

# Nature needs you

## Labs without walls

Ashley Whitworth/Bigstockphoto



*Open Air Laboratories (OPAL) is an England-wide initiative that has received a grant from the Big Lottery Fund to bring scientists and local communities closer together. The project hopes to uncover new insights into the world around us by encouraging people to explore, study and understand their local environments.*



*Exploring nature with OPAL – outside the Natural History Museum in London.*

Anyone can take part and all kinds of outdoor spaces are of interest; from backyards and beaches to playing fields and window boxes. The project wants to create an ongoing dialogue between scientists and local people so that each party can benefit from the other's knowledge of the environment. Local people will have the opportunity to share what they know about nature near them, and scientists will help communities improve and maintain local green spaces. Ultimately, this collaboration will lead to a ground-breaking community-led study of the natural world which will reveal new information about England's flora and fauna.

*Identifying lichen species on trees and rocks can tell you about local air quality.*

### Key words

survey  
distribution map  
identification



## National surveys

OPAL is organising a series of five national surveys which will take place between now and 2012. They will cover the key OPAL areas of soil, air, water, biodiversity and climate. Free packs for each survey are available to schools and community groups, and materials are also available to download on the OPAL website for anyone wishing to take part individually.

To support the surveys, OPAL has developed an exciting new website where participants can input their data onto an interactive map and then view it in relation to other local and regional tests. The information they gather will form the basis of real scientific research and will also be fed into a 'state of the environment' report to be published by Imperial College London in 2012.

The soil and earthworm survey is the first of five national surveys and is available to take part in now. Little is known about earthworms and their distribution so this study aims to map the 27 different species found in England alongside information about the different soils they live in. Taking part requires participants to dig a small hole and then encourage the earthworms to the surface using mustard diluted in water (which is non-toxic to the worms).

The worms are counted and identified using a fold-out key and then there are some simple soils tests to carry out as well.



Terril Henriksen/Bigstockphoto

*A handful of earthworms – but are they all the same species?*

In September 2009 the OPAL air survey launches with the aim of gathering detailed data about England's air quality. This will require taking a closer look at lichens, special plant-like organisms that are related to fungi. Some lichens are sensitive to changes in the environment which makes them great air quality indicators. Good air quality is essential for our health and for the wellbeing of our natural environment. But with pollution coming from cars,

Some regional OPAL themes

**East Midlands:**  
Conserving heathland

**West Midlands:**  
Understanding local biodiversity

**London:**  
Urban climate

**South West:**  
Pollution and woodlands

**South East:**  
Car fumes and the environment



*Taking part in the OPAL soil survey.*

planes, industry and agriculture, good air quality is something we can not take for granted. The survey will also involve investigating the tar spot fungi growing on sycamore leaves – another good measure of how polluted the air is. The remaining national surveys will launch at different times between now and 2011.



Take a closer look at lichens.

## Your OPAL

OPAL is made up of a network of regional partners, each with its own community scientist. Their work involves close liaison with local people to help find out what local environmental issues are of concern to them. The scientists are then helping people to improve and protect their local green spaces for residents, visitors and for future generations.

Each regional project is running events that anyone can take part in, regardless of age or ability, and they are always on the look out for volunteers.

“A lot of people think that you have to go out to the countryside to enjoy nature, but in fact there’s a whole wealth of wildlife waiting to be discovered in the towns and cities all over England,” said Sarah West, Community Scientist for York and Humber. “By getting involved with your local OPAL office you can find out about all the great wildlife havens that happen to be right on your doorstep. You can also help scientists like me to gather new information about local plants, insects and other wildlife which will ultimately pave the way to new scientific research.”

The OPAL website has pages dedicated to each region and its activities. The site provides a forum for local people to exchange ideas and talk about things they have found in their area. Some of the community scientists are even writing blogs to share their local discoveries, like the May Bug in the photograph, found by Sarah near Leeds recently. Anyone can join the conversation and share their thoughts with the OPAL community by leaving comments on the posts.



A May Bug, found during an OPAL survey.

## Do more for nature!

OPAL hopes to inspire a new generation of nature enthusiasts and encourage people to develop their interest in the natural world. The project is working with natural history groups right across the country which cover all sorts of interests; from general local nature groups to those with specific interests, such as the RSPB or the Bat Conservation Trust. Getting involved with one of the 1,000 plus groups here in England is a great way to indulge an interest in nature. Not only do such groups play an important role in the monitoring and conservation of plants and animals, but they are an excellent way to meet new people and spend time outdoors.

Callum Lyle is 14 and lives in East Sussex. He is a member of several natural history societies including Butterfly Conservation, Amateur Entomology Society and the Sussex Wildlife Trust. He highlights that many nature groups attract members of all ages and backgrounds which means that there is usually something for everyone. “There’s a great deal of diversity in terms of the kinds of activities that some natural history societies run. Practical, outdoor activities like walks and surveys are brilliant, they get you out there looking at wildlife as it is, in its natural state; live and wild. And then there’s the indoor, informative stuff, like lectures and meetings; these are great too as you get to meet all sorts of people who share your interest.” Callum highly recommends that anyone with an interest in nature gets in touch with a local or national natural history group. “Investigate which natural history societies work in your area and get involved. You’ll be amazed at how productive and fun participating in its work can be, no matter what your age.”

*Laura Stowe is the Communications Officer for the Open Air Laboratories project and is based at the Natural History Museum in London.*

## Look here!

Find out more about OPAL activities and details of your regional office:

[www.OPALexplorenature.org](http://www.OPALexplorenature.org)





# Drug formulation

## Key words

medicine  
pH  
digestion  
solubility

*You wake up with an aching head. You scramble around the medicine cabinet, searching for a packet of painkillers. When you hold that little pill in your hand, do you ever stop to think what it's made of? Duncan Hay knows the answer.*

Well, it's obvious, isn't it? A paracetamol tablet is surely made from paracetamol. This is partly true, but it's far from the whole story. Medicines rarely contain just one pure chemical substance. The vast majority are made of a complex mixture that contains an active ingredient (the compound that has the desired effect in the body) and compounds called excipients. This mixture is known as a formulation. But just what are these excipients, why are they there and how are these formulations designed?

## Research

When new medicines are discovered, scientists spend years selecting a chemical compound that they hope will be able to treat a particular condition. This compound will hopefully form the active ingredient in the final medicine. Once they have selected this, one of the next steps is to design a formulation so that it can be administered to the patient in a safe, reproducible and convenient manner. In effect, this formulation will be a vehicle for getting the active ingredient into your body.

How do scientists go about designing a formulation that will show off the medicine to its full potential? One of the first things to consider is what will be the most appropriate method for administering the compound. For example, if the new compound is designed to treat asthma, it would be quite sensible to have an inhaled formulation that gets the compound directly into the lung. Other options include injections or applying the compound directly to the skin as a cream or ointment. In practice, most medicines are given orally, by swallowing or dissolving in the mouth, and the majority of oral medicines are in the form of a tablet, or a capsule. These provide a measured amount of the active ingredient in a convenient little package. It is also the preferred method for the patient. If your doctor offered you a choice of swallowing a small capsule or getting an injection, which would you choose?

