

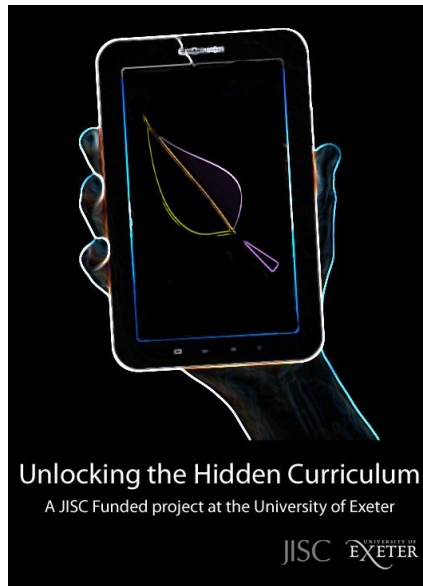


# Engaging Students in Practical Work Through New Technologies

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- eBioLabs at Exeter
  - UK Centre for Biosciences  
Departmental Teaching  
Enhancement Scheme
  
- Unlocking the Hidden Curriculum
  - JISC Learning and  
Teaching Innovation  
Grant



# eBioLabs

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- Created by Dr Gus Cameron at University of Bristol School of Biochemistry
- funded by JISC and University of Bristol
- “a set of integrated tools that help students prepare for laboratory classes and help staff track student achievement”
- interactive media
- formative and summative assessments
- increased understanding of the wider aims, rationale and science behind practical work

## Volumetric (Gilson) pipette

### Useful information

Biochemists commonly use Gilson 'Pipetman' pipettes to measure and transport small volumes of liquids. These are continuously adjustable and provide a gold standard in accuracy, precision and robustness.

The diagram on the right highlights the important areas of a Gilson pipette - roll over each area for further information.



Make sure you understand all the steps involved in using a volumetric pipette accurately:

Make sure you understand all the steps involved in using a volumetric pipette accurately:

Using volumetric pipettes (Gilson)

Select pipette

Place tip on pipette

Set volume

Prepare for aspiration

Immerse tip of pipette

Aspirate liquid


Dispense majority of liquid

Dispense remaining liquid

Remove from vessel

Eject used tip

Select pipette



00:00 / 00:10

Make sure to choose the appropriate pipette for the volume to be pipetted.



# eBioLabs at Exeter

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- Extension of eBioLabs to other areas of Biosciences
- Enhance preparation for, and engagement in, practical work at Exeter
- Enhance understanding of practical work
- Emphasis on plant and whole organism systems



# eBioLabs at Exeter

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- All L1 lab manuals on eBioLabs
- New techniques videos
- Information galleries
- 'Get to know your specimen'
- Stats help
- New animations

# eBioLabs at Exeter

## ■ Plant Diversity and Physiology

- <http://vle.exeter.ac.uk/mod/resource/view.php?id=87898>

▶ Plant Diversity Picture Gallery





# eBioLabs at Exeter

## ■ Plant Diversity and Physiology

- <http://vle.exeter.ac.uk/mod/resource/view.php?id=84372>




# eBioLabs at Exeter

## ■ Plant Diversity and Physiology

- <http://vle.exeter.ac.uk/mod/resource/view.php?id=84371>

Leaf Abscission in *Coleus blumei*

Prep of Explants



The stem is cut 1cm above and below the node. Each node is then sliced longitudinally. Out of the 8 explants, 4 lamina (leaf blade) will be removed, 2 will have 5mm lamina and 2 will have 10mm lamina.

# eBioLabs at Exeter

## ■ Whole Organism Biology


- <http://vle.exeter.ac.uk/mod/resource/view.php?id=82962>

### Classification Quiz

Question 1 of 7 Point Value: 10

Re arrange the words below to give the correct classification for the Lion. 1 = Kingdom and 7 = species

1. Felidae
2. Chordata
3. Panthera
4. Mammalia
5. Animalia
6. Carnivore
7. Leo



Score so far: 0 points out of 0 SUBMIT

# eBioLabs at Exeter

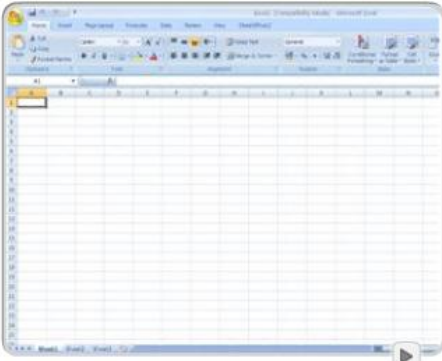
## ■ Statistics

- <http://vle.exeter.ac.uk/mod/resource/view.php?id=96258>

How to do ANOVA in Excel 2007

Installing the Analysing Tool Pack

Installing the Analysing Tool Pack



If you can't find Data Analysis Tab in Excel you will need to install it. Please watch the animation above which gives you a step by step on how to install the Analysis ToolPak.

Introduction to ANOVA's

How to Insert Data into Test

How to translate the table

Single Factor

Two Factor With Replication

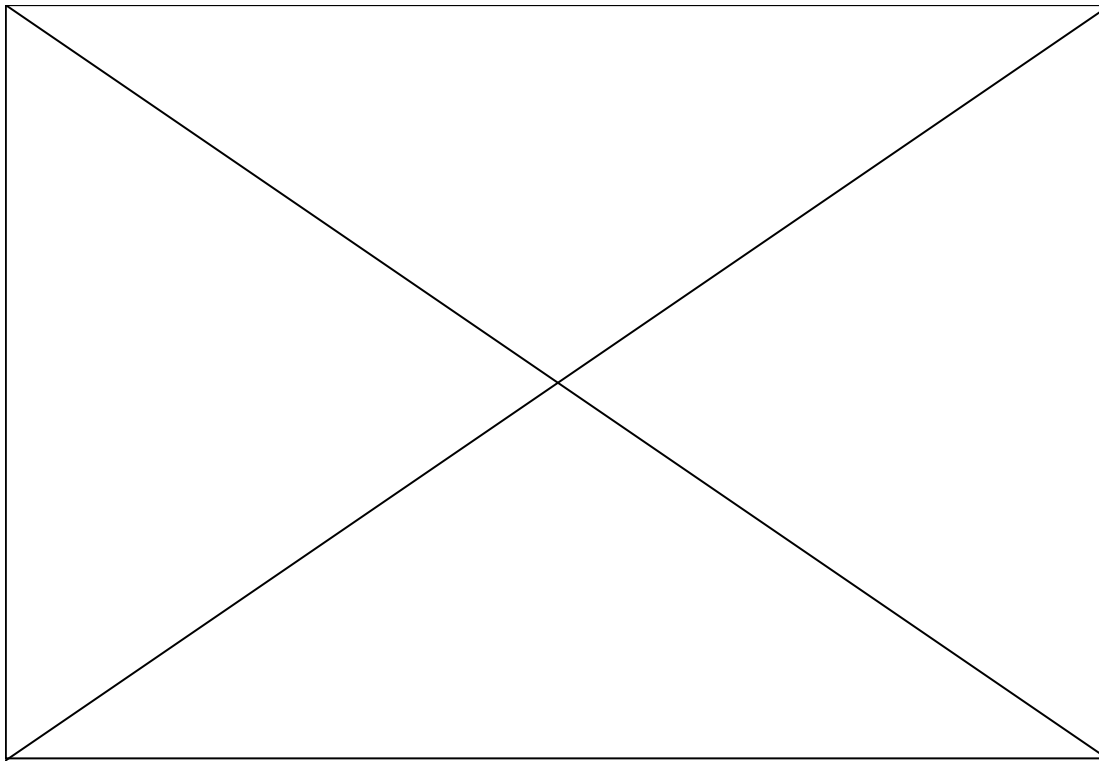
Two Factor Without Replication



# eBioLabs at Exeter

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- Simulation of capture-mark-recapture

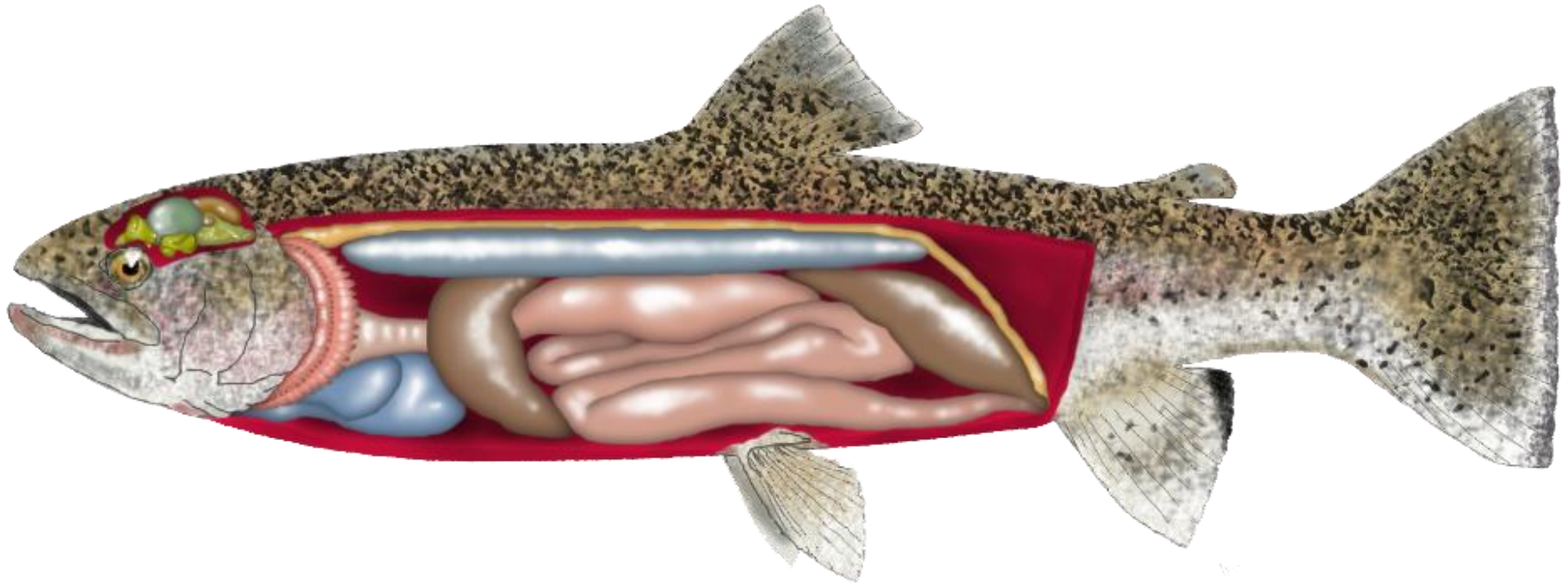




# eBioLabs at Exeter

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- Virtual Dissection





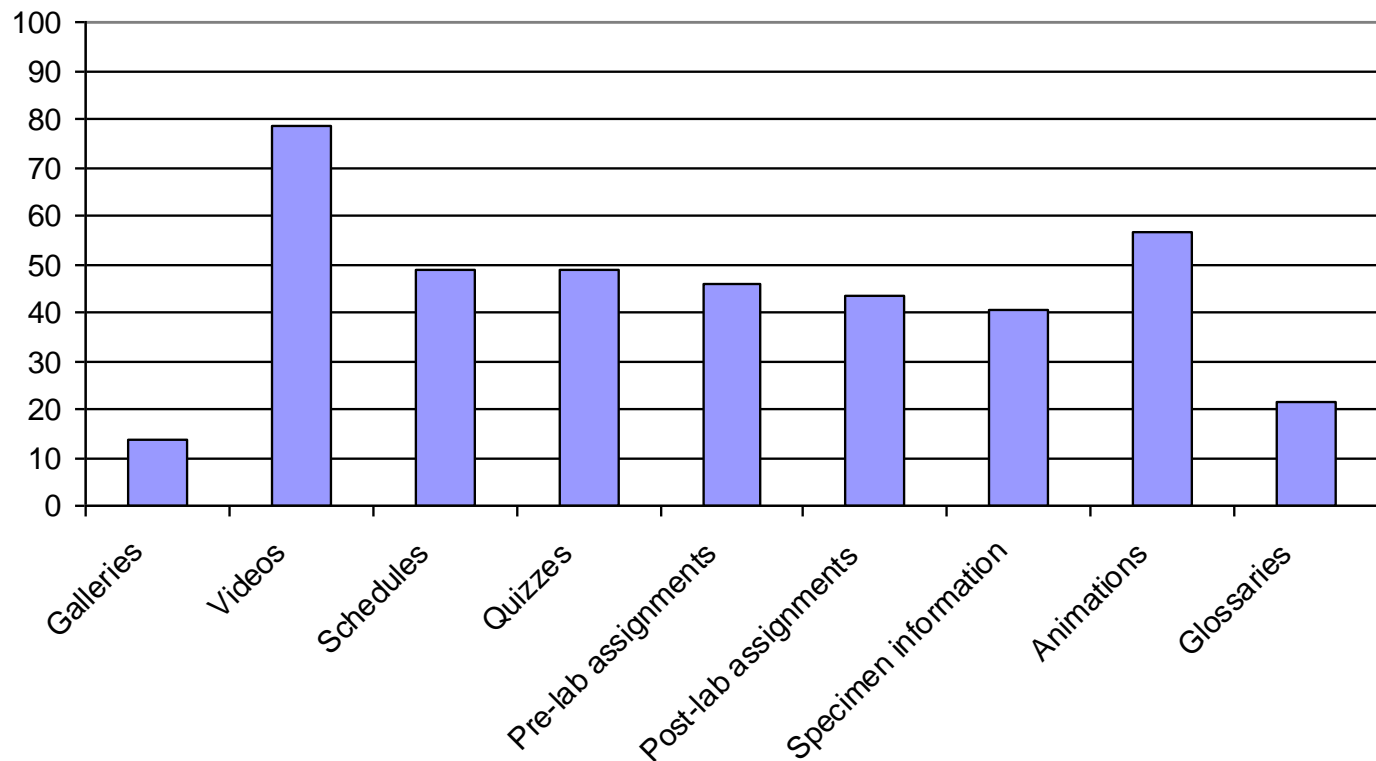
# eBioLabs at Exeter

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- Lab sessions help me understand the rest of the module
  - 68% 1<sup>st</sup> years agree vs 58% 2<sup>nd</sup> years
- Lab sessions are one of the most enjoyable aspects of the course
  - 57% 1<sup>st</sup> years agree vs 42% 2<sup>nd</sup> years
- I frequently feel that I don't understand how to use lab equipment
  - 13% 1<sup>st</sup> years agree vs 27% 2<sup>nd</sup> years
- I feel well prepared for lab sessions when I enter the lab
  - only 19% 1<sup>st</sup> years disagree vs 40% 2<sup>nd</sup> years

# eBioLabs at Exeter

- eBioLabs is an important resource for my course
  - 60% agree







# eBioLabs at Exeter

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- Current Projects
  - Virtual Dissection
  - Interspecific competition simulation
  - Enhanced pre- and post- lab assignment provision
  - Embedding within teaching practice across Biosciences
  - Working with mobile technology

# Unlocking the Hidden Curriculum

- Using Augmented Reality to unlock the biodiversity on campus as a learning resource
- Using GPS and camera within smart phone
- Two final year project students worked on design and content





# Unlocking the Hidden Curriculum

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- Enables students to explore previously unknown diversity
  - Night footage
  - Non-seasonal images/footage
  - Time lapse photography
  - Microscopic images
  - Video images

SAMSUNG

6 results found



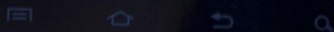
Red Fox



(powered by www.hoppala-agency.com)

22m

- More Information
- Wikipedia Article
- Fox video 1 (no vid)
- Fox video 2



# Unlocking the Hidden Curriculum





3 results found


### Grass Snake




Natrix natrix

powered by www.hoppala-agency.com

86m

 More Information

 Take me there





22 results found



Little Egret (Egretta Garzetta)

powered by www.happala-agency.com

More Information

Wikipedia Article

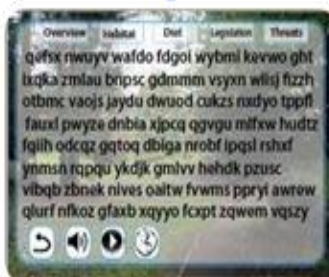
## View from camera



**Species introduction box:** appears at point of interest, user clicks on what information they wish to see



**3D season 'wheel':** spin to change seasonal display



**Species text information:** Tabs linking to different layers, icons for other data forms and a 'back' icon. If another species is mentioned here the user can click on this and will be taken to that species introduction box



**Species video:** Video of species in action



**Season shot:** Overlaid onto current view through camera





# Unlocking the Hidden Curriculum

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- “Very intuitive”
- “It’s amazing how much wildlife is here”
- “Interactive, interesting and fun”
- “A good alternative way of learning”
- Less than half had visited area before
- All participants felt they had learnt something from the app



# Unlocking the Hidden Curriculum

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- Improve look and feel
- Students can input 'sighting' data
- 'What species is this?'
- Interface with VLE
- Use on field trips



# Thank you!

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- eBioLabs

- Gus Cameron and University of Bristol
- Joanna Hall
- Ollie Chanter
- UK Centre for Biosciences and the HEA

- Unlocking the Hidden Curriculum

- Education Enhancement
  - Dale Potter
  - Liz Dunne
- Rich Maskey
- Emma Barker
- JISC