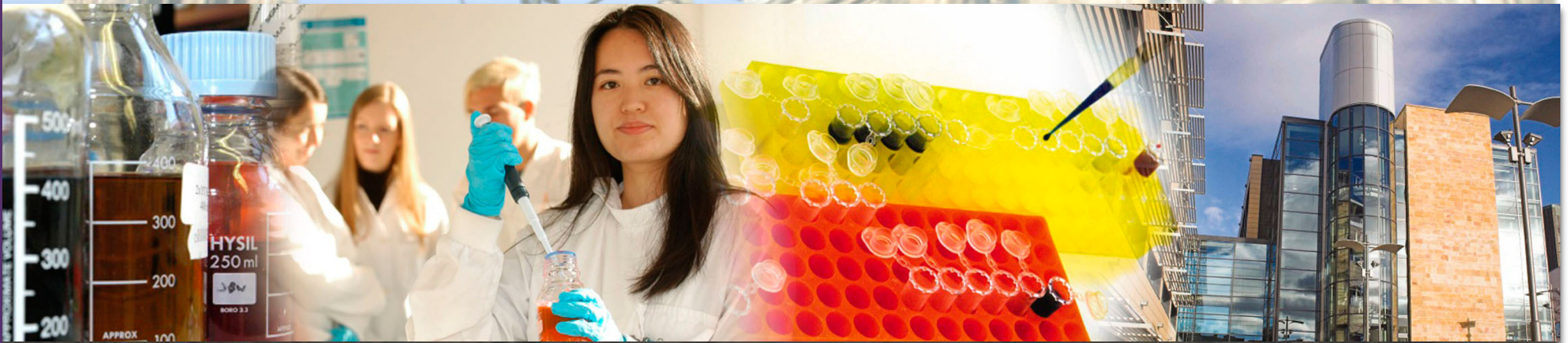




University of Glasgow | Faculty of Biomedical & Life Sciences

Molecules of Life: Supporting student learning in the transition to a second year Biochemistry course

Maureen R Griffiths, Ute Barrett and Angela Watt



[moodle link](#)

<http://moodledev.cent.gla.ac.uk/moodle/conference/>



Think of a course that you currently teach – do you, or how could you use Moodle features (groups, forums, quiz, lesson etc) to support student learning?

In your own course, are there any areas where you would use the Moodle features shown, but to support different learning outcomes?

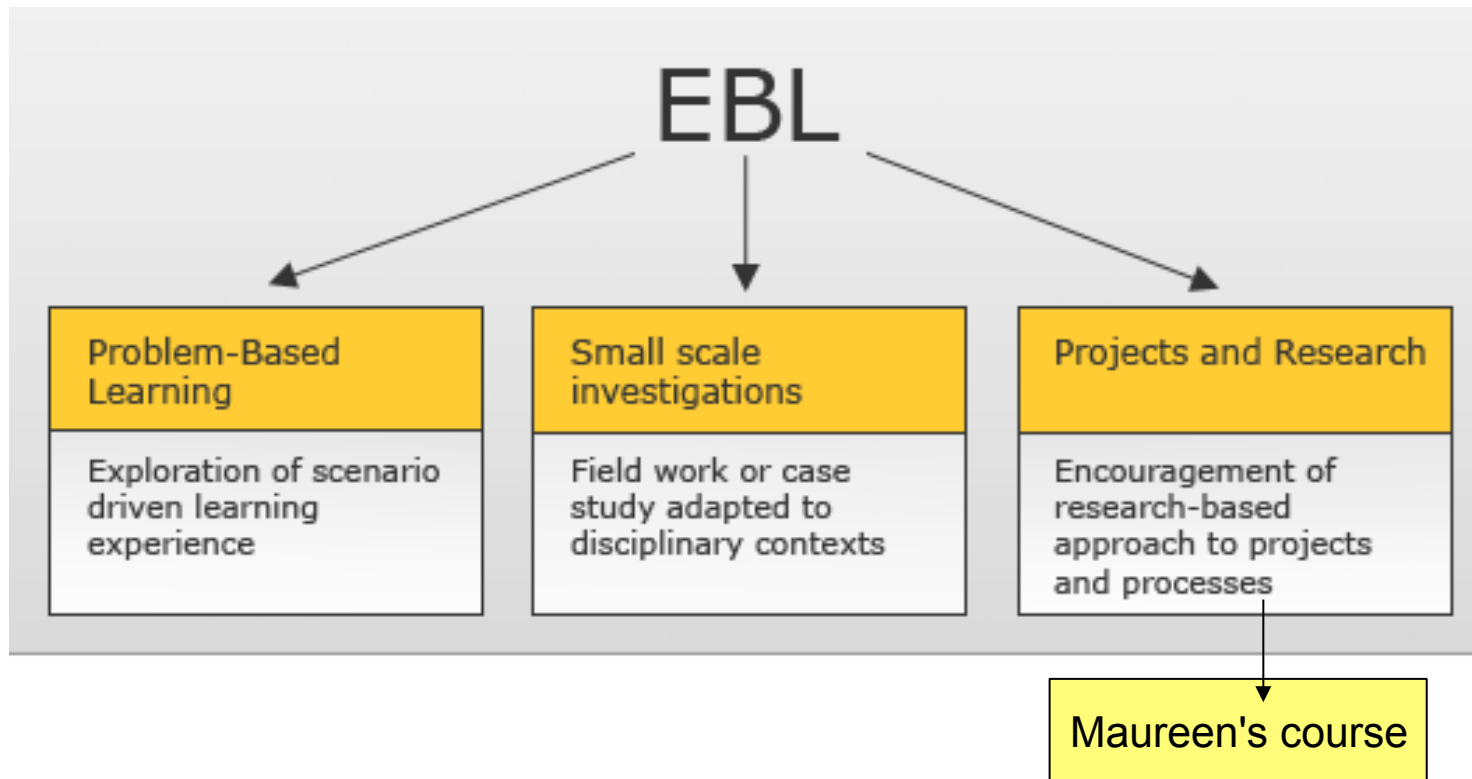
When you look at the ILOs for your course, what Moodle features could support them?

EBL describes an environment in which learning is driven by a process of enquiry owned by the student.

(University of Manchester, Centre for Excellence in Enquiry-based Learning)

- Students start with a ‘scenario’.**
- Facilitator guides them.**
- Students identify their own issues and questions.**

- Students examine resources they need to research the topic, thereby acquiring the requisite knowledge.**
- Knowledge more readily retained - acquired by experience and in relation to a real problem.**
- It is essential that our students are educated for knowledge creation, lifelong learning and leadership. They will take on leading roles in their future working environments: directing change, asking important questions, solving problems and developing new knowledge.**





- **EBL integrated online as part of 2nd year Moodle course 'Molecules of Life'**
- **'Blended Learning' experience: course blends online activities and face-to-face interaction in lectures/ tutorials /labs**
- **Moodle lends itself to this approach because it is based on social constructivism:**
knowledge is created through experience and social interaction

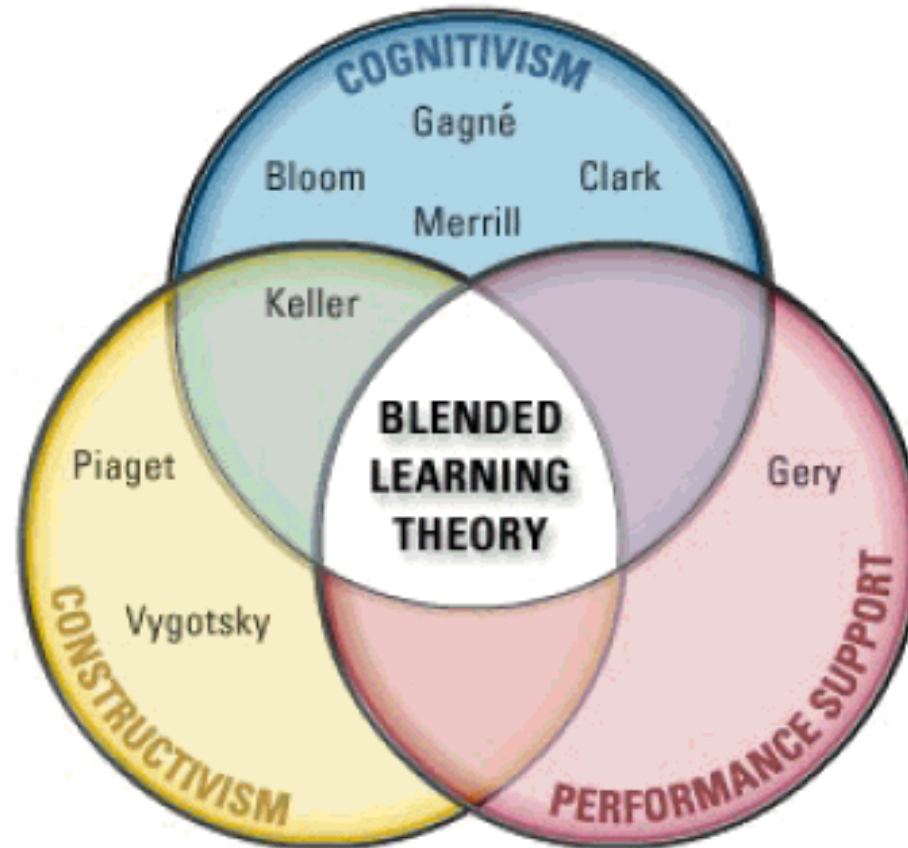
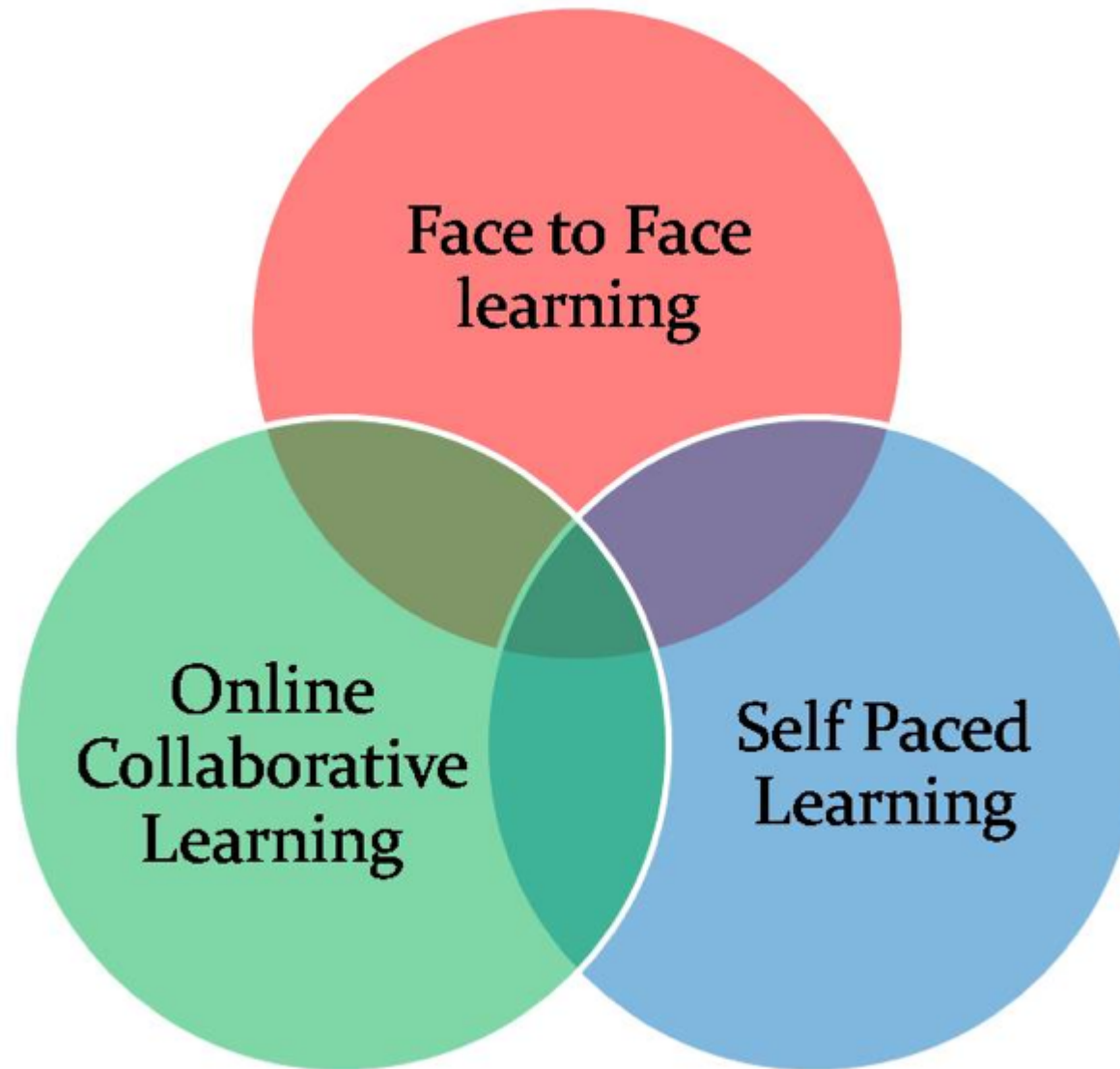
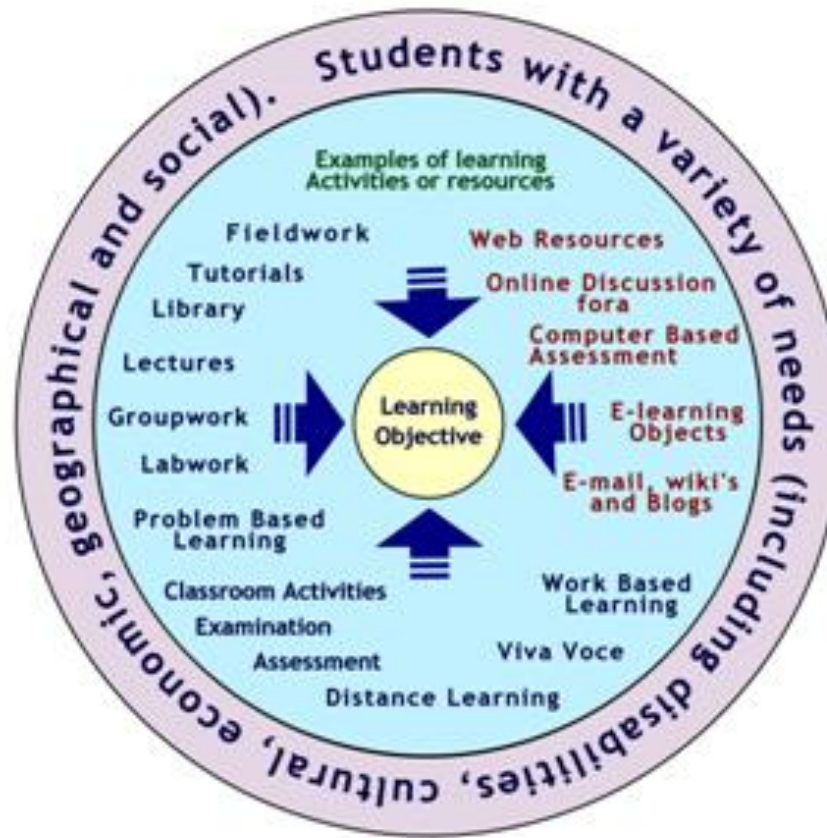


Figure 1: A Blend of Learning Theories





Moodle **Visual Identity** for
'Molecules of Life':

Better navigation (e.g. directories)

Effective use of media (video of
students acting out a biochemical
process)

Colours and format

**These visual changes promote a
sense of community online.**

Moodle '**Activities**' used in
'Molecules of Life':

Forum

Groups

Lesson/ Quiz

Choice

**These activities support group
work and peer assessment.**



The course was developed from 2 pre-existing Level-2 courses.

Most of the academic material was already developed, but there was little support material available online.

Level-1 Biology course was highly structured, with a recognisable “home”

This is a compulsory Level-2 course for some students, optional for others.

We wanted to encourage an independent approach to studying at this level, with clearly identifiable support and peer-group contact.



- Twice weekly lectures,
- Pre-lab in lecture format,
- 1 lab per semester, post-lab lecture.
- 2 tutorials on material already covered,
- Standard Moodle page, student forum for questions
- Interactive exam practice questions on Moodle
- Assessment – class test (10%), essay (20%), end-of-course exam inc lab material (70%)

- **Twice weekly lectures, 1 lab per semester**
- **Interactive exam practice questions**
- **Assessment: class test, essay, exam inc lab material and question on poster**

- **Tutorials moved in advance of lecture material with online support and group forum. Work submitted and discussed at tutorial but not marked. Class feedback posted with further resources after tutorial**

- **Videos on lab techniques – available in advance of lab**

- **Post-lab lesson – available immediately after lab**

- **Group work – poster tutorial, poster preparation using Moodle groups, poster presented to class and vote for best poster.**

- **Glossary**

- **New course identity for Moodle site**

- **Group for notes for SDS registered students**



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fbis > archive > 3C_old

Switch role to... Turn editing on

Topic outline

Interactive forum and Course news forum

[Information for all students on this course](#)

[Interactive forum for staff and students](#)

1 Course information

[3C CID 2008-9](#)

Class reps

[3C Staff contact details](#)

[Revised lecture details](#)

[Format of class test](#)

2 Laboratory material

[How to use a micropipette - watch this video BEFORE the lab session](#)

[Copy of Lab book 1 - please read through before attending lab. Printed copy will be issued at the lab](#)

[Lab 2 Manual](#)

3 Assessment information

[FAQ](#)

Essay titles and details

[What makes a "good" essay? Have a look at the 3C markers guidelines and the student feedback sheet that you will get back with your essay](#)

Formative assessment material

[Essay titles for 3C](#)

Latest News

[Add a new topic...](#)

21 Nov, 16:26

Maureen Griffiths

[Class test more...](#)

[Older topics ...](#)

Recent Activity

Activity since Monday, 19 April 2010, 09:38 PM

[Full report of recent activity...](#)

Nothing new since your last login

People

[Participants](#)

Administration

[Turn editing on](#)

[Settings](#)

[Assign roles](#)

[Grades](#)

[Groups](#)

[Backup](#)

[Restore](#)

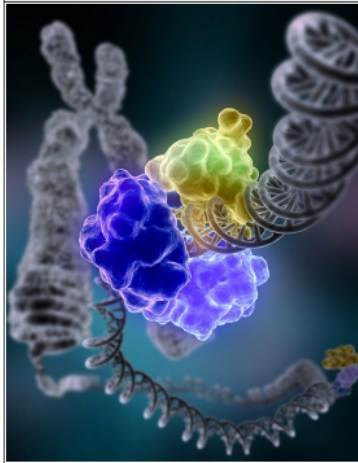
[Import](#)

[Reset](#)



Topic outline

Welcome to the Course



Welcome to the [Molecules of Life](#) Course.

Please refer to the [far right side](#) for all of your Course Administration. At the start of this course, you will need to

- look carefully at the Aims, Assessment and Timetable document
- Check your lab and tutorial groups
- Sign up if you wish to be a class rep

The Course Administration section also houses two general forums for discussion. More specific forums for discussion will appear clearly in the labeled sections below as the course progresses.

Protein Synthesis: An Epic on the Cellular Level

The YouTube video below was directed in 1971 by Robert Alan Weiss for the Department of Chemistry of Stanford University, and is an unusual way of explaining this process! Watch it, see how much of it you understand or remember from first year then do the revision quizzes in Block 3 below to see how much you already know about DNA and RNA from first year...



Course Administration and Information

[Check your lecture, lab and tutorial groups here](#)

Admin

- [Aims, Assessment and Course Timetable](#)
- [Staff contact details](#)
- [Interested in becoming a class rep?](#)

Discussion Forums

- [Important news and announcements](#)
- [Interactive forum for staff and students](#)

Recent Activity

Activity since Monday, 19 April 2010, 02:08 PM
Full report of recent activity...
Nothing new since your last login

People

[Participants](#)

Administration

- [Turn editing on](#)
- [Settings](#)
- [Assign roles](#)
- [Grades](#)
- [Groups](#)
- [Backup](#)
- [Restore](#)
- [Import](#)
- [Reset](#)
- [Reports](#)
- [Questions](#)
- [Files](#)
- [Unenrol me from 3C](#)
- [Profile](#)



Tutorials moved in advance of lecture material with online support and group forum. Work submitted and discussed at tutorial but not marked. Class feedback posted with further resources after tutorial

5 Tutorial Material

 Tutorial and laboratory programme

 Lab, Tutorial and Assessment overall timetable

 Tutorial group forum

Tutorial 1

 Tutorial assignment 1- Complete this in advance, and bring it to the tutorial

 Feedback and answers for Tutorial 1

 Supplementary information for tutorial 1

 Semilog graph paper for tutorials

 Still confused about SDS PAGE?

Tutorial 2

 Semester 2 Tutorial locations - *****NEW*****

 Tutorial assignment 2 - Complete this in advance and bring it to the tutorial

 Supplementary information for Tutorial 2

 Semilog Graph paper for Tutorial 2

 Check your tutorial group here

 Feedback and answers for tutorial 2

[tutorial](#)



7 Laboratory Material

The video below shows the correct way to use a micropipette. Watch it BEFORE you come to the first lab!



 **Manual for Lab 1.** Please read before attending the session. You will get a printed copy at the actual lab.

Agarose gel video - this is for the second lab



 **Manual for Lab 2.** Please read before attending the lab. A printed copy will be provided at the lab.



Question type 1 Text based with no “correct” answer

University of Glasgow LOG-OUT | IT HELPDESK | search university web

Faculty of Biomedical & Life Sciences

conference ► Miscellaneous ► 3C ► Lessons ► **test your understanding of Lab 1 here** Update this Lesson | Edit page contents

test your understanding of Lab 1 here

[Preview](#) [Edit](#) [Reports](#) [Grade Essays](#)

Think back to what you actually did in the tutorial and lab, and when you completed your calculations and graphs. Now think about the skills and experience that you have developed as a result of carrying out the experiments on alkaline phosphatase activity .

What were the most important things that you learned?

[Continue](#)

Your answers may have included some or all of the following

- * To obtain practical experience in performing experiments and obtaining reliable data
 - * To obtain experience in data handling
 - * To obtain experience in drawing conclusions from observed data
 - * As a practical introduction to certain key concepts about enzymes that you have covered in lectures (such as enzyme activity, assay, kinetics and inhibition)
- So why is it important to be able to measure the activity of an enzyme?**
- One common purpose is for a clinical diagnosis, and here are some common examples
- * Creatine kinase is released following a heart attack. If you measure CK activity, you can monitor the time course of disease and the effects of therapy.
 - * Serum alkaline phosphatase can be an indicator of liver disease and of bile duct obstruction.
 - * The Michaelis constant (K_m) can be used to assess physiological role of enzymes (e.g. the 4 forms of hexokinase/glucokinase).
 - * You can examine the effects of inhibitors on specific enzymes, for example, to distinguish between prostate gland and erythrocyte acid phosphatase, and also in designing drugs to cure specific disorders.

[Continue](#)



Question type 2 - Sample calculation with guidance

Now try this calculation based on the lab material

Using the values from the standard results in your lab book

Q1 What is the substrate concentration in wells A2 (and B2 and C2)?

We added 10 μ l of a 5 mM solution in 140 μ l total volume,

$$V_s \times C_s = V_f \times C_f$$

This gave 10 μ l x 5 mM = 140 μ l x (final concentration, mM)

What is the final concentration of the substrate in the well ?

- 50mM
- 0.357mM
- 5 mM
- 140 μ l

Now try this calculation based on the lab material

Using the values from the standard results in your lab book

Q1 What is the substrate concentration in wells A2 (and B2 and C2)?

We added 10 μ l of a 5 mM solution in 140 μ l total volume,

$$V_s \times C_s = V_f \times C_f$$

This gave 10 μ l x 5 mM = 140 μ l x (final concentration, mM)

What is the final concentration of the substrate in the well ?

Your answer :
50mM

Did you multiply the volume x concentration of the stock solution?


final concentration = (10 x 5)/140 mM

Try again.



4 Poster assignment □

What was the best poster for "your" molecule? Every vote counts!

 Have a look at the other posters that were presented this year, and choose the best poster for "your" molecule. Voting closes at 1pm, 22nd March

 Choose the best p53 poster - do NOT vote for yourself

 Choose the best herceptin poster - do NOT vote for yourself

 Choose the best Haemoglobin poster - do NOT vote for yourself

 Choose the best prion protein poster - do NOT vote for yourself

 Choose the best IgG poster - do NOT vote for yourself

 Poster template - download this for your group

 Forum for group work

 Check your group molecule choice here

 Arrange your group meetings with Doodle

Have a look at some of last year's posters. Which ones do YOU think worked well, and why?

 Sample posters from 2008-9 here

 Poster presentations - this contains all the guidelines and templates for your poster



missing poster						Tue, 9 Mar 2010, 08:14 PM
Presentation next week		S163 Num163	7DY	0		S163 Num163 Tue, 9 Mar 2010, 07:33 PM
Presentation		S81 Num81	2EX	7		S81 Num81 Tue, 9 Mar 2010, 12:08 PM
poster workshop thingy		S319 Num319	3EX	2		S103 Num103 Tue, 9 Mar 2010, 10:37 AM
Missing poster		Maureen Griffiths	2BY	1		S283 Num283 Mon, 8 Mar 2010, 08:45 PM
Poster stuff		S199 Num199	7DX	0		S199 Num199 Mon, 8 Mar 2010, 02:59 PM
DONE!		S91 Num91	2CY	1		S195 Num195 Sun, 7 Mar 2010, 11:15 PM
Tomorrow		S110 Num110	1EY	0		S110 Num110 Sun, 7 Mar 2010, 09:39 PM
Poster		S315 Num315	2CX	10		S288 Num288 Sun, 7 Mar 2010, 08:27 PM
intro		S224 Num224	7DX	2		S224 Num224 Sun, 7 Mar 2010, 06:51 PM
THE POSTER (final draft)		S225 Num225	1CY	0		S225 Num225 Fri, 5 Mar 2010, 06:40 PM
Poster		S105 Num105	2BX	2		Maureen Griffiths Fri, 5 Mar 2010, 04:42 PM
Molecule = Haemoglobin		S283 Num283	2BY	41		S283 Num283 Fri, 5 Mar 2010, 01:46 PM
Poster so far		S88 Num88	3CY	7		S312 Num312 Fri, 5 Mar 2010, 12:21 PM
Poster Pieces		S36 Num36	3CX	0		S36 Num36 Fri, 5 Mar 2010, 08:52 AM
progress		S153 Num153	7AY	2		S198 Num198 Thu, 4 Mar 2010, 05:24 PM
Poster for Learning		S192 Num192	5CY	2		S192 Num192 Thu, 4 Mar 2010, 04:48 PM
the poster		S255 Num255	3CX	0		S255 Num255 Thu, 4 Mar 2010, 04:01 PM
Submitted Poster		S163 Num163	7DY	2		S235 Num235 Thu, 4 Mar 2010, 03:57 PM



Viewed posters

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conference > Miscellaneous > 3C > Resources > Have a look at the other posters that were presented this year, and choose the best poster for "your" molecule. Voting closes at 1pm, 22nd March > p4

Name	Size	Modified
1BY_p53.ppt		214KB
1dy_p53.ppt		3MB
2DY_P53.ppt		713KB
2EX_p53.ppt		267KB
3AX_p53.ppt		1.6MB
3DX_p53.ppt		330.5KB
5DX_P53.ppt		546.5KB
5EX_P53.ppt		320.5KB
6BY_P53.ppt		4.3MB
6DY_p53.ppt		1.6MB
7AY_p53.ppt		357.5KB
7EX_P53.ppt		320.5KB

University of Glasgow

Faculty of Biomedical & Life Sciences

conference > Miscellaneous > 3C > Choices > Choose the best p53 poster - do NOT vote for yourself

Update this Choice

View 37 responses

Which was the best p53 poster ?
Vote here!

- 1BY
- 1DY
- 2DY
- 2EX
- 3AX
- 3DX
- 5DX
- 5EX
- 6BY
- 6DY
- 7AY
- 7EX

Save my choice

Vote for poster (using "choice")

Result of vote

University of Glasgow

Faculty of Biomedical & Life Sciences

conference > Miscellaneous > 3C > Choices > Choose the best p53 poster - do NOT vote for yourself > Responses

Update this Choice

Responses

1BY	1DY	2DY	2EX	3AX	3DX	5DX	5EX	6BY	6DY	7AY	7EX
<input type="checkbox"/> S68 Num68	<input type="checkbox"/> S140 Num140	<input type="checkbox"/> S305 Num305	<input type="checkbox"/> S145 Num145	<input type="checkbox"/> S141 Num141	<input type="checkbox"/> S342 Num342	<input type="checkbox"/> S236 Num236	<input type="checkbox"/> S248 Num248	<input type="checkbox"/> S191 Num191	<input type="checkbox"/> S54 Num54	<input type="checkbox"/> S60 Num60	<input type="checkbox"/> S65 Num65
<input type="checkbox"/> S144 Num144	<input type="checkbox"/> S294 Num294	<input type="checkbox"/> S215 Num215		<input type="checkbox"/> S182 Num182	<input type="checkbox"/> S204 Num204		<input type="checkbox"/> S226 Num226		<input type="checkbox"/> S132 Num132		
<input type="checkbox"/> S259 Num259	<input type="checkbox"/> S169 Num169			<input type="checkbox"/> S227 Num227	<input type="checkbox"/> S197 Num197		<input type="checkbox"/> S81 Num81		<input type="checkbox"/> S254 Num254		
	<input type="checkbox"/> S201 Num201			<input type="checkbox"/> S75 Num75			<input type="checkbox"/> S175 Num175		<input type="checkbox"/> S59 Num59		
	<input type="checkbox"/> S297 Num297			<input type="checkbox"/> S119 Num119					<input type="checkbox"/> S200 Num200		
									<input type="checkbox"/> S97 Num97		
									<input type="checkbox"/> S198 Num198		
									<input type="checkbox"/> S360 Num360		
									<input type="checkbox"/> S162 Num162		
									<input type="checkbox"/> S238 Num238		
3	5	2	1	5	3	1	4	1	10	1	1

Select all / Deselect all
With selected

Download in ODS format | Download in Excel format | Download in text format

Jump to: []

Media Tools for this page



conference ▶ Miscellaneous ▶ 3C ▶ Participants ▶ Groups ▶ **Create group**

Group name*

Group description

Trebuchet 1 (8 pt) Lang **B I U S** x_2 x^2

For conference

Path: **body**

Administration

- Turn editing on
- Settings
- Assign roles
- Grades
- Child courses
- Groups**
- Backup
- Restore
- Import
- Reset
- Reports
- Questions
- Files
- Profile

Enrolment key Unmask

Hide picture

New picture (Max size: 64MB)



Group setup – add users to group

conference ▶ Miscellaneous ▶ 3C ▶ Participants ▶ Groups ▶ **Add/remove users**

Add/remove users: test group1

Existing members: 3

- Student**
- S110 Num110
 - S120 Num120
 - S187 Num187

◀ Add
Remove ▶

Potential members: 352

- S134 Num134 (1)
- S135 Num135 (1)
- S136 Num136 (1)
- S137 Num137 (1)
- S138 Num138 (1)
- S139 Num139 (1)
- S140 Num140 (1)
- S141 Num141 (1)
- S142 Num142 (1)**
- S143 Num143 (1)
- S144 Num144 (1)
- S145 Num145 (1)
- S146 Num146 (1)
- S147 Num147 (1)
- S148 Num148 (1)
- S149 Num149 (1)
- S150 Num150 (1)
- S151 Num151 (1)
- S152 Num152 (1)
- S153 Num153 (1)

Search

Selected user's membership:

- Group 2E

Can be in
>1 group

Back to groups



Allows easy subdivision of class

Groups can be selected or random

Can target specific students (such as those entitled to notes in advance, class rep space)



Molecules of Life Moodle course [Exit this survey](#)

1. Default Section

* 1. Thank you for participating in this online questionnaire. We would like to identify the material on Moodle that you find most useful in supporting your learning for the Molecules of Life course. Your response will help us to further develop the Moodle site for this course. All the responses are completely anonymous and may be used for publication. If you are willing to have your responses included in this research, please tick "yes" below.

yes
 no

2. Use of Moodle in Level-1 Biology

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
I used Moodle regularly in Level-1 Biology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found Moodle useful in Level-1 Biology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Use of Moodle in Level-2 Biology

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I use Moodle regularly for Level-2 Biology courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, I find Moodle useful for Level-2 Biology courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. The following questions refer specifically to the Moodle site for Molecules of Life (3C)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I use this site regularly and check for new material	<input type="radio"/> 0	<input type="radio"/> 5	<input type="radio"/> 9	<input type="radio"/> 14	<input type="radio"/> 12
This site has a strong identity when compared to other courses	<input type="radio"/> 0	<input type="radio"/> 3	<input type="radio"/> 11	<input type="radio"/> 16	<input type="radio"/> 10
This site provides useful support for the course	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 8	<input type="radio"/> 14	<input type="radio"/> 15
I find this site easy to use and to find resources	<input type="radio"/> 1	<input type="radio"/> 7	<input type="radio"/> 5	<input type="radio"/> 18	<input type="radio"/> 9

5. Any other comments about this Moodle course or suggestions for improvement?

n=40

Thank you for completing this survey.

Moodle questionnaire on SurveyMonkey. 40 students replied,

(1=strongly disagree, 3=neutral, 5=strongly agree)

**This site has a strong identity compared to other sites
- 3.83**

This site provides useful support for the course – 4.05

14 / 40 students posted free text comments and these were very varied.

- 1. Love it absolute lifesaver when theres exams**
- 2. I hate moodle.**
- 4. The whole page is a bit jumbled up, it would be easier to use if it was more like the other moodle pages, which are basic and simple. Its more important that information is easily accessible to students, rather than it looking better.**
- 5. i think that it is great that you have a support material section.i use it all the time to practise.**
- 12. There is a great deal of useful information on the 3C moodle page, but this can make it quite difficult to find the specific thing you're looking for (especially when you end up watching some mad hippy biology/dance video from the 70s for ages when you're really only trying to find out your lab times, although it did explain transcription well!). If it was divided into clearer sections it would probably be easier to navigate.**

I enjoyed doing the tutorials and I think it major improvement to have the students hand in a copy of their answers as they arrive, as this gets more to think and at least attempt the questions before the day. If they don't even try the questions, the tutorials are hopeless.

I rather enjoyed my two MoL tutorials as at least some of the students tried to take part. Most had clearly prepared the material ahead of time, and the need to submit material for retention was an excellent innovation. For the poster session, the students appeared to me to have enjoyed the exercise, too, and they had clearly thought about the work and their own posters. They seemed happy enough to talk about them, it was a very relaxed and positive atmosphere.

I think that this format is quite good at getting the students to find out stuff for themselves.



The end of course exams are similar to previous years' papers – will the student performance improve?

Alter the overall layout with more use of directories to clean up the presentation

Investigate the use of databases for the project material

Roll this out to other courses – both the flexibility of the visual presentation and extra features of Moodle



Deneka MacDonald

Avril Edmond

Staff and students on this course

Moodle support staff



Think of a course that you currently teach – do you, or how could you, use Moodle features (groups, forums, quiz, lesson etc) to support student learning?

In your own course, are there any areas where you would use the Moodle features shown, but to support different learning outcomes?

When you look at the ILOs for your course, what Moodle features could support them?