

## Evolution and adaptation Classroom activity pack

This pack contains a series of activities for you to complete with your class both before and after your visit to Kew.

You may choose to do all the activities or just select one. Post-visit activities are intended to build on the learning from the educational session at Kew. Many of the resources can be used on a whiteboard or can be printed.



## Pre-visit teacher notes



### KS5 Evolution and adaptation

Thank you for booking the Evolution and Adaptation education session at Kew. You can use the pre-visit activity to support your pupils' learning.

Ahead of your visit, your pupils could answer the question below. They can tell us about their answers when they come to Kew.



#### Question:

Within the Princess of Wales conservatory, we have hundreds of species of plants from around the world. At one point these all shared a common ancestor. How could they have diversified to become so many different species?

You can encourage your pupils to discuss:

- Natural selection
- Allopatric and sympatric speciation
- Isolation mechanisms
- Genetic drift

## Pre-visit pupil activity



### KS5 Evolution and adaptation



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How could they have diversified to become so many different species?



## Post-visit teacher notes

We hope that the teaching session at Kew assisted in developing the skills and knowledge of your pupils and provided them with an insight into the amazing plants and world-leading plant science at Kew.

Following your visit, you can use the post-visit activity to further support your pupil's learning.

Pupils can have a go at the exam-style question on the following page, and then use the mark scheme to check their answers.





### KS5 Evolution and adaptation



*Erythranthe lewisii* and *Erythranthe cardinalis* are two different-coloured species of Monkeyflower in North America that have likely arisen via sympatric speciation. *E. lewisii* is almost exclusively pollinated by bees, whilst *E. cardinalis* is pollinated by hummingbirds.



The purple coloured *Erythranthe lewisii*, which is pollinated by bees.



A hummingbird; the main pollinator of the red-coloured *Erythranthe cardinalis*.

Suggest how the two species might have arisen by sympatric speciation.

[6 marks]



Question	Marking Guidance	Mark	AO	Comments
1.	<ol style="list-style-type: none"> <li>1. This occurs in one habitat</li> <li>2. Mutation caused different coloured flowers to be produced.</li> <li>3. One colour flower was only pollinated by bees, and the other one by hummingbirds - reproductive isolation occurred.</li> <li>4. Different <u>alleles</u> are passed on.</li> <li>5. <u>Disruptive selection</u> occurred.</li> <li>6. Two separate species are formed – cannot interbreed to produce fertile offspring.</li> </ol>	6	AO3	<p>Accept: environment/population/place for habitat. Accept: <b>not</b> geographically isolated.</p> <p>For point 3 accept: no gene flow OR gene pools remain separate.</p>