The Free University of Iran (FUI) operates by means of a multimedia teaching system, teaching students at a distance and developing a learning environment based near the place of residence or work of its students. This document reviews the development of the Foundation English Course according to the systems approach to instruction adopted by FUI. The purpose of this course is to improve English language reading skills and comprehension so that students can use selected, subtechnical passages to supplement their texts in math, science, and humanities. Course units focus on vocabulary, grammar, and word functions, each of which is described briefly in this document. The first appendix outlines terminal and enroute objectives, while the second appendix consists of a prototype unit. (JM)
The Free University of Iran (FUI) is a new and very unusual university in Iran. The FUI operates by means of a multi-media teaching system; it teaches students at-a-distance. It is developing a learning environment that is based near the place of residence or work of its students.

Because of the scattered nature of Iran's population and the very limited coverage of the existing institutions, the fundamental goal of FUI is to expand higher education opportunities. Secondly, the FUI is to produce active professional men and women whose skills, knowledge and attitudes will allow them to contribute to the continued development of Iran, and to respond creatively to changes within Iran's socio-economic environment. A third aim will be to provide educational opportunities for the general population and to upgrade and improve its knowledge and skills.

Initially, the FUI will offer degree programs in three areas; Teacher Education, Health Sciences, and Rural Development. The Teacher Education Program will provide secondary level teachers in mathematics and science. The Health Sciences students will be trained as medical assistants, nurses, and midwives which are greatly needed in the small towns and villages. The Rural Development Program which will not accept its first students until 1979 will prepare professionals to help improve socio-economic conditions in the rural areas of Iran.

The lengthy period of detailed planning and staff training began in December 1973 at the Tehran headquarters. This center is responsible for the design, development and maintenance of all teaching and support systems, which include the planning and programming of courses and the creation and distribution of course materials.

Initially, there will be 55 local centers throughout Iran. The centers will be equipped with libraries, radio, televisions, tape recorders, cassettes and other audio-visual materials and devices. The local centers will also house course tutors and counsellors who will provide the human interaction so necessary for rapid academic progress.
The FUI also plans to set up a number of regional centers in some of the provincial capitals. The primary purpose of the regional centers will be to support the local centers in administrative and educational matters. In addition, these centers will contribute to the creation and expansion of local centers; the recruitment and training of local staff; the organization of summer residential courses; and the supervision of final examinations.

The teaching system of the FUI which will be implemented through the local and regional centers consists of five components; presentation of knowledge, practice of knowledge, practice of skills, management of students, and quality control. To insure the proper development and integration of these five elements, the FUI has adopted a systems approach to instructional design. The purpose of this paper is to review the application of this approach to the development of the Foundation English Course (FEC) of the FUI.

A Systems Approach to Course Development

Although the systems approach is not a new concept, it has only recently become a viable force in curriculum and course development. The decision to use this approach was not an arbitrary one. Past experience from institutions like the FUI, primarily from the Open University of England, has clearly demonstrated the need for a highly structured course design procedure.

The teaching-at-a-distance format presents a variety of administrative and academic problems that do not exist in a conventional university. For example, the preparation of self-study correspondence units is not simply a matter of putting ordinary lectures into printed form. In a typical lecture situation, students usually have the opportunity to question the lecturer. However, this feedback mechanism is missing in the correspondence unit: Since the correspondence unit authors will never be directly in contact with the students, the unit materials must be well structured, lucidly written, self-explanatory, and set at the right level of difficulty. In addition, a conscious effort must be made to prepare materials that arouse a sense of excitement and purpose in the student. All of this must also be considered when preparing unit-related student activities, home experimental kits, radio and television programs, and other supplemental learning materials (Lewis, 1971).

Figure 1 shows a flow diagram of one systems approach to instructional design. There are many others. The following explanation briefly outlines the application of this system for FEC development.
Determining Content and Objectives

The first step in the developmental process is to determine the general content area, and at the same time to identify specific instructional objectives. The objectives should give a concise, behavioral description of the required skills. Selection of objectives should be based upon the following factors: 1) what the students should be able to do in the instructional units which follow the unit of concern, and after completing their education; 2) what the students are able to do prior to the beginning of the unit or course; and 3) the available instructional resources.

Another important factor to consider is the distinction between "terminal" and "enroute" objectives. Terminal objectives refer to what a student should be able to do at the end of a unit or series of units which are not followed by further instruction. Enroute objectives refer to what a student should be able to do at the end of some unit of instruction which will permit him to proceed to a subsequent unit (Miles and Robinson, 1971).

In Appendix I is a copy of the terminal and enroute objectives for the EEC. The objectives state the aims of the EEC in specific behavioral terms including an example of the type of passage the students should be able to read after completing the course. It also lists the vocabulary, grammatical structures, and word functions the students should know. The enroute objectives appear in outline form. They will be finalized as each unit is prepared.
Assessing Student Entry Level

Before beginning to write the actual course units, it is necessary to determine: 1) how much of what is to be learned in the unit, the students already know; 2) whether the students have the prerequisite behavioral capabilities for the instruction to follow; and 3) general characteristics such as age, socio-economic status, level of previous scholastic performance, etc. This information helps to determine the unit topics for the course.

Since very little statistical information on students exists in Iran, the FEC was forced to rely heavily upon subjective input about student entry levels. The most reliable, subjective information came from the Iranian high school teachers on the FEC staff. Each of them had at least five years experience teaching English as a foreign language.

In addition, the FEC did conduct three, small studies to determine high school students' knowledge of English grammar, vocabulary, and comprehension. These studies were compared with some Ministry of Education studies from Tehran.

In general it was concluded that beginning FUI students have the following characteristics:

1. Possess a high school diploma.
2. Live in smaller cities (under 100,000 population) or villages in the Iranian provinces.
3. Range in age from 18 to 25 years old.
4. Maintain a higher level of motivation than their counter-parts in the larger cities.
5. Be able to recall grammatical rules, but not apply them.
6. Know the Farsi equivalent about 1300 English words, possibly more in context.
7. Read English word for word usually translating the entire passage into Farsi beforehand.

Determining Instructional Alternatives and Preparing Course Materials

After assessing student entry levels and before selecting the appropriate instructional procedures, the content and objectives should be reviewed and refined. This is a rather small step, but very critical, if we expect our final course or unit to be a high quality product. In fact, periodic review and revision is the best way to insure that the course will continue to meet the current needs of the students.
Once the content and objectives have been refined, the instructional procedures must be selected and designed. This involves: 1) selecting the method or methods of instruction which appear most efficient for getting the most students to achieve the specified objectives; 2) selection of available instructional materials such as books, films, videotapes, lesson plans, etc.; 3) preparing new instructional materials when necessary; and 4) developing a sequential plan which takes students from where they are at the beginning of the unit to mastery of the unit objectives. This final step should include strategies for individual adaptation as much as possible (Davis, Alexander, and Yelon, 1974).

The prototype unit found in Appendix II shows the procedures adopted by the FEC. The selection was influenced by the emphasis on non-productive language skills. All of the FEC materials are being prepared to encourage reading as much as possible. It should be noted that each unit will end with a selection of supplemental readings which will be used as practice materials.

Television and radio programs were selected to supplement the textual materials. Television will be used for vocabulary expansion and reinforcement, clarification and expansion of unit topics, and student motivation. Topics for the television programs will include development projects in Iran, oil, biographies of famous scientists, and dramatizations of selected unit texts.

Radio will be used to introduce the students to the supplemental readings at the end of each unit. This will be done through dramatizations or documentary presentations. In later programs, there might be discussion of the readings in Farsi bringing out difficult vocabulary items, ideas or themes in the reading, or the attitudes of the authors. While radio will present only a selection of the supplemental readings, audio-cassettes will be prepared on all the readings so that students may borrow them from the local centers at their convenience.

Analyzing Student Performance

The next step is to determine the success or failure of the course or instructional system. This step is divided into two parts. First, the appropriate assessment procedures must be prepared or selected and then applied. It is most important that the assessment instruments measure the identical behaviors specified in the objectives. In fact, when it is possible, the assessment items should be written before the content.

Secondly, once the assessment has been made, the results must be interpreted so that the unit or course can be evaluated. This is not as simple as it may seem. Often, individuals attempt to evaluate a procedure or program without the
appropriate information. This usually leads to erroneous conclusions about the value of the instructional system in question.

The FEC will make use of both, objective and subjective assessment and evaluation procedures. Objective assessment will measure low level reading and comprehension skills such as recognition and recall of vocabulary, facts, ideas, data, and discussions. Summative, inferential, and evaluative comprehension skills will be assessed with subjective instruments.

Revising the System

Improving the system is an important final step. Of course, the assessment results are the best source of information on which to base this revision. It should be emphasized that:

1. Unsuccessful instruction is usually the result of one of the following reasons:
   a. Students did not have the prerequisites necessary to begin the unit.
   b. The instructional activities were inadequately designed.
   c. The instructional activities were inadequately implemented.

2. Changes in objectives, entry levels, and instructional alternatives should be made, if necessary, so that the most students achieve the most objectives possible.

Course development is a continuing process. In order for an instructional unit or course to meet the changing needs of students and subject areas, it should be revised regularly. The FEC will receive copies or summaries of all student assessments. Tutors and counsellors, who will be interacting with the students on a more personal basis, will send progress reports to the course team at least once a month. Occasionally, a course team member will visit the local centers to get a first hand report on progress and problems. All of this information will be used to keep the FEC as up to date as possible.

Foundation English Course: Progress to Date

Foundation English Course production is beginning to pick up momentum. The three month period from March to May was used for hiring personnel, refining content and objectives, determining instructional format, and identifying media and materials. Currently, course units are being written. During the month of August preliminary developmental testing will be conducted on the units that have been prepared up to that time.
After each unit is tested, it will be revised and retested. By December of this year, all written course materials must be ready for publishing. Media production has begun and will continue into the middle of next year. Assessment procedures will be prepared with the assistance of some testing consultants. Each procedure will be checked for validity and reliability using the unit objectives as a standard. Once certain phases of FEC production are completed, some of our personnel will begin planning future English Courses. These courses will probably be more technically oriented complementing the FUI degree programs in Teacher Education, Health Sciences, and Rural Development.

The place of the systems approach in FEC development is significant. Its strength lies in its ability to adapt to the peculiarities of the student and the course objectives. It also serves as a guide and coordinating framework for all those interested in course development; academics, educational technologists, media production personnel, and testing specialists. It is for these reasons that the FUI and FEC are committed to this approach to course development.
REFERENCES


Appendix 1

Foundation English Course
Terminal and Enroute Objectives
Terminal Objective for the Foundation English Course

The purpose of the Foundation English Course is to improve English language reading skills so that FUI students can use selected, sub-technical passages (see enclosure) to supplement their texts in the Math, Science, and Humanities Foundation Course. It is expected that these skills will be practiced and applied in later courses in the Teacher Education, Health Sciences, and Rural Development Programs.

The vocabulary, grammatical structures, and word function lists (see enclosures) will be used as guides and checklists for the Foundation English Course. The partial target vocabulary provides a corpus of words representative of the types of words whose knowledge will aid the student in reading sub-technical English. The grammatical structures include those that either need review, can be learned easily, or need emphasis because they do not occur in Farsi. The functional categories of lexical items help simplify the preparation of exercises which improve comprehension. Since these are checklists no attempt was made to arrange the items in a presentation hierarchy.

The goal of each unit is to improve reading comprehension by increasing the students', vocabulary, knowledge of grammar and word functions in context. Since the emphasis is on reading, the student will be required to exhibit other language skills (production, listening, etc.) only to the extent that these skills relate to reading or facilitate the demonstration of the required reading skills. Upon completion of the final unit the student should have mastered the following comprehension skills:

1. Locate and compare specified facts, date, ideas, concepts, and discussions from two passages with similar level of difficulty and style.
2. Write short answer (word or phrase) in English that requires recognition or recall of the main ideas or themes explicitly stated in the passages.
3. Paraphrase or summarize a passage in Farsi including the main idea and supporting details.
4. Appropriately carry out a set of instructions or follow a set of procedures, and be able to interpret a diagram from its caption and description in the passage.
5. Infer sequence, cause and effect, unstated assumptions and be able to predict outcomes.
Enroute Objectives Checklist

As the student progresses through the Foundation English Course, he will be able to:

Vocabulary Skills

1. Use contextual clues to learn the meaning of new words.
2. Enrich his vocabulary by recognizing compound words and derivatives.
3. Use a standard English to English dictionary (this will be included in a supplemental unit).

Paragraph Structure and Comprehension Skills

1. Identify and select main idea (topic sentence).
2. Scan for specified details and supporting ideas.
3. Summarize a selected paragraph in Farsi.

Comprehension of Complete Selection

1. Outline main and supporting ideas of a selected passage as the author discussed them.
2. Skim a passage and identify the paragraph where selected topics are found.

Speed of Recognition and Comprehension Skills

1. Improve motor activity as related to reading.
   a. Eye movement left to right and top to bottom.
   b. Eye span—key words and multiple word groups.
   c. Speed—forward movement and retraction.
   d. Eliminate lip movement and reading aloud.
2. Improve perceptual activity as related to reading.
   a. Rapid recognition of contextual clues, structural clues, and orthographic clues such as punctuation and capitalization.
   b. Rapid recognition of word units, verb phrases, noun phrases and clauses.

Note: The enroute objectives will further specified and finalized as each unit is written.
We live in unusual times. The population of the earth, now about 3 billion people, is increasing at an unprecedented rate of about 1.8 per cent per year. At this rate 54 million consumers of food are added to the earth every year. Thus, the daily net increase (births minus deaths) is more than 100,000 people, or more than one extra mouth to feed every second. As public health measures are extended and improved, lowering the death rate, the rate of increase in population will itself rise. We can expect the population, therefore, to just about double every 40 years. Clearly, something must change before the "population bomb" explodes.

All animals, including man, are dependent for their fuel on the solar energy trapped by green plants. How many people we can support on the earth depends on the amount of energy that can be trapped by photosynthesis. Most estimates of photosynthetic productivity show that the waters of the earth contribute much to the total. At least half and possibly up to 80 percent of the photosynthesis on earth occurs in salt and fresh water. One day it may become necessary to increase food productivity by farming the seas.

Another way to increase food production is to improve the plant itself. A good deal has been accomplished in the field already by the development of scientific agriculture: Scientists have given us increasingly better kinds of plants. We now know how to eliminate insect and fungus pests, and how to improve the soil. Some day, perhaps, we may understand the mechanism of photosynthesis so well that we will be able to control and improve its efficiency within the plant.

Even if the food productivity of the earth is increased, this increase will be more than negated by an unrestricted increase in the population. Why try to double food productivity when in 40 years the gain will be completely negated by a doubling of the number of mouths to feed? Clearly, man must some day decide what number of people can comfortably live on the earth. Then means must be found to restrict the population to that number. The alternatives seem to be either a peaceful, planned, voluntary limitation or a violent and chaotic limitation imposed by starvation, disease, or war.

-Arthur W. Galson, The Life of the Green Plant (adapted)
The partial target list was generated in an attempt to provide a corpus of words representative of the types of words whose knowledge will aid a student in reading sub-technical English. It is suggested that during the Foundation English Course a student will become familiar with and learn vocabulary items included in this list. This list was designed as a reference list, providing a large number of words commonly found in sub-technical writing (words common to a number of disciplines) as well as basic words of general usage. The target list also contains the words classed as "unknown". This list is not meant to constitute a target requirement for the Foundation English Course. It will be used as a check list in the process of determining those words which should be emphasized in the teaching of vocabulary items during the course.

The Foundation English Course Team has agreed that the selection of specific vocabulary items will be determined by the reading passages selected for the Course Units. This policy is particularly important for the determination of appropriate concrete nouns, as the proposed target list does not deal with this aspect of vocabulary items.

The target list has been compiled from the following sources provided to the English Course Team. Symbols appearing in parentheses after each reference are used in the target list to denote the sources of each word appearing on the list.

1. A list of words, determined as "unknown to the average Iranian high school graduate, was taken from the high school English text series, Graded English Books 1-6. (GE)

2. Selected words were taken from the glossary of a first semester technical English course taught at Polytechnic University, Tehran. The words were compared with the "Rank List" taken from the Kucera-Francis study of word frequency. The frequency is given with the word in the target list. (PT, RL-frequency).

3. Two lists were prepared by the course Team Chairman. One list was compiled from the Basic English vocabulary list (Encyclopedia Britannica, 1949) and the Kucera-Francis "Rank List". Only words with a frequency of 100 or above were used. (BE, 100+).
4. A list of words was taken from the appendix to an article by Strevens on technical English. Specifically, sections 4-7, experimental notions, theoretical concepts, and mathematical concepts were used. (5) Strevens, P. The Medium of Instruction (mother tongue - second language) and the Formation of Scientific Concepts. International Review of Applied Linguistics, 9(3), 1971, 273-274.

5. A list was taken from an article by Bates and Dudley-Evans. (D) Bates, M., and Dudley-Evans, A. Notes on the Introductory English Course for Students of Science and Technology at the University of Tabriz: English Language Teaching Documents. English Teaching Information Centre, the British Council, 4, 1974.

Grammatical Structure

At the time of admission to the Free University, a high school graduate has completed six years, study of the English language as presented in the textbook series, Graded English, Books 1-6, provided by the Iranian Ministry of Education. The high school English course focuses on introducing English grammar to the student. The grammar is organized according to a logical hierarchy representing increasing difficulty and complexity of structure. This high school series emphasizes production. Included with this report is a list of all grammatical structures found in the Graded English Series. The student has been exposed to these structures but he may not have mastered them.

Because the aim of the Foundation English Course is teaching reading skills and comprehension, a new approach to teaching grammar will be employed. The ordering for the presentation of grammar will be dictated by the structures which occur in the passages selected for the course Book (these passages will be arranged in the Course Book in order of their difficulty, this being determined by a consideration of vocabulary, grammar and readability). The section of each lesson devoted to grammar study will follow a functional approach to grammar. Recognition rather than production will be stressed.

A report was prepared evaluating the high school graduate's knowledge of grammar. Each grammatical item was considered in the context of a sentence. This report described the following categories: structures which are understood by the student, but require review; structures to which the student has not been exposed but which can be learned easily; and structures which need emphasis because they do not occur in Farsi. From this list of grammatical structures, those structures important for reading skills and comprehension were extracted. This final list is also included below.

Upon completion of the first draft of the materials written for the Foundation English Course, the grammar which has been taught will be evaluated in order to ensure that there has been no omissions of important structures. Any omitted grammatical item which is considered to be significant will then be worked into the course material.
List of Grammatical Structures Relevant for Teaching Reading Skills

1. Structures which are understood by the student but require review.
   1. Comparative and superlative of some adjectives e.g. bad worse worst good better best
   2. Adverbs of frequency. e.g. generally, seldom, frequently, usually, etc.
   3. Perfect tense distinctions Have been, has been, had been
   4. Modals in questions Must she go?
      - Modal meaning distinctions - difference between CAN and MAY
   5. Referents relative pronouns: who, whom, which, whose
   6. Since, for, so far, for ever
   7. Not only .... but also
   8. I would go if I could.
   9. The signals of conjunctions in compound sentences. e.g. He worked hard so he passed the examination. Cause and effect.

2. Structures to which the student has not been exposed but which can be learned easily.
   1. Past tense and past participles of verbs which are new.
   2. Unreal present e.g. what would you do if you were Prime Minister?
   3. Prefixes: mis-, un-, dis-
   4. Uses of COULD Difference between Could you help me? (present)
      You could have helped me but you didn't.

3. Structures which need emphasis they do not occur in Farsi.
   1. Various uses of GET e.g. I can't get the man to do the job for you.
   2. Introductory adverbial or adjectival phrase e.g. Having done his work, he left for school.
   3. -ed forms used as adjectives e.g. The learned man delivered the lecture.
4. The use of 'it' in a subject position.
   e.g. It's always wise to look before you leap.
   It has been suggested that you keep the change.

   as referent
   e.g. He picked the book up from the table, but in his
       hurry he dropped it.

5. Passive tenses. various different uses
   e.g. It was said.
   He had his leg operated on.
   They were robbed.
Functional Categories.

A. Semantic Implication.
B. Lexical relationship
   a. Synonymy
   b. Hyponymy realised by cognate word
   c. Antonymy
   d. Established by writer
   e. Depending on factual knowledge
   f. Depending on shared presuppositions/values
C. Syntactic
   1. Time and place relators
      a. ordering previous to given time reference
         i. adjectival
            earlier, former, previous, prior
         ii. adverbial
            already, as yet, before, beforehand, earlier, first,
            formerly, previously, so far, yet
            that, this, by, now, until, then
            pro-forms: before, now, until, then
      b. simultaneous:
         i. adjectival:
            concurrent, current, contemporary, simultaneous
         ii. adverbial:
            at present, at this point, here, (in the) meanwhile,
            (in the) meantime, now, then, throughout, when (relative)
      c. subsequent
         i. adjectival
            ensuing, following, later, next, subsequent
         ii. adverbial
            after, afterwards, (all) at once, finally, immediately,
            last, later, next, since, subsequently, suddenly, then
   d. ordinals
   e. verb forms (tense / aspect).
2. Place relaters:
   a. Ellipsis:
      the front/ back + prepositions
   b. Pro-forms:
      there, there

3. Logical connecters:
   a. Enumeration [AND]
      i. ordering: first, second, etc..., finally, last of all
         one two ... : for one thing ... for another...
      ii. ordering + evaluating: above all, on top of it all,
         last but not least, first and foremost, to begin/start with,
         in the first/second place, moveover, to conclude.
      iii. formulaic expressions:
         I want to begin by saying ..., etc.

   b. Addition [AND]
      i. Non-evaluative: also, again, then, too, either, neither/nor
      ii. Evaluative: equally, moreover, what is more, not only...
          but also
      iii. Attitudinal: indeed, actually, in fact

   c. Transition [AND]
      i. Non-evaluative: now, as for, with, respect
         reference to regard

   d. Summation
      in all, in sum, altogether, in brief, briefly, in short
      to sum up, in conclusion

   e. Apposition
      i. Paraphrase: that is, that is to say, in other words
      ii. Exemplification: for example / instance

   f. Result
      therefore, as a result, accordingly, hence, consequently,
      thus, for this/that reason.

   g. Inference:
      in this / that case, if so / not, otherwise
Replacement:
alternatively, on the other hand, worse still

i. Contrast:
on the contrary, by comparison, (way of) contrast, on the one hand ... on the other hand, instead

j. Concession:
yet, however, still, admittedly, certainly, of course, really true / of course ..... but however .....

Attitudinal: Nominally, officially, superficially, technically, theoretically, actually, really, in fact

Even

k. Cause:
for .......

SUBORDINATES.

after, (al) though, as, because, before, but, if, once, since, till, unless, until, whereas, whereby, whereupon, while

in that, so that, such that, except that

now, suppose, given
providing, supposing, granted
provided, considering
admitted, assuming seeing
as far/long/soon as

ADJUNCTS

1. Restrictives:
a. Exclusives: alone, exactly, exclusively, just, merely, only, precisely, purely, simply, solely

b. Particularisers: chiefly, especially, largely, mainly, mostly, particularly, primarily, principally, specifically, at least, in particular

2. Additives:
again, also, either, equally, even, further, likewise, neither, nor, similarly, too, as well, in addition

3. Emphasisers:
actually, certainly, clearly, definitely, indeed, obviously, plainly, surely, of course
frankly, honestly, literally, simply, just

4. Maximisers:
absolutely, altogether, completely, entirely, extremely, fully, perfectly, quite, thoroughly, totally, utterly, in all respects.
5. Boosters:
   badly, bitterly, deeply, enormously, far, greatly, highly,
   intensely, severely, so, strongly, violently, well, a great
   deal, a good deal.

6. Downtoners:
   quite, rather, enough, sufficiently, more or less

7. Diminishers:
   mildly, moderately, partly, slightly, somewhat, in part, to some
   extent, in some respects / ways

8. Minimisers:
   Neg: barely, hardly, little, scarcely, in the least / slightest,
   at all

9. Approximators:
   almost, nearly, practically, virtually, as good as
Appendix II

Foundation English Course

Prototype Unit
LESSON ONE: READING ONE, "SCIENCE AND IMAGINATION"
READING TWO, "VACATION LANDS IN THE SKY"

Part 1: Key Words to Reading One, Simplified Version.
Part 2: Reading One, Simplified Version.
Part 3: Key Words to Reading One, Original Version.
Part 4: Reading One, Original Version.
Part 5: Comprehension Questions on Reading One.
Part 6: Grammatical Questions on Reading One.
Part 7: Grammar Points to Remember.

Part 8: Key Words to Reading Two, Simplified Version.
Part 9: Reading Two, Simplified Version.
Part 10: Key Words to Reading Two, Original Version.
Part 11: Reading Two, Original Version.
Part 12: Comprehension questions on Reading Two.
Part 13: Grammatical Questions on Reading Two.
Part 14: Grammar Points to Remember.

Correct answers to Parts 5, 6, 12, and 13.

(Note: This is the format for lessons 1-4 only. Lessons 5-16 will not have double readings, simplified and original. They will have single readings, some of them adapted.)
Part 1: Key Words to Reading One, Simplified Version

Study the following words. Each word is first defined and is then presented in several contexts. The words are taken from the reading passage that follows. If you know these words well, you will be able to read the passage faster and without too much translation. Not all meanings of each word are given. Only the meaning of the word as it is used in the reading is given.

1. To imagine. To imagine is to make a picture in your mind.
   Imagine that you are walking on the moon.
   Imagine that you were living five hundred years ago.
   Can you imagine living on the moon?
   Can you imagine Europe five hundred years ago?

2. To suppose. To suppose something is to imagine it.
   Suppose that you could live to be two hundred years old.
   What do you suppose life will be like two hundred years from now?
   Suppose you could live on the moon.

3. To believe. To believe something is to think that it is true.
   Do you believe everything your friends tell you?
   Do you believe that there is life on the moon?
   Five hundred years ago the earth was believed to be flat.

4. To explain. To explain something is to tell everything about it.
   The teacher explained the lesson very well.
   Parents explain many things to their children.
   Some dictionaries do not explain words well enough.

5. To describe. To describe is to give a picture in words.
   The radio announcer described the football game.
   Can you describe your friend's new car?

6. To happen. To happen is to take place, to go on, to occur.
   A bad accident happened on the road to town.
   There was an accident yesterday. It happened at four o'clock.
   What is happening in the world today?
7. Birth. Birth is coming into the world.
   The birth of the healthy baby made the parents happy.
   His friends give him a party every year on the day of his birth.

8. Death. Death is the end of life on earth.
   The death of his friend made him very sad.
   His death happened in a car accident.

9. Event. An event is a happening, usually an important one.
   His birth was a happy event.
   The events of the day are described every night on television.

Part 2: Reading One, Simplified Version.

SCIENCE AND IMAGINATION

Imagine that you are in a small village in Europe five hundred years ago. The people in this village believe that the earth is flat. They also believe that the stars are little lights on a big dome. And they believe that the dome moves around an immovable earth.

A farmer in this small village lives and dies in a world that does not change. The world did not change much in the century before his birth and it will not change much in the century after his death.

Suppose that you try to explain to the farmer about today's world. You say to him:
"You can sit at home and look at a screen that shows you what is happening a thousand miles away. On that screen you can also see things that happened a few hours ago or yesterday or ten years ago."
"You climb up some steps into a big house. The house looks like a cucumber with wings on it. It speeds along the ground and flies into the air. Soon you are eight kilometers up.

You can fly from Paris to Rome faster than you can walk to town from here.

A man walks into a tall metal tube which is as high as a tower. A flame comes from the bottom of the tube and there is a very loud noise. Then the tube rises into the air. In fifteen minutes that man is three hundred kilometers up and he is flying at a speed one thousand times faster than a good horse can run. Millions of people on the ground are listening to him as he describes what he sees. Other people on the ground are seeing on their screens the same thing that he sees."

If the farmer could believe these unusual stories these events would certainly seem like miracles to him.

Part 3. Key Words to Reading One, Original Version

Study the following words. They are taken from the reading passage that follows. This passage is the original version of the easier passage that you have just read.

1. To transport. To transport something is to take or to carry it from one place to another.
   Ships transport oil from one country to another.
   Mail is often transported by airplane.
   The woman was transported to the hospital in a car.

2. Some. Some means about or approximately when used before numbers
   We walked some five miles. (We walked about five miles.)
   The apartment building was some eighteen meters high.
3. To consider. To consider is to believe or to think that something is true.

We considered his story to be true.
His teachers consider him to be very smart.
She was considered to be a good speaker.
For a long time, Neptune was considered to be the planet farthest from Earth.

4. To revolve. To revolve is to move around in a complete circle.

The earth revolves around the sun.
The moon revolves around the earth.
The hands of the clock revolve around the face of the clock.

5. To fix. To fix something is to put it in a place so that it cannot move.

Fixed means immovable, always in one place.
The earth is not fixed because it revolves around the sun.
We could not move the best because it was fixed to the floor.

6. To be the same as. To be the same as is the opposite of to be different from.

My breakfast today was the same as my breakfast yesterday.
We are in the same class, so his book is the same as my book.
The work of a doctor now is not the same as the work of a doctor one hundred years ago.

7. To be like. To tell what something is like is to describe it.

He explained to me what flying an airplane is like, but I couldn't imagine it.
A history book can tell us what life was like in the past.
Suppose you were transported back in time to a small village in Europe some five hundred years ago. The earth is still considered to be flat. The stars are believed to be little spots of light on a big dome that revolves around a fixed earth.

A farmer in this small village lives in a world that is much the same when he dies as when he was born. It was much the same a century before his birth as it will be a century after his death.

Suppose you try to explain to the farmer what the world of the twentieth century is like. "You sit in a chair at home and watch a screen that shows you what is happening a thousand miles away. On that screen you can also be shown things that happened a few hours ago or yesterday or ten years ago.

"You climb up some steps into a big, cucumber-shaped house with wings on it. It speeds along the ground and zooms into the air. Soon you are eight kilometers up. In less time than it takes to walk to town you can fly from Paris to Rome.

"A man steps into a tall metal tube, as high as a tall building. There is a flash of flame from the bottom of the tube and a thundering roar. Then the tube rises into the air. In fifteen minutes that man is three hundred kilometers up and zooming around the earth at a speed one thousand times faster than a good horse can run. Millions of people
30 on the ground are listening to him describe what he sees. Others on the ground are seeing just what he sees."

These events would surely seem miracles to the farmer, if he could believe such fantasies.

--Hy Ruchlis, Discovering Scientific Method. (adapted)

Part 5: Comprehension questions on Reading One.

A. True and False. Mark each statement either true (T) or false (F). Refer back to the Original Version of Reading One, which you have just read.

1. The villagers believed that the earth moved.
2. The world of the villagers changed more than today's world.
3. Today people can see on television what is happening many miles away.
4. The villager could walk to town in less time than it takes us to fly from Paris to Rome.
5. There is a thundering roar after the tube zooms into the air.
6. The farmer would think that these events were miracles.
7. The people of the village are just beginning to consider the earth to be flat.

B. Multiple choice. Circle all possible correct answers, as in the following example:

Five hundred years ago the villagers believed that:

a. the earth was immovable.
b. the earth revolved around the sun.
c. a dome revolved around the earth.
d. the dome did not move.
1. The world in which the farmer lived was
   a. different from when he was born.
   b. like 100 years before he was born.
   c. similar to when he was born.
   d. different from 100 years after he died.

2. The village of the farmer
   a. changed little during his life.
   b. changed much during his life.
   c. was the same from century to century.
   d. was very different after his death.

3. "Some 500 years" means
   a. 1500 years
   b. 1000 years
   c. exactly 500 years
   d. about 500 years

4. A television screen cannot show you
   a. what will happen in the future
   b. what happened in the past
   c. what is happening now
   d. what is happening a thousand miles away

5. The cucumber shaped house described in paragraph four is probably
   a. a train
   b. an airplane
   c. a space ship
   d. a car

6. The tall metal tube described in paragraph five is probably
   a. a building
   b. an elevator
   c. a space ship
   d. a flame

7. When an airplane travels through the air it travels
   a. slowly
   b. fast
   c. slower than a horse
   d. faster than a space ship
8. If you were transported back in time you would be living
   a. at the present moment
   b. next week
   c. in the past
   d. in the future

9. A thundering roar would most likely be made by
   a. a space ship
   b. a horse
   c. a building
   d. a screen

10. "a good horse" appears in line 29. In this sentence "good" means
    a. expensive
    b. fast
    c. strong
    d. quiet

11. "just" in line 32 means
    a. exactly what he sees
    b. almost the same thing that he sees
    c. more than what he sees
    d. the same thing that he sees

12. "surely" in line 33 means
    a. probably
    b. never
    c. certainly
    d. always

13. "such fantasies" in line 34 refers to
    a. these events
    b. the events you described to the farmer
    c. the events seen on television
    d. the events the farmer has in his life.

14. Which of the following tells what is happening in paragraphs 3, 4, and 5?
    a. You are describing the world of the twentieth century.
    b. The writer is describing the village of 500 years ago.
    c. You are describing events seen on television.
    d. You are telling the farmer about events which seem like miracles to him.
Part 6: Grammatical questions on Reading One.

A. Multiple choice. Circle all possible correct answers.

1. Who is being asked to suppose in line 1?
   a. the writer
   b. the reader
   c. the villager
   d. the pilot

2. "It" in line 9 refers to
   a. the farmer
   b. the village
   c. the world
   d. the dome

3. In line 11 "you" refers to
   a. the farmer
   b. the writer
   c. the reader
   d. the people

4. In line 12 who does "you" refer to?
   a. the farmer
   b. the writer
   c. the reader
   d. the people

5. In line 23, the tall metal tube is
   a. higher than a tall building
   b. shorter than a tall building
   c. the same height as the tall building
   d. the same shape as the tall building

6. In line 30 "him" refers to the
   a. farmer
   b. reader
   c. writer
   d. man
7. In line 30 the people on the ground are listening to him
   a. as he describes what he sees.
   b. which he is describing what he sees.
   c. and describing him.
   d. and describing what he sees.

8. In lines 30 and 31 "him" and "he"
   a. refer to different persons
   b. refer to the same person
   c. refer to the world
   d. refer to the reader

9. In line 31 "others" refers to
   a. people in the village 500 years ago
   b. people today
   c. pilots
   d. that man

10. In line 38, which of the following best describes "these events"?
    a. the events seen on the television screen
    b. the events of the future
    c. the events the farmer has in his life
    d. the events you described to the farmer

Part 7: Grammar points to remember.

1. Passive constructions. Look at these sentences:
   a. You were transported back in time.
   b. The earth was considered flat.
   c. Many things were shown on the television screen.

To make an active sentence into a passive sentence, the direct object of the
active sentence is used as the subject of the passive sentence. The verb
phrase of a passive construction is formed with the verb to be plus the past
participle. For example:
Active                                      Passive

**Scientists discovered the new planet.**  **The new planet was discovered.**

*subject*                              *subject* to be past participle

*direct object*                        *(by scientists.)*

Several men built the space ship.  **The space ship was built (by several men).**

*subject*                              *subject* to be past participle

*direct object*

Can you change the following active sentences to passive sentences?

a. We discuss many things in our classes.
b. We teach many things on television.
c. We discuss difficult problems with our tutor.
d. We study many subjects in class.
e. George built the airplane.

2. Verbs like believe, consider, think, and say is the passive with to be.

Look at these sentences:

a. The earth was considered to be flat.
b. The stars were considered to be spots of light.
c. The farmer is thought to be intelligent.
d. The world is said to be round.

Note that certain verbs (believe, consider, think, say) can be used in passive constructions followed by to be. Can you change the following active sentences into passive sentences using to be?

a. People consider the earth to be round.
b. We believe the stars are suns.
c. People thought the earth was flat.
d. People say the sun is very large.
e. We say that the earth revolves.
Part 8: Key Words to Reading Two, Simplified Version

Study the following words. Each word is first defined and is then presented in several contexts. The words are taken from the reading passage that follows. If you know these words well, you will be able to read the passage faster and without too much translation. Not all meanings of each word are given. Only the meaning of the word as it is used in the reading is given.

1. Flight. Flight is flying, a trip made by flying.
   - They watched the flight of the bird.
   - The airplane flight from Tehran to New York is long.
   - Scientists have made space flight possible.

2. Curious. To be curious is to want to know or understand.
   - A curious child is always asking questions.
   - She was curious about the box. She wanted to know what was in it.

3. Curiosity. Curiosity is the noun form of curious.
   - He couldn't control his great curiosity.
   - Her curiosity about foreign lands was great.

4. Visible. Something is visible if it can be seen with the eyes.
   - That high building is visible from every part of the city.
   - The moon is usually not visible in the daytime.
   - Some stars are even bigger than the sun, but they are not visible to people on the earth because they are so far away.

5. Parallel. Two parallel lines always have the same distance between them.
   - The top of the window is parallel to the bottom of the window.
   - The road is parallel to the river.
   - A road which goes from north to south is not parallel to a road which goes from east to west.

6. To mark. To mark something is to indicate it.
   - On a map, the color blue usually marks water.
   - On a map, a border marks the line between two countries.
   - Important roads are usually marked on a map.
Imagine a society in which space flight is common and is not more difficult or unusual than air flight is now. What vacation lands in the sky will space tourists visit?

The closest place will be the moon. Probably in the future the schoolteacher from Tehran and the curious young person from London will carry their cameras with them on a tour of the moon. They will go just to see it and send back postcards to their friends who stay at home.

Naturally, tourists will experience many strange things on the moon: the silence, the unwinking stars, and the slowly moving, fiery sun.

The earth itself will be the most unusual sight. When the earth is seen from the moon, it will be much more impressive than the moon is when it is seen from the earth. The earth will seem to be nearly four times as large as the moon seems to be from the earth. The earth will seem to be seventy times as bright as the moon. The continents and oceans will not be clearly visible through the earth’s cloudy atmosphere. The earth will look blue-white with cloudy bands. These bands are parallel to the equator. Oceans will appear deep blue; the fertile lands will appear blue-green, and the deserts will appear a light orange.

The sight of the earth will be especially wonderful when the sun travels behind it and the sun is hidden. At these times the sun will approach the earth from the east. The outer part of the sun will move behind...
the earth first, and then gradually the sun will be covered.

30 The complete eclipse of the sun will take just an hour after it starts to move behind the earth.

During that hour the tourists will be watching from under a clear dome with filters which keep out ultraviolet rays and most of the visible light. When the sun is completely behind the earth, the filters will be taken away and the great sight will be clearly visible.

Part 10: Key Words to Reading Two, Original Version.

1. Sphere. A sphere is something which has a shape like a round ball.
   An orange is a sphere.
   A football is a sphere.
   The earth has a shape like a sphere.

2. Remarkable. Something which is remarkable is unusual, not common.
   Walking on the moon is a remarkable thing.
   Ferdowsi was a remarkable poet.
   It would be remarkable if a person could travel from Tehran to Paris in one hour.

3. Presume. To presume something is to accept that it is true without complete proof, to think that something is likely.
   Most people presume that there will always be enough water to drink.
   I presume that you are hungry because you didn't eat anything today.
   He presumed that the airplane would arrive on time.

4. Presumably. Presumably means likely or probably.
   He never does his work. Presumably he will not pass the examination.
   The weather this spring was very hot. Presumably the summer weather will be worse.
   There are dark clouds in the sky. Presumably it will rain.
   Presumably scientists will discover new ways to cure diseases.
5. **To view.** To view something is to look at it or to examine it.
   - They viewed the moon through a telescope.
   - The astronauts viewed the earth from space.
   - The moon can be viewed easily from the earth.

6. **Solar.** Solar means related to the sun.
   - Solar energy is energy which comes from the sun.
   - There are nine planets in the solar system.
   - The Iranian calender is a solar calendar.

7. **Transparent.** Something which is transparent is clear or easy to see through.
   - You can see through a window because the glass is transparent.
   - The lens of a microscope is transparent.
   - The water was so transparent that we could see the fish swimming in it.

8. **Remove.** To remove something is to move it, to take it away.
   - After dinner he removed the dishes from the table.
   - She removed the skin of the orange.
   - The blackboard was removed because they wanted to paint the wall.

9. **Appearance.** The appearance of something is what it looks like.
   - The man was very ill but he did not have the appearance of a sick person.
   - The appearance of the earth is very beautiful to someone in space.
   - A person's appearance changes as he gets older.

10. **To approach.** To approach is to move towards or to come near something.
    - He approached the house because he wanted to speak to the owner.
    - If a space ship approaches too near the sun it will burn.
    - An airplane goes more slowly as it approaches the airport.
Imagine a society in which space flight is routine and no more difficult or remarkable than air flight is now. What celestial vacation lands will space tourists visit?

The closest will be the moon. Presumably there will be a time when the schoolteacher from Tehran and the curious young person from London will carry their cameras along on some tour of the moon, just to see it and send back postcards (by rocket mail, of course) to their stay-at-home friends.

Naturally there will be many strange things on the moon: the vast silences, the unwinking stars, and the slowly moving, fiery sun.

The most unusual sight will be that of the earth itself. The earth as viewed from the moon will be far more impressive than the moon as viewed from the earth. The earth's sphere will be nearly four times the diameter of the moon as seen by us now. It will seem seventy times as bright. The continents and oceans will not be clearly visible through the earth's cloudy atmosphere, but the globe will have a blue-white appearance, with misty bands arranged parallel to the equator. There may be areas of deeper blue, of blue-green, and of faint orange to mark oceans, fertile lands, and deserts.

In particular, the sight of the earth will be wonderful on those occasions when the sun travels behind it and is hidden. At such times the sun will approach the earth from the east. The solar corona will move...
behind the earth's globe first, and then gradually the sphere of the sun will be covered. The complete eclipse of the sun, after its initial contact with the earth, will take just about an hour.

During that hour the tourists will be watching from beneath a transparent dome fitted with filters to cut out ultraviolet rays and most of the visible light. When the sun's sphere completely disappears, the filters will be removed and the spectacle will be visible in full clarity.

---Isaac Asimov, Fact and Fancy
(adapted).

Part 12: Comprehension Questions on Reading Two.

A. True and False. Mark each statement either true (T) or false (F). Refer back to the Original Version of Reading One, which you have just read.

1. In the society which you have imagined, space flight will be as easy as air flight is today.
2. The sun will be one of the celestial vacation lands the space tourists will visit.
3. The earth as seen from the moon is bigger and brighter than the moon as seen from the earth.
4. The earth's clouds will be visible from the moon.
5. When you are on the moon, the earth's oceans seem to be faint orange.
6. An eclipse of the sun happens when the earth moves behind the sun.
7. The tourists watch the eclipse from the moon.
B. Multiple choice. Circle all possible correct answers.

1. Space tourists will travel to celestial vacation lands by
   a. car
   b. helicopter
   c. rocket
   d. airplane.

2. The strangest and most wonderful thing that you can see from the moon will be
   a. the stars
   b. the sun
   c. the earth's continents
   d. the solar eclipse

3. There may be areas of deeper blue, blue-green, and faint orange on
   a. the moon
   b. the earth
   c. the stars
   d. the sun

4. After about an hour, the earth will cover
   a. the outer part of the sun
   b. the globe of the sun
   c. half of the sun
   d. the solar corona.

5. The purpose of the filters is
   a. to increase the ultraviolet rays
   b. to keep out all of the visible light
   c. to increase the visible light
   d. to keep out ultraviolet rays.
Part 13: Grammatical Questions on Reading Two.

A. Multiple choice. Circle all possible correct answers.

1. In line 1 who is being asked to imagine?
   a. the writer
   b. the reader
   c. the space tourists
   d. the schoolteacher and the curious young person

2. In line 2, "no more difficult....than" means
   a. not more difficult than
   b. has the same degree of difficulty as
   c. is just as easy as
   d. is more difficult than

3. The "space tourists" of line 3 are
   a. in today's society
   b. in the imaginary society
   c. in the society of the past
   d. in the society of the future

4. The last sentence of the paragraph 1 leads us to expect the next paragraph to
   a. describe the space tourists
   b. describe the flight through space of the tourists
   c. describe the flight through space of the tourists
   d. describe the imaginary society

5. "The closest" in line 5 refers to the closest
   a. imaginary society
   b. space flight
   c. air flight
   d. celestial vacation land

6. To whom is it closest?
   a. people on Venus
   b. people on the moon
   c. people on the earth
   d. people in outer space
7. The society which you have imagined would be one on the
   a. sun
   b. earth
   c. moon
   d. an imaginary planet

8. Which of the following expressions best expresses the meaning of
   "Presumably there will be a time when..." in line 5?
   a. we know that at some time in the future...
   b. probably there will be some time in the future...
   c. we know the exact time in the future when...
   d. there will certainly be a time when...

9. In line 8, "it" refers to
   a. the earth
   b. the tour
   c. the moon
   d. the space flight

10. The young person and the schoolteacher go to the moon just
    a. to study it scientifically
    b. to see it
    c. to send back postcards
    d. to telephone their friends

11. The friends of the young person and the schoolteacher
    a. are tourists
    b. travel a lot
    c. want to visit the moon
    d. do not travel very much

12. In line 11 "naturally" means
    a. as it is in nature
    b. nevertheless
    c. however
    d. of course
13. In line 12 ":" could be replaced by
   a. for example
   b. such as
   c. however
   d. like

14. The "sight" in line 14
   a. is seen from the earth
   b. is seen from the moon
   c. is seen by the space tourists
   d. is seen by the tourists' stay-at-home friends

15. In line 18, "it" refers to
   a. the moon
   b. the diameter of the moon
   c. the diameter of the earth
   d. the sphere of the earth as it is seen from the moon

16. The "white" of the "blue-white" globe (line 22) indicates
   a. the earth's oceans
   b. the earth's continents
   c. the earth's cloudy atmosphere
   d. misty bands parallel to the equator

17. The earth's fertile lands will be marked by
   a. deeper blue
   b. blue-green
   c. faint orange
   d. bright red

18. In line 27, "on those occasions" means
   a. at those times
   b. after those times
   c. during those times
   d. before those times
19. In line 27 "it" refers to
   a. the earth
   b. the moon
   c. the fertile lands
   d. the sun

20. The eclipse of the sun will be when
   a. the earth is behind the sun
   b. the moon is behind the sun
   c. the sun is behind the earth
   d. the sun is behind the moon

21. The ultraviolet rays (line 36) will be cut out by
   a. the dome
   b. the filters
   c. the tourists
   d. the fittings

Part 14: Grammar Points to Remember

1. Phrases with past participles that describe nouns. Look at these phrases:
   a. a transparent dome fitted with filters
   b. misty bands arranged parallel to the equator
   c. a young person educated in Europe
   d. the oceans seen through the earth's cloudy atmosphere

Note that a phrase beginning with a past participle may function as an adjective. It follows the noun it describes. It is much the same as a clause beginning with who, which, or that. Look at the following examples:

   a. a dome which is fitted with filters
   b. a dome fitted with filters
   a young person who is educated in Europe
   a young person educated in Europe
Can you change the following phrases into phrases without who, which, or that?

a. problems which are discussed in class
b. a sun that can be seen through a filter
c. a person who is transported back in time
d. a space ship which was made in America
e. a girl who is dressed in a space suit

Correct answers to Parts 5, 6, 12 and 13.

Part 5: Comprehension questions on Reading One
A. True or False.
1. F
2. F
3. T
4. F
5. F
6. T
7. F
B. Multiple choice
1. c
2. d
3. b
4. b
5. d

Part 12: Grammatical questions on Reading Two
A. Multiple choice.
1. b
2. a, b, c
3. b, d
4. b
5. d
6. c
7. c
8. b
9. c
10. b, c
11. d
12. d
13. a, b, d
14. b, c
15. d
16. c, d
17. b
Part 6: Grammatical Questions on Reading One.
A. Multiple Choice.
1. b 7. a
2. c 8. b
3. c 9. b
4. 10. d
5. c 11. a, c
6. d

Part 11: Comprehension questions on Reading Two.
A. True or False.
1. T
2. F
3. T
4. T
5. F
6. F
7. T

NOTES: 1. Answers to parts 5, 6, 12 and 13 will be expanded to include explanations for each answer.

2. A selection of supplemental readings will be included here.