

Writing and Taking Multiple Choice Questions

This is your basic reference to writing and taking multiple choice test questions.

Multiple choice questions are designed to be objective, easy to grade, and efficient in time. They can be used quickly and efficiently in test item banks to create multiple versions of the same test. Their greatest disadvantage is that they do not allow the student to create their own answer, and cannot tell you how an answer was arrived at. In other words, they can detect right answers, but not methods, style, or the ability to go beyond the call of duty. They are typically better at detecting recall of facts rather than understanding of concepts, although it is possible to write conceptually based items if done with care. It is harder to write a concept based multiple choice question rather than a knowledge based one. It is also harder to write a good multiple choice question than a bad one.

Multiple Choice Question Writing

Multiple Choice Questions work best when:

- Able students who know the material get the answer right
- Challenged students who work hard get the answer right
- Students who do not prepare do not get the answer right

This means the question should not be “guessable” by someone who has not worked on the material; and the question should require specific knowledge rather than the ability to use logic in generic situations. (Questions that test that are typically found on IQ tests.)

Multiple Choice questions typically have a lead-in question, called a “stem”, and several choices for answers. Multiple Choice questions should have 4-5 options. Too few options means guessing is rewarded more. Too many options means the student wastes time.

One of those items is the correct response, and the others are “distractors.” A good distractor *looks* like a right answer, but is not. At least one distractor should be obviously wrong, so a student who knows something will have an increased chance of guessing the right answer by process of elimination. The other distractors should be reasonable responses, but clearly incorrect to someone who understands the material. The other distractors may in fact be true statements, but not relevant to understanding the question being asked.

Here is an example of a poor item, given on a test after a unit on the planet Neptune:

1. Some scientists believe that Pluto is
 - a. an escaped moon of Neptune
 - b. usually the most distant planet in the solar system
 - c. the name of Mickey Mouse’s dog
 - d. all of the above

This item is poor because a typical student will know that either a or b is true; and c is certainly true but unrelated to the lesson. Given two right answers, d is correct and only a minimal knowledge of the content was needed to make this distinction. In a test setting “all of the above” usually is a flag that something is unusual about the item, and more often than not, test writers only use it when it is the right answer.

Here is the same item, rewritten to give better results.

1. Pluto is sometimes called a planet, and sometimes a moon of Neptune. The reason it is sometimes called a planet is:

- a. It is located in an orbit that is exactly like the orbits of all the other planets.
- b. It orbits the sun, rather than Neptune.
- c. It is very large, larger than the sun itself.
- d. It is sometimes farther from the sun than Neptune.

In this example, you can see that choice “c” is the throwaway--most students would have a good chance of seeing that this is the wrong answer. (The throwaway answer, if there is one, is often the one that looks most inviting. It may stick out from the others for some reason. A badly written item may also have the right answer stick out for some reason.)

However, all the other statements in the example are true to some extent, but only one of them is the right answer. Just because a statement is true does not make it address the question. This is another characteristic of good distractors. Choice “a” is sort of true, but does not really apply to Pluto. It has a solar orbit, but is highly inclined and greatly stretched (eccentric)--something only a student of the material is likely to know. Such students would also know that “d” is true. However, only choice “b.” is correct. A knowledgeable student would be able to determine this because this is the only choice distinguishes between what is a planet (Neptune and Pluto) and what is not (something that orbits Neptune). Pluto is clearly the former, and therefore “b” is the correct answer.

Multiple Choice Test Taking

Since we now know some of the tricks test writers use, we can use that knowledge to avoid those tricks and take multiple-choice items with more confidence. However—

The only surefire way to improve your odds of getting a question right is to be thoroughly familiar with the material. **Your best strategy is to master all of the material. If you don't know what the test is about, your best strategy is to remain calm and think logically.**

Having seen the material before, you are likely to remember it or know how to solve it.

Your second best strategy is to know and use as many general skills as possible, such as graph interpretation, being able to read passages for information, interpreting equations, basic math skills, understanding how experiments are designed, and so on.

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- a.
- b. yellow submarine
- c. 9.8 meters per second per second
- d. the War of 1812.

Obviously all the wrong answers here make no sense. But even if you don't know what the acceleration of gravity is, you can pick the right choice. So make sure you know why each answer is right or wrong, then pick the choice you mark right. On a standardized test, this item wouldn't perform very well and would probably be eliminated. It wouldn't distinguish between students who know what gravity is (the smart kids) and the students who know what a stupid answer is (everyone else).

Guessing:

If you get credit for the number of right answers, without penalty for wrong answers, it's best to guess. Eliminating clearly wrong answers improves your chances. If an item has four choices you have a 25% chance of guessing the right answer. If you can cross one off as clearly wrong, then your chances of guessing the right answer improve to 33%. (This strategy doesn't work if your test penalizes you for wrong answers.) The odds of you getting an answer right that you leave blank are

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Having said that, here are some things to consider when you really don't know which answer is right:

Eliminate wrong answers and see what is left:

If you can eliminate all the wrong answers, therefore whatever is left must be right. That may not be the same as knowing the right answer. Consider this question:

4. What is the acceleration of gravity?
purple

ZERO.

Look for things that stick out

When a set of possible multiple choice answers has one that sticks out, it deserves special attention. It is either the right answer (because it is different than the others) or the wrong “throwaway” answer (because it is unreasonable and the others are reasonable.)

Try all the answers.

Try out all the answers, especially on items requiring computation. The first one that looks good may not be the right answer. A common multiple choice item strategy is to place the most tempting wrong answer before the right answer. On a standardized test, such patterns are eliminated through scrambling of the choices on different forms. Also, sometimes true statements are used as wrong answers. They may be true, but they might not address the question that was asked.

Beware of true statements that don't answer the question

Work backward.

Unless there is an error in the test writing, one of the answers is right. It may be possible for you to work backwards in order to solve a problem you don't know how to approach in any other way.

Beware of true statements that don't answer the question

Many wrong answers are actually true. To see how this is, look at this example:

1. For every action there is an equal and opposite reaction. If a football player kicks a football, that is the action. What is the reaction?
A. the football flies away.
B. the football kicks him back.

Many people would choose A, because B sounds silly and A actually does happen. It's a true statement. But it isn't the right answer, because the question is not asking “what happens next?”; it's asking “what is the reaction?” A knowledgeable student will know the reaction must involve the same two objects and be simultaneous, so therefore the correct answer is B. The most tempting right answer, and a true but irrelevant statement, came first.

Draw diagrams or charts to eliminate confusing choices

If you have several similar choices, use a diagram or chart to separate the answers. Often rewriting the choices helps you tell the difference.

Read slowly and carefully.

On a traffic school test, one choice might read “Never turn right by left of way” which contains trafficky-sounding words, but actually makes no sense. If you don't read the choices carefully, you might not realize the words are different.

Here's another example. Read the words in the figure below RIGHT NOW AS FAST AS YOU CAN WITHOUT PAUSING!



Did you read “Paris in the Spring?” or “Paris in the the Spring?” If you read too fast, you might skip over important words.

Skip items you are stuck on. Guess if necessary--don't leave it blank.

As difficult as it may be, you sometimes have to let go. If a test is scored by the number of correct responses, as many standardized tests are, you can improve your score more by finishing the test and getting most of the items right, as compared to getting every item right but not finishing the test. In fact, logic indicates you should do all the easy ones first (a good confidence booster) then return to the harder ones.

Some items are just hard. There's no way around it.

Especially on a standardized test. Some items are designed to be hard for nearly everyone. So just do your best and go on.

Get some rest.

You can't be clever if you're dead tired. While taking a test, pause occasionally and rest your eyes and your hand. Change pencils.

Eat something for breakfast.

You can't function without energy. According to the law of conservation of energy...oh, well, just skip it. You need to eat breakfast. Do it.

Review your answers.

You may have heard that you should always go with your first instinct and not change answers you already marked. This may work for some folks, but if you can definitely eliminate an answer as being wrong, go ahead and do it.

Web Resources

There are many, many resources on testing on the internet. Here are a few pertinent to multiple choice in particular:

Writing Multiple Choice

<http://naio.kcc.hawaii.edu/org/oir/guide.html>

Good general guide similar to this document.

http://www.ed.gov/databases/ERIC_Digests/ed398238.html

A more technical treatment including some examples of bad writing you will be surprised to find on many standardized tests.

<http://ericae.net/digests/tm9503.htm>

General how-to information.

Taking Multiple Choice

<http://classes.ttu.edu:8902/psy1300/resources/multiple.html>

How to take tests.

<http://students.berkeley.edu/slc/CalRen/TestsGeneral.html>

Interesting section on analyzing the results of a taken test at the end.