

TIPS, TRICKS AND STRATEGIES FOR DOING WELL ON MULTIPLE-CHOICE EXAMINATIONS

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1. BEFORE THE EXAM

1.1 Write your own questions

If you try writing a few multiple choice questions you will realize that they aren't that easy to write. You will learn that it is easier to write questions on some topics and harder on others. All useful information! You can do this as a review technique with a study partner. Decide on a topic to review and each try to write a few multiple choice questions on the subject. Now exchange questions. You should learn something from both halves of the exercise.

As you become more familiar with multiple choice questions you will note some familiar question techniques. It is hard to write plausible incorrect answers, one technique is to write the exact opposite of the truth as an incorrect answer— this often looks on first glance like a good answer, until you notice that a crucial word is missing.

1.2 Use your textbook

Practice, practice, practice. Most textbooks come with question banks. You can use the ones in your textbook, the ones on the accompanying CD, and the ones from other major biology textbooks, often available online at their websites (e.g. Purves, Orians & Heller: Life, Raven, Johnson, Losos & Singer: Biology, Freeman: Biological Science and Solomon, Berg & Martin: Biology). Even though the Bio1B examinations are multiple choice it is still worth checking out the short answer questions since you may identify gaps in your understanding.

1.3 Time Management

(Note: In summer session there are three 50 question midterms, each in an 80 minute timeslot, rather than the two shorter midterms and longer final in regular session.)

I'll illustrate this for a Bio1B midterm but the principal applies to lots of other exams.

Let's assume that you find 35 of the 50 questions straightforward, they only take you a minute or so, let's say 40 minutes total. There are another 10 questions that you find harder, maybe they are problems, or take extra reading or calculation. You take two minutes over each of these for a total of 20 minutes. You now have 20 minutes left for the last 5 questions which you are really puzzling over. It is pretty easy to spend most of this time puzzling over these questions and only leave a few minutes for a cursory check of your answers to the earlier questions. You become obsessed by the harder questions at the expense of checking for errors on the easier questions.

However, if you are anything like me, you have probably made at least half a dozen mistakes on those 35 'easy' questions because you misread the question, filled in the wrong entry on the scantron, failed to notice a negative qualifier etc. etc. Fifteen minutes spent checking your answers will probably bring you much better returns than agonizing over the questions you find hardest.

A better strategy, in this example, would be to allot about 1 minute per question to work through the entire 50 questions. Some questions may take less time but try not to go beyond 1 minute on any question. Cross out answers you know to be wrong as you go along. If you run out of time then put a question mark by your best guess and move on. You should finish this in less than 50 minutes. Now split the remaining time in two parts. Spend half the time (15 mins) checking your answers. Make sure you read the question correctly. Look for negatives and qualifiers. In doing this you can take another look at the questions you didn't complete the first time. Something new might come to you. Finally, divide the last 15 minutes between the questions that remain.

Time is a resource and you should use it wisely. Give some thought to a strategy ahead of time based on the exam format, exam length and your known strengths and weaknesses.

1.4 Scantron and instructions

Before the exam starts read all the instructions carefully. Most importantly, make sure you know how many questions there will be and how many answers there can be to each question. Remember that it is the Scantron that is scanned and graded, not the test booklet. A common strategy is to complete all the answers in the test booklet and then transcribe them to the Scantron. I would not recommend this strategy for two reasons: it wastes time and it introduces an unnecessary source of error.

2. DURING THE EXAM

2.1 Look for the point

If a question stumps you, then try to take an alternative point of view. Most questions have a point. For example to see if you understand X, or can distinguish Y from Z, or can apply A to situation B. If you strip away the 'story' it is likely that most questions that are not strictly factual have some aim like this behind them. Looking for such a point might help you see the wood for the trees.

2.2 Don't overanalyze

I would estimate that nine times out of ten if you have a problem with a question you are reading too much into it – and usually making the question much harder than it really is. Try to mentally take a step back and ask yourself whether this question might actually be much easier than you are assuming.

2.3 Don't make assumptions

Take Occam's advice and make as few assumptions as possible, preferably none. If the question doesn't tell you the population is in Hardy Weinberg equilibrium (either explicitly or implicitly by telling you the five conditions have been met) then you shouldn't assume it is.

2.4 Derive your own answers

Many people like to decide on their own answers to multiple choice questions before they look at the given answers. This won't work for all questions (i.e. it usually can't be used for 'Which of the following is....' type questions) but can be a useful strategy – especially for calculations.

2.5 Read the question

If all else fails then read the question. Seriously, you should really do that first, but there is something in the human brain that desperately wants to answer the question you know the answer to rather than the one you are asked. It is amazingly common for people to effectively stop reading the question part way through and answer a wholly different question that may, or may not, resemble the question being asked.

2.6 Re-read all the questions and answers

Plan to save enough time to be able to check ALL your answers. Don't just quickly skim through, if you have time then re-read all the questions and re-work all the answers. Take the mental attitude that you HAVE made mistakes (I actually pick a specific number, on a multiple choice midterm with 50 questions I'd probably assume I'd made at least 6 mistakes) and your task is now to find them. Going back through the questions in reverse order may help (i.e. prevent you making the same mistake twice) by making you see things differently. Another advantage to leaving enough time to go carefully back through the questions is that information provided in a later question may provide a clue to an earlier question. This might sound unlikely but it is actually surprisingly common.

2.7 Changing your answers

There is a belief that most people who change their answers will change from a correct one to an incorrect one. The origin of this belief is probably that those questions that you changed from correct to incorrect are far more prominent, and annoying, when you review your exam - you won't notice the ones you changed from incorrect to correct.

The best advice is to not be afraid to change your answers *if you have good reason to do so*. There are plenty of studies to suggest that answers are *usually* changed for the better. For example, a May, 2005, study of 1,561 introductory psychology midterm exams found that when students changed their answers, they went from wrong to right 51% of the time, right to wrong 25% of the time, and wrong to a different wrong answer 23% of the time (Journal of Personality and Social Psychology, Vol. 88, 725-735). A common mistake however is to make a lot of changes at the last minute. All too frequently these are *not* good changes because you do not have time to carefully consider them.

2.8 Pay attention to qualifiers

Qualifiers (e.g. 'not' 'except') are not put in to trick you. They are usually used because it is very hard to think of four incorrect answers to a question. So the question is reversed with a negative and you are given four correct answers and one incorrect. I usually try to put all such vital words (including words such as 'always', 'not', 'except') in bold capitals. Even if this is done for you I'd still recommend highlighting such words as you come across them to make it less likely you will overlook them later.

2.9 Answers are more than just correct – they answer the question

To take a simple example (albeit one reduced to absurdity): What is 2+2? A) 1 B) 2 C) 4 or D) the sky is blue. Answer D) may well be correct but it is hardly the right answer to this question. This might sound somewhat ridiculous but when the question is wrapped up in an example it is surprising how often people fall for a mistake like this. They then come and see me in office

hours to argue, often passionately, how blue the sky really is. To take another example a question might ask you for the explanation for X. Answers might include numerous correct statements about X but only one of them will actually be the explanation requested.

2.10 Don't pick answers you think are wrong!

Usually your gut instincts are correct. I get a lot of people coming to see me after the exam saying things like ' I thought the answer was a) (IE THE CORRECT ANSWER) but I put B) because.....'. There then follows a very long-winded explanation making numerous assumptions that outlines a scenario, often totally implausible, where B) could under very bizarre circumstances not be as incorrect as intended. You are asked to pick the BEST answer so pick it!

2.11 Look at the 'wrong' answers too

Even if you absolutely and positively know the correct answer. For a simplistic example, say you are a soccer fan and are asked who won the British FA cup in 1887 (an unlikely occurrence but bear with me). The possible answers are A) Chelsea B) Aston Villa C) Sheffield United and D) Old Carthusians. You know FOR A FACT that Chelsea won the FA cup in 1997 and are pleased to get such an easy question. (See section 2.5 for a comment on this type of error). If you later peruse the 'incorrect' answers it might strike you that 'Old Carthusians' is a very odd incorrect answer to have since the team no longer exists. In fact the Old Carthusians haven't been around since the late 1800's.....

Wrong answers may also remind you of a term or concept that helps you to answer another question.

2.12 Guess intelligently

If you really have to guess at the answer to a question then at least try to rule down the answers. Using logic and common sense you can often eliminate one, two or sometimes three answers. In calculations, even if you don't know how solve the question you may be able to see that some of the answers cannot possibly be correct simply by using logic. Look out for a '4/1 split' in the answers. You can sometimes identify the correct answer by choosing the "odd one out". This occurs when the question writer is short of incorrect answers and accidentally or carelessly makes the 3 or 4 incorrect answers all synonyms (often antonyms of the correct answer).

2.13 Calculations

One of the advantages of having a multiple choice exam is that I get abundant feedback on how many people got every question right, what proportion picked each answer etc. If I crudely divide the questions in the evolution section up into three categories and calculate the average percentage of people that got questions in that category correct I get something like:

Genetic problems requiring calculations - 54%

Genetic problems requiring just logic or Punnet squares etc - 73%

Everything else - 82%

Another way of looking at this is that although only a fifth or a quarter of questions fall into the first two categories the average person will lose between a third and a half of the total points they

lose on these few questions alone. For the average person, any time you can spend improving your performance on calculation problems is time well spent.

There are two tricks to dealing with calculations. One, as you may already have guessed, is practice, practice, practice. The second is to categorize the question. For example problems and calculations on the Hardy Weinberg principle can be dressed up in many ways but all basically ask you to calculate genotype frequencies from allele frequencies or vice versa. Always set out clearly what you have been told, and what you are asked to calculate.

2.14 If all else fails....

The best strategy is to know the material well but if you are totally stumped on a question then here are some tips that may help. Note that these tips will not help you much if the person who constructs the exam is aware of them!

Looking for patterns in the answer grid ('if the last four were A the next one can't possibly be A') is probably a waste of time. Personally I try not to have an excessive number of one particular answer and then the question order is dictated by the fact I try to order the questions to use as few sheets as possible and not waste paper. Having said this there are studies that show that the first i.e. A and, to a lesser extent, the last, D or E, answers on multiple choice exams are the correct answer less frequently than you would expect by chance. The suggestion is that question writers feel the correct answer is too 'obvious' if it comes first (or last) and tend to hide it in the middle. So, if all else fails, pick B or C.

In a similar vein, an easy mistake for the question writer to make is to make the correct answer longer than the incorrect answers. I see lots of multiple choice questions with this 'mistake'. It usually comes about as you add clarifications and further information to the correct answer. Incorrect answers don't usually need much clarification. A good example of this is question 9 in chapter 23 of Campbell 7th where the correct answer is nearly as long as all the rest of the answers combined! A more subtle variation on this tip is that the correct answer is often the choice with the most information.

A final tip of this type is that an answer with a glaring typo is often a wrong answer. The tester may have proofread the correct answers carefully, but not the incorrect ones. Although these tips may be useful when you are totally stumped do not let them distract you from using your knowledge to choose the correct answer!

3. AFTER THE EXAM

3.1 Analyzing your performance

A post-mortem analysis of your exam can be very useful to find out where you need to improve. Make sure that you understand why you got questions wrong. Was it because the answers looked very similar but were slightly different from one another in a way you did not notice? Did you read too much into the question and make unnecessary assumptions? Did you read the question incorrectly?

Another way to analyze your performance is to realize that all questions generally fall into three categories: factual, which could be answered by recall from lecture (the 5 conditions for the Hardy Weinberg), conceptual, which can be answered by utilizing the appropriate concept (e.g. using the Hardy Weinberg to calculate allele frequencies given genotype frequencies) and application, which can be answered by taking a concept you have been given and applying it to a novel situation (e.g. extending the Hardy Weinberg to a situation with 3 alleles). Generally students find factual questions easiest and application questions hardest. Most tests probably have a majority of factual questions, a healthy dose of conceptual questions but relatively few application questions. Understanding which types of questions you are having problems with can help you improve. Go through a midterm and analyze which questions you got right and wrong and which category they fall into.

3.2 Develop YOUR strategy

Your mind is unique and strategies that work for me may not work for you. Understand what questions you get wrong and why you get them wrong. I'm good at making stupid mistakes, and even better at repeating stupid mistakes. I need to find ways to look objectively at questions without repeating mistakes. Use the information here to help you understand and improve your own strategy.

3.3 Stress reduction

Many students find exams to be stressful. A little adrenaline may be a good thing and may sharpen your mind but if you find that stress and anxiety is interfering with your performance you should take some steps to control them. There are numerous steps you can take on your own and these can include positive visualization and breathing exercises. If you feel the problem is more severe then you can find help at Counseling and Psychological Services (CPS) at the University Health Services Tang Center. Counselors are skilled at assessing stress and anxiety and can help determine what would be helpful in your situation.