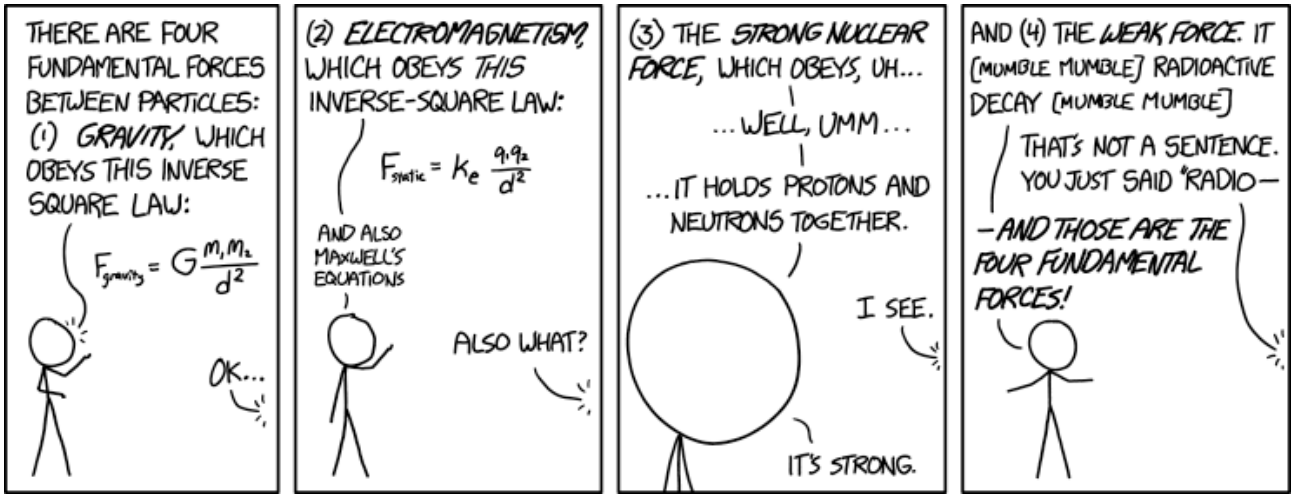
PHYSICS & MECHANICS

XKCD – Fundamental Forces



© XKCD - https://xkcd.com/1489/

X31 ENGLISH HANDOUT

Université de Nantes
2020-2021

X31A040
cecile-marie.lereste@univ-nantes.fr

PROGRAM

1	Academic and Technical Vocabulary	Watching/Speaking/Writing
2	Scientific literature and summarizing Vocabulary building: Presentation vocabulary	Reading/Writing
3	Literature review: methodology	Listening
4	Process Descriptions	Reading/Writing
5	Lab Experiments	Watching/Speaking
6	Comprehension: Octopus-Inspired Camouflage	Reading/Speaking
7	Technical Vocabulary	Reading/Speaking
8	Comprehension: Blue LEDs	Reading/Speaking
9	In-class prep	
Project Presentations		
Sessions 10 to 12, 9 to 12 if necessary.		

ASSESSMENT: The module is assessed through 100% continuous assessment. You will be assessed on

- two written tests (50% of the final grade)
  - One multiple-choice language test for which you will prepare using the distance learning activities on MADOC. This will count for 10% of the final grade (20% of the written grade) and will be taken on MADOC. Your group teacher will tell you when to take the test.
  - One writing assignment for which you will choose a practical that you completed over the course of the semester and produce a 250-word summary of it (+/- 10%) following the IMRAD pattern (see session 2 for more detail on that assignment). Your group teacher will tell you the deadline for when you need to have uploaded your text on the submission space on MADOC. (40% of the final grade, 80% of the written grade).
- your presentation (see opposite page) (50% of the final grade)

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 on Madoc AND get in touch with the head of the module when you miss a test (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-attendee 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 christine.foucat@univ-nantes.fr as early as possible to discuss your situation.

This CANNOT be arranged directly with your group teacher.

Online Activities:
Online activities available on Madoc are compulsory and **must be completed by session** 6 at the latest.

TOEIC PREPARATION ONLINE COURSE:
If you are considering taking the TOEIC this semester, an online training course is available on Madoc

PROGRAM

ASSIGNMENT

In groups of three, you will be asked to prepare a LITERATURE REVIEW on a topic of your choice.

1. You will prepare and present an oral presentation on a topic of your choice related to your field of study: your presentation should give an overview of the question, putting various sources in perspective. It should be structured, documented and personal (i.e. in your own words).

   You will have approximately 15 minutes (per group) to present your work 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 "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. You will be asked to ask questions after one of your fellow students' group presentation. You will not present yourselves but should be sufficiently prepared to react to the proposed presentation.

3. For all oral presentations: you will have to make notes during the presentations and ask questions.

AIM & 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 to 4 sessions.

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

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
	•	ɾ	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, Hluhluwe

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
•	•	iː	fleece, sea, machine
•	•	eɪ	face, day, steak
•	•	aɪ	price, high, try
•	•	ɔɪ	choice, boy
•	•	uː	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
•	•	ɑː	start, father
	•	ɑː	lot, odd
•	•	ɔː	thought, law, north, war
•		ʊə	cure, poor, jury
•		ɜː	nurse, stir
	•	ɜˠ	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:

•		ɒ̃	grand prix, chanson
	•	ɑ̃ː	grand prix, chanson
•	•	æ̃	vingt-et-un
•		ɜ̃ː	vingt-et-un

Source: Longman Pronunciation Dictionary

ACADEMIC & TECHNICAL VOCABULARY

Video - Academic and physics vocabulary acquisition - MIT Physics Dept Research

Part 1: fill in the blanks:

1. The missions of the Physics Department at MIT:
    a. Pursue _____ (3 words) at the frontier of Physics _____ many _____ (2 words)
    b. _____ students _____ (4 words) in both the physics professions and in other fields…
2. Kristin Beck works…
    a. …in _____ (3 words)
    b. …on a system aimed at studying how to make mediated _____ (3 words)
3. Laura Lopez:
    a. She looks at _____ that went off in the last _____ years (4 words), looking at _____ (4 words) to better understand the physics of the explosion and how the explosion _____ (4 words).
4. Wolfgang Ketterle at Center for Ultracold atoms:
    a. Collaboration between the _____ at MIT and Harvard
    b. The _____ of his research group is _____ (2 words)
    c. Future: _____ (2 words)
5. Nergis Malvalvala, Laser and Interferometer Gravitational-wave Observatory (LIGO):
    a. Main facilities: a pair of _____ (Washington State, Louisiana)
    b. Goal: _____
    c. Future: regular detection of radiation from different sources in the sky to launch the era of gravitational wave astrophysics.

Part 2: identify the main ideas/information mentioned by the following people

Undergraduate Research Opportunities Program (UROP):

6. Sabrina Gonzalez Pasterski:
7. Prashanth Venkataram:
8. Christie Chiu:
9. Edward Mazenc: UROP

ACADEMIC & TECHNICAL VOCABULARY

10. Katelin Schultz:

Note:
TLL = Teaching and Learning Laboratory
TA = Teaching Assistant, graduate student who tutors undergraduates

a. A lot of universities…

b. With TLL,…

Speaking:

A. In groups of 4, prepare and discuss:

a. What did you like about your own undergraduate program?

b. What do you know about your university's graduate programs?

c. What do you know about your university's research groups?

d. What do you know of research groups in your field outside your university?

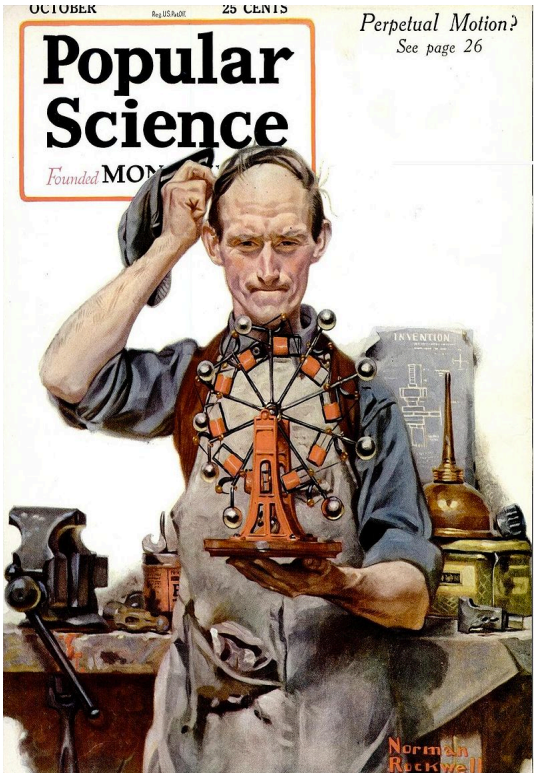
B. In pairs, using the previous activity, prepare and discuss your study and career plans/goals (link study and career)

Writing Skills Practice:

You are applying for admission into a graduate program in a field of your choice at your dream graduate school. It can be at the same university, where you are going to college, or a different one. In ~150-200 words, write a letter or e-mail, to the professor who is head of the program to explain why you would like to work under her/his supervision in that program.

VIDEO: Are perpetual motion machines possible?

BEFORE YOU WATCH
Do you know what a perpetual motion machine is?
Do you know how it works?
Can you think of examples?



VIDEO

1. How does the machine presented by Dianna Cowern (aka Physics Girl) work? Fill in the gaps:

As the wheel turns, the coins fall in the **(1) …** so that one side of the wheel is always **(2) …** than the other. The wheel could **(3) …** on forever without a push.

2. What could be a great application of this machine according to her? Choose the correct answer:

A. boats
B. solar panels
C. wind turbines
D. fossil fuels

3. Does it work? Choose the correct answer then explain by filling in the blanks.

Choose the correct answer: Yes it does … / No it doesn't …

… because of 2 forces:

ACADEMIC & TECHNICAL VOCABULARY

- **(1) …**: because of the coin(s), the wheel will **(2) …** back and **(3) …** where the center of **(4) …** is at its **(5) …**
- and **(6) …** on the axle until it stops

4. The Drinking Bird: describe the device by filling in the blanks.

The bird **(1) …** itself into the glass then **(2) …** itself over and over again…

5. How does it work?

FIRST, _____

_____

_____

THEN, _____

_____

_____

FINALLY,

_____

6. What is the source of energy for the drinking bird?

7. What other phenomenon can be explained likewise?

VOCABULARY

Give two other verbs used in the video meaning 'TO TURN':

What is the other name for the perpetual motion machine in the video?

What expression does Physics Girl use to say that perpetual motion machines are impossible?

GRAMMAR – EXPRESSING CAUSE and CONSEQUENCE

Complete the following sentences adapted from the video

_____ the wheel turns, the coins fall in the slots _____ one side of the wheel is always heavier than the other.

The pressure difference _____ the liquid flow to the top and the bird tip over.

Can you rephrase them using other structures?

SCIENTIFIC LITERATURE AND SUMMARIZING

For this semester's writing assessment, you will have to produce a summary of a practical of your choice. Therefore, you need to have the right tools and methods to tackle this type of exercise. This is what this session is about.

SCIENTIFIC LITERATURE

1. SPEAKING PRACTICE: Speaking together with your neighbor discuss the following questions and remarks. Below each question you will find some prompts to help you express your ideas. Use them as you speak together.
    a. What is the difference between a scientific journal and a science magazine?

Journals are meant to… whereas magazines are intended for…

The articles published in journals are… while those in magazines…

    b. Do you enjoy reading any scientific magazine (online or paper)? Do you know the names of some major scientific journals in your field of study? What sources do you personally use to learn about science?

I love reading… since they often publish articles on…

My personal favorite is… because…

I'd say the most influential probably is…

One journal that the vast majority of [group of scientists] read is…

I watch a lot of…

2. AN INTRODUCTION TO SCIENTIFIC LITERATURE

To avoid spending too much time reading material that is not directly related to their own research, scientists first read an article's abstract. An abstract is a very brief, very concise summary of the article. So the first thing you need to learn, is to know how to deal with abstracts. Here are a few tips from Leah Carroll, a professor at Berkeley University in California:

An abstract is a short summary of your completed research. If done well, it makes the reader want to learn more about your research. These are the basic components of an abstract in any discipline:

1) Motivation/problem statement: Why do we care about the problem? What practical, scientific, theoretical or artistic gap is your research filling?

2) Methods/procedure/approach: What did you actually do to get your results? (e.g. analyzed 3 novels, completed a series of 5 oil paintings, interviewed 17 students)

3) Results/findings/product: As a result of completing the above procedure, what did you learn/invent/create?

4) Conclusion/implications: What are the larger implications of your findings, especially for the problem/gap identified in step 1?

However, it's important to note that the weight accorded to the different components can vary by discipline. For models, try to find abstracts of research in your field.

The general pattern you should try to remember is as follows:

Introduction **M**ethod **R**esults **D**iscussion

This general pattern also applies to research papers themselves and is known as the IMRAD pattern.

Your practical summary should follow the IMRAD pattern.

SCIENTIFIC LITERATURE AND SUMMARIZING

SUMMARIZING AND TAKING NOTES

The following articles were not published by a team of scientists but by a journalist for a science magazine. Therefore, they do not follow the general outline of hypothesis, methodology, results, discussion. However, they still give you a nice opportunity to practice summarizing.

1. Get together in groups of 4 (2 groups of 2). Two students will read and summarize article A, while the other two students will read and summarize article B.
2. Together, produce a summary. It should be around 10 sentences or about 100 words.
3. When your summary is ready, read it to the other group. The other group needs to be able to rephrase what you said to show they understood everything clearly.

Here are a few prompts to help you start your presentation to the other group:

This article deals with…

The article introduces the work of…

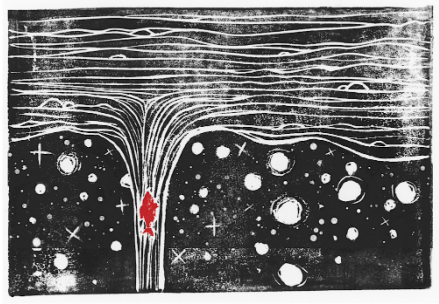
The first part of the article is dedicated to… then the author moves on to…

Researchers have managed to…

[The research] sheds light on…

[The research] represents a major breakthrough in…

Thanks to [the research], scientists are now able to…



Credit: Olena Shmahalo/Quanta Magazine

Article A:

In a first, scientists took the temperature of a sonic black hole

By Emily Conover

Taking a black hole's temperature is a seemingly impossible task. But now, physicists report the next best thing. They've measured the temperature of a lab-made sonic black hole, which traps sound instead of light.

If the result holds up, it will confirm a prediction of cosmologist Stephen Hawking, who first proposed a surprising truth about black holes: They aren't truly black. Instead, a relatively small stream of particles bleeds from each black hole's margin at a temperature that depends on how massive the black hole is. Such Hawking radiation is too faint to observe in true black holes. But physicists have spotted hints of similar radiation from analogs of black holes created in the lab (*SN: 12/18/10, p. 28*). In the new study, the sonic black hole's temperature agrees with that predicted by Hawking's theory, the team reports in the May 30 *Nature*.

"It's a very important milestone," says physicist Ulf Leonhardt of the Weizmann Institute of Science in Rehovot, Israel, who was not involved with the study. "It's new in the entire field. Nobody has done such an experiment before."

To produce the sonic black hole, the researchers used ultracold atoms of rubidium, chilled to a state known as a Bose-Einstein condensate, and set them flowing. Analogous to a black hole's gravity trapping light, the flowing atoms prevent sound waves from escaping, like a kayaker rowing against a current too strong to overcome. Previous experiments with this setup have shown signs of Hawking radiation, but it wasn't yet possible to measure its temperature

Hawking radiation comes from pairs of quantum particles that constantly pop up everywhere, even in empty space. Normally, those particles immediately annihilate one another. But at a black hole's edge,

if one particle falls in, the other could escape, resulting in Hawking radiation. In the sonic black hole, a similar situation occurs: Pairs of sound waves known as phonons can appear, with one falling in and the other escaping.

Measurements of the phonons that escaped and those that fell in allowed the researchers to estimate the temperature, 0.35 billionths of a kelvin. “We found very good agreement with the predictions of Hawking’s theory,” says physicist Jeff Steinhauer of the Technion-Israel Institute of Technology in Haifa.

The result also agrees with Hawking’s prediction that the radiation would be thermal, meaning that the particles’ energies would have a distribution like that of the glow emitted by a warm object, such as the reddish light of a hot electric stove.

After Hawking proposed his theory, this predicted thermal property of the radiation led to a conundrum known as the black hole information paradox. In quantum mechanics, information can never be destroyed. But particles escaping black holes would slowly sap the behemoth’s mass, and over a long period of time, the black hole would shrink into nothingness.

That means that the information that fell into the black hole (in the form of particles, encyclopedias or otherwise) would no longer be contained within it. And if Hawking radiation is thermal, the information couldn’t have been carried away by the fleeing particles. That’s because the emitted particles are indistinguishable from those radiated by a commonplace object with a given temperature, or even by a different black hole of the same mass. That suggests that information can be lost as a black hole evaporates away, a violation of quantum mechanics.

It’s unclear whether the new study could help scientists resolve the information paradox. A solution will probably demand a new theory that combines gravity and quantum mechanics into one new theory of quantum gravity — a task that is one of the biggest outstanding problems in physics. But that theory wouldn’t apply to sonic black holes, since they aren’t created by gravity. “The solution to the information paradox is in the physics of a real black hole, not in the physics of an analog black hole,” Steinhauer says

From https://www.sciencenews.org/article/first-scientists-took-temperature-sonic-black-hole

Credit: physicsworld.com

Article B

LIGO will be getting a quantum upgrade

By Emily Conover

Gravitational wave detectors are going quantum.

A planned revamp of the Advanced Laser Interferometer Gravitational-Wave Observatory, LIGO, relies on finessing quantum techniques, LIGO scientists announced February 14. That $35 million upgrade could let scientists catch a gravitational wave every day, on average. LIGO’s current tally of 11 gravitational wave events could be surpassed in a single week, LIGO researchers said in a news conference at the annual meeting of the American Association for the Advancement of Science.

Starting up in 2024, the revved up detector, known as Advanced LIGO Plus, will seek to wrangle a quantum rule, the Heisenberg uncertainty principle, to improve the machine’s ability to detect ripples in spacetime. The Heisenberg uncertainty principle states that it’s impossible to precisely measure certain properties, such as the position and momentum of an object, at the same time.

In LIGO, this translates to a give-and-take in the light scientists monitor to detect gravitational waves. At each of the observatory’s two detectors, located in Livingston, La., and Hanford, Wash., laser light bounces back and forth within two 4-kilometer-long arms arranged in an “L”. To determine whether a

gravitational wave is passing through, scientists measure the brightness of the light where the arms meet and the beams recombine.

Due to quantum mechanics, that light fluctuates in two ways: in its phase, the timing of the light wave; and in its amplitude, which determines the light's intensity. This variation muddles LIGO's measurements, making it more difficult to pick out the subtle signals of a gravitational wave. So in LIGO's next round of operation, to begin in April, researchers will for the first time use quantum "squeezed" light, in which the fluctuations in the light's phase are decreased. As a result, LIGO will better capture waves of higher frequencies — ripples that would have a higher pitch if converted into sound waves.

"That's exciting, but it comes with a penalty," physicist Michael Zucker of Caltech and MIT LIGO Laboratory said in the news conference. Fluctuations in the power of the light are increased, which makes measuring lower frequency gravitational waves more difficult. "It doesn't excuse you from Heisenberg's uncertainty principle."

But in Advanced LIGO Plus, scientists will use a system that will make the best of both worlds, squeezing the light one way for lower frequency ripples and another for higher frequency signals, to improve the machine's performance overall. "That is another step in complexity," says physicist Hartmut Grote of Cardiff University in Wales. Grote helped pioneer light squeezing techniques in a smaller gravitational wave detector called GEO 600, located near Hannover, Germany.

Another detector in India, called LIGO-India, is also expected to turn on at around the same time as Advanced LIGO Plus, and will employ the same quantum techniques.

From https://www.sciencenews.org/article/ligo-gravitational-wave-detector-quantum-upgrade

SUMMARY:

……

……

……

……

……

……

……

……

……

……

ASSIGNMENT: ADVICE

The following two pages provide advice and methodology help for your writing assignment. Read them thoroughly on your own time.

HOW TO SUMMARIZE

Adapted from essaysdeluxe.com

The summary you will submit for the writing portion of this semester's assignment will follow the IMRAD pattern that research papers use. The following tips should help you with your summarizing methodology for this exercise.

1. **Find the following information in your original work in French**

Briefly go over the text and look at each of its sections to find:

- The reason for doing the practical and the question stated (this is usually found in the introduction of research papers)
- The hypothesis (or hypotheses) that were tested (also in the intro)
- How they tested the hypothesis (found in the methodology section of papers)
- What the findings were (found in the results section of research papers)
- How those findings were interpreted (found in the discussion section of research papers)

2. **Take notes in English about the information you just elicited**

The idea here is not to translate the French text, but to express the important, relevant ideas in condensed note form so you are better able to free yourself from the French when writing your summary. This is a crucial step and it requires that your notes be both concise and detailed enough that you do not need to refer back to the original text too much (because if you do, you run the risk of just translating word for word).

3. **Write the summary in English**

- State the question explored in the practical and explain why it's important.
- State the hypotheses that were tested.
- Describe the methods in a few sentences.
- Point out the results and explain how you interpreted them / why they were significant.

4. **Edit your summary**

Try to avoid any generalities and keep your summary concise and focused. Your test will be 250 words (+/- 10%). If you are over the limit, you will need to edit it to bring it down. Respecting the instructions, including the number of words and the format, will be part of the criteria used to assess your work.

To make your summary look perfect, you need to:

- Check spelling and grammatical mistakes using a spellchecker.
- Eliminate wordiness (such as adverbs or other words that aren't really necessary)
- Use concrete and specific language: readers need to be able to understand you without having done the practical themselves!
- Use language that is scientifically accurate

ASSIGNMENT: ADVICE

DEALING WITH JARGON

You may not know all the technical terms you will need for your summary. There are a number of ways to find the equivalents for technical or specialized vocabulary in another language.

First, you can use specialized resources such as http://gdt.oqlf.gouv.qc.ca/ (Le grand dictionnaire terminologique), or https://www.btb.termiumplus.gc.ca/tpv2alpha/alpha-eng.html?lang=eng&index=alt (Termium Plus), which are both Canadian resources. Don't forget specialized dictionaries as well.

If you are looking for the translation of a French term into English, you can also look for French language research papers that deal with the same subject, look for the keywords in French to see if the terms you need are listed and then look at the keywords in English to see if those match up with the French terms.

Finally, you can sometimes use Wikipedia to find the English language equivalent of a specific term, either because that term is the title of an article on Wikipedia (easiest case) or because the word appears in the text of an article in French that also exists in English (in this case, the actual text of the article will probably not be the exact same, so finding the term you are looking for will be more difficult and may even prove fruitless).

Finally, don't forget that you can always ask your teachers if you are still unsure after all this or you have hit a wall.

Other useful resources:

Good general online dictionaries include https://www.macmillandictionary.com/, https://www.lexico.com/, or https://www.wordreference.com/. It is good practice to look up words in English-to-English dictionaries as well as English-to-French dictionaries.

If you want to practice summarizing texts, you can have a look at the tips and examples on the following website:

http://www.uefap.com/reading/notetake/summary.htm

PRESENTATION VOCABULARY

The following exercises are adapted from Blanpain, Kristin, and An Laffut. *Academic Spoken English: A Corpus-Based Guide to Lectures, Presentations, Seminars and Tutorials.* Acco: Leuven, 2012 (2nd edition).

COLLOQUIAL VOCABULARY: COMPLETE EACH SENTENCE WITH THE APPROPRIATE PREPOSITION.

1. Are you **.....** me?
2. Could you just pick **.....** where we left **.....** yesterday?
3. And there are a few others that I'll just run **.....** really quickly.
4. That goes **.....** saying.
5. I'll talk about that **.....** due course.
6. Let's leave it **.....** that.
7. I'll first give you the framework, and then I'll flesh it **.....**
8. I'll probably touch **.....** this subject only briefly.
9. There were hardly any data to fall back on, so we had to start **.....** scratch.
10. It is difficult to pin **.....** the factors involved.
11. This kind of problem has cropped **.....** before.
12. We're still struggling to figure **.....** how we might be able to integrate this in the research.

STRUCTURE: BELOW ARE A NUMBER OF WAYS TO STATE THE PURPOSE OF YOUR PRESENTATION. COMPLETE THE SENTENCES USING THE WORDS GIVEN.

IN THIS PRESENTATION/LECTURE, I'D LIKE TO…

TALK – INTRODUCE – EXPLORE – TAKE – REPORT – TELL

1. **.....** to you about our project.
2. **.....** you about my research.
3. **.....** you to the fascinating topic of data protection.
4. **.....** a look at the impact of social media on our everyday lives.
5. **.....** on the results of a study on risk analysis.
6. **.....** the issue of algorithmic efficiency.

I'LL START BY…

MAKING – DESCRIBING – BRINGING – GIVING – FILLING – LOOKING

1. **.....** you in on the general background.
2. **.....** a few preliminary remarks on the methodology I used.
3. **.....** you up-to-date on developments at the EU level.
4. **.....** recent technological developments.
5. **.....** you an overview of current theories.
6. **.....** at the main indicators of school effectiveness.

AND THEN I'll GO ON TO

PUT – DISCUSS – MAKE – HIGHLIGHT – TAKE

1. **.....** you through a couple of practical applications.
2. **.....** the implications of my results.
3. **.....** a number of recommendations to improve existing legislation.
4. **.....** the situation into some kind of perspective.
5. **.....** three key methodological features.

CREATING A REVIEW

VIDEO: CITING SOURCES RESEARCH GUIDE: LITERATURE REVIEWS

This video from NCSU Libraries gives a helpful overview of literature reviews. Even though it says it's "for graduate students," the principles are the same for undergraduate students too!

1. DEFINING A REVIEW

   a. There are several contexts in which you might be requested to create a literature review. Can you **match the ones mentioned in the video** with the appropriate definition?

	They usually take the form of written pieces of work that are set by your course tutors. They also usually contribute towards your final course mark or grade. The types depend on the course you are studying. The most common are essays or reports. However, it is also possible that you will be set other kinds such as a group project or an oral presentation in your subject area, which may also be assessed. (adapted from prepareforsuccess.co.uk)
	Also called culminating project, or senior exhibition, among many other terms, it is a multifaceted assignment that serves as a culminating academic and intellectual experience for students, typically during their final year of high school or middle school, or at the end of an academic program or learning-pathway experience. (..) It is generally designed to encourage students to think critically, solve challenging problems, and develop skills such as oral communication, public speaking, research skills, media literacy, teamwork, planning, self-sufficiency, or goal setting. (adapted from edglossary.org)
	A document submitted in support of application for an academic degree or professional qualification presenting the author's research and findings. Depending on context, the terms can be used to refer either to part of a bachelor's or master's course, or to a doctorate. (adapted from Wikipedia.org)

   b. What are the **3 main functions** of a literature review as part of the research process?

.....

.....

   c. What is “the literature”?

Can you think of other sources of information on a given topic, besides those mentioned in the video?

.....

.....

   d. The literature needs to be seen as “a continuously evolving network of works that interact with each other”.

Can you explain what this means? Why is the interaction process important?

.....

.....

   e. How can you ensure coherence?

.....

.....

CREATING A REVIEW

2. HOW?

Make notes on the different steps of the review process:

TOPIC	*RESEARCH AND INFORMATION COLLATION*	*BRAIN*	*CITATIONS*	*FINAL REVIEW*

3. A PRACTICAL APPROACH TO CREATING A REVIEW

a. Which of the listed skills correspond to each learning outcome?

DESCRIBE, SUMMARIZE, COMPARE AND CONTRAST, CRITICALLY EVALUATE, ANALYSE, ORGANIZE

Learning outcome	**Skills involved**
Collect and read relevant literature	
Provide an overview of relevant literature	
Highlight key concepts and papers	

b. Looking for links and relations between documents: what can they be?

……

……

c. Some sources can come in support of an argument. Some refute it. Can you think of examples of sources based on the following topics?

TOPIC	ARGUMENT	SOURCES THAT MIGHT SUPPORT THE ARGUMENT	SOURCES THAT MIGHT REFUTE THE ARGUMENT
Vaccines	Vaccines cause autism		
Nuclear energy	Nuclear power is a clean and sustainable energy		

d. What is the main pitfall you want to avoid?

But don't fall into the trap of making your review a larger list of …….. of the works you read. A literature review is not an annotated …….. Your goal should be to go one step further and …….. and …….. what you find in that literature into …….. . Ideally, you will create your own conceptual map or outline of the literature on …….. .

e. To conclude: what does your review need to consist in besides direct use of sources?

……

……

CREATING A REVIEW

EXAMPLE: THE PRESS REVIEW

An exercise similar to the literature review is the very French Revue de Presse*, or Press Review*

Watch the following video from France 24 and answer questions about it.

- General comprehension

Which French papers are mentioned by the journalist?

What can you say about the general structure of the presentation?

What types of issues did the journalist choose to report about? Why?

- Creating coherence

About the budget crisis: how many papers are mentioned regarding that issue? How are they put in perspective?

About the Nice jewellery shooting: what types of articles from *Liberation* does the journalist report on? Why choose such articles for a press review?

About the power crisis inside the UMP: what is the connection/ transition with the previous item? How is the article about Alain Juppé brought up by the journalist?

About prostitution: in what way is the treatment of that issue different from the three previous ones? What is the main purpose here for the journalist / benefit for viewers?

About ducks in Villotran: what would you call that sort of news item? Why include it in the report?

- Transcript

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

PROCESS DESCRIPTIONS

BRAINSTORMING: *Just like cooking is partly chemistry, in what ways does physics apply in the kitchen?*

PROCESS DESCRIPTIONS

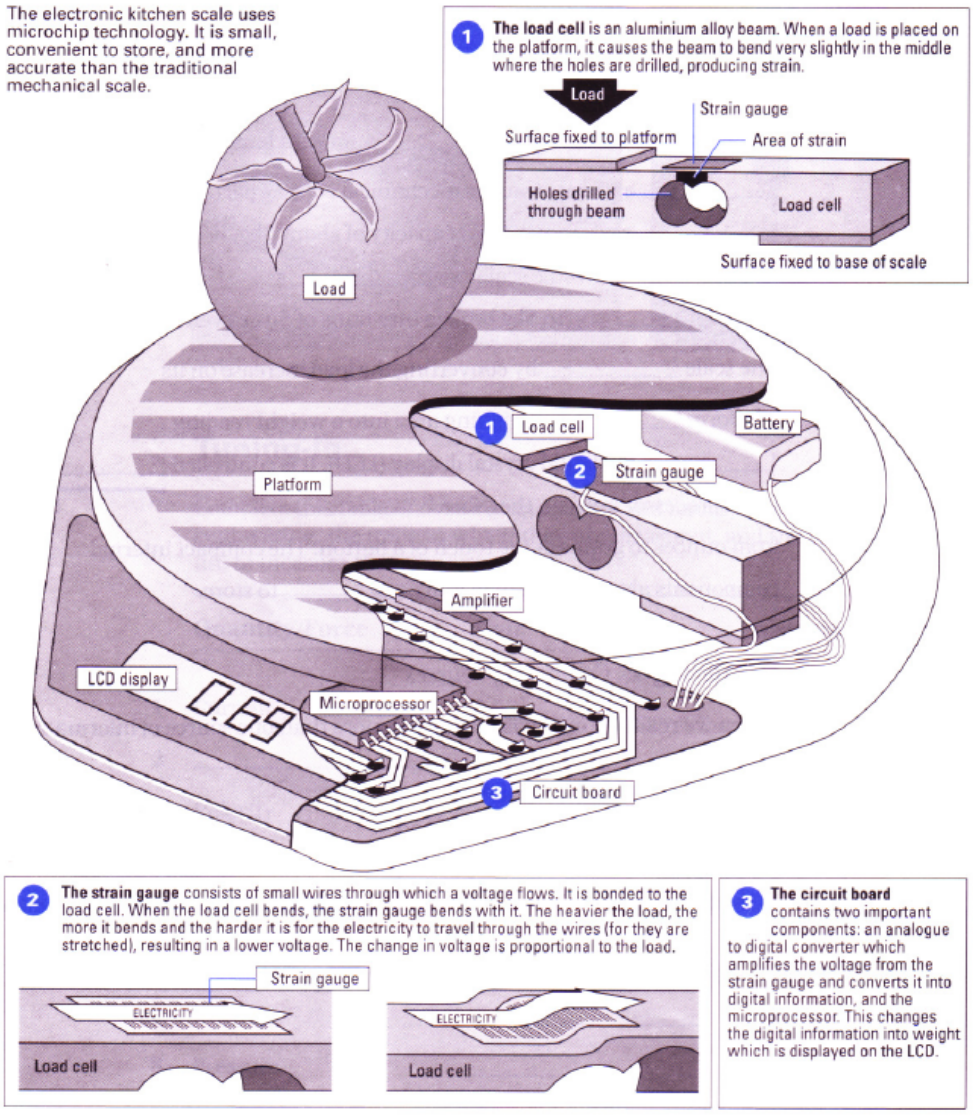
Read the following text and answer the questions

Electronic scales use a weighing device called a load cell underneath the platform. The load cell, an aluminium alloy beam, eliminates the need for springs, cogs, or other moving parts which can wear, break, or cause inaccuracy in mechanical scales.

A strain gauge is bonded on the load cell. The strain gauge consists of a small piece of metal foil which detects any bending of the beam. A controlled input voltage is supplied to the strain gauge from a battery powered circuit.

When a load is placed on the platform, it causes the load cell to bend very slightly. This in turn causes a change in strain, which triggers a change in the electrical resistance of the strain gauge.

As the resistance changes, so does the output voltage from the strain gauge. In short, the change in voltage across the strain gauge is proportional to the load on the platform.



The voltage from the gauge is small and has to be amplified and then converted into a digital signal. Under the platform, a circuit board holds the necessary components. First, an amplifier increases the amplitude of the signal. It is then fed to a specially programmed microprocessor, which converts it into a weight reading. This is displayed on the LCD. The display will automatically switch off a few minutes after weighing is finished, thereby saving battery power.

Adapted from *"Inside Out: Electronic Scales", Education Guardian,* in *Oxford English for Electrical and Mechanical Engineering*

1. Skim the text and focus on the verbs. Which tense is mostly used in process descriptions?
2. Focus on the first paragraph.
    a. What is the subject of the second sentence?
    b. Is it the first time this expression has been mentioned?
    c. Could you replace the expression with the word "it" in the second sentence? Why or why not?

PROCESS DESCRIPTIONS

d. Could you start the second sentence with “the need for springs, cogs, or other moving parts which can wear, break, or cause inaccuracy in mechanical scales”? Justify your answer.

3. Now focus on the second paragraph.
   a. Which verbs are in the passive voice? Put them into the active voice.
   b. Why do you think the passive voice is used in these cases?
4. Now look at the last paragraph and focus on the following sentences: “First, an amplifier increases the amplitude of the signal. It is then fed to a specially programmed microprocessor, which converts it into a weight reading.”
   a. Which verb here is in the passive voice?
   b. What is the purpose of the passive voice in this case?
5. Link words.
   a. Out of the following words or expressions, which one corresponds to the meaning of “thereby” in the last sentence?
      i. however
      ii. by that means
      iii. despite
      iv. overall
   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.

WRITING PRACTICE: *Work in groups of three. Using the diagram, write a text that describes the refrigeration cycle.*

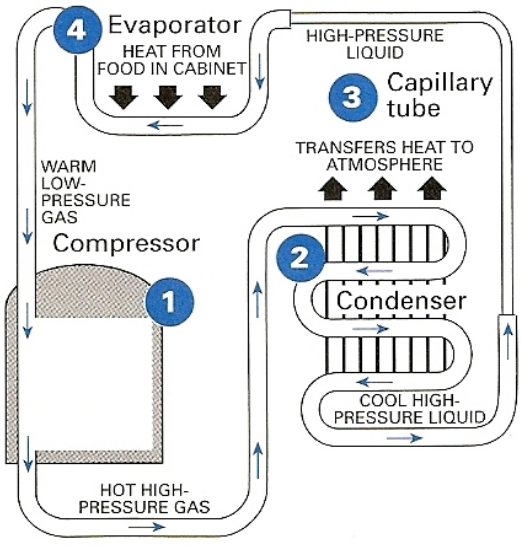


Image Source: Eric H. Glendinning & Norman Glendinning. Oxford English for Electrical and Mechanical Engineering. OUP Oxford: 1995.

LAB EXPERIMENTS – VIDEO

FLUID MECHANICS LAB EXPERIMENTS

Intro:

How do you pronounce NASA?

List the 4 areas of research:

1. _____
2. _____
3. _____
4. _____

Wind tunnel experiments:

Vocabulary:

5. Upward force counteracting gravity:
6. Longitudinal retarding force exerted by air or fluid on a moving object:
7. Different ways in which the air can flow: flow _____
8. Weight borne by the model:
9. Action of placing the model in operating position inside the wind tunnel:
10. A series of tests in the wind tunnel under a certain set of conditions:

Water channel experiments:

Steps of the process:

1. Planning: We _____, make sure it's _____
2. Preparation: We _____ go _____the model
3. Setup: Then _____ it into the water channel
4. Operation (1): And then _____.
5. Operation (2): To _____, we then _____ that goes _____ the model.
6. Data collection: We _____ there solely by videos and still photos.
7. Adjustments: _____, we go and _____ the orientation and attitude of the model and _____ all the data we're looking for.

Aeroacoustics:

1. Purpose of the research:

2. Name of the tests:
3. What equipment is used and where:
    a. In the field: _____, connected to…
    b. In a control room: …a _____.

LAB EXPERIMENTS – VIDEO

4. Type of data acquired:
5. Example of rocket launchers:
    a. Task: we _____ taking an _____ technology in sound _____ and _____ this _____ to rocket launchers.
    b. Reasons:
        i. To _____ sound sources to _____
        ii.
    c. Result: we're able to _____ of excessive vibrations and sound sources.

Flow around a parachute:

Steps of the process:

1.

2.

3. Technique used (explain):

4. Future application:

Final comments:

The fluid mechanics lab helps with: the design of the next generation of _____

Going forward:

Follow-up - Speaking:

In pairs, describe a lab experiment that you have conducted recently.

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

Octopus-Inspired Camouflage Flashes to Life in Smart Material

By Katherine Harmon Courage | August 21, 2014 – Published in Scientific American

Octopuses and their cephalopod cousins are the undisputed masters of disguise. An octopus can change its color, texture and luminosity faster than you can say "camouflage."

So far our lowly human attempts at imitation have been quite crude. But a flashy new smart material might just be our closest step yet.

The main tool the octopus uses for its visual display is a cell called a chromatophore. These small, pigment-filled sacs expand and contract to create an array of colors and patterns. How does the octopus decide what colors and patterns to make? Recent research suggests that octopuses can also sense light—and possibly even color—through photo-sensitive cells (called opsins) in their skin.

The idea of a material that can both sense and create visual change is quite appealing to science (and the military). Renowned cephalopod researcher Roger Hanlon, a senior scientist at Woods Hole Marine Biological Laboratory, and John Rogers, a professor of materials science and engineering at the University of Illinois at Urbana-Champaign (whose previous work includes flexible temporary tattoo-like circuits), teamed up with a crew of international researchers to create a changing heat- and light-sensitive sheet of pixels, described earlier this week in *Proceedings of the National Academy of Sciences*.

The color change here is only black and white. But it mimics the octopus's skin by using what the researchers call "artificial chromatophores" that employ a heat-sensitive dye. When the temperature surpasses 47 degrees Celsius, the "cell" turns clear. A photo-sensitive layer sits below these faux-chromatophores. Small holes in the surface allow light to penetrate to the light-sensing portions.

So far, different appearances "including triangles, arrays of dots and even random patterns can be achieved," the researchers note. Not exactly an ocean of camo options, but certainly more sophisticated than the standard, static branch-and-mud pattern of current military-issue gear.

A future iteration of this technology might be able to be "wrapped onto solid objects to modulate their visual appearance," the researchers write. And that could serve "consumer, industrial and military applications."

When I spoke with researchers a few years ago working on this same problem with nanotechnology at Rice University, they were excited about potential uses for these sorts of reading-writing materials. They suggested clothing that could deflect heat if it sensed it was hot outside, internal sensors that could alert a patient or doctor of a health change, or even wallpaper that could sense—and report—how many people were in a room.

The current configuration can change appearance in a second or two. A snail's pace compared with the octopus. And it still lacks color. But just about all technology has to crawl before it can run. Or swim.

READING

QUESTIONS ABOUT THE TEXT:

1. How would you sum up the text in one sentence?
2. What is the secret of the octopus's disguise?
3. What indicator is used in the artificial material to sense light?
4. How advanced is the new material? What are its limitations?
5. What applications other than military are mentioned for this technology?

GRAMMAR:

1. Find in the text three examples of compound adjectives (like "Green-eyed"). How are they formed? Explain what they mean.

    a.
    b.
    c.

2. Form compound adjectives to characterize:

    a. Someone who sees everything (all):
    b. An article that has five pages:
    c. A device that can sense things remotely:

3. Synonym match: Find words in the text that correspond to the following definitions

Line	*Words from the text*	*Synonyms*
		Undoubted, incontestable
		Primitive, simple
		Increase in size, become larger
		Range, collection
		Design, motif
		Imitate
		Coating, sheet, film
		Equipment
		Bundled, enveloped

SPEAKING: Work in groups of two people and choose either of the following topics

1) Think about other possible applications of such research and discuss the ways this kind of technology could be misused in the future (you can refer to examples of similar types of technology in fiction if you want). Then consider whether you think the gains outweigh the potential risks.

2) PhD support: role play using the following two roles

    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!

TECHNICAL VOCABULARY

DESCRIBING PHYSICAL FORCES

Reading comprehension 1

An engineer specializing in the design of very tall structures has given a conference to a group of engineering students. Read the transcript below and answer the questions.

There are all kinds of different forces acting on a tall structure. With very tall structures, one of the main loads you need to take into consideration is the mass of the structure, in other words its weight. Due to gravity, the mass exerts a downward load, which has to be transmitted to the ground. That downward force means the structure is in compression, especially near the bottom. The closer you are to the bottom, the more compressive force the structure is subjected to. But with tall structures, downward load compressing the structural element is only part of the problem.

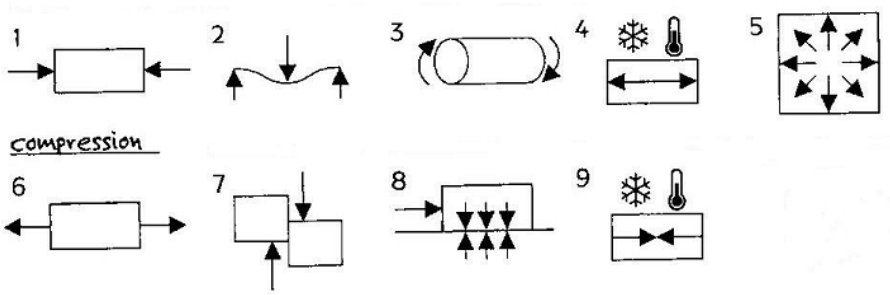
Another major force acting on the structure is wind load, which is a horizontal load, exerted by air pressure against one side of the structure. Because the structure is fixed at ground level, and free at the top, that generates bending forces. And when elements bend, you have opposing forces: compression at one side, tension at the other. And at ground level, the wind effectively tries to slide the structure along the ground, and the foundations below the ground resist that. The result of that is shear force between the substructure and the superstructure. The wind generates tensile loads on the foundations of tall structures as well, as the bending action tries to pull them out of the ground on one side, like a tree being uprooted by the wind. So the foundations need to rely on friction with the ground to resist the pull-out force, just as tree-roots do. The action of the wind can also generate torsion. Sometimes you get a twisted force, when the air pressure is comparatively higher against one corner of a building, although this is less of a problem with chimneys because of their circular profile.

With very large masses of concrete, you also have to think about the forces generated by thermal movement. When concrete absorbs heat from the sun, you get expansion; as soon as the sun goes in, there is contraction. That movement can be significant over a large area, especially as the sun heats one side of the structure much more than the other.

Source: Technical English. *David Bonamy. London: Pearson Longman, 2008.*

1. Make a list of the forces mentioned in the text. Work in pairs to make sure you understand what they mean.

2. Label the following diagrams using your list.



1.
2.
3.
4.
5.
6.
7.
8.
9.

***FOLLOW UP**: Visit http://www.sixtysymbols.com to learn more about physical forces.*

TECHNICAL VOCABULARY

Reading comprehension 2

I. Before you read, think of ways of harnessing renewable energy from nature you know about. Give examples.

II. Now read the article and answer the questions below.

SOLAR TOWERS

The need to develop renewable energy is widely seen as a futuristic technological challenge. In reality, some of the most effective ways of harnessing horsepower from nature are based on concepts that have existed for donkey's years. The wind turbine is an obvious example. Another – less well-known, but conceived almost a century ago – is the solar tower or solar chimney. And if the Australian company EnviroMission completes an ambitious solar tower project in the New South Wales desert, the technology could capture not just the sun's rays but the public's imagination worldwide. The firm is planning to construct a tower a colossal one kilometer high. If built, it will be the world's tallest structure by a huge margin.

http://www.enviromission.com.au/EVM/content/technology_technologyover.html

How does it work? A large glass enclosure is built, with a chimney at its centre. The sun heats the enclosure, causing expansion of the air inside. At the top of the chimney, the lower temperature and lower pressure due to the higher altitude create a pressure differential known as the stack effect. This causes air to flow up the chimney. Electricity is generated by turbines at the bottom of the chimney, which are driven by the flow of air. The bigger the area of glass and the taller the chimney, the greater the airflow and the higher the generating capacity.

Source: Technical English*. David Bonamy. London: Pearson Longman, 2008.*

1. What is a solar tower and what forces does it use?

2. What forces would act on a tower 1km high?

3. What else do you know about the stack effect? What is the French translation for that expression?

PHONOLOGY

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.

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).

READING

Blue LEDs

Andrew Grant, *Science News*, 07 October 2014

Blue light-emitting diodes are central to the energy-efficient lights illuminating homes, offices and electronic displays. “If we look at the landscape of technology, there’s the transistor and the integrated circuit, and then there’s the blue LED,” says Fred Schubert, an electrical engineer.

The blue LED is the crucial ingredient for white LED lamps, which are rapidly replacing incandescent bulbs. Edison’s classic invention uses a filament that emits light in a range of colors that together look white. But a lot of electricity gets wasted heating the filament rather than generating light.

LEDs are far more energy efficient because they use electrons to generate photons. LEDs are made out of layers of semiconductors, materials similar to the ones in computer chips. Some layers have an excess of electrons; others have a deficit, leading to the emergence of positively charged holes where electrons should be. Combine the electrons and holes in a concentrated area and they emit light.

In 1962, Nick Holonyak at General Electric serendipitously discovered the first semiconductor diode to emit visible light when he turned off the lights in his lab and noticed a sample of gallium arsenide phosphide glowing red. From there, scientists rapidly developed LEDs that emitted red and green light. But attaining blue, which is essential for creating a variety of other colors including white, remained a major challenge. Blue light is at the high-energy end of the visible spectrum, and there aren’t many materials that can coax electrons to emit such high-energy light.

By the early 1990s, Nakamura, working at Nichia Chemicals, a chemical engineering company, developed a method to simply and cheaply produce blue LEDs. The discovery caused acrimony. Nichia initially paid Nakamura about $200 for his invention even though the company had told him not to pursue blue LEDs; he had come into the lab late at night to perform the research. Nakamura sued Nichia, and in 2005 the company settled with him for about $8.1 million.

The researchers’ discovery arrived during the golden age of CDs and just before the advent of DVDs, Schubert says, so the first application was the development of blue lasers which soon enabled high-capacity Blu-ray discs and more precise laser printers. In 1996, Nichia engineer Yoshinori Shimizu combined blue LEDs with a yellowish coating called a phosphor to create a device that emits white light. Now white LED bulbs last up to 100,000 hours, compared with 1,000 hours for an incandescent bulb.

Technology based on blue LEDs is ubiquitous today, to the tune of a $15 billion industry. Besides illuminating homes, streets and offices, LEDs serve as the backlight for many electronic displays, resulting in energy-efficient televisions and longer battery life for laptops and smartphones.

Energy-sipping LEDs can help provide light to the roughly 1.5 billion people worldwide with no access to electrical grids. Besides, lighting accounts for about 20 percent of the world’s electricity usage. “If we replace existing lighting with LEDs, we could save half of that electricity,” he says, eliminating the need for about 500 large power plants.

READING

READING:

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

1. Edison's bulb is energy-efficient.
2. Semiconductor technology permitted the rise of LED technology.
3. Holonyak discovered the properties of gallium arsenide phosphide on purpose.
4. Compared to other colours, obtaining red light is not that hard.
5. Nakamura's discovery had nothing but positive outcomes.
6. Nakamura's salary was 8.1 million dollars for his discovery.
7. White LEDs last about 100 more hours than incandescent bulbs.
8. Today's electricity for lighting probably represents the equivalent of the production of 1000 large power plants.

Choose the best answer to the following questions

1. What advantage of LEDs is being emphasized?
   a. It is cheap
   b. it is safe
   c. it is green
   d. it is dangerous
2. One may say that the market for LEDs is…
   a. booming
   b. decreasing
   c. stabilizing
   d. collapsing

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

Line	*Synonyms/definitions*	*Words from the text*
	Sheet, level, stratum	
	Lack	
	To accede to, arrive at	
	To persuade	
	Hostility	
	To follow, to keep on researching	
	To take legal action	
	To make something possible	
	To the amount of, to the extent of	
	To give	

SPEAKING: Work in pairs of two people and choose a technology that you think has a lot of potential for the future. Imagine that you are partners and you have developed a prototype but you lack the money to produce your product on a larger scale. You now have to convince potential investors to invest in your company. Prepare a short talk to discuss the following points with your investors:

What your product does / what are its potential applications?

How the product works.

How it compares with existing technologies, if applicable.

Why it would be a good investment for them.

Then you will work with another group. You will play their investors and they will play yours. At the end, you will have to decide whether or not you would invest in their product.

HOW TO DELIVER EFFECTIVE PRESENTATIONS

EFFECTIVE PRESENTATION DELIVERY

The following examples are taken from the excellent website *http://www.ruf.rice.edu/~comcoach/.*

We will not cover everything that they do, so you should visit the website to get more advice on delivering great presentations.

1. Eye contact: In which video does the presenter use eye contact most effectively? Why?
2. Gestures: In which video does the presenter use gestures most effectively? Why?
3. Nonverbals: In which video does the presenter use nonverbals most effectively? Why?
4. Voice: In which video does the presenter use his voice most effectively? Why?
5. Visual aids: In which video does the presenter use visual aids most effectively? Why?

CRITERIA FOR PRESENTATION ASSESSMENT

The following table summarizes the main points you will be graded on in your end-of-term presentations. Make sure you apply what we've discussed today!

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
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.

HOW TO DELIVER EFFECTIVE PRESENTATIONS

SPEAKING PRACTICE: Impromptu speeches (Groups of 4)

Each group member picks up a statement card from the pile. You will then get 5 minutes to plan a 2-minute speech in support of the statement on the card.

After the preparation time, you will each deliver your speeches to the rest of the group. At the end of each round, you vote on whether or not you were convinced by each presentation.

DISTANCE LEARNING ALTERNATIVE (Individual practice)

Follow the “Impromptu Speech Topic Generator” link on MADOC to generate a list of topics. Choose one and give yourself five minutes to plan your 2-minute presentation. You will then deliver your speech in front of a mirror or webcam, trying to use your intonation and body language to deliver a convincing presentation.

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-yeared
    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

FURTHER PRACTICE

c. in
d. to

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

<u>Pay attention to the end of your sentences</u>

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.

THE PRINCIPLES OF CLEAR WRITING

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

- 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/