Writing Great Test Questions

DYOUVILLE

INSTITUTE FOR TEACHING INNOVATION

Today's agenda

1. Introduction - Dr. Leah Sciabarrasi
2. Considerations for Articulating and Assessing StudentsUsing Written-Response Question - Sam D'Amato
3. Best Practices for Online Exams - Jamie Tabone and Humberto Hernandez

What is Assessment?

ASSESSMENT HELPS FACULTY

Assessment helps teachers gain insight into what students understand in order to plan and guide instruction, and provide helpful feedback to students.

ASSESSMENT HELPS STUDENTS

When students are able to see how they are doing in a class, they are able to determine whether or not they understand course material.

Why are we assessing?

D'YOUVILLE EDUCATIONAL GOALS FRAMEWORK

What are you assessing for?

1. GOALS

Goals are statements about general aims; e.g., “clear communication”, “problem-solving skills”, etc.

2. OBJECTIVES

Objectives describe the desired learning outcomes of instruction. Objectives are intended results or consequences of instruction, curricula, programs, or activities.

3. OUTCOMES

Learning Outcomes identify what the learner will know and be able to do by the end of a course or program. Outcomes are achieved results or consequences of what was learned; i.e., evidence that learning took place.

When do you assess?

Summative Assessment

Usually given at the end of instruction to assess mastery of learning objectives.

Types:
Exams
Presentations
Creation of a product
Portfolio
Group project

Formative Assessment

Given frequently throughout the course to evaluate progress.

*Feedback must be given to be effective.

Types:
Learning logs/HW/activities
Discussions
Reflection
Group presentation
Practice quizzes

Types of Assessment

AUTHENTIC ASSESSMENT

Use creative learning experiences to test students' skills and knowledge in realistic situations.

TESTING

Standard and faculty-developed tests (exams, quizzes).

WHY DO YOU THINK....

Students report a higher level of test anxiety over teacher-made tests (64%) than over standardized tests (30%) (NCATE, 2001)?

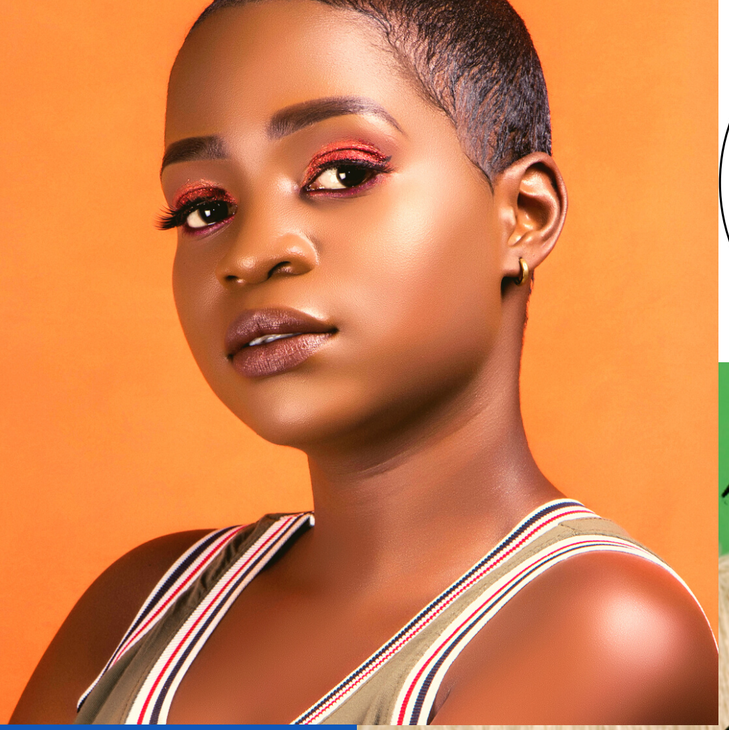
Question Composition

Susie Science has discovered a mutant form of insulin that lacks a signal peptide. What will be the final cellular destination of the mutant insulin?

Stem

Answer	A. Cytosol
Distractor	B. Endoplasmic reticulum
Distractor	C. Extracellular space
Distractor	D. Golgi apparatus
Distractor	E. Peroxisome
Distractor	F. Plasma membrane

Alternatives



Stem Composition

1. The stem should be meaningful by itself and should present a definite problem.

STEM IS NOT MEANINGFUL

Which of the following is a true statement?

A. Mitochondrial genomes are relatively constant in content (i.e., types of genes present).
B. Mitochondrial genomes are relatively constant in organization.
C. Mitochondrial genomes are relatively constant in size.

BETTER STEM

What characteristic is relatively constant in mitochondrial genomes across species?

A. Content (i.e., types of genes)
B. Organization
C. Size

2. The stem should not contain irrelevant material.

IRRELEVANT MATERIAL

Mitochondria evolved from free-living bacteria that could carry our oxidative phosphorylation. For this reason, they have circular genomes that reproduce independently of the nuclear genome. What characteristic is relatively constant in mitochondrial genomes across species?

A. Content (i.e., types of genes)
B. Organization
C. Size

3. The stem should be negatively stated only when significant learning outcomes require it.

NEGATIVE PHRASING

Which of the following is not true about mitochondria?

A. They contain DNA.
B. They make some of their own proteins.
C. They are static.

NEGATIVE PHRASING

All of the following are true about mitochondria except

A. They contain DNA.
B. They make some of their own proteins.
C. They are static.

BETTER USE OF NEGATIVE PHRASING

A water-type extinguisher is suitable for putting out a fire caused by burning all of the following except

A. alcohol
B. cotton
C. paper
D. wood

4. The stem should be a question or a partial sentence.

INTERIOR BLANK

In addition to the nucleus,_____are organelles that contain DNA.

A. Golgi bodies
B. Mitochondria and chloroplasts
C. Ribosomes

BETTER

In addition to the nucleus, which organelles contain DNA?

A. Golgi bodies
B. Mitochondria and chloroplasts
C. Ribosomes

Alternative Composition

1. All alternatives should be plausible.

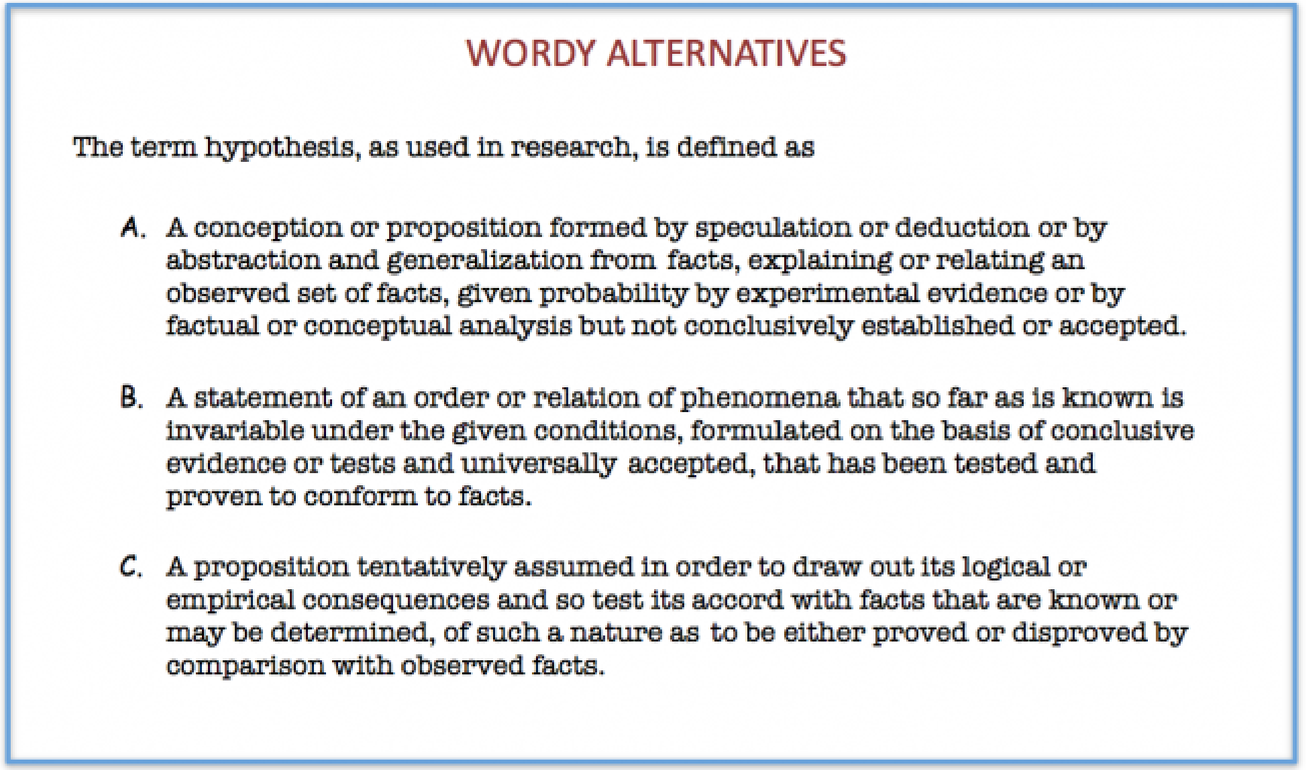
IMPLAUSIBLE ALTERNATIVES

Who gathered the data that helped reveal the structure of DNA?

A. Francis Crick
B. George Washington
C. James Watson
D. Rosalind Franklin
E. Snoopy

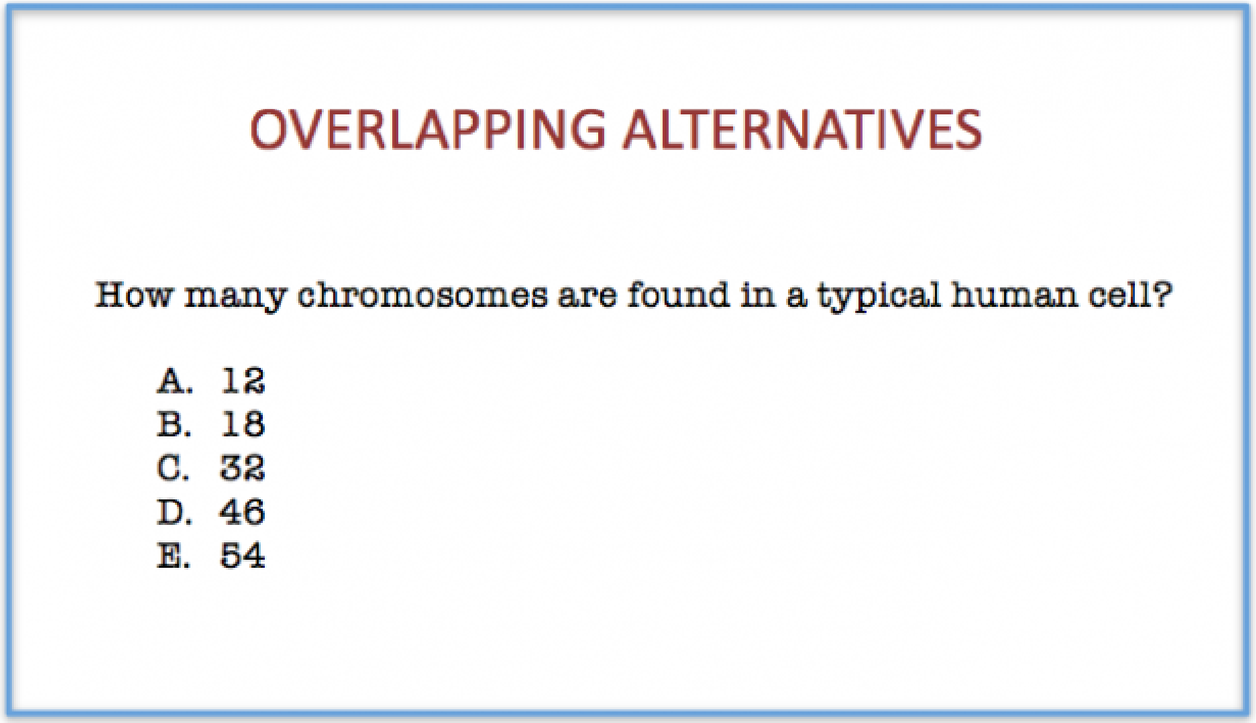
Note: *B and E are not functional distractors and so do not contribute to the item.*

2. Alternatives should be stated clearly and concisely.



Source: Steven J. Burton, Richard R. Sudweeks, Paul F. Merrill, and Bud Wood. How to Prepare Better Multiple Choice Test Items: Guidelines for University Faculty. 1991.

3. Alternatives should be mutually exclusive.



NOTE: The alternatives are overlapping because a cell that contains 18 chromosomes also contains 12; a cell that contains 32 also contains 18 and 12; etc.

4. Alternatives should be homogenous in content.

HETEROGENEOUS CONTENT

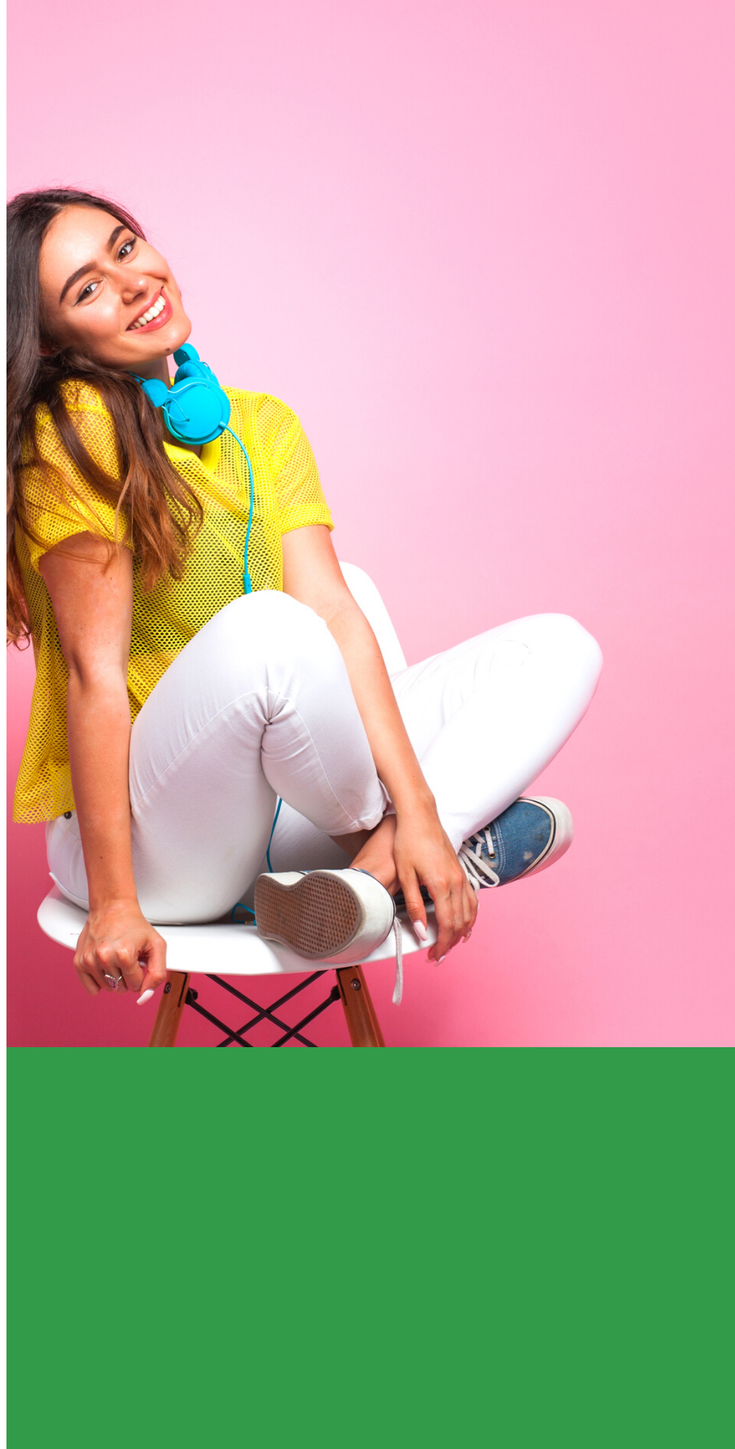
Which of the following is one of the ways that the membranes of winter wheat are able to remain fluid when it is extremely cold?

A. by increasing the percentage of cholesterol molecules in the membrane
B. by decreasing the percentage of unsaturated phospholipids in the membrane
C. by decreasing the percentage of short-chain fatty acids in the phospholipids of the membrane
D. by increasing the percentage of saturated phospholipids in the membrane

NOTE: *Because option A focuses on a different type of molecule (cholesterol) than items B, C, and D, it can cue savvy test-takers to the correct answer.*

Additional Guidelines

1. The alternatives “all of the above” and “none of the above” should not be used.
2. Avoid complex multiple choice items & combinations (e.g., a and b)

Resources

- Vanderbilt - Writing Good MC Questions
- Kansas Curriculum Center - Is this a Trick Question?
- Brigham Young - 14 Rules for MC Questions