

# TEACHER NOTES

## Science: Physics/Biology crossover

### Energy/Conservation & Ecosystems/Material Cycling



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## Contextual Summary

This resource is for students at key stage 4 and relates to the energy conservation parts of the Science National Curriculum, focusing on the use of various methods and practices for energy self-sufficiency.

The tasks link to their visit to Tapnell Park Farm with various methods of energy self-sufficiency. Tasks are designed to appeal to students at key stage 4 working at lower or higher abilities.

## Task Implementation

This is an on-site resource (setting up post-visit classroom work) that is designed to be used in conjunction with the on-site resource. It focuses on sustainable methods and equipment. Students will follow a path to discover the various methods and equipment used at Tapnell Park Farm.

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sustainability.

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The post-visit aspect of the task requires students to work in small groups and acting as a company they will research additional equipment and methods to increase sustainability for Tapnell Farm Park. Students will then propose a bid to carry out the work necessary to implement the additional equipment and methods at Tapnell Farm Park. They are required to present their bid to the rest of the class. The most successful bid can be forwarded to Tapnell Farm Park for their consideration.

Ideally, teachers will have introduced students to various key phrases (carbon neutral, net exporters of electricity, anaerobic digesters and biomass boilers) prior to the trip.

## Ability Levels

There are two variants of this resource, one for low ability key stage 4 students, and one for high ability key stage 4 students. The language has been simplified and more support is provided in the lower ability resource.

### Key skills practised in this unit:

- ▶ Identifying benefits of various sustainable equipment and methods
- ▶ Researching skills and application of this knowledge to Tapnell Farm Park site
- ▶ Working as part of a team
- ▶ Recording and presenting information
- ▶ Communication skills.

## Relationship to Curriculum

- ✓ Physics: Energy, Conservation, Dissipation
- ✓ Biology: The principle of material cycling; Ecosystems
- ✓ Working Scientifically: The development of scientific thinking; analysis and evaluation

### SUBJECT

Science - Physics/Biology

### UNIT

Energy Conservation; Ecosystems

### OPPORTUNITIES FOR USE

- ✗ Pre-Visit
- ✓ On-Site Activity
- ✓ Post-Visit



Peripheral Task

### CURRICULUM / SYLLABUS

- ✓ National Curriculum 2014
- ✓ Curriculum for Excellence

Applies to Resource numbered:

1 5 2 1 1 1  
1 5 2 1 1 2



## Learning Opportunities

### Pre-Visit

- ▶ Ideally, teachers will have introduced students to various key phrases (carbon neutral, net exporters of electricity, anaerobic digesters and biomass boilers) prior to the trip.

### During the Visit

- ▶ Students complete the activities in the resources linked to this document: *Tapnell Farm Park: A Bid for Sustainability*

Resource ID: **152111** (KS4 lower ability) **152112** (KS4 higher ability)

### Post-Visit

- ▶ Students complete the follow-up tasks identified on page 4 of the resource.

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- ▶ Students will be able to relate the activities at Tapnell Farm Park to the 'Conservation of Energy' sections of the Key Stage 4 national curriculum and examination board criteria.

- ▶ The worksheets and experiences will enable students to explain everyday and technological applications of science, evaluating associated economic and environmental implications.
- ▶ They will make decisions based on their research and their understanding of sustainability aspects of Tapnell Farm Park.

## Learning Outcomes

- ✓ Students will demonstrate an understanding of various sustainable methods and equipment.
- ✓ They will demonstrate their ability to apply their knowledge by suggesting additional energy self-sufficiency equipment and methods suitable for Tapnell Farm Park.
- ✓ Students will communicate their findings and reasoned conclusions using either paper-based or electronic reports/presentations.

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