



Faculté
des Sciences
Aix-Marseille Université

women *in* SCIENCE



BY THE END OF THIS SEMESTER, YOU WILL...

- Be able to identify more women scientists than you can now!
- Know a bit more about the history of women in science.
- Understand some of the reasons why there are so few women in science today.
- Be able to spot sexism in science more easily and be able to name it.
- Have improved your pronunciation (esp. word stress)

HOW AM I EVALUATED?

- **ORAL EXPRESSION** (a group presentation, max 4 students per group, 5 minutes per student)
- **WRITTEN EXPRESSION** (a poster - a written summary of your presentation to be handed in on the last lesson. Slides for presentation, do not present your poster)
- **LISTENING COMPREHENSION:** in the last lesson, 10 MCQs
- **READING COMPREHENSION:** x1 or x2 depending on your degree:
 - RC 1: Ben Barres, *Does Gender Matter?* (20 MCQ)
 - RC 2: unseen text (20 MCQ)

* NB: the specific percentages for each element will depend on your degree

YOUR PRESENTATION

4 students max in each group (5 mins each) + slideshow (*not* a presentation of a poster), starting in week 3 or 5 (depending on your group)

TOPIC: anything to do with women in science, for example:

- Any female scientist (living or dead) and why she deserves recognition
- Explain why there are so few women in science, why there is a gender imbalance in your domain, (differences in intelligence, motivation, different obstacles, sexism, imposter syndrome...), offer solutions, use examples of real women scientists, statistics, different theories...)
- Any scientific theories about women (film Hysteria about female orgasms, hysteria as a woman's disease, phrenology, biological sex (Anne Fausto Sterling))
- Plan an event for high school students in order to encourage girls to do science. How could AMU encourage more female students?

YOUR POSTER

- This is a summary of your oral presentation (so it should be on the same topic as your oral presentation)
- Hand in on the last lesson (+ upload in PDF format on AMeTICE)
- 300-500 words (in **YOUR OWN ENGLISH!** We use a software programme to check for plagiarism)
- University logo
- Your names (first name *then* surname, i.e., Julie MACHIN not MACHIN, Julie)
- Your degree course (e.g., 3rd year Biochemistry) and the academic year (2021-22)
- You can use a free online template (see link on AMeTICE)



Mary Anning,
paleontologist
(1799–1847)

1



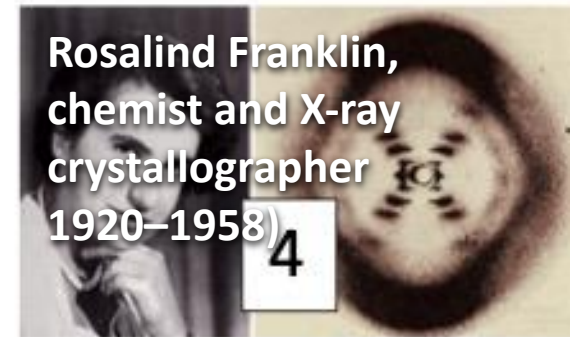
Ada Lovelace
mathematician
(1815–1852)

2



Katherine Johnson,
mathematician
(1918–2020)

3



Rosalind Franklin,
chemist and X-ray
crystallographer
(1920–1958)

4



Caroline
Herschel,
astronomer
(1750–1848)

5



Lise Meitner,
physicist
(1878–1968)

6



Florence Nightingale,
nurse and statistician
(1820–1910)

7

Emilie du
Châtelet,
philosopher
and
mathematician
(1706–1749)



8



Jocelyn Bell Burnell
(1943–),
astrophysicist

9



Gladys West
(1930–),
mathematician

11



Rachel Carson
(1907–1964),
marine biologist

16

Marie Curie
(1867–1934),
chemist and
physicist



12



Maria Sibylla
Merian
(1647–1717)
entomologist

13



Lady Mary
Wortley
Montagu
(1689–1762)

14



Jennifer Doudna (1964–)
& Emmanuelle Charpentier
(1968–),
pioneers of CRISPR gene
editing

15



**Mary Anning, paleontologist
(1799–1847)**



**Mary Eliza Mahoney, nurse
(1845–1926)**



**Maria Sibylla Merian,
entomologist and artist
(1647–1717)**



**Katherine Johnson,
mathematician
(1918–2020)**



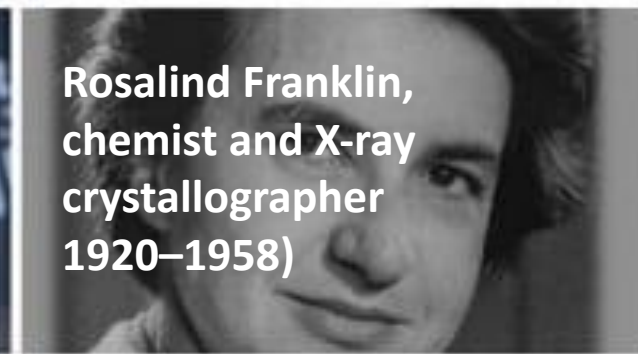
**Alice Ball,
chemist
(1892–1916)**



**Lise Meitner, physicist
(1878–1968)**



**Raye Montague, naval
engineer
(1935–2018)**



**Rosalind Franklin,
chemist and X-ray
crystallographer
1920–1958)**



**Mae Jemison, astronaut
(1956–)**



**Rachel Carson,
marine biologist
(1907–1964)**



**Caroline Herschel,
astronomer (1750–1848)**



**Bessie Coleman, aviator
(1892–1926)**



**Elizabeth Blackwell, doctor
(1821–1910)**



**Ada Lovelace, mathematician
(1815–1852)**



**Patricia Bath,
ophthalmologist and inventor
(1942–)**



**Zaha Hadid,
architect
(1950–2016)**

An illustration of a woman with orange skin and purple hair tied in a bun, looking upwards with a slight smile. She is positioned in the center of the frame. The background is a dark blue space filled with white line-art icons of celestial objects: a ringed planet (Saturn), a satellite, an astronaut, a spiral galaxy, and various stars and constellations. At the bottom, the text "WOMEN IN SCIENCE" is written in large, bold, white capital letters, with a small star icon integrated into the letter 'I' and another near the end of the word "SCIENCE".

WOMEN IN SCIENCE

- **Marie Curie:** 1st and only person in history (at that point) to win 2 Nobel Prizes in 2 different fields, pioneered radiation research and discovered 2 new elements. Denied membership of the French Academy of Sciences (because she was a woman).
- **Caroline Herschel:** German astronomer, discovered several comets, 1st woman we know of who was paid for her contribution to science, 1st woman to be awarded a Gold Medal of the Astronomical Society, 1st woman to be named an honorary member of the Royal Astronomical Society.
- **Lise Meitner:** Nuclear physics and radioactivity, she discovered nuclear fission but only her collaborator (a man) was awarded the Nobel Prize.
- **Hypatia of Alexandria:** Greek mathematician, philosopher and astronomer, head of a school in Alexandria, murdered by a Christian mob

- **Jocelyne Bell Burnell:** Discovered the 1st radio pulsar “the greatest astronomical discovery of the 20th century!”. Her PhD supervisor was later awarded a Nobel Prize for her discovery!
(BTW she's done a TED talk about sexism in science which is very good!)
- **Cecila Payne-Gaposchkin:** Discovered what the sun is made from. The leading astronomer of the day dismiss her hypothesis and told her NOT to present her findings. 4 years later HE published her findings under HIS name!
- **Rosalind Franklin:** Performed work that was vital to the structure of DNA. Her colleague shared her work with Watson and Crick without her permission. This info helped them discover structure of DNA - they won the Nobel Prize, Franklin got nothing.
- **Amalie Emmy Noether:** contributions to rings, fields and algebras. Her theorem = “one of the most imp mathematical theorems ever proved in guiding the development of modern physics”. Worked without pay for 7 years and lecture under a male colleague's name because her university objected to women lecturers.

WOMEN SCIENTISTS IN THE ANCIENT WORLD



Aglaonice

2nd / 1st century BCE

Astronomer who could predict the time and general area where a lunar eclipse would occur.



Metrodora

1st Century CE

Physician and author of the oldest medical text known to have been written by a woman, *On the Diseases and Cures of Women*.



Hypatia of Alexandria

4th Century CE

Philosopher, astronomer and mathematician. Murdered by a mob of Christians.

AGNODICE /'ægnədɪs/





PÉNÉLOPE BAGIEU

CULOTTÉES 1

Des femmes qui ne font que ce qu'elles veulent



GALLIMARD
SANGRE DE FEMME



PÉNÉLOPE BAGIEU

CULOTTÉES 2

Des femmes qui ne font que ce qu'elles veulent



CULOTTÉES: AGNODICE



AGNODICE NAÎT AU IV^È SIÈCLE AV. J.-C.,
À ATHÈNES.



ENFANT, ELLE VOIT DES FEMMES
DE SA FAMILLE SOUFFRIR (ET MOURIR)
EN COUCHE.



« GÉNÉRALEMENT PARCE QU'ELLES
ONT PRÉFÉRÉ SE DÉBROUILLER
ENTRE ELLES... »



« PLUTÔT QUE
FAIRE VENIR UN
MÉDECIN (HOMME)
POUR LES SOIGNER. »



EN EFFET, LES ATHÉNIENS ONT RÉCEMMENT
INTERDIT L'EXERCICE DE LA MÉDECINE AUX
FEMMES, LES SOUPÇONNANT DE PRATIQUER
DES AVORTEMENTS.



(DÉTRUISANT AINSI LE LIEN DE
CONFIANCE QUI EXISTAIT JUSQU'ALORS
ENTRE LES FEMMES MÉDECINS ET LEURS
PATIENTES.)



LA JEUNE AGNODICE EST
RÉVOLTÉE PAR CETTE SITUATION
ABSURDE.



"Pas
le droit?"

"C'est
ce qu'on
va voir..."

PRÉTENDANT UNE VISITE
À UNE AMIE MALADE,
ELLE EMBARQUE POUR UN
LONG VOYAGE.



"Et ne parle
pas aux
inconnus!"

EN RÉALITÉ, ELLE
PART EN ÉGYPTE...



... OÙ LES FILLES SONT AUTORISÉES À
ÉTUDIER LA MÉDECINE.



"T'as
répondu
à la
question?"

"Ablation
du foie,
et toi?"

SA SOLIDE (ET SECRÈTE) FORMATION
EN POCHE, ELLE REVIENT EN GRECE,
BIEN DÉCIDÉE À VENIR EN AIDE
AUX FEMMES D'ATHÈNES.



Hmm...
Enfin c'est
bien joli, mais
je n'ai toujours
pas le droit
de travailler.

ELLE SE RÉSOIT ALORS À
SE DÉGUISER EN HOMME
POUR POUVOIR EXERCER.



ELLE RENCONTRE D'ABORD
LES MÊMES RÉTICENCES
QUE SES CONFRÈRES



"Faites-moi
confiance, d'accord!"

MAIS UN JOUR, ELLE SAUVE
LA VIE D'UNE DE SES PATIENTES...



et hop!

... QUI PARLE À SES AMIES DE SON
MÉDECIN PAS COMME LES AUTRES.

LE BOUCHE-À-OREILLE SUIVANT SON COURS,
AGNODICE DEVIENT TRÈS VITE
"LE" GYNÉCOLOGUE D'ATHÈNES.



LES AUTRES MÉDECINS
COMMENCENT À S'AGACER
DE CE MYSTÉRIeux MONOPOLÉ...



... ET FINISSENT PAR
ACCUSER AGNODICE
D'ABUSER DE SES PATIENTES
MARIÉES.



ELLE EST JUGÉE PAR UN
TRIBUNAL DE MARIS ET DE MÉDECINS.



Tiens
bien.

Vous
l'avez
vu?

ACCULÉE, AGNODICE LEUR
RÉVÈLE LA PREUVE INDISCUTABLE
DE SON INNOCENCE



ENCORE PLUS VULGÈRES
(ET SURTOUT HUMILIÉES
D'AVOIR ÉTÉ DUPES), ILS
LA CONDAMNENT À MORT
POUR EXERCICE ILLÉGAL
DE LA MÉDECINE



C'EST ALORS QUE DÉBARQUE UNE FOULE
DE PATIENTES EN COLÈRE. ELLES INCENDIENT
LEURS MARIS, ET FONT REMARQUER AUX
MÉDECINS QU'ILS N'AVAIENT QU'À PAS ÊTRE
AUSSI NULS.



HONTEUX, ILS FINISSENT
PAR ACQUITTER
L'ACCUSÉE...



... ET RÉAUTORISENT
LES FEMMES MÉDECINS
À ATHÈNES.



AGNODICE WAS BORN IN THE 4TH CENTURY BCE
IN ATHENS



AS A CHILD, SHE SAW WOMEN IN HER FAMILY
SUFFER (AND DIE) DURING CHILDBIRTH.



GENERALLY, BECAUSE THEY PREFERRED
TO MANAGE THINGS AMONG
THEMSELVES...



...RATHER THAN CALL
FOR A MALE DOCTOR
TO TREAT THEM.



IN FACT, THE ATHENIANS HAD RECENTLY FORBIDDEN WOMEN FROM PRACTICING MEDICINE, SUSPECTING THEM OF PERFORMING ABORTIONS.

*Bunch of
witches!*

*We'd
prefer
to let
them
suffer,
damn
it!*

*You
can't be
serious!*



(THUS DESTROYING THE BOND OF TRUST THAT HAD EXISTED UP TO THAT POINT BETWEEN FEMALE DOCTORS AND THEIR PATIENTS.)

*Now, now,
don't make a
fuss!*

*Let's
spread our
legs now,
shall we?*



YOUNG AGNODICE WAS OUTRAGED
BY THIS ABSURD SITUATION.



PRETENDING TO VISIT A SICK
FRIEND, SHE SET OFF ON A LONG
TRIP



IN REALITY, SHE WENT TO
EGYPT...



WHERE GIRLS WERE ALLOWED TO STUDY MEDICINE.



HER SOLID (AND SECRET) TRAINING IN THE BAG, SHE CAME BACK TO GREECE, DETERMINED TO HELP THE WOMEN OF ATHENS.



Hmm... Yes, that's all well and good, but I still don't have the right to work.

SO, SHE RESOLVED TO DISGUISE
HERSELF AS A MAN TO BE ABLE
TO WORK



AT FIRST, SHE ENCOUNTERED THE
SAME RELUCTANCE AS HER MALE
COLLEAGUES



BUT ONE DAY, SHE SAVED THE LIFE OF
ONE OF HER PATIENTS...



WHO TOLD HER FRIENDS ABOUT
A VERY UNCOMMON DOCTOR

NEWS TRAVELLED ALONG THE GRAPEVINE,
AND AGNODICE QUICKLY BECAME "THE"
GYNAECOLOGIST IN ATHENS.



THIS MYSTERIOUS MONOPOLY
WAS STARTING TO GET ON THE
OTHER DOCTORS' NERVES...



AND THEY ENDED UP ACCUSING
AGNODICE OF TAKING
ADVANTAGE OF HER MARRIED
PATIENTS.



SHE WAS JUDGED BEFORE A COURT
OF HUSBANDS AND DOCTORS.



WITH NO OTHER OPTION,
AGNODICE WAS FORCED TO REVEAL
THE INDISPUTABLE PROOF OF HER
INNOCENCE.



THEY WERE EVEN MORE FURIOUS
(AND ESPECIALLY HUMILIATED FOR
HAVING BEEN FOOLED), AND
CONDEMNED HER TO DEATH FOR
THE ILLEGAL PRACTICE OF
MEDICINE.



THAT WAS WHEN A CROWD OF ANGRY PATIENTS
APPEARED. THEY HAULED THEIR HUSBANDS OVER THE
COALS AND POINTED OUT TO THE DOCTORS THAT ALL
THEY NEEDED TO DO WAS BE LESS USELESS.



ASHAMED, THEY
EVENTUALLY CLEARED THE
ACCUSED...

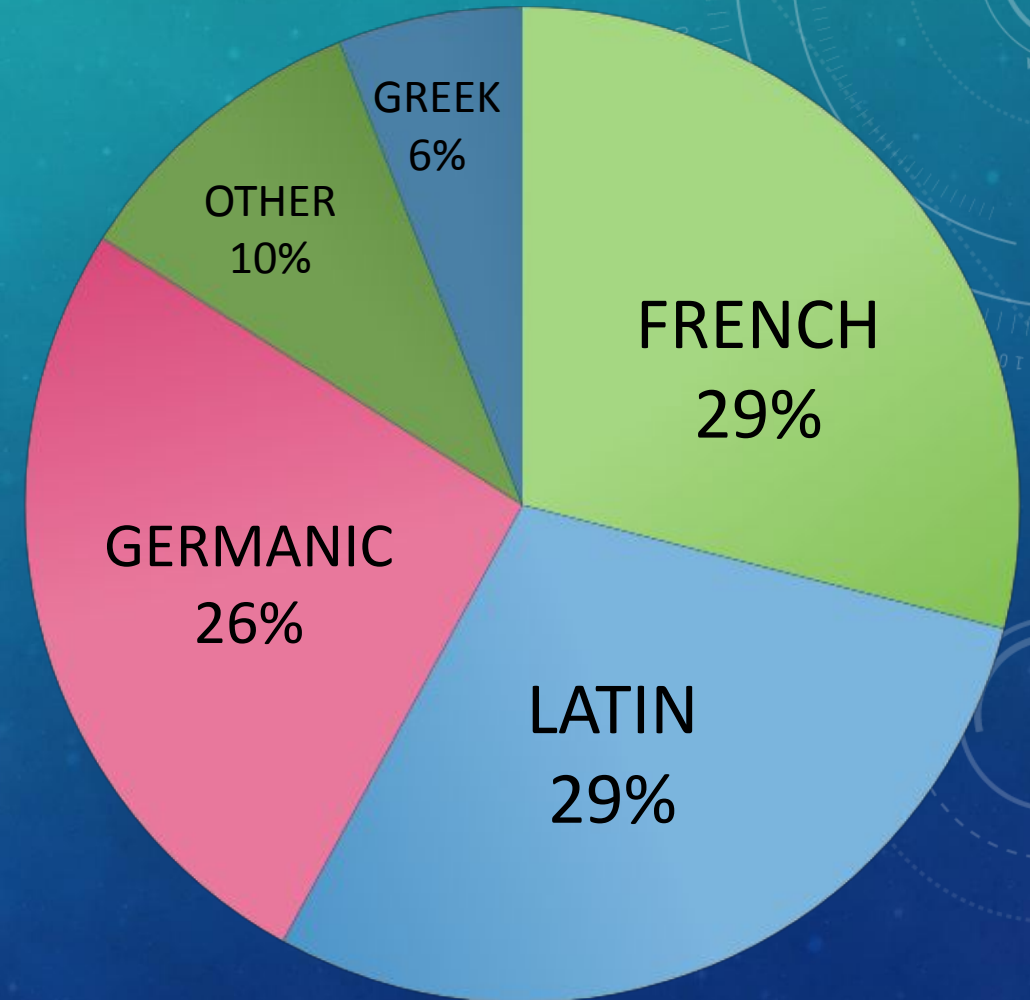
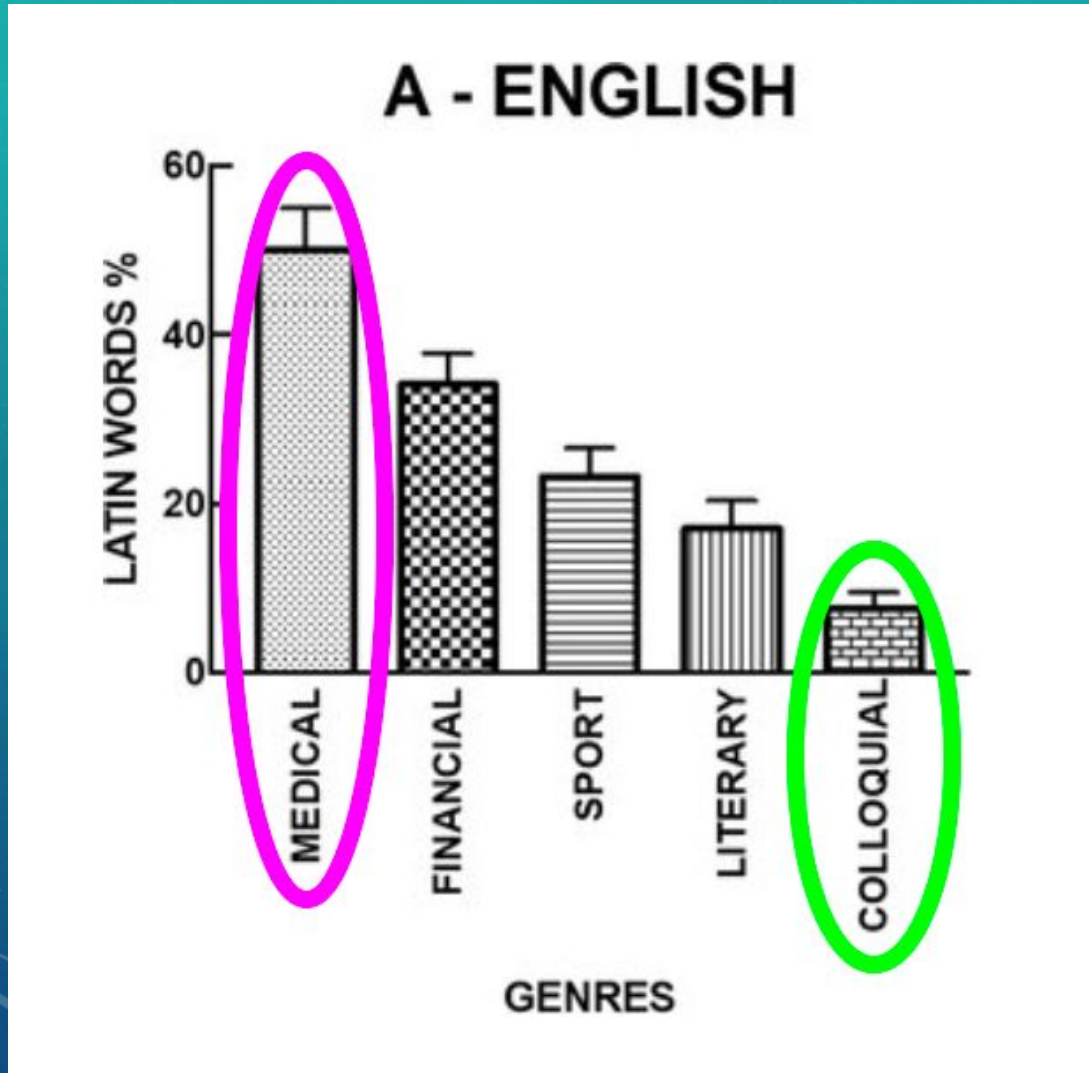


... AND AUTHORISED FEMALE
DOCTORS ONCE AGAIN IN
ATHENS.



Pénélope

THE ORIGIN OF WORDS IN ENGLISH



SOME EXAMPLES

- *ou* (not) + *topos* (place) → **utopia** (1516)
- *zôion* (animal) + *logos* (knowledge) → **zoology** (1669)
- *hydro* (water) + *dunamikos* (powerful) → **hydrodynamics** (1738)
- *phōtós* (light) + *graphê* (drawing / writing) → **photography** (1834)
- *gynē* (woman) □ *gynaiko* + *logos* (knowledge) → **gynaecology** (1847)
- *ōión* (egg) + *kutos* (vessel / jar) → **oocyte** (1895)
- *helix* (spiral shaped) + *baktēría* (little staff /stick) → **helicobacter** (1989)

EVER WONDERED WHY SOME ENGLISH PLURALS ARE “IRREGULAR”?

- -on → a
 - phenomen~~on~~ → phenomen~~a~~, criteri~~on~~ → criteri~~a~~
- -sis --> -ses /sɪs/ → /si:z/
 - crisi~~s~~ → crisi~~s~~, analysi~~s~~ → analysi~~s~~, hypothesi~~s~~ → hypothesi~~s~~
- -um → a
 - bacteri~~um~~ → bacteri~~a~~, dat~~um~~ → dat~~a~~
- -us → i /aɪ/
 - fung~~us~~ → fungi, cact~~us~~ → cacti

GREEK INFLUENCE ON **ENGLISH**



ελληνική γλώσσα



English

ANSWERS to video

1. What are the two estimates for the percentage of Greek words in English?
Explain the difference..

6% and 12-15%%

6% = *token* frequency (how often the word is used)

12%-15% = *type* frequency (does *not* take into account frequency of use)

Lots of Greek words in English but not used that frequently (specialised vocab)

2. How did most Greek words enter English?

Indirectly through Latin or Latin via French

3. True or false: most Greek words in English already existed in Greek.

False – most of them were created from Greek morphemes but didn't exist before that as whole words.

4. What is interesting about the words *television*, *automobile* and *sociology*?

Greek + Latin morphemes = “hybrid” [they usually tried to avoid mixing morphemes]

5. What does *bio* mean in Greek?

Life, living thing

6. What does *micro* mean in Greek? nb /maɪkrəʊ/

Small

7. How are Latin and Greek words used differently in the field of medicine?

Latin for parts of the body and Greek for illnesses or specialisations, e.g.,
cutis (Latin) *dermatology* (Greek)

[sore throat = everyday language (Germanic origin) vs pharyngitis (what your doctor might say)]

Greek pharynx (= throat) + -itis (= inflammation)

8. What are the 4 hints for recognising Greek vocabulary?

- Words starting with ph-
- Ae / oe
- -y- between consonants (apocalypse, encyclopedia)
- Words beginning with certain consonant clusters, e.g., ps-, pn-, chr-

9. How do English speakers pronounce these consonant clusters?

We drop the first letter.

PHONOLOGY 1:

SILENT LETTERS AT THE BEGINNING OF A WORD IN SOME GREEK CONSONANT CLUSTERS

- **ps** = /s/
 - **p**psychology, **p**psychiatrist, **p**pseudo-scientific
- **pn-** = /n/
 - **p**neumonia...
- **gn** = /n/
 - **g**nome, **g**nostic, **g**nat, **g**naw, ...
- **mn-** = /n/
 - **m**nemonic

But no silent letters if in the middle:

- **ps** = /**ps**/
 - syn**ops**is
- **pn-** = /**pn**/
 - hyp**pn**osis
- **gn** = /**gn**/
 - pro**gn**osis
- **mn-** = /**mn**/
 - a**mn**esia

PHONOLOGY 2:

GREEK CLASSICAL COMPOUNDS & WORD STRESS

- Why '*ph*otograph but *pho'**to*grapher?
- Why '*mi*croscope but *mi'**cro*scopy?
- Why '*pen*tagon but *pen'**tag*onal?

Element A (1, 2 or 3 syllables)	Element B (usually monosyllabic)	Element C (monosyllabic non-neutral suffix)
For example: Eu-, syn/sym, anti-, auto-, atmo-, bio-, cata-, deca-, dia-, epi-, cosmo-, hecto-, hexa-, homo-, hydro-, iso-, micro-, mono-, ortho-, oxy-, para-, patri-, photo-, tele-, anthropo-, biblio-, cephalo-, gastero-, helio-, hetero-, ideo-, idio-, lexico-, megalo-, ornitho-, palaeo-, radio-, spermato-, stereo, ...	For example: -arch-, -crat-, -dox-, -gene-, -gloss-, -glot-, -gram-, -graph-, -gon-, -log(ue)-, -lys-, -nom-, -nym-, -path-, -phon-, -pol-, -pod-, -scop-, -soph-, -stat-, -thes-, -latr-, -metr-, -loqu-, ...	The full list: -al, -ence, -ent, -er, -es, -is, -ism, -ist, -ise/-ize, -ous and -y

- Element A + B = stress on **1st syllable of element A** ('**ph**otograph)
- Element A + B + C = stress on **last syllable of element A** (pho'**to**grapher)

HOMEWORK (READING): HYPATIA OF ALEXANDRIA

