How to inspire students to prepare for lab work?
Answer: Ask them questions

Guest access at:
http://qmp.bris.ac.uk

Select 'Log-in as Guest

Username 1abc
Password 2xyz

..... and make feedback respond to their responses

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Time to wake up…….

- 3+7+8+9+2+5+8 = 42
- 5+2+5+4+3+8+6+6= 42
- Flash Anzan
- Stroop test

Size and scale

- How much does your body use per day?
  - ~ body weight
  - 1 mole ~ 0.5Kg

1 million per second is …..

60×10^6 per minute

360×10^6 per hour

$86400 \times 10^6 = 8.64 \times 10^{10}$ over 24 hours

$3155.8 \times 10^{10} = 3.1558 \times 10^{13}$ in one year

So $6.02 \times 10^{23} / 3.1558 \times 10^{13} = 1.9 \times 10^{10}$ years

This is 19 billion years

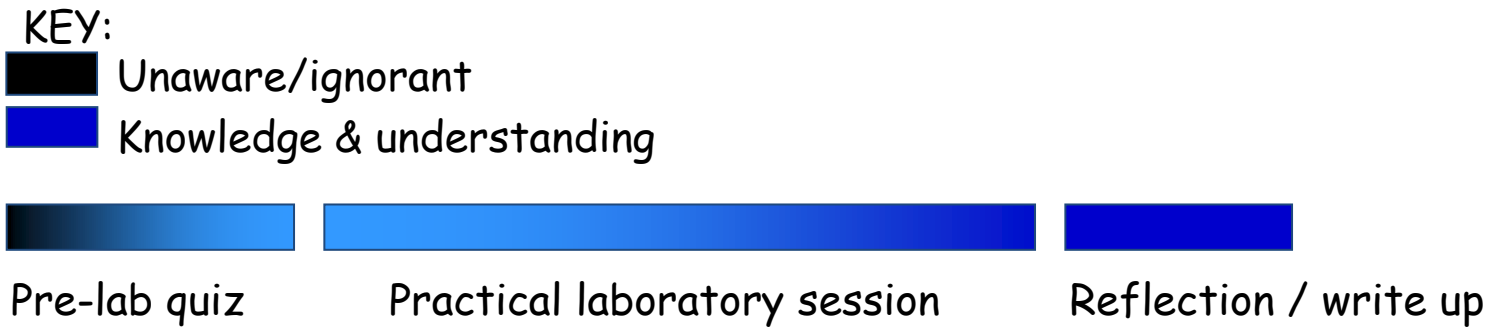
Practical skills

- Year 1:
  - Approx. 50% of contact time = lab-related activity
  - Approx. 38% of end of year mark
    - Extended practical - 4%
    - Practical exam - 10%
    - Proforma reports (peer-marked) - 4%
    - Data interpretation questions ~ 20%
- Year 2:
  - Approx. 50% of contact time = lab-related activity
  - Approx. 20% of end of year mark
    - Extended practical – 10%
    - Data interpretation questions ~ 10%

Laboratory teaching

- Problems
  - Students prepare poorly for Yr 1 laboratory work
  - Students with poor laboratory skills in Yr2
- Objectives
  - Better engagement in Yr 1 laboratory practicals
  - More effective development of laboratory skills
- Demographics
  - ~180 physiology students (about 120 subsidiary)
  - 11 first year laboratory practicals

“Most people are more comfortable with old problems than with new solutions.”



- Strategy
  - On-line [pre-practical] quizzes
    - MUST be complete BEFORE laboratory practical

- Method
  - Delivery by QuestionMark Perception
  - Questions developed by all staff
  - Policy of “*enforced engagement*”
    - Quizzes made part of mandatory coursework
    - Non-compliance followed up in laboratory sessions

Implementation and plans

- Implementation
  - Quizzes integral to laboratory practical coursework
    - quiz visible 7 days prior to lab practical
    - failure to satisfactorily (>40%) attempt quizzes = failure to adequately complete coursework & Unit
  - Adopted for all first year programmes from 2008_9

Implementation: Look and feel

5 of 20

Information: The baroreceptor reflex is a cardiovascular reflex that controls blood pressure by altering heart rate. The baroreceptor reflex gain (BRG) is calculated (and defined) as the change in heart rate (HR) per mmHg change in blood pressure (BP) and has units of bpm/mmHg.

NOTE: *If HR falls in response to an increase in BP then BRG will be negative ie. a negative number. Computers assume that a number is positive unless you use a 'minus' sign.*

Question: In a human subject, raising BP by 13mmHg caused HR to fall from 76 to 50 bpm. What is the value of the BRG for this person?

(*enter the value of your answer but do NOT type in the units*)

6 of 20

Information: The Fick equation relates cardiac output (litres of blood pumped by the heart per minute) with the amount of oxygen used by the body and the amount of oxygen in each litre of arterial and mixed venous blood. *The Fick equation strikes fear into the heart of most students.*

Before tackling the Fick equation in its proper context, it is often helpful to consider an analogy. Let's consider the takings at your Hall bar.

Using the modified Fick equation:

$$\text{number of students} = \frac{\text{total takings}}{\text{money @ start} - \text{money @ end}}$$

money @ start = the money in your pocket at the START of the evening (assuming same for all students)

money @ end = the money in your pocket at the END of the evening (assuming same for all students)

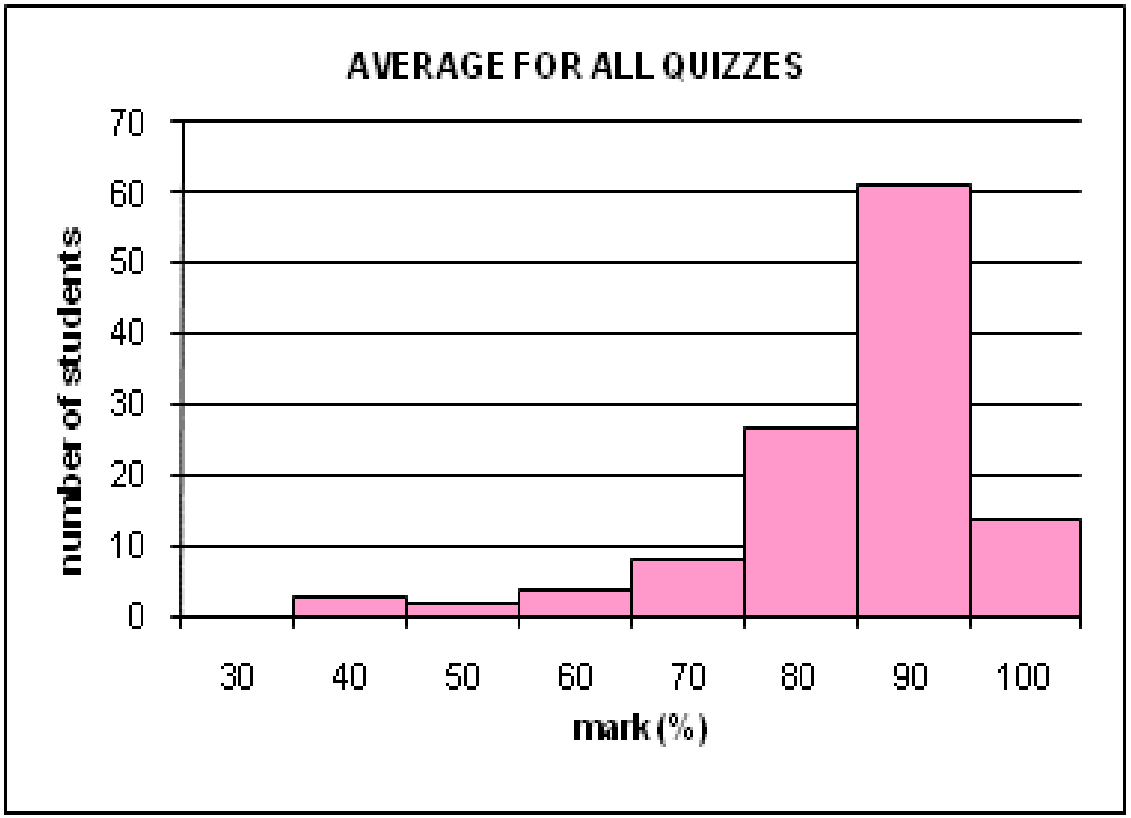
Question: Assume th

How many students w

- Emphasis on the use of knowledge to solve problems and demonstrate understanding

Cohort results – Vet 1 (2010_11)

Minimum	39.1%
25% Percentile	76.9%
Median	82.1%
75% Percentile	87.4%
Maximum	95.1%



- 98 students completed all quizzes
- 120 number of students
- 840 (7x120) number of possible quizzes
- 806 total number of completed quizzes (96%)
- 34 (840-804) number of quizzes not completed (4%)

A ‘Practical’ Application

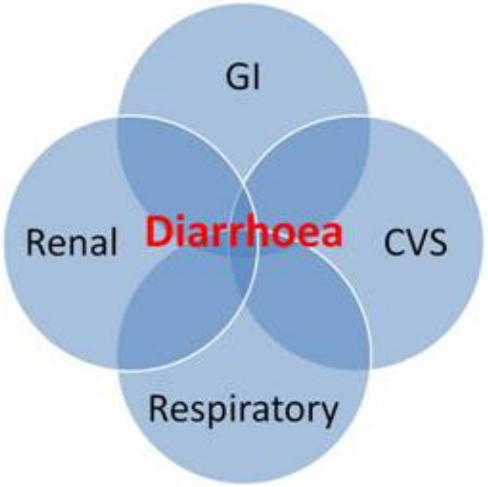
* Oral Rehydration Therapy *

- First year Veterinary Practical
- Within Gastro-Intestinal lecture block
- Focuses on REAL issue of clinical significance
- Requires integration (GI, Renal, CVS, Resp)

- Requires ‘*use of knowledge*’ – c.f. Damian Parry
- Provides ‘*context and meaning*’ – c.f. Anne Tierney

Overview - ORT practical resource

This resource, the lectures and a subsequent pre-practical quiz aim to give you the necessary insight to tackle the oral rehydration practical.



Diarrhoea is important clinically and economically and understanding how it affects the body and the rationale for current treatment is perhaps the most significant challenge you will face in the first year of the veterinary course. Why? Understanding diarrhoea is a challenge because a simple GI disorder (excessive secretion of small bowel) quickly affects the animal as a whole; requiring you to have a good working knowledge of several 'physiological systems'. Given that you have been taught each system (renal, cardiovascular, respiratory etc) by different people, many of you have yet to piece it all together to gain that 'working knowledge'.

These resources and the practical have been developed by scientists and clinicians to help you understand as well as possible an area of physiology and medicine that still has many unknowns and is rife with misunderstanding and flawed premises.

We recommend you work through these materials in groups - you will all benefit from this group work.

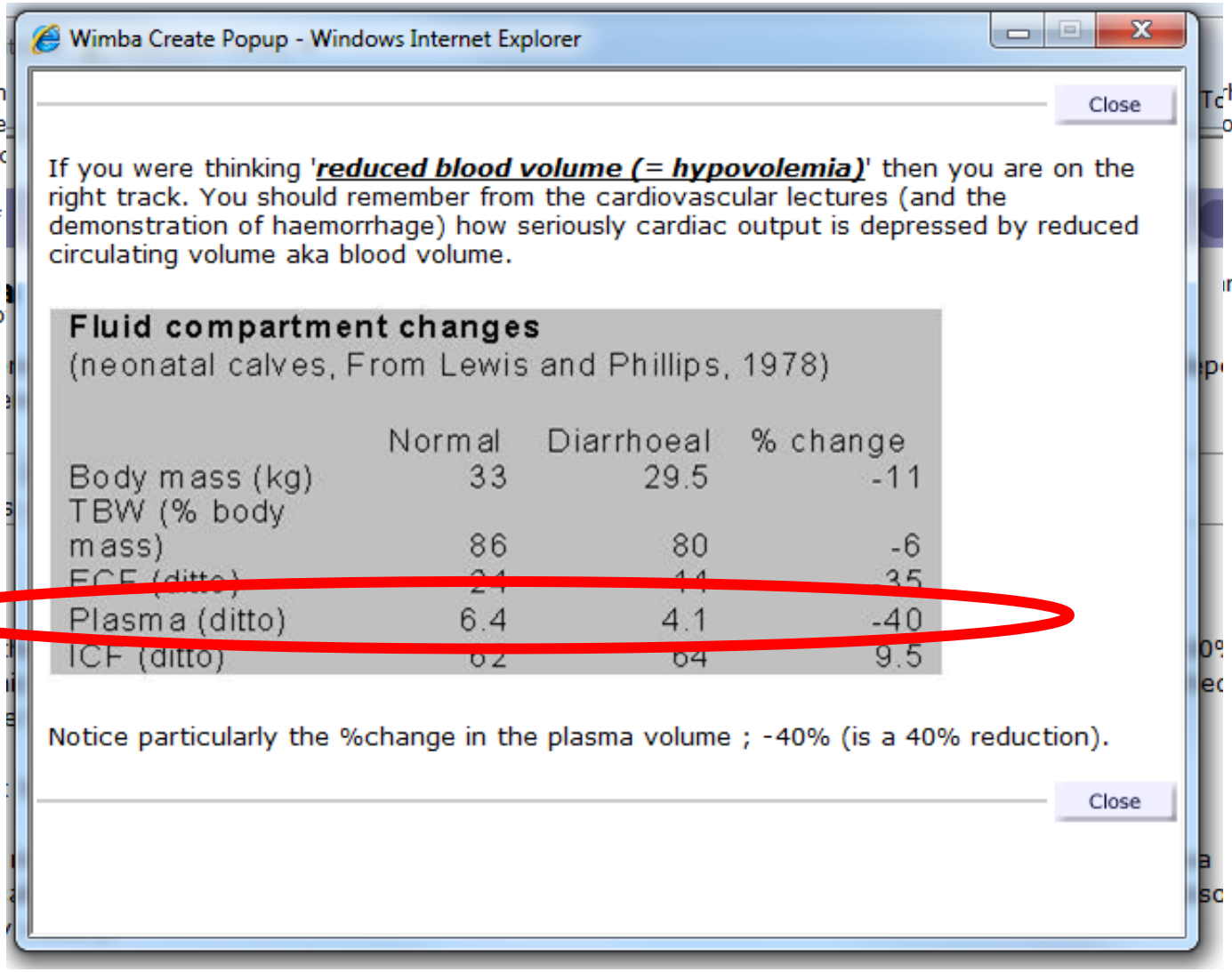
ORT Practical - Support

Table of Contents

The first page……

Consequences of diarrhoea….

[students encouraged to think..]



The last page……

Putting it all together (integration)

You have had lectures on the following systems:

- Cardiovascular
- Respiratory
- Renal
- Gastrointestinal (in progress)

You have also worked through the materials above and so using:

- these resources
- your lecture notes
- some time to think

You will appreciate the rationale for the composition of ORT solutions.

As a final test of this you need to complete the pre-practical quiz that accompanies the oral rehydration practical.

You will find this at http://qmp.bris.ac.uk (available from 1st March).

Pre-practial quizzes

- *"I think they are a great way to prepare for practicals, especially if you have little lab experience."*
- *"They [quizzes] provide a good way of preparing us for the practicals and give us chance to think about the concepts that we need for the practicals."*
- *"I think they [quizzes] are really useful, especially this one for ORT. It gave me time to understand the physiology of diarrhoea and ORT and the clinical relevance."*

The practical itself

- 95 students
- Teams of 4 or less
- Students use a document (analytical)
- 5 staff (demonstrators)
- Incentives for hard work…..

Prizes

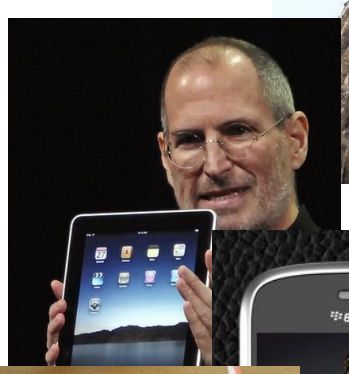
For the team finishing first:

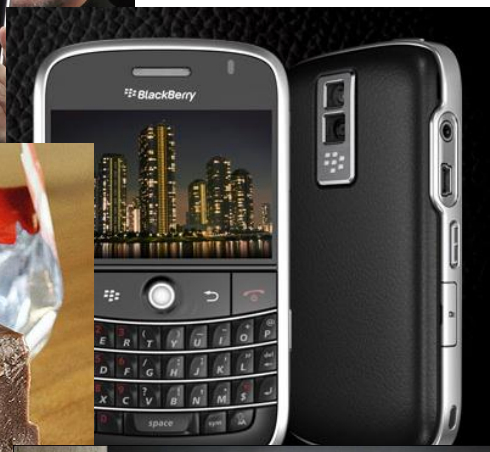
1. European city break

2. iPad (gen. 2)

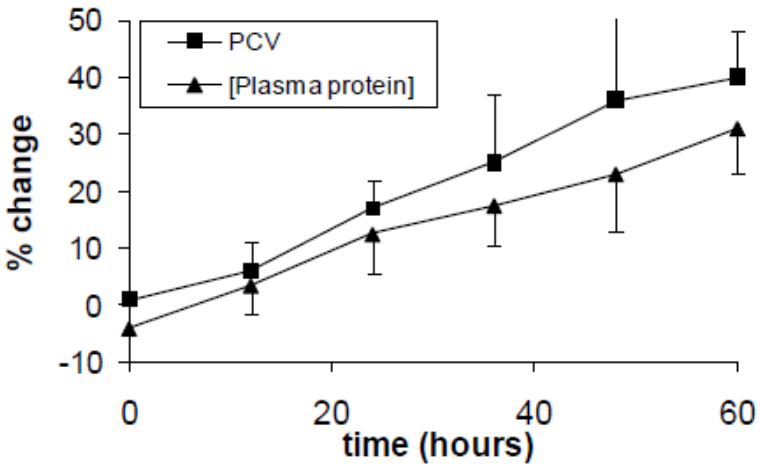
3. Blackberry Bold

4. Chocolate bar



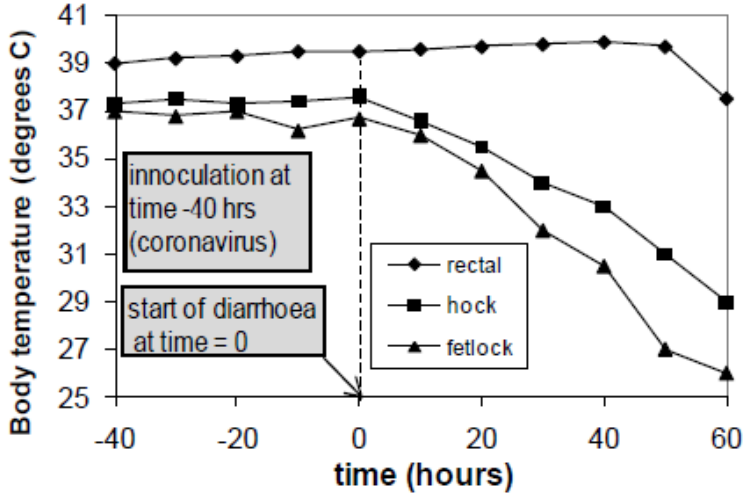


1 Packed cell volume (PCV) and plasma protein changes during diarrhoea



Describe and explain the changes you see here - what is happening? Keep the time scale in mind too.

Body temperature during diarrhoea



Describe and explain the changes you see here - what is happening? How do you explain peripheral temperatures?

What students get …..

Experience of playing 'the whole game'

- Problem solving
- Making appropriate connections between areas of knowledge (*integrating*)
- Focus – looking for the 'big picture' (not detail)

Find the right words .....

"Progress is impossible without change, and those who cannot change their minds cannot change anything." George Bernard Shaw

"Too often we... enjoy the comfort of opinion without the discomfort of thought." John F. Kennedy

"Most people are more comfortable with old problems than with new solutions." Author Unknown

The devil is in the detail

- Development
  - Paper phase
    - Drafting
    - Discussion
    - Revision
  - Perception phase
    - Inputting of questions
    - On-line trialling
    - Development of question feedback
    - Repeated editing, bug checks and revisions
  - Teaching Committee
    - Final presentation & proposed policies
    - Some issues unresolved
    - Sub-group of TC formed
- Review
  - Sub-group (four members)
    - Remit to decide policy for implementation
    - proposals for each issue pre-circulated
    - Sub-group's decisions made in one hour meeting
    - Reported back up to TC
- Revision
  - In accordance sub-group decisions
    - Mandatory part of course
    - Not negatively marked
    - Multiple attempts OK
    - No laboratory data used
    - Maths to GCSE level only
    - Explicit feedback for wrong answers