

# COMPUTER SCIENCE



## X5 ENGLISH HANDOUT

**PROGRAM**

1	Technical Vocabulary	Reading
2	Process Descriptions	Speaking/Writing
3	Ethics	Reading/Speaking
4	Video: Cracking the Enigma code	Watching/Speaking
5	Comprehension: RATting	Reading
6	Abstracts & Research Papers	Reading/Writing
7	Points of view: e-waste + TEST	Watching/Speaking
8	Video: Digital art / Presentation Skills	Watching/Speaking

**Project Presentations**

9	
10	
11	
12	

**ASSESSMENT**

The module will be assessed through continuous assessment (100%). You will be assessed *indirectly* on everything you do in class, and *directly* on

- an in-class test on **session 7** (reading comprehension, 40 minutes) (40%)
- your project work (see opposite page) (60%)

**ATTENDANCE**

Attendance is, of course, **obligatory**. Please remember to **notify your group teacher** (preferably in advance) if you cannot attend a lesson.

Relevant **justification does have to be addressed to the Office of the Registrar (Scolarité)** so that it can be taken into account.

Please note that, if unaccounted for, **absences will lead to direct penalty** on your project grade.

**VERY IMPORTANT: TESTS AND JUSTIFIED ABSENCES**

For ANY justified absence you will HAVE TO take a RESIT (or get ZERO for the corresponding mark).

To make sure you attend that resit, it is YOUR RESPONSIBILITY to justify your absence through the Office of the Registrar (Scolarité) AND get in touch with the head of the module when you miss a test ([cecile-marie.lereste@univ-nantes.fr](mailto:cecile-marie.lereste@univ-nantes.fr)).

**IMPORTANT: A NOTE TO NON-ATTENDEE STUDENTS (*étudiant-e-s dispensé-e-s d'assiduité*)**

Assessment procedures for non-attendeé students are specific. If you have or acquire this status in the course of the semestre, **you cannot be assessed through continuous assessment**.

If you have or acquire this status in the course of the semester and wish to audit the lessons, you **MUST** contact [alice.townend@univ-nantes.fr](mailto:alice.townend@univ-nantes.fr) as early as possible to discuss your situation.

This CANNOT be arranged directly with your group teacher.

**TOEIC PREPARATION CLASSES**

If you are considering taking the TOEIC test this semester, you can attend an 8-hour preparatory course (Monday 5-7 PM, weeks 39-42, Room U5)

## SCIENCE IN ENGLISH PROJECT

### ASSIGNMENT

In groups of three, you will be asked to work on TWO of the proposed articles (the articles are on MADOC).

1. You will choose ONE article and present an oral synthesis on it, taking care to include the following elements:

Introduction
- Present the article (author(s), date), its title/ subject and content.
- Give a <u>brief</u> overview of your talk (i.e., plan)
Presentation
Explain as much as you can
- the context of research in that field if relevant, or the context of the article (explain what makes the article interesting)
- the contents of the article (what it demonstrates / the ideas it expands on / the theories it builds on / the experiments it presents, as relevant)
Conclusion
- Recapitulate on the conclusions of the article
- Explain possible applications of this work, if relevant
- Mention further research, if relevant
- Say what you personally thought about the article and the research behind it

You will have approximately 10 minutes (per group) to present your synthesis and will be expected to use appropriate presentation tools.

Following your presentation, you will be expected to answer questions from the audience.

According to the so-called "Dublin descriptors" that define international standards for learning outcomes at university, completion of a Bachelor's degree means that students should be able to "communicate information, ideas, problems and solutions to both specialist and nonspecialist audiences." Your presentation should therefore be clear even to non-specialists.

2. The second article you will work on will be assigned to you by your group teacher. It will be one of the articles presented by your fellow students. You will be asked to review their presentation. You will not present yourselves but should be sufficiently prepared to assess the proposed synthesis.  
You will be expected to point out the strong and weak points in your colleagues' work and say how it could have been improved. You will also be expected to ask questions following your classmates' presentation.
3. For all oral presentations: you will have to make notes during the presentations and ask questions.

### LEARNING OBJECTIVES

#### Language and communication:

- Developing your knowledge of specific vocabulary in context
- Improving oral and presentation skills

#### Scientific communication

- Practicing oral synthesis
- Interacting with a speaker/an audience

### ASSESSMENT

Presentations will take place in the last 3 or 4 sessions.

You will receive individual marks based on your oral presentation (assessing content, communication, and language) as well as on your debriefing session and involvement in questioning.

- |  |                         |
|--|-------------------------|
| 1. Alice and Bob in Cipherspace                            | 16. The Robot's Dilemma |
| 2. The Information Paradox                                 |                         |
| 3. Pixels or Perish  |                         |
| 4. Uniquely Me!  |                         |
| 5. Programming Your Quantum Computer                       |                         |
| 6. Digital Forensics                                       |                         |
| 7. Delving into Deep Learning                              |                         |
| 8. Computation and the Human Predicament                   |                         |
| 9. The Math of Segregation                                 |                         |
| 10. Imitation of Life                                      |                         |
| 11. Brain in a Box + Brain Fog                             |                         |
| 12. The Learning Machines + Smart Connections              |                         |
| 13. The Library Reboot + Beyond the Paper                  |                         |
| 14. Mozilla Plan seeks to debug Scientific Code + ...Error |                         |
| 15. People Power + Strength in Numbers                     |                         |

## INTERNATIONAL PHONETIC ALPHABET

## Key to phonetic symbols for English

RP Gen  
Am Consonants

- • **p** pen, copy, happen
- • **b** back, bubble, job
- • **t** tea, tight, button
- **t̪** city, better
- • **d** day, ladder, odd
- • **k** cup, kick, school
- • **g** get, giggle, ghost
- • **tʃ** church, match, nature
- • **dʒ** judge, age, soldier
- • **f** fat, coffee, rough
- • **v** view, heavy, move
- • **θ** thing, author, path
- • **ð** this, other, smooth
- • **s** soon, cease, sister
- • **z** zero, zone, roses, buzz
- • **ʃ** ship, sure, station
- • **ʒ** pleasure, vision
- • **h** hot, whole, behind
- • **m** more, hammer, sum
- • **n** nice, know, funny, sun
- • **ŋ** ring, long, thanks, sung
- • **l** light, valley, feel
- • **r** right, sorry, arrange
- • **j** yet, use, beauty
- • **w** wet, one, when, queen

*In foreign words only:*

- • **x** loch, chutzpah
- **ɬ** Llanelli, Hluhlwe

RP Gen  
Am Vowels

- • **ɪ** kit, bid, hymn
- • **e** dress, bed
- • **æ** trap, bad
- **ɒ** lot, odd, wash
- • **ʌ** strut, bud, love
- • **ʊ** foot, good, put
- • **i:** fleece, sea, machine
- • **eɪ** face, day, steak
- • **aɪ** price, high, try
- • **ɔɪ** choice, boy
- • **u:** goose, two, blue
- **əʊ** goat, show, no
- **oʊ** goat, show, no
- **ɒʊ** variant in cold
- • **aʊ** mouth, now
- **ɪə** near, here, serious
- **eə** square, fair, various
- • **ɑ:** start, father
- **ɑ:** lot, odd
- • **ɔ:** thought, law, north, war
- **ʊə** cure, poor, jury
- **ɜ:** nurse, stir
- **ɜ:** nurse, stir, courage
- • **i** happy, radiation, glorious
- • **ə** about, comma, common
- father, standard
- • **u** influence, situation, thank you
- • **ɪ** intend, basic
- **ʊ** stimulus, communist

*In foreign words only:*

- **õ** grand prix, chanson
- **ɑ̃:** grand prix, chanson
- • **æ̃** vingt-et-un
- **ɛ̃:** vingt-et-un

Source: Longman Pronunciation Dictionary

## TECHNICAL VOCABULARY

### STARTER:

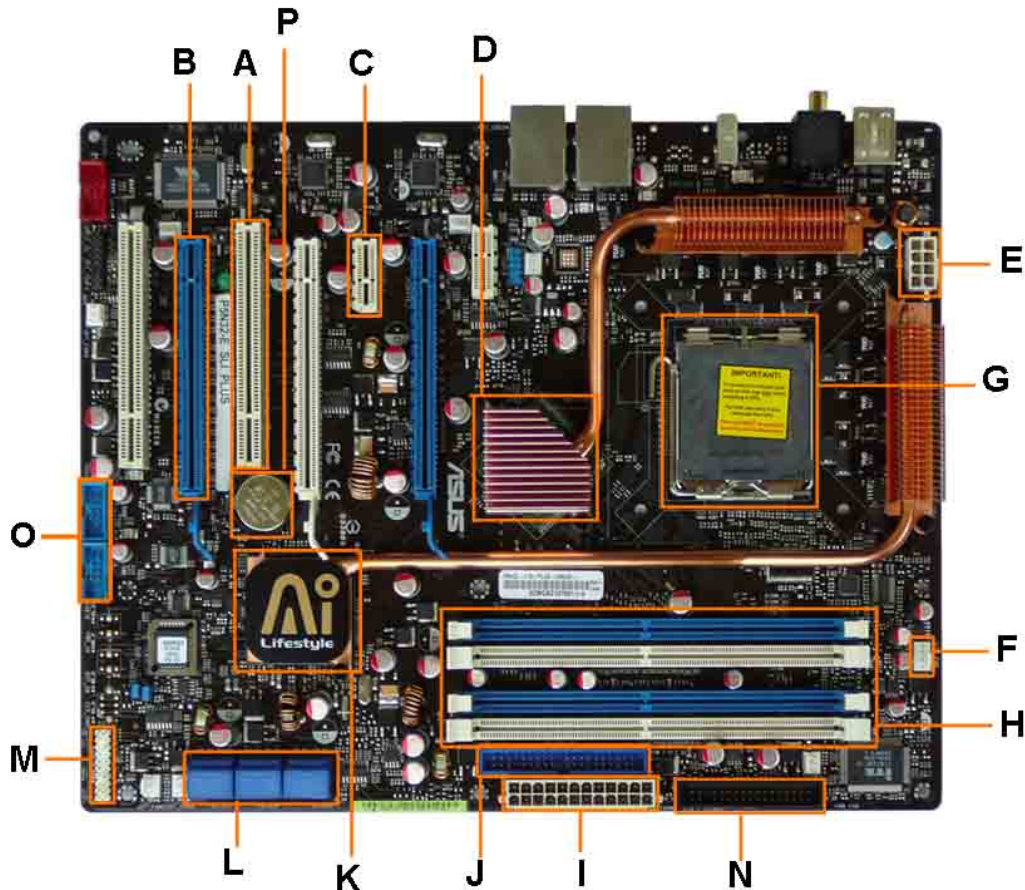
- Which of the following components can you name?

### Basic Hardware for a Desktop Computer System



- Complete the following visual of a motherboard using the terms listed below (From <http://www.build-your-own-computer.net/motherboard-diagram.html>).

IDE Connection; Northbridge; CMOS Battery; PCI Slot; CPU Socket; External USB Connections; PCI-E 1x Slot; Memory Slots; CPU-Fan connection; SATA Connections



- |  |                        |                            |
|--|------------------------|----------------------------|
| A.                                       | F.                     | L.                         |
| B. PCI-E 16x Slot                        | G.                     | M. Front Panel Connections |
| C.                                       | H.                     | N. FDD Connection          |
| D.                                       | I. ATX Power Connector | O.                         |
| E. ATX 12V 2X and 4 Pin Power Connection | J.                     | P.                         |
|  | K. Southbridge         |                            |

**TECHNICAL VOCABULARY****READING:**

*Read the text on page 6 and say whether the following statements are true or false.*

1. This article discusses how the researchers working in the field of A.I. have been using human consciousness as a model for their robots for many decades.
2. The BotPrize Contest is a duel in which the two opponents rate how human they think the other is at the end of the fight.
3. The \$7,000 prize has never been awarded.
4. The reason why the bots have been less successful at passing off as humans is because they seem too concentrated on winning.
5. In order to access the global workspace, Neurobot's "neurons" must communicate with other "neurons" in different regions.
6. Fountas, Neurobot's creator, thinks that Neurobot might be dangerous if it is conscious.

*Fill in the following table with words from the text that correspond to the definitions.*

Line	Synonyms/definitions	Words from the text
	To imitate	
	An accomplishment, an exploit, something impressive	
	To clarify, to explain, to illuminate	
	Extremely exciting	
	To promote, to support	
	To judge, to consider	
	To apply, to put into use	
	A sudden increase in something	
	To compete for, to fight for	
	To compare	

*Answer the following questions on the text.*

1. What are the possible applications of this kind of research into Artificial Intelligence?
2. What is the difference between Neurobot and previous bots?
3. Explain how Global Workspace Theory has been used by the team that created Neurobot.
4. The two winners of the 2012 BotPrize contest were the UT<sup>2</sup> bot (produced by a team from the University of Texas at Austin) and Mirrorbot (developed by a doctoral student currently studying artificial intelligence in Brest). Given its name, can you guess Mirrorbot's strategy in the game?

## TECHNICAL VOCABULARY

### AI cyber-fighter: does it feel human, punk?

By Celeste Biever

*New Scientist*, Magazine issue 2881, 6 September 2012

*A software bot designed to act human by mimicking consciousness is poised to go into battle in the Unreal Tournament arena*

THE warrior dashes through one dark corridor after another, as laser shots crackle past his body. He crouches, jumps, swivels... does he detect the source? He fires at a potential enemy, barely visible in the shadows, then decides to flee.

Though the character inhabits the first-person shoot 'em up video game, Unreal Tournament, there's no human player in the driving seat. This warrior, called Neurobot, is a character controlled entirely by a biologically inspired model of consciousness. The feat could help us to build more human-like machines, and even shed light on the workings of consciousness itself, one of the biggest mysteries in science.

The thrilling run I watched was just a practice, but next week the neuroscience-inspired warrior will compete in the fight of his life: the annual BotPrize contest. It is a video-game alternative to the Turing test, the most famous test of machine intelligence.

In the Turing test, programs called bots try to convince human judges that they are human via text-based conversation. In the BotPrize contest, multiple humans and bots play Unreal Tournament simultaneously, all-against-all and anonymous in the same arena of battle. At the end of the match, the human players judge the "humanness" of all of their opponents.

The winning bot will be announced at the IEEE Conference on Computational Intelligence and Games in Granada, Spain, on 13 September. The prize is \$7000 shared between all the bots that receive as many "human" votes as the average human player. If none reaches that threshold, the bot with the highest humanness score wins \$2000. So far, bots have only won the smaller prize. An earlier version of Neurobot finished second last year, after technical difficulties hampered it in the final round, says its creator, Zafeirios Fountas at Imperial College London. He expects to go one better this year.

It's difficult to unpick exactly what gives a bot the human touch in Unreal Tournament, but Philip Hingston of Edith Cowan University in Perth, Western Australia, who has run the contest since 2008, has some ideas. "Some of the judges have reported the feeling that one of the players is determined to get them - some kind of sense of purpose," he says. By contrast, bots seem less likely to focus their attention.

The idea behind BotPrize is to foster software capable of navigating physical space in a human-like way. This could be used to create more realistic video-game characters, better simulate crowd behaviour in emergency situations or control robots in the real world. Neurobot's performance, in particular, will provide an indication of whether the theory of consciousness that it is based on - global workspace theory (GWT) - can really produce human-like behaviour.

According to GWT, unconscious processing such as the gathering and processing of sights and sounds is carried out by various autonomous brain regions working in parallel. Only when information is deemed important enough can it enter the global workspace - or "consciousness" - and be broadcast to other regions of the brain.

Though a program that mimicked a simple version of GWT in software - without virtual neurons - won BotPrize in 2010, Neurobot is the first to implement it from the bottom up. It simulates 20,000 individual neurons and the electrical currents that flow between them, creating 1.5 million connections. This is a far cry from simulating a whole brain - made of about 120 billion neurons - but it is an important step if such bots are to inform theories of consciousness, says Murray Shanahan, Fountas's supervisor at Imperial.

To implement GWT, Neurobot's simulated neurons are divided into different populations, each responsible for controlling and reacting to different actions and perceptions. One set is responsible for sensory information, for example, so produces spikes in electrical activity in response to objects moving into Neurobot's field of view, or incoming shots from enemies. Another set is responsible for Neurobot's behaviours, and includes subsets such as movement, navigation, exploration and gun-firing.

These populations work simultaneously as Neurobot goes about its business, but at any one moment, only one can broadcast from the bot's global workspace. Like actors on a stage vying for the spotlight, which process ends up in the global workspace depends on which neurons have the highest prominence at any given moment. Winning access means those neurons can communicate with others. For example, if the bot is to approach an object, information must be shared between the set of neurons that perceive the object and behavioural neurons that move its body. This can only happen if one of these sets makes it into the workspace.

At the same time as this focused behaviour is going on, there are other actions that don't require Neurobot's attention. These can be likened to the way that people in conversation walking down the street avoid obstacles effortlessly.

It is this mixture of conscious and unconscious processes that Fountas hopes will make Neurobot's behaviour seem human. "I have no idea why he chooses to shoot when he does," Fountas says. "The decision is completely his."

Neurobot's main rival, ICE-CIG2012, created in the Intelligent Computer Entertainment Lab at Ritsumeikan University in Kyoto, Japan, approaches it differently. That bot comes preprogrammed with tactics it has learned from previous human players. Last year, that strategy allowed ICE-CIG to beat Neurobot to the prize. Five other teams will also be competing this year.

Whether it wins or not, the most intriguing question of all remains unanswered: is Neurobot actually conscious?

"It's a dangerous word," says Fountas. "I hope he is."



## PROCESS DESCRIPTIONS

**BRAINSTORMING:** List as many uses as you can for computers in one of these areas:

Supermarkets - Hospitals - Airports - Police headquarters

**PROCESS DESCRIPTIONS:** Read the following text and answer the questions.

### How Compilers Work

A compiler is a program that translates human readable source code into computer executable machine code. To do this successfully the human readable code must comply with the syntax rules of whichever programming language it is written in. A compiler's complexity depends on the syntax of the language and how much abstraction that programming language provides. A compiler is likely to perform many or all of the following operations: lexical analysis, preprocessing, parsing, semantic analysis, code generation, and code optimization. Let's look at the different phases of the compiling process.

Lexical analysis happens first: this is where the compiler reads a stream of characters (usually from a source code file) and generates a stream of lexical tokens. Each token is a single atomic unit of the language, for instance a keyword, identifier or symbol name. The sequence of tokens is transformed by the parser into a syntax tree. The parse tree is often analyzed, augmented, and transformed by later phases in the compiler. Lexing and parsing comprise the syntactic analysis (word syntax and phrase syntax, respectively). The semantic analysis phase is generally more complex and written by hand, but can be partially or fully automated using attribute grammars. Semantic analysis is the phase in which the compiler adds semantic information to the parse tree and builds the symbol table. This phase performs semantic checks such as type checking, object binding (associating variable and function references with their definitions), or definite assignment (requiring all local variables to be initialized before use), rejecting incorrect programs or issuing warnings. Semantic analysis usually requires a complete parse tree.

The final stage is generating machine code. This can be an extremely complicated process. The main phases include the following:

1. Analysis: This is the gathering of program information from the intermediate representation derived from the input. An intermediate representation is a representation of a program partway between the source and target languages. If the IR is fairly independent of the source and target languages, its ability to be used in a retargetable compiler is maximized. Intermediate representations are generated by an intermediate code generator.
2. Optimization: the intermediate language representation is transformed into functionally equivalent but faster (or smaller) forms. This process is called machine independent code optimization.
3. Code generation: this produces the actual target code or something close. Then the target code is cleaned up and improved. This code improvement is machine dependent.

Adapted from <http://cplus.about.com/od/introductiontoprogramming/p/compiler.htm>  
<http://en.wikipedia.org/wiki/Compiler>  
<http://cs.lmu.edu/~ray/notes/compilerarchitecture/>  
<http://cs.lmu.edu/~ray/notes/ir/>

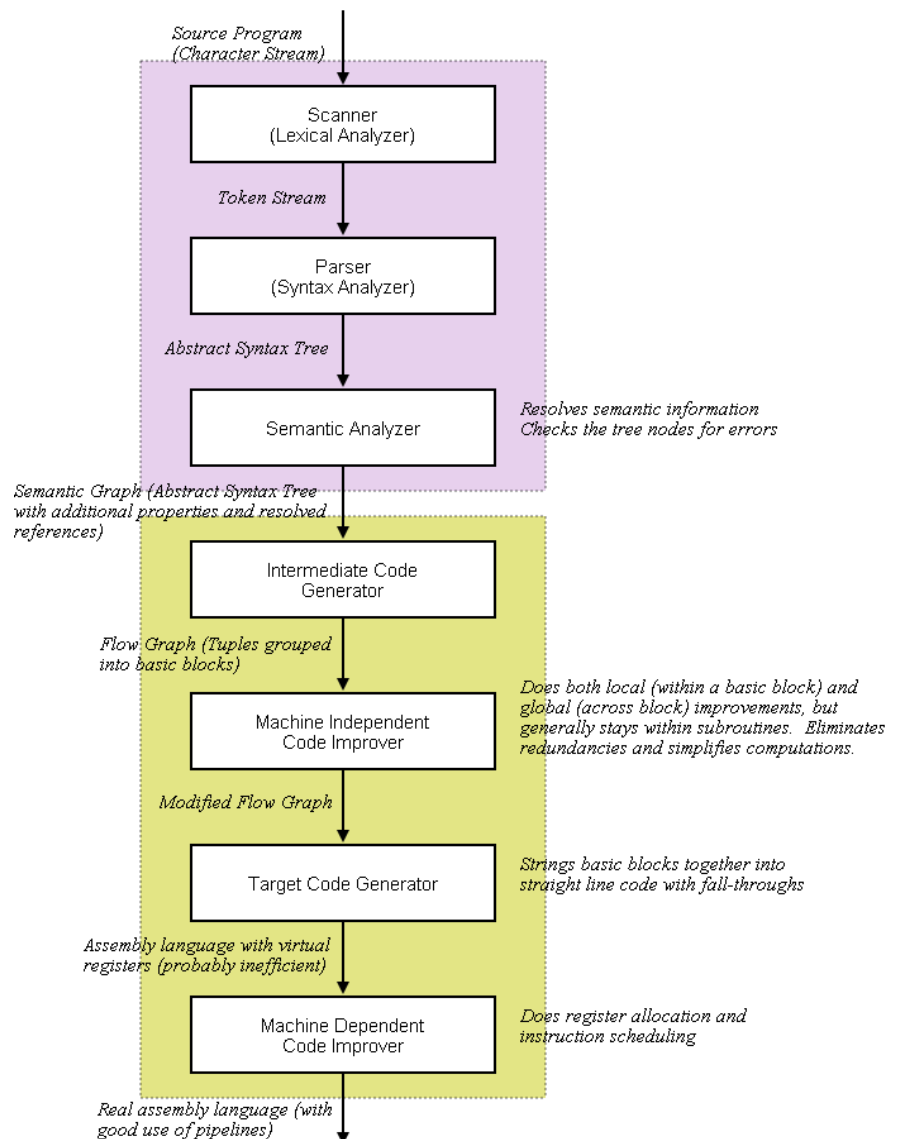


Image source: <http://cs.lmu.edu/~ray/notes/compilerarchitecture/>



## PROCESS DESCRIPTIONS

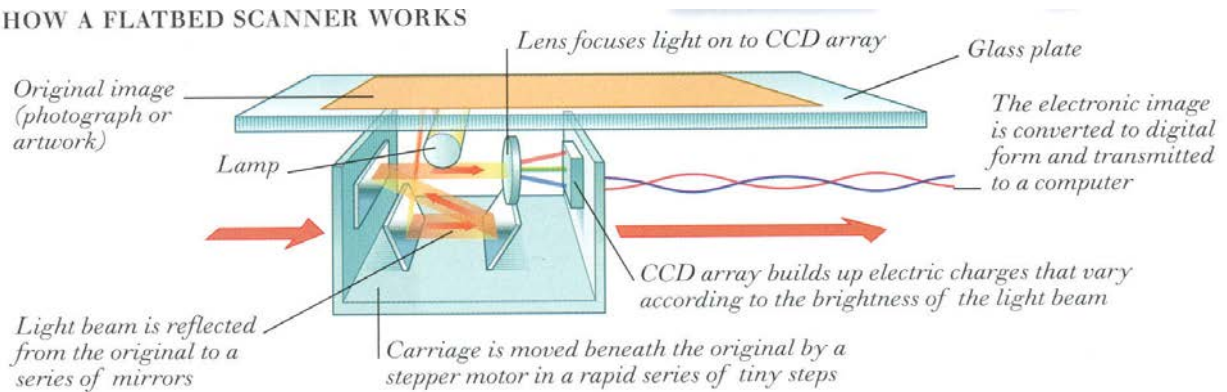
1. Skim the text and focus on the verbs. Which tense is mostly used in process descriptions?
2. Now focus on the first paragraph.
  - a. What is the subject of the second sentence?
  - b. When it appears, is it the first time this expression has been mentioned?
  - c. Could you replace the expressions with “it”? Why or why not?
3. Look at the second paragraph.
  - a. Consider the following way of writing the second, third, and fourth sentences: “Each token is a single atomic unit of the language, for instance a keyword, identifier or symbol name. The parser transforms the sequence of tokens into a syntax tree. Later phases in the compiler often analyze, augment, and transform the parse tree.” Which option do you think is better and why?
  - b. Look at the verbs in the third and fourth sentences in the original text. Which tense and voice are they in?
  - c. Can you give two reasons why writers might choose to use the passive voice rather than the active voice in scientific or technical texts?
  - d. Put the two verbs in the following sentence into the passive voice: “the compiler reads a stream of characters and generates a stream of lexical tokens.”
4. Link words.
  - a. Look at the following sentence from the text (ll. 44–45): “If the IR is fairly independent of the source and target languages, its ability to be used in a retargetable compiler is maximized.” How could you rephrase it using “unless”? Why is the original sentence better?
  - b. Choose one of the following link words to complete the sentences below. (*Source*: Sue Blattes, Véronique Jans & Jonathan Upjohn. Minimum Competence in Scientific English. EDP Sciences: 2003.)
 

doubtless – whereas – besides – thereby – namely – despite – obviously – as a rule – nevertheless

    - i. .... using rechargeable batteries, what other ways are there of storing energy?
    - ii. The combustion of methane can produce an undesirable product, ..... carbon dioxide, which is responsible for global warming.
    - iii. .... its numerous spectacular successes, magnetic resonance imaging is not entirely satisfactory when applied to proteins.
    - iv. The evidence has often been contradictory. ...., hypnosis is finding numerous medical uses.
    - v. ...., animals who survive in desert habitats tend to be small.
    - vi. Oral administration of insulin does not reduce blood sugar, ..... orally administered corosolic acid can.
    - vii. ...., when dealing with toxic and hazardous material, robots offer great advantages.
    - viii. The gas containers are kept underground, ..... minimising temperature changes.
    - ix. Environmental concerns will ..... be heightened in the years to come.

**PROCESS DESCRIPTIONS**

5. **WRITING PRACTICE:** *Work in groups of three. Using the diagram below, write a text that describes how a flatbed scanner works.*

**HOW A FLATBED SCANNER WORKS**

Source: *The Visual Dictionary*, London: Dorling Kindersley, 2011, p. 570

## ETHICS

*In groups of four, you will work on one of the situations below. Read the situation and answer the questions together. Then present the situation to your classmates and justify your answers.*

### **Situation N°1: Calculator Accuracy**

A Buffalo computing company (ABC2) located in Fargo, ND, has designed a chip for a new scientific calculator that features high-precision floating-point accuracy to 17 significant digits for all 250 mathematical functions provided with the unit. After one-and-a-half years in development, and after shipping over 500 (or 5,000) beta units to key customers, the company discovers that there is a problem with certain calculations, as described below.

In order to expedite floating-point (ft.-pt.) operations (used in handling scientific notation in mathematical operations) in a computer or calculator, often certain tables of values are used to assist in the speed of execution of these ft.-pt. operations. (For example, a calculator requiring as long as 3 minutes to perform a tangent calculation would have no market appeal.) These tables can contain up to 100 integer entries. During beta testing, ABC2 discovers that several of these values were incorrectly entered before burning them into the firmware. Further testing concludes that because of the location and use of these table errors, the only mathematical results affected will occur in the 13th to the 17th significant digits for the double-precision fl.-pt. operations.

1. As the senior engineer on this project for ABC2, you are asked to propose a resolution for this situation. How serious is the problem? What should be done?
2. Call together a committee of your peers and have the group propose as many different alternative solutions as you can think of within 10-15 minutes.
3. Now, try to project each option's impact on the company and determine the best possible course of action.
4. Do you think your answers would have been the same if you had held another position at the firm? (company manager, stockholder, etc.)
5. Suppose the chip has been installed, 100,000 units have been sold, and an additional 50,000 are on dealers' shelves. Create a new list of possible actions and reactions.

From <http://www.onlineethics.org/cms/4877.aspx>

### **Situation N°2: Who Can Change Proprietary Source Code**

Derek Evans used to work for a small computer firm that specializes in developing software for management tasks. Derek was a primary contributor in designing an innovative software system for customer services. This software system is essentially the "lifeblood" of the firm. The small computer firm never asked Derek to sign an agreement that software designed during his employment there becomes the property of the company. However, his new employer did.

Derek is now working for a much larger computer firm. Derek's job is in the customer service area, and he spends most of his time on the telephone talking with customers having systems problems. This requires him to cross reference large amounts of information. It now occurs to him that by making a few minor alterations in the innovative software system he helped design at the small computer firm the task of cross referencing can be greatly simplified.

On Friday Derek decides he will come in early Monday morning to make the adaptation. However, on Saturday evening he attends a party with a friend, Horace Jones. Derek mentions his plan to Horace, who asks, "Isn't that unethical? That system is really the property of your previous employer." "But," Derek replies, "I'm just trying to make my work more efficient. I'm not selling the system to anyone. It's just for my use—and, after all, I did help design it. Besides, it's not exactly the same system—I've made a few changes."

1. Who do you agree with, Horace or Derek?

Derek installs the software Monday morning. Soon everyone is impressed with his efficiency. Derek begins to realize that the software system might well have company-wide adaptability. This does not go unnoticed by his superiors. So, he is offered an opportunity to introduce the system in other parts of the company.

Now Derek recalls the conversation at the party, and he begins to wonder if Horace was right after all. He suggests that his previous employer be contacted and that the more extended use of the software system be negotiated with the small computer firm. This move is firmly resisted by his superiors, who insist that the software system is now the property of the larger firm. Derek balks at the idea of going ahead without talking with the smaller firm. If Derek doesn't want the new job, they reply, someone else can be invited to do it; in any case, the adaptation will be made.

2. What should Derek do now?

Suppose Horace Jones is friends with people who work at the smaller computer firm.

3. Should he tell them about Derek's use of the software system?

From <http://www.onlineethics.org/Resources/Cases/WhoCanChange.aspx>

### **Situation N°3: All in the Interpretation**

Kate is a graduate student in Professor Bigwig's lab. She started a project examining the effects of certain video games in children during her first year of graduate school. She knows that some of the funding for her project comes from a video game manufacturer, but the money does not give the company control over how the research is conducted, and she believes she has been careful not to let the source of funds influence her project design and data collection.

1. Might a researcher's source of funding create a bias or the perception of bias? How might Kate (and the research community in general) deal with potential bias?
2. Even if Kate believes the source of funding will not influence her research, should she be concerned with how the presence of industry funding may affect her credibility with colleagues and the public?
3. What should Kate and her institution do to help preserve her scientific integrity in this case?

## ETHICS

Kate has collected all of the data for her project, and she has been carefully examining the trends. She is excited to see a clear trend in her data that indicates a positive effect of educational video games, but the effect washes out after about a year or two, and she is unsure how to interpret it. She creates a rough draft of a paper that carefully outlines all of her analyses and gives it to Dr. Bigwig for review. Later in his office, Dr. Bigwig explains that the "Results and Conclusions" section of her paper is very weak. He says that she does not make a strong case for the importance of her research, and that the quality of the journal where her paper will be published depends largely on her ability to interpret the data. "I'm not saying to leave out data," he says, "but the story you tell about the data is at least as, if not more, important than the data themselves."

Kate knows that research papers are rarely air-tight. In fact, members of her lab will often spend lab meetings ripping apart a paper from another group in order to stimulate discussion about the author's conclusions and generate ideas for future research. She feels she must choose a black or white stance in her interpretation of the effects of gaming in order to create a strong paper. She also knows that if she emphasizes the positive effects of the games, she could easily write another grant to the video game manufacturer to study the later wash-out period with a high probability of funding.

4. What is Kate's responsibility in presenting her research findings? Is Dr. Bigwig correct in stating that her story is as important as the data themselves? Is Kate correct in assuming she must choose one side and stick to it?

The paper is published, and Kate receives a great deal of recognition and congratulations from others within the university. She also receives a number of requests from news reporters to discuss her findings. The reporters seem not to notice that the numbers wash out and do not ask about it.

5. Knowing that most people will not look up the original article when they hear a news report, what is Kate's and/or Dr. Bigwig's responsibility to the public when interacting with the press? Is Kate ultimately responsible for the information that is disseminated by the media to the public?

From <http://www.onlineethics.org/Resources/Cases/Interpretation.aspx>

### **Situation N°4: Joint Authorship of Paper**

Jan and Keith, both engineers, are faculty members at a major university. Both are seeking tenure from the university, and as part of the requirement, they are required to publish original articles in scholarly journals.

As a graduate student, Jan developed a paper that he had never published, but now feels would be an excellent topic to publish in a journal. Jan discusses this idea with Keith, and they agree to work together on revising the paper.

Jan does most of the work of revising the paper to bring it up to date. Keith's contributions are minimal, but Jan agrees to include Keith's name as co-author, so as to enhance Keith's chances of obtaining tenure. The article is accepted and later published in a scientific journal.

1. Is it ethically acceptable for Jan to go back to his graduate work for an article to publish?
2. Is it responsible for Jan to ask Keith to help revise the article? How much could (or should) Jan and Keith have agreed upon at the start of their collaboration?
3. Was it ethical for Keith to accept credit for development of the article?
4. Was it either unethical or unwise for Jan to include Keith's name as co-author?

From <http://www.onlineethics.org/cms/7839.aspx>

### **Situation N°5: Claim of Prior Discovery by Reviewer**

As the editor of J.AAA you ask Prof. Sharp to review a manuscript submitted to your journal by Prof. Wright, because you know that Sharp works in the same area.

Sharp takes the full time allowed for review of Wright's article and, at the end of the review period, sends a letter recommending that J.AAA reject the work by Wright, on the grounds that it is not novel. Sharp claims that it is simply a repeat of the work that Sharp has published in the J.BBB, but Sharp does not give a full citation of that work.

1. What do you do?
2. Would you, as an editor of a journal, knowingly send a manuscript to a direct competitor of the author of an article? If you do, what if any precautions would you take to ensure fairness of review?
3. Given that reviewers need to be knowledgeable about the work they review, would you expect a reviewer engaged in the same research necessarily to disqualify themselves and return the manuscript? Why, or why not? How would the reviewer learn of these expectations?

If you discovered that the reviewer's work in J. BBB had not actually been published, what action would you take? Would the action be different if the article was under review by J.BBB? Would you notify anyone else about the reviewer's misrepresentation?

From <http://www.onlineethics.org/cms/12962.aspx>

### **Situation N°6: The Very Interested Reviewer**

As a recent Ph.D., you receive a journal article to referee. This article provides a proof for a result in your area of study. You become intrigued by the topic, and after a few weeks you come up with a shorter and better proof. You feel confident that this has not affected your judgment about the publishability of the result submitted to you.

1. Is there a conflict of interest in your reviewing the article?
2. Should you indicate in your review that you have found a better, shorter proof?
3. What, if anything, can and should you do or say about your own new proof?

From <http://www.onlineethics.org/cms/13010.aspx>

**VIDEO: CRACKING THE ENIGMA CODE****STARTER: Secret messages**

1. Think of at least one easy technique (accessible to anyone) for you to use code messages with a friend.
2. Think of a more elaborate technique based on your studies and explain how it would work.
3. How can we try to decode a secret message today?

**VIDEO: Cracking the Enigma code (From “The Codebreakers,” National Geographic Special, 2009)**

1. Fill in the blanks

In post WWI Europe, secrecy between paranoid nations becomes \_\_\_\_\_. The growth of international commerce creates a need for companies to keep their information secret from \_\_\_\_\_. Germany's Arthur Scherbius develops the Enigma machine as a means of keeping those business transactions \_\_\_\_\_. It works by generating an \_\_\_\_\_ when a letter key is pressed. A number of moving mechanical parts then \_\_\_\_\_ the path of the current, producing a different letter each time the key is pressed. The Enigma machine is about to become the German army's most powerful \_\_\_\_\_ in WWII, a weapon they're confident can keep their secret military codes ... secret.

2. What happened if the enemy captured an enigma machine?
3. How many different configurations for the machine are estimated?
4. How often did the setting of the machine change?
5. How is a coded message created?
6. Who is Alan Turing?
7. What did Enigma coded messages allow the Germans to do in the North Atlantic?
8. What flaw (=weakness) in the machine allowed Turing to eliminate thousands of permutations in his deductions?
9. What human weakness also helped to crack the code?
10. What type of German message was used to finally crack the code? Why?
11. What machine did Turing develop?
12. What was Jean Valentine's job and what made it unusual?
13. What did the capture of U-boats make possible?
14. The war was won by soldiers, not code breakers, but what did code breakers make possible?



*Original Author: Bob Lord at Wikipedia.org*

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**VIDEO: CRACKING THE ENIGMA CODE****PHONOLOGY****EXERCISE 1: SYLLABLE STRESS:**

*Identify the stressed syllable in these words and underline it.*

adorn	jester	cushion	
even	rugged	protest	people
support	parent	appeal	kidnap

**EXERCISE 2: INTONATION GROUPS:**

*Underline the nucleus in the following sentences, as spoken in a neutral way.*

My name's Fred.

I'm a tourist.

What do you mean?

What's your name?

Is it time to go?

How do you do?

Can I come in?

Would you like some tea?

What would you like to drink?

Source: Ray Parker & Tim Graham. *The Phonology of English: An Introduction for Teachers of ESOL*. ELB Publishing: Brighton, 2009 (First published 1994).



**READING**

Meet the men who spy on women through their webcams

Adapted from *ars technica*, 11 March 2013 by Nate Anderson

"See! That shit keeps popping up on my fucking computer!" says a blond woman as she leans back on a couch. The woman is visible from thousands of kilometres away on a hacker's computer. The hacker has infected her machine with a remote administration tool (RAT) that gives him access to the woman's screen, webcam, files, microphone.

RAT operators have nearly complete control over the computers they infect; they can (and do) browse people's private pictures in search of erotic images to share with each other online. They even have strategies for watching where women store the photos most likely to be compromising.

Women who have this done to them, especially when the spying escalates into blackmail, report feeling paranoia.

For many ratters, though, the spying remains little more than a game. It might be an odd hobby, but it's apparently no big deal to invade someone's machine, rifle through the personal files, and watch them silently from behind their own screens.

Welcome to the weird world of the ratters. They operate quite openly online, sharing the best techniques for picking up new female "slaves" in public forums.

**How it's done**

RAT tools aren't new; the hacker group Cult of the Dead Cow famously released an early one called BackOrifice at the Defcon hacker convention in 1998. The Cult of the Dead Cow press release made clear that BackOrifice was meant to expose "Microsoft's Swiss cheese approach to security." Compared to today's tools, BackOrifice was primitive. It could handle the basics, though: logging keystrokes, restarting the target machine, transferring files between computers, and snapping screenshots of the target computer.

Today, a cottage industry exists to build sophisticated RAT tools with names like DarkComet and BlackShades and to install and administer them on dozens or even hundreds of remote computers. When anti-malware vendors began to detect and clean these programs from infected computers, the RAT community built "crypters" to disguise the target code further. Today, serious ratters seek software that is currently "FUD" -- fully undetectable.

Building an army of slaves isn't particularly complicated; ratters simply need to trick their targets into running a file. This is commonly done by seeding file-sharing networks with infected files and naming them after popular songs or movies. For those who can't even manage this on their own, RAT experts hawk their slave-infecting expertise in e-books. And if even this handholding isn't enough, more successful ratters sometimes rent out slaves they have already infected. In other cases, they simply hand them off to others in a "Free Girl Slave Giveaway."

Calling most of these guys "hackers" does a real disservice to hackers everywhere; only minimal technical skill is now required to deploy a RAT and acquire slaves. Once infected, all the common RAT software provides a control panel view in which one can see all current slaves, their locations, and the status of their machines. With a few clicks, the operator can start watching the screen or webcam of any slave currently online.

The process is now simple enough that some ratters engage in it without knowing how RATs really work or even how vulnerable they are to being caught. Back in 2010, one Hack Forums member entered the RAT subforum worried about going to jail. "LOL, don't worry you ain't going to jail," another member responded. This is probably true; few such ratters are ever found.

**All Most information is good information**

Regardless of legality why would anyone want to host such content? I put the question to Jesse LaBrocca, the Las Vegas-based creator and operator of Hack Forums, which is one of the largest public hacker-focused sites anywhere. (Serious criminals, of course, prefer private forums that require vetting to enter -- which is one reason that law enforcement creates such sites when it wants to catch them.)

He responded with a strong defence of the idea that information should be open to all and he pointed to the Wikipedia entry on keyloggers to illustrate his point. "It's a fair amount of information including functions in Windows you would hook into to use a keylogger," he told me by e-mail. "At what point does Wikipedia and the Internet community decide it's too much information? And is there actually such a thing as 'too much information?'"

Possibly not, but my question wasn't about the existence of a forum devoted to RATs or to technical discussion about them. It was about the fact that the RAT subforum is *filled* with posts in which people

**READING**

55 explicitly show that they have illegally invaded other people's computers, that they are spying on them, and that they buy, sell, and trade slaves openly.

RATs can be entirely legitimate. Security companies have used them to help find and retrieve stolen laptops, for instance, and no one objects to similar remote login software such as LogMeln. The developers behind RAT software generally describe their products as nothing more than tools that can be used for good and ill.  
60 And yet some tools have features that make them look a lot like they're built with lawlessness in mind.

RATs aren't going away, despite the occasional intervention of the authorities. Those who don't want to end up being toyed with in a YouTube video are advised to take the same precautions that apply to most malware: use a solid anti-malware program, keep your operating system updated, and make sure plugins (especially Flash and Java) aren't out of date. Don't visit dodgy forums or buy dodgy items, don't click dodgy  
65 attachments in email, and don't download dodgy torrents. Such steps won't stop every attack, but they will foil many casual users looking to add a few more slaves to their collections.

**READING:**

*Say whether the following statements are true or false*

1. When installed on a user's computer, RAT software can allow unauthorized remote access to the computer.
2. Ratters frequently blackmail their victims with the information obtained from their computers.
3. The world of ratting is a highly secretive world in which members are vetted before being accepted.
4. BackOrifice's purpose was primarily to show the security deficiencies in Microsoft's system.
5. In order to get slaves, ratters have to be able to persuade their victims to run an infected file.
6. RAT software is illegal, but not many ratters get caught.

*Fill in the following table with words or expressions from the text that correspond to the definitions*

Line	Synonyms/definitions	Words/expressions from the text
	To appear suddenly	
	Embarrassing, shameful	
	To browse or search quickly through something	
	To manage to do something successfully	
	A system for making products to sell in which people work in their own homes and use their own equipment	
	To advertise or offer something for sale	
	To do something that makes people's opinion of someone or something not as good as it should be	
	A software program or hardware device that records all strokes on a computer keyboard, used either overtly as a surveillance tool or covertly as spyware	
	Evil (n)	
	To prevent someone from doing something that they are trying to do	

**READING**

*Answer the following questions on the text in your own words*

1. Why do you think victims of ratters are called “slaves”?
2. How does ratting work and what skills does it require?
3. What do you think of LaBrocca’s defense of his hosting ratting-related discussions on his site?
4. What can people do to protect themselves against ratters?

**GRAMMAR:**

*Resultative constructions*

1. Translate the following sentences into French

“Building an army of slaves isn't particularly complicated; ratters simply need to trick their targets into running a file.” (ll. 28–29)

I talked him into moving out.

I talked him out of moving out.

2. Change the following sentence so that it uses a resultative construction

The team laughed so much at Abed’s silly scheme that he gave it up.

3. Translate the following sentences from French into English

À force de menaces, ils l'ont amenée à dire la vérité.

À force de faire honte à son mari, Helen l'a contraint à faire son propre repassage.

**SPEAKING: PHD SUPPORT**

STUDENT A: Your friend is working on his/her PhD thesis and is feeling really low: things are not coming together as well as they wish and they fear not to be able to meet the hand-in deadline. Talk to them about what they have already achieved and try to cheer him/her up!

STUDENT B: You are a PhD student and feeling really low: hand-in deadline is looming and you feel there is no way you will be able to meet it. You confide in one of your good friends explaining your worries and discouragement and letting them cheer you up!

## ABSTRACTS AND RESEARCH PAPERS

## I. Discuss the following questions.

1. What is the structure of a research paper?
2. What is the purpose of an abstract?
3. How can an abstract help a researcher choose which papers to read?
4. What information does the abstract usually include?

## II. Read the following extracts from an abstract. Match each section from the IMRAD pattern to an extract (A-D).

- A With the aim of evaluating this possibility two microorganisms, *Acidithiobacillus ferrooxidans*, an acidophile, and *Deinococcus radiodurans*, a radiation-resistant microorganism, were exposed to simulated Mars conditions; that is, 95% CO<sub>2</sub>, 2.7% N<sub>2</sub>, 1.6% Ar and 0.6% H<sub>2</sub>O with a pressure of 7 mbars. Temperature was set at 150 K and ultraviolet radiation was in the wavelength range of 200–400 nm. Exposure was for different times under the protection of 2 and 5 mm layers of oxidised iron minerals. Survival was evaluated by growing the organisms on fresh media.
- B The resistance of organisms to extreme conditions like the conditions which exist on the surface of Mars under the protection of a thin material layer increases the possibility that life could exist on Mars.
- C Here we report that both the 2 and 5 mm thick layers provided enough protection against radiation and Mars environmental conditions for the bacteria to survive (Figs. 2 & 3).
- D Current surface conditions on Mars are extremely challenging for life. However, Nicholson and Schuerger (2005) reported that *Bacillus subtilis* was able to survive for 19 days under Mars atmospheric pressure and composition. The question is whether there are any features on Mars that could provide protection against the surface conditions. One possibility is that the surface material plays a protective role due to the fact that it is composed of iron oxides and hydroxides.

Source: Cambridge English for Scientists. Tamzen Armer. Cambridge: 2011.

## III. In the document, the author uses phrases to signal the purpose of each part of the abstract. In each extract, identify a phrase used for a purpose listed in the following table and write it down:

State research question	Present hypothesis	Introduce method	Introduce key results

## IV. Rewriting exercise: The abstract below (from UC Berkeley's website) meets most of the criteria for a good abstract. However, it contains language mistakes. See if you can correct them.

## "Quantifying the Mechanics of Laryngoscopy"

Laryngoscopy is a medical procedure that involves passing a breathing tube through the mouth and into the lungs of a patient. The ability to successfully perform a laryngoscopy depends of the operator's skill; experienced physicians have failure rates of 0.1% or less, while less experienced paramedics may have failure rates of 10-33%, which can lead to death or brain injury. Consequently, better training methods are needed. The immediate objective of this research project were to measure the mechanics of laryngoscopy, so that an advanced training mannequin could to be developed. Last summer a laryngoscope was developed to quantify the interactions between the laryngoscope and the patient. Experienced physicians as well as residents used these device on an existing mannequin, and the trajectories were visualized in 3D. One objective was to enable the development of a realistic training simulator. In the future an advanced training mannequin based on our measurements was developed.

Breathing tube = respirateur  
Lungs = poumons

Brain injury = lésion cérébrale  
Residents = internes

**ABSTRACTS AND RESEARCH PAPERS****V. PRACTICAL SKILLS: in-class project prep**

- Gather with the students you are enrolled with on the project, and make sure you have enough copies of the paper or article you have selected.
- If you are working on a research paper:
  - Read the abstract / introduction and determine what it conveys (context, task, method(s), object of the document, findings, conclusions, and/or perspectives). Does the abstract follow the IMRAD pattern? Are there any elements missing?
  - If some components are missing, look for the missing information in other parts of the paper. If this information is not there either, use your own knowledge of the field to make an educated guess.
  - Make sure that every student in your group is reading/has read the article and knows what his/her tasks are for the project. You should make the most of this prep time to share questions and answers about the contents of the article and the methods you will use to make your presentation.
- If you are working on an article from a science magazine:
  - Skim the article to identify its structure and its main points (context, task, method(s) mentioned, theories presented, findings, conclusions, and/or perspectives).
  - Look at the diagrams and visuals that accompany the text and check that you understand them and how they relate to the text.
  - During reading, write down any areas in which you might need to do some more research to understand the ideas in the article.
  - Make sure that every student in your group is reading/has read the article and knows what his/her tasks are for the project. You should make the most of this prep time to share questions and answers about the contents of the article and the methods you will use to make your presentation.

**POINTS OF VIEW: E-WASTE****STARTER:**

*Do you think that we are throwing away our electronic devices too easily? What alternatives are there to throwing them away? Can you think of ways in which the electronics industry tries to make us replace equipment that is still working?*

**Additional resource:** Log onto MADOC to watch a video about five ways manufacturers make devices hard to repair

**LISTENING:** Now listen to the report and answer the following questions ("How E-Waste Is Becoming a Big, Global Problem," NPR: *Science Friday*, *Talk of the Nation*, <http://www.sciencefriday.com/segment/01/11/2013/how-e-waste-is-becoming-a-big-global-problem.html>)

1. How many tons of electronic waste does the US produce every year according to the EPA?
2. Is the majority of it recycled or not?
3. How does Derek Markham define e-waste?
4. What percentage of cellphones gets recycled?
5. What are the three factors that Derek Markham mentions to explain why the number is so low?
6. What are some of the toxic metals that can be found in cellphones and what can happen to them if the cellphones are thrown away and end up in a landfill?

**WATCHING:** Watch the video and list all the solutions to the problem mentioned by the different speakers ("How Big of a Problem Is Electronic Waste?," *CBS This Morning Saturday*, <http://www.cbsnews.com/videos/e-waste-how-big-of-a-problem-is-electronic-waste/>)

	Solutions to the problem of e-waste
Vinita Nair <i>CBS This Morning Saturday</i> anchor	
Anthony Mason <i>CBS This Morning Saturday</i> anchor	
Dan Ackerman CNET Senior Editor	

**SPEAKING:**

A TV debate/talk show is being organized to discuss the problem of e-waste and electronics recycling. Decide who is going to play what character in the talk show. The following is a possible list of characters:

- A journalist/host, responsible for introducing the issue, for keeping the discussion going, and for making sure that everybody gets to speak
- A representative of an electronics company who wants to present his/her company in a positive light by emphasizing its commitments to the environment
- A representative of a recycling company that's been accused of shipping the electronic products they receive to developing countries instead of really recycling them
- A representative of an environmental organization who wants the regulations surrounding the recycling of electronic equipment to be tightened
- A politician who is opposed to having more regulation

**READING COMPREHENSION TEST:** The test will last for 40 minutes and will take place at the end of the session.



**VIDEO: DIGITAL ART**

**STARTER:** *Find the answers to these questions as quickly as you can*

6. How many of these apps come from the Tate Gallery?
7. What does the Smithsonian's app do?
8. Why is Magic Tate Ball called thus?
9. Which of these apps would you use if you wanted to know more about the history of a famous place in London?
10. Do you have to be at the Tate to play Tate Trumps?
11. Is the exhibition at the Metropolitan Museum of Art concerned with the impact of Photoshop on image manipulation?

**1) Tate Trumps by the Tate Gallery**

Tate Trumps is a digital card game you play with Tate's collection. Imagine if all the artworks in the gallery came to life and had a fight. Could you pick which one would win? Take a look at your favourite painting and try to gauge its mood. Is it menacing, exhilarating or absurd? Have you ever started planning the ultimate home gallery? Will you pick works which are famous or which would fit in your living room?

Play at home in "Anywhere" mode, choosing artworks from a selection from Tate's collection, displayed on the virtual gallery wall. Or play at Tate Modern itself, picking your collection from the paintings on display in the London gallery. You can play on your own or with your friends or family. (Each player requires their own iOS device). Tate Trumps is a game by Hide&Seek for Tate Media

Supported by Bloomberg

**2) Faking It by the Metropolitan Museum of Art**

Can you spot which photos are fake? Can you imagine why they were altered? Put your eyes to the test.

Digital cameras and image editing software have made photo manipulation easier than ever, but photographers have been doctoring images since the medium was invented. The false "realities" in altered photographs can be either surprising and eye-catching or truly deceptive and misleading.

Faking It is a quiz that asks players to spot which photos are fake and figure out why they were altered. Through fifteen sets of questions accompanied by more than two dozen remarkable images, the Faking It app challenges misconceptions about the history of photo manipulation.

Images in the app range from a heroic portrait of Ulysses S. Grant to a playful portrait of Salvador Dalí, and from New York's glamorous Empire State Building to Oregon's sublime Cape Horn.

This app complements The Metropolitan Museum of Art's special exhibition "Faking It: Manipulated Photography Before Photoshop." Additional content and information about the exhibition is available at [www.metmuseum.org/fakingit](http://www.metmuseum.org/fakingit).

This app is made possible by Adobe.

**3) MEanderthal by the Smithsonian**

Do you look like your relatives? Your prehistoric relatives? Try morphing yourself backward in time with MEanderthal. You might be surprised when you see your face transformed into the face of an early human with the Smithsonian Institution's first-ever mobile app.

**4) Magic Tate Ball by the Tate Gallery**

Magic Tate Ball reveals the hidden connections between art and your everyday life!

Shake your phone day or night, anywhere in the world, and the app's clever search algorithm will present you with the most relevant artwork from Tate's archive. It uses date, time of day, your GPS location, local weather conditions and ambient noise levels to match an artwork to that unique moment in time.

Concept and content from Tate and Thought Den. Designed and built by Thought Den, with Mobile Pie. Sponsored by Bloomberg.

**5) Museum of London: Streetmuseum by Thumbspark Limited**

Streetmuseum gives you a unique perspective of old and new London whether you're discovering the capital for the first time or revisiting favourite haunts. Hundreds of images from the Museum of London's extensive collections showcase both everyday and momentous occasions in London's history, from the Great Fire of 1666 to the swinging sixties.

Select a destination from our London map or use your GPS to locate an image near you. Hold your camera up to the present day street scene and see the same London location appears on your screen, offering you a window through time. Want to know more? Simply tap the information button for historical facts.

Once you've got the hang of it, use Streetmuseum to create your own trails around London. At home, on the way to work or enjoying a trip to the capital – whatever you're doing, Streetmuseum offers you a different outlook on London.

**VIDEO: DIGITAL ART**

**VIDEO:** "Digital Revolution at the Barbican: the highlights," *Time Out London*, <http://video.ldn.timeout.com/video/Digital-Revolution-at-the-Barbi>

1. What is the title of the exhibition at the Barbican and what is its theme?
2. What is the name of the first piece shown in the video? Why is the piece called thus?
3. Describe the technology they are using for this piece.
4. What is the name of the technology developed for *Gravity* that Tim Webber describes?
5. Explain how it works and what its purpose was.

**VIDEO:** "How to become a virtual bird," BBC World News: *Click*, <http://www.bbc.co.uk/programmes/p022v995>, and "Turning a wish into a virtual butterfly," BBC World News: *Click*, <http://www.bbc.co.uk/programmes/p022v8zh>

1. Who created *The Treachery of Sanctuary*?
2. Describe the piece.
3. What is the impact of the piece on the viewer, according to Spencer Kelly?
4. Describe the piece called *The Wishing Wall*.
5. What technology do they both use?
6. According to Spencer Kelly, what does this technology allow many of the pieces at the exhibition to do?

**REVIEWING STRESS PATTERNS:** Watch the interview with the two artists behind *Assemblance*. Using the provided script, indicate

(a) the primary stress (in underlined words), (b) the phonetic transcription of the **boldfaced** words

Usman Haque: We are in the Pit theater, which is at the Barbican in London, setting up for a project called *Assemblance*. It's part of the **Digital Revolution** exhibition which is going to be about three months this summer.

Nitipack "Dot" Samsen: I'm Dot Nitipak Samsen. I'm a designer and partner at Umbrellium.

Usman Haque: I'm Usman Haque, and I'm founding partner of Umbrellium. The Barbican approached us to talk about doing a project. The beginning of an idea here was to look at what might we do with light. We're interested to look at how people can kind of give form to **structures** made out of this light through their **gestures** and movements. So they walk into the space, they'll see almost like a kind of forest of light beams, curtains of light, that have been created by previous visitors. And they'll respond to them and they'll be able to create new ones to add to that. I suppose that it's experimental in the sense that we use the process of iterative experimentation to figure out what it is that we are doing. We're definitely very process-driven. We use the process of the project to kind of figure out what the idea is.

Nitipack "Dot" Samsen: We were experimenting a lot. A lot of this project, it's like very trial-and-error based, like we try and, "ah no that's not good," "this one is good," we know that there's something in it, which I mean we wouldn't feel it otherwise if we didn't actually try it that way.

Usman Haque: Yeah, and actually the **errors** are sometimes the things that lead us down a very new path. It's kind of only in the last two or three weeks that we've actually figured out what the idea really is. What we **realized** was that the thing that really intrigued us: How do you actually build an **environment** in which lots of people can collaborate to make something? It's almost modeling the outside world, where sometimes we

**VIDEO: DIGITAL ART**

have to suspend our distrust of others. You're building these delicate light structures, which can be wiped out by somebody just walking through them. You know, sometimes you're collaborating to make your structures stick together or build off of each other or bounce off each other, but it sort of requires a kind of care on the part of the visitor for each other's creations.

"Umbrellium at the Barbican," Crane.tv, <http://www.crane.tv/umbrellium-barbican-digital-revolution>

**GRAMMAR:** *The following are excerpts adapted from Varvara Guljajeva and Mar Canet's page about their Wishing Wall project (<https://devart.withgoogle.com/#/project/16494767>). Find and correct the grammatical mistakes.*

Software development

Simply put, softwares development can be divided into three mains parts:

- Rendering the butterflies with three.js
- Getting the server and database ready using node.js and mongoDB
- Figuring out the interactive component (computer vision using depth cameras)

Getting our hands on Node.js

Since node.js is a great solution for web servers and it is in javascript, we have decide to go for it. This way, we will can write the majority of our code in javascript.

Creating a number of different butterflies

Since every wishes will create a unique butterfly, text analysis will determine what shapes and colours are picked for the creation of the butterfly. There will be used more than one colour per butterfly.

Cocoon development

First, we started programming a shader for Three.js for to roll the text into a spiral. We used dat.GUI to create sliders for all shader parameters and we play with many of them in order to find the right values for each equations.

**PHONOLOGY****EXERCISE 1: CONTENT WORDS VS FUNCTION WORDS****GENERALLY STRESSED****Content** words (also called lexical words)

- Nouns
- Verbs
- Adjectives
- Adverbs

**GENERALLY NOT STRESSED****Function** words (also called structure words)

- (most) Determiners
- (most) Auxiliaries
- (most) Prepositions
- (most) Conjunctions
- (most) Pronouns

Read the following sentences and decide if the words are **CONTENT** or **FUNCTION** words (circle the content words). Then listen to the audio track and check your answers.

1. Put the flowers on the table.
2. The meeting ended with a vote.
3. The worst problem was the matter of status.
4. The effect of these gases is growing daily.
5. I had never spoken to her before.

**EXERCISE 2: WEAK vs STRONG FORMS**

Normal meaning + normal situation = probably unstressed (weak form)  
 Normal meaning + emphatic situation = probably stressed (strong form)  
 Special meaning = almost inevitably stressed (strong form)

For the following featured words, decide, in each pair, which one is weak (unstressed) and which one is strong (stressed). Read the sentences and mark your answers, then listen to the audio track and check.

1. THAN
  - a. She's better than I am.
  - b. 'Than' comes between 'texture' and 'thanks' in my dictionary.
2. THERE
  - a. Is there any milk left?
  - b. There's an old mill by the stream, they tell me.
3. OF
  - a. He's the only one I've ever heard of.
  - b. A box of matches please.
4. WAS
  - a. Bobby Charlton was a marvellous striker.
  - b. "Was there anything else, Sir?"
5. CAN
  - a. "YOU CANNOT BE SERIOUS!"
  - b. I can see clearly now the rain has gone.
6. AND
  - a. I ate a full English breakfast, a five course lunch and a substantial dinner.
  - b. I love fish and chips but I'm on a diet.
7. FROM
  - a. Where's he coming from?
  - b. He came from a long line of aristocrats.
8. US
  - a. Give us this day our daily bread...
  - b. He didn't give it to us, he gave it to them.
9. SOME
  - a. Some hope!
  - b. I'd love some cream on these strawberries.
10. TO
  - a. He came to the party after all.
  - b. After the party he was some time coming to.

Source: Ray Parker & Tim Graham. *The Phonology of English: An Introduction for Teachers of ESOL*. ELB Publishing: Brighton, 2009 (First published 1994).

## HOW TO DELIVER EFFECTIVE PRESENTATIONS

CONTENT	
Structure	Your presentation has to be structured AND your structure has to be made apparent (announcing outline in intro, using transitions)
Thoroughness	Even if you do not have much time, you can and should be thorough: focus on the most important things you have to say and be straightforward
Accuracy	Do not assume that your audience is ignorant: be precise and accurate.
COMMUNICATION	
Body language	When standing in front of an audience, remember your body says as much as your tongue: do not slouch, fidget, or keep your back to the board. Engage in communication with the whole group!
Volume and speed	Do not read/ hide behind your notes! Articulate and speak loud enough. Remember you WANT (remember TO want!) your message to be understood!
Eye contact	Look at everyone!
Visual aid	Communication tools may include ppt slideshows, diagrams, or other props (experimental setup). Either way, they remain TOOLS that need to be fully integrated in your communication plan. Simple approaches can help enhance the quality of your work!
LANGUAGE	
Grammar	Even though grammar mistakes are more acceptable in an oral than written context, basic errors must be eliminated (see L1+2 forbidden mistakes)
Pronunciation	It is crucial to check the pronunciation of new vocab as well as key (and therefore recurring) elements in your presentation: not only will mistakes hinder communication, they also discredit your performance
Vocabulary	Use simple language (both in terms of syntax and lexis). But make sure you DO have the right lexical references.

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**TRANSLATION EXERCISES****GRAMMAR: Translate the following sentences from French into English**

1. Cette augmentation de 70% s'explique par le fait qu'aucune vaccination systématique n'a été effectuée pendant cette période.
2. Ce montage comprend 5 parties. Les différents éléments sont reliés à un ordinateur, équipé/muni d'un scanner.
3. Ce nouvel appareil de détection de fumée sera bientôt commercialisé.
4. Ce robot, qui a la forme d'un être humain et qui résiste à l'eau, a une intelligence artificielle qui s'adapte rapidement.
5. Les données sont en train d'être traitées, mais il semble que l'érosion est restée stable depuis près d'un siècle.
6. Regarde-le ! Pourquoi porte-t-il un T-shirt « Einstein avait tort » ? – C'est parce qu'il écrit une thèse sur le sujet.
7. Les scientifiques travaillent sur ce projet depuis deux ans, mais n'ont fourni aucun résultat fiable.
8. Les ventes d'ordinateurs portables ont augmenté de façon spectaculaire ces trois dernières années, tandis que les ordinateurs de bureau se vendent de moins en moins dernièrement.
9. Il s'est spécialisé dans l'étude du mode de reproduction de cette espèce en voie de disparition.
10. L'expérience de Miller, qui est censée expliquer l'origine de la vie, est très controversée.
11. Ils seraient capables de comprendre la physique quantique s'ils pensaient à acheter les bons livres.
12. Nous sommes heureux de vous annoncer que vous avez réussi à découvrir un nouvel élément.
13. Les scientifiques de la NASA se sont peut-être trompés ; ils n'auraient pas dû publier leurs résultats aussi tôt.
14. D'ici 2020, la température de l'océan aura augmenté de 0,5°, ce qui risque de provoquer des disparitions d'espèces marines.
15. Beaucoup de fausses informations ont circulé sur les implications de ces recherches.
16. De moins en moins d'étudiants choisissent d'étudier les mathématiques fondamentales ; l'attrait des mathématiques appliquées s'explique en partie par les nombreux débouchés de ces filières, notamment dans la finance. Pourtant, l'expérience prouve que peu de ces étudiants toucheront beaucoup d'argent.



**FURTHER PRACTICE**

Choose the best answer to complete the following sentences.

1. The deadline for ... an abstract was in November.
  - a. submit
  - b. sustaining
  - c. submitting
  - d. submitted
2. Did they comment ... her performance?
  - a. on
  - b. about
  - c. Ø
  - d. to
3. They wished to participate ... the conference.
  - a. to
  - b. with
  - c. at
  - d. in
4. More than two ... people attended the conference.
  - a. thousands
  - b. thousand of
  - c. hundreds
  - d. hundred
5. The aim of my presentation is to describe ... our process for recycling polymers.
  - a. you
  - b. at you
  - c. to you
  - d. with you
6. I am going to present ... an overview of the physics of smart materials.
  - a. you
  - b. at you
  - c. to you
  - d. you to
7. Let me show ... this graph.
  - a. you
  - b. at you
  - c. to you
  - d. you to
8. I would like to introduce ... a new approach.
  - a. you
  - b. at you
  - c. you to
  - d. you at
9. We had been requested to limit one slide ... one main idea.
  - a. for
  - b. at
  - c. to
  - d. on
10. Don't leave a slide on the screen after ... its subject.
  - a. discussing
  - b. discussed
  - c. to explain
  - d. to discuss
11. Each poster session author will be provided ... a horizontal poster board and chair.
  - a. of
  - b. on
  - c. Ø
  - d. with
12. Use duplicates if you need to refer ... the same slide at several different times in your talk.
  - a. at
  - b. to
  - c. back
  - d. for
13. This course is a general introduction ... the history of science.
  - a. to
  - b. in
  - c. at
  - d. on
14. This course is designed to provide ... an overview of the theory of Fourier transform.
  - a. with
  - b. over
  - c. Ø
  - d. by
15. He undertook a ... undergraduate course in 2005.
  - a. two-year
  - b. two-year's
  - c. two years
  - d. two year's
16. She had been admitted ... ISIA in 1991.
  - a. at
  - b. Ø
  - c. to
  - d. for
17. They entered ... Cambridge University in 2013.
  - a. at
  - b. into
  - c. in
  - d. Ø
18. They had pursued studies ... Computer Science.
  - a. of
  - b. for
  - c. in
  - d. to

**FURTHER PRACTICE**

19. I was advised ... Physics.  
 a. not choose c. not to choose  
 b. choose not d. not choosing
20. Our training ... 5 months ago.  
 a. has started c. started  
 b. has begun d. begin
21. They requested ... before the end of the academic year.  
 a. us to get in touch with them c. that we'll get in touch with them  
 b. us get in touch with them d. we got in touch with them
22. This course will introduce students ... the phenomenon of light scattering.  
 a. over c. at  
 b. Ø d. to
23. This course will end ... a general discussion.  
 a. at c. by  
 b. with d. into
24. Attendance ... the first class meeting is mandatory.  
 a. at c. in  
 b. for d. to
25. Enrollment is limited ... 60 students.  
 a. at c. to  
 b. on d. by
26. For more ... about the program, please contact the administration office.  
 a. informations c. items  
 b. detail d. information
27. Before ..., make sure you have chosen the right program.  
 a. enrolling c. to enroll  
 b. you enrolled d. you'll enroll
28. Your chance of getting into a good school is very dependent ... how you score on the Graduate Management Admission Test (GMAT).  
 a. of c. on  
 b. over d. by
29. Pr Dupont has been teaching cellular biology ... over 12 years.  
 a. in c. during  
 b. on d. for
30. Dr Durand among others will acquaint students ... the principles of computing.  
 a. on c. to  
 b. about d. with

Source: Lydie Navard, *Scientifically Yours: 400 tests d'anglais appliqués à la communication scientifique internationale*, Tec & Doc Lavoisier: Paris, 1999.

## THE PRINCIPLES OF CLEAR WRITING

In the following pages, you will find some information to keep in mind when writing in English. Those principles will (hopefully) help you write clear, effective, and logical sentences and texts.

### Make characters subjects and actions verbs

Compare the following sentences:

*A: Researchers have identified the AIDS virus but have failed to develop a vaccine to immunize those at risk.*

*B: Attempts by economists at defining full employment have been met with failure.*

Sentence A is clearer for two reasons:

- The characters in sentence B are not the subject. The subject is attempts but the characters are *economists*.
- The actions in sentence B are not verbs but abstract nouns (*attempts, failure*) and the verb (*have been met with*) expresses little meaning.

=> Sentence A is clearer because the characters are subjects and the actions are verbs. Also, the subjects are short, specific, and concrete.

So, when you match characters to subjects and actions to verbs in most of your sentences, readers are likely to think your prose is clear, direct, and readable.

Using that principle, sentence B could be rewritten as follows:

*Economists have attempted but failed to define full employment.*

It does not follow that all nominalizations are bad, but French speakers tend to use too many of them, so keep that in mind when writing in English.

### Old information goes before new information

We depend on the beginning of a sentence to give us a context of what we know before we read what's new. A sentence confuses us when it opens with information that is new and unexpected. For example, in this next passage, the subject of the second sentence gives us new and complex information (**boldfaced**), before we read more familiar information that we recall from the previous sentence (underlined):

*We must decide whether to improve education in the sciences alone or to raise the level of education across the whole curriculum. **The weight given to industrial competitiveness as opposed to the value we attach to the liberal arts** will determine our decision.*

We could read the second sentence more easily if it were passive, because the passive would put the short, familiar information first and the newer, more complex information last:

*We must decide whether to improve education in the sciences alone or to raise the level of education across the whole curriculum. Our decision will be determined by the weight we attach to industrial competitiveness as opposed to the value we attach to the liberal arts.*

So remember that sentences are cohesive when the last few words of one set up information that appears in the first few words of the next. That is what gives us our experience of flow. And in fact, that's one of the biggest reasons the passive is in the language: to let us arrange sentences so that they flow from one to the next easily.

In every sentence that you write, you have to balance principles that make individual sentences clear and principles that make a passage cohesive. But in that tradeoff, give priority to helping readers create a sense of cohesive flow. Fortunately, the principle of old before new cooperates with the principle of characters as subjects. Once you mention your main characters, readers take them as familiar information. So when characters are up front, so is familiar information.

### Pay attention to the beginning of your sentences

Readers are more likely to judge as clear a unit of writing that opens with a short segment that they can easily grasp and that frames the longer and more complex segment that follows.

There are two rules of thumb about beginning a sentence: (1) Get to the subject quickly and (2) get to the verb and object quickly.

## THE PRINCIPLES OF CLEAR WRITING

- Get to the subject quickly:

Avoid beginning more than a few sentences with long introductory phrases and clauses. When you find a sentence with a long introductory clause, try moving it to the end. If it doesn't fit there, try turning it into a sentence of its own.

*Because of the growing use of computers to store and process corporate information, industrial spying is increasing rapidly.*

*=> Industrial spying is increasing rapidly because of the growing use of computers to store and process corporate information.*

It is, however, a fact of English style that clauses beginning with *if*, *when*, and *although* tend to appear before main clauses rather than after. So if you cannot avoid opening with a subordinate clause, keep it short.

- Get to the verb and object quickly:

- Avoid long, abstract subjects: revise long subjects into short ones.

*The possibility that some termini have a base composition different from that of DNA simply because they are the nearest neighbors of termini specifically recognized by the enzymes can be checked by comparing the experimental results with those expected from the nearest neighbor data.*

*=> If we compare the experimental results with those expected from the nearest neighbor data, we can check the possibility that some termini have a base composition different from that of DNA simply because they are the nearest neighbors of termini specifically recognized by the enzymes.*

- Avoid interrupting the subject-verb connection: move the interruption to the beginning or end of its sentence, depending on whether it connects more closely to what precedes or follows it. However, short interruptions (for instance, one-word adverbs) are not a problem.

*The continued and unabated emission of carbon dioxide gas into the atmosphere, unless there is a marked reduction, will eventually result in serious changes in the climate of the world as we know it today.*

*=> If we do not reduce our emissions of carbon dioxide, the current climate will be seriously changed//affected. OR Unless we reduce our emissions of carbon dioxide, the current climate will be seriously changed.*

- Avoid interrupting the verb-object connection: Move the interrupting element to the beginning or end of its sentence, depending on what comes next.

*The Institute launched, in partnership with the University of Lisbon, a new Ecodynamics Award.*

*=> The Institute launched a new Ecodynamics Award in partnership with the University of Lisbon.*

### **Pay attention to the end of your sentences**

The first few words of a sentence are especially important because they state its topic, what the sentence is about or comments on. The last few words of a sentence are also particularly important because they receive special emphasis. This is what we will call the sentence stress. How you manage the emphasis in that stress position helps establish the voice readers hear in your prose. If you end a sentence on words that have little meaning, your sentence will seem to end weakly.

Three tactical revisions:

- Trim the end:

*Sociobiologists claim that our genes control our social behavior in the way we act in situations we are in every day.*

*=> Sociobiologists claim that our genes control our social behavior.*

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## THE PRINCIPLES OF CLEAR WRITING

- Shift peripheral ideas to the left:

*The data offered to prove ESP are weak, for the most part.*

*=> For the most part, the data offered to prove ESP are weak.*

*Job opportunities in computer programming are getting scarcer, it must be remembered.*

*=> It must be remembered that job opportunities in computer programming are getting scarcer.*

- Shift new information to the right:

*Questions about the ethics of withdrawing intravenous feeding are more difficult [than something just mentioned].*

*=> More difficult [than something just mentioned] are questions about the ethics of withdrawing intravenous feeding.*

Sources: Joseph M. Williams and Joseph Bizup, *Style: Lessons in Clarity and Grace*, Pearson: Boston, 2013.

<https://cgi.duke.edu/web/sciwriting/index.php?action=lesson3#examples>

<https://owl.english.purdue.edu/owl/resource/600/01/>

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## FUN WITH SPELL CHECKERS

**ADDITIONAL ACTIVITY:** *Read the following poem and correct all the mistakes in it*

A Little Poem Regarding Computer Spell Checkers...

Eye halve a spelling chequer  
It came with my pea sea  
It plainly marques four my revue  
Miss steaks eye kin knot sea.

Eye strike a key and type a word  
And weight four it two say  
Weather eye am wrong oar write  
It shows me strait a weigh.

As soon as a mist ache is maid  
It nose bee fore two longs  
And eye can put the error rite  
Its rare lea ever wrong.

Eye have run this poem threw it  
I am shore your pleased two no  
Its letter perfect awl the weigh  
My chequer tolled me sew.

From <http://www.latech.edu/tech/liberal-arts/geography/courses/spellchecker.htm>