

Development of interactive online resources to support and enhance numerical skills among Medical Science students



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The problem:

- Numerical skills are an inherent part of many science and non-science disciplines.
- Many students routinely struggle with numerical problems, often because they cannot see the link between the numbers and their discipline, but also because they have not performed numerical manipulations since school.
- Anecdotal data suggest this is particularly true of students articulating from college and also mature students.
- The Foundation Skills for Medical Sciences (SM2001) course, which is compulsory for all Medical Science students was designed to address this shortfall in generic skills and includes a numerical skills component.
- Recent feedback from students and staff teaching on the course suggests many students are still having difficulties with this aspect of the course and that further support is required.

The aim and methodology:

- Financial support was obtained from the QAA enhancement theme “developing and supporting the curriculum” fund and was used to employ a student intern (V.S Psalmon) for 7 weeks.
- The aim was to design a variety of online resources that would support students in revising and developing their numerical skills and to build confidence in this area.
- These would be available initially to the 205 students on the SM2001 course, with a view to becoming more widely available for all levels in the School and potentially to prospective students to help their transition to HE.
- Use of these exercises was non-compulsory.
- Design would involve use of Questionmark (an online assessment tool) to develop resources and MyAberdeen (the Institutional virtual learning platform) to provide access to the resources database.

The resources:

- Catalogue of text and web-based resources for revising mathematical skills, theory and practice available through the ACHIEVE and SM2001 MyAberdeen sites:

154 hits from SM2001 class (205 students registered) in first term of use.

- Variety of discipline specific interactive Questionmark exercises available through the SM2001 MyAberdeen site with the number of hits in the first 2 months from the SM2001 class (205 students total):

Resource	No. of hits in first 2 months of release
Web resources for Medical Sciences	154
Diagnostic tests	166
Yellow Submarine Mathematics!	156
In Situ Hybridisation Protocol	168
Chocolate Heartbreak	161

Diagnostic Test 1

1 of 1
Which of the following statements is/are true about the number 0.6315789? Select all that apply.

- It is a decimal number.
- It is a fraction.
- Can be rounded up to two decimal places as 0.63.
- Can be rounded to three decimal places as 0.631.

Diagnostic Test 2

1 of 1
0.1=...? Select all that apply.

- 1/10
- 10⁻²
- 1/100
- 10⁻¹

- Diagnostic tests are designed to probe key areas of student numerical skills with results determining whether further work is required.

Yellow Submarine - 1

This exercise was designed to help you work on CONVERSIONS without a scientific context. The practical, day-to-day aspect should help you develop your math skills in these areas without worrying about the science behind it!

The quiz works so that you can only move on to the next question once you have found the correct answer to the previous one. Advice is given in this "loop" so that you don't get stuck! Because of this structure, a final score at the end does not reflect how comfortable you were with the maths in the exercises. So it is recommended that you take a look at the resource sheets if you struggled at any point. In the resource sheets you will find many suggestions of documents, websites and videos to help you, accessible to different learning styles.

1 of 1
Jude, Rita, Desmond and Michelle are four rich Beatles' fans who find a stranded submarine and want to paint it yellow. They read various websites trying to identify their submarine, but different units of length, speed etc. are used worldwide. Help them convert everything into metric units using the information below:

1knot=1.852km/h
1ft=30.48cm

Length 550 feet
Submerged speed 20knots
Draft 35ft
Beam 42ft
Surfaced speed 12knots

Helpful feedback and return to question

Correct answers!
Well done! You converted everything perfectly.
Reinforcing feedback and advance to next question

Incorrect answers!
Hmmm... Conversions can be confusing!
If you are given the relation: 1(unit A)=n (unit B)
- to get from unit A to unit B you multiply by n
- to get from unit B to unit A you divide by n
Indeed the relation you are given can be re-written as: 1n (unit A)= 1 (unit B).

- Some of the exercises (Yellow Submarine) take numerical manipulations out of a scientific context to help students grasp core principles without added scientific complexity.
- Chocolate dilemma and *in situ* hybridisation exercises involve scientific context.
- The structure of the yellow submarine, *in situ* hybridisation and chocolate dilemma exercises in feedback loops (see above) drives experiential and independent student learning.

The outcome:

- A varied and interactive set of resources, which has seen significant usage in its first 2 months, supporting student driven learning and self help.
- This approach is broadly applicable across many disciplines, which involve any type of numerical skills.