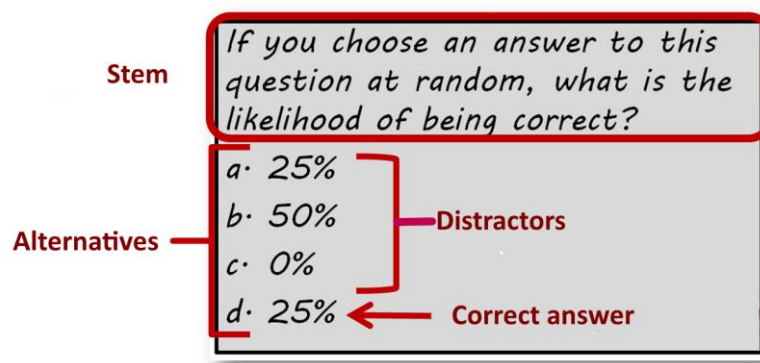


Hints and tips for writing multiple choice questions

There are many assessment activities and tools which can be used to assess learning, but one of the more popular tools is the multiple choice test or exam. Thoughtfully considered multiple choice questions can produce a reliable, consistent assessment which accurately measures student achievement of learning outcomes; but they need to be used only for appropriate levels of learning, and they need to be carefully created.


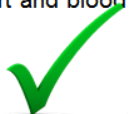
Question components

Each MC question includes a stem, to ask the question, and the alternatives, a set of selectable answers. Of the answers, usually just one is correct (although MC questions can be set up with more than one correct answer) and the others are known as distractors – that is, options which are either inferior or incorrect.



Guidelines for the stem

1. **Keep the stem meaningful.** The stem should be able to stand alone as a meaningful statement, and should present a definite problem. You can see two examples here, one good and one less so.

<p>Cardiovascular disease is:</p> <ol style="list-style-type: none">1. Any disease of the internal organs2. Any disease of the respiratory system3. Characterized by high blood glucose levels4. Any disease of the heart and blood vessels 	<p>Which of the following most accurately describes cardiovascular disease?</p> <ol style="list-style-type: none">1. Any disease of the internal organs2. Any disease of the respiratory system3. Characterized by high blood glucose levels4. Any disease of the heart and blood vessels 
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The aim is to produce a question stem which stands alone, rather than needing the answer options added to make sense. The easy way to do this is just to make sure that most of the words are in the stem, which is in the format of a complete question, rather than just a phrase. Also try to avoid putting blanks in the stem.

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2. **Keep the stems simple to understand.** The principle to follow is to keep the stem as grammatically simple as you can, and try to state it in positive rather than negative terms. You can see an example of this here, and an example of how to fix it. If you *must* use negatives, highlight the negative word in the stem.


A nurse is assessing a client who has pneumonia. Which of these assessment findings indicates that the client does **NOT** need to be suctioned?

- Diminished breath sounds.
- Absence of adventitious breath sounds.
- Inability to cough up sputum.
- Wheezing following bronchodilator therapy.



Which of these assessment findings, if identified in a client who has pneumonia, indicates that the client needs to be suctioned?


- Absence of adventitious breath sounds.
- Respiratory rate of 18 breaths per minute.
- Inability to cough up sputum.
- Wheezing prior to bronchodilator therapy.



3. **Avoid double negatives.** Avoid putting a negative word (no, not, un) in the stem, as well as putting negative words in the alternatives. This is an extreme example, but you can see how difficult it is to try to work out what the question is asking in relation to the alternatives. The second example is a much simpler way of presenting the question.


Which of the following is **not** an indication of a poor lifestyle choice?

- Not avoiding cigarette smoking
- Not avoiding healthy fats
- Not avoiding alcohol



All of the following are indications of poor lifestyle choices except for one – which is it?

- Cigarette smoking
- Consumption of healthy fats
- Consumption of alcohol



Guidelines for the correct answer

When considering the correct alternative, your main aim for the question is that the student is able to select the right answer based on their learning, rather than guessing. Don't try to trick them by providing answers which can be legitimately interpreted in different ways.


Keep the correct answer unambiguous, unless you want the students to pick a best or most likely answer – and if you want this, make it clear in the stem.

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Make sure also that you don't give the correct answer away by having it as the only option which really matches the stem, or the most sophisticated option (for example, using textbook language), or the longest option – all dead giveaways. You can see a good and not-so-good example here.


The term operant conditioning refers to which of the following learning situations?

- New stimulus
- Individual associations in sequence
- The learner's response is instrumental in leading to a subsequent reinforcing event
- Verbal responses



The term operant conditioning refers to which of the following learning situations?

- A familiar response is associated with a new stimulus.
- Individual associations are linked together in sequence.
- The learner's response leads to reinforcement.
- Verbal responses are made to verbal stimuli.



Guidelines for the distractors

If a MC question is to be really effective, the distractor alternative answers are as important as the correct answer, and need to be carefully considered. In fact, the most challenging part of creating the MC question is coming up with distractors which would be ignored by students who did achieve the learning outcome, and selected by students who did not achieve the learning outcome.


- 1. Make sure that the distractors are plausible.** If they are not plausible answers, they are not functional. Statements based on common student errors and misconceptions make excellent distractors and provide a learning opportunity in formative activities.

Avoid the ridiculous, funny distractors (as in the example to above), because they are really not adding any value to your question.

- 2. Keep the distractors homogenous and mutually exclusive.** This means that all the distractors should be related to each other. If not, the question becomes unnecessarily confusing, as you can see here. If you create a set of alternatives which are based on the same content, you are better able to use the results of the test to identify knowledge or skills gaps related to the specific learning objective. Also ensure that the


The fluid imbalance known as oedema is commonly associated with which of the following conditions?

- Allergic reactions
- Measles
- Hair loss
- Boredom in class!



Which of the following best describes oedema?

- It is characterized by an excess of watery fluid collecting in the cavities or tissues of the body.
- It produces swelling of the ankles.
- It can lead to serious problems with bowel function.
- It only occurs at high altitude.



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alternatives are independent and mutually exclusive – as you can also see here (both of the first two options are correct). If the distractors have overlapping content, the students will get unfairly confused.

3. **Avoid the options of ‘all of the above’ and ‘none of the above’.** These give students an opportunity to get the question correct even if they don’t fully understand the material, by just identifying one alternative as correct or incorrect.
4. **Create as many distractors as you need, and no more.** You don’t need to always produce four possible answers. Plausible distractors will be rejected by students who understand the material, regardless of how many there are, so use as many alternatives as suitable for the question.
5. **Avoid complex combinations of alternatives.** This means offering options such as
 - a. *a and b*
 - b. *a, b and d*
 - c. *all except c*If your question requires these types of combinations, try rewriting the question instead.
6. **Align each alternative grammatically to the stem.** If you are using an incomplete stem (although better not to), align each alternative grammatically to the stem, so that when the student reads the stem and alternative together, they make sense as a sentence.
7. **Vary the position of the correct answer.** It may seem obvious, but it’s an easy trap to fall into – the unthinking tendency is to always put the correct answer as the second or third option.

If using graphics ...

The old adage that a picture is worth a thousand words applies to test questions as well. Multiple choice questions with alternatives based on or including images/diagrams can be very effective for evaluating student understanding. In the same way, use of charts or diagrams in the stem can clarify or enrich the question.

However, **MAKE SURE** that any graphics have reproduced cleanly, are big enough for the detail to be easily seen, and are at the same level of detail. In the example below, you can see what poor quality the images are. They are also different sizes and backgrounds, which makes identification even harder. If students are selecting from images in the alternatives, the differences between the images must be crystal clear. And, of course, all the guidelines we have discussed above apply to questions with graphics as well.

