. 6 minutes = __360__ seconds
   Think: 1 minute = 60 seconds,
   so 6 minutes = 6 × 60 seconds, or 360 seconds

2. 5 weeks = __________ days

3. 3 years = __________ weeks

4. 9 hours = __________ minutes

5. 9 minutes = __________ seconds

Compare using <, >, or =.
6. 2 years __ 14 months

7. 3 hours __ 300 minutes

8. 2 days __ 48 hours

9. 6 years __ 300 weeks

Problem Solving

10. Jody practiced a piano piece for 500 seconds.
    Bill practiced a piano piece for 8 minutes.
    Who practiced longer? Explain.

11. Yvette’s younger brother just turned 3 years old. Fred’s brother is now 30 months old.
    Whose brother is older? Explain.

12. Write Math Explain how you can prove that 3 weeks is less than 24 days.
Lesson Check (4.MD.A.1)

1. Glen rode his bike for 2 hours. For how many minutes did Glen ride his bike?

2. Tina says that vacation starts in exactly 4 weeks. In how many days does vacation start?

Spiral Review (4.NF.B.3b, 4.NF.C.5, 4.MD.A.1, 4.MD.A.2)

3. Kayla bought $\frac{9}{4}$ pounds of apples. What is that weight as a mixed number?

4. Judy, Jeff, and Jim each earned $5.40 raking leaves. How much did they earn together?

5. Melinda rode her bike $\frac{54}{100}$ mile to the library. Then she rode $\frac{4}{10}$ mile to the store. How far did Melinda ride her bike in all? Write your answer as a decimal.

6. One day, the students drank 60 quarts of milk at lunch. How many pints of milk did the students drink?