

How plants can
shift through
continental drift



KEYSTAGE 3-4
GEOGRAPHY

< Acer sieboldianum



< Acer palmatum 'Ozakazuki'



Useful resources:

Britannica's information on biogeography
RHS's pages on Quercus robur and Quercus rubra
The European Environment Agency's web page on plant distribution and climate change

Next time you're out on a walk or a bike ride...

...take a look around you and notice how many different types of plants you can spot. Five? Ten? Twenty?

You may be surprised to hear that there are close to 391,000 different species of plants in the world, with 70,000 different types in the UK. At Marks Hall Estate alone, we are home to several hundred plant species.

Many of these plant species have an extensive range and can thrive on different continents (for example coconut palms, which can be found in tropical islands in the Pacific, Atlantic and Indian Oceans). Others have a very limited range, such as Antarctic hair grass.

In today's challenge, we'd like you to explore the different ways that plants can 'travel' to different continents and the reasons why they can thrive in geographic locations far removed from each other.

Introduction

Quercus (oak) >



Please print out the following pages...

Activity 1

How plants distribute cross continents

There are four main ways that plant species can be distributed across several continents. Take some time to research each one, explaining in your own words how it might contribute to plant 'travel'.

Please find an example on the following page and add your answers under each heading.



2. Oceans and river systems

1. Continental drift

Blank white space for writing answers under the heading '1. Continental drift'.



Activity 1

Continued...

3. Human introduction



4. Animal migration

Some plants rely on animals to spread their seeds or spores as part of their reproductive cycle. Depending on the behaviour of the animal, this can mean that the plants can travel quite a long distance, especially during seasonal migration. Many bird species migrate to warmer climates during the winter, and may take seeds back and forth across their journeys, leading to plant populations distributed between different continents.



Activity 2

Case study: *Quercus* (oak tree)

At Marks Hall Estate we have many varieties of oak trees including *Quercus robur* (native to the UK, common name English oak) and *Quercus rubra* (native to North America, common name Northern Red Oak). Both oaks belong to the same family (Fagaceae). They grow in the Northern Hemisphere, but originate thousands of miles apart and have adapted to their individual natural habitats in order to thrive.

Can you research these two varieties of oaks and answer the following questions?



**BARK
PATTERN**

***Quercus robur*
(Honywood Oak >**



**LEAF
COLOUR**

**THINK
ABOUT...**



< *Quercus rubra*



**LEAF
SHAPE**



1. How do you think the species travelled between the two continents?

Tip: Refer back to the reasons for plant travel and decide which explanation you think is the most likely.

Activity 2

Continued...



< **Quercus robur**

2. What similarities are there in these two environments?

Tip: Consider factors like climate, physical geography and soil types.

A large, empty white rounded rectangular box intended for student answers to question 2.

3. Suggest another environment where this plant may thrive, and why.

Tip: Consider the 'biome' that oaks flourish in. Where else in the world is this type of biome?



A large, empty white rounded rectangular box intended for student answers to question 3.

Activity 3

Climate change and the distribution of plant species

< **Quercus rubra**

Did you know?

The Arboretum at Marks Hall Estate features **Wollemi pines**, originally native to Gondwanaland, one of two supercontinents formed by continental drift 550 million years ago.

Climate change has had a massive impact on how plant species can both colonise new territories and survive in their existing ones. At Marks Hall Estate we're keen to raise awareness about the importance of plant biodiversity - on a global scale. Below we have listed a few reasons why climate change is affecting plant biodiversity and we'd like you to research these and, in each instance, explain them in your own words, writing about the impact of these factors on plant life.

Research and add an additional climate change factor affecting plant distribution. Out of all of these factors, which do you think has the greatest impact? What could we do to make this less of a problem?

Activity 3

Continued...

Reason 1. Changes to growing conditions (temperature/sea levels/rainfall/soil type etc.)

Explanation

Impact

Reason 2. Animal/insect migration (food chain disruption)

Explanation

Impact

Reason 3. Previously harmless alien species becoming invasive

Explanation

Impact