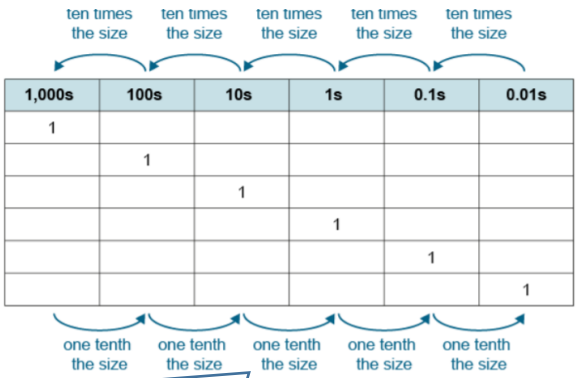
St Michael's Years 5 Maths Parent Information

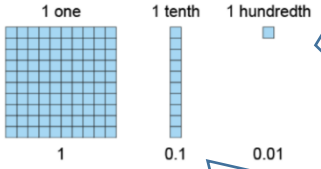
The value of a given digit is made **10 times the size** if it is moved **1 position to left**, and is **made one tenth times the size** if it is moved **1 position to the right**.



A '1' in the tenths column has a value of one tenth, and is one tenth the size of 1.

A '1' in the hundredths column has a value of one hundredth, and is one hundredth the size of 1.

Tenths and **Hundredths**



One-tenth is 10 times the size of one-hundredth.

1 is 10 times the size of one-tenth.

1 is 100 times the size of one-hundredth

10 tenths is equal to 1 **one**.
10 hundredths is equal to **1 tenth**.
100 hundredths is equal to **1 one**.

One-tenth can be written as both 0.1 and $\frac{1}{10}$

10 hundredths is equal to 1 tenth.

5 NPV-1

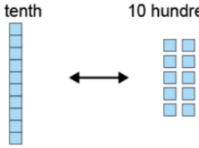
18 hundredths is equal to 10 hundredths and 8 more hundredths.

10 X 0.01 = 0.1

8 X 0.01 = 0.08

So 18 hundredths is equal to 1 tenth and 8 more hundredths, which is 0.18.

One tenth is written as 0.1



One hundredth is written as 0.01

The **decimal point** is used between the ones digit and the tenths digit. It marks the **boundary between whole numbers and decimals**.

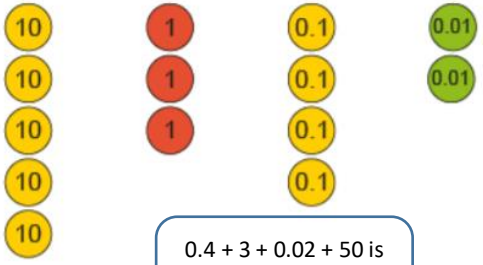
One hundredth can be written as both 0.01 and $\frac{1}{100}$

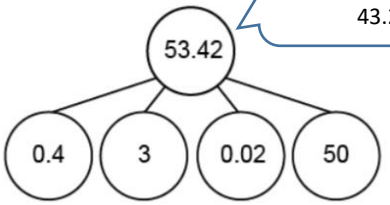
18 hundredths can be written as both 0.18 and $\frac{18}{100}$

5 NPV-2

Identify the **place value** of **each digit** in numbers with up to **2 decimal places**.

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09





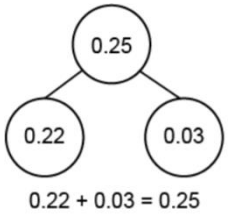
0.4 + 3 + 0.02 + 50 is equal to 53.42, not 43.25.

$53.42 - 3 = \square$

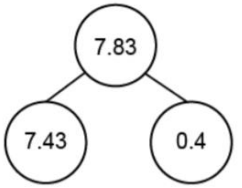
To solve this, I only need to take away the ones.

$53.42 - \square = 53.02$

To solve this, I need to identify which digit has changed and what it is worth.



0.22 + 0.03 = 0.25

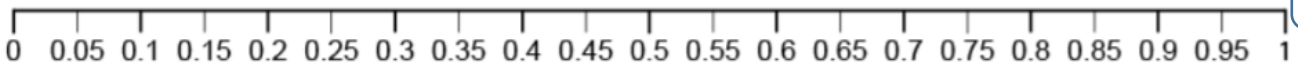


7.83 – 0.4 = 7.43

Numbers with up to **2 decimal places** can be partitioned in many ways. These partitions can be represented as addition and subtraction

5 NPV-3

Identify and **explain** the **position** of numbers with **up to two decimal places** on the **number line.**

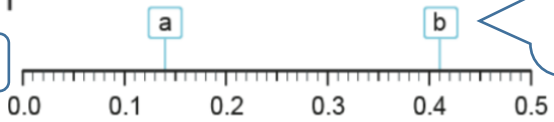


0.3 is three tenths. It can also be written as 0.30

0.5 can also be written as 0.50. It lies halfway between 0.45 and 0.55

a is 0.14 because it is 1 hundredth less than the midpoint of 0.1 and 0.2, which is 0.15.

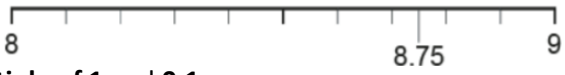
b is 0.41 because it is 1 hundredth more than 0.4.

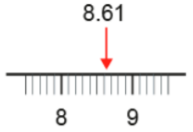


Reason about the **position** of numbers with **up to two decimal places** on the **marked** and **unmarked** number lines.

8.6 is about here on the number line because it's just over half way.

8.75 is about here on the number line because it's the midpoint of 8.7 and 8.8.





8.61 rounded to the nearest whole number is 9.

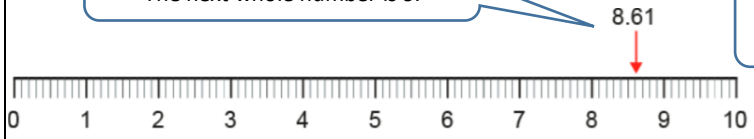
previous whole number | **next** whole number

8 < 8.61 < 9

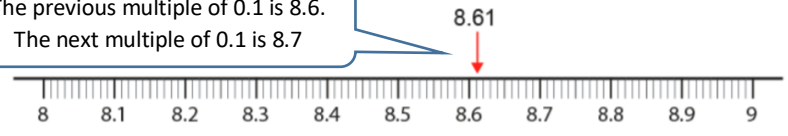
The closest whole number is 9.

The previous whole number is 8.
The next whole number is 9.

Identify the **previous** and the **next multiple of 1** and **0.1.**



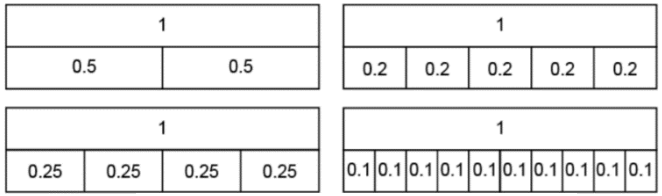
The previous multiple of 0.1 is 8.6.
The next multiple of 0.1 is 8.7



...2.1, 2.0, 1.9....

Count forwards and backwards from any decimal fraction in steps of 1, 0.1 or 0.01.

...2.85, 2.95, 3.05...



5 NPV-4

One, divided into 2, 4, 5 and 10

...0.7, 0.8, 0.9, 1.0...

...1.4, 1.2, 1.0, 0.800...

Count in multiples of **0.1, 0.2, 0.25** and **0.5** from 0, or from any multiple of these numbers, both **forwards and backwards**.

...3.00, 2.50, 2.00, 1.50...

...1.50, 1.75, 2.00, 2.25...

If each loaf needs 0.2kg of flour, I can make 5 loaves from a 1kg bag of flour.

I can use 10 – 7 to work out 1.0 – 0.7.

If I run 0.5km at school every day, in a week I will run 2.5km.

6+4 = 10 so 0.6+0.4 = 1.

Solve equations and problems based on partitioning 1 into multiples of 0.1, 0.2 and 0.5.

A 30cm ruler is 0.3m long.

Remember: **1 = 0.25 + 0.75**; **1.0 – 0.25 = 0.75**; **0.25 = 1 – 0.75**

Memorise the following conversions

1km = 1,000m 1m = 100cm 1cm = 10mm

1 litre = 1,000ml 1kg = 1,000g £1 = 100p

5 NPV-5

1m is 100cm. So $\frac{3}{4}$ m is 75cm.

1m	100cm
$\frac{3}{4}$m	75cm

1,000ml is 1 litre. So 3,000ml is 3 litres, and 3,700ml is 3.7 litres.

1,000ml	1 litre
3,700ml	3.7 litres

100p is £1. So 50p is £0.50, and 52p is £0.52.

100p	£1
52p	£0.52

Distance in km expressed as a fraction	Distance in km expressed as a decimal fraction	Distance in metres
$\frac{1}{5}$km	0.2km	200m
$\frac{1}{4}$km	0.25km	250m
$\frac{1}{2}$km	0.5km	500m
$\frac{3}{4}$km	0.75m	750m
$\frac{1}{10}$km	0.1km	100m
all other multiples of $\frac{1}{10}$km, for example, $\frac{7}{10}$km	0.7km	700m

$2\times2=4$	$3\times3=9$						
$3\times2=6$	$4\times3=12$	$4\times4=16$					
$4\times2=8$	$5\times3=15$	$5\times4=20$	$5\times5=25$				
$5\times2=10$	$6\times3=18$	$6\times4=24$	$6\times5=30$	$6\times6=36$			
$6\times2=12$	$7\times3=21$	$7\times4=28$	$7\times5=35$	$7\times6=42$	$7\times7=49$		
$7\times2=14$	$8\times3=24$	$8\times4=32$	$8\times5=40$	$8\times6=48$	$8\times7=56$	$8\times8=64$	
$8\times2=16$	$9\times3=27$	$9\times4=36$	$9\times5=45$	$9\times6=54$	$9\times7=63$	$9\times8=72$	$9\times9=81$
$9\times2=18$							

Know from memory all table facts and associated division facts.

$$\begin{array}{r} 3\ 4\ 2 \\ \times\quad\ 7 \\ \hline 2,\ 3\ 9\ 4 \\ \ \ 2\ 1 \end{array}$$

$7\times2=14$
$7\times4+1=28+1$
$7\times3+2=21+2$

$$8\overline{)4,^{4}9\ ^{1}5\ ^{7}2}\quad 6\ 1\ 9$$

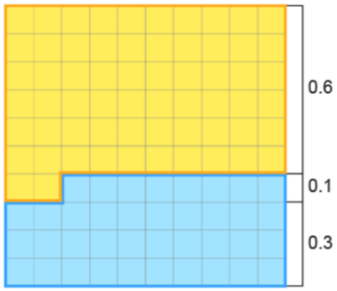
$4\div8=0\text{ r }4$
$49\div8=6\text{ r }1$
$15\div8=1\text{ r }7$
$72\div8=9$

5 NF-1

Apply known facts and to written methods for short multiplication and division.

$8+6=14$
$0.8+0.6=1.4$
$14-8=6$
$1.4-0.8=0.6$
$14-6=8$
$1.4-0.6=0.8$

8 + 6 is 14 so eight tenths plus 6 tenths must be fourteen tenths. Fourteen tenths is equal to one and four tenths.



Scale known complements to 100 **by a factor of 0.1** and **0.01**

$62+38=100$

$0.62+0.38=1$

3 hundredths times 5 is equal to 15 hundredths.

$3\times5=15$
$0.03\times5=0.15$

3 times 5 is equal to 15.

15 hundredths is equal to 0.15

5 NF-2

If I make one factor one-hundredth times the size, I must make the product one hundredth times the size.

$3\times5=15$
$3\times0.05=0.15$

3 times 5 hundredths is equal to 15 hundredths

$15\div3=5 \longrightarrow 0.15\div3=0.05$

If I make the dividend one-hundredth times the size and keep the divisor the same, I must make the quotient one-hundredth times the size

$15\div3=5 \longrightarrow 0.15\div0.03=5$

If I make the dividend one-hundredth times the size and the divisor one-hundredth times the size, the quotient remains the same.

21 is a multiple of 3. 3 is a factor of 21.

Understand **square numbers** as the **product** of a number **multiplied by itself** – $3^2 = 9$

Commutativity - factors can be written in any order

Understand the meaning of the terms ***factor*** and ***multiple*** and use them **appropriately**.

$\text{factor}\times\text{factor}=\text{product}$

A **factor** of a given number is a **whole number** that the given number can be **divided by without giving a remainder**

A **multiple** of a given number is **the product** of the given number and **any whole**

Applying commutativity		Applying associativity (example)
$3\times7\times10=210$	$3\times10\times7=210$	$3\times7\times10=210$
$7\times3\times10=210$	$7\times10\times3=210$	$(3\times7)\times10=21\times10=210$
$10\times3\times7=210$	$10\times7\times3=210$	$3\times(7\times10)=3\times70=210$

Express products in the multiplication tables as **products of 3 factors**

48 = 2 X 3 X 8

50 = 2 X 5 X 5

Associativity - any pair of the factors can be multiplied together first

Recognise **prime numbers** as numbers that have exactly **two factors –** 7 has the factors 1 and 7.

Use **knowledge of tables** and **scaling** to find **larger factors and multiples**.

380 is a multiple of 20
175 is a multiple of 25
8,500 is a multiple of 500

20 is a factor of 380
25 is a factor of 175
500 is factor of 8,500

Use the **relevant digits** to **identify multiples**.

$$8\overline{)4,^{4}9\ ^{1}5\ ^{7}2}\quad 6\ 1\ 9$$

Use **short division** to identify multiples.

4952 is a multiple of 8 because 8 divides into 4952 **without a remainder.**

5 MD-2

$7\times3=21$

21 is a multiple of 3, so…

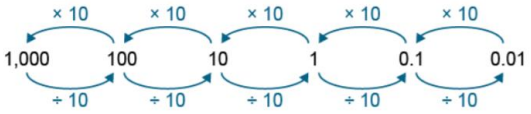
$7\times300=2{,}100$

….2,100 is a multiple of 300

$700\times3=2{,}100$

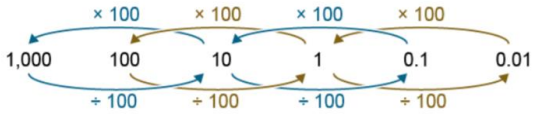
….2,100 is a multiple of 3

Multiplying by 10 is making a number 10 times the size



Dividing by 10 is making a number 1 tenth the size

Multiplying by 100 is making a number 100 times the size



Dividing by 100 is making a number 1 hundredth the size

0.8 multiplied by 10 is equal to 8

0.8, made 10 times the size, is 8.

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

× 10 ÷ 10

8 divided by 10 is equal to 0.8.

8, made one-tenth of the size, is 0.8.

$0.8 \times 10 = 8$ $\quad$ $8 \div 10 = 0.8$

First we had 8 ones. Now we have 8 tenths.

1,000s	100s	10s	1s	0.1s	0.01s
			8		
			0	8	

× 10 ÷ 10

First we had 8 tenths. Now we have 8 ones.

$8 \div 100 = 0.08$ and $0.08 \times 100 = 8$ ← Divide ones by 100 and the inverse.

Divide tenths by 10 and the inverse. → $0.8 \div 10 = 0.08$ and $0.08 \times 10 = 0.8$

$0.13 \times 100 = 13$

$2.65 \times 10 = 26.5$

$47.1 \times 100 = 4{,}710$

Multiply numbers with up to 2 decimal places by 10 and 100.

Multiplying by 100 is the same as multiplying by ten and then multiplying by ten again.

Dividing by 100 is the same as multiplying by ten and then dividing by ten again.

Divide numbers with up to 2 decimal places by 10 and 100.

$13 \div 100 = 0.13$

$26.5 \div 10 = 2.65$

$4{,}710 \div 100 = 47.1$

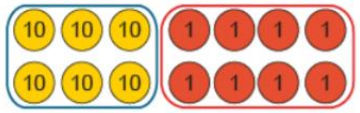
5 MD-1

0.25kg is one-hundredth times the mass of 25kg.

8cm is 10 times the length of 0.8cm.

Apply understanding of multiplying and dividing by 10 and 100 to real life contexts.

150 pencils is 10 times as many as 15 pencils.



$34 \times 2 = 30 \times 2 + 4 \times 2$

$= 60 + 8$

$= 68$

5 MD-3

2 times 4 ones is equal to 8 ones: write 8 in the ones column.

Use a formal written method to multiply any whole number with up to 4 digits by a one digit number.

	10s	1s
	3	4
×		2
		8
	6	0
	6	8

2 × 4 ones = 8 ones

2 × 3 tens = 6 tens

2 times 3 tens = 6 tens: write 6 in the tens column.

	10s	1s
	3	4
×		2
	6	8

Always begin multiplying with the digit furthest to the right.

$$\begin{array}{r} 3\ 6\ 7 \\ \times \quad\ 4 \\ \hline 1,4\ 6\ 8 \\ 2\ \ 2 \end{array}$$

4×7 ones = 28 ones = 2 tens + 8 ones

4×6 tens = 24 tens = 2 hundreds + 4 tens

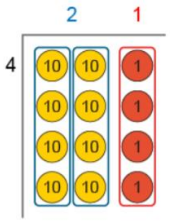
plus 2 more tens = 2 hundreds + 6 tens

4×3 hundreds = 12 hundreds = 1 thousand + 2 hundreds

plus 2 more hundreds = 1 thousand + 4 hundreds

Recognise when it is not appropriate to use a formal written method. → **201 X 4 = 200 X 4 plus 4**

Recognise when to use multiplication to solve a missing number problem. → $\square \div 2{,}854 = 3$



5 MD-4

	10s	1s
	2	1
4	8	4

8 tens ÷ 4 = 2 tens

4 ones ÷ 4 = 1 one

4 ones divided by 4 is equal to 1 one: write 1 in the ones column.

8 tens divided by 4 is equal to 2 tens: write 2 in the tens column.

Use a formal written method to divide any whole number with up to 4 digits by a one digit number.

$$4\overline{)\,6^{2}1^{1}2} \quad 153$$

6 hundreds ÷ 4 = 1 hundred remainder 2 hundreds

2 hundreds = 20 tens

plus 1 more ten = 21 tens

21 tens ÷ 4 = 5 tens remainder 1 ten

1 ten = 10 ones

plus 2 more ones = 12 ones

12 ones ÷ 4 = 3 ones

Division is the only operation in which you begin calculating with the digit furthest to the left.

Interpret remainders appropriately in context.

Recognise when to use division to solve a missing number problem. → $? \times 5 = 1{,}325$ or $952 \div ? = 7$

Recognise when it is not appropriate to use a formal written method. → **804 ÷ 4 = 200 plus one more 4**

If there are 30 scouts and 4 scouts can sleep in a tent, I can do 30 ÷ 4 to find out how many tents I need. 30 ÷ 4 = 7 r2, The 7 is the number of tents with 4 scouts in but the remainder is 2 scouts who will need a tent so I will need 8 tents for all of the scouts to have a tent.

Find **non unit** fractions of quantities.

5 F-1

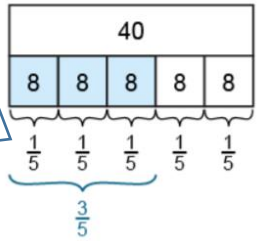
To find $\frac{1}{5}$ of 15, we divide 15 into 5 equal parts.

$\frac{1}{5}$ of 15 = ?

15 divided by 5 is equal to 3, so $\frac{1}{5}$ of 15 is equal to 3.

To find a **unit fraction**, divide by the **denominator**.

Three-fifths is equal to 3 one-fifths.

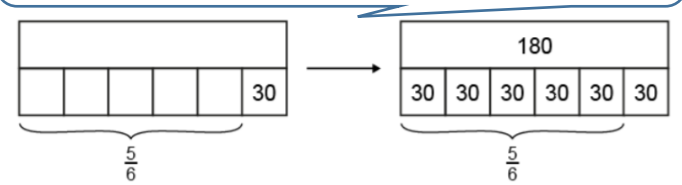


$40 \div 5 = 8$ $\quad 8 \times 3 = 24$

So, $\frac{1}{5}$ of 40 = 8 So, $\frac{3}{5}$ of 40 = 24

To find 3 one-fifths of 40, first find one-fifth of 40 by dividing by 5, and then multiply by 3.

Miss Reeves has some tangerines to give out during break-time. She has given out 5 6 of the tangerines, and has 30 left. How many tangerines did Miss Reeves have to begin with?



Use **formal written methods** to find non unit fractions of **larger numbers**. → $\frac{4}{9}$ of 3,411

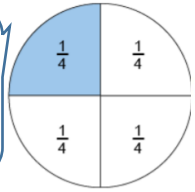
Apply **knowledge of place value** to find non unit fractions of **multiples of 10 or 100**. → **$\frac{3}{7}$ of 21 is 9 so $\frac{3}{7}$ of 210 is 90**

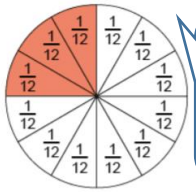
A **unit fraction** has a **numerator** that **is 1**.
A **non unit fraction** has a **numerator** that **isn't 1**.

Find equivalent fractions.

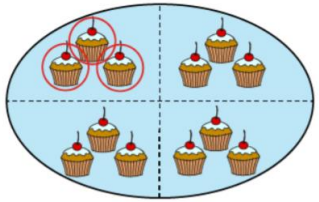
5 F-2

The whole is divided into 4 equal parts and 1 of those parts is shaded.

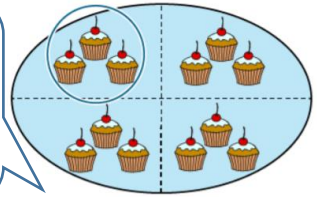


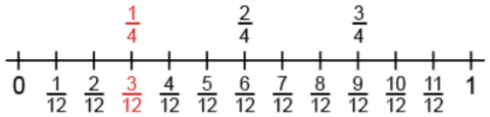


The whole is divided into 12 equal parts and 3 of those parts is shaded.



$\frac{1}{4}$ and $\frac{3}{12}$ are equivalent because 1 is the same portion of 4 as 3 is of 12.

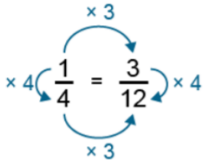




Equivalent fractions have the same value and the same position on the number line.

$\frac{3}{5} = \frac{6}{10}$ Non unit fractions follow the same rules of equivalence. $\frac{3}{12} = \frac{8}{32}$

In equivalent fractions, the proportional relationship between the numerator and the denominator is the same.

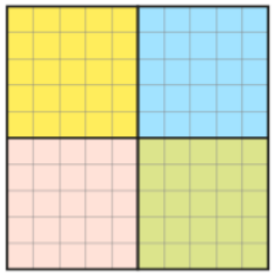


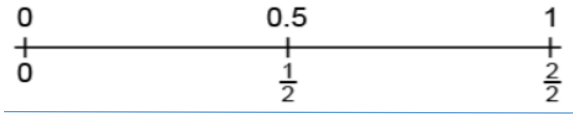
In equivalent fractions, the multiplicative relationship between the pair of numerators is the same as that between the pair of denominators

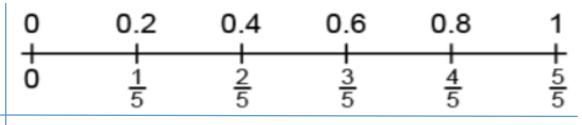
Know the decimal equivalent to common unit fractions.

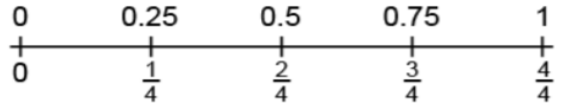
Unit fraction	Decimal fraction
$\frac{1}{2}$	0.5
$\frac{1}{4}$	0.25
$\frac{1}{5}$	0.2
$\frac{1}{10}$	0.1

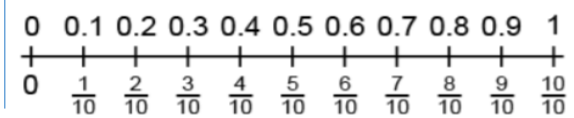
$\frac{1}{4} = \frac{25}{100} = 0.25$











Apply understanding to values beyond 1 in real life contexts.

3.2km = $3\frac{1}{5}$ km **4.5 litres = $4\frac{1}{2}$ litres** **8.9kg = $8\frac{9}{10}$ kg**

5 F-3

5 G-1

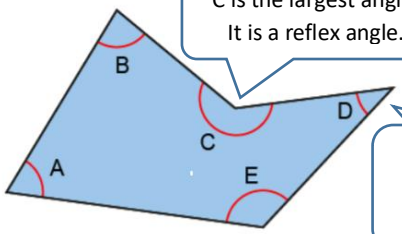
Compare, estimate, measure and draw angles.

An obtuse angle is larger than a right angle but less than the angle on a straight line.

Estimate the size of angles on a line and in polygons.

A reflex angle is larger than the angle on a straight line, but less than the angle for a full turn.

An acute angle is smaller than a right angle.



C is the largest angle. It is a reflex angle.

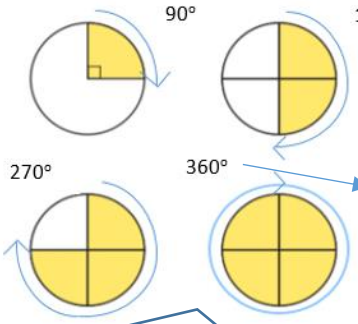
D is the smallest angle. It is an acute angle.

Identifying angles in a polygon.

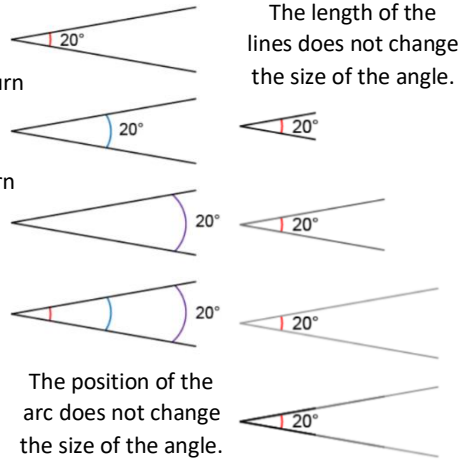
The angle of a **straight line** is **180°**

An **obtuse** angle **is greater than 90°** but **less than 180°**

An **acute** angle is **less than 90°**



A **reflex** angle **is greater than 180° but less than 360°**

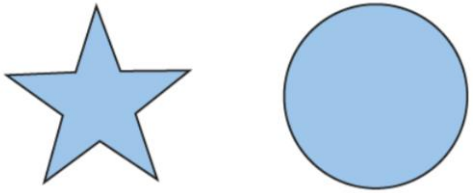


The length of the lines does not change the size of the angle.

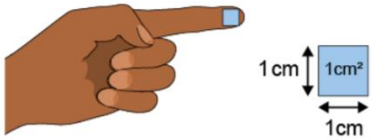
The position of the arc does not change the size of the angle.

Measure and draw angles up to 180° accurately using a **protractor**.

The **area** of a shape is the **space within** a shape.

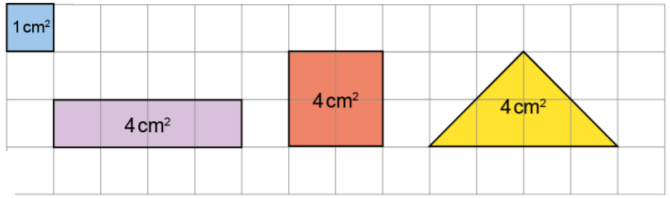


Compare the area of shapes by looking at the **space within** them and estimating which is greater.



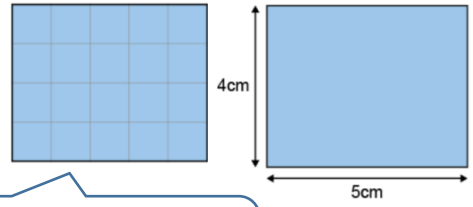
A **standard unit** for **measuring** area is the **square centimetre (cm²)** – a square with sides 1cm in length.

Measuring is more **accurate** than **estimating.**



5 G-2

Compare and calculate areas.



To find the area of a rectangle, multiply the length by the width.

4cm × 5cm = 20cm²

5cm × 4cm = 20cm²

Other standard units, such as meters squared (m²) exist for measuring larger areas, such as rooms.