

MODULE 2: GREAT CRESTED NEWTS - TEACHERS' NOTES

This activity is a student research project where students must research the lifecycle, characteristics and ecology of great crested newts. This activity relies on students completing independent research to answer the questions.

Before completing this activity, it is useful for students to have some prior knowledge of food chains and food webs, adaptation and habitat succession; this activity draws these cross-curricular themes together in a real-life ecology careers context.

Learning objectives

Students will learn to:

- Describe the lifecycle and adaptations of great crested newts;
- Explain the feeding relationships between great crested newts and other organisms in their ecosystem;
- Understand the activities of ecologists in conserving great crested newt populations in the UK.

Curriculum links

These objectives apply to and link to the following areas of the KS3 Science 2015 programme of study:

Students should be taught about:

- Interactions and interdependency relationships in an ecosystem;
 - The interdependence of organisms in an ecosystem, including food webs and insect-pollinated crops;
 - How organisms affect and are affected by their environment, including the accumulation of toxic materials.
- Inheritance, chromosomes, DNA and genes;
 - Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction;
 - The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.

Skills Builder Essential Skills

In this activity students will use problem solving steps 7-10.

See the Skills Builder framework (www.skillsbuilder.org/universal-framework/listening) for more explanation.

Inventory

For a class of 30 students you will need:

- 30 x Great Crested Newts Worksheets
- 1 x Great Crested Newts Teachers Notes
- 1 x Great Crested Newts Presentation
- Access to internet-connected computers or smart devices.




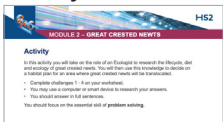
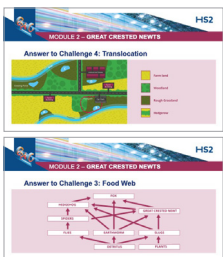

Preparation

Review the presentation and presenter's notes. Decide on which content you will include in your session, and adjust the timings below to suit your lesson length. This example lesson is based on a 75-minute session with a mixed ability Year 8 class.

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Sequence

Use the following sequence to plan this activity. You may wish to adjust the timings according to your style of delivery, group and workshop length.

Time (min)	Sequence	Instructions	Slides
5	Welcome 	Introduce yourself, the HS2 project and the learning objectives for the lesson.	1-2
5	Ecology and HS2 	Explain the role of ecologists in civil engineering projects such as HS2 using the presentation slide.	3
5	Great Crested Newts & Translocation 	Introduce the great crested newts using the presentation slide. Explain the process and purpose of translocation.	4-5
40	Activity 	Introduce the activity sheet using the presentation slide and the essential skill that will be the focus of the lesson: problem solving. Students are to complete Challenges 1-4.	6
15	Student answers 	Using the answer sheet, mark the answers to Challenges 1-4. Ask for student answers for each. Use slide 7 to illustrate discussions on the answer to Challenge 4 and slide 8 to show the answer to Challenge 3.	7-8
5	Plenary 	Use the plenary questions above to recap the students learning. These questions refer to the learning objectives from the beginning of the lesson and to the essential skill of problem solving. Use the additional plenary questions above to adjust the focus of your plenary.	9

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Questions

Use these questions to stimulate the students' learning during the activity:

- Why is it important that the great crested newt populations can mix?
- What could happen if a barrier is placed between the aquatic and terrestrial habitats required by great crested newts?
- Why is it important to translocate at-risk species?
- Great crested newts are adapted for their environment. What could happen if their environment changes?
- What can we do to increase biodiversity?

Tips and tricks

- This activity could be set as a homework task, for review and discussion in class.
- To make the activity harder, challenge students to illustrate the lifecycle of the great crested newt on a separate sheet of paper.
- To make the activity easier, you could provide a list of useful websites or search terms. Useful search terms include "great crested newt conservation", "great crested newt lifecycle" and "great crested newt feeding relationships".
- Biodiversity is an important theme in this activity. You could extend on this theme with a practical habitat management challenge:
 - You could challenge your students to plant a bee-encouraging flower, either at home or in your school grounds.
 - You could form an ecology club. Projects could include planting a meadow or building a pond in your school grounds, to increase biodiversity and to create a 'stopping off' point for animals moving between larger habitats.

Video content

You may wish to show these videos to compliment the learning from this activity.

- An animation introducing HS2's Green Corridor approach (3 mins) <https://youtu.be/Sr1WmwUXfzc>
- Habitat creation for newts at Finham Brook (90 sec) <https://youtu.be/-SjXSMgt6OY>

As the HS2 project develops new videos are regularly added to our You Tube channel. There may be more detailed information about your local area, or new videos uploaded since this resource was made. Check out our You Tube channel for the latest updates:

<https://www.youtube.com/user/HS2ltd/videos>

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Answers

Challenge	Answer																																								
1	<p>1 - Egg - Each egg is laid on an underwater leaf, which is wrapped around it.</p> <p>2 - Larva - Newly hatched, they swim using their tails, developing their front legs, then back legs. They hunt tadpoles, insects and other newt larvae in competition with fish.</p> <p>3 - Juvenile - Almost at maturity, they leave the pond, losing their tail fins and gills.</p> <p>4 - Adult - On land they are active at night, hunting earthworms, slugs and other invertebrates. By day they shelter under rocks and logs. They return to the pond for breeding.</p>																																								
2	<p>a) They are proficient swimmers, which enables them to hunt on land and in water.</p> <p>b) They wrap their eggs in leaves to help protect them.</p> <p>c) Their dark bumpy skin helps them to camouflage amongst rocks and logs.</p> <p>d) They can absorb oxygen through their skin, which helps them to breathe underwater.</p> <p>e) The males grow a jagged, spikey crest, which helps them to attract females during the mating season.</p>																																								
3	<p>a)</p> <pre>graph BT DETRITUS --> EARTHWORM DETRITUS --> SLUGS DETRITUS --> FLIES PLANTS --> SLUGS FLIES --> SPIDERS FLIES --> HEDGEHOG EARTHWORM --> HEDGEHOG EARTHWORM --> FOX EARTHWORM --> GCN[Great Crested Newt] SLUGS --> GCN SLUGS --> FOX SPIDERS --> HEDGEHOG HEDGEHOG --> FOX GCN --> FOX</pre> <p>b) An increase in hedgehogs would have a negative impact. Great crested newts could face increased predation and greater competition for food.</p>																																								
4	<p>a)</p> <table><thead><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th></tr></thead><tbody><tr><td>Does it connect to another pond?</td><td>No</td><td>No</td><td>Yes</td><td>No</td></tr><tr><td>Does it offer access to grassland?</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr><tr><td>Does it offer access to woodland?</td><td>No</td><td>Yes</td><td>Yes</td><td>Yes</td></tr><tr><td>Does it connect to other habitats?</td><td>No</td><td>Yes</td><td>Yes</td><td>Yes</td></tr><tr><td>Is it safe from fish invasion?</td><td>Yes</td><td>No</td><td>Yes</td><td>Yes</td></tr><tr><td>Is it at low risk of disturbance from dog walkers or farm animals?</td><td>No</td><td>No</td><td>Yes</td><td>No</td></tr><tr><td>Is it safe from the risk of pollution from runoff?</td><td>No</td><td>Yes</td><td>Yes</td><td>No</td></tr></tbody></table> <p>b) Site C is the most suitable as:</p> <ul style="list-style-type: none">It connects to an existing pond;It offers access to grassland and woodland;It connects to other habitats;It is safe from fish invasion as it is not on a floodplain;There is little chance of disturbance as it is not on a path or near a farm;It is safe from industrial or agricultural runoff. <p>c) Adding more newts could damage the balance of the ecosystem, as there might not be enough food to support a larger newt population.</p> <p>d) Having access to more than one pond enables the newts to breed with another newt population, increasing genetic diversity.</p> <p>e) Fish could outcompete the newts for food. Additionally, fish could also eat newt eggs or tadpoles.</p>		A	B	C	D	Does it connect to another pond?	No	No	Yes	No	Does it offer access to grassland?	Yes	Yes	Yes	Yes	Does it offer access to woodland?	No	Yes	Yes	Yes	Does it connect to other habitats?	No	Yes	Yes	Yes	Is it safe from fish invasion?	Yes	No	Yes	Yes	Is it at low risk of disturbance from dog walkers or farm animals?	No	No	Yes	No	Is it safe from the risk of pollution from runoff?	No	Yes	Yes	No
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