Properties of Shapes: Measuring Angles in Degrees

Aim	**Success Criteria**	**Resources**
Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Draw given angles, and measure them in degrees (°). **DfE Ready-to-Progress Criteria** Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size (5G–1) To measure angles of a turn in degrees.	I can describe an angle as a turn. I can identify right, acute, obtuse and reflex angles as an angle of a turn. I can describe angles of a turn in degrees.	Lesson Pack
	Key/New Words Angle, turn, degrees, acute, right, obtuse, reflex, quarter-turn, half turn, three-quarter turn, full turn, clockwise, anticlockwise.	**Preparation** Differentiated Measuring Angles in Degrees Activity Sheets – one per child Diving into Mastery Activity Sheets – as required

Prior Learning	It will be helpful if children can revisit acute, right and obtuse angles and recap how to identify them. This is covered in this Types of Angles lesson.

Learning Sequence

	Remember It: Using the corresponding slide on the Lesson Presentation, the children will sort angles on to a table based on whether they are acute, right-angled or obtuse. This activity is intended to recap prior learning in year 4. To extend learning further, children can draw three more angles for each section of the table.	
	Key Vocabulary: Using the corresponding slides on the Lesson Presentation, the children recap the keywords 'clockwise' and 'anticlockwise'. These words occur within the lesson, so it is important that children are familiar with the terms and can apply them when discussing directions of turns.	
	Measuring Turns in Degrees: Using the corresponding slides on the Lesson Presentation, the children learn how to describe turns in terms of quarter-turns, half turns, three-quarter turns and full turns. Children will learn the measurements of these turns using degrees and shown how to calculate them correctly. Children will be introduced to reflex angles within this section of the lesson. Can the children describe an angle as a turn? Can the children identify right and reflex angles as an angle of a turn? Can the children describe angles of a turn in degrees?	
	Turning Anticlockwise: Using the corresponding slides on the Lesson Presentation, the children engage in a talk task where they describe Charlie's anticlockwise turns using key vocabulary. They describe his turns using measurements in degrees and state the fraction of a turn that he turns through. Can the children describe an angle as a turn? Can the children identify right and reflex angles as an angle of a turn? Can the children describe angles of a turn in degrees?	
	Acute, Obtuse and Reflex Angles: Using the corresponding slides on the Lesson Presentation, the children engage in new learning involving turns around a compass. Children will learn that each turn on the compass measures 45° and use this knowledge to measure any turn on the compass. Children will be encouraged to add values around the compass to find the total. Following this, children will engage in a talk task where they describe turns involving eight points and will use key vocabulary alongside measurements in degrees. Can the children describe an angle as a turn? Can the children identify right, acute, obtuse and reflex angles as an angle of a turn? Can the children describe angles of a turn in degrees?	

Measuring Angles in Degrees: Using the differentiated Measuring Angles in Degrees Activity Sheets, the children complete tasks that provide them with opportunities to practise measuring angles in degrees..

To support children working towards expected level, there is a talk task provided which enables children to discuss angles as turns using key vocabulary. Sentence stems are provided to scaffold discussions. Children will be able to practise describing angles in terms of direction, fractions and measurements in degrees.

Children working at expected level will engage in a talk task where they discuss angles as turns using key vocabulary. Children will be able to apply new learning on acute, obtuse and reflex angles and describe angles in terms of direction, fractions and measurements in degrees.

To challenge children working at greater depth there is a task provided which allows the application of new learning. Children will complete an information table linked to finding angles around a compass. Children will draw a child's bedroom based on a set of instructions, then create their own instruction list for designing a zoo. This will provide children with an opportunity to apply the key vocabulary linked to measuring angles in degrees.

Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity. These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

Children complete fluency questions related to measuring angles in degrees.

Children answer reasoning questions related to measuring angles in degrees.

Children work individually or collaboratively on problem-solving questions related to measuring angles in degrees.

Exploreit

Showit: Children can create a large-scale version of an activity to show turns around a point. They can place objects at different compass points and then stand in a position in the middle. They can turn around the point and have their partner describe their measurement of turn in degrees.

Drawit: Children can create a drawing of their bedroom and describe the positioning of items in their room in terms of degrees.

Learnit: Children will find this superb Knowledge Organiser helpful to learn about measuring in degrees.

DISCLAIMER

We hope you find the information on our website and resources useful.

Displaying the Presentation

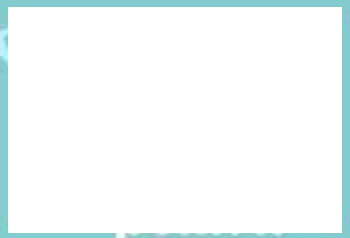
To ensure this presentation displays correctly: If you are a Mac user, the presentation may open in 'slide master' mode - to see all the content, click 'close slide master' and the presentation should display correctly. If you are using Google Drive, the presentation won't display correctly if you open it in Google Slides. If you have opened it in Google Slides, you will need to download it again from the Twinkl website and this time open it from your computer.

Animations

This resource has been designed with animations to make it as fun and engaging as possible. To view the content in the correct formatting, please view the PowerPoint in 'slide show mode'. This takes you from desktop to presentation mode. If you view the slides out of 'slide show mode', you may find that some of the text and images overlap each other and/or are difficult to read.

To enter slide show mode, go to the **slide show menu tab** and select either **from beginning or from current slide**.

You may wish to delete this slide before beginning the presentation.



Maths

Properties of Shapes

Measuring Angles in Degrees

Aim

- To measure angles of a turn in degrees.

Success Criteria

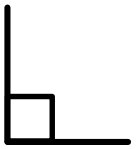
- I can describe an angle as a turn.
- I can identify right, acute, obtuse and reflex angles as an angle of a turn.
- I can describe angles of a turn in degrees.

Remember It

Sort the angles into the table below. Are they acute, right or obtuse?
Can you explain your reasoning?

a)

b)

c) 

d)

e)

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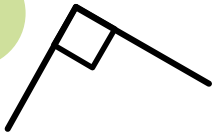
g) 

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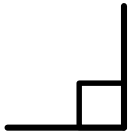
j) 

Acute	Right	Obtuse
a d i	**c g j**	**b e f h**

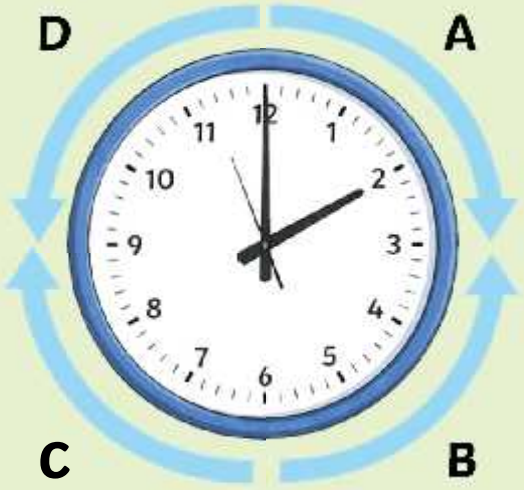
Ready for a challenge?
Draw three more angles for each part of the table!

Key Vocabulary

To describe turns, we use the phrases **clockwise** and **anticlockwise.**

Which arrows are showing clockwise turns?

Why do you think the term **clockwise** is used?



Which arrows are showing anticlockwise turns?

Why do you think the term **anticlockwise** is used?

A and C show clockwise turns.

The movement is in the same direction as the hands on the clock and the numbers are going around the clock face.

B and D show anticlockwise turns.

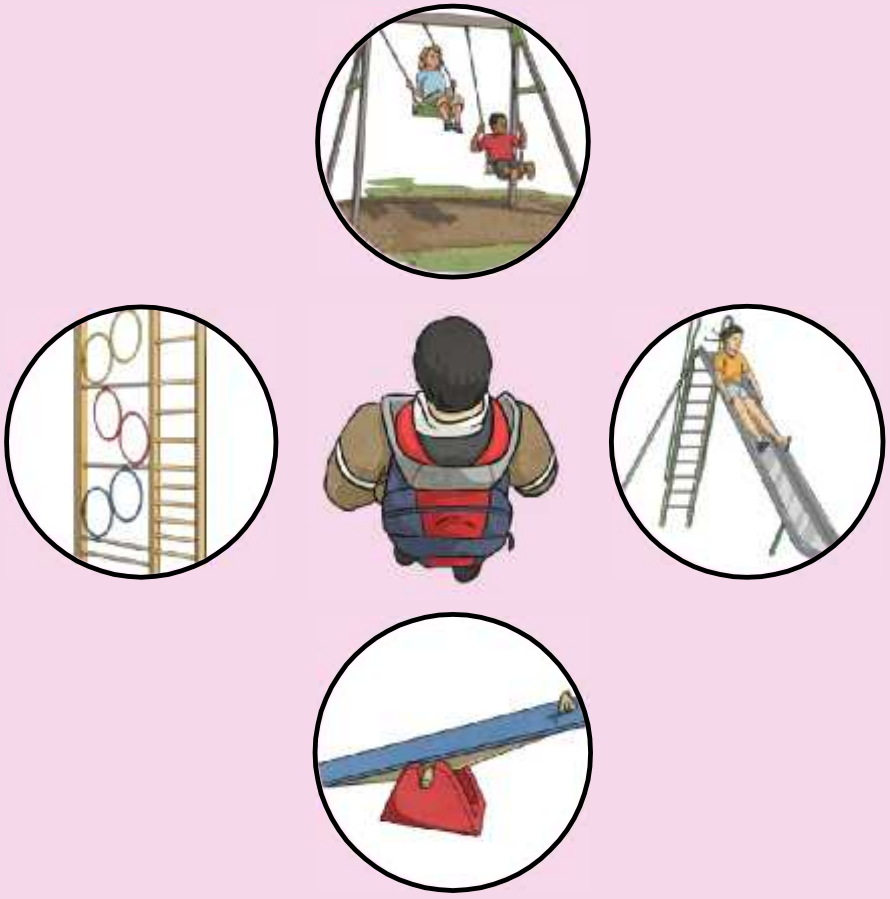
They move in the opposite direction to the clock hands and numbers.

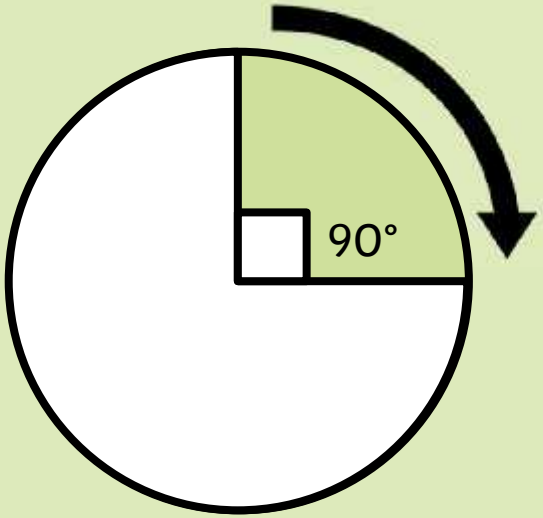
Measuring Turns in Degrees

Charlie is in a park. He is facing the swings.

In this lesson, we will be measuring turns in degrees (°).

Charlie has turned through a quarter-turn and is now facing the slide. He has turned 90 degrees. An angle that measures exactly 90° is called a **right angle**.



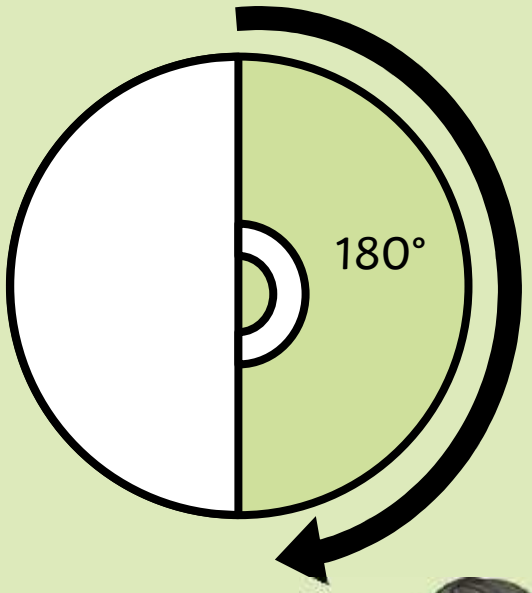


Measuring Turns in Degrees

Charlie has turned through two right angles. A right angle is 90°, so we can multiply 90 by 2 to calculate half a turn: $90 \times 2 = 180$.

An angle that measures exactly 180° is called a **straight line angle**.

Charlie is facing the swings again. He turns a half turn clockwise. Where is he facing after the turn? How many degrees has he turned in total?



You can use your knowledge of multiples of 9 to help!

Measuring Turns in Degrees

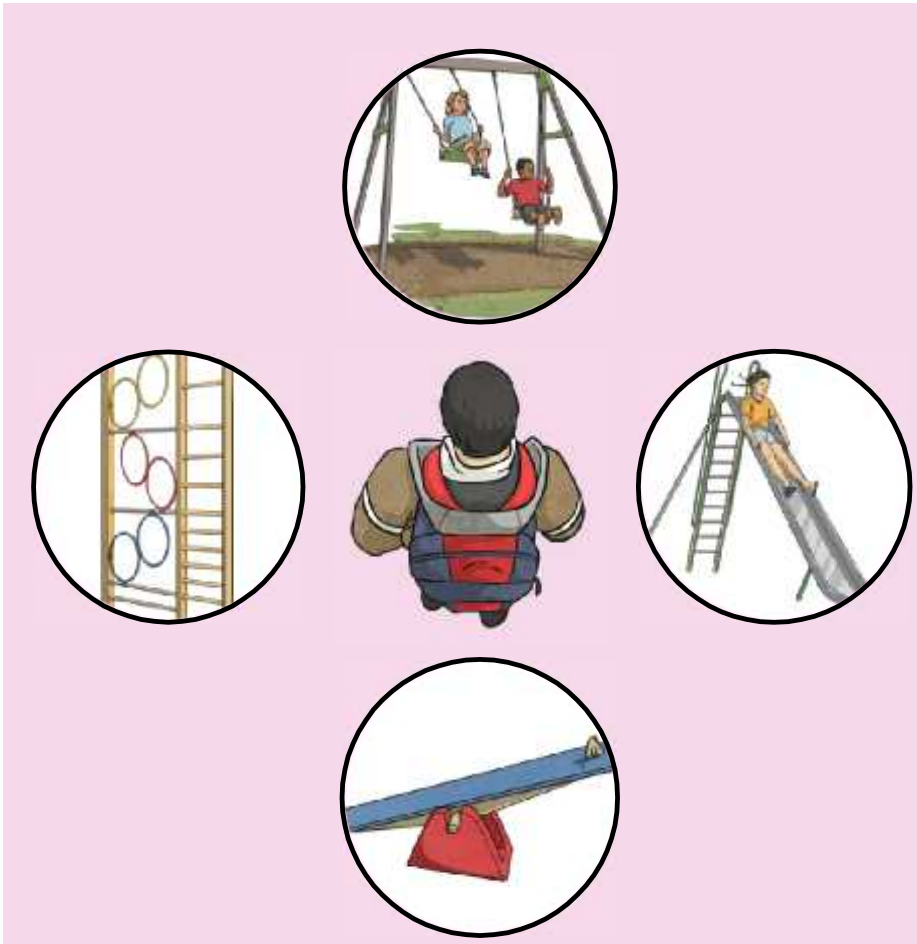
Charlie has turned through three right angles. A right angle is 90° so we can multiply 90 by 3 to calculate the clockwise. We can find 90 × 3 = 270°.

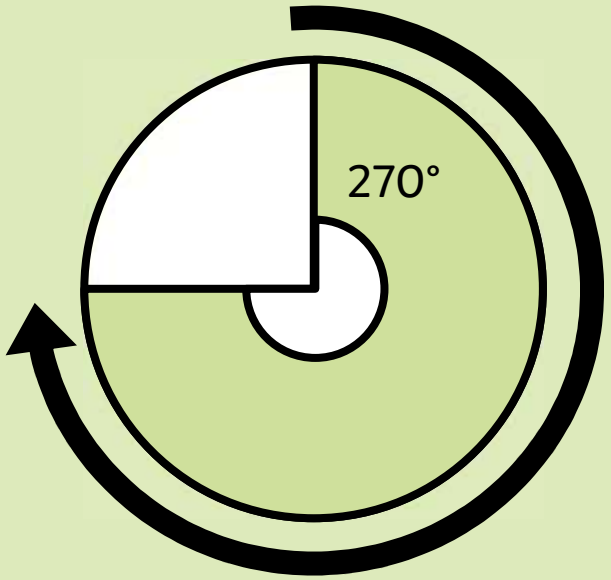
Charlie is facing the swings again.

A reflex angle is greater than 180° (a straight line angle).

Charlie has moved three quarters of a turn and is now facing the climbing frame.

This type of angle is called a **reflex** angle.

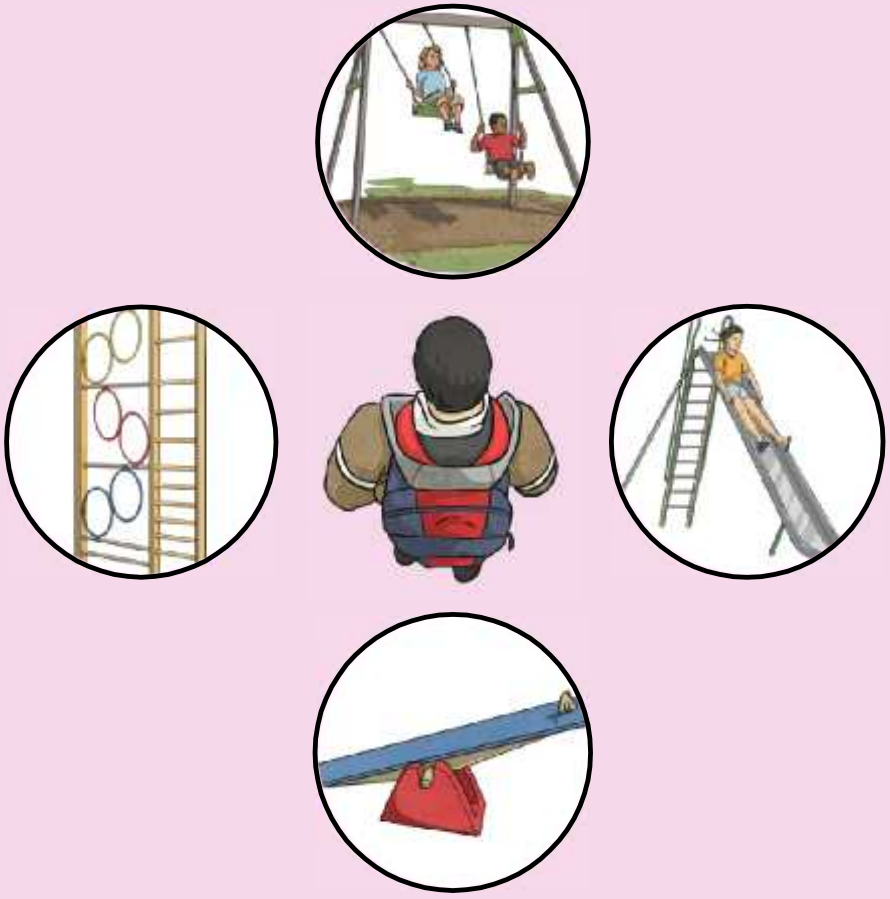


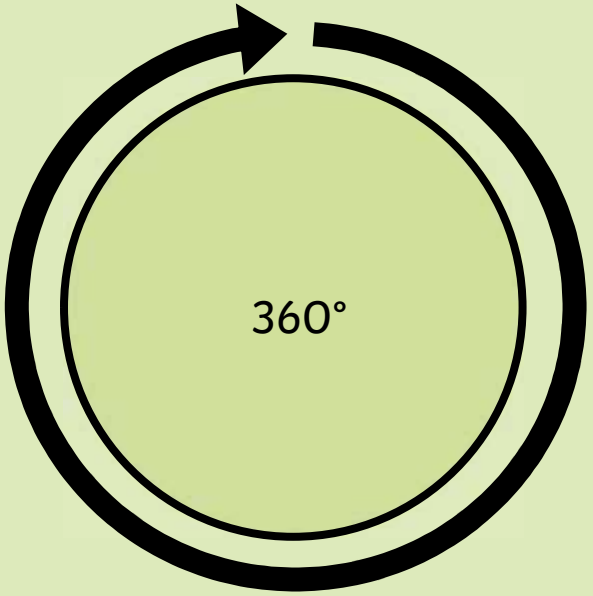


Measuring Turns in Degrees

Charlie is facing the swings again. He turns through a full turn clockwise.
Charlie has moved a full turn. He starts and ends facing the swings.
How many degrees has he turned in total?

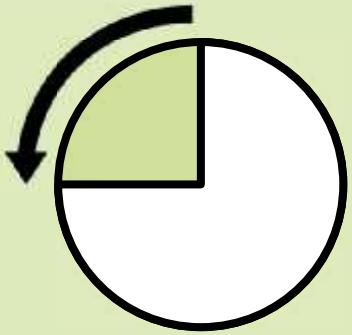
A full turn is the same as four right angles. A right angle is 90° so we can multiply 90 by 4 to calculate a full turn. 90° x 4 = 360°.





Turning Anticlockwise

Charlie is facing the swings again. Discuss with a partner what would happen if Charlie turned **one quarter-turn anticlockwise**?



Charlie starts facing the swings.

He turns through $\frac{1}{4}$ turn.

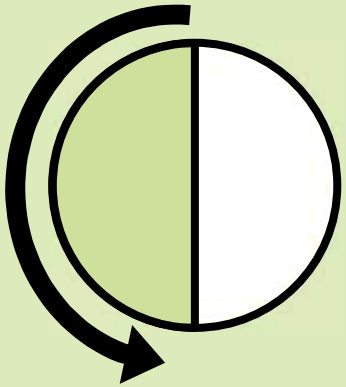
Charlie is now facing the **climbing frame**

He has turned **90°**

This is called a **right** angle.

Turning Anticlockwise

Charlie is facing the swing again. He now moves **half a turn anticlockwise**.



Charlie starts facing the swings.

He turns through $\frac{1}{2}$ turn.

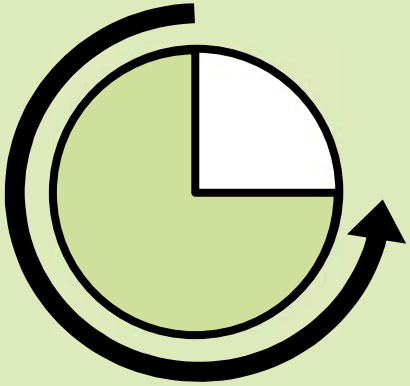
Charlie is now facing the **seesaw**

He has turned **180°**

This is called a **straight line** angle.

Turning Anticlockwise

Charlie is facing the swing again.
He now moves **three-quarters of a turn anticlockwise**.



Charlie starts facing the swings.

He turns through $\frac{3}{4}$ turn.

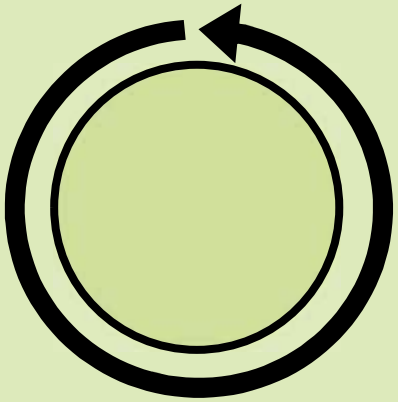
Charlie is now facing the **slide**

He has turned **270°**

This is called a **reflex** angle.

Turning Anticlockwise

Charlie is facing the swings again.
He finally moves a **full turn anticlockwise**.



Charlie starts facing the swings.

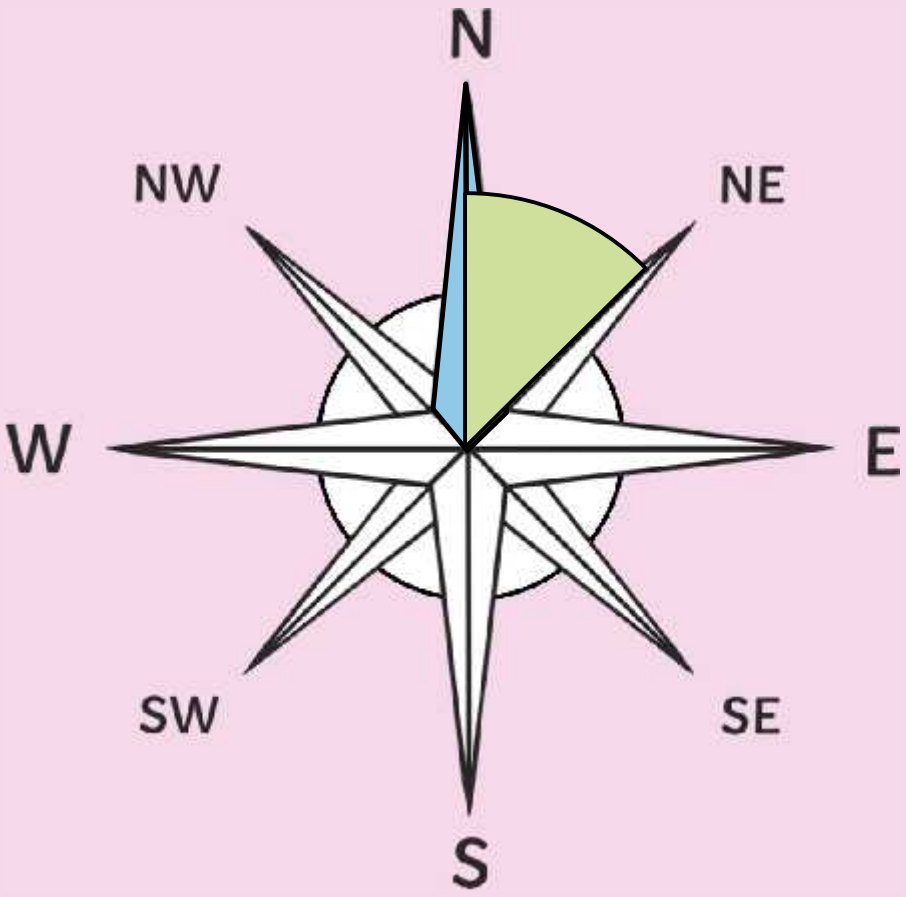
Charlie is now facing the **swings**

He has turned **360** °

This is called a **full** angle.

Acute, Obtuse and Reflex Angles

Now, what's the angle that the (N) shows as point in?

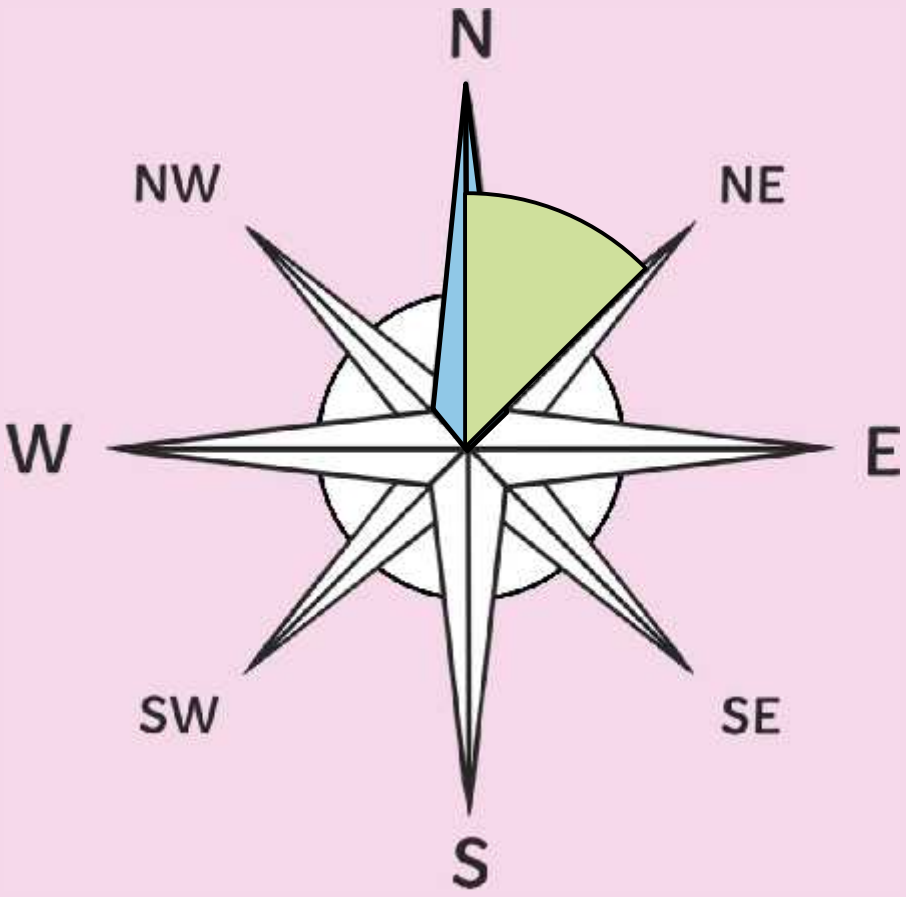


Acute, Obtuse and Reflex Angles

The angle between N and NE is 45°. It is an acute angle.

We can use our knowledge of quarter-turns to help us calculate this angle.

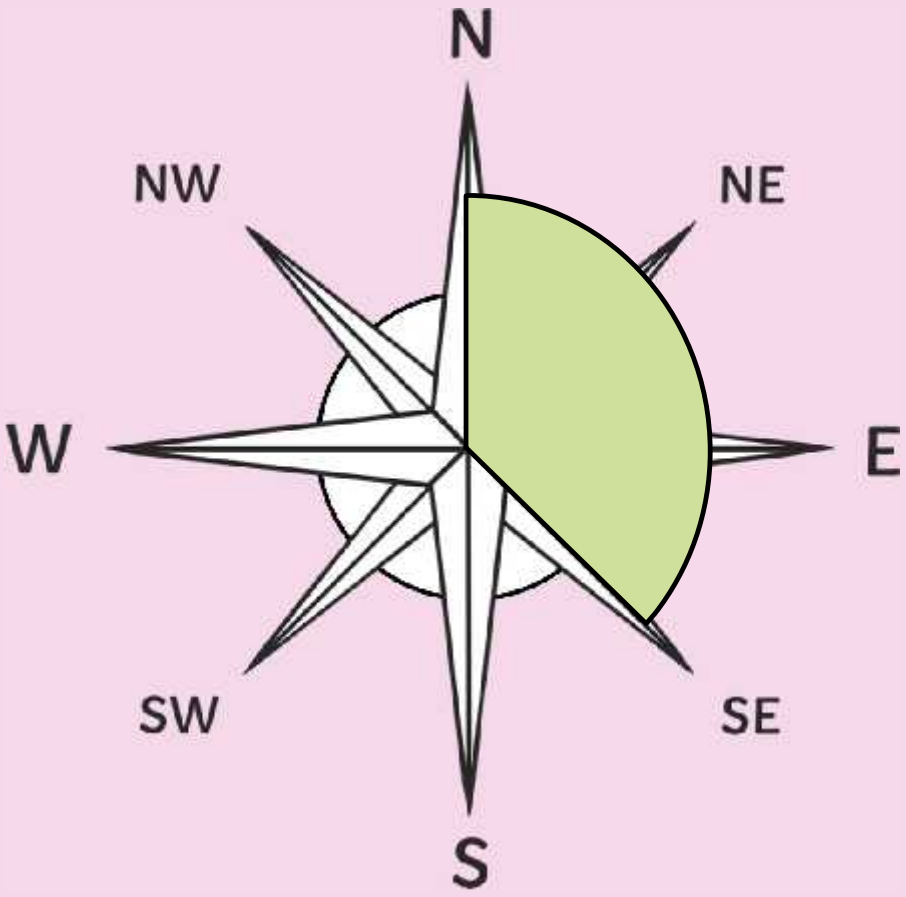
We can see that it is $\frac{1}{8}$ of a full turn.



Acute, Obtuse and Reflex Angles

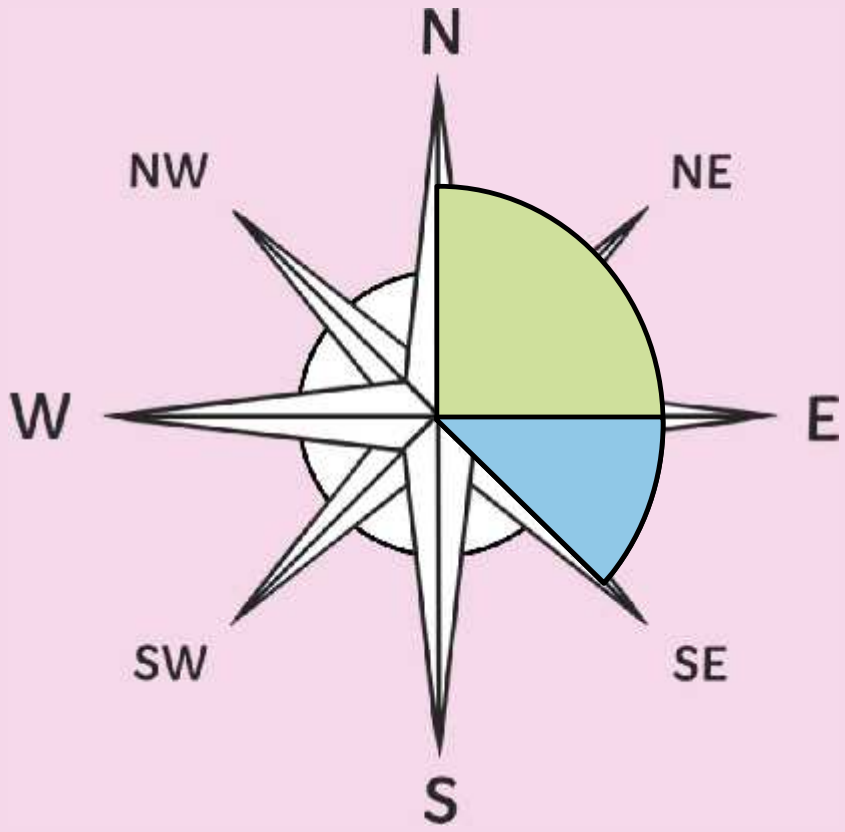
How can we calculate how many degrees this turn is?

Look at the turn shown.



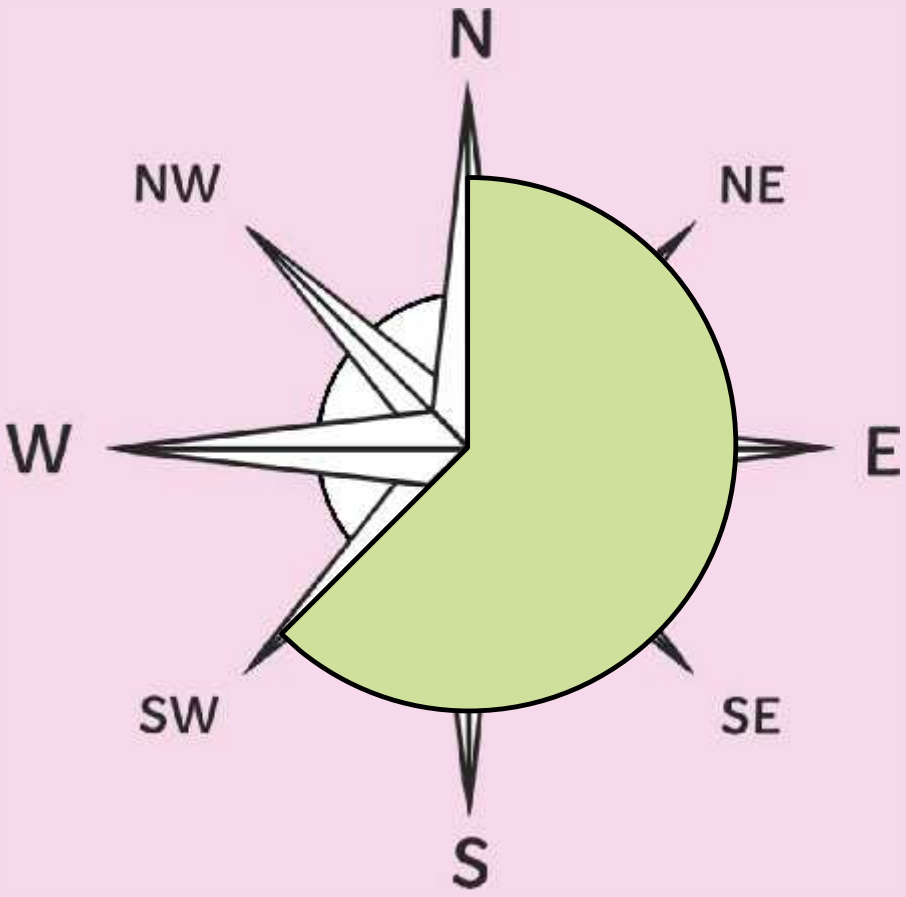
Acute, Obtuse and Reflex Angles

The measurement from N to E is 90°.
135° is an **obtuse** angle as it is greater than 90° but less than 180°.
So, 90° + 45° = 135°.



Acute, Obtuse and Reflex Angles

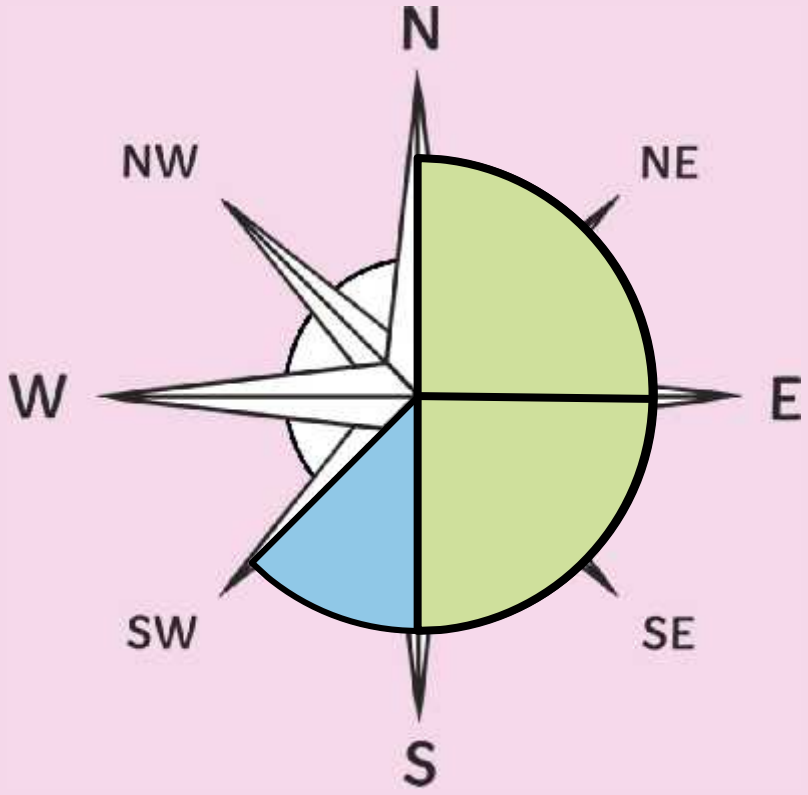
How can we calculate the number of degrees this turn is?



Acute, Obtuse and Reflex Angles

The measurement from N to E is 90°.
The measurement from E to S is 90°.
The measurement from S to SW is 45°.
So, 90° + 90° + 45° = 225°.

225° is a **reflex** angle as it is greater than 180° but less than 360°.



Acute, Obtuse and Reflex Angles

Charlie is facing the school. Discuss with a partner, what would happen if Charlie turned through 45° clockwise?

Charlie starts facing the school.

Charlie is now facing the **fire station**.

He has turned through **45** °.

This is called **an acute** angle.

Acute, Obtuse and Reflex Angles

Charlie is facing the cafe.
What would he be facing if he turned 135° anticlockwise?

Charlie starts facing the cafe.

Charlie is now facing the **school** .

He has turned through **135** °.

This is called **an obtuse** angle.

Acute, Obtuse and Reflex Angles

Charlie is facing the library.
What would he be facing if he turned 225° clockwise?

Charlie starts facing the library.

Charlie is now facing the **supermarket**.

He has turned through **225°**.

This is called **a reflex** angle.

Acute, Obtuse and Reflex Angles

Charlie is facing the hospital.
What would he be facing if he turned 315° clockwise?

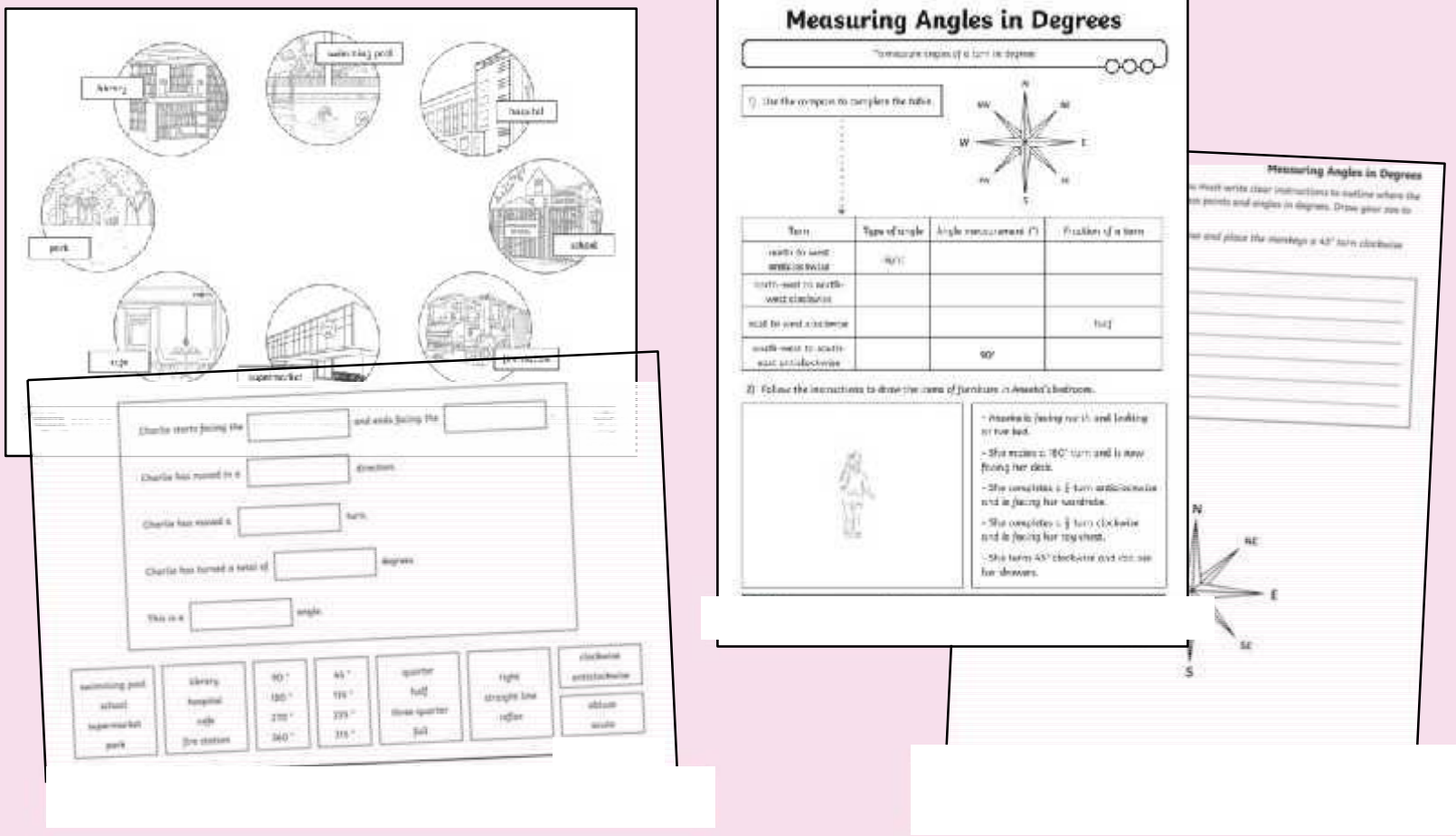
Charlie starts facing the hospital.

Charlie is now facing the **swimming pool**.

He has turned through **315°**.

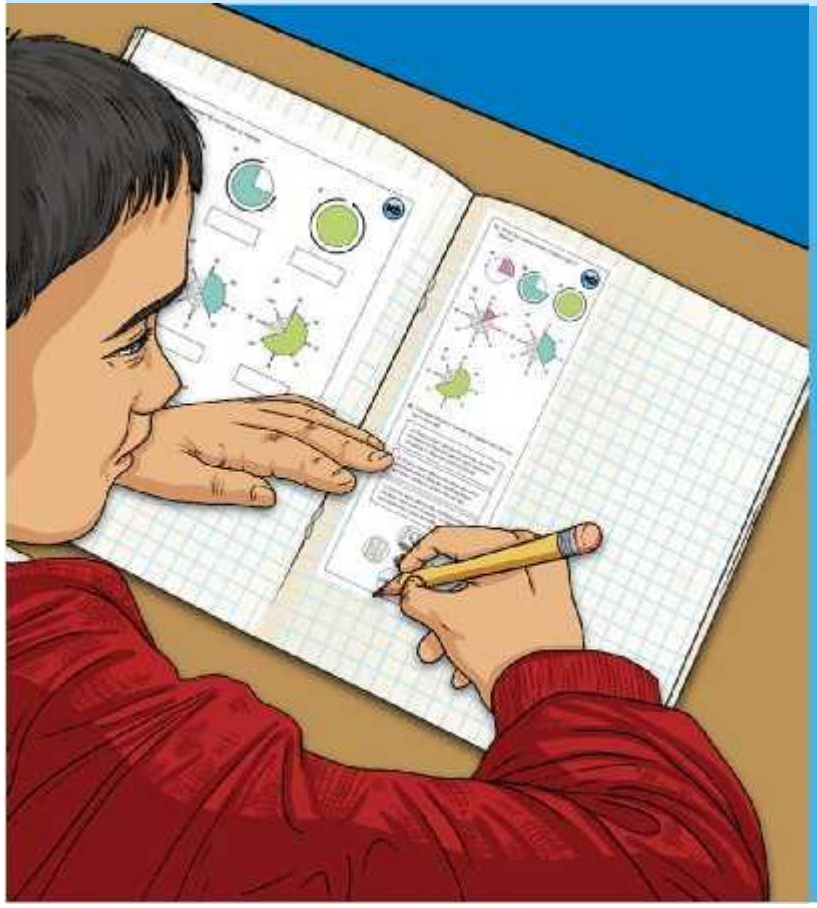
This is called **a reflex** angle.

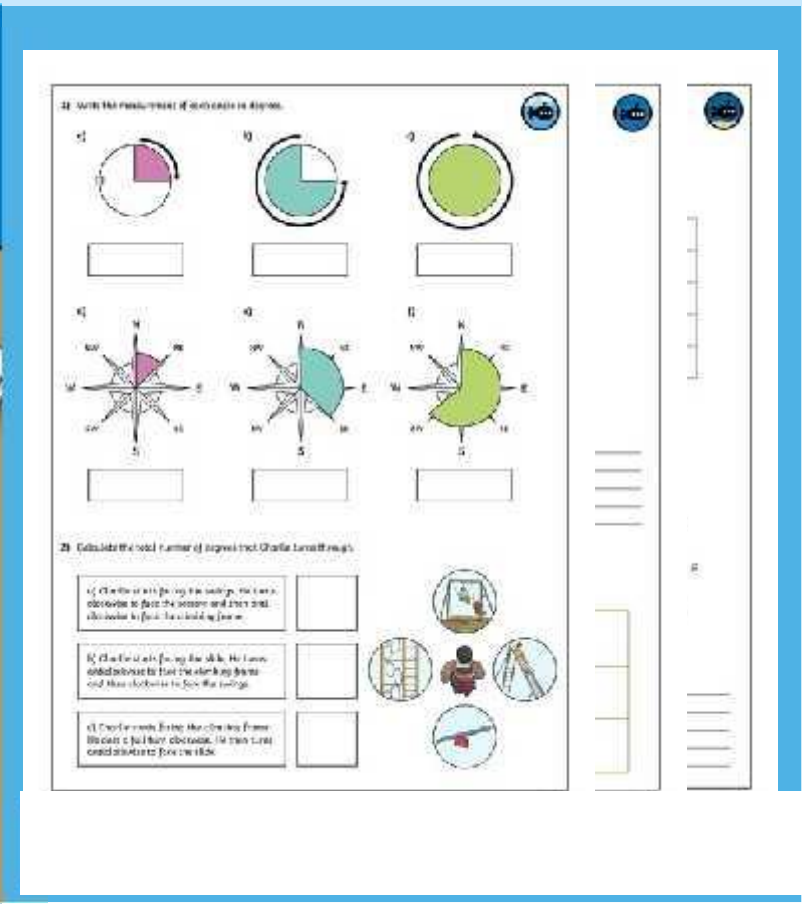
Measuring Angles in Degrees



Diving into Mastery

Dive in by completing your own activity!



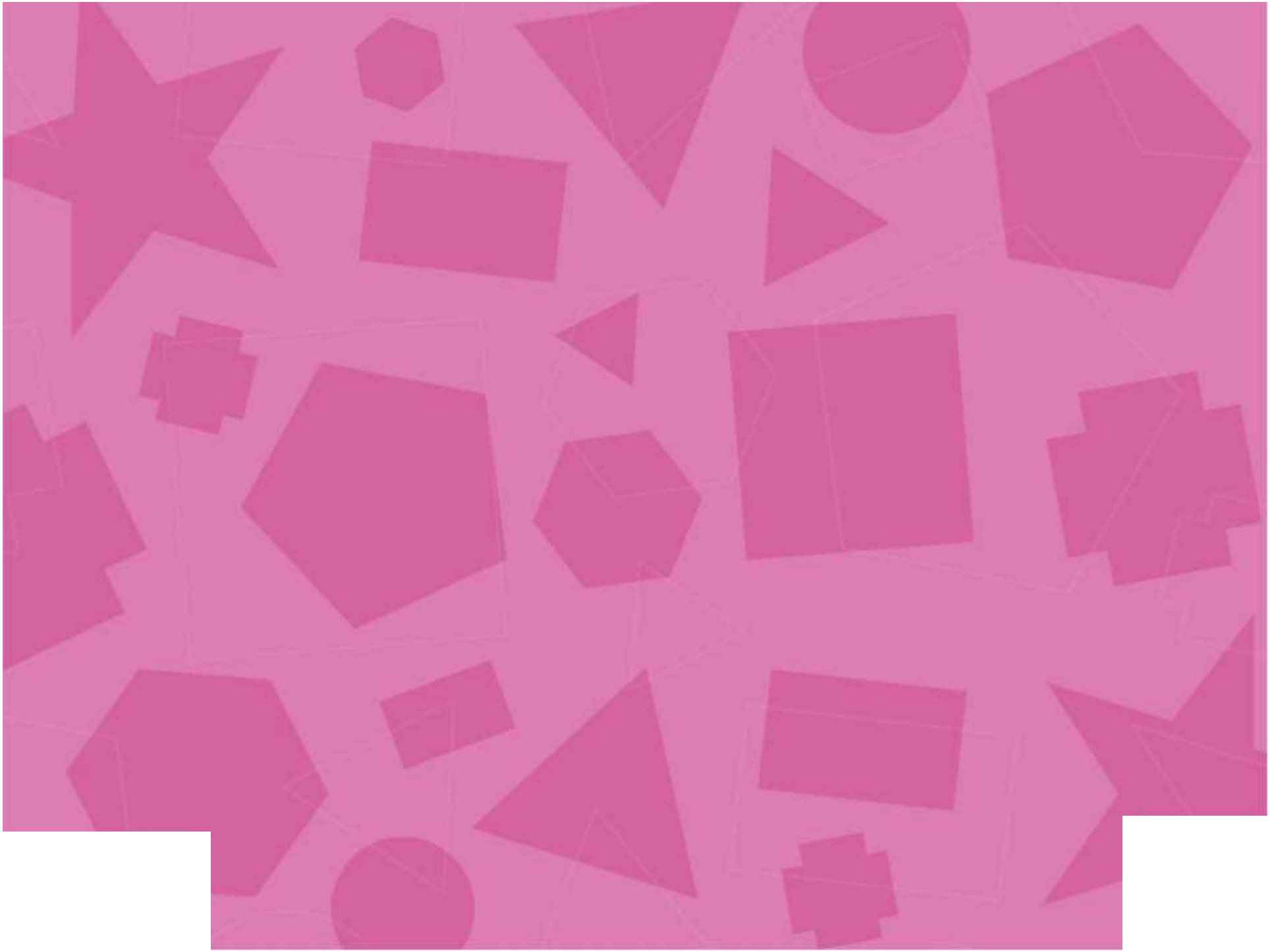


Aim

- To measure angles of a turn in degrees.

Success Criteria

- I can describe an angle as a turn.
- I can identify right, acute, obtuse and reflex angles as an angle of a turn.
- I can describe angles of a turn in degrees.



Aim: To measure angles of a turn in degrees.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can describe an angle as a turn.				**Notes/Evidence**					
I can identify right, acute, obtuse and reflex angles as an angle of a turn.									
I can describe angles of a turn in degrees.									

Next Steps

- _____
- _____

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

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I can identify right, acute, obtuse and reflex angles as an angle of a turn.									
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Next Steps

- _____
- _____

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
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1)

a) 90°

b) 270°

c) 360°

d) 45°

e) 135°

f) 225°

2)

a) 450°

b) 270°

c) 540°

1)

a)	135°	**<**	$\frac{1}{2}$ turn
b)	$\frac{3}{4}$ turn	**>**	240° + 20°
c)	$\frac{1}{4}$ turn	**=**	120° - 30°
d)	320° + 30°	**<**	a full turn

2) Sam is correct because this turn has a value of 225°

3)

Two right angles are the same amount of turn as a straight line angle.	**Always**
Angles greater than 90° are acute.	**Never**
The distance between two compass points will be obtuse.	**Sometimes**

1) Accept answers where the apple and the orange provide a total that equals 180°.

For example: 100° + 80° = 180°

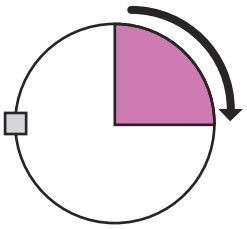
170° + 10° = 180°

2)

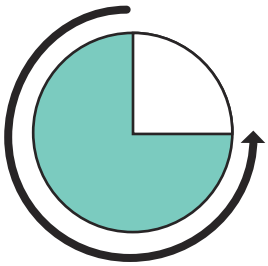
E	**SW**	**SE**	**N**

1) Write the measurement of each angle in degrees.

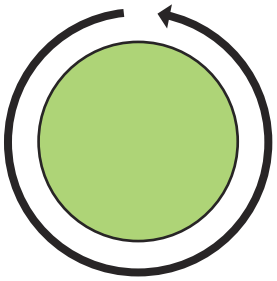
a)



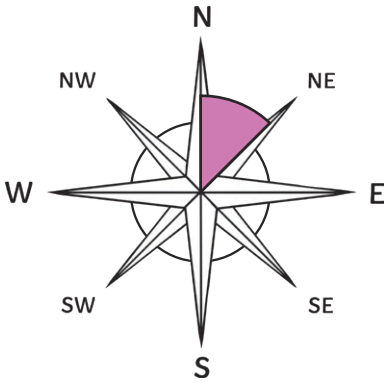
b)



c)



d)



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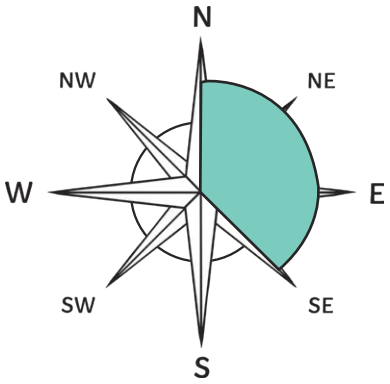

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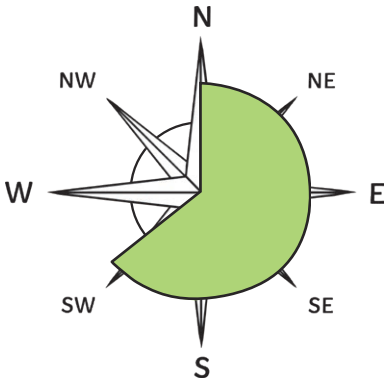

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a) Charlie starts facing the swings. He turns clockwise to face the seesaw and then anti-clockwise to face the climbing frame.	
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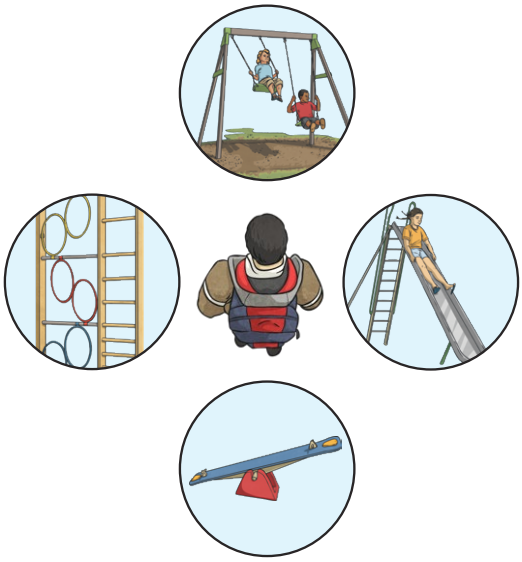

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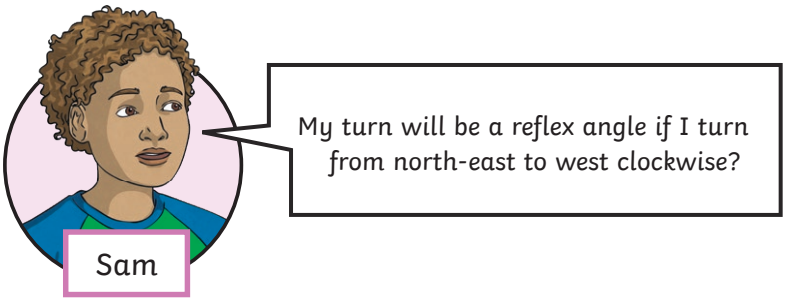
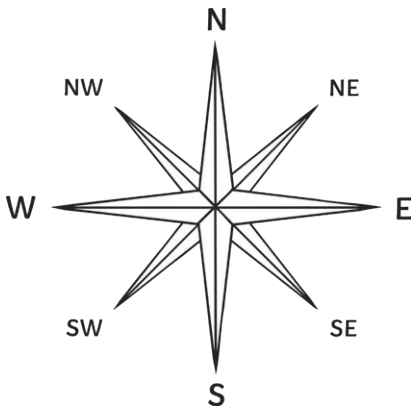


Is Sam correct? Explain your answer.



3) Label the statements with always, sometimes or never. Give reasons for your answers.

Two right angles are the same amount of turn as a straight line angle.	
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1) Complete the statement. Can you think of 5 different combinations?

+ = straight line angle

1.	
2.	
3.	
4.	
5.	

2) Follow the instructions to work out the code to unlock the cookie jar.

Imagine you are facing N. Make a $\frac{3}{4}$ turn anticlockwise.

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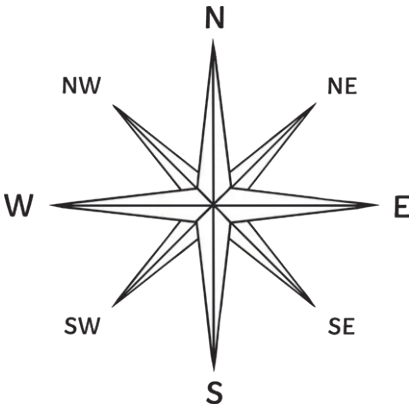
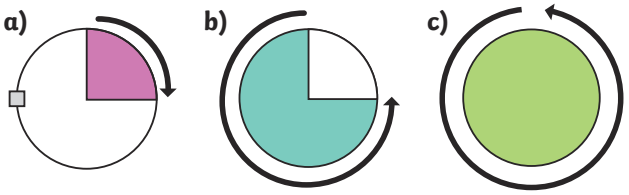
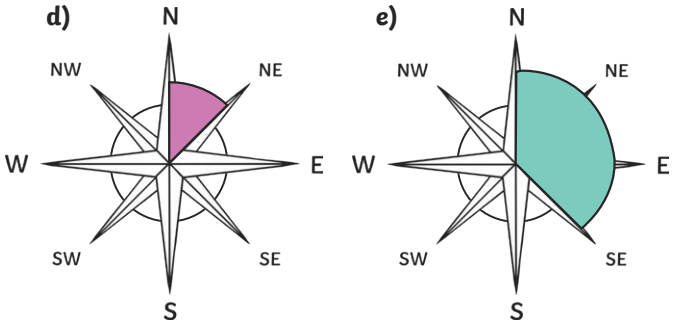
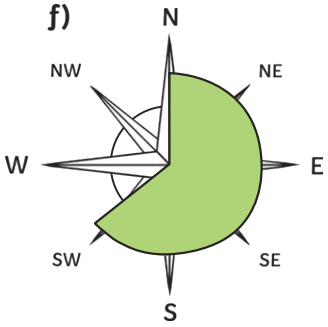


Can you find 2 other ways to write the instructions to give the same code?

1) Write the measurement of each angle in degrees.







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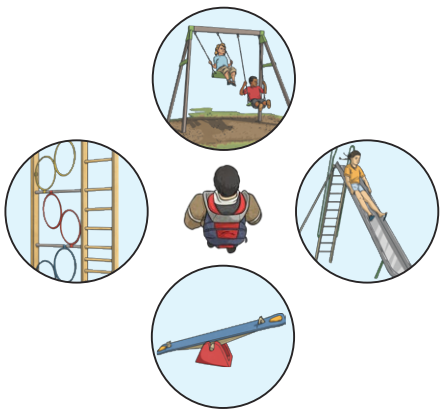

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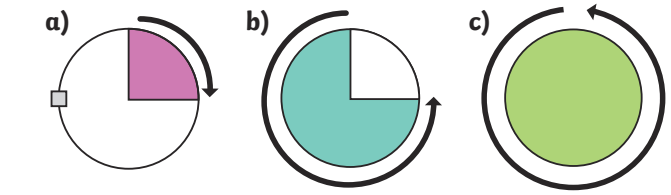

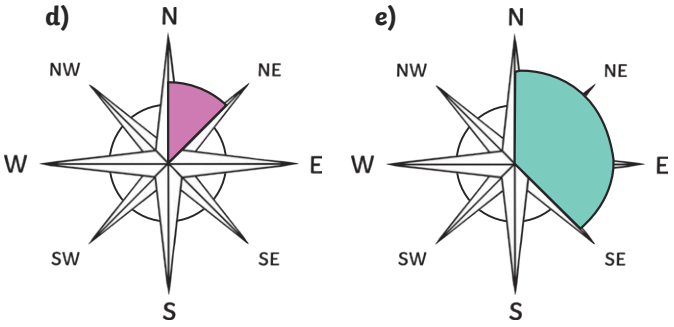

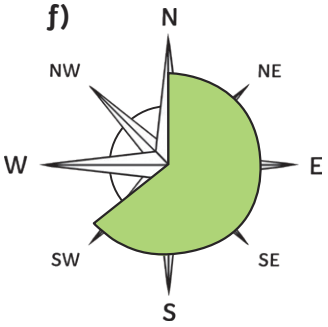

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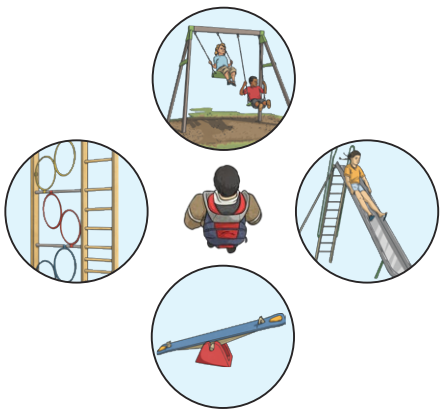

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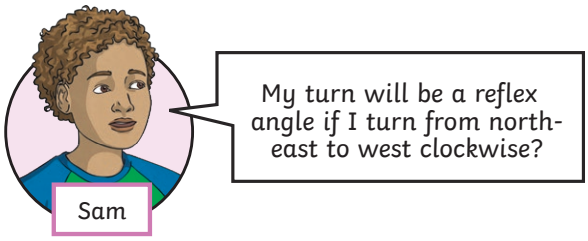

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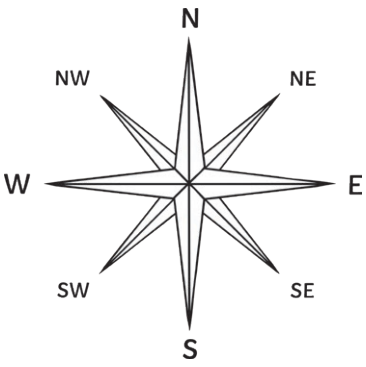

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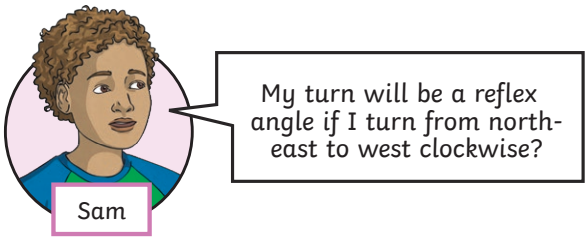

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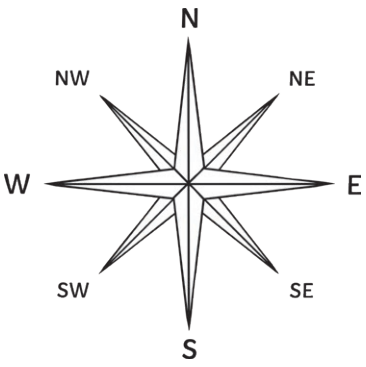

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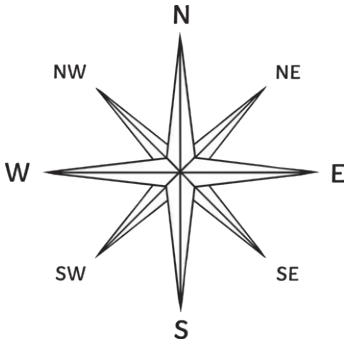

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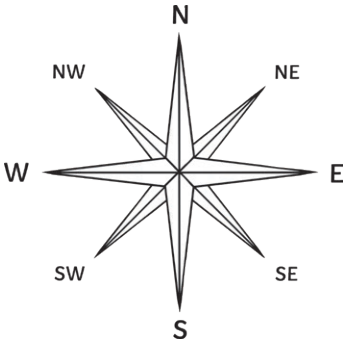

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Measuring Angles in Degrees

To measure angles of a turn in degrees

Instructions for adult guided task:

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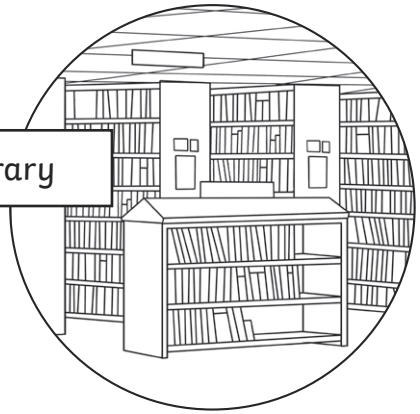
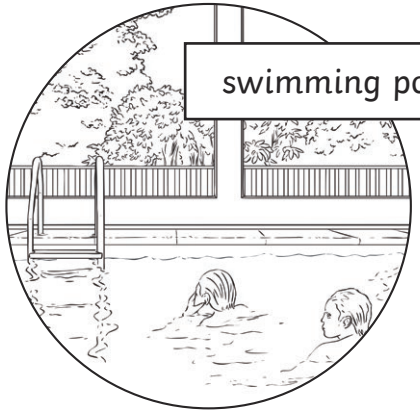
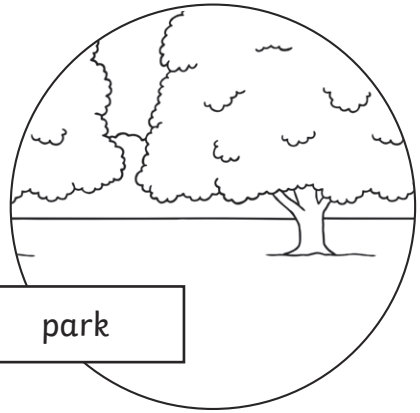


library



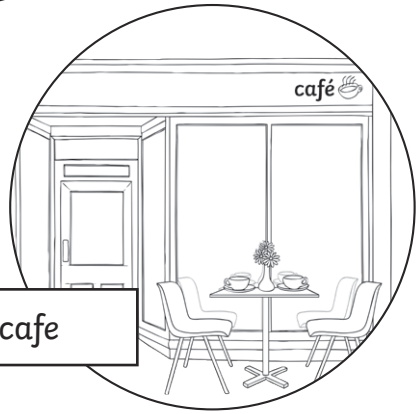
swimming pool

hospital



park

school



cafe

supermarket

fire station

Charlie starts facing the _____ and ends facing the _____ .

Charlie has moved in a _____ direction.

Charlie has moved a _____ turn.

Charlie has turned a total of _____ degrees.

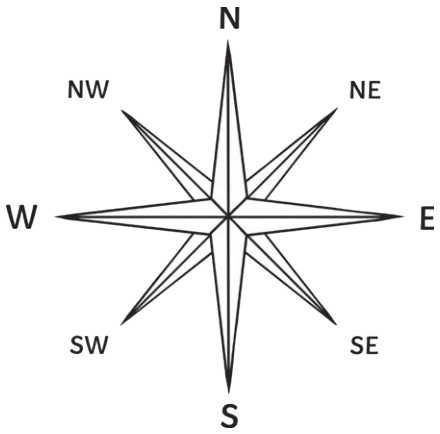
This is a _____ angle.

swimming pool school supermarket park	library hospital cafe fire station	90 ° 180 ° 270 ° 360 °	45 ° 135 ° 225 ° 315 °	quarter half three-quarter full	right straight line reflex	clockwise anticlockwise obtuse acute

Measuring Angles in Degrees

To measure angles of a turn in degrees

1) Use the compass to complete the table.



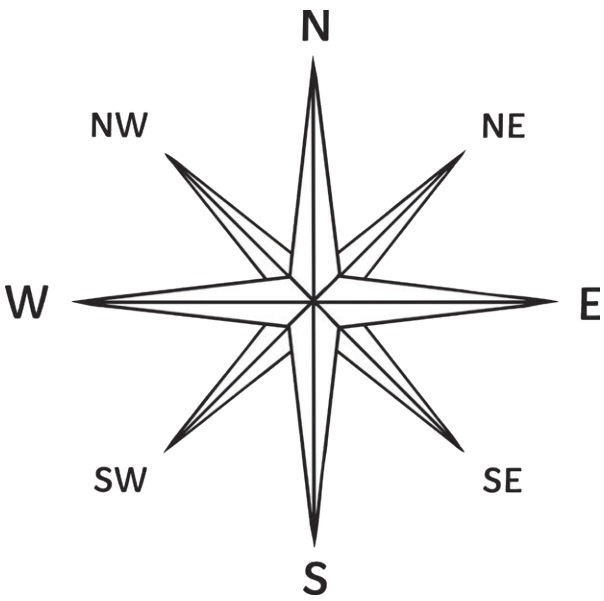
Turn	Type of angle	Angle measurement (°)	Fraction of a turn
north to west anticlockwise	right		
north-east to north-west clockwise			
east to west clockwise			half
south-west to south-east anticlockwise		90°	

2) Follow the instructions to draw the items of furniture in Aneeka's bedroom.

- Aneeka is facing north and looking at her bed.
- She makes a 180° turn and is now facing her desk.
- She completes a $\frac{1}{4}$ turn anticlockwise and is facing her wardrobe.
- She completes a $\frac{1}{2}$ turn clockwise and is facing her toy chest.
- She turns 45° clockwise and can see her drawers.

3) You are in charge of designing a zoo. You must write clear instructions to outline where the animals must be placed. Include compass points and angles in degrees. Draw your zoo to match your design brief.

Example, Place the elephants north of the zoo and place the monkeys a 45° turn clockwise from the elephants.



Measuring Angles in Degrees **Answers**

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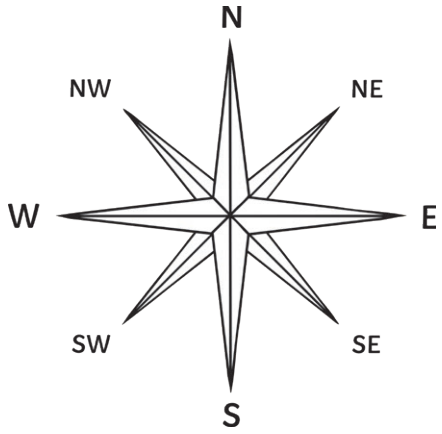

Turn	Type of angle	Angle measurement (°)	Fraction of a turn
north to west anticlockwise	right	**90°**	**$\frac{1}{4}$**
north-east to north-west clockwise	**reflex**	**270°**	**$\frac{3}{4}$**
east to west clockwise	**straight line angle**	**180°**	half
south-west to south-east anticlockwise	**right**	90°	**$\frac{1}{4}$**

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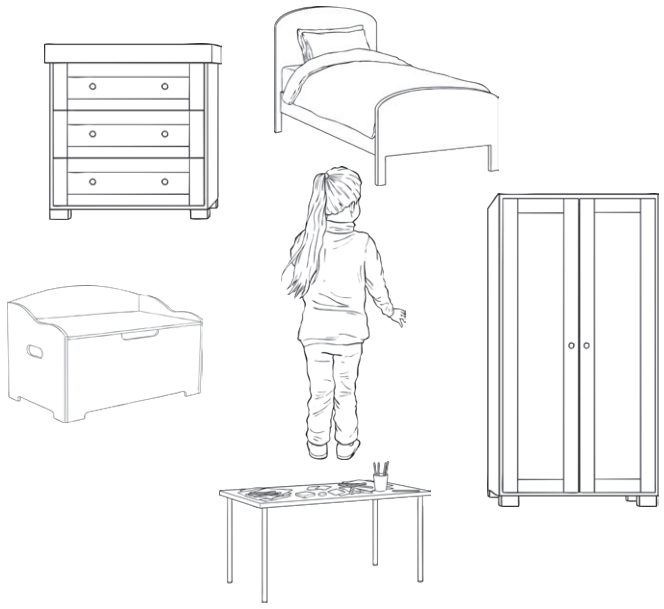

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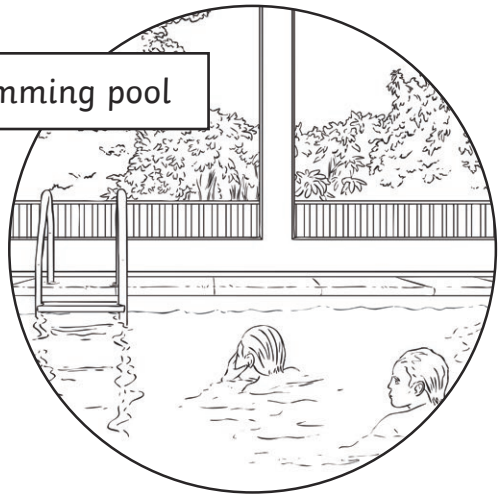
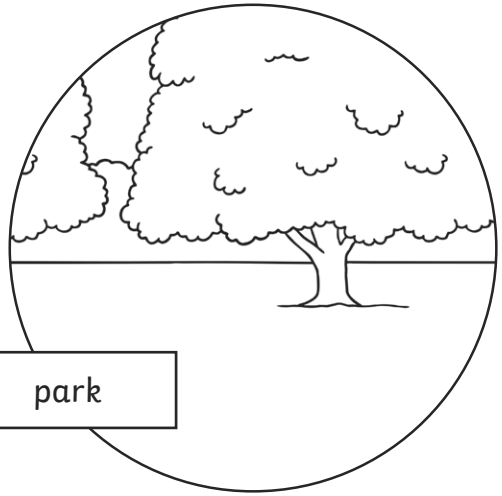
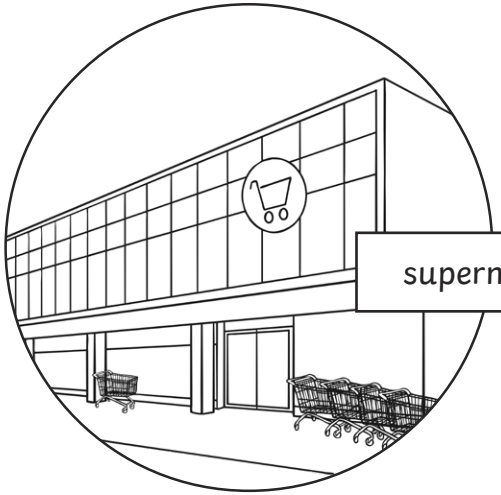
swimming pool





park

school



supermarket

Charlie starts facing the _____ and ends facing the _____ .

Charlie has moved in a _____ direction.

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Charlie has turned a total of _____ degrees.

This is a _____ angle.

swimming pool	clockwise	quarter	90 °	right
school	anticlockwise	half	180 °	straight line
supermarket		three-quarter	270 °	reflex
park		full	360 °	

Properties of Shapes | Measuring Angles in Degrees

To measure angles of a turn in degrees.		
I can describe an angle as a turn.		
I can identify right, acute, obtuse and reflex angles as an angle of a turn.		
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Properties of Shapes | Measuring Angles in Degrees

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