

Discussion Problems

Step 1: Turns and Angles

National Curriculum Objectives:

Mathematics Year 3: (3G4a) [Recognise that angles are a property of a shape or a description of a turn](#)

Mathematics Year 3: (3G4b) [Identify right angles, recognise that two right angles make a half turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle](#)

About this resource:

This resource has been designed for pupils who understand the concepts within [this step](#). It provides pupils with more opportunities to enhance their reasoning and problem solving skills through more challenging problems. Pupils can work in pairs or small groups to discuss with each other about how best to tackle the problem, as there is often more than one answer or more than one way to work through the problem.

There may be various answers for each problem. Where this is the case, we have provided one example answer to guide discussion.

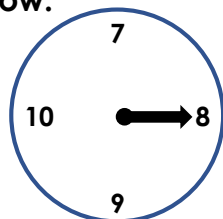
We recommend self or peer marking using the answer page provided to promote discussion and self-correction.

More [Year 3 Properties of Shapes](#) resources.

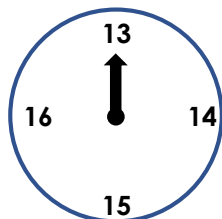
Did you like this resource? Don't forget to [review](#) it on our website.

Turns and Angles

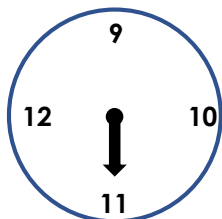
1. Investigate what the code word is by working out which number each arrow will be pointing to after it has made its turn. Each number has a letter which is shown in the grid below.



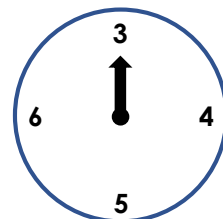
$\frac{1}{4}$ turn anti-clockwise



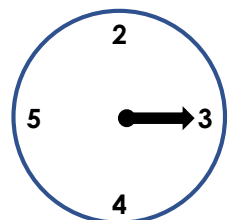
$\frac{1}{2}$ turn clockwise



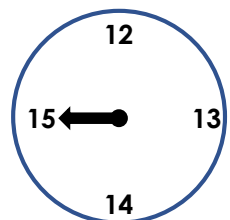
$\frac{3}{4}$ turn anti-clockwise



$\frac{1}{4}$ turn clockwise



$\frac{1}{2}$ turn anti-clockwise

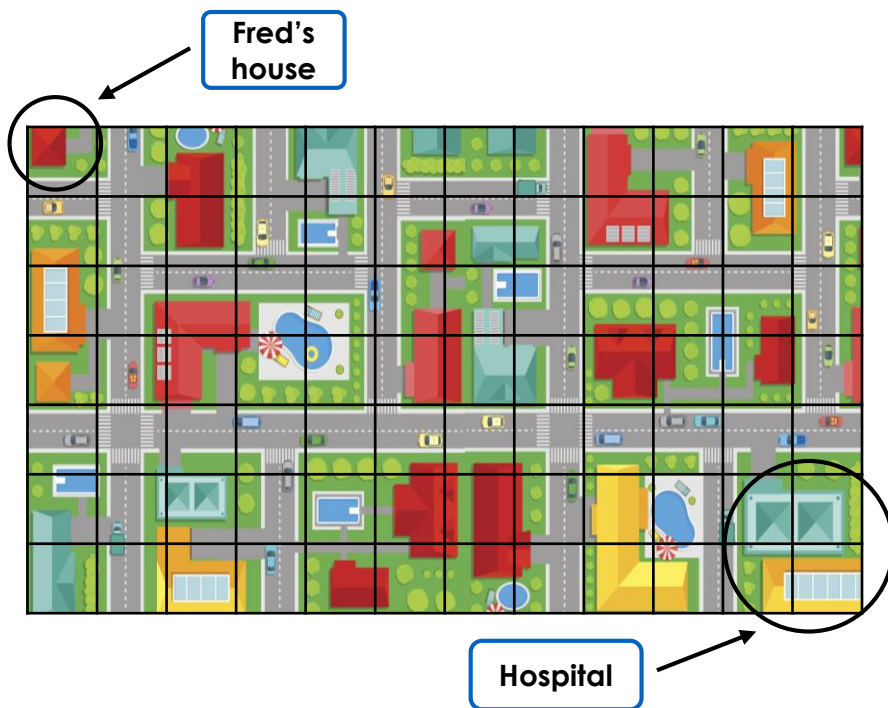


$\frac{1}{4}$ turn anti-clockwise

| | | | | | |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| ¹ A | ² B | ³ C | ⁴ D | ⁵ E | ⁶ F |
| ⁷ G | ⁸ H | ⁹ I | ¹⁰ J | ¹¹ K | ¹² L |
| ¹³ M | ¹⁴ N | ¹⁵ O | ¹⁶ P | ¹⁷ Q | ¹⁸ R |
| ¹⁹ S | ²⁰ T | ²¹ U | ²² V | ²³ W | ²⁴ X |
| ²⁵ Y | ²⁶ Z | | | | |

DP

2. Explore whether the instructions given would help Fred to reach the hospital from his house. Fred's house faces east. He steps outside his door and is also facing east.



1. Walk forward one square.

2. Make a quarter turn south and walk forward 4 squares.

3. Make a quarter turn east and walk forward 9 squares.

4. Make a quarter turn south and walk forward one square.

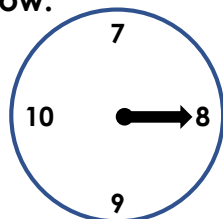
You have arrived.

Using the compass points to help you, write a set of instructions for each alternative route which would take Fred to the hospital.

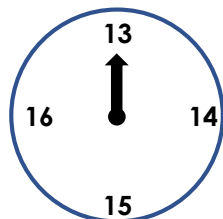
DP

Turns and Angles

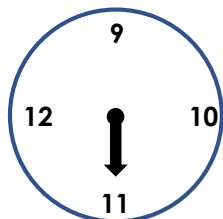
1. Investigate what the code word is by working out which number each arrow will be pointing to after it has made its turn. Each number has a letter which is shown in the grid below.



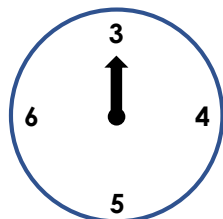
$\frac{1}{4}$ turn anti-clockwise



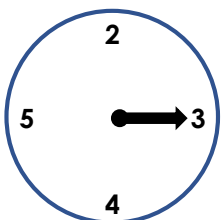
$\frac{1}{2}$ turn clockwise



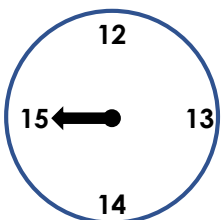
$\frac{3}{4}$ turn anti-clockwise



$\frac{1}{4}$ turn clockwise



$\frac{1}{2}$ turn anti-clockwise

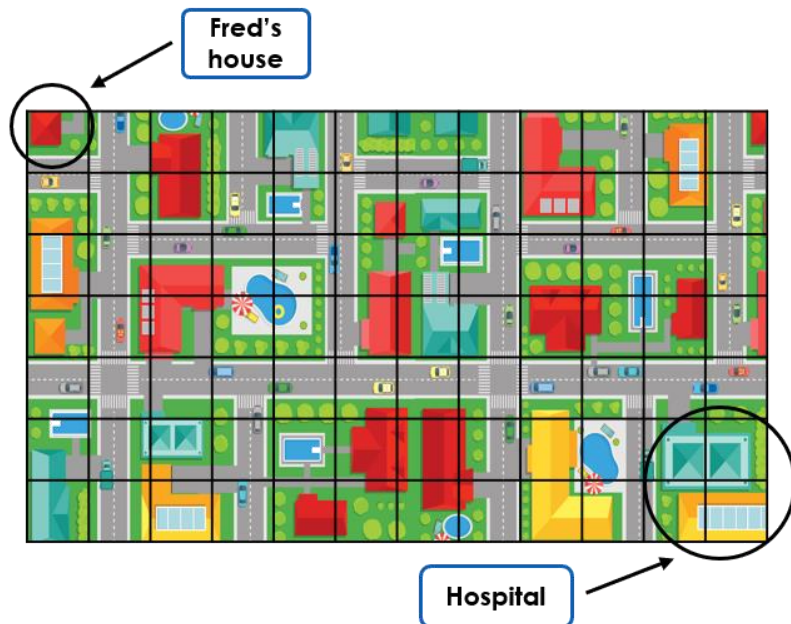


$\frac{1}{4}$ turn anti-clockwise

| | | | | | |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| ¹ A | ² B | ³ C | ⁴ D | ⁵ E | ⁶ F |
| ⁷ G | ⁸ H | ⁹ I | ¹⁰ J | ¹¹ K | ¹² L |
| ¹³ M | ¹⁴ N | ¹⁵ O | ¹⁶ P | ¹⁷ Q | ¹⁸ R |
| ¹⁹ S | ²⁰ T | ²¹ U | ²² V | ²³ W | ²⁴ X |
| ²⁵ Y | ²⁶ Z | | | | |

 G O L D E N

2. Explore whether the instructions given would help Fred to reach the hospital from his house. Fred's house faces east. He steps outside his door and is also facing east.



1. Walk forward one square.

2. Make a quarter turn south and walk forward 4 squares.

3. Make a quarter turn east and walk forward 9 squares.

4. Make a quarter turn south and walk forward one square.

You have arrived.

Using the compass points to help you, write a set of instructions for each alternative route which would take Fred to the hospital.

Accept any sets of instructions which correctly direct Fred to the hospital and use appropriate language (north, south, east, west, quarter turn, half turn etc).