

## **Multiple-Choice Item Design**



- 1. The purpose of the stam is to remove the**
  - a. octal**
  - b. stam bar**
  - c. denton**
  - d. rotator**

**2. Which of the following pairs has won the greatest number of Abby awards?**

- a. Williams and Jones**
- b. Jones and Richards**
- c. Cooper and Smith**
- d. Smith and Jones**

**3. How many pounds of pressure is exerted by a callum?**

- a. 2.5**
- b. 250**
- c. 1800**
- d. 2500**

**4. The Stanton is aided by a**

- a. amsel**
- b. immon**
- c. octal**
- d. port**

**5. The stanton frequently overheats because**

- a. all amstels are belious**
- b. ports are always actial**
- c. the octal is usually causable**
- d. no immon is directly fectitious**

- 6. Stamation normally occurs when the**
- a. amstels rupture**
  - b. ports pass easily over the carm**
  - c. octal rotates easily**
  - d. immom falls and the denton is in place**

## **Multiple-Choice Items**

**Three components**

- 1. Item stem**
  - The part of the item that explains the basis for answering question or problem**

**The stem is followed by two or more alternatives**

- 2. Item key**
  - Correct answer**
- 3. Item distractors**
  - Incorrect choices**

## Types of Multiple-Choice Items

### The Correct Answer Variety

- One alternative is unambiguously correct, while the others are unambiguously incorrect.
  - Most straightforward and easiest to write of all types of multiple-choice items.
- $6 + 3 =$
- a. 2  
b. 3  
**c. 9** ←  
d. 18

## Types of Multiple-Choice Items

### The Best Answer Variety

- Alternatives consist of several responses which are correct to varying degrees... examinees select the best alternative.
- According to PCMag, the best cell phone on the market is the
- a. Samsung Galaxy S21  
b. iPhone 13 Pro ←  
c. Goggle Pixel 5a  
d. OnePlus 9 Pro  
e. Huawei Mate 40 Pro

## Types of Multiple-Choice Items

### The Best Answer Variety

- Alternatives consist of several responses which are correct to varying degrees... examinees select the best alternative.

According to PCMag, the best cell phone overall on the market in 2021 is the

- a. Samsung Galaxy S21
- b. iPhone 13 Pro
- c. Goggle Pixel 5a
- d. OnePlus 9 Pro
- e. Huawei Mate 40 Pro



## Types of Multiple-Choice Items

### The Multiple-Response Variety

- Alternatives contain at least one answer which is unambiguously correct...select all that are correct.
- essentially a series of true-false questions.

Which of the following are valid ways of assessing how well individual students have grasped the course material?

- a. Homework assignments
- b. Asking students what grade they think they deserve
- c. Group projects
- d. Essay exams



## Types of Multiple-Choice Items

### The Negative Variety

- select the one alternative that is incorrect.
- occasionally useful when several good answers exist.

Which of the following is **not** a common side effect from Covid 19 vaccine?

- a. irregular heart beat
- b. Fever
- c. fatigue
- d. headache
- d. joint pain

## Types of Multiple-Choice Items

### The Combined-Response Variety

- pick the alternative which indicates the correct relationship among the statements
  - Identify correct ordering
  - Identify which are true
- Difficult to write, but well-suited for measuring complex tasks

For a test to be valid, it must

- I. be internally consistent.
- II. accurately measure the construct.
- III. include items of various difficulty levels.

- a. I only
- b. II only
- c. I and II
- d. II and III
- e. I, II, and III

## **General Rules for Writing Test Questions**

- Express the item as clearly as possible
  - Ambiguous, imprecise, or otherwise not understood items will not discriminate well.
  - Let the difficulty arise from the content, not the wording.
- Choose words with precise meanings
  - Adjectives such as often, frequently, high/low, substantial, good, etc. should be avoided or clearly specified with criteria.
- Avoid complex or awkward word arrangements
  - Use standard rules of written English.
- Include all necessary qualifications
  - Students can't read minds.
  - Write items so that people with different perspectives can still agree on the right answer.

## **General Rules for Writing Test Questions**

- Avoid superfluous information
  - Students are under time constraints
  - Superfluous information detracts from the primary focus of item
  - Can cause the student to be tricked or mislead
    - Generally hurts validity
    - Can cause considerable test anxiety
- Make difficulty of items appropriate for group
  - Avoid using too many items that
    - all students will know
    - only the ideal students will know
  - Test should mostly include items that measure what a typical student knows
    - Test the rules, rather than the exceptions

### **General Rules for Writing Test Questions**

- **Avoid irrelevant clues to the correct response**
  - **Pattern among keyed response**
  - **Select keyed location first**
  - **Randomly assign distractors to their locations**

### **General Rules for Writing Test Questions**

- **Avoid irrelevant clues to the correct response**
  - **Grammatical construction**
    - Stem calls for plural and some alternatives are singular
    - Alternatives lead to fragments or incoherent sentences
    - Alternatives are the wrong part of speech
  - **Lack of parallel structure**
    - Alternatives should be uniform with respect to specificity and length

### **Rules for Writing Multiple-Choice Items**

- **Provide a single response that experts agree is best.**
  - Make keyed response unambiguously correct.
- **Distractors must be plausible and attractive to those who lack knowledge.**
  - Simulate the likely errors and misunderstandings
  - Use as many distractors as are plausible.
    - Don't include silly or absurd distractors
    - 4- and 5-alternative items are ideal

### **Summary: Writing Multiple-Choice Items**

- Students particularly dislike MC testing and will try to use any strategy to help them succeed.
- The goal of the item writer is to be aware of the strategies and design items that cannot be answered using such strategies alone.
- Any aspect of the item or test that allows examinees to eliminate certain choices should be changed.
- Any aspect of the item or test that causes examinees to orient towards the key, without the proper knowledge, should be changed.

## Resources

- Burton, S. J., Sudweeks, R. R., Merrill, P. F., & Wood, B. (1991). *How to prepare better multiple-choice test items: Guidelines for university faculty*. Department of Instructional Science, Brigham Young University. Retrieved from <https://testing.byu.edu/handbooks/betteritems.pdf>
- Carneson, J., Delpierre, G., & Masters, K. (2016). *Designing and managing multiple choice questions* (2<sup>nd</sup> ed.). Retrieved from [https://www.researchgate.net/publication/309263856\\_Designing\\_and\\_Managing\\_Multiple\\_Choice\\_Questions\\_2nd\\_Ed](https://www.researchgate.net/publication/309263856_Designing_and_Managing_Multiple_Choice_Questions_2nd_Ed)
- Centre for Teaching and Learning, Western University (n.d.). *Multiple choice questions*. <https://teaching.uwo.ca/teaching/assessing/multiple-choice.html>
- Parkes, J., & Zimmaro, D. (2016). *Learning and assessing with multiple-choice questions in college classrooms*. Routledge.
- Western Technology Services, Western University (n.d.). *OWL help: Tests and quizzes*. <https://owlhelp.uwo.ca/instructors/tools/testsquizzes/index.htm/>

## Multiple-Choice Item Design

