

LEONARDO DA VINCI Project No (EL/01/BP LA 114443))

ORION: Development of Virtual Learning Environment in environmental science, with online re-usable interactive modules in marine pollution and ecology, with self-learning packages in English, Greek, Portuguese and Swedish

SHARE AND RE-USE CONTENT MODULES WORKPACKAGE

Interactive Online Deliverable (D 12)

DIAGNOSTIC TEST APPLICATION IN

SHARE AND RE-USE COURSES

ORION SELF-STUDY LANGUAGE MODULES

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1. INTRODUCTION

1.1 Provenance of diagnostic and self-assessments

1.1.1 *Scope of previous relevant work*

The English language matrix units, and the English language course unit on marine ecology entitled “Introduction to the Marine Environment”, originated from work done by the ORION Coordinator in the ONEDIN project (EL/99/1/086810/PI/III.3a and EL/99/1/068610/PI/III.3.a/CONT), as was made clear in the original project proposal. The diagnostic and self-assessment template tests had their origin in work carried out at the Department of Biology, University of Crete.

The present Report therefore describes in detail the work which took place in advance of, and led up to, the ORION project. Without a full description of these previous events, the rationale and execution of the ORION materials will not be clear to the external evaluator. The present Report must therefore commence with a description of the previous piloting and use of these materials carried out from 1998-2002.

1.1.2 *Scope of ORION course and language modules piloting*

The materials referred to above (para.1.1.1) underwent exhaustive testing for their suitability for use and delivery as an essential part of the linguistic range of the course. The teaching methodology upon which the finalised ORION modules were based were communicated to all the ORION partners while the proposal was being formulated. Consequently, the ORION partners were already convinced by the methodology used and results obtained so that piloting of the other ORION courses was limited to testing the functionality of the ORION distributed network, and use of the ORION tool as an acceptable and user-friendly ODL methodology, suitable for the needs of both tutor and student user. This applied to both the language modules and the course modules.

1.1.3 *DIALANG Project Self-assessment provision*

When the ORION proposal was formulated, and indeed up until 2003, the DIALANG project offered the potential for users to test their language knowledge online free of charge, and initially the ORION project hoped to be able to use this freely available facility in its own freely available modules. However, the DIALANG project withdrew the free availability of their tests early in 2003 and as a result the ORION project then relied on its own tests for language diagnosis and course materials(see above) which are, likewise, not freely available online but form part of the restricted course materials

1.2 Background and Evolution of ORION diagnostic and self assessment measures

1.2.1 *Provenance of language modules*

The ORION Coordinator, Mrs M.Eleftheriou, lectured in English at the Department of Biology, University of Crete, from 1988-2002. During this period she piloted several innovatory ICT and online courses, including the basis of the ORION language modules and the Introduction to the Marine Environment module. The Biology Department (University of Crete) participated in the European Community Course Credit Transfer System (ECTS), with courses calculated in credits (140 credits for the B.Sc. award) since 1993. The English for Specific Purposes course was a 4-semester compulsory course, each semester valued at 4 ECTS credits; this non-elective total of 16 ECTS

credits is an indicator of the value given to the English for Biology modules by an external evaluator.

1.2.2 *Diagnostic Test*

Each student was required to take a diagnostic test (see Annex 1), comprising five parts covering different linguistic skills, Listening, Grammar, Sentence Construction, Letter-writing and specific reading Comprehension. The pass grade, which enabled students to be exempted from the English 1 course, was set at 70%, to be achieved in all five test areas. In the knowledge of English grammar section, there was a detailed set of questions, covering basic and advanced grammar. A detailed analysis of the results provided what amounted to an x-ray photograph of each individual's gaps in knowledge. The course lecturer used the test i) to analyse the weaknesses of the student intake both generally and individually; ii) to construct a class weakness profile and iii) to provide remedial support for individual students who had specific weaknesses, or whose basic English skills were very low or non-existent. Because no exceptions were made for lack of knowledge of English, specific remedial support, based on the results of the diagnostic test, had to be provided.

1.2.3 *Need for remedial language provision*

In addition, an analysis of students' previous language skills undertaken by Mrs Eleftheriou in 1995 had revealed the need for a reconstruction of the content of the course. 65 - 70% of the annual intake from 1989-95 already had Cambridge Lower or equivalent, 5 - 7% had Cambridge Proficiency, but in the majority of cases (68 - 70%) these certificates had been obtained 2-4 years previous to University Entrance. It was evident from the examinations results in English 1 (see Appendix 1 for full details of examination results from 1988-2001) that new students had false confidence in their previous language levels and many were what is termed "false beginners". A remedial language syllabus was created aiming to restore their knowledge of syntax and grammar, their knowledge of vocabulary, and to introduce them to the specific English terminology for Biology, a multi-domain discipline, with the required terminological areas being covered incrementally.

1.2.4 *Scope of remedial language provision*

From this type of remedial support, used, tested and updated by the very experienced ORION Coordinator from 1996-2001, derives the linguistic content of the ORION basic language modules. A description of the work covered (shown below) mirrors the description of the grammar and syntax provision given in ORION WP 6.

- a) the use of: singular/plural nouns, irregular plurals, definite/indefinite article, demonstrative pronouns, countable /uncountable nouns, present tense (forms and functions), agreements (subject/verb), pronouns, adjectives
- b) classification and measurement (numbers, quantities/amounts, weight, dimension/area, volume, location/position, properties, shape
- c) how to make statements, negative statements, asking and answering questions
- d) how to make simple measurements, how to make simple comparisons/contrasts).

1.2.5 *Piloting of ORION basic grammar and syntax language concepts*

In 2000, the diagnostic test referred to above(Appendix1) was taken by 65 students and in 2001 by 76 students. In 2000, results showed that 10 had serious grammatical problems. In 2001, 12 had similar difficulties. These were the students who used the Basic Language modules as a means of remedial support, of refreshing their memory block, and of doing this rather humiliating but absolutely necessary piece of work both flexibly and without open identification.

2. INTRODUCTION OF ONLINE COURSE MODULES IN ENGLISH AT DEPT. OF BIOLOGY UNIVERSITY OF CRETE

2.1 New IT methodology

In 1997, the Department of Biology, having made a considerable investment of funds, staffing and resources in its computer classroom dedicated for student use, decided on the objectives for using online materials in its compulsory English course. These were:

- i) to familiarize students with the concept of distance learning, which was new to them, and which the new learning environment was particularly suited to deliver
- ii) to provide a specially designed IT tool in a necessary, not especially difficult subject area which lends itself well to modular delivery and which students often find boring by traditional delivery methods
- iii) to enhance the learning process by means of new technology which can present certain types of material more easily and more flexibly than by traditional methods

2.2 New Assessment instruments and Methodology

2.2.1 *Paving the way*

The first departmental use of IT used a custom-designed CD-ROM “Basic Techniques in Fish Haematology”. The results (see Appendix 2) were sufficiently startling for the Department of Biology to continue the innovatory methodology and introduce an online module as a parallel teaching/learning method. This module (the ONEDIN Meristics module) was concerned solely with information retrieval and flexible learning tool and could not be used to assess a wider range of learning activities. It was, however, very useful as an introduction to new assessment methods previously not used in the Department.

2.2.2 *Criterion-referenced Assessment*

The Syllabus and Curriculum Committee agreed that criterion referenced assessment¹ was a suitable assessment instrument and set up the Performance Criteria in which the main feature was that 90% achievement represented mastery level and that anything below 70% represented failure. Criterion-referenced- assessment (CRA) is quite distinct from the usual form of assessment (norm-referenced assessment) which ranges student performance along a grid from 95%- 5%. It was also in complete contrast to the system used in Greek universities where a simple 50% is considered to be a pass level. It was not considered however, that in language learning the latter assessment method is the most appropriate one for assessing learning and linguistic performance. The use of CRA also entails the rigid use of item analysis (categorisation of the content of the questions and the total responses to each question), so that actual student performance and understanding can be objectively assessed.

Level 1 90% -100%

Level 2 80% - 90%

¹ In criterion-referenced assessment students are measured against identified standards of achievement rather than being ranked against each other. In criterion referenced assessment the quality of achievement is not dependent on how well others in the cohort have performed, but on how well the individual student has performed as measured

Level 3 70% - 80%

Fail below 70%.

2.2.3 *CRA's links with formative and self assessment*

What had emerged from the early piloting exercises was the need for the students to be take a short and simple Criterion-referenced test at the end of each part of the module. This would normally be given after each week's work. The weekly test is administered online (the student is not given a paper copy of the assignment, but it forms part in the email/online and flexible part of the course). In other words, the student must access the materials in his/her own time, must study the online course materials in his/her own time, and must respond in his/her own time, thus carrying out an ODL course but with the added incentive of tutor aid if this is needed ("blended" learning before the term was invented, in fact). Because the weekly self-administered tests were criterion-referenced tests (i.e., attempting to ensure mastery of content on the part of the learner rather than as a summative assessment of the learning that had taken place), they were eminently suitable for both formative and self-assessment purposes.

Details of the changes made to the marine ecology course are given in the Piloting Report (unnumbered deliverable) and need not be repeated here. Suffice it to say once more that this method has been accepted by some though not all of the ORION partners.

3. CONCLUSIONS

3.1 Language Diagnostic

The Diagnostic test on which the self-study modules are based is given as Annex 1. This test is not included in the external freely available website but can be accessed by each tutor for the specific needs of his students. When the DIALANG placement test is one again freely available (or access can be provided by the ORION consortium), this will be available on the public site. There are difficulties at present as the software will not run on a Linux server, and the ORION site and the mirror sites are all Linux-based.

3.2 Results from preliminary and subsequent Criterion-referenced tests at UOC

The results from the first IT English course content experiences are given in Appendix 1, to show the provenance and testing of the CRA methodology employed (Appendix 1). The detail of the subsequent CRA testing, and its clear links with formative and self-assessment, are given in another deliverable. However, the weekly tests are given here, along with a complete course description (Appendix 2) along with some of the students' comments, showing the effectiveness of the method (Appendix 3).

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Annex 1

Diagnostic test used to test entry level students' knowledge of English grammar

Diagnostic |Test

Look at the example given below:

a) like

In cold climates people b) **likes** sitting in the sun
c) **are liking**

The correct answer is (a).

Write the correct answer on your answer sheet in the following way

A. (X)

B. ()

C ()

a) **is freezing**

1. Water b) **is freezed** at a temperature of 0 ° Celsius.
c) **freezes**

a) **it is**

2. In some parts of Europe, b) **is** very little scientific research.
c) **there is**

a) **for getting**

3. In some countries, students work very hard b) **to get** to university.
c) **for to get**

a) **don't happen**

4. Cheating b) **isn't happening** very often in Greece.
c) **doesn't happen**

a) **the**

5. In sandy deserts, there isn't b) **some** grass.
c) **any**

a) **wet**

6. In Crete, b) **the wetter** time of the year is in January and February.
c) **the wettest**

a) **is taken**

7. The patient's temperature b) **is taking** every two hours.
c) **is took**

a) **won**

8. Kostas Kederis b) **has won** his first Olympic Gold Medal in 2000.
c) **was winning**
- a) **had won**
9. After he b) **have won** he became very well-known.
c) **was winning**
10. His success a) **made her to**
b) **made** the Greek people very proud.
c) **did make**
- a) **wins**
11. If he b) **will win** another medal in 2004, many Greeks will be very happy.
c) **would win**
- a) **should**
12. Even if he does not win another medal, Greeks b) **will remember** him as a
champion
c) **did**
- a) **was not winning**
13. He b) **didn't win** another big race since the Sydney Olympics.
c) **hasn't won**
- a) **has been training**
14. He b) **was training** very hard in 2000.
c) **did training**
- a) **has not got**
- 15/16. It's a good thing that Athens b) **did not get** to hold the 96 Olympics
c) **was not getting**
- a) **would have caused**
because the Games b) **should have caused** many transport problems.
c) **will have caused**
- a) **computer**
17. The history of b) **a computer** is quite a short one.
c) **the computer**
- a) **were**
- 18/19. At first, computers b) **have been** very large and it was not b) **until**
c) **have** c) **just**
- the invention of the small computer that ordinary people could benefit.
a) **has been**
20. The first person to achieve this breakthrough b) **was** Steve Jobs.
c) **has**
- a) **could**
- 21/22. Steve Jobs, inventor of the Apple Macintosh, b) **should** hardly have imagined
that c) **couldn't**
- a) **would be using**

fifteen years later, so many people b) **will be using** personal computers.
c) **would use**

a) **since**

23/25. B) Although satellites have existed b) **during** less than 30 years,
c) **for**

a) **information**

we now depend on them for certain kinds of b) **informations**

c) **an information**

a) **have been carried out**

26. The experiments b) **to carrying out** monthly.
c) **were carried out**

a) **are they**

27/28. Not only b) **they are** being used for scientific research in space,
c) **there are**

a) **is coming**

but also to see what kind of weather b) **comes**

c) **coming**

a) **have been shared**

29. These scientific findings, including weather data, b) **having been shared**
c) **were being shared**

a) **have been working**

30 Scientists b) **worked** on global warming for several years now.
c) **work**

a) **would bring**

31. It is considered that such research b) **will bring** many benefits to the world.
c) **was bringing**

a) **coming**

32/33. Before b) **to come** to a conclusion, the facts b) **must to be considered.**
c) **come** c) **must be considered**

a) **which**

34/35. Atmospheric changes b) **they** are very important for the environment,
c) **who**

a) **can also to be monitored**

b) **can also be monitored** from satellites.

c) **must to be monitored**

a) **such as**

36/38. Environmental issues b) **such like** the destruction of the rain forest
c) **as**

a) **used to**

a) **were given**

which b) **use** be unknown, b) **are now given** much higher priority.
c) **are used** c) **are been given**

39. Scientists reported that oil pollution a) **had reached**
b) **was reaching** the Antarctic.
c) **reached**

40. The environment cannot be protected a) **if**
b) **unless** we change our attitudes.
c) **whereas**

A

APPENDIX 1

2. METHODOLOGY

2.1 Classroom and Equipment

The CD-ROM application, “Basic Techniques in Fish Haematology” was introduced to the students by the course tutor in the first week of the 4th Semester (12 February 1998). There were 28 students on the class list, of whom 22 were present at the first explanatory session. Since September 1997, each Biology student has automatically been given a personal email address upon registration in the Department. Two computer rooms were set up and equipped as classrooms for undergraduates and postgraduates,

2.2 Composition of the Class

Of the 28 students enrolled in the course, English 4, 16 came more or less regularly to class (57%)(Group A). Of those who did not come to class regularly, five (18%), having previously failed to pass English 4, were in their third year, and found it difficult to attend English 4 regularly because the second and third year have different timetables (Group B).

Six (25%) did not want to come to English 4, for a variety of reasons (Group C), and one claimed that she had too much work to come. There was one other member of the class who came to no classes at all, and did not communicate in any way with the tutor.

It was discovered that of the 22 students present, six did not know that they had an email address, a further two did not know what their email address was, and two had no idea how to use a computer.

2.4 Organisation of Course Module

2.4.1 General Procedures

The methodology of the “virtual classroom” was explained to them, i.e., that each week a certain portion of the course as set out on the CD-ROM was to be set as course work, and that each week a set task would be prescribed from that week’s work. All communication and instruction was to be carried out electronically: the course tutor was to send the details of the work as well as the homework to each student individually; the student was to return the work electronically; and at the end of six weeks each student was to be given an assessment of performance for each unit of work.

2.4.2 Detailed Procedures

In practical terms, it was explained that entry into the “virtual classroom” had to be undertaken by the student, and that therefore the initiative would have to come from the user. The email address of the tutor was given to each student who was to send a message to the tutor. Receipt of the first message would indicate that the student had learnt how to use the technology sufficiently well to be able to handle the “virtual classroom” process. Thereafter, the tutor would communicate on an individual basis with each student. The responsibility of the students was to make the first move, without which there could be no further progress nor follow-up. Everything else was in position: there was sufficient provision of hardware, there was the necessary software

and there was the necessary technical support in the form of well-qualified and helpful technicians.

2.5 Reaction of Participants

There was a very mixed reaction from the class. Those who were already familiar with computers and email were enthusiastic from the start (12 of the 22 present). Those who were not familiar with the technology were much more hesitant until it was pointed out to them that this type of coursework enabled them to use the CD-ROM materials at a time convenient to them, in lieu of coming to a class which had been timetabled for 9am. Learning how to use email seemed to be a much lesser evil than getting up early.

It was also pointed out to them that this was part of an induction course, and also part of their English course, so that emphasis would not be laid on the retention of content, but rather on their ability to access content, their ability to grasp content, and their ability to understand and use new terminology.

2.6 Tutor Support

Since normal course work continued for two hours each week, there was ample tutor support. At each lecture, questions were asked and instructions were given verbally, but on no occasion was any work on the “Basic Techniques in Fish Haematology” module handed out in class to students.

3. RESULTS

3.1 Length of Course Module

The course was scheduled to run from 17th February until 19th April (the Greek Easter) but because of a serious failure in the IMBC server, and a later failure in the GR.Network used by the University of Crete, when a significant number of assignments were lost or disappeared, assignments were accepted until May 1. However, it became clear that there was no way of checking whether the last assignment had been done individually or was a joint effort and therefore it has been discarded from the results presented here.

Explanations and instructions had been given on Thursday February 12. English 4 classes continued each Tuesday for two hours for the remainder of the semester, until May 15. Verbal Search/reading instructions were always given in these Tuesday classes and repeated by email.

3.2 Type of Assessment Instrument chosen for Evaluation

Questions were designed to test students’ ability to find information and to test their understanding of both basic and advanced vocabulary. There were no constraints of time nor of access to the knowledge source. Therefore grades ranging from 70 - 100 were deemed appropriate for the set task, with the cutoff score being set at 70%.

Level 1 90% -100%

Level 2 80% - 90%

Level 3 70% - 80%

Fail below 70%.

3.3 Student entry

On Friday 13th two messages arrived, followed by three on 16th, one on 17th. Most of the messages (15) arrived on Wednesday 18th February, just before the deadline. Four more arrived by 25th February and these included one repeat student and one who was computer-phobic, i.e., claimed never before to have touched a computer. There were two stragglers, both of whom, significantly, belonged to Group C, who sent their first messages on 5th March, asking if they could be allowed to enter the procedures at that late stage.

3.4 Tutor Response

3.4.1 Assignment 1

The tutor verbally instructed the class to read the first three parts of the first section of the Module, on Fish Blood Constituents, Introduction, Blood, Plasma/Serum and Cells, and on 23rd February, sent each member of the class who had sent the initial email, Assignment One(Annex 2) (21 messages). Those students who responded later were also sent the first assignment.

The results were quite interesting.

18% achieved Level 1, 7% Level 2, 21% Level 3, so that only 46% of the total achieved mastery in the first assignment, and 54% failed. (Table 1).

3.4.2 Assignment 2

The second Search/reading Assignment was given in class verbally one week later, and concerned the Erythrocytes and Leucocytes Sections. This was followed by Assignment 2 (Annex 3) sent out electronically on 26th February. Once again, the results are interesting because there is a perceptible change. In the second assignment, failures dropped to 14%, with 21% achieving Level 1, a very respectable 51% Level 2, and 14% Level 3. This time, a very noticeable improvement as 86% achieved mastery level.(Table 2). In this Assignment, Question 4 asks the students to comment on a structural matter, as to whether the course should include a graphical illustration of a the four subunits of haemoglobin. 80% answered in the affirmative.

3.4.3 Assignment 3

A similar procedure was followed for the third Search/reading Assignment, which covered Granulocytes and Lymphocytes, with the Assignment (Annex 4) being sent electronically on 5th March. This time there was not much change to be seen in the results (Table 3) On the third assignment, Level 1 remained static at 21%, 40% achieved Level 2, and 18% Level 3. This time failure rose to 21%. (Table 3).

3.4.4 Assignment 4

A similar procedure was followed for the fourth Search/reading Assignment, which covered Monocytes and Thrombocytes, with the Assignment (Annex 5) being sent electronically on 12th March.

In Assignment 4, 44% achieved Level 1, and 28% achieved Level 2, ie., 72% achieved a respectable Level 1 or 2 , with only 14% at level 3 and 14% failing. (Table 4).

3.4.5 Assignment 5

As before, with the Assignment (Annex 6) being sent electronically on 18th March. This time the Search/reading task involved a good deal of reading and so the task was correspondingly reduced, and for the first time there was quite a significant written element. The grasp of terminology was to be demonstrated in this assignment. There were again high grades overall; 36% gained Level 1, 25% Level 2, ie 61% achieved Level 1 & 2, whereas 14% came in at Level 3, but a high percentage(25%) did not even complete the assignment. (Table 5).

The spelling and grammar mistakes which occurred in this assignment are worth noting. There was only one grammatical mistake throughout, the omission of an “öf”. There were a few obvious “typos” (myst for must, etc). But of basic English vocabulary, there were only the following single occurrences:

immediatly,plased, miminum,usully,bood,prepared,heamoglobin, administrate.

Of the terminology used in the module, most mistakes occurred in caudal(3), peduncle (4) and capillary(5). Therewas severed (2) sacrifise(12) and heperinised(1).

In the opinion of the author, who spent 24 years teaching English in Britain, many native English speakers might not have performed so well.

3.4.6 Assignment 6

This assignment (Annex 7) was sent on 31st March, but, as previously mentioned, a failure in each of the systems being used led to a degree of chaos. There was no way of checking on the validity of the answers being received and so it was decided there was no choice but to abandon the assignment which meant that the whole of Section 3 has not been included.

3.4.7 Other uses of electronic mail by students

75% of the class liked the electronic method of delivering homework and sent other assignments, which did not form part of this module, by this method as they found it much more convenient.

All of the “repeat” students sent all their work electronically.

4. DISCUSSION

This was the first time that a CD-ROM has been used in a virtual classroom context in the Biology Department of the University of Crete. The discussion is based on a very small sample and cannot be evaluated formally, particularly in the light of the failure of systems which meant that one third of the module could not be properly evaluated. However, as a starting point for workshop discussion, it could prove quite useful, as a few conclusions can already be drawn.

There is no doubt that nearly all the students (only one exception) responded in a positive way to the innovative methodology.

They quickly learned how to use their email facility constructively and used it to ask relevant questions about the set text, as well as to send the tutor other messages. This noticeably increased their ability to produce acceptable written English, without stress and strain on the part of the tutor. Perhaps because the task was a real task, and the messages were genuine messages, all the students(apart from one) responded very positively and the fluency of their English improved.

They quickly learned how to handle the CD-ROM and access the set work. Their initial lack of experience shows up very clearly in the results from the first assignment, in which 54% did not achieve mastery, while thereafter there was a noticeable continuous improvement shown in the learning curve.

Three out of twenty-seven students quickly learned how to cheat, i.e., cut-and-paste the answers (rather surprisingly, more did not follow suit). The tutor devised a method whereby all incoming emails were immediately checked against a template to check for exact copies.

As a result, the tutor also quickly learned the importance of setting different types of task that could not be so easily copied.

There has been a noticeable increase in group cohesion, which up till now has not been a characteristic of this particular class (doubtless the Hawthorn effect).

The whole class particularly liked the “virtual classroom” context, which allowed them to do the work in their own time, carrying out clearly defined procedures and tasks, again within a flexible time scale. This was particularly noticeable in the case of the “repeat” students and most of the non-attenders. Though acting from entirely different motives, all the “repeats” and most of the non-attenders were able to join the “virtual classroom” and there was a distinctly beneficial effect on their overall performance.

Some linguistic, procedural and visually-oriented questions were set in the Terminology part of the Final Examination. These were all adequately tackled. However, one question was set which the whole class failed to answer. When asked to identify the Monocyte from the microscope image, there was not a single correct answer, thus upsetting one of the tutor’s most cherished illusions - that a picture is more powerful than a thousand words!

All 28 enrolled students turned up to take the final examination, and the only one who failed was the one who had not participated in any way.

CRA Test 1

BASIC TECHNIQUES IN FISH HAEMATOLOGY CD-ROM

OPEN/DISTANCE LEARNING

ENGLISH linguistic work from CD-ROM

English 4 homework for 26th February, 1998

PLEASE SEND THE ANSWERS TO THE FOLLOWING QUESTIONS, FROM
LAST WEEK'S READING (19th February)

to

margaret@imbc.gr

1. List the functions of blood as given.
 - a)
 - b)
 - c)
2. What is the proportion of water in plasma?
3. What is the rest of the plasma made up of?
4. What are albumins?
5. What is the primary function of leucocytes?
6. How do leucocytes differ from erythrocytes?
7. What is the proportion of blood cells in fish?
8. What is the proportion of blood cells to plasma in sea bream?

Margaret Eleftheriou
23rd February, 1998

CRA Test 2

BASIC TECHNIQUES IN FISH HAEMATOLOGY CD-ROM

OPEN/DISTANCE LEARNING

ENGLISH linguistic work from CD-ROM

English 4 homework for 5th March, 1998

**PLEASE SEND THE ANSWERS TO THE FOLLOWING QUESTIONS, FROM
LAST WEEK'S READING (26th February)**

Erythrocytes & Leucocytes

to

margaret@imbc.gr

1. What shape is the nucleus of a fish erythrocyte?
2. What is the name given to an immature erythrocyte?
3. In what visible way does an immature erythrocyte differ from a mature erythrocyte?
4. This is a different kind of question, in which I am asking your opinion.
There are two definitions/descriptions given for haemoglobin. One is a general description, the other concerns the structure of haemoglobin.
In your opinion, would it be helpful to have an illustration of the four subunits of haemoglobin, the alpha and the beta chains?
5. Where are red blood cells produced in bony fishes?
6. Are there the same amount of erythrocytes in all species of fish?
7. What are the four main categories of leucocyte?
 - i)
 - ii)
 - iii)
 - iv)
8. Which organs produce white blood cells in fishes?
9. What are the differences in the main functions of erythrocytes and leucocytes?
10. In fishes, in which organ can both red and white blood cells be formed?
11. In which of the species given is there the biggest difference in the proportion of red to white blood cells?

Margaret Eleftheriou
26th February, 1998

CRA Test 3

BASIC TECHNIQUES IN FISH HAEMATOLOGY CD-ROM

OPEN/DISTANCE LEARNING

ENGLISH linguistic work from CD-ROM

English 4 homework for 12th March, 1998

PLEASE SEND THE ANSWERS TO THE FOLLOWING QUESTIONS, FROM THE READING FOR 5th MARCH

Leucocytes

Granulocytes & Lymphocytes (no comparisons)

to

margaret@imbc.gr

GRANULOCYTES

1. What are PMN leucocytes?
2. What is the name given to the shape of lymphocytes?
3. What is the difference between neutrophils and eosinophils?
4. Do granulocytes recognise specific antigens?
5. What is another term given for the cytotoxic response?
6. Where is the origin of granulocytes in fish?
7. i) Do all authors agree as to the amount of granulocytes in fish?

ii) What is the recorded variation?

LYMPHOCYTES

8. Lymphocytes are large, spherical cells. What is another term given for the latter adjective?
9. What is the difference between mature and immature lymphocytes?
10. Explain the difference between the humoral and the cellular immune response.
11. Lymphocytes can originate in three places. Which are these?
12. What is the proportion of lymphocytes in fish species?
13. Why is it difficult to estimate the numbers of lymphocytes accurately?
14. What is the percentage of lymphocytes in Sea bass?

Margaret Eleftheriou

5th March, 1998

CRA Test 4

BASIC TECHNIQUES IN FISH HAEMATOLOGY CD-ROM

OPEN/DISTANCE LEARNING

ENGLISH linguistic work from CD-ROM

English 4 homework for 19th March, 1998

PLEASE SEND THE ANSWERS TO THE FOLLOWING QUESTIONS, FROM THE READING FOR 12th MARCH

Monocytes
Thrombocytes
to
margaret@imbc.gr

MONOCYTES

1. i) What is the shape of the monocyte nucleus?

ii) How much of the available cell space does the nucleus take up?
2. i) In what ways do monocytes resemble granulocytes?

ii) In what ways are they different?
3. Which phagocytes are mobile?
4. i) What part does the T-helper cell play in the functioning of phagocytes?

ii) What happens to the activated B-cells?
5. Where do monocytes originate?
6. What is the percentage of monocytes in White Sea Bream?

THROMBOCYTES

7. What are the four types of thrombocyte?
8. One type of thrombocyte is markedly different from the rest. Which one?
9. What major function is carried out by thrombocytes?
10. What is prothrombin?
11. How is prothrombin converted to thrombin?
12. How is fibrin formed?
13. Where do thrombocytes originate in fish?
14. Is there a difference between mammalian thrombocytes and fish thrombocytes?

Margaret Eleftheriou
12th March, 1998

Test 5 (Not CRA)

BASIC TECHNIQUES IN FISH HAEMATOLOGY CD-ROM

OPEN/DISTANCE LEARNING

ENGLISH linguistic work from CD-ROM

English 4 homework for 26th March, 1998

PLEASE SEND THE ANSWERS TO THE FOLLOWING QUESTIONS, FROM THE READING FOR 19th MARCH

View the whole of Part 2. This is quite a lot of reading. It is a demonstration of an activity, so there is no need to ask many questions.

Send your answers

to

margaret@imbc.gr

Explain very simply how to take blood from the tail of a small fish.

Margaret Eleftheriou

18th March, 1998

CRA Test 5

BASIC TECHNIQUES IN FISH HAEMATOLOGY CD-ROM

OPEN/DISTANCE LEARNING

ENGLISH linguistic work from CD-ROM

English 4 homework for 7th April, 1998

PLEASE SEND THE ANSWERS TO THE FOLLOWING QUESTIONS, FROM THE
READING FOR 2nd APRIL

View the whole of Part 3. This is quite a lot of reading.

Send your answers

to

margaret@imbc.gr

1. What is Drabkin's solution used for?
2. i) What is the minimum number of cells needed in an erythrocyte count?

ii) What is the preferred number of cells in an erythrocyte count?
3. Do all laboratories carry out the same procedures in a leucocyte count?
4. What kind of haemocytometer is used in the demonstration on this CD-ROM?
5. What is the purpose of differential staining?

Margaret Eleftheriou
31st March, 1998

Appendix 2

Weekly CRA Tests in Share and Re-use content modules

Appendix 3

Comments from Users