

Suggestions For Writing Multiple Choice Test Items

1. When possible, state the stem as a direct question rather than as an incomplete statement.

Undesirable:

Alloys are ordinarily produced by...

Desirable:

How are alloys ordinarily produced?

2. Present a definite, explicit and singular question or problem in the stem.

Undesirable:

Psychology...

Desirable:

The science of mind and behavior is called...

3. Eliminate excessive verbiage or irrelevant information from the stem.

Undesirable:

While ironing her formal, Jane burned her hand accidentally on the hot iron. This was due to a transfer of heat between...

Desirable:

Which of the following ways of heat transfer explains why Jane's hand was burned after she touched a hot iron?

4. Include in the stem any word(s) that might otherwise be repeated in each alternative.

Undesirable:

In national elections in the United States the President is officially:
A. chosen by the people.
B. chosen by members of Congress.
C. chosen by the House of Representatives.
D. chosen by the Electoral College. ✓

Desirable:

In national elections in the United States the President is officially chosen by
A. the people.
B. members of Congress.
C. the House of Reps.
D. the Electoral college. ✓

Remember...

- Use at least four alternatives for each item to lower the probability of getting the item correct by guessing.
- Use capital letters (A, B, C, D) as response signs rather than lower case letters ("a" gets confused with "d" and "c" with "a" if the type or duplication is poor).
- Randomly distribute the correct response among the alternative positions throughout the test, having approximately the same proportion of alternatives A, B, C, and D as the correct response.
- Avoid irrelevant clues such as grammatical structure, well known verbal associations or simplistic connections between stem and answer.
- When possible, present alternatives in some logical order (e.g., chronological, most to least, alphabetical).
- Use the alternatives **none of the above** and **all of the above** sparingly. When used, such alternatives should occasionally be used as the correct response.

Remember...

- In testing for definitions, use the term in the stem rather than as an option.
- List alternatives on separate lines (rather than including the options as part of the stem) so that all options can be clearly distinguished.
- Keep all alternatives in a similar format (i.e., all phrases, all sentences, etc.).
- Try to make alternatives for an item approximately the same length. (Making the correct response consistently longer is a common error.)
- Use misconceptions students have indicated in class or errors commonly made by students in the class as the basis for incorrect alternatives.
- Way to judge a good stem: students who know the content should be able to answer before reading the alternatives.

Multiple choice exams provide easier conditions for cheating than essay tests since single letters or numbers are easier to see than extensive text. Cheating can be minimized by using alternative test forms and controlling seating.

5. Use negatively stated stems sparingly. When used, underline and/or capitalize the negative word.

Undesirable:

Which of the following is not cited as an accomplishment of the Kennedy administration?

Desirable:

Which of the following is NOT cited as an accomplishment of the Kennedy administration?

6. Make all alternatives plausible and attractive to the less knowledgeable or skillful student.

Undesirable:

What process is most nearly the opposite of photosynthesis?
A. Digestion
B. Assimilation
C. Respiration ✓
D. Catabolism

Desirable:

What process is most nearly the opposite of photosynthesis?
A. Digestion
B. Relaxation
C. Respiration ✓
D. Exertion

7. Make the alternatives mutually exclusive.

Undesirable:

The daily minimum required amount of milk that a 10 year old child should drink is
A. 1-2 glasses.
B. 2-3 glasses. ✓
C. 3-4 glasses. ✓
D. at least 4 glasses.

Desirable:

What is the daily minimum required amount of milk a 10 year old child should drink?
A. 1 glass.
B. 2 glasses.
C. 3 glasses. ✓
D. 4 glasses.

8. Make alternatives approximately equal in length.

Undesirable:

The most general cause of low individual incomes in the United States is:
A. lack of valuable productive services to sell. ✓
B. unwillingness to work.
C. automation.
D. inflation.

Desirable:

What is the most general cause of low individual incomes in the United States?
A. A lack of valuable productive services to sell. ✓
B. The population's overall unwillingness to work.
C. The nation's increased reliance on automation.
D. An increasing national level of inflation.

Suggestions For Writing True-False Test Items

Remember...

- Keep language as simple and clear as possible.
- Use a relatively large number of items (75 or more when the entire test is T/F).
- Be aware that extremely long or complicated statements will test reading skill rather than content knowledge.
- Require students to circle or underline a typed "T" or "F" rather than to fill in a "T" or "F" next to the statement, thus avoiding having to interpret confusing handwriting.
- If a proposition expresses a relationship, such as cause and effect or premise and conclusion, present the correct part of the statement first and vary the truth or falsity of the second part.
- Make true and false items of approximately equal average length throughout the test.
- Randomize the sequence of true and false statements.
- Make use of popular misconceptions/beliefs as false statements.
- Write items so that the incorrect response is more plausible or attractive to those without the specialized knowledge being tested.

1. Base true-false items upon statements that are absolutely true or false, without qualifications or exceptions.

Undesirable:

Nearsightedness is hereditary in origin.

Desirable:

Geneticists and eye specialists believe that the predisposition to nearsightedness is hereditary.

2. Express the item statement as simply and as clearly as possible.

Undesirable:

When you see a highway with a marker that reads, "Interstate 80" you know that the construction and upkeep of that road is maintained by the state and federal government.

Desirable:

The construction and maintenance of interstate highways are provided by both state and federal governments.

3. Express a single idea in each test item.

Undesirable:

Water will boil at a higher temperature if the atmospheric pressure on its surface is increased and more heat is applied to the container.

Desirable:

Water will boil at a higher temperature if the atmospheric pressure on its surface is increased.

4. Include enough background information and qualifications so that the ability to respond correctly to the item does not depend on some special, uncommon knowledge.

Undesirable:

The second principle of education is that the individual gathers knowledge.

Desirable:

According to John Dewey, the second principle of education is that the individual gathers knowledge.

5. Avoid the use of extreme modifiers or qualifiers.

Undesirable:

—All sessions of Congress are called by the President. (F)
—The Supreme Court **frequently** rules on the constitutionality of law. (T)
—An objective test is **generally** easier to score than an essay test. (T)

Desirable:

—The sum of the angles of a triangle is **always** 180°. (T)
—The galvanometer is the instrument **usually** used for the metering of electrical energy used in a home. (F)

6. Avoid lifting statements from the text, lecture or other materials so that memory alone will not permit a correct answer.

Undesirable:

For every action there is an opposite and equal reaction.

Desirable:

If you were to stand in a canoe and throw a life jacket forward to another canoe, chances are your canoe would jerk backward.

7. Avoid using negatively stated item statements.

Undesirable:

The Supreme Court is not composed of nine justices.

Desirable:

The Supreme is composed of nine justices.

8. Avoid the use of unfamiliar vocabulary.

Undesirable:

According to some politicians, the *raison d'être* for capital punishment is retribution.

Desirable:

According to some politicians, justification for capital punishment is retribution.

Extreme Modifiers:

all	none
always	never
only	nobody
invariably	no one
best	absolutely
worst	absolutely not
everybody	certainly
everyone	certainly not

Qualifiers:

usually	frequently
often	sometimes
some	seldom
many	much
probably	a majority
apt to	most
might	a few
may	unlikely

Remember...

- Determine that the questions are appropriately answered by "True" or "False" rather than by some other type of response, such as "Yes" or "No."
- Arrange the statements so that there is no discernible pattern of answers (such as T, F, T, F, T, F and T, T, F, F, T, T, F, F) for True and False statements.
- Avoid the tendency to add details in true statements to make them more precise. The answers should not be obvious to students who do not know the material.
- Be sure to include directions that tell students how and where to mark their responses.

Writing Hint...

One method for developing true-false items is to write a set of true statements that cover the content, then convert approximately half of them to false statements. **Remember:** When changing items to false (as well as in writing the true statements initially), state the items positively, avoiding negatives or double negatives.

Suggestions For Writing Matching Test Items

Remember...

- Review your teaching objectives to make sure that a matching component is appropriate.
- Keep matching items brief, limiting the list of stimuli to 10 - 15.
- When possible, reduce the amount of reading time by including only short phrases or single words in the response list.
- Use the more involved expressions in the stem and keep the responses short and simple.
- Arrange the list of responses in some systematic order if possible (chronological, alphabetical).
- Make sure that there are never multiple correct responses for one stem (although a response may be used as the correct answer for more than one stem).
- Avoid breaking a set of items (stems and responses) over two pages. (Students go nuts flipping pages.)

1. Include directions which clearly state the basis for matching the stimuli with the responses.

Explain whether or not a response can be used more than once and indicate where to write the answer.

Undesirable:

Directions: Match the following.

Desirable:

Directions: On the line to the left of each identifying location and characteristics in Column I, write the letter of the country in Column II that is best defined. Each country in Column II may be used more than once.

2. Use only items that share the same foundation of information.

Unrelated topics included in the same matching item may allow for obvious matches and mismatches.

Undesirable:

Directions: Match the following.

- | | |
|---|---------------------|
| 1. Water | A. NaCl |
| 2. Discovered Radium | B. Fermi |
| 3. Salt | C. NH ₃ |
| 4. Ammonia | D. 1942 |
| 5. Year of the first
Nuclear Fission | E. H ₂ O |
| | F. Curie |
| | G. 1957 |

Desirable:

Directions: On the line to the left of each compound in Column I, write the letter of the compound's formula presented in Column II. Use each formula only once.

- | Column I | Column II |
|----------------------|-----------------------------------|
| ___ 1. Water | A. H ₂ SO ₄ |
| ___ 2. Salt | B. HCl |
| ___ 3. Ammonia | C. NaCl |
| ___ 4. Sulfuric Acid | D. H ₂ O |
| | E. H ₂ HCl |

3. Avoid grammatical or other clues to the correct response.

Undesirable:

Directions: Match the following in order to complete the sentences on the left.

- | | |
|--|--------------------------------------|
| ___ 1. Plato insisted that government was | A. The Prince. |
| ___ 2. Machiavelli wrote about achieving political unity in | B. desirable and inevitable |
| ___ 3. Hobbes argued that human nature made absolute monarchy | C. a science requiring experts. |
| ___ 4. Marx was a German philosopher and economist who founded | D. organized along industrial lines. |
| | E. Communism. |

Desirable:

Directions: On the line to the left of each statement write the letter of the philosopher from the right hand column that the statement describes. Use each philosopher once.

- | | |
|---|----------------|
| ___ 1. Thought government was a science requiring experts. | A. Hobbes |
| ___ 2. Described methods of achieving political unity. | B. Marx |
| ___ 3. Founded Communism. | C. Machiavelli |
| ___ 4. Believed that human nature made absolute monarchy desirable and inevitable | D. Durkheim |
| | E. Plato |

4. The column of stimuli on the left should set the question clearly.

Undesirable:

Directions: Match the following.

- | | |
|-------------------------|------------------------|
| ___ 1. City dwellers | A. Wild animals |
| ___ 2. Hunter-gatherers | B. Farm |
| ___ 3. Pastoral nomads | C. Apartment buildings |
| | D. Graze animals |

Desirable:

Directions: On the line to the left of each definition, write the letter of the term in the right hand column that is defined. Use each term only once.

- | | |
|--|---------------------|
| ___ 1. Live in areas of high population density. | A. Pastoral nomads |
| ___ 2. Move from one place to another in search of wild animals. | B. Ranchers |
| ___ 3. Move from one place to another with grazing animals. | C. Hunter-gatherers |
| ___ 4. Till land for cash crops. | D. City dwellers |
| | E. Farmers |

Suggestions For Writing Completion Test Items

Remember...

- When possible, provide explicit directions as to what amount of variation will be accepted in the answers.
- Give much more credit for completions than for true-false or matching items.
- Avoid using a long quote with multiple blanks to complete.
- When working with definitions, supply the term, not the definition, for a better judge of student knowledge.
- For numbers, indicate the degree of precision/units expected.
- Facilitate scoring by having the students write their responses on lines arranged in a column to the left of the items.

Suggestion...

It is difficult to write completion items so that there is only one correct answer. When preparing a scores key, list the correct answer and any other acceptable alternatives. Be consistent in using the key; it would not be fair to accept an answer as right on one paper and not accept it on others.

1. Omit only significant words from the statement.

Undesirable:

Every atom has a central _____ called a nucleus.

Desirable:

Every atom has a central core called a(n) _____.

2. Do not omit so many words from the statement that the intended meaning is lost.

Undesirable:

The _____ were to Egypt as the _____ were to Persia and as _____ were to the early tribes of Israel.

Desirable:

The Pharaohs were to Egypt as the _____ were to Persia and as _____ were to the early tribes of Israel.

3. Avoid obvious clues to the correct response.

Undesirable:

Most of the United States' libraries are organized according to the _____ decimal system.

Desirable:

Which organizational system is used by most of the United States' libraries? _____.

4. Be sure there is only one correct response.

Undesirable:

Trees which shed their leaves annually are _____.

Desirable:

Trees which shed their leaves annually are called _____.

5. Avoid grammatical clues to the correct response.

If the indefinite article is required before a blank, use **a(n)** so that the student does not know if the correct answer begins with a vowel or a consonant.

Undesirable:

A subatomic particle with a negative electric charge is called an _____.

Desirable:

A subatomic particle with a negative electric charge is called a(n) _____.

6. If possible, put the blank at the end of a statement rather than at the beginning.

Asking for a response before the student understands the intent of the statement can be confusing and may require more reading time.

Undesirable:

_____ is the measure of central tendency that is most affected by extremely high or low scores.

Desirable:

The measure of central tendency that is most affected by extremely high or low scores is the _____.

Ask yourself:

Why are these completion items crummy?

- The _____ of _____ took place in the year _____.
- _____ was a crucial event to German history.

Beware of Clever Students

Nudity, infancy, and bliss are some of the answers for the following completion item:

- George Washington was born in the state of _____.

Attention Students: Completion Test Taking Tips

- Read the question with the intent to give an answer and make the sentence grammatically correct. In this process it is important to focus on how the sentence is written. For example, if the blank is preceded by the article "an," you know the word that goes in the blank must start with a vowel.
- Concentrate on the number of blanks in the sentence and the length of the space. The test maker is giving you clues to the answer by adding spaces and making them longer.
- Provide a descriptive answer when you cannot think of the exact word or words. The instructor will often give you credit or partial credit when you demonstrate that you have studied the material and can give a credible answer, even when you have not given the exact words.

Suggestions For Writing Essay Test Items

Standard Phrases for Writing Essay Test Items

Agreement or Disagreement: The student is being asked to assert and support a thesis with evidence.

Analyze: Analyzing is a picking apart of the whole.

Classification and Division: Grouping items into a category according to a consistent principle.

Compare/Contrast: Comparing shows similarities, while contrasting points out differences.

Cause and Effect: Establishes a link between two things and also to describe the outcome.

Define: Consists of three parts: term, class, and differentiating characteristics.

Define and give an example of: Asks students to not only define the term, but to supply an example.

Describe: Requires students to explain something in detail.

Discuss: Too vague and may elicit vague, overgeneralized, unsupported responses.

Illustrate: Give examples and/or analogies to demonstrate a particular process/idea or steps in a series.

Summarize: The overall view of some process, speech, play, concept, etc.

1. Formulate the question so that the task is clearly defined for the student.

Use words that *aim* the student to the approach you want them to take. Words like discuss and explain can be ambiguous. If you use *discuss*, then give specific instructions as to what points should be discussed.

Undesirable:

Discuss Karl Marx's philosophy.

Desirable:

Compare Marx and Nietzsche in their analysis of the underlying problems of their day in 19th century European society.

2. Pay attention to the number of items.

In order to obtain a broader sampling of course content, use a relatively large number of questions requiring shorter answers (one-half page) rather than just a few questions involving long answers (2-3 pages).

3. Avoid the use of optional questions on an essay test.

When students answer different questions, they are actually taking different tests. If there are five essay questions and students are told to answer any three of them, then there are ten different tests possible. It makes it difficult to discriminate between the student who could respond correctly to all five, and the student who could answer only three.

Use of optional questions also affects the reliability of the scoring. If we are going to compare students for scoring purposes, then all students should perform the same tasks. Another problem is that students may not study all the course material if they know they will have a choice among the questions.

(Continued on next page...)

5. Write essay items at different levels of learning.

The goal is to write essay items that measure higher cognitive processes. The item should represent a situation that tests the student's ability to use knowledge in order to analyze, justify, explain, contrast, evaluate, and so on.

Try to use verbs that elicit the kind of thinking you want the students to demonstrate. Instructors often have to use their best judgment about what cognitive skill each question is measuring. Ask a colleague to read the questions and classify them according to Bloom's taxonomy.

5. Choose a scoring model.

The major task in scoring essay tests is to maintain consistency, to make sure that answers of equal quality are given the same number of points. There are two approaches to scoring essay items: (1) analytic or point method and (2) holistic or rating method.

1. **Analytic:** Before scoring, prepare an ideal answer in which the major components are defined and assigned point values. Read and compare the student's answer with the model answer. If all the necessary elements are present, the student receives the maximum number of points. Partial credit is given based on the elements included in the answer. In order to arrive at the overall exam score, the instructor adds the points earned on the separate questions.
2. **Holistic:** This method involves considering the student's answer as a whole and judging the total quality of the answer relative to other student responses or the total quality of the answer based on certain criteria that you develop.

5. Prepare students to take essay exams.

Essay tests are valid measures of student achievement only if students know how to take them. Many college freshmen do not know how to take an essay exam, because they have not been required to learn this skill in high school.

Take some class time to tell students how to prepare for and how to take an essay exam. Use old exam questions and let students see what an "A" answer looks like and how it differs from a "C" answer.

Remember...

- Make essay questions comprehensive rather than focused on small units of content.
 - Provide clear directions as to the expectations.
 - Allow students an appropriate amount of time. (It is helpful to give students some guidelines on how much time to use on each question, as well as the desired length and format of the response, such as full sentences, phrases only, outline, etc.)
 - Inform students, in advance of answering the questions, of the proportional value of each item in comparison to the total grade.
 - Require students to demonstrate command of background information by asking them to provide supporting evidence for claims and assertions.
 - Students should be informed about how you treat such things as misspelled words, neatness, handwriting, grammar, etc.
 - Decide how to treat irrelevant or inaccurate information contained in students' answers.
 - Write comments on the students' answers. Teacher comments make essay tests a good learning experience for students. Comments serve to refresh your memory should the student question the grade.
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