



An innovative approach to the maintenance and enhancement of laboratory and fieldwork skills

Jane Yea
Emily Woods



Experiential
Learning CETL
Centre for Excellence
in Teaching and Learning



Overview

- The origins of the LABplus concept
- How LABplus was designed and implemented
- LABplus - a reality
- Examples of undergraduate resources
- Outreach Work
- Future sustainability



The EL CETL

- In 2005 HEFCE awarded the University of Plymouth 4 Centres of Excellence in Teaching and Learning, of which one focused on Experiential Learning.
- This particular award recognised an existing excellence in ‘hands on’ Learning – embracing Fieldwork, Laboratory Work and Work based Learning within Geography, Geology, Biology and Environmental Science.
- The focus of the EL CETL’s work (2005-2010) was to maintain and enhance the student experience of fieldwork, laboratory work and work based learning.
- One expression of this focus led to the development of LABplus



LABplus – The Vision

“to create an innovative learning space for students studying natural and environmental sciences”

- The aim was therefore to provide undergraduates with an open access resource centre combining aspects of a library, museum & laboratory.
- This space would contain resources that complimented practicals, fieldwork, laboratory sessions and lecture sessions. Therefore enhancing experiential learning.



Developing LABplus

- A project team was set up by Geoff Wigham (LABplus manager) comprising academic and technical staff seconded from the core CETL departments.
- Existing laboratories were converted into a large open plan space that was designed to be relaxing and flexible.
- With a high standard finish, it has a unique feel unlike a standard laboratory, library or museum.





Contents of LABplus

- Physical resources (called boxes) were created and contained in Stanley organiser boxes.
- Supporting virtual resources, housed on the website to complement the physical boxes
- 20 laptops
- Selection of field and laboratory equipment
- Books and assorted documents
- TV for presentations
- Self-issue machines.

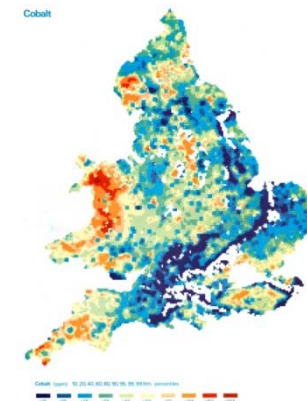




What's in a box?

[Link](#)

- Visual materials
- Information guide
- Relevant literature
- Specimens
- Digital material
- Chemicals
- Equipment.





Virtual Box

- Supports physical box
- Accessed through LABplus website
- PDF's
- Links to websites
- Journal articles
- Images
- Media clips
- Wider reading (links to library catalogue)

The screenshot shows the LABplus website with a green navigation bar at the top containing links for Home, Projects, About LABplus, Staff, and Links. The main content area features the LABplus logo, which consists of the word 'LAB' in bold green letters and 'Plus' in a grey serif font, with a green graphic element resembling a plus sign. Below the logo is a wide photograph of a modern laboratory with several workstations and people. Underneath the photo is a paragraph of text describing the lab's purpose and the types of resources available. At the bottom left of the page is a photograph of two students, a man and a woman, looking at a computer monitor while a woman in a pink top uses a microscope. To the right of this photo is the lab's physical address and contact information.

Home Projects About LABplus Staff Links

LABplus

LABplus is an important teaching aid for students from the disciplines of [Biological Sciences](#), [Environmental Sciences](#), [Geography](#) and [Geology](#), but is open to all Plymouth University students. The lab features specified learning tasks designed to complement field and laboratory work. Certain LABplus projects will be supported with web resources developed and hosted in-house. You can access any of these projects by clicking on the 'Projects' link in the horizontal menu bar above.

The LABplus location is:

707, Davy Building
University of Plymouth
Drake Circus
Plymouth
Devon
PL4 8AA
(01752) 5 84530
labplus@plymouth.ac.uk



Rationale

- Prepares students for fieldwork and laboratory sessions and supports their learning thereafter.
- LABplus provides an alternative learning experience – an informal self directed learning with the aid of guided resources.
- Encourages students to gain additional skills (e.g. microscope techniques) and explore other disciplines.
- Relieves time and resource pressures on teaching and technical staff and assists with large group teaching.



Do student's use LABplus?



Help themselves to resources, help themselves to microscopes, books, laptops etc. They can in theory sign them out on their library cards using the self-issue touch screen.// They have wifi access as well as cable internet. They can bring in their own laptops.// Our laptops have the range of university software and some specialist packages associated the resources.// They can sign out GPS, PDA, ARCHOS players which work outdoors to aid with their fieldwork.// The lab is open 9-5pm, however we have trial a late opening on a Tuesday and Thursday for a 2 month period, which has been successful. This came as a result from a student questionnaire as a way to improve the facility. // We work closely with the CRU which is also located within this space, which supports students with mapping. //Due to the design of the space and tables, LABplus is popular for group working especially for presentation preparation and poster making.// No-rule space (noise levels), students are trusted to use the space, facilities and equipment in a responsible way. Staff always on hand to offer assistance when required.// Technicians work all year, summer period is when most of the resources get developed.



Some resources in detail

- Invertebrate Sampling Techniques
- Microscope Techniques
- Wembury Fieldtrip
- Forensic Pre-Lab



Invertebrate Sampling Techniques



INTERCEPTION TRAPS

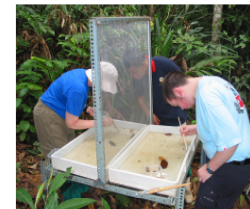
Malaise Traps

These comprise a tent-like structure made of fine nylon mesh (usually black), where one end is higher than the other. The long sides of the trap are open and there is a central partition. At the top of the highest end a catchpot is attached. Malaise traps are normally erected at right angles to a recognised insect flight path, with the higher end directed to the lightest part of the sky (South in the UK). Insects that fly into the trap encounter the central partition, then move upwards in an attempt to navigate around it. This takes them to the ridge, which they then follow towards the lighter area where the catch pot is located.



Window traps

These are transparent perspex windows that intercept insects passing through a known area of space. Flying insects fail to see the perspex and bump into the window. Stunned, they fall into a tray containing preservative that is situated at the window's base.



Window traps can generate comparative data, as long as the windows used have the same dimensions. They are extremely effective at sampling Coleoptera, as they tend to fold their wings when stunned, but other orders such as Diptera can recover and resume flight before landing in the trays. The traps can be orientated to sample flight paths such as hedgerows, or used to examine movements between habitats if trays are situated on both sides of the window.

Kick sampling

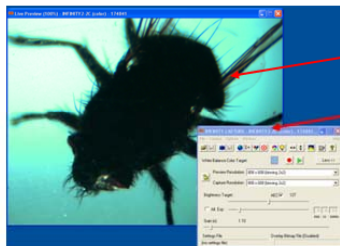


Microscope techniques



RECORDING & SAVING VIDEOS

1) Once Infinity Capture is open and the camera is connected properly two windows should appear: 'Infinity Capture' menu and 'Live Preview' (if these windows do not open then the camera is most likely not connected into the USB drive properly).

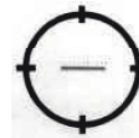


Live Preview Window

Infinity Capture Menu



Graticule slide



Accurate scale markings in central ring of graticule slide





Wembury fieldtrip

Welcome

Welcome to the tour of Wembury fieldwork site. This website aims to;

- provide essential background information on the Wembury field site,
- provide essential information on the biogeochemical cycling and determination of the nutrient elements nitrogen and phosphorus
- apply core fieldwork principles and practices e.g. good field notebook annotation
- demonstrate generic fieldwork techniques e.g. the collection of freshwater and sediment samples
- demonstrate the use of generic field instrumentation e.g. pH, dissolved oxygen,

thereby enabling you to be better prepared for your timetabled fieldwork sessions and enhancing the quality of the field data collected.



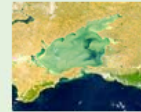
Introduction



Wembury background



Nutrients



Eutrophication



Fieldwork



Safety



Acknowledgements

**TO VIEW EMBEDDED VIDEOS IN THE WEB PAGES, CLICK ONCE ON THE BLACK SCREEN TO ACTIVATE THE MEDIA PLAYER
AND THEN SELECT  'PLAY' TO START THE VIDEO**

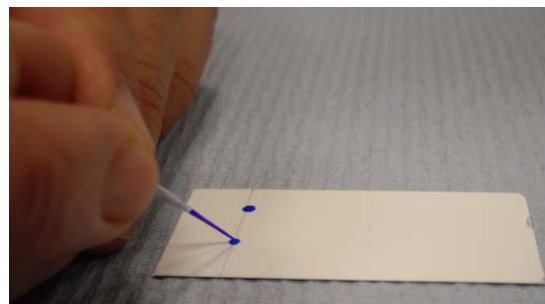
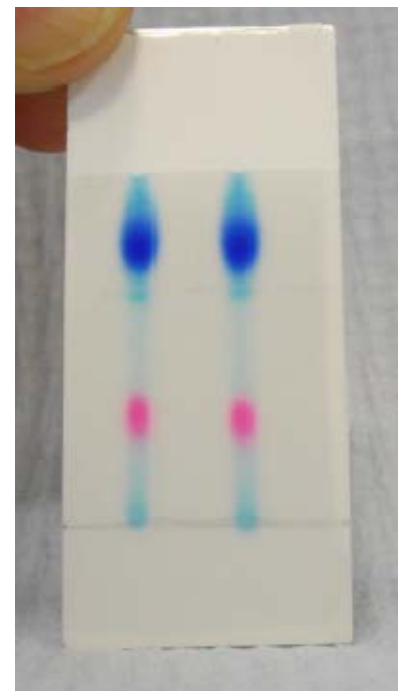
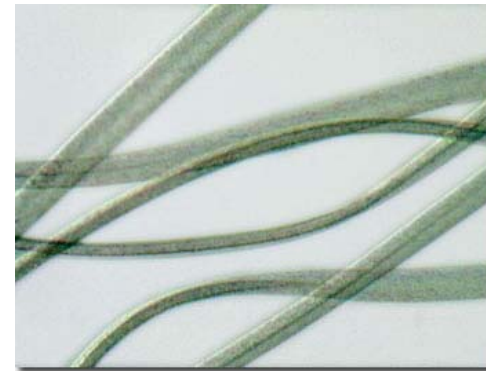
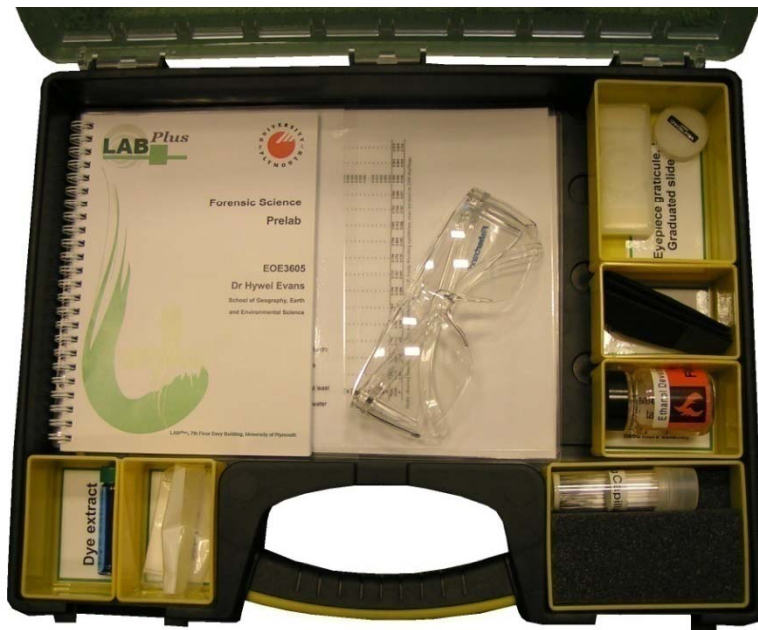
You may need to adjust your security settings to view all the web page content such as the black screen that activates the media player or links to support lectures and documents, by selecting the ' blocked content' (e.g. scripts or ActiveX controls) information bar that appears upon opening web pages and then selecting 'Allow Blocked Content'



[link](#)



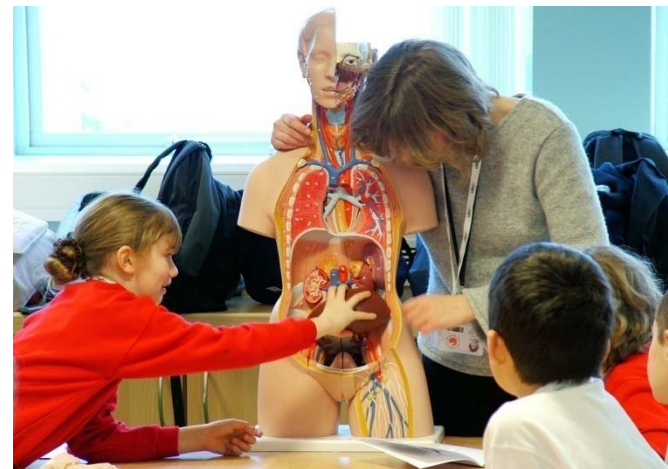
Forensic prelab





Outreach

- Aim: To promote sciences at Higher Education
- Work closely with the University of Plymouth's Widening Participation & Schools liaison departments to deliver outreach activities for visiting schools.
- Existing undergraduate resources have been adapted and new resources developed to meet the needs of visiting schools from Primary to Further Education.
- Example activities include:
 - Human Anatomy
 - Human Skeleton
 - DNA extraction
 - Climate change
 - Terrestrial Invertebrate Identification





Summary

Current Issues

- Staff Perceptions
 - Creating resources is time consuming for them
 - Few students use the resources
- Student Use
 - Self Issue machines good in principle but hard to enforce
 - Demand for extended and weekend opening hard to meet
 - Occasional technical problems with the laptops



Current Success and Future Sustainability

- The integration of LABplus within the University
 - very popular with students
 - Staff participation has increased & very successful
 - attracting interest from other departments (esp Bio Medical and Business)
 - successful outreach programme.
- Dissemination of LABplus externally
 - The National Marine Aquarium
 - 'Education Through Expedition'
 - Plymouth City Council (Summermix)
 - The University of Zadar in Croatia



Thanks for listening



LABplus website: <http://www.ssb.plymouth.ac.uk/labplus>

EL CETL website: <http://www.plymouth.ac.uk/cetl/el>

Contact LABplus: labplus@plymouth.ac.uk