

FIELD PAPERS

Junior Secondary Educational Improvement Project

BOTSWANA

**Instructional Design Course
Unit Three: Aims and Objectives**

Draft June 1987

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USA
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UNIT THREE

I. TITLE

Aims and Objectives

II. AIM

The aim of the unit is to enable you to write instructional aims and objectives taking into consideration content area, student characteristics and entry behaviours.

III. CONTENT OUTLINE

A. Identifying Content Area

Source of content Area, e.g., scheme of work

B. Writing Aims for the lesson

1. Purpose of aims, e.g., gives an overall impression of what the lesson is about.
2. Examples of aims

C. Matching Content Area with Student Characteristics

1. Student characteristics, e.g., ability, experience, interest, motivation and home environment
2. Relating content to student characteristics, e.g., relate content to needs of students, use suitable examples and illustrations

D. Specifying Entry Behaviours

1. Identify pre-requisites or subskills, e.g., knowledge and skills required before beginning instruction
2. Design test for pre-requisites, e.g, oral or written quiz
3. Test for pre-requisites

E. Writing Instructional Objectives for the Lesson

1. Purpose of instructional objectives , e.g., specifies what students should be able to do after completing instruction.
2. Tips for writing objectives, e.g., points to keep in mind
3. Elements in objectives, e.g., major elements in objectives and their meanings.
4. Criteria for selecting elements to include in instructional objectives, e.g., learning situation, purpose of the objectives.
5. Categories of Instructional Objectives, e.g., Bloom; Gagne and Briggs' categories
6. How to use the categories of instructional objectives

IV. OBJECTIVES

- A. Identify sources from which instructional content may be derived**
- B. Generate (write) aims that match a given instructional content area**
- C. Describe student characteristics which should be taken into consideration when planning instructional content**
- D. Specify entry behaviours and its methods of assessment**
- E. State the purpose for writing objectives for instruction**
- F. Describe the elements in instructional objectives**
- G. Identify criteria for selecting elements to include in instructional objectives**
- H. Originate (create) objectives for a given instructional content area**
- I. Describe the categories for writing instructional objectives**

V. Introduction

The major challenge of a teacher is how to teach effectively and efficiently. For an inexperienced teacher, the task of teaching appears to be easy. But, after a few lessons, these teachers will soon discover that teaching all that was planned for the lesson and helping students to understand the content of the lesson requires considerable preparation. The purpose in Units three to eleven is to help you to learn all about the the different things you have to do in order to teach effectively and efficiently. The focus of Unit three is on identifying content area, writing aims, matching content area with student characteristics, specifying entry behaviours and writing instructional objectives.

VI. Presentation

a. Identifying Content Area

The first thing to consider when planning a lesson is the content on which you will base your instruction. Can you think of a source from which lesson contents may be derived? The primary source of reference from which lessons content are derived is the scheme of work. However, if you mention the syllabus you may be right. But, remember that in Unit Two you were told that the syllabus is prepared by the Curriculum Development Unit of the Ministry of Education and sent to schools for implementation. In the schools, the contents of the syllabus are used for preparing scheme of work. The scheme of work is in turn used for preparing lessons. Although lessons should be planned from the scheme of work, the syllabus should be referred to as often as necessary to see how lesson contents blend in with the other content areas in the syllabus. Another source of information for planning a lesson is current events. Current events were described and categorised in Unit Two. Below is an additional information on syllabus, scheme of work and current events.

i. Syllabus

The syllabus, as defined and described in Unit Two, is a condensed outline of what should be studied. However, as interpreted in Botswana, a syllabus is associated with an outline of learning contents for a single subject, for example, Science syllabus and Home Economics syllabus. You should now refer to Appendix A (Science) and Appendix B (Home Economics) at the end of this unit to see how syllabuses are outlined.

On pages two to three of Appendix A (Science Syllabus) is an outline of learning contents for term one. The contents are divided into two sections, "Basic Science Skills" for weeks 1-6, and "Cells, Reproduction and Family Life" for weeks 7-12. Notice that the number of lesson periods to assign to each of the topics is not indicated. This is why teachers are required to plan a scheme of work at the beginning of the term.

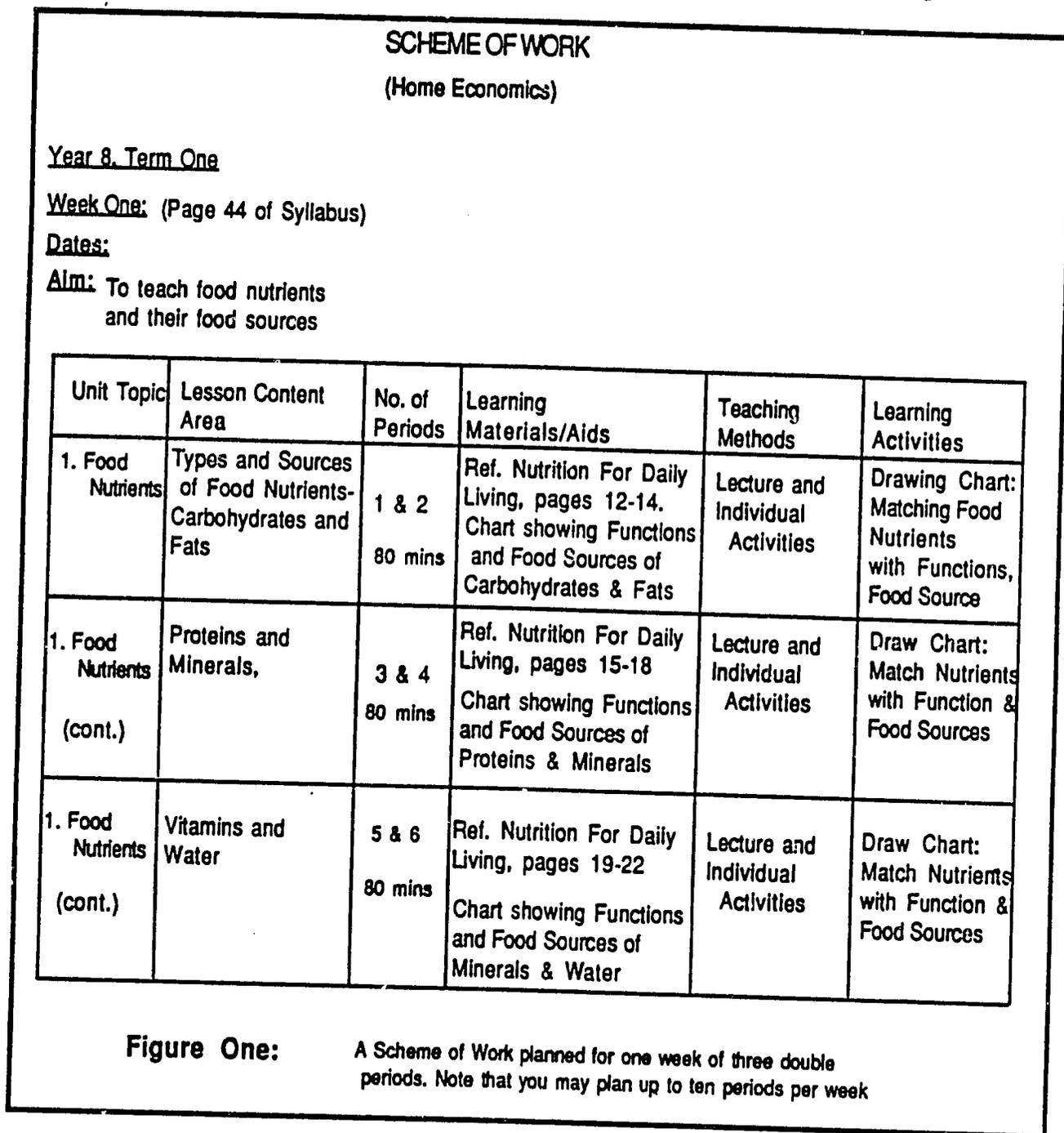
In Home Economics syllabus (Appendix B), there are 11 topic areas for standard 8 (which is the First Year of the Junior Secondary School of the new curriculum). Similar to the outline of the Science syllabus, the topic areas in Home Economics syllabus are not divided into lessons. Thus, a scheme of work should be prepared to break down the contents into lesson periods.

ii. Scheme of Work

A scheme of work is an outline of what is to be taught (Figure One). It may be prepared for one or more weeks of instruction, usually for the whole term. All teachers in Botswana are required to prepare scheme of work. The scheme of work should precisely outline topics or content areas and

other information necessary for planning lessons. Apart from using the scheme of work to plan lessons, it also gives school inspectors an idea of what is being taught in schools.

The example of a scheme of work shown in Figure One may not be exactly what you may find in schools because there is no one common method of preparing a scheme of work. However, the type of information shown in a scheme of work should be able to help the teacher to plan lessons.



iii. Current Events

Current events are the important things that are happening in society which students should know. For example, AIDS (Acquired Immune Deficiency Syndrome) is a disease that was recently

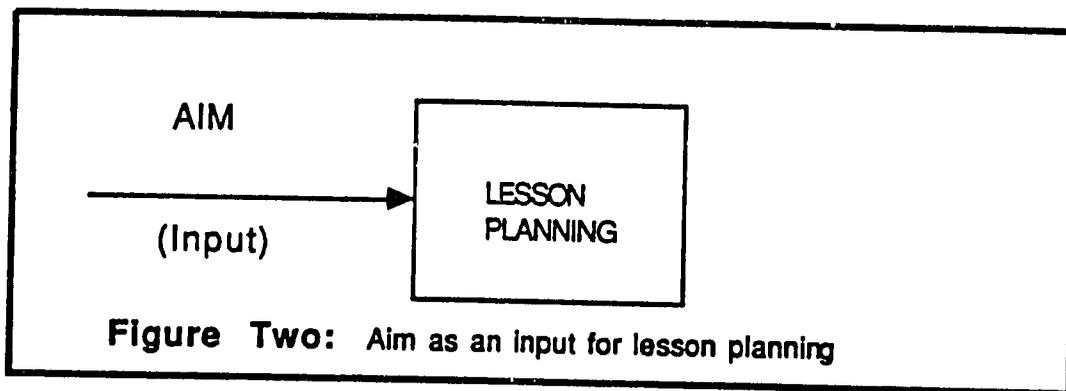
discovered and found to be a serious health problem. If you find out that a topic in the scheme of work on "Sexually Transmitted Diseases" did not include AIDS, it will be useful to include it in your lesson plan. This is because of the importance of the topic. Current events are usually reported in newspapers, government publications, journals and periodicals.

b. Writing Aims for the Lesson

An aim is a general statement of what is intended to be taught or an input for planning the lesson (Figure Two). Although an aim is a general statement, a lesson aim should contain an idea or ideas that can be taught in the lesson. For example, compare these three aim statements:

- "-to teach the systems of the human body";
- "-to teach the circulatory system";
- "-to teach the parts of the circulatory system".

Although the above three examples are aim statements, the first one would require about ten or more lessons to teach; the second one would require about three lessons to teach; and the third one would require one lesson to teach. After writing aims for the lesson, examine it to make sure that the intention of the aim can be met in the lesson.



Purpose of Writing Aims

The purpose of including aims in a lesson is to give the reader an overall impression of what the lesson is about. In terms of planning aims are input statements which may contain one or more ideas for planning the lesson. Later, when you write instructional objectives, the importance of stating aims for the lesson will be more obvious because the aims become the focus of the instructional objectives.

Examples

- (a) (From Figure One: Home Economics -- Scheme of Work, Periods 1-2)

Content Area: Types and Sources of Food Nutrients-Carbohydrates and Fats

Aim: To teach the functions of carbohydrates and Fats and identify food sources from which they are obtained.

- (b) (From Figure One: Home Economics -- Scheme of Work, Periods 3-4)

Content Area: Types of and Sources of Food Nutrients-Proteins and minerals.

Aim: To teach the functions of Proteins and Minerals and identify locally available food sources from which they are obtained.

(c) **Content Area** The Kgotla

Aim: To learn the roles of the members of the Kgotla by observing a session.

Note: The above examples show that aims should be stated in a very simple language and should contain information for planning a lesson. As in examples (b) and (c), aims can be made clearer by adding a context to the learning situation.

c. Matching Content with Student Characteristics

Have you ever been discouraged from reading a book because it was very difficult to understand? Or have you been in a lesson where you already knew the contents being taught and found it boring? Well, these are some of the examples of what could happen to a student when what is being taught is not related to the backgrounds of the students.

After writing aims for the lesson, before you proceed to write objectives, it is important for you to think about the students you are going to teach. In order to plan a lesson that is easy to understand and interesting, it should be related to the student's characteristics, that is, their ability, experience, interest and motivation and home environment.

i. Ability

Ability is used to mean the capacity to learn or mental readiness for learning knowledge, skills and attitudes. The ability to learn varies from student to student. In a normal classroom setting, the students you will be teaching have different learning abilities. When the syllabus was designed, topics were arranged to match the expected learning abilities of students in each standard or form. For example, the topics for Mathematics in Form Two are more advanced than topics for Form One. However, topics that are planned on the basis of expected learning abilities of students may not always be appropriate for a given standard or form of students in a any school. Therefore, the teacher should make sure that the different learning abilities in the class are taken into consideration when planning the lesson. Since a teacher cannot, at the lesson level, change what students should learn, the situation can be helped by specifying entry behaviours for each set of instructional content. A strategy for achieving this will be discussed under "Entry Behaviours".

ii. Experience

Learning experience include the knowledge, skills and attitudes the student already has and the way they were acquired. In terms of teaching, the learning experience which a teacher should consider when planning the lesson should include the student's vocabulary level in the language of instruction; ways in which the student is usually taught such as lecture, project, and individual or group assignment and; the student's personal ways of organising learning, such as using available learning resources without being urged or working in small study groups. Knowing the experience of the students helps the teacher to plan learning activities that are suitable for the students. In teaching, the teacher should use a language that the students can easily understand, use examples that are meaningful, use methods and techniques that are suitable, present instruction at a suitable pace and give assignments that can be done successfully.

iii. Interest and Motivation

Interest and motivation are the student's willingness to learn, based on how useful and interesting the lesson is perceived to be. Interest is associated with the level of feeling a student has for a lesson as revealed by the amount of attention and involvement shown in the lesson. For the lesson to be interesting, the teacher should use teaching aids, methods and techniques that appeal to all senses of learning such as touching, seeing, hearing, smelling and tasting. For example, when teaching about "Hard and Soft Water", it is better to ask students to taste the water and describe their experience, rather than telling them the difference between both types of water. Similarly, a subject in history can be made lively by dramatisation and using maps, charts and pictures.

Motivation is associated with what causes a student to behave in a certain way. The way a student behaves may be entirely a personal choice of action. For example, a student may choose to spend more time reading novels than textbooks. The reason may be that the novels are more interesting than textbooks or that textbooks are difficult to read and understand. On the other hand, a student may choose to read textbooks than novels because the student is curious or likes to maintain high marks in tests.

A student's behaviour may be influenced by the learning environment. For example, the amount of learning opportunities provided in the classroom and the way lessons are presented. When planning the lesson, the teacher should consider how to motivate students. For example, the teacher may introduce a lesson on "Primary Colours" by saying to the students:

"Do you know which colours to mix to create green, brown, grey, pink or other colours?"

"Would you like to know these colours?"

The teacher may then inform the learner of the objective of the lesson by saying:

"Today we are going to learn about primary colours. In this lesson you will learn how to create other colours from the primary colours and use them to paint patterns. When you have finished I will put on the wall, ten best patterns painted from the colours you created."

This type of introduction arouses interest, curiosity and motivates the students to pay attention and want to learn. Interest and motivation are important concepts in teaching. A teacher can increase the interest and motivation of the students by varying methods of teaching, using teaching aids, providing challenging learning activities, using familiar examples and making the content meaningful to the students. Thus, when planning the lesson, it is important to think about what may interest and motivate the students.

iv. Home Environment

The student's home environment is a factor that many teachers overlook when planning the lesson. Conditions in the home environment which can affect student learning are: (a) the amount of responsibility which is likely to affect how much time the student can devote to study or do homework; (b) the living condition of the home such as lighting, quality of food, studying space and noise; (c) the amount of educational stimulation received at home such as learning resources (books, television and radio), extra tutoring from parents or other members of the family; (d) a successful person in the family whom the students would like to emulate; and (e) resources within the community such as the library which a student may use as a learning resource.

Knowing the student's home environment will enable the teacher to plan more effective learning activities. For example, in schools located in an environment where most of the parents are poor and uneducated, teachers should make the school learning environment as rich as possible and

homework assignment limited to what students can actually do. Also, what students learn should be (as much as possible) made relevant to the needs of the student including the home environment.

c. **Specifying Entry behaviours**

Entry behaviours have been defined as the knowledge, skills and other experiences which a student should have before understanding, without much difficulties, the instruction to be presented. Two major errors can occur when a lesson is planned without considering necessary entry behaviours for the lesson. First, the instruction may be started at a point where it is too difficult for students to understand or even dangerous. For example, when teaching students to calculate simple interest, a teacher must not assume that the students already know how to calculate percentages. When teaching how to use chemical acids, teacher should not assume that students already know the effects of acids on objects. Such an assumption may result in some students burning themselves with acid. Second, the instruction may be started at a point where it is too easy for the students. Such an instruction will be boring and waste time of students.

The procedure for specifying entry behaviours involves three steps: identify instructional pre-requisites or subskills; design a test for the subskills test; and testing to determine where to begin instruction.

i. **Identify Instructional Pre-requisites or subskills**

Instructional pre-requisites are the knowledge, skills and attitudes a student requires in order to more easily understand the lesson (some lesson topics or content may not require any pre-requisites, see Example Two next page). The following procedures are suggested for identifying lesson pre-requisites or subskills.

List the concept or skill to be taught and asking yourself these questions: "What should the student know before performing this skill?" The answer to this question will result in identifying the first subskill. Ask the same question about the first subskill. The answer to this question will result in identifying the second subskill. If you keep on asking this question about the answer to the previous question, you would have eventually identified all of the subskills required to understand the lesson content or topic. The cut-off point when asking this question should be based on your judgement, that is, what you think the student ought to have known.

Examine example one below. All of the skills required to meet the aim of the lesson are derived by asking the above question. The entry behaviour line was drawn based on the judgement of the teacher. Sometimes, the teacher may be wrong in assuming where to start instruction. To avoid the probability of incorrectly estimating where to begin instruction, the teacher should prepare to teach all of the subskills.

Example One (from Appendix A- Science)

Content Area: Estimation of length

Aim: The aim of the lesson is to enable students to estimate lengths of objects in given metric units of measure.

Breakdown of Learning Content (read from item 1 below)

8. Estimate length of given objects and record results in a given linear unit and check correctness of estimate by actually measuring.

7. Convert results in step 6 to centimetre, e.g, 1/2 a ruler is 15 cm; 2 rulers is 60 cm; 2 1/3 rulers is 70 cm.
6. Estimate the length of given objects in a ratio to the standard ruler and record results in number of rulers, e.g. 1/2 a ruler; 2 rulers; 2 1/3 rulers.
5. Use a standard ruler to measure objects and record results in any given linear unit.

Skills to be taught in the lesson (5-8)

Skills required to begin the lesson (1-4)

4. Know the length of a standard ruler (30cm)
3. Convert from one linear metric to another, e.g, from Millimetre to Centimetre --- to Metre
2. Know linear metric units
 - i. Interpret whole numbers, fractions and decimals

Examples Two (From Figure One: Sample Scheme of Work, Periods 1-2)

Content Area: Types and Sources of Food Nutrients-Carbohydrates and Fats

Aim: The aim of the lesson is to teach students about the functions of carbohydrates and Fats and food sources from which they are obtained.

Pre-requisites: There are no prerequisites for this topic since the lesson is mostly on giving information. However, when teaching the lesson, the teacher may ask students to state the importance of foods; seek information from personal experience of the students such as, "have you seen a thin or fat person; do you know why people become thin when they are sick?" These types of questions are called recall of related knowledge or experience, which is somewhat different from subskills.

ii. **Design test for pre-requisites**

Oral questions. Oral questions should be prepared based on all of the subskills identified. The questions should be based on the concepts students should know before beginning the instruction to be presented. For example in teaching division of a three-digit number by a two-digit number, the teacher may ask students questions on addition, subtraction and multiplication.

Written questions. Written questions may be prepared for each of the subskills identified. The questions should be based on the components listed for oral questions and may be written in the form of short answer questions, fill-in-the-blanks, completion or matching and objective or multiple-choice items. In fact, the multiple choice type is preferred because it enables the teacher to cover a lot of content, and is easier to grade.

iii. **Test for Pre-requisites or subskills**

Oral test questions should be administered in the first lesson of the new topic. If the majority of the students did not know the answers to most of the questions, you may then proceed to teach the subskills. If only a small proportion of the class did not understand, you may spend about ten

minutes for review and proceed with the lesson as planned. Later, you should provide, during study hours, extra help to the students who did not have most of the subskills.

Written test questions is difficult to administer, given the manner in which periods are scheduled in schools. For example, the time to administer, grade the test and be able to use the information could be a problem. One of the strategies to overcome the problem is by using multiple-choice questions which students could be asked to mark in the class. After the questions have been marked and returned, the teacher could ask the students who missed each question to raise their hands. Based on a quick count by question, the teacher will then decide how much revision to provide during the lesson and during study hours. Another strategy is to give the written test during study hours and use the information in planning the lesson.

Perhaps one of the best ways to avoid using much of class time for testing for subskills and providing remediation is to include most of the subskills in the scheme of work (this ensures that contents are appropriately allocated to periods). Note that subskills are of primary importance whenever a new topic is introduced. The amount of emphasis to place on subskills will depend upon the nature of the subject being planned. For example, most topics in Mathematics or Science may require subskills involving knowledge of facts and procedures which a student must have in order to begin the new topic. In other subjects like Social Studies, subskill for some topics are simply recall of familiar examples or situations.

E. Writing Instructional Objectives

One of the most important aspects of planning the lesson is writing objectives. The type of objectives written for the lesson has several names such as lesson objectives, performance objectives, behavioural objectives or instructional objectives. All these terms mean the same thing, that is, precise statements of what students should be able to do at the end of instruction. In this course, the term instructional objectives will be used to describe objectives that are written for the lesson.

The usefulness of instructional objectives have been argued extensively without a compromise. The stem of the argument is in stating the objectives in measurable behaviours (knowledge, skills and attitudes) which students should be able to demonstrate after completing instruction. It is argued that not all learnings that occur in the classroom can be measured or stated in behavioural terms, for example, appreciation or enjoyment; that measuring overt or external behaviours is misleading because the result of such measurement does not include covert or internal learning such as "true" feelings or opinion; and that basing instructions on pre-stated behaviours assumes that human behaviours are fixed and always predictable.

While the above arguments may be true, it should be remembered that one of the major purposes of education is to help students to acquire knowledge, skills and attitudes that will enable them to survive and contribute to the development of the society. Since it is possible to define most of these knowledge, skills and attitudes, effective educational activities can be planned. The planning process involves writing specific objectives which help to communicate both to the learner and teacher, the expected results of instruction.

1. Purpose of Instructional Objectives

The purpose of instructional objectives may be presented in the following categories

a. The Teacher

- i. Instructional objectives guide the teacher in selecting and developing instructional materials.
- ii. Instructional objectives help the teacher to be more effective and efficient. By specifying instructional objectives in advance, the teacher is better able to plan teaching and learning activities that can be taught and understood in the shortest time.
- iii. Instructional objectives help the teacher to communicate to other teachers, administrators and parents what is being taught to students.
- iv. Instructional objectives help the teacher to set tests that appropriately measure what was learnt, thereby allowing the teacher to find out the effectiveness of instruction and how to revise it.

b The student

- i. When students are given instructional objectives in advance, they are less likely to be lost; they know what to expect from the lesson; and can better prepare for the lesson.
- ii. Clearly stated instructional objectives help students to review with purpose.
- iii. Instructional objectives given to students at the beginning of each weekly units of instruction can help them to use available learning resources more effectively.

c. School Officials

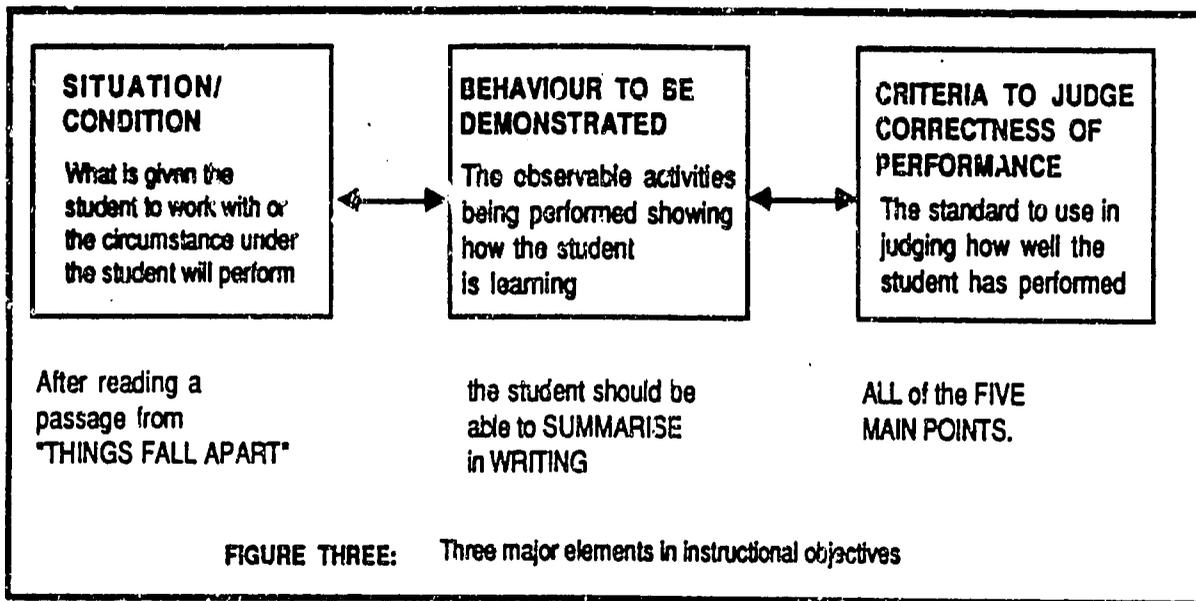
Instructional objectives communicate to the headmaster and school inspectors contents taught and the level at which the contents are taught.

d. Parents

Instructional objectives indicate to parents what students are being taught in school. This information can be used by parents to provide help to the student.

2. Tips for Writing Instructional Objectives

There are many ways of writing instructional objectives. The objective form suggested below consists of three parts or elements (Figure Three). This form is suggested because it is simple to understand and use.



a Objectives should be stated in terms of STUDENT PERFORMANCE. That is, what the student should be able to do after completing instruction. The verb for indicating what the student should be able to do is the action verb, which is also called the behavioural verb because it indicates the behaviour to be observed. The action verb refers to the mental operation taking place in the mind of the student. The words that immediately follow the action verb show the result of the mental operation indicated by the action verb. Usually the behavioural verb follows the word be able to. Examine the following statements and note the underlined action verbs and words that follow each one.

Example: The student will be able to:

- (i) list the names of the main rivers of Botswana
- (ii) construct a right-angle triangle
- (iii) identify the main points in the passage

- (iv) mend a straight line tear on a garment
- (v) demonstrate that water changes state at 100° C

Note that the objectives showed what the student, not the teacher will be doing. The verbs underlined in each statement specifies the behaviour the student should demonstrate.

b. Objectives should describe the **CONDITION** or the **SITUATION** under which the student will be working or demonstrate the behaviours specified. The condition or the situation in the objective can be indicated by the word given or a description of the learning environment. The condition or situation refers to **WHAT** the student should be working with.

Example: i. Given a paper and a pencil, the student should be able to draw a boundary map of Botswana.

Example: ii. construct a right-angle triangle.

Example: iii. After reading a passage from " Things Fall Apart", the student should be able to summarise the main points in the passage.

Example: iv. The student should be able to mend a straight line tear on a garment using a sewing machine and a thread.

Example: v. Given a beaker of water, ringstand, Bunsen burner and a thermometer, the student should be able to demonstrate that water changes state at 100° C.

Note: The condition or situation does not have to be stated at the beginning of the sentence--see Example (iv).

c. The objective should include (as much as possible) the **CRITERIA** that should be used to evaluate the performance of the student. This is also called the **PERFORMANCE LEVEL** or the standard that will be used to judge how well the student has performed.

Example: i. Given a paper and a pencil, the student should be able to draw a boundary map of Botswana which should resemble the one drawn to scale or the one drawn by the teacher.

Example: ii. Using a paper, pencil, a pair of compasses and a protractor, the student should be able to construct a right-angle triangle accurately.

Example: iii. After reading a passage from " Things Fall Apart", the student should be able to summarise accurately five main points in the passage.

Example: iv. The student should be able to mend a straight line tear on a garment, using a sewing machine and a thread. The mended surface should be smooth and the stitches must be even.

Example: v. Given a beaker of water, ringstand, Bunsen burner and a thermometer, the student should be to demonstrate that water changes state at 100° C. The student should note exactly what happened to the water when the temperature reached 100° C

Note: The criteria or performance level can be difficult to specify in some objectives. Examine the difference between examples (iii) and (v). In example (iii), the criteria is simply accurately summarised Five main points which the teacher will be looking for when judging a student's performance. In example (v), the criteria is difficult to specify. However, the teacher can find out if a student had observed carefully by reporting the temperature at which the water boiled. If a student reports that the water boiled at 90 or 110 degrees Celsius, the teacher can then infer that the student failed to observe accurately.

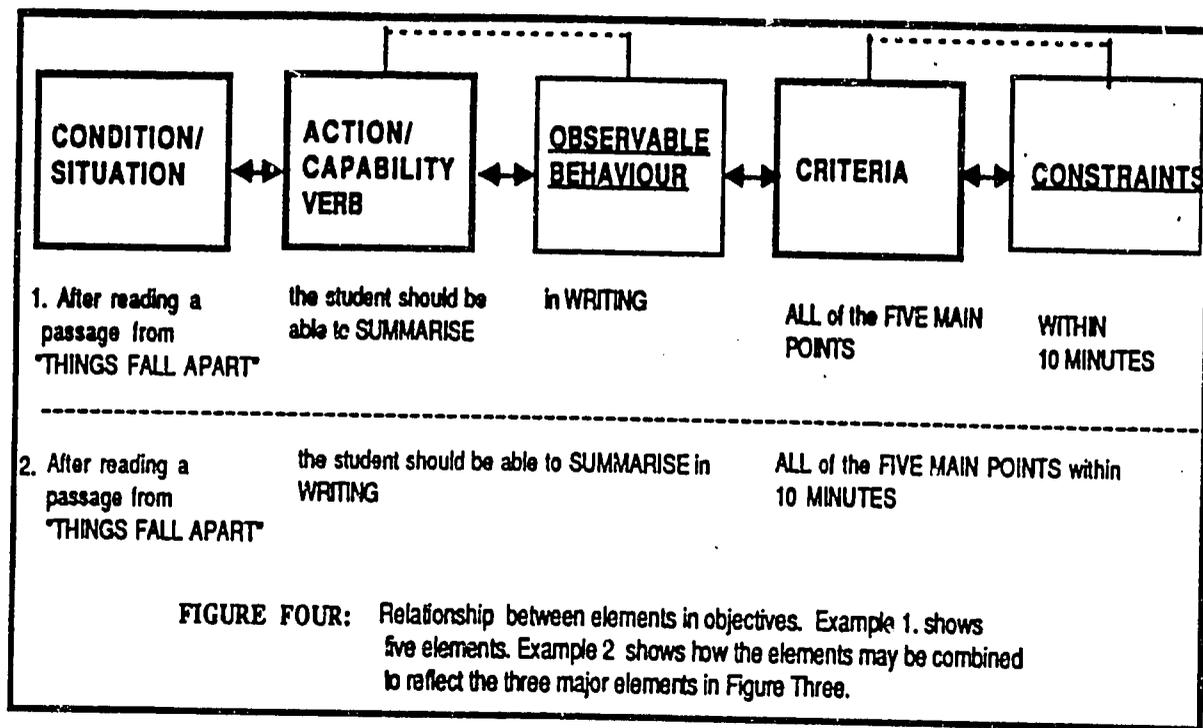
Also, note that the criteria may be stated in another sentence as in examples (iv) and (v). The reason is to avoid making the objective complicated or confusing to read.

3. Elements in Objectives

The tips given for writing instructional objectives consists of three main elements. These elements are sometimes referred to as Mager type of objectives. Mager (see reference) recommended this style in his book, "Preparing Instructional Objectives", published in 1962. They are:

- a. What students should be able to do. This is revealed by the type of verb used in the objective.
- b. The situation or condition under which performance will occur. This is shown by the word given or a description of the situation.
- c. The criteria of performance or performance level. This is shown by the standard with which to judge student performance.

While the above elements are necessary, in most cases, to state instructional objectives, there are other elements which may be included, depending upon the purpose of the objective (Figure Four).



a. **Constraints:** The constraints in an objective are the extended form of the criteria.

Example: After reading a passage from " Things Fall Apart", the student should be able to summarise accurately five main points in the passage, within 10 minutes.

Example: The student should be able to mend a straight line tear on a garment, using a sewing machine and a thread. The mended surface should be smooth and the stitches must be even. The student will use a manual hand sewing machine.

b. **Action:** The action helps to clarify the behaviour to be demonstrated. That is, HOW is the student to perform?

Example: After reading a passage from " Things Fall Apart", the student should be able to identify the five main points in the passage in writing, within 10 minutes.

4. Criteria for Selecting Elements to Include in Instructional Objectives

a. **Communication to the Student**

If the purpose of the objective is to communicate to the student, then, you should include as many elements as possible that will enable the student to know exactly the behaviour to be demonstrated. Objectives written for students should be complete. Here is an example of incomplete and complete objectives.

Incomplete Objective

- i. The student should be able to mend a straight line tear on a garment.
- ii. The student should be able to draw a right angle triangle

Complete Objective

- i. The student should be able to mend a straight line tear on a garment, using a sewing machine and a thread. The mended surface should be smooth and the stitches must be even.
- ii. Using a paper , pencil, a pair of compasses and a protractor, the student should be able to construct a right-angle traingle accurately.

After writing objectives to be given to students, you should evaluate it by asking yourself, "Does the objective contain sufficient information to enable the student to know what he or she is supposed to learn?" "Does the objective contain information for setting a test?" " Did the objective specify the activities the student should perform?"

b. Communication to other Teachers or School Administrators

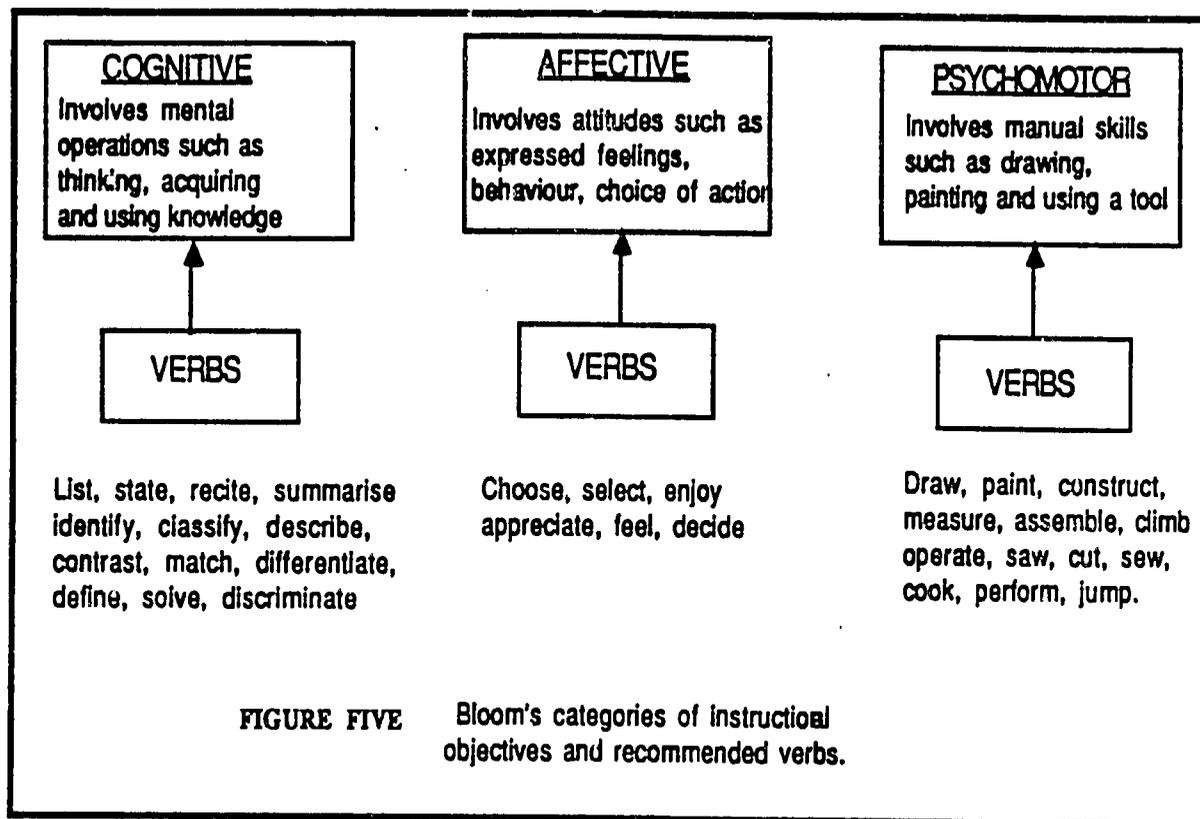
Instructional objectives written to communicate to teachers or school administrators should be brief but contain sufficient information to show what is being taught. Objectives written for this purpose may be incomplete. For example, the student should be able to draw a map of Botswana showing the major rivers. Although the objective is incomplete, it has communicated clearly what the student will be able to do. This type of objective may be also called an abbreviated objective because it shows only what the student is able to do after completing instruction. This is the type used in writing the modules for this course. Sometimes you may choose to use abbreviated objectives for your lesson. But, you should not form a habit of it. You should write complete objectives as much as possible.

5. Categories of Instructional Objectives

Categories of instructional objectives refer to the type of learning that the objectives are based. There are two major categories of instructional objectives.

a Blooms's Category

Bloom (see Appendix C for details) suggests that objectives may be written in three categories called domains (Figure Five).



These are Cognitive, Affective and Psychomotor.

- i. Cognitive domain deals with learning that results in acquiring knowledge. Cognitive domain has different levels (see Appendix C). Objectives written in cognitive domain contain action verbs such as list, classify and state (Figure Five). Each verb implies the level of mental operations involved. For example, list is a lower level mental operation than classify.
- ii. Affective domain deals with learning that results in acquiring attitudes. Affective domain has different different levels (see Appendix C). Objectives written in the affective domain contain action verbs such as choose, select, enjoy, appreciate (Figure Five).
- iii. Psychomotor domain deals with learning that results in acquiring manual skills. To acquire psychomotor skill, the student must first know the nature of the action to be demonstrated, observe the action from an example or imagine it, and practice the action. Objectives written in the psychomotor domain contain action verbs such as draw, paint, perform, operate, type and jump (Figure Five).

b. Gagne and Briggs' Categories

Gagne and Briggs suggest five categories called "Learning Outcomes or Capabilities" for writing instructional objectives (see Appendix D for details). They are:

i. **Intellectual skills.**

Intellectual skills refer to mental operations involving knowledge and thinking process. For example, learning the shape of a thing (donkey) and using that knowledge to recognise that thing whenever it is seen. Intellectual skills also involve learning of symbols, for example, language. There are five categories of intellectual skills (read the Appendix D for full definition and explanations).

- Discrimination
- Concrete concepts
- Defined concepts
- Rule using
- Higher order rule using (problem solving)

ii. **Cognitive strategies**

Cognitive strategies are specific skills that help learners to adjust to situations, think creatively and control themselves. For example, when you learn and apply the rules of writing objectives, you are learning and using intellectual skills. However, if you are able to write interesting objectives for unfamiliar topic, you are using a cognitive strategy. Another example is writing a poem and finding new ways of doing things

iii. **Information Learning**

Information learning involves learning of facts. In information learning the student simply understands and stores facts as given. For example, listing the names of the rivers of Botswana, giving an account of the historical development of a nation and stating the formula for a triangle.

iv. **Motor skills**

Motor skills deal with learning manual skills such as painting, drawing and performing. The process involves translating knowledge into action. For example, learning to drive a car requires knowledge of driving procedures and practising the procedure.

v. **Attitude**

Attitude requires a personal choice of action. Attitudes are tendencies which enable a student to choose a course of action. For example, one student may like to play soccer while another student may prefer to play lawn tennis.

6. **How to Use the Categories of Instructional Objectives**

The two categories of objectives discussed are important because they are based on psychological principles of learning, and help the teacher to write objectives at different levels to ensure all round learning for students. Figure Six illustrates the relationship between the two categories.

BLOOM'S CATEGORIES		GAGNE & BRIGGS' CATEGORIES	
1	COGNITIVE DOMAIN	1	INTELLECTUAL SKILLS
			a. Discrimination b. Concrete Concepts c. Defined Concepts d. Rule Using (using a single rule) e. Complex Rule Using or Problem Solving (using multiple rules)
		2	COGNITIVE STRATEGY
		3	INFORMATION LEARNING
2	AFFECTIVE DOMAIN	4	ATTITUDE
3	PSYCHOMOTOR DOMAIN	5	MOTOR SKILLS

FIGURE SIX: A comparison of Bloom and Gagne & Briggs' categories of instructional Objectives

Following are some suggestions for using the categories of objectives.

i. Bloom's Categories

After writing objectives for your lesson, you should ask yourself these questions:

- (a) Is this objective written in the cognitive, affective or psychomotor domain?
- (b) What level of learning is the objective written? Does it require students to learn information; to comprehend; to apply knowledge; to analyse; to synthesise; or to make judgement; to value; to do something physical?
- (c) Did I cover each of the categories/domain in my lesson?

For example, when teaching about First Aid, it may be necessary to write objectives that include the cognitive category where students are given some facts; psychomotor where students are asked to demonstrate a procedure or apply knowledge just acquired; and affective where student's feeling about the knowledge and skill just taught is tested.

Example One: Given a first aid box the student should be able to identify the items in the box. (cognitive domain)

Example Two: Given a bandage, iodine tincture, hydrogen peroxide, cotton swab, water and a person with a minor cut, the student should be able to perform first aid treatment for the cut. (psychomotor).

Example Three: Given a situation in which a person sustains a serious injury, the student will choose to help to apply first aid treatment without being asked. (affective)

b. Gagne and Briggs Learning Outcomes

In order to use Gagne and Briggs learning outcomes, you have to understand how each learning outcome and their subcategories are defined (see Appendix D). Notice that there are specific action verbs for each outcome. After writing your objectives, you should ask yourself the same questions listed in item (i) above. The action verb used in the objective determines which learning outcome is reflected.

Example One: Given a first aid box the student should be able to identify the items in the box. (concrete concept under intellectual skills)

Example Two: Given a bandage, iodine tincture, hydrogen peroxide, cotton swab, water and a person with a minor cut, the student should be able to execute (perform) first aid treatment for the cut. (motor skills).

Example Three: Given a situation in which a person sustains a serious injury, the student will choose to help in applying first aid treatment without being asked (attitude).

In summary, the contents of this Unit were on some of the activities involved in preparing for a lesson. The activities are: (1) identifying a topic or content area for the lesson; (2) writing aim statements for the lesson; (3) matching the content with student characteristics; (4) specifying entry behaviours; and (5) writing instructional objectives. Each activity was explained with examples of how used in planning the lesson.

It was suggested that objectives should contain, at least, three elements: (1) behaviour students should be able to demonstrate (as indicated by the action verb); (2) condition or situation under which the student is to demonstrate the behaviour such as the environment, condition or what the student should work with; and (3) criteria or performance level. The number of elements to include in an objective should depend upon the purpose for which the objective is written.

VII. PRACTICE/EXERCISE

Review what you have read so far and do the following exercises. When you have completed each exercise refer to the feedback provided.

A. What are the main reasons for matching learning content with student characteristics?

B. Write an aim statement for each one of the following topics:

Content Area: Major Economic Crops of Botswana

Aim:

Content Area: Subordinate Clauses

Aim:

C. List three major elements that should be included in instructional objectives.

D. Write two instructional objectives for each one of the following aims. The objectives should clearly communicate to the student.

Content Area: Major Economic Crops in Botswana

Aim:

To teach the students about major economic crops in Botswana, their geographical locations, cultivation and market values

Objective One:

Objective Two:

Content Area:

Subordinate Clauses

Aim:

To teach the students how to identify and use subordinate clauses in sentences.

Objective One:

Objective Two:

E. Answer the objective and short answer questions for Unit One, session two. It is suggested you first attempt all of the questions without reference to the instruction. When you have finished, look at the instruction to check your answers. If you still have doubts about your answers check with the teacher.

F. Term Assignment-1

Obtain a copy of a J.C. syllabus for one of your main subjects, choose a single concept topic and write one aim statement. See the introduction to the course for an explanation of this assignment under "Product Grade". Write three to five instructional objectives for the content area and aims you have identified in Session One.

VIII. FEEDBACK

A. What are the main reasons for matching learning content with student characteristics?

One of the ways to answer this question is for you to think of the lessons you really like. Think of how the materials were presented; the examples used; the exercises given and how useful the lesson was to you. Below is a summary of some of the reasons for match learning content with student characteristics.

1. To make the instruction interesting to the student
2. To make the instruction useful to the student
3. To make the instruction easy to understand
4. To motivate the student to learn the materials
5. To enable the teacher to choose instructional materials, methods and technique that are suitable to the student
6. To help the teacher to use more effective learning activities

B. Write an aim statement for each one of the following topics:

Content Area: Major Economic Crops of Botswana

Aim: To teach the students about major economic crops in Botswana, the geographical locations, cultivation and market values

Content Area: Subordinate Clauses

Aim: To teach the students how to identify and use subordinated clauses sentences.

Remember that aims are general statements of intentions and are used as inputs for planning instruction

C. List three major elements that should be included in instruction objectives.

1. What learners should be able to do after completing instruction
2. The condition or situation under which the behaviour should be demonstrated
3. The criteria of performance or the standard to judge how well the student has performed.

Any of the five criteria discussed in the unit will be acceptable for this question.

D. Write two instructional objectives for each one of the following aim. The objectives should clearly communicate to the student.

Content Area: Major Economic Crops in Botswana

Aim: To teach the students about major economic crops in Botswana, the geographical locations, cultivation and market values

Objective One: Given three major economic crops in Botswana, the student should be able to describe their methods of cultivation without reference to source.

Objective Two: Given a list of major economic crops and also of economic values of crops, the student should be able to match each crop with its economic value correctly.

Content Area: Subordinate Clauses

Aim: To teach the students how to identify and to subordinate clauses sentences.

Objective One: Given five sentences, the student should be able to identify, with errors, the subordinate clause in each sentence.

Objective Two: The student should be able to accurately describe the function of subordinate clause orally when asked in the class.

Your objectives may differ from the one given above and yet be correct. The idea is to test your ability to write objectives.

The elements to include depend upon the purpose of the objective. Since the above objectives were intended for the students, they were written to be as complete as possible.

IX. REMEDIATION

Read: Dick, W. & Carey, L. (1985). *The Systematic Design of Instruction*. Glenview, Illinois: Scott, Foresman and Company.

For Aims/Goals (Pages 17-22)

For Student Characteristics (Pages 79-90)

For Objectives (Pages 96-105)

Read: Farrant, J.S. (1985). *Principles and Practice of Education* (5th ed.). Singapore: Longman. Unit

For Scheme of Work (Pages 174-175)

Read: Briggs, L.J., & Wager, W.W. (1981). *Handbook of Procedures for the Design of Instruction*. Englewood Cliffs, N.J.: Prentice-Hall

For Objectives (Pages 39-57)

This reference discusses in detail Gagne and Briggs' Learning Outcomes and instructional objectives. There are ten copies in the reference section of your library.

X. ENRICHMENT

The following reference is recommended in addition to the ones cited under REMEDIATION.

Gagne, R. M. & Briggs. (1979). Principles of instructional design. New York: Holt, Rinehart and Winston. Pages 46-47; 117-135.

XI. EVALUATION

You will be tested in your next class session from the revision test items for this Unit.

The evaluation of the unit will consist of 40 multiple-choice test items and three short answer questions. The revision test questions are intended to help you focus on the main points. **DO NOT TRY TO MEMORISE THE ANSWERS TO THE QUESTIONS.** You will be requested to fill out an attitude questionnaire which will allow you to say how well you liked the modules.

XII. REFERENCES

Briggs, L.J., & Wager, W. W. (1981). Handbook of Procedures for the Design of Instruction. Englewood Cliffs, N.J: Prentice-Hall

Dick, W. & Carey, L. (1985). The Systematic Design Of Instruction. Glenview, Illinois: Scott, Foresman and Company.

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Farrant, J.S. (1985). Principles and practice of education (5th ed.). Singapore: Longman.

Kapfer, M.B. (1972). Behavioural objectives in curriculum development. Englewood Cliffs, N.J: Educational Technological Publications. Pages 211-217.

Mager, R.F. (1962). Preparing instructional objectives. Belmont California: N.J: Fearon Publishers.

Romiszowski, A.J. (1984). Designing instructional systems. New York: Kogan Page.

UNIT THREE SESSION ONE REVISION QUESTIONS

Objective A: Identify sources from which instructional content may be derived

1. A primary source of information for identifying content for the scheme of work is
 - a. textbooks
 - b. newspapers
 - c. syllabus
 - d. students

2. A primary source of information for identifying content for the lesson is
 - a. scheme of work
 - b. students
 - c. newspapers
 - d. other teachers

3. Which one of the following is the **least reliable** source of information on current events?
 - a. Newspapers
 - b. Magazines
 - c. Journals
 - d. Encyclopedia

4. If you find that the learning materials recommended for teaching a topic in the syllabus not adequate the **best thing to do** is to:
 - a. use the materials regardless of their inadequacies
 - b. change the topic to suit the materials recommended
 - c. ignore the materials and use whatever is best
 - d. enrich the materials from other relevant sources

5. Give three reasons why a teacher should refer to the syllabus when planning the scheme work?

Objective B. Generate (write) aims that match given instructional content

6. An aim is a----statement of what is to be learnt
 - a. Specific
 - b. General
 - c. Objective
 - d. Careless

- a. Exercises
 - b. Objectives
 - c. Concepts
 - d. lessons
8. One of the major purpose for writing an aim for a lesson is to give the students
- a. specific information to help them study
 - b. direction for achieving the lesson
 - c. an idea of the exercises to be performed
 - d. an idea of what the lesson is about
9. The topic for the lesson is, " Simple Interest". Which one of the following statements best represents the aim of the lesson?
- To teach students how to calculate:
- a. principal given interest, rate and time
 - b. simple interest
 - c. interest given rate, principal and time
 - d. rate, given principal, time and interest
10. Write an aim statement for the following objectives.
- Given an iodine, sugar or starch and a green leaf, the student will be able to test for the presence of starch in the green leaf.
11. The student should be able to accurately construct sentences using given adjectives.
12. The student should be able to describe the major food sources of proteins commonly available in Botswana.

Objective C: Describe student characteristics which should be taken into consideration when planning instructional content.

13. When instruction is planned on the basis of "expected abilities" of a given group of students, the most likely result of this expectation is
- a. instruction that may not be suitable
 - b. instruction that is effective and efficient
 - c. instruction that is effective only
 - d. instruction that is efficient only

14. One of the effective ways to cater for the different learning abilities in the class is to:
- a. ask students to vote on what the teacher should teach
 - b. breakdown concepts to simplest form when planning lesson
 - c. teach the "slow learners" first, and the "quick" learners later
 - d. spend as much time with individuals students during the class
15. If most of the students in your class came from poor homes where conditions for out-of-school learning opportunities are limited, which one of the following actions will be most helpful to most of the students?
- a. reduce the amount of work each student is asked to do in the school
 - b. ask the parents of the students to help their children to learn at home
 - c. make lessons as short as possible and avoid giving assignments
 - d. make the school learning environment as stimulating as possible
16. A very good method for increasing interest and motivation in the class is to
- a. give students high marks in tests and quizzes
 - b. make lessons as short as possible and give less assignments
 - c. use a variety of teaching methods and learning activities
 - d. give the students a lot of work to keep them busy
17. Describe three conditions in the student's home environment that are likely to promote learning and three that are likely to inhibit learning.

Objective D: Specify entry behaviours and its methods of assessment

18. A teacher who takes student entry behaviours into consideration when planning instruction is concerned with the best way to
- a. assess the lesson
 - b. revise the lesson
 - c. provide reinforcement
 - d. present instruction

Use the following situation to answer questions 18-20.

You have been asked by your headmaster to suggest ways of determining entry behaviours to a group of teaching practice students. Identify in questions 18-20, three sequential steps to take when determining entry behaviours.

18. The first step to take is
- a. testing to find out how much of the content is already known
 - b. estimating the number of students who already know the content
 - c. breaking down the content of the lesson into subskills
 - d. preparing oral or written questions on the subskills

19. The second step to take is
- a. testing to find out how much of the content is already known
 - b. estimating the number of students who already know the content
 - c. breaking down the content of the lesson into subskills
 - d. preparing oral or written questions on the subskills
20. The third step to take is
- a. testing to find out how much of the content is already known
 - b. estimating the number of students who already know the content
 - c. breaking down the content of the lesson into subskills
 - d. preparing oral or written questions on the subskills
21. Describe the action you would take if about 30% of your students failed to pass the entry behaviour test.
22. If a teacher does not want to use much of class time, but would like to find out how much students already know about the subject to be taught, the teacher may:
- a. Give a written test, grade it quickly and give remedial help to all
 - b. Give a written test and grade it, and give help after the lesson
 - c. Give an oral test, provide a quick feedback and go on with the lesson
 - d. Give an oral test and ask students who did badly to study after class

Objective E. State the purpose for writing instructional objectives

23. Give TWO reasons why a student should be given instructional objectives in advance.
24. Give two important reasons explaining how instructional objectives can help a teacher to be effective and efficient.

Objective F. Describe the elements in instructional objectives.

Use the following statement for answering questions 25-27.

In the module, it was suggested that you include at least three major elements in your instructional objectives. These are: (1) condition or situation; (2) what students should be able to do; and (3) criteria for assessing student performance. For each of the following objectives, identify from the list of the elements above, the one that is missing.

25. The student should be able to list the nouns in a given passage.
- a. Condition or situation
 - b. Criteria
 - c. behavioural verb
 - d. No component is missing
26. The student will be able to answer all correctly
- a. Condition or situation
 - b. Criteria
 - c. behavioural verb
 - d. No component is missing
27. Given a list of food and a list of food nutrients, students will correctly match each food nutrient with the food from which it may be obtained.
- a. Condition or situation
 - b. Criteria
 - c. behavioural verb
 - d. No component is missing

For items 27-31, identify the part of the objective underlined.

27. Given an adjective, the student should be able to accurately use it in an oral sentences within one minute.
- a. Condition or situation
 - b. Criteria
 - c. behavioural verb
 - d. Constraint
28. Given a list of objectives, the student will be able to discriminate between those that are adequate and those that are inadequate.
- a. Condition or situation
 - b. Criteria
 - c. behavioural verb
 - d. Constraint

29. Given a diagram of a fruit, students will be able to correctly label the parts indicated with arrows.
- a. Condition or situation
 - b. Action
 - c. behavioural verb
 - d. Constraint
30. Given a piece of wood, an angle and a pencil, the student should be able to cut it to a given specification using only a manual saw.
- a. Condition or situation
 - b. Action
 - c. behavioural verb
 - d. Constraint
31. The student should be able to summarise in writing, the major causes of the Boer Trek.
- a. Condition or situation
 - b. Action
 - c. behavioural verb
 - d. Constraint

Objective G. Identify criteria for selecting elements to include in instructional objectives

32. The student should be able to list the economic resources in Botswana. This major intention in the objective is--
- a. Communication to the teacher/parents/school officials
 - b. Students
 - c. Test writing
 - d. b and c
33. Given a paper and a pencil students should be able to identify correctly 4 out the 6 ideas suggested in chapter 3 of the book, "How to preserve foods". The major intention in the objective is:
- a. Communication to the teacher/parents/school officials
 - b. Students
 - c. Test writing
 - d. b and c
34. Given a reading reference, "Styles in Poetry", the student should be able to write a short poem. The major intention in the objective is:
- a. Communication to school officials
 - b. Students
 - c. Test writing
 - d. b and c

35. Which one the following objectives is most useful to the student?

The student should be able to:

- a. accurately state two functions of Vitamin A
- b. solve given simultaneous equations
- c. know how to mend a tear on garments
- d. understand the uses of diamonds

36. If the intention is to write an objective that specifies a testing situation, which one of the following is most suitable?

The student should be able to:

- a. accurately state two functions of Vitamin A
- b. solve given simultaneous equations
- c. know how to mend a tear on garments
- d. understand the uses of diamonds

37. If you want to write objectives that tell a school inspector about what you are teaching, which elements will you exclude. Give a reason for your choice or choices.

Objective H: Originate (create) objectives for a given content area.

Write Two objectives each for the following situations

38. Content: To teach about the importance of washing hands before eating.

39. Content: To teach the students how to find words in a dictionary

40. Content: To teach about the circulatory system

Objective 1: Describe the categories for writing instructional objectives

41. Which one of the following terms usually refer to objectives that have to do with manual skills?
- a. Affective
 - b. Psychomotor
 - c. Cognitive
 - d. Behavioural
42. Which one of the following terms usually refer to objectives that have to do with attitude?
- a. Affective
 - b. Psychomotor
 - c. Cognitive
 - d. Behavioural
43. Which one of the following terms usually refer to objectives that have to do with knowledge?
- a. Affective
 - b. Psychomotor
 - c. Cognitive
 - d. Behavioural
44. The intellectual skills, Cognitive strategy and Verbal Information in Gagne and Briggs' category of objectives is equivalent to----- category in Blooms' classification.
- a. Affective
 - b. Psychomotor
 - c. Cognitive
 - d. Behavioural
45. Given a paper and a pencil students should be able to identify correctly 4 out the 6 ideas suggested in the book, "How to preserve foods". The category implied is:
- a. Affective
 - b. Psychomotor
 - c. Cognitive
 - d. Behavioural
46. Given a piece of wood, an angle and a pencil, the student should be able to cut it to a given specification using only a manual saw. The category implied is:
- a. Affective
 - b. Psychomotor
 - c. Cognitive
 - d. Behavioural

APPENDIX A

TOPIC	DETAILED OBJECTIVES	CONTENT AND APPLICATIONS	EXTRA ACTIVITIES	INTEGRATION
TERM 1: (week 1-6) Basic Science Skills	PUPILS SHOULD ACQUIRE: *basic skills and techniques needed to work properly and safely in a science room/laboratory. *skills in observing, recording, measuring and estimating which are needed in everyday life.			
	PUPILS SHOULD BE ABLE TO: Behave safely and properly in the Science Room.	CONTENT AND APPLICATIONS SHOULD INCLUDE: Safety rules. First aid treatment.		Home Econ.
	Measure with accuracy.	Measurement of length, volume, mass, time and temperature.	Calculation of area and volume.	Maths.
	Read the scale of an instrument to its smallest division.	Ruler-to the nearest mm. Measuring cylinder-to the nearest cm ³ . Balance-(depends on the type used for kit). Clocks-to the nearest s. Laboratory thermometer-to the nearest °C. Clinical thermometer-to the nearest 1/10 °C.		
	Make reasonable estimates	Estimation of length, temperature, time and mass.	Estimation of area and volume.	
	Carry out some simple laboratory techniques.	Making a solution; filtration; evaporation. Heating; handle hot apparatus. Handle living samples. Use a hand-lens correctly. Handle non-living samples, in particular chemicals.		
Make accurate observations and record the results in the form of tables and drawings.	Observations, characteristics and simple classification of both living and non-living things. Simple flower structure. Colour changes in some chemical reactions. Solubility. Use of solvents other than water. Experiments with bar magnets.	Extended observations e.g. on earthworms and housefly.		
TERM 1: (week 7-12) Cells, Reproduction and Family Life	PUPILS SHOULD ACQUIRE: *knowledge of reproduction in plants and human beings and awareness of the importance of family planning. *ability to observe objectively and to report on their observations by means of drawings and written descriptions.	CONTENT AND APPLICATIONS SHOULD INCLUDE: Observe cells in a variety of organisms. Explain that many cells make a tissue, many tissues make an organ, many organs make a system, many systems make an organism.		Agric. Science

APPENDIX A (cont.)

<p>Draw simple structure of an animal and a plant cell.</p>	<p>Observe onion cells and cheek cells and note differences and similarities. Use of bioviewers. Observe small living creatures in pond water. Identify single and many-cellular animals in pond water.</p>	<p>Use of microscope to observe cells and microscopic organisms.</p>
<p>Describe different types of cells in organisms which may have different functions.</p>	<p>Use bioviewers to study liver cells, blood cells, and leaf cells.</p>	<p>Observe such cells using a microscope.</p>
<p>Identify male and female sex cells.</p>	<p>Show and describe through simple drawings the differences between egg cells and sperm cells, ovules and pollen grains. Pupils should know that sex cells are the basic requirement for sexual reproduction.</p>	
<p>Describe the processes of pollination and fertilisation in local plants.</p>	<p>Explain the process of pollination. Observe wind and insect pollinated flowers and notice the differences. Explain the process of fertilisation Briefly discuss the development of seeds.</p>	
<p>Identify the various ways of dispersal of seeds and fruits.</p>	<p>Examine the seeds and fruits which are adapted to wind and animal dispersal in your area.</p>	
<p>Observe the germination of bean seeds.</p>	<p>Discuss the conditions necessary for germination after observing experiments in which bean seeds are exposed to different conditions.</p>	<p>Agric.</p>
<p>Identify parts of the male and the female reproductive system in man.</p>	<p>Diagram of male reproductive system to show penis, sperm duct, and testes only. Diagram of female reproductive system to show vagina, ovaries, oviduct, and uterus only. Puberty, individual variation.</p>	<p>RME</p>
<p>Describe the process of fertilisation in man</p>	<p>Egg production and the menstrual cycle. Sperm production. Union between the egg and the sperm in the oviduct.</p>	
<p>Describe how the development of the embryo takes place in man.</p>	<p>Explain through a series of diagrams, mentioning amnion, placenta, umbilical cord, how the embryo gets its food and passes out waste materials.</p>	
<p>List the advantages of breast-feeding.</p>	<p>Emphasise the advantages of breast-feeding and the risks of bottle-feeding.</p>	<p>Home Econ.</p>
<p>Mentions methods to prevent fertilisation taking place.</p>	<p>Methods of family planning. Planned parenthood. Population education.</p>	<p>RME Soc. Stud.</p>

APPENDIX B

HOME ECONOMICS FOOD AND NUTRITION

STANDARD 8

STANDARD 9

<p>1. Nutrients - Functions, Sources carbohydrates, fats, proteins, minerals, vitamins, water, Food groups.</p>	<p>1. The alimentary canal - digestion and absorption of food nutrients.</p>
<p>2. Malnutrition and deficiency diseases. Causes and signs of deficiency diseases, prevention and cure of underweight, marasmus, nutritional anaemia.</p>	<p>2. Principles underlying planning of balanced meals. Breakfast, Lunches/Suppers, dinner, teas etc.</p>
<p>3. Food hygiene and handling. Reasons for cooking food. Methods of cooking - boiling, shallow frying, baking, drilling, steaming, including outdoor cooking.</p>	<p>3. Methods of cooking food, deep fat frying, roasting outdoor cooking.</p>
<p>4. Weights and measures: use of scales, measuring jugs, cups, homely measures.</p>	<p>4. Cereals: Sauces and accompanying dishes - pouring and coating sauces.</p>
<p>5. Cereals - Food value, raising agents. Flour mixtures - bread making scones, simple cakes and biscuits rubbing in and creaming.</p>	<p>5. Batter making - pour and coating batters.</p>
<p>6. Principles of meal, Planning and preparing simple balanced meals-breakfast, lunch, supper. Meals for children manual and sedentary workers.</p>	<p>6. Raising agents. Flour mixtures. Cake and biscuit making - melting method.</p>

APPENDIX B (cont.)

FOOD AND NUTRITION Cont'd

STANDARD 8

STANDARD 9

<p>7. Drinks - classification, food value when to serve, Preparation of different drinks - Tray setting.</p>	<p>7. Protective foods - classification, choice, selection, storage, preparation and cookery of fruit and vegetable salads.</p> <p>Salads and food value.</p> <p>Dressings for salads.</p>
<p>8. Protein foods - Eggs and milk. Legumes and nuts.</p> <p>Preparing: eggs using different methods, simple milk dishes including drinks and puddings. Legume dishes e.g. bean curry, bean patties, chilli-corncorn.</p>	<p>8. Protein foods-sources, functions, food value, storage and preservation.</p> <p>Cookery: Fish, cheese, meat and offal.</p>
<p>9. Soup making - classes and food value - Preparation of meat and vegetable broths.</p>	<p>9. Reheating foods. Left over food - meat, fish, cereals, fruit and vegetables.</p>
<p>10. Pure and Cream soups.</p>	<p>10. Meal Planning - Two and three course meals. Table laying and serving.</p>
<p>11. Food preservation - vegetables, fruits and meat.</p> <p>a) Drying. b) Freezing.</p>	<p>11. Special meals - packed invalid and vegetarian meals.</p> <p>12. Food preservation and storage - causes and prevention of food spoilage Jam making.</p>

APPENDIX C

Map 3.7 Objectives in the cognitive domain

Summary of the taxonomy: Handbook I (Bloom <i>et al</i> 1956)	
Introduction: This table is presented here as an example of a taxonomy of objectives. It is the best known of the existing taxonomies. (The use of the taxonomy is discussed in Parts 2 and 3.)	
Descriptions of the major categories in the cognitive domain	Illustrative general instructional objectives
<p>Knowledge. Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.</p> <p>Comprehension. Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.</p> <p>Application. Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area requires higher level of understanding than those under comprehension.</p> <p>Analysis. Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.</p> <p>Synthesis. Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviours, with major emphasis on the formulation of new patterns or structures.</p> <p>Evaluation. Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgements are to be based on definite criteria. These may be internal criteria (organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are higher in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgements based on clearly defined criteria.</p>	<p>Knows common terms Knows specific facts Knows methods and procedures Knows basic concepts Knows principles.</p> <p>Understands facts and principles Interprets verbal material Interprets charts and graphs Translates verbal material to mathematical formulas Estimates future consequences implied in data.</p> <p>Applies concepts and principles to new situations Applies laws and theories to practical situations Demonstrates correct usage of a method or procedure.</p> <p>Recognizes unstated assumptions Recognizes logical fallacies in reasoning Distinguishes between facts and inferences Evaluates the relevance of data.</p> <p>Writes a creative short story Proposes a plan for an experiment Integrates learning from different areas into a plan for solving a problem.</p> <p>Judges the logical consistency of written material Judges the adequacy with which conclusions are supported by data Judges the value of a work by use of internal criteria Judges the value of a work by use of external standards of excellence.</p>

APPENDIX C (cont.)

Map 3.8 Objectives in the affective domain

Summary of the taxonomy: Handbook II (Krathwohl <i>et al</i> 1964)	
Introduction: The second handbook of 'Bloom's taxonomy' deals with attitudes and values. Both these handbooks will be discussed further in Parts 2 and 3.	
Descriptions of the major categories in the affective domain	Illustrative general instructional objectives
<p>Receiving. Receiving refers to the student's willingness to attend to particular phenomena or stimuli (classroom activities, textbook, music, etc). From a teaching standpoint, it is concerned with getting, holding, and directing the student's attention. Learning outcomes in this area range from the simple awareness that a thing exists to selective attention on the part of the learner. Receiving represents the lowest level of learning outcomes in the affective domain.</p> <p>Responding. Responding refers to active participation on the part of the student. At this level he not only attends to a particular phenomenon but also reacts to it in some way. Learning outcomes in this area may emphasize acquiescence in responding (reads assigned material), willingness to respond (voluntarily reads beyond assignment), or satisfaction in responding (reads for pleasure or enjoyment). The higher levels of this category include those instructional objectives that are commonly classified under 'interests', that is, those that stress the seeking out and enjoyment of particular activities.</p> <p>Valuing. Valuing is concerned with the worth or value a student attaches to a particular object, phenomenon or behaviour. This ranges in degree from the more simple acceptance of a value (desires to improve group skills) to the more complex level of commitment (assumes responsibility for the effective functioning of the group). Valuing is based on the internalization of a set of specified values, but clues to these values are expressed in the student's overt behaviour. Learning outcomes in this area are concerned with behaviour that is consistent and stable enough to make the value clearly identifiable. Instructional objectives that are commonly classified under 'attitudes' and 'appreciation' would fall into this category.</p> <p>Organization. Organization is concerned with bringing together different values, resolving conflicts between them, and beginning the building of an internally consistent value system. Thus the emphasis is on comparing, relating and synthesizing values. Learning outcomes may be concerned with the conceptualization of a value (recognizes the responsibility of each individual for improving human relations) or with the organization of a value system (develops a vocational plan that satisfies his need for both economic security and social service). Instructional objectives relating to the development of a philosophy of life would fall into this category.</p> <p>Characterization by a value or value complex. At this level of the affective domain, the individual has a value system that has controlled his behaviour for a sufficiently long time for him to have developed a characteristic 'life style'. Thus the behaviour is pervasive, consistent and predictable. Learning outcomes at this level cover a broad range of activities, but the major emphasis is on the fact that the behaviour is typical or characteristic of the student. Instructional objectives that are concerned with the student's general patterns of adjustment (personal, social, emotional) would be appropriate here.</p>	<p>Listens attentively Shows awareness of the importance of learning Shows sensitivity to human needs and social problems Attends closely to the classroom activities.</p> <p>Completes assigned homework Obeyes school rules Participates in class discussion Completes laboratory work Volunteers for special tasks Shows interest in subject.</p> <p>Demonstrates belief in the democratic process Appreciates good literature (art or music) Shows concern for the welfare of others Demonstrates problem-solving attitude Demonstrates commitment to social improvement.</p> <p>Recognizes the role of systematic planning in solving problems Accepts responsibility for his own behaviour Understands and accepts his own strengths and limitations Formulates a life plan in harmony with his abilities, interests and beliefs.</p> <p>Displays safety consciousness Demonstrates self-reliance in working independently Practices cooperation in group activities Demonstrates industry, punctuality and self-discipline Maintains good health habits.</p>

APPENDIX D

TABLE 7-1 Standard Verbs to Describe Human Capabilities, with Examples of Phrases Incorporating Action Verbs

<i>Capability</i>	<i>Capability Verb</i>	<i>Example (Action Verb in Italics)</i>
Intellectual Skill Discrimination	DISCRIMINATES	discriminates, by <i>marching</i> French sounds of "u" and "ou"
Concrete Concept	IDENTIFIES	<i>identifies</i> , by <i>naming</i> , the root, leaf, and stem of representative plants
Defined Concept	CLASSIFIES	<i>classifies</i> , by using a <i>definition</i> , the concept "family"
Rule	DEMONSTRATES	demonstrates, by <i>solving</i> verbally stated examples, the addition of positive and negative numbers
Higher-order Rule (Problem Solving)	GENERATES	generates, by <i>synthesizing</i> applicable rules, a paragraph describing a person's actions in a situation of fear
Cognitive Strategy	ORIGINATES	originates a solution to the reduction of air pollution, by <i>applying</i> model of gaseous diffusion
Information	STATES	states orally the major issues in the presidential campaign of 1932
Motor Skill	EXECUTES	executes <i>backing</i> a car into driveway
Attitude	CHOOSES	chooses <i>playing golf</i> as a leisure activity

pected to show the meaning of the concept "family," including distinguishing it from other concepts.

Perhaps it should also be pointed out that we propose these five verbs, not because we feel wedded to them as words (some surely have approximate synonyms), but because we consider that there are *five necessary distinctions to be made*. Using these five words as verbs for intellectual skills has the desirable effect of preserving these distinctions. Trying to achieve a better "literary" style for statements of objectives can easily add confusion where there should be as little as possible. If one is inclined to prefer other verbs, their equivalence or lack of equivalence to these should be clearly stated.

Verb for Cognitive Strategy The next entry in the table shows the suggested major verb of the description of a cognitive strategy, which is *originates*. This verb implies the kind of intellectual process presumed to be involved in tasks requiring thinking or problem solving. When confronted with a truly novel task, without a familiar context, we suppose that the learner must search for applicable rules and applicable information. He then, in effect, formulates a general type of solution, and checks to see how such a solution applies to one or more specific

MOLEPOLOLE COLLEGE OF EDUCATION

INSTRUCTIONAL DESIGN COURSE

(FORMATIVE EVALUATION)

Education Section()

instruction

Use the following rating scale to evaluate **Unit Module ()**--enter the unit number. You should refer to the module as you respond. It is very important for your ratings and comments to reflect your best judgement because improvement of this and subsequent modules depends upon what you say. **Shade the box** of your choice.

Rating Scale

- HIGH 4. Very Well, Clearly, Helpful, Useful, Interesting, Easy
3. Well, Clearly, Helpful, Useful, Interesting, Easy
2. Not so Well, Clearly, Helpful, Useful, Interesting, Easy
LOW 1. Not at all Well, Clearly, Helpful, Useful, Interesting, Easy

A. OBJECTIVES

4 3 2 1

1. Were the objectives **clearly** written?
2. Were the objectives **helpful** in preparing you for the instruction?

B. CONTENT INFORMATION

4 3 2 1

3. Were the content **clearly** written?
4. How **useful** was the information given in the module?
5. Was the language used in the module **easy** to understand?
6. How **well** did the information match the objectives?
7. How **well** did you understand what you were supposed to learn?
8. How **well** did the information relate to what a teacher should know?
9. Were the examples given in the module **useful**?
10. How **helpful** did the examples help you to understand the concepts?

C. CONTENT PRESENTATION

4 3 2 1

11. Was the information presented in an **interesting** manner?
12. How **well** was the information presented step by step?
13. Generally how **well** did you like how information was presented?
14. How **useful** were the headings and subheadings used?

D. TEST/REVISION QUESTIONS

4 3 2 1

15. How **well** did the test match the objectives?
16. How **well** did the test adequately measure the objectives?
17. How **well** did the test challenge you personally?
18. How **well** did the multiple-choice questions challenge you?
19. How **well** did the short answer questions challenge you?
20. Were the revision questions **helpful** to you?
21. Were the multiple-choice questions **helpful** to you?
22. Were the short answer questions **helpful** to you?

Rating Scale

- HIGH** 4. Very Well, Clearly, Helpful, Useful, Interesting, Easy
 3. Well, Clearly, Helpful, Useful, Interesting, Easy
 2. Not so Well, Clearly, Helpful, Useful, Interesting, Easy
LOW 1. Not at all Well, Clearly, Helpful, Useful, Interesting, Easy

- E. PRACTICE/EXERCISE** 4 3 2 1
23. Did you find the practice/exercise **useful** to you?
24. How **well** did the exercises relate to the content?
25. How **well** did the exercises challenge you?
26. Should more exercises be included? [YES ; How many() NO] -----

- F. FEEDBACK** 4 3 2 1
27. How **well** did the feedback match the practice/exercises?
28. Was the feedback provided **useful** to you?
29. Was the feedback on the test **useful** to you?

- G. REMEDIATION** 4 3 2 1
30. Did you read the remediation references? YES ; NO -----
31. How **useful** did you find the remediation references?

- H. ENRICHMENT** 4 3 2 1
32. Did you read the enrichment references? YES ; NO -----
33. How **useful** did you find the enrichment references?

- I. REFERENCES** 4 3 2 1
34. Did you read the references at the end of the module? YES ; NO -----
35. How **useful** did you find the references at the end of the module?

J. YOUR OVERALL IMPRESSION

36. What do you like most about **this unit**?

37. What do you like least about **this unit**?

38. What suggestions would make to help improve **this unit**?