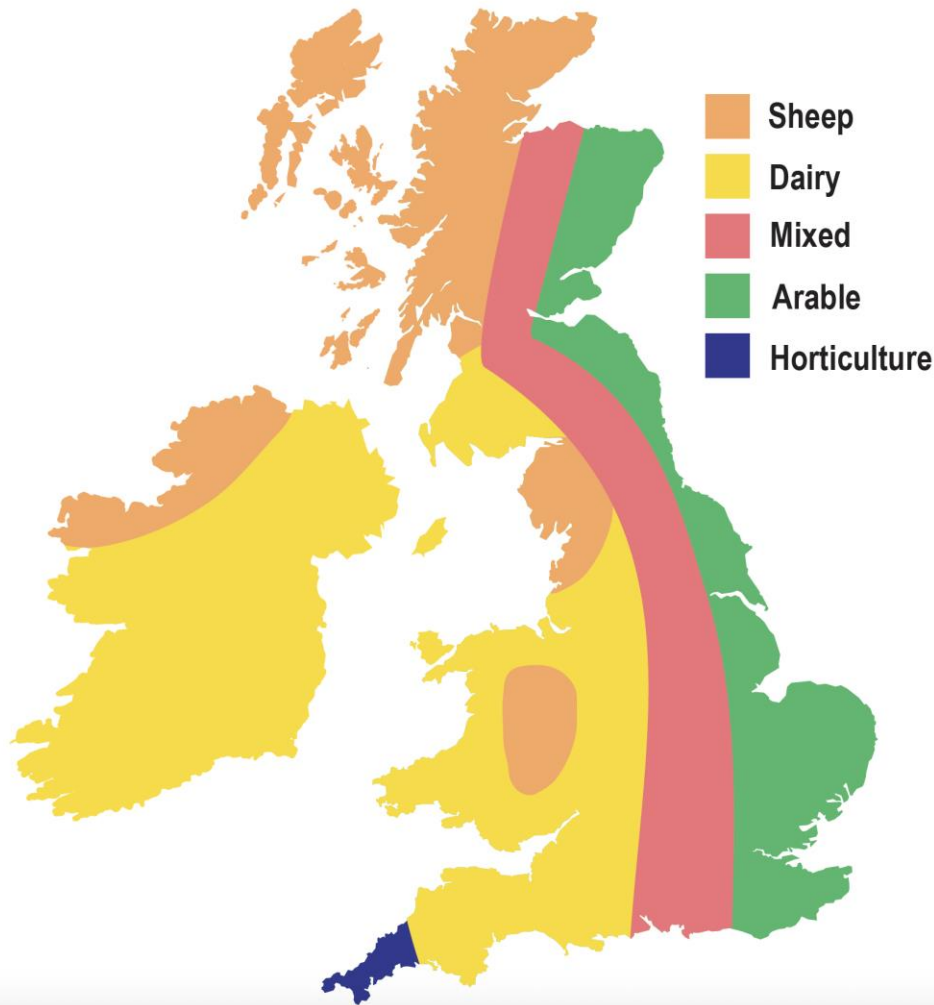




# SESSION 1

## Introduction to British farming





## What variety of farms are there in the UK?

This map shows what **type of farming** takes place in different areas of the UK.

What do you think might happen on these different types of farms?

# What does the data tell us about the types of farming in the UK and why?

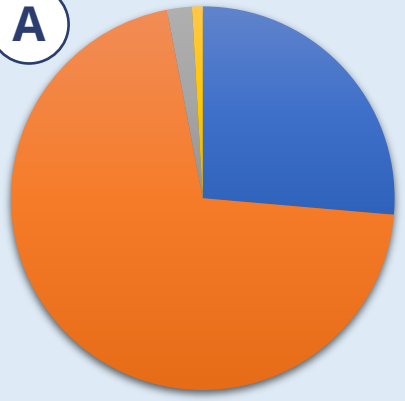
Region	Farmland	Natural	Built on and green urban areas
England	72.9%	14.5%	12.6%
Northern Ireland	72.2%	23.0%	4.8%
Scotland	26.4%	70.6%	3.0%
Wales	59.3%	35.1%	5.6%

Which country has the most farmland?

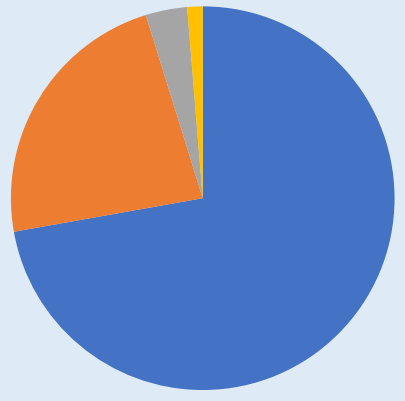
What interesting things do you notice in this data?



A



B

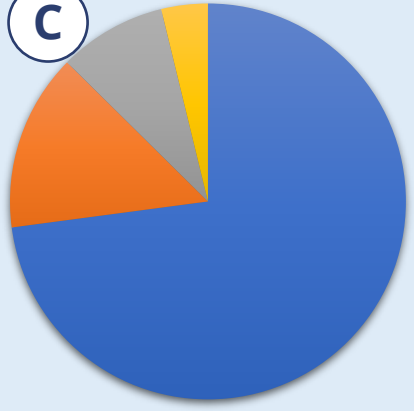


These pie charts do not include labels. They showing land use in England, Scotland, Wales and Northern Ireland.

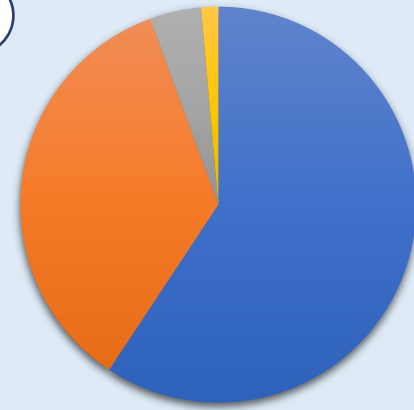
**Can you work out which pie chart represents which country?**

Justify your answer.

C



D



Region	Farmland (%)	Natural (%)	Built on (%)	Green urban areas (%)
England	72.9	14.5	8.8	3.8
Northern Ireland	72.2	23.0	3.5	1.3
Scotland	26.4	70.6	2.1	0.9
Wales	59.3	35.1	4.2	1.4

Farmland
  Natural

Built on
  Green Urban

# Can you represent the data in a pie chart to show land use across the UK?

Region	Farmland	Natural	Built on and green urban areas
England	72.9%	14.5%	12.6%
Northern Ireland	72.2%	23.0%	4.8%
Scotland	26.4%	70.6%	3.0%
Wales	59.3%	35.1%	5.6%

1. Calculate the UK total percentage of land used per category.
2. Use a ratio table to construct a pie chart.
3. Draw your pie chart with an appropriate title and key.



UK land use  
by nation -  
percentage of  
land used per  
category

Region	Farmland (%)	Natural (%)	Built on and green urban areas (%)	Total (%)
England	72.9	14.5	12.6	
Northern Ireland	72.2	23.0	4.8	
Scotland	26.4	70.6	3.0	
Wales	59.3	35.1	5.6	
UK Total				



UK land use  
by nation –  
percentage of  
land used per  
category

Region	Farmland (%)	Natural (%)	Built on and green urban areas (%)	Total (%)
England	72.9	14.5	12.6	100
Northern Ireland	72.2	23.0	4.8	100
Scotland	26.4	70.6	3.0	100
Wales	59.3	35.1	5.6	100
UK Total	230.8	143.2	26.0	400

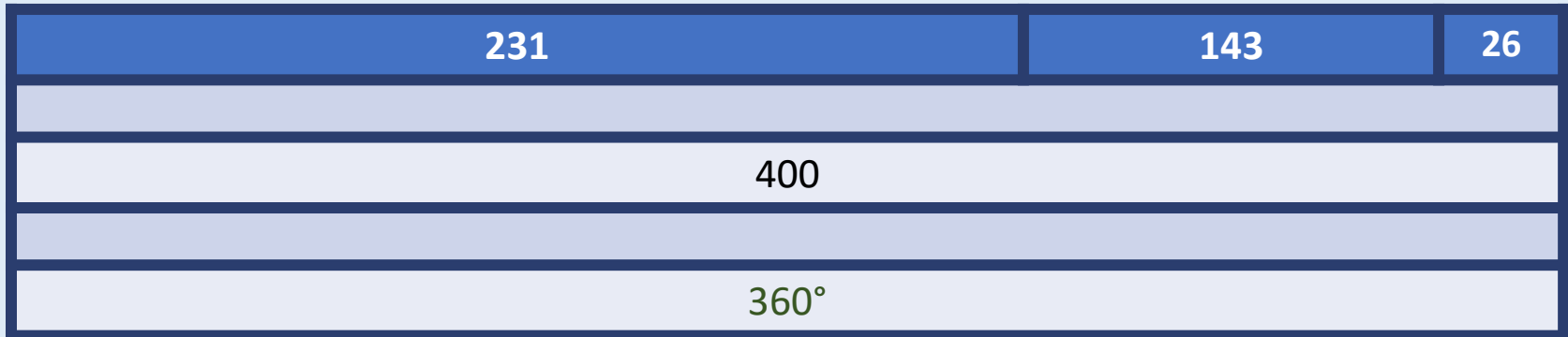


How might this ratio table help you to construct a pie chart to represent the data?

<b>% Land use</b>	<b>400</b>	<b>100</b>	<b>1</b>	<b>26</b>	<b>143</b>	<b>231</b>
Angle size (°)	360°	90	0.9			

Which of these two representations, if any, do you find more helpful?

How else could you construct your pie chart?





# Can you find out?

## Background Information

The total area of agricultural holdings is about 23.07 million acres (9.34 million hectares), of which about **a third** is arable and most of the rest is grassland. During the growing season about half the arable area is cereal crops, and of the cereal crop area, more than 65% is wheat.

**What approximate fraction of the total area of agricultural holdings is:**

- cereal crops
- wheat



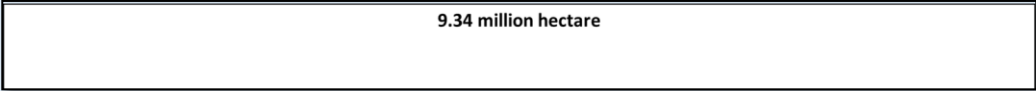
# Step one: Break down the information

- The **total area** of agricultural holdings is about **9.34 million** hectares
- Of which about **a third** is arable and most of the rest is grassland.
- During the growing season, about **half the arable area** is cereal crops
- Of the **cereal crop area, more than 65% is wheat.**

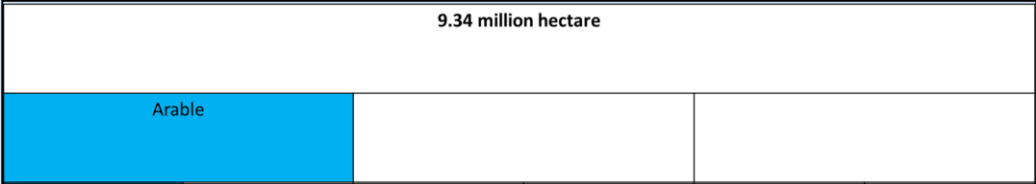


# Step 2: Use a bar model to represent the problem

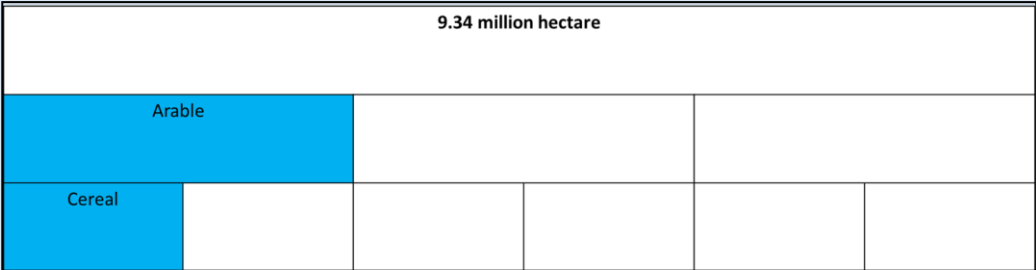
The total area of agricultural holdings is about 9.34 million hectares.



Of which about **a third** is arable and most of the rest is grassland.

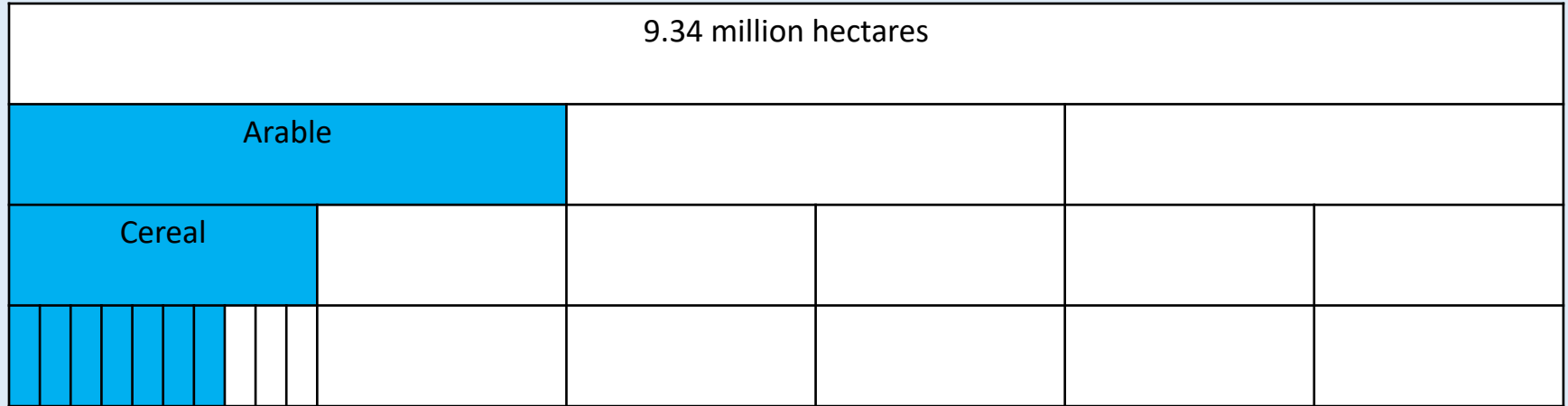


During the growing season, about half the arable area is cereal crops.



# Bar model to support thinking

Of the cereal crop area, more than 65% is wheat.



Calculate:

- What fraction/percentage of the agricultural holdings is used for wheat?
- Approximately how much land is this? Show your answer in hectares and metres squared.

How does the size of a hectare relate to your school?

1 Hectare = 10,000m<sup>2</sup>



# Time to investigate

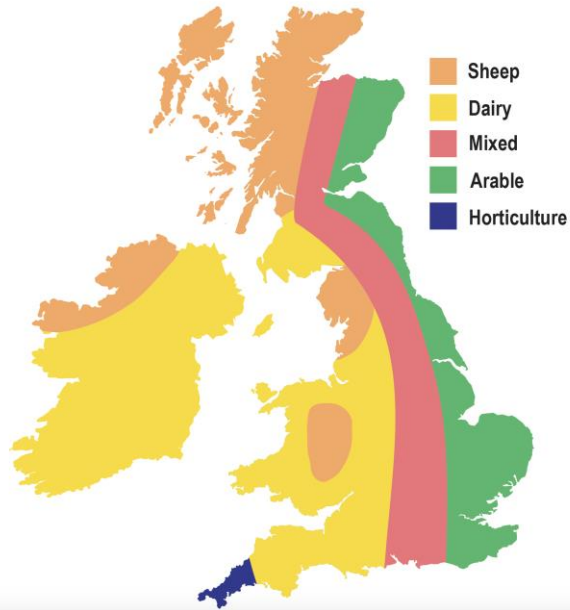
How many  $\text{m}^2$  fit into your school grounds?

How many of your school grounds would fit into a hectare?

What will you need to find out?  
How will you find out?



# Where does farming take place in the UK?



What do you notice about where different types of farming take place?

This is a **topographic map** of the UK. Colours show the **elevation** of the land - the height above the level of the sea.





**Which region of the UK do you live in?**

Have you noticed what type of farming takes place in this region?



# What sort of farms are near you?

Search box

Farms near CV2 2DX

- J Ismay**  
5.0 ★★★★★ (1) ⊕  
Farm · Elm Fields Farm/Wigston Rd  
Open now · 024 7661 2835
- Crowner fields farm**  
3.4 ★★★★★ (19) ⊕  
Farm
- Breachbrook Farm & Market Garden**  
3.0 ★★★★★ (2) ⊕  
Farm · 58 Norman Pl Rd  
024 7633 3907
- Seven Acres**  
4.8 ★★★★★ (5) ⊕  
Farm · 20 Stoneleigh Rd  
024 7669 3284
- Dewes E R B**  
4.3 ★★★★★ (3) ⊕  
Farm · Lenton Lane Farm/Lentons La  
024 7661 2638
- Westmead Farm**  
5.0 ★★★★★ (1) ⊕  
Farm
- Birch Tree Farm**  
4.8 ★★★★★ (4) ⊕  
Dairy farm · 17 Wall Hill Rd  
024 7633 8350
- Payne D & G**  
4.0 ★★★★★ (5) ⊕  
Farm · Home Farm/Hinckley Rd

Update results when map moves

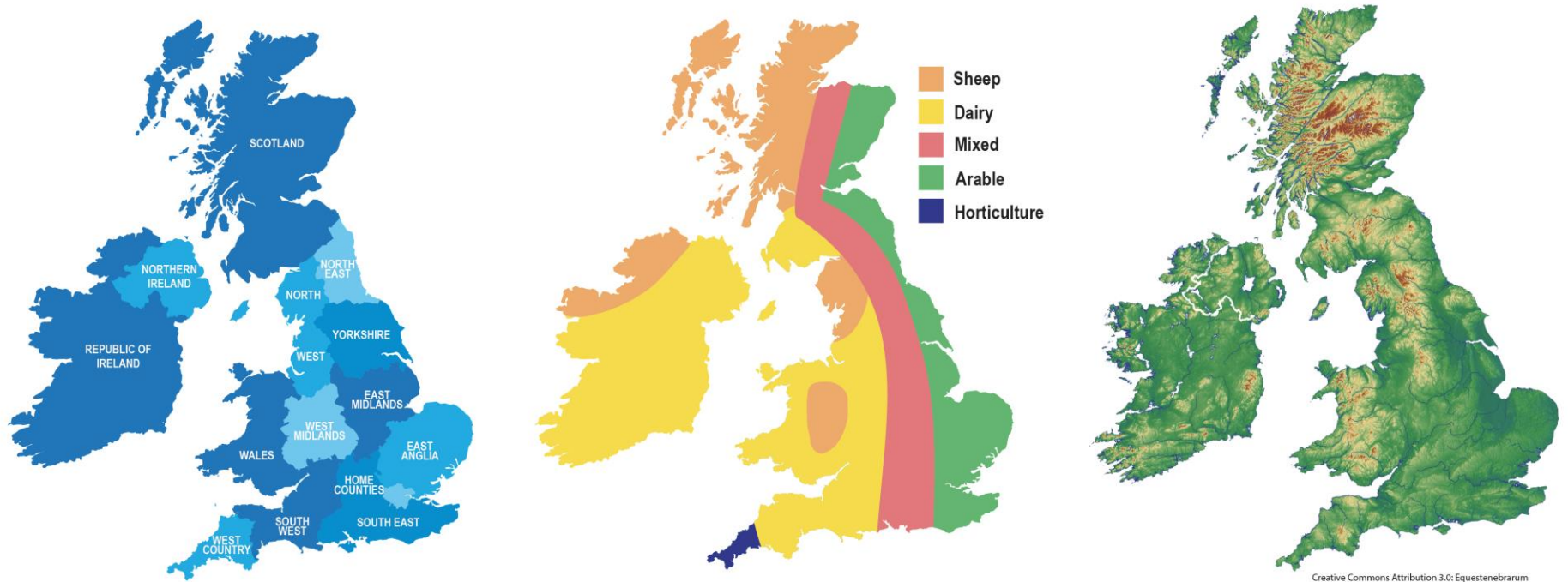
Visit <https://maps.google.com>

In the search box type: 'Farms near [insert your town or city]'.

How many farms appear in your search?

Make a tally of the different types of farms near you.

# Why are different farms in different places?



Squashing the soil in technical terms is called **compaction**. This can be very damaging for the soil because **it squashes earthworms which are very important for our soil health**. It also **prevents moisture and water entering the soil effectively**, which is vital for the growth of our crops.



## Our farming problems...

Can you engineer some solutions?

After sowing we have real difficulty with **pests eating seeds**. Birds, small mammals and insects all eat seeds after they have been planted and this can lead to up to 35 out of every 100 seeds planted not turning into crops.



Keeping our soil healthy is a challenge. We test the soil so we can decide whether we need to add **extra nutrients**. This is to make it healthy and increase the yield so we get much more wheat per acre, or per area, of the field. The **fertiliser** which we add can also be a problem because **it is very expensive** and the production of fertilisers can contribute to **greenhouse gases**.



**Carbon emissions** are really important and we have to reduce them. **Ploughing can actually cause some carbon emissions**. This is because when we turn the soil and bring it to the surface, carbon within the soil reacts with the oxygen in the air. Microbes then turn this into carbon dioxide, a greenhouse gas.



Use the **Engineering Design Process** to find solutions to the farmers' problems.

Can you make things to make things better?



Agri engineers work through the **Engineering Design Process** to solve real-world problems that farmers have.



# SUSTAINABLE FARMS

