



# MARIANO MARCOS STATE UNIVERSITY

## College of Teacher Education

*Center of Excellence in Teacher Education*



# Assessment of Learning 1

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# TEST CONSTRUCTION



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**Why is there a need to study**  
**TEST**  
**CONSTRUCTION?**



13% of students who got low grades in exams are caused by faulty test questions.

**WORLDWATCH**  
**The Philadelphia Trumpet**  
**August 2005**

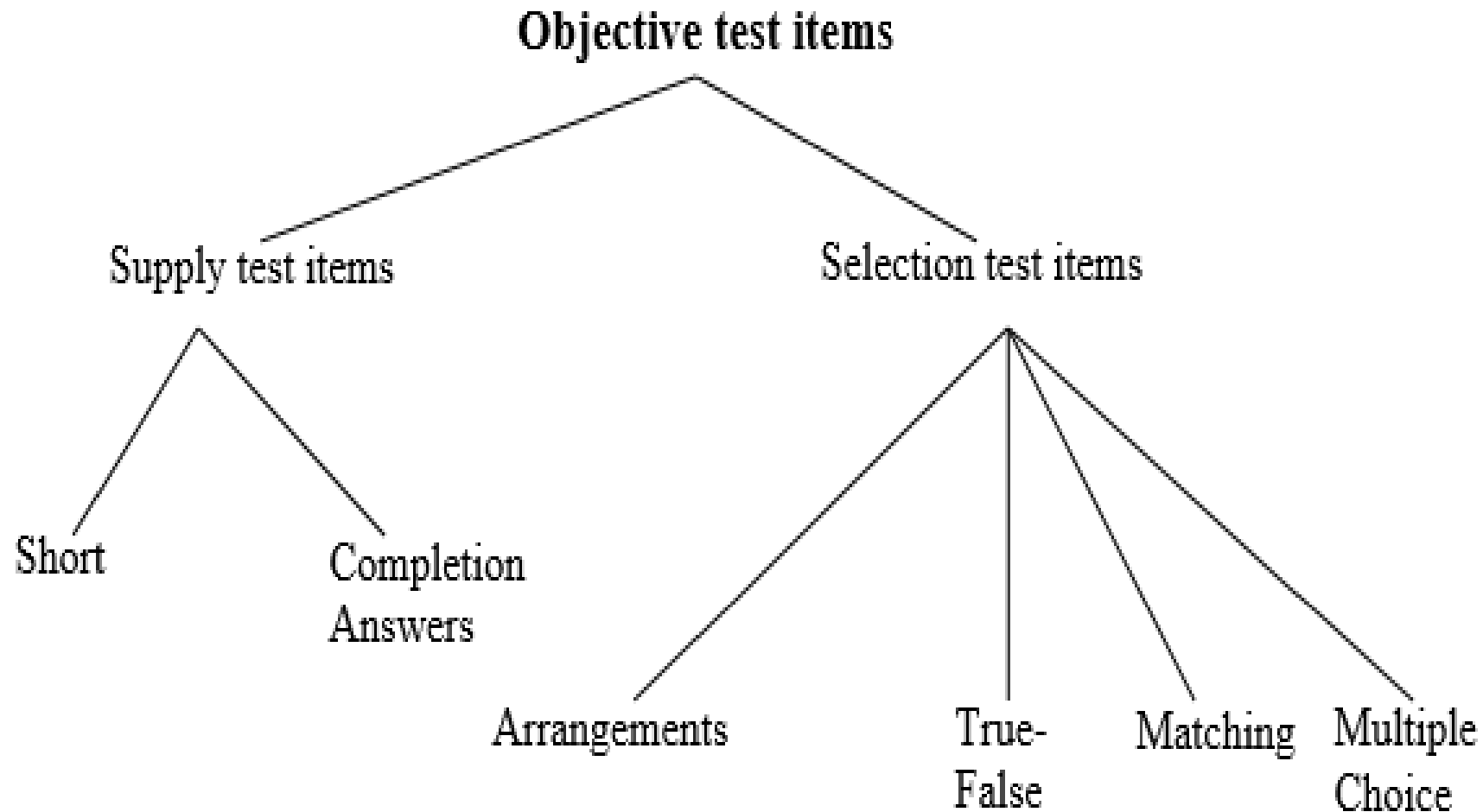


# WHAT IS A TEST?

- ✓ It is a measuring instrument or tool in education.
- ✓ It is an instrument or device that is typically used in the quantification of a trait or characteristics of a person.
- ✓ It is an instrument designed to measure quality, ability, skill or knowledge.



# Types of objective tests



# I. SUPPLY TYPE

## SIMPLE-RECALL TYPE (IDENTIFICATION)

- The response requires the subject to recall previously learned material and the answers are usually short consisting of either a word or a phrase.





# I. SUPPLY TYPE

## SIMPLE-RECALL TYPE (IDENTIFICATION)

EXAMPLES:

1. How many centimeters make up 2 meters? 1. \_\_\_\_\_
2. Convert 7, 000 grams to kilograms. 2. \_\_\_\_\_
3. It is the fundamental unit of element. 3. \_\_\_\_\_



# I. SUPPLY TYPE

## *Suggestions for the Construction of Simple-Recall Type (Identification)*

1. The direct-question form is usually preferable to the statement form.
2. The blanks for the responses should be in a column preferably at the right column of the items.
3. The question / item should be so worded that there is only one correct response.



# COMPLETION TEST (FILL – IN THE BLANK)

I like to shop for shoes. I wish I had more cash to buy a book shelf. Please do not rush through your work. You should not be dirty.



# I. SUPPLY TYPE COMPLETION TEST (FILL – IN THE BLANK)

- This test consists of a series of items that requires the subject to fill a word or phrase on the blanks.



# ***Rules for writing completion test***

1. State the item clearly and precisely so that only one correct answer is acceptable.

## EXAMPLE

**Poor:** The type of test that requires students to select correct answer is \_\_\_\_\_.

**Better:** The type of test that consists of a stem and three to five alternatives is \_\_\_\_\_.



# *Rules for writing completion test*

2. Put the blank toward the end of the sentence.

Example:



\_\_\_\_\_ are the incorrect alternatives in a multiple-choice item.

**Better:** The wrong alternatives in a multiple-choice item are called \_\_\_\_\_.



# ***Rules for writing completion test***

3. Avoid several blanks, one blank is most recommended.
4. Blanks should be equal in length.

**Poor:** The \_\_\_\_\_ subatomic particle is the \_\_\_\_\_.

**Better:** The positively charged subatomic particle is the \_\_\_\_\_.



# ***Rules for writing completion test***

6. Avoid giving grammatical clues to the expected answer.

**Poor:** A collection of questions held in a system of storage is called a \_\_\_\_\_.

**Better:** A collection of questions held in a system of storage is called a/an \_\_\_\_\_.

7. Avoid copying exact words of the textbook.





## II. SELECTION TYPE

### A. ALTERNATIVE RESPONSE TEST / TRUE – FALSE TEST



# II. SELECTION TYPE

## A. True – False Test

True – False items require students to identify statements which are correct or incorrect. Only two possible responses are possible in this item format – true or false, right or wrong, yes or no.



# Rules in the Construction of True – False Test

1. Do not give a hint (inadvertently) in the body of the question.
- Example: The Philippines gained its independence in 1898 and therefore celebrated its centennial year in 2000.



# Rules in the Construction of True – False Test

2. Avoid specific determiners or give-away qualifiers “*always, never, often, seldom*” and other adverbs that tend to be either, always true or always false.
- Example: Christmas always falls on a Sunday because it is a Sabbath day.



# Rules in the Construction of True – False Test

3. Avoid long sentences as these tend to be “true”. Keep sentences short.
- Example: Tests need to be valid, reliable and useful, although, it would require a great amount of time and effort to ensure that tests possess these test characteristics.



# Rules in the Construction of True – False Test

4. Double negatives should be avoided.

**Example:** True-false items cannot be scored by an untrained person.

5. Avoid quoting verbatim from sentence materials or textbooks.



# Rules in the Construction of True – False Test

6. Avoid tricky statements with some minor misleading word or spelling anomaly, misplaced phrases etc. A wise student who does not know the subject matter may detect this strategy and thus get the answer correctly.
- Example: The Principle of our school is Mr. Albert P. Panadero.



# Rules in the Construction of True – False Test

7. Avoid a grossly disproportionate number of either true or false statements or even patterns in the occurrence of true and false statements.





# LET US TRY !

## Which is the better true – false test item?

- ✓ 1 . a) Tuberculosis is a communicable disease.  
b) Tuberculosis is a not non-communicable disease.

Answer: A is better. B is confusing because of the double negative.



# LET US TRY !

## Which is the better true – false test item?

- 2 . a) The true-false item is more subject to guessing but it should be used in place of multiple choice item, if well constructed, when there is a dearth of distracters that are plausible.
- ✓ b) The true-false item should be used in place of the multiple choice item when only two alternatives are possible.

Answer: B is better. The language in B is simple, clear and concise. Avoid long and complex sentences.



# LET US TRY !

## Which is the better true – false test item?

3 . a) A statement of opinion should never be used in a true – false item.



b) A statement of opinion cannot be marked true or false.

Answer: B is better. Avoid using determiners or give-away qualifiers.



# LET US TRY !

## Which is the better true – false test item?



4. a) The true – false item is also called alternative response item.
- b) The true – false item, which is favored by all tests experts, is also called an alternative response.

Answer: A is better. B contains two ideas that are confusing.



## II. SELECTION TYPE

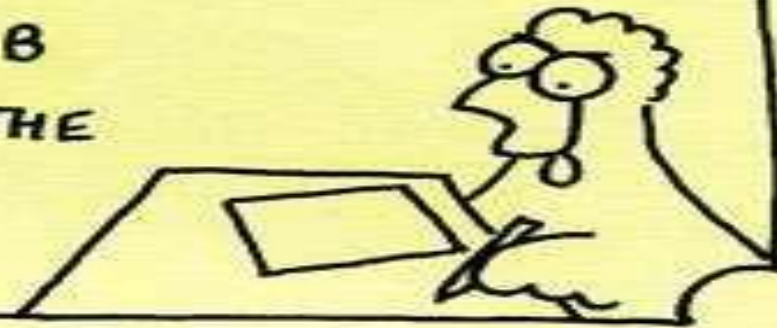
### B. Multiple choice test

*Savage Chickens*

by Doug Savage

ARE MULTIPLE CHOICE  
EXAMS AN ACCURATE MEASURE  
OF ONE'S KNOWLEDGE?

- A. YES
- B. A AND C
- C. A AND B
- D. ALL OF THE ABOVE



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## II. SELECTION TYPE

### B. MULTIPLE CHOICE TEST

**Multiple-choice test.** This test is made up of items that consist of three or more plausible options in each item. It consists of two parts: (1) the stem and the (2) alternatives/options. In the set of options there is a “correct” option while all the others are considered “distracters”.



## II. SELECTION TYPE

### B. Multiple choice test

What is the place value of the underlined digit in number 1952?

- a) ones
- b) tens
- c) hundreds
- d) thousands

**b - correct answer**  
**a,c,d - distracters**



**GUIDELINES  
IN THE CONSTRUCTION OF  
MULTIPLE CHOICE ITEMS  
A. STEM  
B. OPTION**





# A. Stem

1. The stem of the item should present clearly a simple central problem or idea. The problem or idea must be accurately stated.

Steam is

- a. given off when carbon burns.
- b. a by-product of sulfur burning.
- c. produced when magnesium burns.
- d. produced by the burning of natural gas.

**Better:** Steam is given off during the burning of

- a. carbon.
- b. magnesium.
- c. natural gas
- d. sulfur.



# A. Stem

2. All relevant information should be included in the stem. Include all the information necessary for the examinee to understand the intent of the item.
- **Example:** When a piece of stone is dropped into the graduated cylinder, the water level rose. What is the volume of the stone?  
a. 0.6 ml      b. 1.6 ml      c.32 ml      d. 132 ml
  - **Better:** The level of water in a graduated cylinder is 50 ml. When a piece of stone is dropped into the cylinder, the water level rose to the 82 ml mark. What is the volume of the stone?  
a. 0.6 ml      b. 1.6 ml      c.32 ml      d. 132 ml



# A. Stem

3. All irrelevant materials should be omitted from the stem. Avoid the inclusion of nonfunctional words. A word or phrase is nonfunctional when it does not contribute to the basis for choosing a response.

• **Example:** Pitong was walking in the park when he passed by a well. He wanted to know how deep the well was so he picked up a stone and dropped the stone into the well. What kind of force is acting on the falling stone?

- a. electrical      b. friction      c. gravity      d. magnetism

**Better:** A stone was dropped into a deep well. What kind of force is acting on the stone?

- a. electrical      b. friction      c. gravity      d. magnetism



# A. Stem

4. The stem should be stated in positive form. If the negative form is used, emphasize the fact by underlining, using italics or capitalizing it. Avoid using double negatives.
- **Example:** Each of the following substances EXCEPT ONE is a mineral. Which one is not?
  - **Better:** Which of the following substances is a mineral?



# A. Stem

5. Place all information that can be placed in the stem to avoid repetition in the option.
- **Example:** Substances expand when heated because
    - a. molecules move very fast.
    - b. molecules move very slowly.
    - c. molecules move in all directions.
    - d. molecules move farther from each other.
  - **Better:** Substances expand when heated because molecules move
    - a. very fast.
    - b. very slowly.
    - c. in all directions.
    - d. farther from each other.



# A. Stem

## 6. Avoid giving grammatical clues.

### EXAMPLE



A word used to describe a noun is called an

- a) adjective.
- b) conjunction.
- c) pronoun.
- d) verb.



A word used to describe a noun is called

- a) an adjective.
- b) a conjunction.
- c) a pronoun.
- d) a verb.



A word used to describe a noun is called a/ an

- a) adjective.
- b) conjunction.
- c) pronoun.
- d) verb.



## B. The Option for the Item

1. The option should be homogeneous in the sense that each should be a member of the same set of things.

• **Example:** Which one of the following animals is most clearly in danger of extinction?

a. mackerel

c. sampaguita

b. monkey-eating eagle

d. tamaraw

• **Better:**

a. carabao

c. horse

b. cow

d. tamaraw



# B. The Option for the Item

2. The options should be related but must not overlap or be synonymous with one another.
- **Example:** Sliding in the bathroom can be prevented by wearing
    - a. sandals with even soles.
    - b. sandals with rough soles.
    - c. sandals with soapy water.
    - d. sandals with smooth soles.
  - **Better:** Sliding in the bathroom can be prevented by wearing sandals with
    - a. grease.
    - b. rough soles.
    - c. soapy water.
    - d. smooth soles.





# Suggestions in the Construction of a Multiple Choice Test

3. The key (correct option) should be of the same length as the distracters to avoid giving a clue.

- **Example:** One problem met by scientists about cloning animals is that cloned animals.
  - get old fast.
  - remain young.
  - do not reproduce.
  - do not live long as uncloned animals do.

Better:

- die early.
- stay young.
- get old fast.
- do not reproduce.



- **Research:** Numerous studies have indicated that items are easier when the answer is noticeably longer than the distracters as compared when all of the alternatives are similar in length (Haladyna & Downing, 1986 as cited by Burton et. al. 1991)



## B. The Option for the Item

4. Make all the options grammatically consistent and parallel in form with the stem of the item.

Example: How is the movement of bones made possible?

- a) By pushing the skeletal muscle
- b) By pulling the skeletal muscles
- c) Muscles and bones are combined
- d) Muscle pushes the other muscles

- **Options C and D are not parallel in form with the key. They must be revised.**



Better

- a) By pushing the skeletal muscle
- b) By pulling the skeletal muscles
- c) By pulling and pushing the muscles
- d) By combining the muscles and bones



## B. The Option for the Item

5. State options in sequential (natural) order, whether alphabetically or numerically.
- **Example:** Mars' gravity is 0.38 times that of Earth. What will be the weight on planet Mars of an astronaut who weighs 400 N on Earth?
    - a. 3.62 N
    - b. 10.5 N
    - c. 152 N
    - d. 400.38 N



## B. The Option for the Item

Which animal is hatched from eggs?

- a. carabao
- b. goat
- c. rabbit
- d. snake

Options are arranged alphabetically.



## B. The Option for the Item

6. Place a period at the end of every alternative if the stem is an incomplete statement and do not place a blank line toward the end of the sentence.

**Example:** Substances expand when heated because molecules move

- A. very fast.
  - B. very slowly.
  - C. in all directions.
  - D. farther from each other.
7. If alternatives are sentences or phrases, arrange them in order of increasing length.



# Suggestions in the Construction of a Multiple Choice Test

7. Put the term to be defined in the stem and suggest various definitions in the alternatives or options.
- **Example:** The tendency of particles to move from greater concentration to lesser concentration is called
    - A. diffusion.
    - B. evaporation.
    - C. osmosis.
    - D. transpiration.
  - **Better:** Diffusion is
    - A. loss of materials from cells of plants and animals.
    - B. the tendency of particles to be evenly distributed.
    - C. the spreading of particles towards the bottom of a container.
    - D. the movement of particles from lesser to greater concentration.





# What is the difference between the two multiple choice items?

Steam is

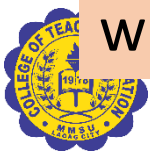
- A. given off when carbon burns.
- B. a by-product of sulfur burning.
- C. produced when magnesium burns.
- D. produced by the burning of natural gas.



Diffusion is

- A. loss of materials from cells of plants and animals.
- B. the tendency of particles to be evenly distributed.
- C. the spreading of particles towards the bottom of a container.
- D. the movement of particles from lesser to greater concentration.

The SECOND STEM is a TERM or a PROCESS that needs to be defined while the first item is a result of a process.



# B. The Option for the Item

8. Avoid using the alternatives ALL OF THE ABOVE and NONE OF THE ABOVE.

## Example:

Which is an example of a mixture?

- a) air
- b) juice
- c) seawater
- d) all of the above

Which is an example of a mixture?

- a) air
- b) gold
- c) salt
- d) water



## B. The Option for the Item



Which of the following is / are mixtures?

I. air

III. seawater

II. juice

IV. steel

a) I only

c) I, II, and IV only

b) I and II only

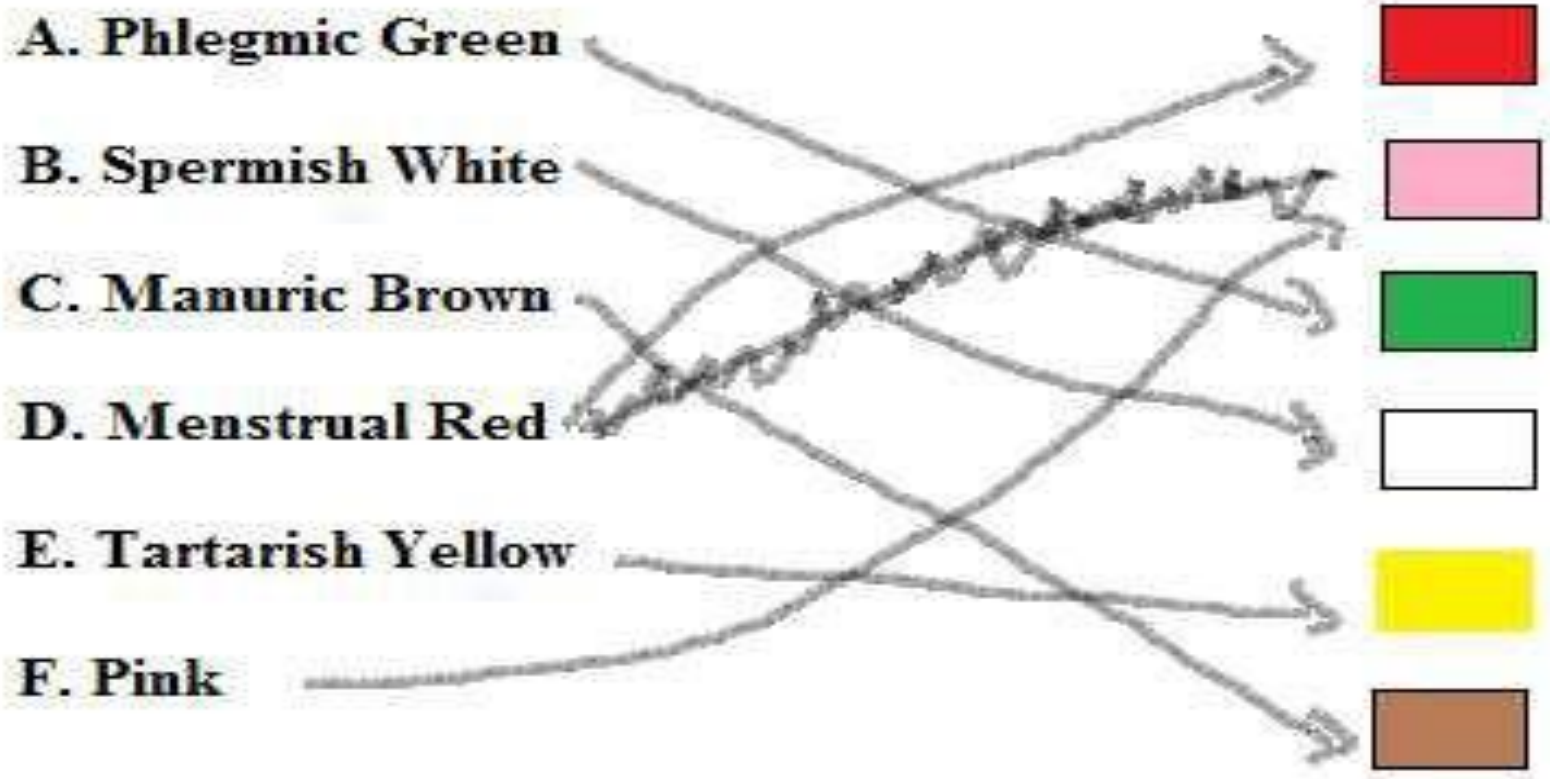
d) I, II, III, and IV



- Most of the time, the item writer has difficulty of thinking any option so that ALL OF THE ABOVE or NONE OF THE ABOVE is used.
- The alternative ( all of the above or none of the above) can be considered a clue for the student
- All of the above – all the other options are correct
- None of the above – all the options are wrong



II. SELECTION TYPE  
C. MATCHING TYPE



# Matching type

**C. Matching type** - consists of two columns in which proper pairing relationship of two things is strictly observed

Column A (Premise)

Accomplishments

Noted events

Definitions

Uses and Functions

Quantities and Qualities

Examples

Plants, Animals, Element

Column B (Response)

Persons

Dates

Terms/Phrases

Parts/Machines

Symbols/Signs

Rules/Principles

Classification/Category



Example:

Match the descriptions of the parts of the digestive system in Column A with the digestive organs being described in Column B. Write the letter of the correct answer on the blank before each number in Column A.

*Column A*

*Column B*

\_\_\_\_ 1. coil-like structure where food is digested and absorbed

a. esophagus

b. large intestine

\_\_\_\_ 2. tube-like structure where food is

c. liver  
d. mouth

swallowed

\_\_\_\_ 3. muscular tube which collects undigested food

e. small intestine

f. stomach

\_\_\_\_ 4. pear-shaped organ where food is churned

\_\_\_\_ 5. an opening where food is digested



# Rules in Writing Matching Type Items

1. Use only homogeneous material in a single matching exercise.
2. Include an unequal number of responses and premises.
3. Keep the list of items to be matched brief, and place the shorter at the right.
4. Arrange the list of responses in logical order.
5. Indicate in the directions the basis for matching the responses and premises.
6. Place all the items for one matching exercise on one page.





# Selection Type

## D. Arrangement

This type consists of a multiple option item where it requires a chronological, logical, rank, etc. order.



**Example:** The group of sentences numbered 1 to 5 below consists of one paragraph. Read the sentences in each number and arrange the best order to have a complete and well-organized paragraph. Choose from the options the best order.

1. Miss Castro, their teacher, gave them a good grade.
2. The study was on the determination of protein content of dried anchovy.
3. One day, the students in the chemistry class conducted an experiment.
4. All of them were happy.
5. They were all successful in their analysis.

a) 32514

c) 35241

e) 25143

b) 31425

d) 23514



# Non – Objective Test Essay



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# Essay

- Essay, is classified as non-objective test, allow for the assessment of higher order thinking skills. Such tests require students to organize their thoughts on a subject matter in coherent sentences in order to inform an audience.
- In essay tests, students are required to write one or more paragraphs on a specified topic.



Essay questions can be used to measure attainment of a variety of objectives. Stecklein (1955) has listed 14 types of abilities that can be measured by essay items:

- Comparisons between two or more things
- The development and defense of an opinion
- Questions of cause and effect
- Explanations of meanings
- Summarizing of information in a designated area
- Analysis
- Knowledge of relationship



- Illustrations of rules, principles, procedures and applications
- Applications of rules, laws and principles to new situations
- Criticisms of the adequacy, relevance or correctness of a concept, idea or information
- Formulation of new questions and problems
- Reorganization of facts
- Discriminations between objects, concepts or events
- Inferential thinking

**Note that all of these involve the higher-level skills mentioned in Bloom's Taxonomy.**



# Types of Essay

## 1. RESTRICTED-RESPONSE ESSAY

- Restricted Response Limit the ways in which you will permit the students to answer. There are correct answers and we allow students to express the answer in their own words.
- Restricted response is predicated on the notion that students supply the answers rather than selecting the answer from a group options



# Restricted – Response Essay

## Examples

1. A car traveling 50 mph leaves Chicago at 9am. A train traveling at 70 mph leaves Milwaukee at 10 am. Who will arrive in Toledo (250 miles away) first? Show your work.
2. Write an essay on the topic “Plant Photosynthesis” using the keywords and phrases: chlorophyll, sunlight, water, carbon dioxide, oxygen, by product, stomata.





# Types of Essay

## 2. EXTENDED-RESPONSE ESSAY

- Extended Response allow students to express their own ideas and interrelationships among ideas and use their own strategy for organization.

### Examples

- Design an experiment to calculate the height of a redwood tree.
- Do you think teachers should be allowed to work abroad as domestic helpers? Explain your answer.



# EXTENDED-RESPONSE ESSAY

- Because the focus is on logical argument and reasoned answering the teacher must be open and accept uncomfortable responses



# Rules in Preparing/Administering Essay Questions

1. State questions that require clear, specific and narrow task or topic to be performed.
  - Some sample terms to use that make the task clear and specific are as follows: compare, describe, explain, summarize, relate differentiate, criticize and appraise.
  - Give explicit instructions on type of answer desired

**Example:** Your answer should be confined to 100-150 words. It will be evaluated in terms of the appropriateness of the facts and examples presented and the skill with which it is written.



# Rules in Preparing/Administering Essay Questions

2. Give enough time limit for answering each essay question.
- 3 . Make it clear to students if spelling, punctuation, content, clarity and style are to be considered in scoring the essay questions. When these criteria are clear and specific to students, the item becomes valid.



# Rules in Preparing/Administering Essay Questions

4. Grade each essay question by the point method, using well-defined criteria.
  - By using certain criteria as guide, scoring essay questions becomes less subjective and more objective.

Examples of criteria to be used in scoring an essay

- Completeness of ideas presented (40%)
- Clarity of expressions used (30%)
- Organization of ideas (30%)



# Rules in Preparing/Administering Essay Questions

6. Evaluate all of the students' responses to one question before going to the next question.

7. Evaluate answers to essay questions without identifying the student.



# POINTS TO PONDER

- A good *lesson* makes a good *question*
- A good *question* makes a good *content*
- A good *content* makes a good *test*
- A good *test* makes a good *grade*
- A good *grade* makes a good *student*
- A good *student* makes a good **COMMUNITY**

*Jesus Ochave Ph.D.*

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