

ENGLISH FOR SCIENCE AND TECHNOLOGY

PREAMBLE

Authentic English has grown out of an educational, project, viz., "**English for Science and Technology**" sponsored and implemented by the British Council in two universities and two autonomous colleges of science and technology in south India. The project brought together specialists with experience in global EFL/ESL contexts, and sought to give attention to EST pedagogy, techniques, course design and materials writing. The project also explored and validated ways of assessing language skills.

Series highlights

1. The lessons in each unit focus on developing communicative competence through simulated tasks involving and integrating skills (reading, speaking, writing and listening) and study skills (for example, listening and taking notes, engaging in discussion and making presentations).
2. Learners engage with authentic reading, writing, listening and speaking tasks with carefully planned pre-reading, - writing, -listening and –speaking tasks. These are followed by the consolidation work by way of post-reading, -writing, -listening and –speaking tasks. Each lesson unit thus has a clear profile of skills as well as language use.
3. The learning materials used in this course book are also authentic in that they are real-world materials used by practising engineers, nutritionists, bio-chemists, agricultural scientists and other specialists in diverse fields.
4. The books use a range of interactive formats. Learners work in pairs, groups and as a whole class with the teacher as facilitator and guide. Across these formats, students work not only with language and content but also with the social and linguistic conventions accompanying these formats, for example, turn-taking, cooperating and mediating.

To put to in a nutshell, the texts have been selected with a view to fulfilling the academic audit of imparting English which will be useful to the students in **life-situations** and **job-situations**

Source: Hariharan, S. 2003. Authentic English for Agriculture and Allied Sciences.

Orient Longman, Hyderabad.

Theoretical foundations

The four communication skills are:

Listening	}	Receptive skills
Reading		
Speaking	}	Productive skills
Writing		

Listening:

Intensive listening: Listening to classroom lectures, instructions given by the boss.

Extensive listening: Listening to the news, reports etc.

Selective listening: Listening to a T.V. programme on sports, especially a live relay.

Reading:

Skimming: Extracting the main ideas by reading the first and last sentence of each paragraph of a complete discourse.

Scanning: Looking for a particular source of information in terms of persons, places and numbers.

+*Speaking:* The essential qualities of a good speaker.

- (a) Clarity of expression
- (b) Audibility
- (c) Modulation'
- (d) Power of expression
- (e) Pitch
- (f) Quality of voice
- (g) Stress, rhythm and intonation
- (h) Eye-contact with audience.

Features of good oral presentation:

Audible voice, a tolerable speed of delivery, language with simple sentences with a variety of words within the level of the audience, A sense of humour, self-confidence, visual aids, and body language including space-distance

Writing: Pre-writing, writing and post-writing.

Pre-writing: Free wheeling of ideas, jotting down all the points.

Writing: Deleting the redundant and irrelevant ideas.

Post-writing: Proof reading and editing.

Writing is rewriting

Pre-writing is free writing.

Genre: A way and style of writing writing. It may be

- (a) *Descriptive:* eg. Describing a grain in terms of length, breadth, smell etc.
- (b) *Classification:* Different types of farmers, students of the class.
- (c) *Narration:* Narrating a success story.
- (d) *Compare and contrast:* eg. Chemical pesticides and biopesticides.
- (e) *Problem posing, problem causing and problem solving:* eg. UNIT FOUR – Death and the Devil's water (P.No.40).

Various types of writing

1. *Personal writing:* Letters / e-mails to our friends and relatives.
2. *Public writing:* Writing on issues of general problems like over crowding in buses, traffic rules not followed, water pollution, water scarcity, etc.
3. *Social writing:* Writing to our friends birthday greetings, congrats, condolence, bon voyage etc.
4. *Creative writing:* Composing a poem, writing a skit for the college day, etc.
5. *Study/Institutional writing:*
 - (a) Curriculum vitae (British), Resume (U.S.A.)
 - (b) Course assignments
 - (c) Project report
 - (d) Record writing

(e) Thesis writing

UNIT ONE

Answers for Cloze text, CW – Content word, GW – Gram. word

Te A sample analysis

1. Experiment (noun) - C.W.
2. at (preposition) – G.W.
3. exposed (verb) – C.W.
4. to (preposition) – G.W.
5. the (definite article) – G.W.
6. groups (noun) – C.W.
7. was (helping verb) – G.W.
8. extracted (verb) – C.W.
9. which (relative pronoun) g.w.
10. experiment (noun) – C.W.
11. in (preposition) – G.W.
12. found (verb) – C.W.
13. inflammatory (adjective) - C.W.
14. and (linking word) – C.W.
15. dysentery (noun) – C.W.
16. effective (adjective) – C.W.
17. the (definite article) – G.W.
18. that – pointer
19. varieties – noun
20. green – adjective

Points for discussion

- (a) Control group and the experimental group.
- (b) Why rats are used for clinical trials at first?
- (c) Determine the genre of the text.
 - (1) *Word power*: Carry out, exposure, survival, bring down, such as, effective, allegedly.

(2) *Prefix and suffix*: Give two examples for the underlined prefix/suffix

1. radioactive – interactive
2. physiotherapy – physiology
3. processes- promotion
4. antibiotic – antiseptic
5. extracted – exposure

Generally nouns, verbs, adjectives and adverbs are called content words and articles, prepositions, pronouns etc come under grammatical words. A word, which is a grammatical word in one context, can play the role of a content word in another context.

He has got back his bag

has – Auxiliary verb

He has four cars

has – main verb

The same word can play different functions. It is the context that determines everything.

UNIT 2

Writing Task

Topic : Biopiracy (Basmati vs. Texmati)

Pair work

1. Go through the cartoon (P.No. 9) and write your comments in consultation with your partner.
2. Read the article 'How to safeguard our traditional plants' and relate it with the cartoon.

Group work

3. Assume that you are an agricultural scientist and write a letter to a national daily on the issue raised in consultation with your group.
4. Exchange your draft with the other group and by assuming yourself as an editorial group.

5. Edit the draft in terms of
 - (a) Organization of ideas.
 - (b) Coherence and cohesion.

**Tabular representation of the Genres of the reading units
UNIT**

1. Tea (P.No.1)	- Compare and contrast
2. Antioxidants (P.No.14)	- Problem solving
3. Appropriate Technology, Food, Agriculture and Agricultural Engineering (P.No.25)	- Narration
4. Death and the Devils water (P.No.40)	- Description
5. Reducing the use of chemicals in Agriculture (P.No.57)	- Problem-causing, Problem-solving
6. Ozone Alert Follows Cancer Warning (P.No.77)	- Compare and contrast

Writing Activity

- a) Requesting the warden to go to a relative's house for a short-stay of two days.
- b) Requesting the warden to entertain a guest for a short stay.

Activity 2

- a) Could you please pass the salt please.
- b) Would it be possible for you to go through the draft I have written for an essay competition to be held at the regional level, Sir?
- c) To a proposed speaker: We would like to invite you Sir for a lecture on 'Entrepreneurship development' next week.
- d) Thank you very much for the invitation, but I will be on tour for two weeks. You please contact me after two weeks.
- e) Thought-extenders like so, therefore, hence etc.
- f) Thought – reversers like but, however, yet etc.

A model letter is given below:

No sensible person can think of an American Basmati. It is a well-known fact that the crop could be grown only in tropical regions like India and Pakistan. The U.S. with its flexible patent laws snatches the traditional rights of the developing nations.

It is because a CSIR could win the case against turmeric, the U.S. could not pursue further. The basmati issue points to the fact that the patent offices in India have to be strengthened, by technical know-how and technical do-how. More and more issues like Darjeeling tea, wheat are coming to the fore for discussion and debate. It is high time that we protect our traditional crops and safeguard ourselves from biopiracy.

ERROR BANK

1. The doctor discussed about the problems of the patient.
2. The secretary proposed the vote of thanks.
3. I enclose herewith the necessary documents.
4. One of my friend is preparing for IAS examination.
5. Since he is a honest man, people like him.
6. I look forward to hear from you.
7. When people commit blunder mistakes, we have to convince them politely.
8. The team was appraised of the on-going activities of the organization.
9. It is not correct to say that neither the farmer nor the scientist are aware of the field situations and field problems.
10. Both teachers as well as students are proposed to follow the principles of sincerity and punctuality.

TASK FOR STUDENTS

Match with appropriate antonym

- | | | |
|----------------|---|-----------|
| 1. Abhor | X | pragmatic |
| 2. Blasphemy | X | enter |
| 3. Corroborate | X | bolster |
| 4. Din | X | modesty |
| 5. Emit | X | Urban |

6.	Fungible	X	dull
7.	Gambol	X	repulsive
8.	Hone	X	apathy
9.	Impute	X	blunt
10.	Jejune	X	expert
11.	Knotty	X	love
12.	Loutish	X	hostility
13.	Mendacity	X	weaken
14.	Natty	X	iridescent
15.	Officious	X	oppose
16.	Preen	X	enthusiastic
17.	Quixotic	X	simple
18.	Resplendent	X	quiet
19.	Sap	X	lethargic
20.	Tyro	X	reverence
21.	Uphill	X	honesty
22.	Vituperate	X	insensitive
23.	Winsome	X	infer
24.	Xenodochy	X	plot
25.	Yokel	X	refute
26.	Zeal	X	admire
			support
			novice
			sharpen

**DIRECTORATE OF STUDENTS' WELFARE
ANSWERS FOR ERROR BANK-1**

1. The doctor discussed the problems of the patient.
2. The secretary proposed a vote of thanks.
3. I have enclosed the necessary documents.
4. One of my friends is preparing the IAS examination.
5. Since he is an honest man, people like him.
6. I look forward to hearing from you.
7. When people commit mistakes, we have to convince them politely.
8. The team was apprised of the on-going activities of the organization.

9. It is not correct to say that neither the farmer nor the scientist is aware of the field situations and field problems.
10. Teachers as well as students are supposed to follow the principles of sincerity and punctuality.

ERROR BANK-II

The following statements have one error in each. Find out the error and restate them.

1. The official was depromoted for his corrupt activities.
2. I am thriftlessly thankful to the chairman and the members.
3. I could not able to go the college to-day.
4. He left to Mamba yesterday.
5. It is a five-days seminar which we are conducting here.
6. The organization wants an young man to do such difficult tasks.
7. The farmer returned back from his field.
8. The latter you apply, greater are the chances of getting admission in our university.
9. He has got the appointment order yesterday.
10. I kindly request you to grant me leave for two days.

EXPLANATION

1. When we use 'discuss' as a verb, no preposition like 'about', 'on' is be followed.
2. The acceptable phrase is 'a vote of thanks' and Not the vote of thanks.
3. When 'enclose' is used as a verb, no preposition like 'herewith' or 'with' is required.
4. The usage one of requires a plural subject.
egg. One of my students
One of my teachers.
5. English has 26 letters and 44 phonemes / sounds. Though the word 'honest' starts with / 'h' / the pronunciation /a/.
6. Look forward to + verb + 'ing' is the grammatical rule.

Dear readers, the following statements contain one error. Every week ten statements will be given and the next week answers will be provided.

ANALOGY BANK I

1. Match the appropriate analogy
2. Analogies sometimes inevitably overlap
 1. Carpenter : Saw Cause : Effect
 2. Dove : Peace Animal : Place of study
 3. Lion : Pride Worker : tool
 4. Doctor : Clinic Mother : Child
 5. Peccadillo : Sin Member : Class
 6. Fire : Ashes Process : Product
 7. Author : Book Antonym
 8. Gullible : Dupe Gender relationship
 9. Cringing : Fawning Symbol relationship
 10. Soldier : Ambush Member : Group
 11. Talk : Stammer Worker : Product
 12. Pig : Sty Defining characteristic
 13. Car : Stamina Synonym
 14. Perfidy : Disloyalty Manner
 15. Consider : Table Function
 16. Snake : Reptile Worker : Working place
 17. Cat : Kitten Intensity
 18. Goose : Gander

A sentence which is grammatically accurate need not be always contextually appropriate.

1. I could not able to attend the function.
2. I kindly request you to grant me leave
3. As I am suffering from my brother's marriage, I request you to grant me leave.
4. I am leaving to Mumbai tomorrow

5. He was demoted for his wrong doing.
6. He has got the official order yesterday.
7. It is a five days seminar
8. They are having four cars.
9. He is not liking your negative attitude to everything.
10. I am thriftlessly thankful to the chief guest of the session.

ANSWER FOR ERROR BANK – II

1. The official was demoted for his corrupt activities.
2. I am profusely thankful to the chairman and the members.
3. He left for Mumbai yesterday.
4. It is a five day seminar
5. The organization wants a young man to do such difficult tasks.
6. The later you apply the greater are the chances of getting admission in our University.
7. He got the appointment order yesterday.
8. I request you to kindly grant me leave.

DIRECTORATE OF STUDENTS' WELFARE

ANALOGY BANK I

Answer for Analogy Bank I

- | | |
|-----------------------|-------------------------|
| 1. Carpenter : Saw | Worker : tool |
| 2. Dove : Peace | Symbol relationship |
| 3. Lion : Pride | Member : Group |
| 4. Doctor : Clinic | Worker : Working place |
| 5. Peccadillo : Sin | Intensity |
| 6. Fire : Ashes | Cause : Effect |
| 7. Author : Book | Worker : Product |
| 8. Gullible : Dupe | Defining characteristic |
| 9. Cringing : Fawning | Synonym |
| 10. Soldier : Ambush | Worker : tool |

11. Talk : Stammer	Manner
12. Pig : Sty	Animal : Place of stay
13. Car : Stamina	Function
14. Perfidy : Disloyalty	Synonym
15. Consider : Table	Process : Product
16. Snake : Reptile	Member : Class
17. Cat : Kitten	Animal : Young one
18. Goose : Gander	Gender relationship

ERROR BANK – II

The following statements have one error / in each. Find out the error and restate them.

1. The official was depromoted for his corrupt activities.
2. I am are thriftlessly thankful to the chairman and the members.
3. I could not able to go the college to-day.
4. He left to Bombay yesterday.
5. It is a five-days seminar which we are conducting here.
6. The organization wants an young man to do such difficult tasks.
7. The farmer returned back from his field.
8. The latter you apply, greater are the chances of getting admission in our university.
9. He has got the appointment order yesterday.
10. I kindly request you to grant one leave for two days.

SIMULATION

1. **Simulation:** "A willing suspension of disbelief".
2. **Different types of simulation:**

Educational simulation

- Computer simulation
- Crop simulation
- Military simulation

3. **How of simulation:** A small group of five or six.

4. **The topic** may be **convergent** or **divergent**. Generally the latter will be more interactive.
5. Only one person should jot down the ideas in a paper and he or she must enable other people to come out with ideas.
6. After 30 minutes or so, the group leader, chosen by the group or by the teacher should present the view points.
7. In a divergent simulation, the view of the other group should be patiently heard and answered appropriately.
8. The 'text' is **created** by the participants / students and **not** by the teacher.
9. The whole process:

Briefing

intra group interaction

intergroup interaction

Debriefing

"All the world is a stage

All men and women are mere players". - William Shakespeare

UNIT 2

Reading

1. Places – a 'medicine' which has nil effect.
2. Degenerative diseased – a disease which causes harmful effects.

tenet - a rule,
large, randomised
clinical trial
harmful free radicals – harmful bacteria

3. The Finnish study recommends taking B – Cartene.

Writing (P.No.818)

The cartoon has all the effects viz., criticism, sarcasm, caution, humour. Go thro' the co-text safeguarding our Rights and write a letter to a popular newspaper on **biopiracy**.

Listening – Albert Eintein's lecture given to California Institute of Technology.

1. Name the subjects which belong to basic science.
Physics, Botany, Maths, Zoology.
2. Name the subjects which belong to applied science.
Agriculture, Engineering, Medicine, Geology.
3. Which is more beneficial to the society, basic science or applied science?
Applied science.
4. If yes, what are the uses of applied science?
It fulfills the daily needs of human beings food, clothing and health.
5. If no, illustrate your answer with one or two points/examples.

After listening (P.No.19)

1. True
2. False
3. True
4. True
5. True

Speaking (Group work) - Collection of ideas – 20 min
(A) Presentation - 5 min
(B) Discussion - 15 min

1. Technology – Is it a boon or a bane?

2. Knowledge without application is a waste. Application without knowledge is a blind.
3. The greatest invention of the last century.
4. Fast food – its merits and demerits.
5. "Health is wealth".
6. "He who has the heart to help has the right to correct us" – Do you agree or disagree?

Write a five paragraph **essay** on the above topic Post-listening task (P.20) .

A model write up is given in P.20.

Speaking (P.22)

Place : College library

Student: Good morning, I am Shiva doing II year M.Sc. in Environmental Science.

Librarian: OK. Go on.

S : I am doing a project on pollution. Could you please suggest some latest books.

B : Is it in air, water, noise or any other thing?

A : My project is on water pollution.

A : Could I borrow the books and the journals related to this field?

B : I am afraid that you can borrow only the books and not the journals.

A : Since I can't borrow the journals, may I take a photocopy some of the important articles.

B : Yes, you may do that. But please remember that you cannot photocopy the entire journal.

A : Thank you very much for your help, Sir.

B : You are welcome.

Post speaking (P.No.24)

1. You are welcome
2. You are most welcome
3. Doesn't matter
4. It's all right
5. No mention please.

UNIT THREE

Pre-reading task:

1. The chief architect of the green revolution in India was Dr.M.S.Swaminathan and C.Subramaniam, the then Minister for Agriculture.
2. (1) The first green revolution focussed more on crop production than crop protection.
(2) Chemical pesticides became harmful to the crops instead of killing the pests.

Listening and writing (P.No.37)

Listen to the voice which gives do's and don'ts in using pesticides and fill in the columns.

Before using pesticide	During	After
1. Check if you are buying the correct pesticide	Put an apron and a fine muslin rolled around your nose and mouth. See that the pesticide spreads evenly.	Wash hands with running water. Take a clean bath and leave the clothes to dry.
2. Check the correctness of composition of chemicals		
3. Never fail to see the expiry date		

UNIT FOUR

Reading

1. The farmers rely on river water.
2. The green revolution could be achieved thanks to the sustainable efforts taken by Mr.C.Subramaniam and Dr.M.S.Swaminathan.
3. Arsenic poisoning was the cause of many death accidents in West Bengal.

Writing (P.49)

The Maruthi car costs the highest, but its petrol consumption is equally high. Though the Ambassador costs less, its fuel consumption of Ambassador is less, but gives less mileage. The Fiat costs the least but its mileage is poor. One has to sacrifice quality if he/she wants to save money.

UNIT FIVE

1. Chemical pesticides, when extensively used, cause a lot of damage to the plants.

2. The aim of LIFE is to promote ecological agriculture which will be productive and protective.

Writing (P.No.63)

1. What is terminator?
2. What is the main advantage or disadvantage of the terminator seed?
3. Terminator technology can be suitable to all regions and all types of farmers.
(Clue: Is agriculture location-based or not?)

Activity 2 (P.63)

1. Terminator technology is beneficial to the rich countries/farmers.
2. Seeds developed using this technology can be used only once.

Unit 4

Expand the conclusion by writing five paragraph essay of not more than 250 words.

Activity II (P.No.52) – Comment on the table

All the fitters have some negative quality or other. But the table is given by a product manufacturer, it is subject to verification.

Listening

Different sources of Energy (P.No.53)

1. Three people are discussing
2. Thomas
2. a 3. d
3. The crops will fail.
4. The productivity of seeds will diminish.

Speaking and Writing (Group work.

- A. Mercy killing – Is it good or bad?
- B. Genetically modified for a boon or a bane?

1. The terminator technology is not suitable for a country like India, for, the seeds can be reused.

2. The technology was tried out in Andhra and Karnataka where the farmers incurred a heavy loss.
3. The multinational companies (MNCs) are always fond of exaggerating or manipulating the facts for commercial purposes.
4. Our farmers must be cautioned against such exploitation, since the terminator also has the same effect/defect.

Listening – Dictation cloze (Pair work)

1. Listen to the tape on a success story of an Indian farmer.
2. The words deleted will not be indicated, except full stop.
3. You have to **identify** the words deleted and then restore them which are **grammatically correct** and **contextually appropriate** in consultation with your partner
4. **Speaking** (P.No.71) (Group work)
 1. Go through the web site [success stories.com](http://successstories.com) and summarize **five** stories.
 2. Browse the web sites on 'Terminator Technology' and summarize any five bits of information on five different web sites.
Quote the web sites in your assignment.

UNIT SIX

1. Many outsiders go on walk in TNAU campus. State the reason.
2. Oxygen and ozone have the same effect on humans – Discuss.

Post-reading

1. Determine the genre of the text.
2. So, therefore, hence are considered to be sought – extenders while but, however are considered to be thought-reversers. Locate these words in the text and write the statement in your notebook.
 1. Which one will be more profitable to the farmers - crop raising or dairy farming?
 2. Can we combine crop-raising and dairy-farming?
 3. Is it necessary to mix milk with water?
 4. Do the dairy farmers mix water with milk or milk with water?

Dictation class (Pair work)

The success story is narrated very slowly. Full stops will be indicated. The missing words will not be overtly told. You have to identify the missing words and fill in with grammatically correct and (con)textually appropriate words. After 30 minutes, the cloze text will be displayed on the OHP.

1. He is a hard working person and **therefore** he could come up in life.
2. Students get good marks **because of** his effective teaching.
3. **Though** he is a good man, he is not an efficient manager.

Combine the such link words and form a meaningful passage of 75 or 100 words.

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