

Start here

Year 5 Maths - Angles - a complete week

This PDF is the whole unit, in teaching order, so you can read it on a phone without unzipping anything.

What is in this file

Every printable page — the unit plan, every lesson plan, every pupil sheet, every exit quiz and the answer keys.

What is in the ZIP instead

The slide decks, and editable Word versions of everything here. This unit has 5 decks. They are not folded into this PDF: that would run to several hundred pages and make it worse at the one job it has. Open the ZIP when you want to project or edit.

This is a complete resource, given to you free. It is not a sample or a taster. It is the same unit we sell.

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Contents — Angles

Year 5 · 5 lessons

At a glance

Each row below is a daily lesson. Open the matching file in this folder to teach.

Day 1: [Compare Angles By Eye](#)

Compare the size of angles where there is a clear visual difference.

Day 2: [Acute, Obtuse, Reflex](#)

Use the terms acute, obtuse and reflex when describing the size of angles.

Day 3: [Degrees As A Unit](#)

Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.

Day 4: [Estimate Angles In Degrees](#)

Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).

Day 5: [Measure Angles With A Protractor](#)

Use a protractor to measure the size of angles accurately.

Standards alignment

- KS2 subject content: KS2 G-1, KS2 G-2

UNIT PLAN

Angles

Year 5 · 5 daily lessons

Big picture	Pupils develop their understanding of angles: compare angles by eye, classify them (acute, obtuse, reflex, right), introduce degrees as a unit, estimate the size of angles, and measure accurately with a protractor.
Curriculum reference	Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Draw given angles, and measure them in degrees ($^{\circ}$). Identify angles at a point and one whole turn (total 360°). Identify angles at a point on a straight line and $1/2$ a turn (total 180°). Identify other multiples of 90° .
NCETM LO coverage	
Key Stage	KS2
NC subject content	KS2 G-1, KS2 G-2

Prerequisites (Prior Learning)

- Identify right angles (Y4)
- Recognise turns (Y4)

End-of-Unit Goals

- Classify angles as acute, obtuse, right or reflex
- Estimate angle sizes in degrees
- Measure angles accurately with a protractor

Concrete Resources (Whole Unit)

- Protractor (180° and 360°)
- Angle set / wedge
- Geo-strips for hinge demonstrations

Scope & Sequence

Day	Title	Learning Objective
1	Compare Angles By Eye	Compare the size of angles where there is a clear visual difference.
2	Acute, Obtuse, Reflex	Use the terms acute, obtuse and reflex when describing the size of angles.
3	Degrees As A Unit	Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.
4	Estimate Angles In Degrees	Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).
5	Measure Angles With A Protractor	Use a protractor to measure the size of angles accurately.

Compare Angles By Eye

Year 5 · Angles · Day 1 of 5

Learning objective	Compare the size of angles where there is a clear visual difference.
Pupil-friendly LO	I can say which of two angles is bigger by looking.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Angle wedges

Key Vocabulary

- **angle** — the amount of turn between two lines (arms) that meet at a point.
- **compare** — to look at two or more angles and say which is bigger or smaller.
- **rotation** — a turn around a fixed point, measured as an angle.
- **arm** — one of the two straight lines that form an angle and meet at the vertex.
- **vertex** — the point where the two arms of an angle meet.

Teacher Notes

This is the conceptual foundation for the whole unit: pupils must understand an angle as an AMOUNT OF TURN (an opening), independent of how the arms are drawn. The key misconception to pre-empt is 'longer arms = bigger angle'. Tackle it head-on in the Explore by deliberately drawing a small angle with long arms next to a large angle with short arms, then let pupils argue. Use geo-strips so they physically feel the opening change while the strip length stays the same; slide a finger up the strip to 'lengthen' the arm and show the opening is unchanged. Tracing paper is a powerful check — superimpose one opening over another. Narrate the language 'opening', 'turn', 'amount of rotation' throughout, and avoid degrees today; that unit is introduced on Day 3.

Watch Out! (Pupil-Facing)

- Pupils may think the LONGER arms mean a bigger angle. The size is the rotation between arms, not their length.

Key Questions

- (explore) These two angles have arms of different lengths. How will you decide which angle is bigger?
- (explore) If I make an angle's arms longer, does the angle get bigger? Convince me.
- (teach) Show me the OPENING of this angle — where exactly am I comparing?
- (teach) Two angles look similar. What could you do with tracing paper to check which is bigger?
- (iDoWeDo) Which feature of an angle tells us its size — the arms or the opening?
- (iDoWeDo) How could you put these three angles in order from smallest to largest by eye?
- (plenary) In your own words, what does it mean for one angle to be bigger than another?

Lesson Structure

Retrieval Starter · 5 mins

1. What is a right angle? → A quarter turn (a square corner).
2. How many right angles are there in a full turn? → 4
3. Does making an angle's arms longer make the angle bigger? → No — only the opening matters.
4. What do we call a turn around a fixed point? → A rotation.
5. How many right angles make a half turn (a straight line)? → 2

Teaching Sequence · 12 mins

Slide 1 [notice] What do you notice?

Here are two angles. Their arms are drawn at different lengths, but look carefully at how far one arm has TURNED away from the other. Which opening is bigger?

Slide 2 [dialogue] Maya and Ben argue about arm length

Slide 3 [spot-mistake] Can you spot the mistake?

Priya compares two angles to decide which is bigger.

Shown: Priya says: 'Angle X has longer arms than angle Y, so angle X is the bigger angle.'

Fix: Arm length tells us nothing about angle size. We must look at the OPENING between the arms. A small opening with long arms is still a small angle.

Slide 4 [convince-me] Convince me

Claim: Two angles can have arms of completely different lengths but still be exactly the same size.

→ Reason it out — no measuring needed yet.

Slide 5 [match-up] Order the angles by size

→ Match each angle on the left to its description on the right.

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Open a pair of geo-strips (or a hinged angle wedge) a little, then a lot. Each time, feel the OPENING grow as one strip turns away from the other. Now slide your fingers along the strips to make them 'longer' — the opening does not change. The angle is the turn, not the length.

PICTORIAL

Draw the same opening twice: once with short arms, once with long arms. Trace the curved arc between the arms with a coloured pencil — the arc looks the same size in both, because the angle is the same.

ABSTRACT

We say one angle is bigger than another when its arms have turned further apart. We compare the openings, never the arm lengths. Later we will give each opening a number of degrees.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. Compare the angle shown to a right angle (90°). Is it bigger or smaller?

Answer: 71° is smaller a right angle.

I-do 2. Ezra draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

Answer: YES if the OPENINGS are equal. Arm length doesn't affect angle size.

We-do (Class Shared Practice)

We-do 1. Compare the angle shown to a right angle (90°). Is it bigger or smaller?

Answer: 149° is bigger a right angle.

We-do 2. Sara draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

Answer: YES if the OPENINGS are equal. Arm length doesn't affect angle size.

We-do 3. Eli says the bigger angle has the longer arms. What is wrong?

Answer: Angle size = ROTATION between arms (opening), not arm length. Long arms with a small opening = small angle.

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Sara says: 'Angle A has longer arms so it must be bigger.' Test by drawing two angles with the same opening but different arm lengths. Convince me.

Answer: The SIZE of an angle is the OPENING between arms — not arm length. Two angles with same opening have the same size, regardless of arm length. Sara is wrong.

Exit Ticket (Plenary) · 3 mins

1. Compare the angle shown to a right angle (90°). Is it bigger or smaller?

Answer: 40° is smaller a right angle.

2. In your own words: angle size depends on?

Answer: The ROTATION (opening) between the arms — not arm length.

Reflection (Green Pen)

Acute, Obtuse, Reflex

Year 5 · Angles · Day 2 of 5

Learning objective	Use the terms acute, obtuse and reflex when describing the size of angles.
Pupil-friendly LO	I can classify angles as acute, obtuse or reflex.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Angle wedges
- Classification chart

Key Vocabulary

- **acute** — an angle smaller than 90 degrees.
- **obtuse** — an angle larger than 90 degrees but smaller than 180 degrees.
- **reflex** — an angle larger than 180 degrees but smaller than 360 degrees.
- **right angle** — an angle of exactly 90 degrees — a square corner.
- **classify** — to put an angle into a group such as acute, obtuse or reflex.

Teacher Notes

The killer misconception here is treating 'reflex' as a synonym for 'large/obtuse' rather than as a precise category for angles GREATER than 180°. Make the two boundaries — 90° (right angle) and 180° (straight line) — explicit physical reference points before any sorting. Use the wedge to let pupils OPEN past a square corner (now obtuse) and then open so far the arms have swept past a straight line (now reflex). Insist on the ordered chain acute < 90 < obtuse < 180 < reflex < 360 and have pupils chant it. Watch for the boundary errors: pupils often want to call 95° acute or 175° reflex. The Day-2 trap angles are 160° (obtuse, NOT reflex) and 200° (reflex, NOT obtuse) — drill both.

Watch Out! (Pupil-Facing)

- Pupils may confuse obtuse (90°-180°) with reflex (>180°).

Key Questions

- (explore) Which two angles act as our 'fences' when we sort angles, and why?
- (explore) Sort 45°, 90°, 135°, 200°, 350° — which boundary does each one fall against?
- (teach) An angle is just bigger than 90°. Is it acute or obtuse? How do you know?
- (teach) What has to be true about an angle for it to be reflex?
- (iDoWeDo) 160° — obtuse or reflex? Justify using the 180° boundary.
- (iDoWeDo) Can an angle be both obtuse and reflex at the same time? Why not?
- (plenary) Give me the size range, in degrees, for acute, obtuse and reflex angles.

Lesson Structure

Retrieval Starter · 5 mins

1. Is 30° acute or obtuse? → Acute
2. Same-length arms — does that mean two angles are the same size? → No — only the opening matters.
3. How many degrees are in a right angle? → 90°
4. Is an angle of 170° acute, obtuse or reflex? → Obtuse (it is between 90° and 180°).
5. Which is bigger, the largest acute angle or the smallest obtuse angle? → The obtuse one (obtuse starts just above 90°).

Teaching Sequence · 12 mins

Slide 1 [notice] What do you notice?

Here are four angles. The right angle (90°) and the straight line (180°) act like fences. Notice which angles are smaller than a right angle, which are between a right angle and a straight line, and which are bigger than a straight line.

Slide 2 [dialogue] Sofia and Jacob sort the angles

Slide 3 [spot-mistake] Can you spot the mistake?

Omar classifies an angle of 200° .

Shown: Omar writes: ' 200° is obtuse because it is a big angle.'

Fix: 200° is GREATER than 180° (a straight line), so it is a REFLEX angle. Obtuse angles are only between 90° and 180° .

Slide 4 [convince-me] Convince me

Claim: Every acute angle is smaller than every obtuse angle.

→ Use the boundaries 90° and 180° in your reasoning.

Slide 5 [vocab-cloze] Complete the sentence

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Open an angle wedge to a right angle (a square corner). Anything you can open SMALLER than this corner is acute. Open it past the corner but keep it less than a straight line — that is obtuse. Open it so far that it bends back past a straight line — that is reflex.

PICTORIAL

On a sorting chart, draw one angle in each box: acute (a narrow opening), obtuse (a wide opening but not flat), and reflex (an opening that has bent back on itself past a straight line).

ABSTRACT

Classify by checking the boundaries: acute $< 90^\circ$; right $= 90^\circ$; $90^\circ < \text{obtuse} < 180^\circ$; $180^\circ < \text{reflex} < 360^\circ$. Example: $250^\circ > 180^\circ$, so 250° is reflex.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. Classify the angle shown.

Answer: 60° is acute.

I-do 2. Ezra measures the angle shown. What classification?

Answer: 165° is obtuse.

We-do (Class Shared Practice)

We-do 1. Classify the angle shown.

Answer: 270° is reflex.

We-do 2. Diego measures the angle shown. What classification?

Answer: 165° is obtuse.

We-do 3. Theo classifies 200° as obtuse. What's wrong?

Answer: Obtuse is 90° - 180° . 200° is REFLEX ($>180^\circ$).

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Mira classifies a 200° angle as obtuse (because it's past 90°). Test. Convince me.

Answer: Obtuse = 90° to 180° . Reflex = $>180^\circ$. A 200° angle is REFLEX, not obtuse. Mira confused the category boundaries.

Exit Ticket (Plenary) · 3 mins

1. Classify the angle shown.

Answer: 85° is acute.

2. In your own words: classify 120° ?

Answer: Obtuse.

Reflection (Green Pen)

Degrees As A Unit

Year 5 · Angles · Day 3 of 5

Learning objective	Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.
Pupil-friendly LO	I can describe angles in degrees.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Protractor

Key Vocabulary

- **degree ($^{\circ}$)** — the unit we use to measure the size of an angle; a full turn is 360° .
- **straight line** — a half turn; the angles on it add up to 180° .
- **full turn** — a complete rotation around a point, equal to 360° .
- **around a point** — the angles that meet at one point and together make a full turn of 360° .
- **rotation** — a turn around a fixed point, measured in degrees.

Teacher Notes

Introduce the degree as the agreed unit so that angle size becomes a number we can calculate with, not just a vague comparison. Anchor everything to the three reference turns — 90° , 180° , 360° — using a physical body-turn so pupils feel a half turn really is two right angles. The two facts to embed today are: angles on a straight line sum to 180° and angles around a point sum to 360° . Model the subtraction ($180^{\circ} - \text{known} = \text{missing}$) explicitly. Two misconceptions to pre-empt: forgetting the $^{\circ}$ symbol (or writing 'deg'), and assuming a full turn is 100° by false analogy with percentages — stress that a circle is divided into 360 equal degrees by convention. The pie-chart figure (4 parts) makes the four 90° quarters of a full turn visible.

Watch Out! (Pupil-Facing)

- Pupils may forget the degree symbol or write 'deg' instead.

Key Questions

- (explore) How many degrees are in a right angle, a straight line and a full turn?
- (explore) Why is it more useful to say '120°' than to say 'a bit more than a right angle'?
- (teach) Two right angles sit side by side on a straight line. What is their total?
- (teach) Angles around a point make a full turn. What do they always sum to?
- (iDoWeDo) On a straight line, one angle is 130° . How do you work out the other?
- (iDoWeDo) Three angles around a point are 120° , 150° and one more. How big is the last angle?
- (plenary) Why must you always write the degree symbol after the number?

Lesson Structure

Retrieval Starter · 5 mins

1. A right angle = $90^\circ \rightarrow 90^\circ$
2. What range of degrees is an acute angle? $\rightarrow$ Greater than 0° and less than 90° .
3. How many degrees are in a full turn? $\rightarrow 360^\circ$
4. Angles on a straight line add up to how many degrees? $\rightarrow 180^\circ$
5. On a straight line, one angle is 60° . What is the other? $\rightarrow 120^\circ$ (because $180^\circ - 60^\circ = 120^\circ$).

Teaching Sequence · 13 mins

Slide 1 [notice] What do you notice?

A full turn is split into 360 equal parts. Each part is one degree (1°). Notice the special turns: a quarter turn is 90° , a half turn (straight line) is 180° , and a full turn is 360° .

Slide 2 [dialogue] Aisha and Tom add up a straight line

Slide 3 [spot-mistake] Can you spot the mistake?

Leah writes the size of an angle.

Shown: Leah writes the angle as '90' with no symbol, and reads a full turn as 100 because 'numbers go up in hundreds'.

Fix: Always write the degree symbol: 90° . And a full turn is 360° , NOT 100 — a circle is divided into 360 equal degrees.

Slide 4 [convince-me] Convince me

Claim: Angles on a straight line always add up to 180° .

$\rightarrow$ Reason from the idea of a half turn.

Slide 5 [match-up] Match the turn to its degrees

$\rightarrow$ Match each turn on the left to the correct number of degrees on the right.

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Stand up and make a full turn on the spot — that whole turn is 360° . Turn just a quarter (face the next wall) — that is 90° . Turn to face the opposite wall (a half turn) — that is 180° . Feel each special turn in your body.

PICTORIAL

On a circle, shade a quarter (90°), then a half (180°), then three-quarters (270°). Each quarter you shade adds another 90° , and the whole circle is 360° .

ABSTRACT

Use the unit: a right angle is 90° , a straight line is 180° , a full turn is 360° . Angles on a straight line sum to 180° ; angles around a point sum to 360° . Example: $180^\circ - 110^\circ = 70^\circ$.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)

Answer: 135°

I-do 2. Kai draws a full turn and asks how many degrees. Answer?

Answer: 360° .

We-do (Class Shared Practice)

We-do 1. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)

Answer: 90°

We-do 2. Tess draws a full turn and asks how many degrees. Answer?

Answer: 360° .

We-do 3. A pupil writes 90 without the degree symbol. What's missing?

Answer: The ° symbol. Always include it for angles. 90° not 90.

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Sara says: 'Angle A has longer arms so it must be bigger.' Test by drawing two angles with the same opening but different arm lengths. Convince me.

Answer: The SIZE of an angle is the OPENING between arms — not arm length. Two angles with same opening have the same size, regardless of arm length. Sara is wrong.

Exit Ticket (Plenary) · 3 mins

1. How many degrees in the angle shown? (Reference: right = 90°, straight = 180°, full turn = 360°.)

Answer: 135°

2. In your own words: degree symbol?

Answer: ° — always include after the number.

Reflection (Green Pen)

Estimate Angles In Degrees

Year 5 · Angles · Day 4 of 5

Learning objective	Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).
Pupil-friendly LO	I can estimate angle sizes in degrees.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Angle set

Key Vocabulary

- **estimate** — to make a sensible guess of an angle's size without measuring it exactly.
- **reference angle** — a known angle, such as 90° , used to judge how big another angle is.
- **benchmark** — a familiar angle (like 45° , 90° or 180°) you compare against to estimate.
- **right angle** — an angle of exactly 90 degrees — the most useful reference angle.
- **approximately** — close to, but not exactly; we say 'about' when we estimate.

Teacher Notes

The purpose of estimating is twofold: it builds angle sense, and it is the safety net that catches protractor errors on Day 5 (reading the wrong scale typically produces an answer that is 180° minus the true value, or wildly off). Teach pupils to ALWAYS compare to a right angle first — opening inside 90° means estimate below 90° , opening outside means above. Pre-empt the misconception of estimating by arm length (carried over from Day 1) and the misconception of guessing wildly without anchoring to a benchmark. Model the benchmarks 45° , 90° , 135° , 180° and the language 'a bit more than', 'about half of'. Stress the routine 'estimate, then measure, then check the measurement is close to the estimate' so it becomes habit before the protractor lesson.

Watch Out! (Pupil-Facing)

- Pupils may estimate based on arm length.

Key Questions

- (explore) Which reference angles do you already know well enough to estimate with?
- (explore) Why estimate at all if we have a protractor to measure exactly?
- (teach) Is this angle's opening inside or outside a right angle? So is your estimate above or below 90° ?
- (teach) Which benchmark — 45° , 90° , 135° or 180° — is this angle closest to?
- (iDoWeDo) You estimated 40° . When you measure, you get 220° . What does that tell you?
- (iDoWeDo) How would you estimate an angle that is just less than a straight line?
- (plenary) How does a sensible estimate protect you from a measuring mistake?

Lesson Structure

Retrieval Starter · 5 mins

1. Half of $90^\circ = ? \rightarrow 45^\circ$
2. A full turn = $?\circ \rightarrow 360^\circ$
3. Angles on a straight line sum to $?\circ \rightarrow 180^\circ$
4. Is an angle clearly narrower than a right angle more or less than 90° ? $\rightarrow$ Less than 90° .
5. Three-quarters of a right angle is about how many degrees? $\rightarrow$ About 67° – 68° (roughly 70°).

Teaching Sequence · 12 mins

Slide 1 [notice] What do you notice?

Estimate before you measure. Use the reference angles you know — 90° (a right angle), 45° (half of a right angle) and 180° (a straight line) — to judge each angle. Notice how each one compares to a right angle.

Slide 2 [dialogue] Noah and Grace estimate an angle

Slide 3 [spot-mistake] Can you spot the mistake?

Ella estimates an angle that is clearly less than a right angle.

Shown: Ella estimates the angle as 130° , even though its opening is narrower than a square corner.

Fix: An angle narrower than a right angle MUST be less than 90° . A sensible estimate here is around 40° – 50° , not 130° . Always compare to 90° first.

Slide 4 [convince-me] Convince me

Claim: If an angle's opening is narrower than a right angle, your estimate should be less than 90° .

$\rightarrow$ Reason using the 90° reference angle.

Slide 5 [vocab-cloze] Complete the sentence

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Hold up the corner of a book or an angle wedge set to 90° next to the angle you want to estimate. If the angle's opening fits INSIDE the right angle, your estimate must be less than 90° . If it spills outside, estimate more than 90° .

PICTORIAL

Draw the angle and lightly sketch a right-angle corner over its vertex. Compare the opening to the corner: clearly inside $\rightarrow$ about 45° ; just past the corner $\rightarrow$ about 100° – 110° .

ABSTRACT

Estimate using benchmarks: about 45° (half a right angle), 90° (right angle), 135° (between a right angle and a straight line), 180° (straight line). Choose the nearest benchmark, then refine. Example estimate: 'a bit more than 90° , so about 100° '.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. Estimate the angle shown. Closer to 90° or 180° ? What category?

Answer: 220° — reflex.

I-do 2. Fatima sees an angle that looks half of a right angle. Estimate degrees.

Answer: $45^\circ (= 90^\circ / 2)$.

We-do (Class Shared Practice)

We-do 1. Estimate the angle shown. Closer to 90° or 180° ? What category?

Answer: 160° — obtuse.

We-do 2. Theo sees an angle that looks half of a right angle. Estimate degrees.

Answer: $45^\circ (= 90^\circ / 2)$.

We-do 3. Sara estimates an angle as 200° but it looks acute. What is wrong?

Answer: Acute angles are $< 90^\circ$. 200° is reflex (more than half a turn). Sara confused acute with reflex.

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Mira classifies a 200° angle as obtuse (because it's past 90°). Test. Convince me.

Answer: Obtuse = 90° to 180° . Reflex = $>180^\circ$. A 200° angle is REFLEX, not obtuse. Mira confused the category boundaries.

Exit Ticket (Plenary) · 3 mins

1. Estimate the angle shown. Closer to 90° or 180° ? What category?

Answer: 135° — obtuse.

2. In your own words: angle just over 90° ?

Answer: Obtuse ($\sim 95^\circ$ - 100°).

Reflection (Green Pen)

Measure Angles With A Protractor

Year 5 · Angles · Day 5 of 5

Learning objective	Use a protractor to measure the size of angles accurately.
Pupil-friendly LO	I can use a protractor to measure an angle in degrees.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Protractor
- Ruler

Key Vocabulary

- **protractor** — a tool with a scale of degrees used to measure or draw angles.
- **centre** — the middle point of the protractor that you line up with the angle's vertex.
- **baseline** — the straight 0° line on a protractor you line up along one arm of the angle.
- **scale** — the row of numbers on the protractor; there are two, running in opposite directions.
- **measure** — to find the exact size of an angle in degrees using a protractor.

Teacher Notes

This lesson pulls the unit together: pupils MEASURE accurately and then CLASSIFY. The dominant misconception is reading the wrong scale (inner vs outer), which gives the supplement of the true angle (180° minus the answer). The single most effective defence is the Day-4 routine: estimate first. Drill the three-step protocol — (1) centre on vertex, (2) baseline along one arm at 0° , (3) read up the SAME scale that started at 0° on that arm. Make the estimate-versus-measurement check non-negotiable: if they disagree wildly, the most likely cause is the wrong scale, and the fix is 180° minus the reading. Also watch for the protractor centre being off the vertex and for not holding the protractor still. Finish by classifying each measured angle so pupils connect measuring back to Day 2's vocabulary.

Watch Out! (Pupil-Facing)

- Pupils may read the WRONG scale on the protractor (inside vs outside). Always start at 0° .

Key Questions

- (explore) What must line up with the vertex before you can measure? What must line up with one arm?
- (explore) Why does a protractor have two scales of numbers?
- (teach) I lined the baseline along this arm. Which 0° do I start counting from?
- (teach) My estimate was 50° but the protractor shows 130° . What has gone wrong and how do I fix it?
- (iDoWeDo) The two scales for one angle add to 180° . How does that help me pick the right reading?
- (iDoWeDo) After measuring, how do I classify the angle as acute, right or obtuse?
- (plenary) List the three steps for measuring an angle accurately, in order.

Lesson Structure

Retrieval Starter · 5 mins

1. Estimate an angle that is a bit less than 90° . → About 75° – 85° .
2. An angle measured at 120° — is it acute or obtuse? → Obtuse
3. The two protractor scales for one angle add up to how many degrees? → 180°
4. You read 160° but estimated 20° . What is the true angle? → 20° ($180^\circ - 160^\circ = 20^\circ$) — you read the wrong scale.
5. What part of the protractor must sit on the vertex of the angle? → The centre (the cross or hole).

Teaching Sequence · 13 mins

Slide 1 [notice] What do you notice?

To measure an angle, place the protractor's CENTRE on the vertex and line the BASELINE (the 0° line) along one arm. Then read up from 0° along the SAME scale until you reach the other arm. Notice this angle has been estimated at about 50° first.

Slide 2 [dialogue] Hassan and Lily read the protractor

Slide 3 [spot-mistake] Can you spot the mistake?

Zara measures an acute angle with her protractor.

Shown: Zara lines the baseline up correctly but reads the OUTER scale, getting 150° for an angle that is clearly less than a right angle.

Fix: The angle is acute (less than 90°), so 150° is impossible. Zara read the wrong scale. Reading from 0° on the inner scale gives the correct answer of 30° .

Slide 4 [convince-me] Convince me

Claim: If you estimate an angle first, you will never accidentally record the wrong protractor scale.

→ Reason about how the two scales differ.

Slide 5 [match-up] Match the measured angle to its classification

→ Match each measured angle on the left to its correct name on the right.

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Place a real protractor flat on the angle. Slide it so the small cross/hole at its CENTRE sits exactly on the vertex, then rotate it until the 0° baseline lies along one arm. Hold it still — the protractor must not move while you read.

PICTORIAL

Draw the angle, mark the vertex, and shade the arm you start from. Trace from 0° on that arm, following the SAME scale, round to the second arm — the number you land on is the angle.

ABSTRACT

Record the measurement with the degree symbol and check it against your estimate. If estimate $\approx 60^\circ$ and the protractor reads 120° , you read the wrong scale: the true value is $180^\circ - 120^\circ = 60^\circ$. Then classify: 60° is acute.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. Measure the angle shown. Kira reads 60° on the protractor. What category?

Answer: 60° — acute.

I-do 2. Rafi uses a protractor. Where do they line up?

Answer: Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.

We-do (Class Shared Practice)

We-do 1. Measure the angle shown. Kai reads 30° on the protractor. What category?

Answer: 30° — acute.

We-do 2. Theo uses a protractor. Where do they line up?

Answer: Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.

We-do 3. A pupil measures an angle and gets 60° (inside scale) AND 120° (outside scale). Which is right?

Answer: Estimate first. If the angle looks ACUTE, read the smaller value. If OBTUSE, read the bigger. Always reason from estimation.

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Tia measures an angle with a protractor and gets 60° (reading inside scale) BUT 120° on the outside scale. Test which is right. Convince me.

Answer: Depends on the ARM you align with 0° . If the arm is on the right and the opening goes anticlockwise, read inside; if clockwise, read outside. Always check by ESTIMATING first — is it bigger or smaller than 90° ?

Exit Ticket (Plenary) · 3 mins

1. Measure the angle shown. Sara reads 45° on the protractor. What category?

Answer: 45° — acute.

2. In your own words: inner vs outer scale?

Answer: Depends which arm is on 0° . Use estimation to pick the scale.

Reflection (Green Pen)

How to use this pack

Angles

1. Before the lesson (5 minutes)

- Open the .pptx and skim the slides — they mirror the lesson plan.
- Skim the teacher lesson plan (.docx). Note the timing, key questions, common misconceptions.
- Print the pupils worksheet front-to-back, one per learner.

2. During the lesson

- Recap → Retrieval → Explore → Vocab → Teach → CPA → I-do / We-do → You-do → Exit ticket → Green-pen reflection.
- Use the I-do slides to model, the We-do slides as shared practice with mini-whiteboards.
- Send pupils to their tier (Support / Core / Stretch) on the worksheet — they pick or you assign.

3. After the lesson

- Mark the worksheet using the answer-key page (last page, teacher reference).
- Run the exit quiz in the last 5 minutes for fast formative data.
- Note any common misconception for the next lesson's retrieval starter.

Suggested unit pacing

- Day 1 sets the foundation — don't skip it even if pupils have seen the topic before.
- Use the master unit plan (00-*-unit-plan.docx) as a pre-read; teach from the per-day .pptx files.
- The mid-unit consolidation day is built in — use the exit-quiz data to set re-teaches.

Compare Angles By Eye

Year 5 · Angles · Day 1 of 5

Learning objective	Compare the size of angles where there is a clear visual difference.
Pupil-friendly LO	I can say which of two angles is bigger by looking.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Angle wedges

Key Vocabulary

- **angle** — the amount of turn between two lines (arms) that meet at a point.
- **compare** — to look at two or more angles and say which is bigger or smaller.
- **rotation** — a turn around a fixed point, measured as an angle.
- **arm** — one of the two straight lines that form an angle and meet at the vertex.
- **vertex** — the point where the two arms of an angle meet.

Teacher Notes

This is the conceptual foundation for the whole unit: pupils must understand an angle as an AMOUNT OF TURN (an opening), independent of how the arms are drawn. The key misconception to pre-empt is 'longer arms = bigger angle'. Tackle it head-on in the Explore by deliberately drawing a small angle with long arms next to a large angle with short arms, then let pupils argue. Use geo-strips so they physically feel the opening change while the strip length stays the same; slide a finger up the strip to 'lengthen' the arm and show the opening is unchanged. Tracing paper is a powerful check — superimpose one opening over another. Narrate the language 'opening', 'turn', 'amount of rotation' throughout, and avoid degrees today; that unit is introduced on Day 3.

Watch Out! (Pupil-Facing)

- Pupils may think the LONGER arms mean a bigger angle. The size is the rotation between arms, not their length.

Key Questions

- (explore) These two angles have arms of different lengths. How will you decide which angle is bigger?
- (explore) If I make an angle's arms longer, does the angle get bigger? Convince me.
- (teach) Show me the OPENING of this angle — where exactly am I comparing?
- (teach) Two angles look similar. What could you do with tracing paper to check which is bigger?
- (iDoWeDo) Which feature of an angle tells us its size — the arms or the opening?
- (iDoWeDo) How could you put these three angles in order from smallest to largest by eye?
- (plenary) In your own words, what does it mean for one angle to be bigger than another?

Lesson Structure

Retrieval Starter · 5 mins

1. What is a right angle? → A quarter turn (a square corner).
2. How many right angles are there in a full turn? → 4
3. Does making an angle's arms longer make the angle bigger? → No — only the opening matters.
4. What do we call a turn around a fixed point? → A rotation.
5. How many right angles make a half turn (a straight line)? → 2

Teaching Sequence · 12 mins

Slide 1 [notice] What do you notice?

Here are two angles. Their arms are drawn at different lengths, but look carefully at how far one arm has TURNED away from the other. Which opening is bigger?

Slide 2 [dialogue] Maya and Ben argue about arm length

Slide 3 [spot-mistake] Can you spot the mistake?

Priya compares two angles to decide which is bigger.

Shown: Priya says: 'Angle X has longer arms than angle Y, so angle X is the bigger angle.'

Fix: Arm length tells us nothing about angle size. We must look at the OPENING between the arms. A small opening with long arms is still a small angle.

Slide 4 [convince-me] Convince me

Claim: Two angles can have arms of completely different lengths but still be exactly the same size.

→ Reason it out — no measuring needed yet.

Slide 5 [match-up] Order the angles by size

→ Match each angle on the left to its description on the right.

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Open a pair of geo-strips (or a hinged angle wedge) a little, then a lot. Each time, feel the OPENING grow as one strip turns away from the other. Now slide your fingers along the strips to make them 'longer' — the opening does not change. The angle is the turn, not the length.

PICTORIAL

Draw the same opening twice: once with short arms, once with long arms. Trace the curved arc between the arms with a coloured pencil — the arc looks the same size in both, because the angle is the same.

ABSTRACT

We say one angle is bigger than another when its arms have turned further apart. We compare the openings, never the arm lengths. Later we will give each opening a number of degrees.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. Compare the angle shown to a right angle (90°). Is it bigger or smaller?

Answer: 71° is smaller a right angle.

I-do 2. Ezra draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

Answer: YES if the OPENINGS are equal. Arm length doesn't affect angle size.

We-do (Class Shared Practice)

We-do 1. Compare the angle shown to a right angle (90°). Is it bigger or smaller?

Answer: 149° is bigger a right angle.

We-do 2. Sara draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

Answer: YES if the OPENINGS are equal. Arm length doesn't affect angle size.

We-do 3. Eli says the bigger angle has the longer arms. What is wrong?

Answer: Angle size = ROTATION between arms (opening), not arm length. Long arms with a small opening = small angle.

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Sara says: 'Angle A has longer arms so it must be bigger.' Test by drawing two angles with the same opening but different arm lengths. Convince me.

Answer: The SIZE of an angle is the OPENING between arms — not arm length. Two angles with same opening have the same size, regardless of arm length. Sara is wrong.

Exit Ticket (Plenary) · 3 mins

1. Compare the angle shown to a right angle (90°). Is it bigger or smaller?

Answer: 40° is smaller a right angle.

2. In your own words: angle size depends on?

Answer: The ROTATION (opening) between the arms — not arm length.

Reflection (Green Pen)

LO: Compare the size of angles where there is a clear visual difference.

Name: _____

Date: _____

GREEN TASK

GREEN · Practice.

Answer in your book.

- 1.** Compare the angle shown to a right angle (90°). Is it bigger or smaller?



-
- 2.** Compare the angle shown to a right angle (90°). Is it bigger or smaller?



-
- 3.** Compare the angle shown to a right angle (90°). Is it bigger or smaller?



-
- 4.** Compare the angle shown to a right angle (90°). Is it bigger or smaller?



-
- 5.** Emma draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

-
- 6.** Zara draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

-
- 7.** Compare angles.

a) 45° vs 90°

b) 180° vs 175°

c) Same opening but different arm lengths — same angle?

8. Eli says the bigger angle has the longer arms. What is wrong?

9. Fill in: rotation · arm · degrees · opening

An angle is a measure of _____ between two _____ s. It is measured in _____ ($^{\circ}$). The _____ between the arms is the size — not how long the arms are.

10. TRUE or FALSE: A longer arm = bigger angle.

11. Order angles: A: 45° , B: 90° , C: 130° , D: 200° .

12. Omar draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

LO: Compare the size of angles where there is a clear visual difference.

Name: _____

Date: _____

BLUE TASK

BLUE · Practice with pictures and sentence starters.

Answer in your book.

- 1.** Compare the angle shown to a right angle (90°). Is it bigger or smaller?



- 2.** Compare the angle shown to a right angle (90°). Is it bigger or smaller?



- 3.** Vik draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

- 4.** Amir draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

- 5.** Fill in: rotation · arm · degrees · opening

An angle is a measure of _____ between two _____ s. It is measured in _____ ($^\circ$). The _____ between the arms is the size — not how long the arms are.

PURPLE TASK

PURPLE · Extra challenge — multi-step reasoning and worded problems.

Answer in your book.

1. Compare the angle shown to a right angle (90°). Is it bigger or smaller?



-
2. Two angles add to 90° . One is 35° . Find the other.

-
3. Three angles meet at a point and total 360° . Two are 90° and 120° . Find the third.

-
4. In your own words: when comparing angles, what matters?

-
5. List FIVE angles smaller than a right angle.
-

LO: Compare the size of angles where there is a clear visual difference.

Name: _____

Date: _____

DIG DEEPER · Challenge

Dig Deeper · Show all your thinking and working out.

★ **Challenge 1.** Sara says: 'Angle A has longer arms so it must be bigger.' Test by drawing two angles with the same opening but different arm lengths. Convince me.

LO: Compare the size of angles where there is a clear visual difference.

Name: _____

Date: _____

EXIT TICKET

Show me what you've learnt

- 1.** Compare the angle shown to a right angle (90°). Is it bigger or smaller?



- 2.** In your own words: angle size depends on?

✂ cut here ✂

GREEN PEN · REFLECTION

Green pen reflection — copy this into your book and complete the sentence in green pen.

Answer Key — teacher reference

GREEN

1. 60° is smaller a right angle.
2. 98° is bigger a right angle.
3. 151° is bigger a right angle.
4. 133° is bigger a right angle.
5. YES if the OPENINGS are equal. Arm length doesn't affect angle size.
6. YES if the OPENINGS are equal. Arm length doesn't affect angle size.
7. a) 90° is bigger. b) 180° is bigger. c) YES.
8. Angle size = ROTATION between arms (opening), not arm length. Long arms with a small opening = small angle.
9. rotation / arm / degrees / opening
10. FALSE.
11. $A \rightarrow B \rightarrow C \rightarrow D$.
12. YES if the OPENINGS are equal. Arm length doesn't affect angle size.

BLUE

1. 53° is smaller a right angle.
2. 37° is smaller a right angle.
3. YES if the OPENINGS are equal. Arm length doesn't affect angle size.
4. YES if the OPENINGS are equal. Arm length doesn't affect angle size.
5. rotation / arm / degrees / opening

PURPLE

1. 118° is bigger a right angle.
2. 55° .
3. $360^\circ - 90^\circ - 120^\circ = 150^\circ$.
4. The OPENING between arms. Arm length is irrelevant.
5. 10° , 30° , 45° , 60° , 80° , 89° . (Anything below 90° .)

DIG DEEPER

1. The SIZE of an angle is the OPENING between arms — not arm length. Two angles with same opening have the same size, regardless of arm length. Sara is wrong.

EXIT TICKET

1. 40° is smaller a right angle.
2. The ROTATION (opening) between the arms — not arm length.

EXIT QUIZ · Compare Angles By Eye

Year 5 · Angles · Day 1/5 LO: Compare the size of angles where there is a clear visual difference.

Name: _____

Score: / 3

BLUE TASK · 3 questions

1. Compare the angle shown to a right angle (90°). Is it bigger or smaller?



2. Compare the angle shown to a right angle (90°). Is it bigger or smaller?



3. Emma draws two angles. The first has arms 5 cm; the second 10 cm. The openings look the same. Same size?

GREEN TASK · 3 questions

4. Compare the angle shown to a right angle (90°). Is it bigger or smaller?



5. Compare the angle shown to a right angle (90°). Is it bigger or smaller?



6. Compare the angle shown to a right angle (90°). Is it bigger or smaller?



PURPLE TASK · 3 questions

7. Compare the angle shown to a right angle (90°). Is it bigger or smaller?



-
8. Two angles add to 90° . One is 35° . Find the other.
-
9. Three angles meet at a point and total 360° . Two are 90° and 120° . Find the third.
-

ANSWER KEY

Compare Angles By Eye — Exit Quiz

BLUE TASK

1. 113° is bigger a right angle.
2. 134° is bigger a right angle.
3. YES if the OPENINGS are equal. Arm length doesn't affect angle size.

GREEN TASK

4. 29° is smaller a right angle.
5. 72° is smaller a right angle.
6. 25° is smaller a right angle.

PURPLE TASK

7. 110° is bigger a right angle.
8. 55° .
9. $360^\circ - 90^\circ - 120^\circ = 150^\circ$.

Acute, Obtuse, Reflex

Year 5 · Angles · Day 2 of 5

Learning objective	Use the terms acute, obtuse and reflex when describing the size of angles.
Pupil-friendly LO	I can classify angles as acute, obtuse or reflex.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Angle wedges
- Classification chart

Key Vocabulary

- **acute** — an angle smaller than 90 degrees.
- **obtuse** — an angle larger than 90 degrees but smaller than 180 degrees.
- **reflex** — an angle larger than 180 degrees but smaller than 360 degrees.
- **right angle** — an angle of exactly 90 degrees — a square corner.
- **classify** — to put an angle into a group such as acute, obtuse or reflex.

Teacher Notes

The killer misconception here is treating 'reflex' as a synonym for 'large/obtuse' rather than as a precise category for angles GREATER than 180°. Make the two boundaries — 90° (right angle) and 180° (straight line) — explicit physical reference points before any sorting. Use the wedge to let pupils OPEN past a square corner (now obtuse) and then open so far the arms have swept past a straight line (now reflex). Insist on the ordered chain acute < 90 < obtuse < 180 < reflex < 360 and have pupils chant it. Watch for the boundary errors: pupils often want to call 95° acute or 175° reflex. The Day-2 trap angles are 160° (obtuse, NOT reflex) and 200° (reflex, NOT obtuse) — drill both.

Watch Out! (Pupil-Facing)

- Pupils may confuse obtuse (90°-180°) with reflex (>180°).

Key Questions

- (explore) Which two angles act as our 'fences' when we sort angles, and why?
- (explore) Sort 45°, 90°, 135°, 200°, 350° — which boundary does each one fall against?
- (teach) An angle is just bigger than 90°. Is it acute or obtuse? How do you know?
- (teach) What has to be true about an angle for it to be reflex?
- (iDoWeDo) 160° — obtuse or reflex? Justify using the 180° boundary.
- (iDoWeDo) Can an angle be both obtuse and reflex at the same time? Why not?
- (plenary) Give me the size range, in degrees, for acute, obtuse and reflex angles.

Lesson Structure

Retrieval Starter · 5 mins

1. Is 30° acute or obtuse? → Acute
2. Same-length arms — does that mean two angles are the same size? → No — only the opening matters.
3. How many degrees are in a right angle? → 90°
4. Is an angle of 170° acute, obtuse or reflex? → Obtuse (it is between 90° and 180°).
5. Which is bigger, the largest acute angle or the smallest obtuse angle? → The obtuse one (obtuse starts just above 90°).

Teaching Sequence · 12 mins

Slide 1 [notice] What do you notice?

Here are four angles. The right angle (90°) and the straight line (180°) act like fences. Notice which angles are smaller than a right angle, which are between a right angle and a straight line, and which are bigger than a straight line.

Slide 2 [dialogue] Sofia and Jacob sort the angles

Slide 3 [spot-mistake] Can you spot the mistake?

Omar classifies an angle of 200° .

Shown: Omar writes: ' 200° is obtuse because it is a big angle.'

Fix: 200° is GREATER than 180° (a straight line), so it is a REFLEX angle. Obtuse angles are only between 90° and 180° .

Slide 4 [convince-me] Convince me

Claim: Every acute angle is smaller than every obtuse angle.

→ Use the boundaries 90° and 180° in your reasoning.

Slide 5 [vocab-cloze] Complete the sentence

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Open an angle wedge to a right angle (a square corner). Anything you can open SMALLER than this corner is acute. Open it past the corner but keep it less than a straight line — that is obtuse. Open it so far that it bends back past a straight line — that is reflex.

PICTORIAL

On a sorting chart, draw one angle in each box: acute (a narrow opening), obtuse (a wide opening but not flat), and reflex (an opening that has bent back on itself past a straight line).

ABSTRACT

Classify by checking the boundaries: acute $< 90^\circ$; right $= 90^\circ$; $90^\circ < \text{obtuse} < 180^\circ$; $180^\circ < \text{reflex} < 360^\circ$. Example: $250^\circ > 180^\circ$, so 250° is reflex.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. Classify the angle shown.

Answer: 60° is acute.

I-do 2. Ezra measures the angle shown. What classification?

Answer: 165° is obtuse.

We-do (Class Shared Practice)

We-do 1. Classify the angle shown.

Answer: 270° is reflex.

We-do 2. Diego measures the angle shown. What classification?

Answer: 165° is obtuse.

We-do 3. Theo classifies 200° as obtuse. What's wrong?

Answer: Obtuse is 90° - 180° . 200° is REFLEX ($>180^\circ$).

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Mira classifies a 200° angle as obtuse (because it's past 90°). Test. Convince me.

Answer: Obtuse = 90° to 180° . Reflex = $>180^\circ$. A 200° angle is REFLEX, not obtuse. Mira confused the category boundaries.

Exit Ticket (Plenary) · 3 mins

1. Classify the angle shown.

Answer: 85° is acute.

2. In your own words: classify 120° ?

Answer: Obtuse.

Reflection (Green Pen)

GREEN · Practice.

Answer in your book.

1. Classify the angle shown.



-
2. Classify the angle shown.



-
3. Classify the angle shown.



4. Classify the angle shown.



5. Leo measures the angle shown. What classification?



6. Rafi measures the angle shown. What classification?



7. Classify angles.

a) 45°

b) 120°

c) 300°

8. Theo classifies 200° as obtuse. What's wrong?

9. Fill in: acute · obtuse · right · reflex

An _____ angle is $< 90^\circ$. A _____ angle is exactly 90° . An _____ angle is between 90° and 180° . A _____ angle is $> 180^\circ$.

10. TRUE or FALSE: 200° is a reflex angle.

11. Match each angle to its category. A: 45° , B: 90° , C: 120° , D: 270° .

12. Diego measures the angle shown. What classification?



LO: Use the terms acute, obtuse and reflex when describing the size of angles.

Name: _____

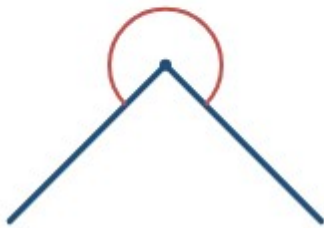
Date: _____

BLUE TASK

BLUE · Practice with pictures and sentence starters.

Answer in your book.

1. Classify the angle shown.



2. Classify the angle shown.



3. Leo measures the angle shown. What classification?



4. Beatrice measures the angle shown. What classification?



5. Fill in: acute · obtuse · right · reflex

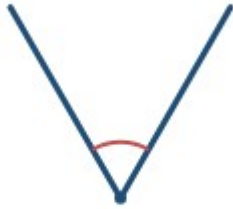
An _____ angle is $< 90^\circ$. A _____ angle is exactly 90° . An _____ angle is between 90° and 180° . A _____ angle is $> 180^\circ$.

PURPLE TASK

PURPLE · Extra challenge — multi-step reasoning and worded problems.

Answer in your book.

1. Classify the angle shown.



-
2. An obtuse angle could be ??°. Give one.

-
3. Classify all FIVE: 30°, 90°, 135°, 180°, 270°.

-
4. In your own words: how do you classify angles?

-
5. List the four CATEGORIES and the range for each.
-

LO: Use the terms acute, obtuse and reflex when describing the size of angles.

Name: _____

Date: _____

DIG DEEPER · Challenge

Dig Deeper · Show all your thinking and working out.

★ **Challenge 1.** Mira classifies a 200° angle as obtuse (because it's past 90°). Test. Convince me.

LO: Use the terms acute, obtuse and reflex when describing the size of angles.

Name: _____

Date: _____

EXIT TICKET

Show me what you've learnt

1. Classify the angle shown.



2. In your own words: classify 120°?

✂ cut here ✂

GREEN PEN · REFLECTION

Green pen reflection — copy this into your book and complete the sentence in green pen.

Answer Key — teacher reference

GREEN

1. 90° is right.
2. 85° is acute.
3. 30° is acute.
4. 60° is acute.
5. 110° is obtuse.
6. 220° is reflex.
7. a) Acute. b) Obtuse. c) Reflex.
8. Obtuse is 90° - 180° . 200° is REFLEX ($>180^\circ$).
9. acute / right / obtuse / reflex
10. TRUE.
11. A: acute. B: right. C: obtuse. D: reflex.
12. 130° is obtuse.

BLUE

1. 270° is reflex.
2. 30° is acute.
3. 220° is reflex.
4. 45° is acute.
5. acute / right / obtuse / reflex

PURPLE

1. 60° is acute.
2. Any value in (90° , 180°). E.g. 120° , 150° .
3. Acute, right, obtuse, straight, reflex.
4. Compare to 90° , 180° : below 90 = acute; equal = right; between = obtuse; above 180 = reflex.
5. Acute: $< 90^\circ$. Right: 90° . Obtuse: 90° - 180° . Reflex: $> 180^\circ$.

DIG DEEPER

1. Obtuse = 90° to 180° . Reflex = $>180^\circ$. A 200° angle is REFLEX, not obtuse. Mira confused the category boundaries.

EXIT TICKET

1. 85° is acute.
2. Obtuse.

EXIT QUIZ · Acute, Obtuse, Reflex

Year 5 · Angles · Day 2/5 LO: Use the terms acute, obtuse and reflex when describing the size of angles.

Name:

Score: / 3

BLUE TASK · 3 questions

1. Classify the angle shown.



2. Classify the angle shown.



3. Felix measures the angle shown. What classification?



GREEN TASK · 3 questions

4. Classify the angle shown.



5. Classify the angle shown.



6. Classify the angle shown.



PURPLE TASK · 3 questions

7. Classify the angle shown.



-
8. An obtuse angle could be ??°. Give one.

-
9. Classify all FIVE: 30°, 90°, 135°, 180°, 270°.
-

ANSWER KEY

Acute, Obtuse, Reflex — Exit Quiz

BLUE TASK

1. 30° is acute.
2. 270° is reflex.
3. 130° is obtuse.

GREEN TASK

4. 270° is reflex.
5. 30° is acute.
6. 60° is acute.

PURPLE TASK

7. 200° is reflex.
8. Any value in $(90^\circ, 180^\circ)$. E.g. 120° , 150° .
9. Acute, right, obtuse, straight, reflex.

Degrees As A Unit

Year 5 · Angles · Day 3 of 5

Learning objective	Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.
Pupil-friendly LO	I can describe angles in degrees.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Protractor

Key Vocabulary

- **degree ($^{\circ}$)** — the unit we use to measure the size of an angle; a full turn is 360° .
- **straight line** — a half turn; the angles on it add up to 180° .
- **full turn** — a complete rotation around a point, equal to 360° .
- **around a point** — the angles that meet at one point and together make a full turn of 360° .
- **rotation** — a turn around a fixed point, measured in degrees.

Teacher Notes

Introduce the degree as the agreed unit so that angle size becomes a number we can calculate with, not just a vague comparison. Anchor everything to the three reference turns — 90° , 180° , 360° — using a physical body-turn so pupils feel a half turn really is two right angles. The two facts to embed today are: angles on a straight line sum to 180° and angles around a point sum to 360° . Model the subtraction ($180^{\circ} - \text{known} = \text{missing}$) explicitly. Two misconceptions to pre-empt: forgetting the $^{\circ}$ symbol (or writing 'deg'), and assuming a full turn is 100° by false analogy with percentages — stress that a circle is divided into 360 equal degrees by convention. The pie-chart figure (4 parts) makes the four 90° quarters of a full turn visible.

Watch Out! (Pupil-Facing)

- Pupils may forget the degree symbol or write 'deg' instead.

Key Questions

- (explore) How many degrees are in a right angle, a straight line and a full turn?
- (explore) Why is it more useful to say ' 120° ' than to say 'a bit more than a right angle'?
- (teach) Two right angles sit side by side on a straight line. What is their total?
- (teach) Angles around a point make a full turn. What do they always sum to?
- (iDoWeDo) On a straight line, one angle is 130° . How do you work out the other?
- (iDoWeDo) Three angles around a point are 120° , 150° and one more. How big is the last angle?
- (plenary) Why must you always write the degree symbol after the number?

Lesson Structure

Retrieval Starter · 5 mins

1. A right angle = $90^\circ \rightarrow 90^\circ$
2. What range of degrees is an acute angle? $\rightarrow$ Greater than 0° and less than 90° .
3. How many degrees are in a full turn? $\rightarrow 360^\circ$
4. Angles on a straight line add up to how many degrees? $\rightarrow 180^\circ$
5. On a straight line, one angle is 60° . What is the other? $\rightarrow 120^\circ$ (because $180^\circ - 60^\circ = 120^\circ$).

Teaching Sequence · 13 mins

Slide 1 [notice] What do you notice?

A full turn is split into 360 equal parts. Each part is one degree (1°). Notice the special turns: a quarter turn is 90° , a half turn (straight line) is 180° , and a full turn is 360° .

Slide 2 [dialogue] Aisha and Tom add up a straight line

Slide 3 [spot-mistake] Can you spot the mistake?

Leah writes the size of an angle.

Shown: Leah writes the angle as '90' with no symbol, and reads a full turn as 100 because 'numbers go up in hundreds'.

Fix: Always write the degree symbol: 90° . And a full turn is 360° , NOT 100 — a circle is divided into 360 equal degrees.

Slide 4 [convince-me] Convince me

Claim: Angles on a straight line always add up to 180° .

$\rightarrow$ Reason from the idea of a half turn.

Slide 5 [match-up] Match the turn to its degrees

$\rightarrow$ Match each turn on the left to the correct number of degrees on the right.

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Stand up and make a full turn on the spot — that whole turn is 360° . Turn just a quarter (face the next wall) — that is 90° . Turn to face the opposite wall (a half turn) — that is 180° . Feel each special turn in your body.

PICTORIAL

On a circle, shade a quarter (90°), then a half (180°), then three-quarters (270°). Each quarter you shade adds another 90° , and the whole circle is 360° .

ABSTRACT

Use the unit: a right angle is 90° , a straight line is 180° , a full turn is 360° . Angles on a straight line sum to 180° ; angles around a point sum to 360° . Example: $180^\circ - 110^\circ = 70^\circ$.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)

Answer: 135°

I-do 2. Kai draws a full turn and asks how many degrees. Answer?

Answer: 360° .

We-do (Class Shared Practice)

We-do 1. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)

Answer: 90°

We-do 2. Tess draws a full turn and asks how many degrees. Answer?

Answer: 360° .

We-do 3. A pupil writes 90 without the degree symbol. What's missing?

Answer: The ° symbol. Always include it for angles. 90° not 90.

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Sara says: 'Angle A has longer arms so it must be bigger.' Test by drawing two angles with the same opening but different arm lengths. Convince me.

Answer: The SIZE of an angle is the OPENING between arms — not arm length. Two angles with same opening have the same size, regardless of arm length. Sara is wrong.

Exit Ticket (Plenary) · 3 mins

1. How many degrees in the angle shown? (Reference: right = 90°, straight = 180°, full turn = 360°.)

Answer: 135°

2. In your own words: degree symbol?

Answer: ° — always include after the number.

Reflection (Green Pen)

LO: Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.

Name: _____

Date: _____

GREEN TASK

GREEN · Practice.

Answer in your book.

- 1.** How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



-
- 2.** How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



-
- 3.** How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



-
- 4.** How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



-
- 5.** Owen draws a full turn and asks how many degrees. Answer?

-
- 6.** Beatrice draws a full turn and asks how many degrees. Answer?

-
- 7.** Reference angles.

a) Right angle = ?? $^\circ$

b) Straight line = ?? $^\circ$

c) Full turn = ?? $^\circ$

-
- 8.** A pupil writes 90 without the degree symbol. What's missing?

9. Fill in: rotation · arm · degrees · opening

An angle is a measure of _____ between two _____ s. It is measured in _____ ($^{\circ}$). The _____ between the arms is the size — not how long the arms are.

10. TRUE or FALSE: A right angle is 90° .

11. Match: right=?, full turn=?, straight=?, half-right=?.

12. Sara draws a full turn and asks how many degrees. Answer?

LO: Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.

BLUE · Practice with pictures and sentence starters.

Answer in your book.

- 1.** How many degrees in the angle shown?
(Reference: right = 90° , straight = 180° , full turn = 360° .)



- 2.** How many degrees in the angle shown?
(Reference: right = 90° , straight = 180° , full turn = 360° .)



- 3.** Daisy draws a full turn and asks how many degrees. Answer?

- 4.** Felix draws a full turn and asks how many degrees. Answer?

- 5.** Fill in: rotation · arm · degrees · opening

An angle is a measure of _____ between two _____ s. It is measured in _____ ($^{\circ}$). The _____ between the arms is the size — not how long the arms are.

PURPLE TASK

PURPLE · Extra challenge — multi-step reasoning and worded problems.

Answer in your book.

1. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



-
2. Three right angles = ?? $^\circ$

-
3. A turn of $1/4$ = ?? $^\circ$. A turn of $3/4$ = ?? $^\circ$.

-
4. In your own words: how do degrees work?

-
5. List FIVE angle measurements you would commonly meet.
-

LO: Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.

Name: _____

Date: _____

DIG DEEPER · Challenge

Dig Deeper · Show all your thinking and working out.

★ **Challenge 1.** Sara says: 'Angle A has longer arms so it must be bigger.' Test by drawing two angles with the same opening but different arm lengths. Convince me.

LO: Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.

Name: _____

Date: _____

EXIT TICKET

Show me what you've learnt

- 1.** How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



- 2.** In your own words: degree symbol?

✂ cut here ✂

GREEN PEN · REFLECTION

Green pen reflection — copy this into your book and complete the sentence in green pen.

Answer Key — teacher reference

GREEN

1. 90°
2. 135°
3. 45°
4. 45°
5. 360° .
6. 360° .
7. a) 90° b) 180° c) 360°
8. The $^\circ$ symbol. Always include it for angles. 90° not 90.
9. rotation / arm / degrees / opening
10. TRUE.
11. Right = 90° . Full turn = 360° . Straight = 180° . Half-right = 45° .
12. 360° .

BLUE

1. 90°
2. 135°
3. 360° .
4. 360° .
5. rotation / arm / degrees / opening

PURPLE

1. 135°
2. 270° .
3. 90° and 270° .
4. A full turn = 360° . Each turn is split into 360 equal slices. A right angle is 90° ($= 360 \div 4$).
5. 0° , 45° , 90° , 135° , 180° , 270° , 360° .

DIG DEEPER

1. The **SIZE** of an angle is the **OPENING** between arms — not arm length. Two angles with same opening have the same size, regardless of arm length. Sara is wrong.

EXIT TICKET

1. 135°
2. $^\circ$ — always include after the number.

EXIT QUIZ · Degrees As A Unit

Year 5 · Angles · Day 3/5 LO: Understand and use the degree ($^{\circ}$) as a standard unit for measuring angles.

Name: _____

Score: / 3

BLUE TASK · 3 questions

1. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



2. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



3. Fatima draws a full turn and asks how many degrees. Answer?

GREEN TASK · 3 questions

4. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



5. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



6. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



PURPLE TASK · 3 questions

7. How many degrees in the angle shown? (Reference: right = 90° , straight = 180° , full turn = 360° .)



-
8. Three right angles = ?? $^\circ$

-
9. A turn of $1/4$ = ?? $^\circ$. A turn of $3/4$ = ?? $^\circ$.
-

ANSWER KEY

Degrees As A Unit — Exit Quiz

BLUE TASK

1. 135°
2. 90°
3. 360° .

GREEN TASK

4. 45°
5. 90°
6. 135°

PURPLE TASK

7. 45°
8. 270° .
9. 90° and 270° .

Estimate Angles In Degrees

Year 5 · Angles · Day 4 of 5

Learning objective	Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).
Pupil-friendly LO	I can estimate angle sizes in degrees.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Angle set

Key Vocabulary

- **estimate** — to make a sensible guess of an angle's size without measuring it exactly.
- **reference angle** — a known angle, such as 90° , used to judge how big another angle is.
- **benchmark** — a familiar angle (like 45° , 90° or 180°) you compare against to estimate.
- **right angle** — an angle of exactly 90 degrees — the most useful reference angle.
- **approximately** — close to, but not exactly; we say 'about' when we estimate.

Teacher Notes

The purpose of estimating is twofold: it builds angle sense, and it is the safety net that catches protractor errors on Day 5 (reading the wrong scale typically produces an answer that is 180° minus the true value, or wildly off). Teach pupils to ALWAYS compare to a right angle first — opening inside 90° means estimate below 90° , opening outside means above. Pre-empt the misconception of estimating by arm length (carried over from Day 1) and the misconception of guessing wildly without anchoring to a benchmark. Model the benchmarks 45° , 90° , 135° , 180° and the language 'a bit more than', 'about half of'. Stress the routine 'estimate, then measure, then check the measurement is close to the estimate' so it becomes habit before the protractor lesson.

Watch Out! (Pupil-Facing)

- Pupils may estimate based on arm length.

Key Questions

- (explore) Which reference angles do you already know well enough to estimate with?
- (explore) Why estimate at all if we have a protractor to measure exactly?
- (teach) Is this angle's opening inside or outside a right angle? So is your estimate above or below 90° ?
- (teach) Which benchmark — 45° , 90° , 135° or 180° — is this angle closest to?
- (iDoWeDo) You estimated 40° . When you measure, you get 220° . What does that tell you?
- (iDoWeDo) How would you estimate an angle that is just less than a straight line?
- (plenary) How does a sensible estimate protect you from a measuring mistake?

Lesson Structure

Retrieval Starter · 5 mins

1. Half of $90^\circ = ? \rightarrow 45^\circ$
2. A full turn = $?^\circ \rightarrow 360^\circ$
3. Angles on a straight line sum to $?^\circ \rightarrow 180^\circ$
4. Is an angle clearly narrower than a right angle more or less than 90° ? $\rightarrow$ Less than 90° .
5. Three-quarters of a right angle is about how many degrees? $\rightarrow$ About 67° – 68° (roughly 70°).

Teaching Sequence · 12 mins

Slide 1 [notice] What do you notice?

Estimate before you measure. Use the reference angles you know — 90° (a right angle), 45° (half of a right angle) and 180° (a straight line) — to judge each angle. Notice how each one compares to a right angle.

Slide 2 [dialogue] Noah and Grace estimate an angle

Slide 3 [spot-mistake] Can you spot the mistake?

Ella estimates an angle that is clearly less than a right angle.

Shown: Ella estimates the angle as 130° , even though its opening is narrower than a square corner.

Fix: An angle narrower than a right angle MUST be less than 90° . A sensible estimate here is around 40° – 50° , not 130° . Always compare to 90° first.

Slide 4 [convince-me] Convince me

Claim: If an angle's opening is narrower than a right angle, your estimate should be less than 90° .

$\rightarrow$ Reason using the 90° reference angle.

Slide 5 [vocab-cloze] Complete the sentence

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Hold up the corner of a book or an angle wedge set to 90° next to the angle you want to estimate. If the angle's opening fits INSIDE the right angle, your estimate must be less than 90° . If it spills outside, estimate more than 90° .

PICTORIAL

Draw the angle and lightly sketch a right-angle corner over its vertex. Compare the opening to the corner: clearly inside $\rightarrow$ about 45° ; just past the corner $\rightarrow$ about 100° – 110° .

ABSTRACT

Estimate using benchmarks: about 45° (half a right angle), 90° (right angle), 135° (between a right angle and a straight line), 180° (straight line). Choose the nearest benchmark, then refine. Example estimate: 'a bit more than 90° , so about 100° '.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. Estimate the angle shown. Closer to 90° or 180° ? What category?

Answer: 220° — reflex.

I-do 2. Fatima sees an angle that looks half of a right angle. Estimate degrees.

Answer: $45^\circ (= 90^\circ / 2)$.

We-do (Class Shared Practice)

We-do 1. Estimate the angle shown. Closer to 90° or 180° ? What category?

Answer: 160° — obtuse.

We-do 2. Theo sees an angle that looks half of a right angle. Estimate degrees.

Answer: $45^\circ (= 90^\circ / 2)$.

We-do 3. Sara estimates an angle as 200° but it looks acute. What is wrong?

Answer: Acute angles are $< 90^\circ$. 200° is reflex (more than half a turn). Sara confused acute with reflex.

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Mira classifies a 200° angle as obtuse (because it's past 90°). Test. Convince me.

Answer: Obtuse = 90° to 180° . Reflex = $>180^\circ$. A 200° angle is REFLEX, not obtuse. Mira confused the category boundaries.

Exit Ticket (Plenary) · 3 mins

1. Estimate the angle shown. Closer to 90° or 180° ? What category?

Answer: 135° — obtuse.

2. In your own words: angle just over 90° ?

Answer: Obtuse ($\sim 95^\circ$ - 100°).

Reflection (Green Pen)

LO: Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).

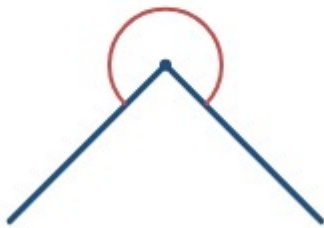
GREEN · Practice.

Answer in your book.

1. Estimate the angle shown. Closer to 90° or 180° ? What category?



-
2. Estimate the angle shown. Closer to 90° or 180° ? What category?



-
3. Estimate the angle shown. Closer to 90° or 180° ? What category?



-
4. Estimate the angle shown. Closer to 90° or 180° ? What category?



-
5. Maya sees an angle that looks half of a right angle. Estimate degrees.

-
6. Omar sees an angle that looks half of a right angle. Estimate degrees.

-
7. Estimate.

a) Half of right = ?

b) $3/4$ of straight = ?

c) Just over 90° (acute or obtuse)?

-
8. Sara estimates an angle as 200° but it looks acute. What is wrong?

9. Fill in: acute · obtuse · right · reflex

An _____ angle is $< 90^\circ$. A _____ angle is exactly 90° . An _____ angle is between 90° and 180° . A _____ angle is $> 180^\circ$.

10. TRUE or FALSE: 45° is HALF of a right angle.

11. Order estimates: A: 30° , B: 100° , C: 150° , D: 270° .

12. Sami sees an angle that looks half of a right angle. Estimate degrees.

LO: Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).

Name: _____

Date: _____

BLUE TASK

BLUE · Practice with pictures and sentence starters.

Answer in your book.

- 1.** Estimate the angle shown. Closer to 90° or 180° ? What category?



- 2.** Estimate the angle shown. Closer to 90° or 180° ? What category?



- 3.** Leo sees an angle that looks half of a right angle. Estimate degrees.

- 4.** Hana sees an angle that looks half of a right angle. Estimate degrees.

- 5.** Fill in: acute · obtuse · right · reflex

An _____ angle is $< 90^\circ$. A _____ angle is exactly 90° . An _____ angle is between 90° and 180° . A _____ angle is $> 180^\circ$.

PURPLE TASK

PURPLE · Extra challenge — multi-step reasoning and worded problems.

Answer in your book.

1. Estimate the angle shown. Closer to 90° or 180° ? What category?



-
2. An angle slightly less than half a turn. Estimate.

-
3. Three angles around a point: 90° , 90° , $??$. Estimate the third.

-
4. In your own words: how do you estimate angles?

-
5. List FIVE reference angles to estimate from.
-

LO: Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).

Name: _____

Date: _____

DIG DEEPER · Challenge

Dig Deeper · Show all your thinking and working out.

★ **Challenge 1.** Mira classifies a 200° angle as obtuse (because it's past 90°). Test. Convince me.

LO: Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).

Name: _____

Date: _____

EXIT TICKET

Show me what you've learnt

1. Estimate the angle shown. Closer to 90° or 180° ? What category?



2. In your own words: angle just over 90° ?

✂ cut here ✂

GREEN PEN · REFLECTION

Green pen reflection — copy this into your book and complete the sentence in green pen.

Answer Key — teacher reference

GREEN

1. 15° — acute.
2. 270° — reflex.
3. 45° — acute.
4. 160° — obtuse.
5. $45^\circ (= 90^\circ / 2)$.
6. $45^\circ (= 90^\circ / 2)$.
7. a) 45° b) 135° c) Obtuse.
8. Acute angles are $< 90^\circ$. 200° is reflex (more than half a turn). Sara confused acute with reflex.
9. acute / right / obtuse / reflex
10. TRUE.
11. $A \rightarrow B \rightarrow C \rightarrow D$.
12. $45^\circ (= 90^\circ / 2)$.

BLUE

1. 270° — reflex.
2. 15° — acute.
3. $45^\circ (= 90^\circ / 2)$.
4. $45^\circ (= 90^\circ / 2)$.
5. acute / right / obtuse / reflex

PURPLE

1. 135° — obtuse.
2. $\sim 170^\circ$ - 175° .
3. $360^\circ - 180^\circ = 180^\circ$ (a straight line — would not be drawn).
4. Compare to KNOWN reference angles: 45° , 90° , 135° , 180° . Decide which the unknown is closest to.
5. 45° , 90° , 135° , 180° , 270° , 360° .

DIG DEEPER

1. Obtuse = 90° to 180° . Reflex = $>180^\circ$. A 200° angle is REFLEX, not obtuse. Mira confused the category boundaries.

EXIT TICKET

1. 135° — obtuse.
2. Obtuse ($\sim 95^\circ$ - 100°).

EXIT QUIZ · Estimate Angles In Degrees

Year 5 · Angles · Day 4/5 LO: Estimate the size of angles in degrees using known reference angles (90° , 180° , 45°).

Name: _____

Score: / 3

BLUE TASK · 3 questions

1. Estimate the angle shown. Closer to 90° or 180° ? What category?



2. Estimate the angle shown. Closer to 90° or 180° ? What category?



3. Beatrice sees an angle that looks half of a right angle. Estimate degrees.

GREEN TASK · 3 questions

4. Estimate the angle shown. Closer to 90° or 180° ? What category?



5. Estimate the angle shown. Closer to 90° or 180° ? What category?



6. Estimate the angle shown. Closer to 90° or 180° ? What category?



PURPLE TASK · 3 questions

7. Estimate the angle shown. Closer to 90° or 180° ? What category?



-
8. An angle slightly less than half a turn. Estimate.

-
9. Three angles around a point: 90° , 90° , $??$. Estimate the third.
-

ANSWER KEY

Estimate Angles In Degrees — Exit Quiz

BLUE TASK

1. 30° — acute.
2. 80° — acute.
3. 45° ($= 90^\circ / 2$).

GREEN TASK

4. 100° — obtuse.
5. 220° — reflex.
6. 15° — acute.

PURPLE TASK

7. 15° — acute.
8. $\sim 170^\circ$ - 175° .
9. $360^\circ - 180^\circ = 180^\circ$ (a straight line — would not be drawn).

Measure Angles With A Protractor

Year 5 · Angles · Day 5 of 5

Learning objective	Use a protractor to measure the size of angles accurately.
Pupil-friendly LO	I can use a protractor to measure an angle in degrees.
Unit	Angles
Year / Grade	Year 5
Total time	61 minutes

Concrete Resources

- Protractor
- Ruler

Key Vocabulary

- **protractor** — a tool with a scale of degrees used to measure or draw angles.
- **centre** — the middle point of the protractor that you line up with the angle's vertex.
- **baseline** — the straight 0° line on a protractor you line up along one arm of the angle.
- **scale** — the row of numbers on the protractor; there are two, running in opposite directions.
- **measure** — to find the exact size of an angle in degrees using a protractor.

Teacher Notes

This lesson pulls the unit together: pupils MEASURE accurately and then CLASSIFY. The dominant misconception is reading the wrong scale (inner vs outer), which gives the supplement of the true angle (180° minus the answer). The single most effective defence is the Day-4 routine: estimate first. Drill the three-step protocol — (1) centre on vertex, (2) baseline along one arm at 0° , (3) read up the SAME scale that started at 0° on that arm. Make the estimate-versus-measurement check non-negotiable: if they disagree wildly, the most likely cause is the wrong scale, and the fix is 180° minus the reading. Also watch for the protractor centre being off the vertex and for not holding the protractor still. Finish by classifying each measured angle so pupils connect measuring back to Day 2's vocabulary.

Watch Out! (Pupil-Facing)

- Pupils may read the WRONG scale on the protractor (inside vs outside). Always start at 0° .

Key Questions

- (explore) What must line up with the vertex before you can measure? What must line up with one arm?
- (explore) Why does a protractor have two scales of numbers?
- (teach) I lined the baseline along this arm. Which 0° do I start counting from?
- (teach) My estimate was 50° but the protractor shows 130° . What has gone wrong and how do I fix it?
- (iDoWeDo) The two scales for one angle add to 180° . How does that help me pick the right reading?
- (iDoWeDo) After measuring, how do I classify the angle as acute, right or obtuse?
- (plenary) List the three steps for measuring an angle accurately, in order.

Lesson Structure

Retrieval Starter · 5 mins

1. Estimate an angle that is a bit less than 90° . → About 75° – 85° .
2. An angle measured at 120° — is it acute or obtuse? → Obtuse
3. The two protractor scales for one angle add up to how many degrees? → 180°
4. You read 160° but estimated 20° . What is the true angle? → 20° ($180^\circ - 160^\circ = 20^\circ$) — you read the wrong scale.
5. What part of the protractor must sit on the vertex of the angle? → The centre (the cross or hole).

Teaching Sequence · 13 mins

Slide 1 [notice] What do you notice?

To measure an angle, place the protractor's CENTRE on the vertex and line the BASELINE (the 0° line) along one arm. Then read up from 0° along the SAME scale until you reach the other arm. Notice this angle has been estimated at about 50° first.

Slide 2 [dialogue] Hassan and Lily read the protractor

Slide 3 [spot-mistake] Can you spot the mistake?

Zara measures an acute angle with her protractor.

Shown: Zara lines the baseline up correctly but reads the OUTER scale, getting 150° for an angle that is clearly less than a right angle.

Fix: The angle is acute (less than 90°), so 150° is impossible. Zara read the wrong scale. Reading from 0° on the inner scale gives the correct answer of 30° .

Slide 4 [convince-me] Convince me

Claim: If you estimate an angle first, you will never accidentally record the wrong protractor scale.

→ Reason about how the two scales differ.

Slide 5 [match-up] Match the measured angle to its classification

→ Match each measured angle on the left to its correct name on the right.

CPA Progression (Concrete · Pictorial · Abstract)

CONCRETE

Place a real protractor flat on the angle. Slide it so the small cross/hole at its CENTRE sits exactly on the vertex, then rotate it until the 0° baseline lies along one arm. Hold it still — the protractor must not move while you read.

PICTORIAL

Draw the angle, mark the vertex, and shade the arm you start from. Trace from 0° on that arm, following the SAME scale, round to the second arm — the number you land on is the angle.

ABSTRACT

Record the measurement with the degree symbol and check it against your estimate. If estimate $\approx 60^\circ$ and the protractor reads 120° , you read the wrong scale: the true value is $180^\circ - 120^\circ = 60^\circ$. Then classify: 60° is acute.

I-do (Teacher Models) · 12 mins (combined with We-do)

I-do 1. Measure the angle shown. Kira reads 60° on the protractor. What category?

Answer: 60° — acute.

I-do 2. Rafi uses a protractor. Where do they line up?

Answer: Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.

We-do (Class Shared Practice)

We-do 1. Measure the angle shown. Kai reads 30° on the protractor. What category?

Answer: 30° — acute.

We-do 2. Theo uses a protractor. Where do they line up?

Answer: Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.

We-do 3. A pupil measures an angle and gets 60° (inside scale) AND 120° (outside scale). Which is right?

Answer: Estimate first. If the angle looks ACUTE, read the smaller value. If OBTUSE, read the bigger. Always reason from estimation.

You-do (Independent Practice) · 13 mins

Pupils complete the differentiated worksheet (see accompanying .docx). Tier counts:

- Support: 5 questions — scaffolded with smaller numbers, visual prompts, sentence starters (working towards expected standard).
- Core: 12 questions — age-related expectation; the bulk of the class lands here.
- Stretch: 5 questions — extension via multi-step reasoning, exam-style worded problems, generalisation (greater depth).

Dig Deeper — early-finisher extension challenges:

Tia measures an angle with a protractor and gets 60° (reading inside scale) BUT 120° on the outside scale. Test which is right. Convince me.

Answer: Depends on the ARM you align with 0° . If the arm is on the right and the opening goes anticlockwise, read inside; if clockwise, read outside. Always check by ESTIMATING first — is it bigger or smaller than 90° ?

Exit Ticket (Plenary) · 3 mins

1. Measure the angle shown. Sara reads 45° on the protractor. What category?

Answer: 45° — acute.

2. In your own words: inner vs outer scale?

Answer: Depends which arm is on 0° . Use estimation to pick the scale.

Reflection (Green Pen)

LO: Use a protractor to measure the size of angles accurately.

Name: _____

Date: _____

GREEN TASK

GREEN · Practice.

Answer in your book.

- 1.** Measure the angle shown. Lara reads 105° on the protractor. What category?



-
- 2.** Measure the angle shown. Tess reads 75° on the protractor. What category?



-
- 3.** Measure the angle shown. Felix reads 105° on the protractor. What category?



-
- 4.** Measure the angle shown. Rafi reads 60° on the protractor. What category?



-
- 5.** Emma uses a protractor. Where do they line up?

-
- 6.** Jamil uses a protractor. Where do they line up?

-
- 7.** Protractor measurements.

a) Line up where?

b) Which scale?

c) Estimate first — why?

-
- 8.** A pupil measures an angle and gets 60° (inside scale) AND 120° (outside scale). Which is right?

9. Fill in: rotation · arm · degrees · opening

An angle is a measure of _____ between two _____ s. It is measured in _____ (°). The _____ between the arms is the size — not how long the arms are.

10. TRUE or FALSE: Always estimate before measuring with a protractor.

11. A protractor reads: A: 30°, B: 90°, C: 120°, D: 170°. Order from acute to reflex.

12. Zeb uses a protractor. Where do they line up?

LO: Use a protractor to measure the size of angles accurately.

Name: _____

Date: _____

BLUE TASK

BLUE · Practice with pictures and sentence starters.

Answer in your book.

- 1.** Measure the angle shown. Diego reads 120° on the protractor. What category?



- 2.** Measure the angle shown. Yara reads 75° on the protractor. What category?



- 3.** Ezra uses a protractor. Where do they line up?

- 4.** Cara uses a protractor. Where do they line up?

- 5.** Fill in: rotation · arm · degrees · opening

An angle is a measure of _____ between two _____ s. It is measured in _____ ($^\circ$). The _____ between the arms is the size — not how long the arms are.

PURPLE TASK

PURPLE · Extra challenge — multi-step reasoning and worded problems.

Answer in your book.

1. Measure the angle shown. Beatrice reads 30° on the protractor. What category?



-
2. An angle is measured as 75° . Classify.

-
3. A pupil draws three angles: 40° , 90° , 135° . Verify each with a protractor (in spirit). Then classify.

-
4. In your own words: how do you read a protractor?

-
5. Steps to measure an angle?
-

LO: Use a protractor to measure the size of angles accurately.

Name: _____

Date: _____

DIG DEEPER · Challenge

Dig Deeper · Show all your thinking and working out.

★ **Challenge 1.** Tia measures an angle with a protractor and gets 60° (reading inside scale) BUT 120° on the outside scale. Test which is right. Convince me.

LO: Use a protractor to measure the size of angles accurately.

Name: _____

Date: _____

EXIT TICKET

Show me what you've learnt

- 1.** Measure the angle shown. Sara reads 45° on the protractor. What category?



- 2.** In your own words: inner vs outer scale?

✂ cut here ✂

GREEN PEN · REFLECTION

Green pen reflection — copy this into your book and complete the sentence in green pen.

Answer Key — teacher reference

GREEN

1. 105° — obtuse.
2. 75° — acute.
3. 105° — obtuse.
4. 60° — acute.
5. Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.
6. Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.
7. a) Vertex at centre; one arm on 0° . b) The one that starts at 0° on the aligned arm. c) To check which scale you should be reading from.
8. Estimate first. If the angle looks ACUTE, read the smaller value. If OBTUSE, read the bigger. Always reason from estimation.
9. rotation / arm / degrees / opening
10. TRUE.
11. A (acute) → B (right) → C (obtuse) → D (obtuse, near straight).
12. Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.

BLUE

1. 120° — obtuse.
2. 75° — acute.
3. Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.
4. Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.
5. rotation / arm / degrees / opening

PURPLE

1. 30° — acute.
2. Acute.
3. Acute, right, obtuse.
4. Vertex at centre. One arm on 0° . Read where the other arm crosses. Use estimation to pick inner vs outer scale.
5. 1. Place vertex at centre of protractor. 2. Align one arm with 0° . 3. Read where the other arm crosses the scale. 4. Estimate first to pick the correct scale.

DIG DEEPER

1. Depends on the ARM you align with 0° . If the arm is on the right and the opening goes anticlockwise, read inside; if clockwise, read outside. Always check by ESTIMATING first — is it bigger or smaller than 90° ?

EXIT TICKET

1. 45° — acute.
2. Depends which arm is on 0° . Use estimation to pick the scale.

EXIT QUIZ · Measure Angles With A Protractor

Year 5 · Angles · Day 5/5 LO: Use a protractor to measure the size of angles accurately.

Name:

Score: / 3

BLUE TASK · 3 questions

1. Measure the angle shown. Eli reads 30° on the protractor. What category?



2. Measure the angle shown. Zara reads 105° on the protractor. What category?



3. Owen uses a protractor. Where do they line up?

GREEN TASK · 3 questions

4. Measure the angle shown. Mei reads 75° on the protractor. What category?



5. Measure the angle shown. Uma reads 120° on the protractor. What category?



6. Measure the angle shown. Owen reads 75° on the protractor. What category?



PURPLE TASK · 3 questions

7. Measure the angle shown. Nara reads 60° on the protractor. What category?



-
8. An angle is measured as 75° . Classify.

-
9. A pupil draws three angles: 40° , 90° , 135° . Verify each with a protractor (in spirit). Then classify.
-

ANSWER KEY

Measure Angles With A Protractor — Exit Quiz

BLUE TASK

1. 30° — acute.
2. 105° — obtuse.
3. Centre of protractor on the VERTEX of the angle. ZERO line on one ARM. Read where the other arm crosses.

GREEN TASK

4. 75° — acute.
5. 120° — obtuse.
6. 75° — acute.

PURPLE TASK

7. 60° — acute.
8. Acute.
9. Acute, right, obtuse.

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