



# Bee Lab: Diagnosing the Health of your Honey Bees

Working with beekeepers and bee scientists, your pupils will analyse the health of the honeybees they have been caring for.

In this full day, hands-on, citizen science workshop, your pupils will investigate if your bee colonies have Nosema using DNA and microscope analysis. This is a chance for them to learn about the science behind bee health, contribute to real-research and meet and work with other bee enthusiasts.

**Learning Level:** NPA Beekeeping  
**Availability:** See website  
**Cost:** £5 per student

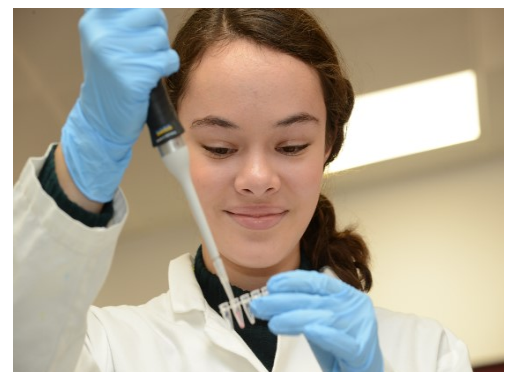
**Minimum attendance:** 16  
**Maximum attendance:** 24

## Learning objectives

- To understand all living things have DNA and that DNA is unique
- To realise that there are different methods for looking for parasites including visual inspection of hives, microscopy and DNA analysis
- To appreciate that beekeeping has lots of science involved and can help scientific research
- To confidently use the scientific method
- To interpret and discuss experimental results

## Techniques used

- Micropipetting
- Polymerase Chain Reaction (PCR)- a method used in molecular biology to "photocopy" the DNA many times so that we can "see" it
- DNA gel electrophoresis
- Microscopy (preparing slides and using microscopes)



A NPA Beekeeping pupil micropipetting DNA of their school honeybees.

Get hands-on  
with real-life  
science



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## Workshop timeline

- Review of honeybee parasites and how bee scientists can look for disease
- Introduction to micropipettes
- Preparation of DNA samples for PCR
- Introduction to PCR and DNA electrophoresis
- Microscope analysis of bees, looking for Nosema
- Visit to our local apiary for a visual inspection of a hive for other parasites\*
- DNA electrophoresis using agarose gels
- Analysis and interpretation of results
- Discussion with beekeepers and bee scientists

\* a visit to our apiary is only possible if you bring your own freshly washed beekeeping suits

## Curriculum links

### **Outcome 3 Describe how to subdue and handle bees.**

#### **Performance criteria**

- (a) Describe the reasons for making a hive inspection.
- (b) Describe the environmental conditions conducive to successful manipulations of bees.

### **Outcome 4 Describe the principal pests and diseases affecting bees in the UK.**

#### **Performance criteria**

- (a) Describe the pests and diseases to which the brood and adult bee are susceptible, and identify which are notifiable.
- (b) Describe the symptoms and effects of the principle bee diseases.

## Developing the Young Workforce – “I can” statements

### **The following statements are supported through EBSOC’s workshops:**

- “I can demonstrate and apply the skills I have learnt across the curriculum in relation to the world of work.”
- “I can demonstrate diverse thinking when exploring learning opportunities and pathways.”
- “I can investigate and assess ethical issues in business and trade decisions.”

