

# Zoology Virtual Laboratory

*experiments in the biological sciences*

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## **Problems to be addressed**

- Increasing numbers of students
- Time
- Constraints of available equipment
- Data sets
  - Limited
  - Poor
  - Shared/duplicated

## Mitigation

- Self managed 24/7 access to campus network
- Time-warping
- Virtual equipment
- Data sets
  - Extended
  - Representative
  - Unique

## How? - The experiments

- Sub-lethal copper toxicity in *Gammarus duebeni*
- 5 experiments
  - Measuring respiration using an oxygen electrode
  - Pleopod beat rates
  - Swimming endurance
  - Pre-copula pairing
  - Sample from contaminated stream
- Lab book, assessed lab report including a variety of statistical analysis.

## **How? - The delivery**

- Network delivery using internet technologies
- Generic laboratory environment shell
- Experiment modules
- Macromedia Flash
- PHP

## Evaluation & Results

- Less time
- More experiments
- Quality of submitted work increased
- Grades comparable to 'wet' labs & previous years
- Students found engaging and ....