Greek and Latin in Scientific Terminology, Lecture 11

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# Final Exam

## Next Thursday, 20 August

* Cumulative: all Greek and Latin vocabulary is fair game.
* Will also include Greek transliteration (i.e. rewriting words in the Greek alphabet into Roman characters, as in the first test).

## Structure

1. Analyse (multiple choice): 5 marks
2. Transliterate (Greek to Roman alphabet): 10 marks
3. Define (definitions of Greek/Latin stems)
   1. Greek: 50 marks
   2. Latin: 50 Marks
4. Dissect (breaking down English words into Greek/Latin stems and providing defintitions): 58 marks
5. Read (pick Latin/Greek words out of an article, break them down, and give definitions for stems): 20 marks
6. Translate (construct an English word out of definitions of stems): 22 marks

# Declensions

## Inflection

* Inflection is the changing of a word’s form to reflect its grammatical role in a sentence.
* Like Greek, Latin is a highly inflected language. The form of a word can vary based on gender, number and case (nouns and adjectives) or on person, number, tense and mood (verbs).
* We will learn how how to decline some Latin nouns and adjectives in two out of six cases.

## Cases

* The nominative case is used for the subject of a sentence. This is the a word’s dictionary form.
* The genitive case is used for a word that depends on another. It can usually be translated using the word ‘of’.
* Each case also has singular and plural forms. For example:
  + lingua (nom. sing.) = ‘tongue’
  + linguae (nom. plur.) = ‘tongues’
  + linguae (gen. sing.) = ‘of the tongues’
  + linguarum (gen. plur.) = ‘of the tongues’

## Genders

* In Latin, nouns are masculine, feminine or neuter. For our purposes, you can always infer the gender of a noun from its ending (though in fact real Latin is not so regular).
* The first declension is made up of words ending in ‘-a’, which are nearly always feminine.
* The second declension is made up of words ending in ‘-us’, which are nearly always masculine, and words ending in ‘-um’, which are neuter.

## First declension

|  |  |  |
| --- | --- | --- |
|  | Singular | Plural |
| Nominative | -a (e.g. lingua) | -ae (e.g. linguae) |
| Genitive | -ae (e.g. linguae) | -arum (e.g. linguarum) |

## Second declension (masculine)

|  |  |  |
| --- | --- | --- |
|  | Singular | Plural |
| Nominative | -us (e.g. nervus) | -i (e.g. nervi) |
| Genitive | -i (e.g. nervi) | -orum (e.g. nervorum) |

## Second declension (neuter)

|  |  |  |
| --- | --- | --- |
|  | Singular | Plural |
| Nominative | -um (e.g. labium) | -a (e.g. labia) |
| Genitive | -i (e.g. labii) | -orum (e.g. labiorum) |

* Thus *arcus costarum* is ‘arch of the ribs’ and *venae oculi* is ‘the veins of the eye’
* NB: Latin has neither the definite (‘the’) nor the indefinite (‘a/an’) article. Therefore *vena* may be translated as ‘vein’, ‘a vein’ or ‘the vein’, whichever seems appropriate.

## Adjectives

* Latin adjectives must agree in gender (masculine, feminine or neuter), number (plural or singular) and case with the adjectives they modify. In real Latin, adjectives can be placed almost anywhere in a sentence, but in scientific expressions they usually follow the noun the modify.
* The adjectives you will see belong to a group that takes the endings of the first or the second declension, as longus, -a, -um
* Thus we could have *nervus longus, lingua longa,* or *labium longum.*

# Example Phrases

## *camera oculi*

* chamber of the eye

## *musculus flexor digiti quinti*

* the muscle (that is the) bender of the fifth finger

## *bursae subcutaneae*

* subcutaneous bags; bags under the skin

# Verb-Forming Suffixes

## -ate

* ‘to make’, ‘to treat’, ‘to do something with’
* alleviate, obviate, illuminate
* NB: This suffix often combines with the noun-forming suffix -ion (e.g. illumination)

## -fy

* ‘to make’, ‘to cause’
* terrify, liquify, pacify
* NB: The adjective ending that corresponds to -fy is -fic, ‘making’, ‘causing’ (e.g. terrific, pacific)

## -igate, -egate

* ‘to make’, ‘to drive’
* mitigate, fumigate, navigate, variegate

## -esce

* ‘to begin’, ‘to be somewhat’
* effervescent, convalescent, arborescent

# Roots, Part I

## CAUL-

* ‘stem’, ‘stalk’ (*caulis*)
* CAULI-COL-ous, applies to fungi growing on plant stems; CAUL-ine, pertaining to a stem (applies to leaves growing on the upper portion of a stem; FILI-CAUL-ine, with a threadlike stem

## FLAV-

* ‘yellow’ (*flavus*)
* FLAV-edo, yellowness of the skin; FLAV-in, one of a group of yellow pigments isolated from various plant and animal sources

## FLOCC-

* ‘tuft, as of wool’ (*floccus*)
* FLOCCUS, a tuft of wooly hairs on a plant; FLOCC-ose, covered with woollike tufts (applies to bacterial growths)

## LABI-, LABR-

* ‘lip’ (*labium or labrum*)
* LABIUM, lip, liplike structure; LABIO-GRESS-ion, location of the anterior teeth in front of their normal position

## LAT-

* ‘to bear’, ‘to carry’
* re-LATE; e-LAT-ed; trans-LATE; ab-LAT-ion, removal of a part by amputation, excision, etc.

## LEV-

* ‘light’ (in weight) (*levis*)
* LEV-ity; LEV-er; e-LEV-at-or, an instrument for lifting a part or for extracting the roots of teeth; al-LEVI-at-ion, the modification of symptoms, the lessening of pain

## LIGN-

* ‘wood’ (*lignum*)
* LIGNE-ous, woody, of the nature of wood; LIGN-in, a complex substance which, associated with cellulose, causes the thickening of plant cell walls, and so forms wood

## LIQU-

* ‘to be liquid’
* LIQUE-FACT-ion, conversion of material into liquid form

## LUMIN-

* ‘light’ (*lumen*)
* LUMEN, the cavity of a tubular part of an organ, or the central cavity of a plant cell; SONO-LUMIN-esc-ence, the emission of light by various liquids when traversed by high-frequency sound or ultrasonic waves

## MAN(U)-

* ‘hand’ (*manus*)
* MANU-FACT-ure, MANU-SCRIPT; BI-MAN-ous, having two hands (applies to certain primates); MANU-DUCT-ion, operation performed by the hands in surgical and obstetric practice

## NIGR-

* ‘black’ (*niger*)
* NIGR-esc-ent, nearly black, blackish

## OSS-

* ‘bone’ (*os*)
* OSS-icle, any small bone; DERMO-OSSI-FIC-at-ion, a bone formed in the skin

## PROXIM-

* ‘near’, ‘nearest’ (*proximus*, ‘nearest the body’)
* PROXIM-ate, nearest, immediate (as proximate cause); PROXIM-al, in dentistry, surface of a tooth next to the adjacent tooth; PROXIMO-LABI-al, pertaining to proximal and labial surfaces of a tooth

## SINISTR-

* ‘left’ (*sinister*)
* SINISTER; SINISTRO-TORS-ion, a twisting or turning toward the left; SINISTR-in, a levorotatory polysaccharide

## SPIN-

* ‘thorn’, ‘spine’ (*spina*)
* SPIN-ul-ate, covered with spines; SPIN-ul-at-ion, a defensive spiny covering, or the state of being spinulate

## STIP-, STIPIT-

* ‘stalk’ (*stipes*)
* STIPIT-ate, stalked; STIP-ule, one of two membranes or foliaceous processes developed at the base of a leaf petiole; BI-STIP-ul-ate, provided with two stipules

## STRAT-

* ‘layer’ (*stratum*)
* BI-STRAT-ose, with cells arranged in two layers; STRAT-iform, applies to fibrocartilage coating osseous grooves

## TUM-

* ‘to swell’
* TUM-esc-ent, swollen, enlarged; de-TUM-esc-ence, subsidence of a swelling (esp. of erecto-sexual organs following orgasm)

## VARI-

* ‘varied’, ‘changing’, ‘spotting’ (*varius*)
* VARI-ous; VARI-ety; VARI-egate-d, marked with different colours; VARI-CELLA, chickenpox

## VENTR-

* ‘belly’ (*venter*)
* VENTRI-LOQU-ism; VENTR-icle, a cavity or chamber, as of the heart or brain; BI-VENTR-al, applies to muscles of the biventer type (= digastric, each of a pair of muscles which run under the jaw and act to open it, from GAST- ‘belly’ because the muscle has two fleshy parts or ‘bellies’ at an angle, connected by a tendon)

# The Heart (καρδία/cor, cordis)

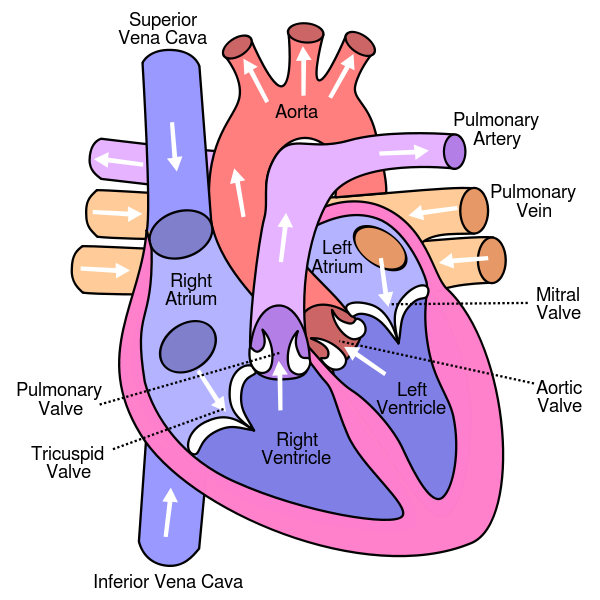


Diagram of the Human Heart

## Vena Cava

* Latin phrase: 'hollow vein’
* Came into English in the 16th century.

## Pulmonary

* Latin *pulmonarius*, from *pulmo, pulmon-* ‘lung’
* 17th cent.

## Tricuspid

* *tri-* ‘three’ + *cuspis, cuspid-* ‘cusp’, 'point'
* 17th cent.

## Atrium

* Latin: a reception hall in a Roman house
* 16th cent.

## Ventricle

* Latin *ventriculus*, diminutive of *venter* ‘belly’
* late Middle English

## Aorta

* Greek *aortē*, from *aeirein* ‘raise’
* 16th cent.: used in the plural by Hippocrates for the branches of the windpipe, and by Aristotle for the great artery

## Mitral

* *mitralis*, from Latin *mitra* 'mitre' (a tall headdress worn by bishops); Greek Greek *mitra* ‘belt or turban’
* 17th cent.

## Poetic Usage

* Our use of the word 'heart' to refer to emotion comes from Greek/Latin usage, and in ancient usage was more than merely figurative.
* Galen appears to have been one of the earliest authors to use the term in opposition to the mind (as the seat of reason).
  + Discussed in the programme [*Heart vs Mind: What Makes Us Human*](https://www.youtube.com/watch?v=6bH8gQezrws#t=7m25s) (starting around 7m25s).

# Counting in Latin

## SEMI-

* ‘half’, ‘partly’
* SEMI-LUN-ate, half-moon-shaped; SEMI-CAUD-ate, with a rudimentary tail

## UN-

* ‘one’ (*unus*)
* UN-ique; UN-iform; UN-ANIM-ity; UNI-FOLI-ate, with one leaf; UNI-PAR-ous, producing one offspring at a birth; UNI-STRATE, having only one layer

## PRIM-

* ‘first’ (*primus*)
* PRIM-ary; PRIM-ates, the highest order of the vertebrate class Mammalia, including man, apes, monkeys and lemurs; PRIMI-PAR-ous, pertaining to a woman bearing or giving birth to her first child

## SESQUI-

* ‘one-and-a-half times’
* SESQUI-CENT-ENNI-ial; SEQUI-CHLOR-ide, a compound of chlorine and another element containing three parts of chlorine and two of the other element; SESQUI-OX-ide

## DU-

* ‘two’ (*duo*)
* DU-et; DU-al; DU-PLIC-ate; DU-PLICI-DENT, with two pairs of incisors in the upper jaw;

## BI-, BIN-

* ‘two’, ‘twice’
* BI-NATE, growing in pairs; BI-FID, forked, opening with a median cleft; BI-STRAT-ose, with cells arranged in two layers

## SECOND-, SECUND-

* ‘second’, ‘following’ (*secundus*)
* SECOND-ary; SECUNDI-GRAV-ida, a woman pregnant the second time

## TRI-

* ‘three’
* TRI-DENT; TRI-VI-al; TRI-COST-ate, with three ribs; TRI-FID, cleft to form three lobes

## TERTI-

* ‘third’
* TERTI-ary, third, pertaining to third stage of disease; TERT-ian, recurring every other day, as a tertian fever

## TERN-

* ‘three each’; TER-, ‘three times’
* TERN-ary, consisting of or based on three, or pertaining to a crystal system in which three-sided forms occur, or an alloy with three elements; TER-VAL-ent, having a valence of three, triple

## QUADR(U)-

* ‘four’
* QUADRU-PLE; QUADRI-JUG-ate, applies to pinnate lear having four pairs of leaflets; QUADRU-PED, a four-footed animal

## QUART-

* ‘fourth’; QUATERN-, ‘four each’
* QUART-an, recurring every three days (or four, counting inclusively), as on first, fourth and seventh day; QUATERN-ate, in sets of four (applies to leaves growing in fours from one point

## QUINQUE-

* ‘five’
* QUINQUE-PART-ite, divided into five parts

## QUINT-

* ‘fifth’; QUIN-, ‘five each’
* QUIN-ary, applies to flower symmetry in which there are five parts to a whorl; QUINTU-PL-et, one of five children born at one birth

## SEX-

* ‘six’; SEXT-, ‘sixth’
* SEXT-ant, a maximum angle of sixty degrees; SEX-OSTI-atae, group of spiders marked by six cardiac ostia

## SEPT-, SEPTEM-

* ‘seven’; SEPTIM-, ‘seventh’
* SEPTEM-ber; SEPTEM-PART-ite, divided into seven parts; SEPTIM-al, based on the number seven

## OCT-

* ‘eight’; OCTAV-, ‘eighth’
* OCT-ave; OCT-avo; OCTO-RADI-ate, having eight rays or arms; OCT-ane, the eighth member of the paraffin or marsh gas series

## NOVEM-

* ‘nine’; NON-, ‘ninth’
* NOVEM-ber; NON-illion, ten to the thirtieth power; NON-an, having an exacerbation every ninth day

## DECEM-

* ‘ten’; DEC-, DECIM-, ‘tenth’
* DECIM-ate; DECI-LITRE, one-tenth of a litre; DECEM-FID, cleft into ten parts

## But what about the months of the year?

## CENT-

* ‘hundred’, ‘hundredth’
* CEN-ENN-ial; CENT-uri-on; CENTI-PEDE, elongated segmented arthropods with many legs; CENTI-metre, one-hundredth of a metre

## MIL(L)-

* ‘thousand’, ‘thousandth’
* MILL-ENN-ium; MILLI-PEDE, myriopods constituting the the class Diplopoda having numerous segments and legs; MILLI-metre, one-thousandth of a metre

# Greek and Latin in the Metric System

## Original Metric Prefixes

|  |  |  |
| --- | --- | --- |
| Text | Factor | Derivation |
| myria | 10000 | Greek, ‘10,000’ |
| kilo | 1000 | Greek, ‘thousand’ |
| hecto | 100 | Greek, ‘hundred’ |
| deca | 10 | Greek, ‘ten’ |
| (*none*) | 1 |  |
| deci | 0.1 | Latin, ‘tenth’ |
| centi | 0.01 | Latin, ‘hundred’ |
| milli | 0.001 | Latin, ‘thousand’ |

|  |  |  |
| --- | --- | --- |
| Text | Factor | Derivation |
| tera | 1000000000000 | Greek, 'monster' |
| giga | 1000000000 | Greek, ‘giant’ |
| mega | 1000000 | Greek, ‘great’ |
| kilo | 1000 | Greek, ‘thousand’ |
| hecto | 100 | Greek, ‘hundred’ |
| deca | 10 | Greek, ‘ten’ |
| (*none*) | 1 |  |
| deci | 0.1 | Latin, ‘tenth’ |
| centi | 0.01 | Latin, ‘hundred’ |
| milli | 0.001 | Latin, ‘thousand’ |
| micro | 0.000001 | Greek, ‘small’ |
| nano | 0.000000001 | Greek, ‘dwarf’ |
| pico | 0.000000000001 | Spanish, ‘little bit’ |

# Roots, Part II

## ARC(U)-

* 'bow', 'arch' (*arcus*)
* ARC-ade; ARCI-FER-ous, applies to the pectoral arch of toads; ARC-iform, shaped like an arch or a bow; ARCU-alia, small, cartilaginous pieces, dorsal and central, fused or free, on the vertebral column of fishes

## CALCAR-

* 'spur' (*calcar*)
* CALCAR-ine, a fissure extending to the hypocampal gyrus on the medial surface of the cerebral hemisphere; CALCAR-ate, having a spur or spur-like point
* NB: Compare *calx, calc-* 'lime'.

## CING-, CINCT-

* 'to bind', 'to gird'
* pre-CINCT; suc-CINCT; CING-ulum, a girdle or the waist; sub-CING-ulum, the lower lip part of the cingulum of rotifers; CING-ul-ectomy, the surgical removal of the cingulate gyrus (in the brain)

## CLIV-

* 'slope' (*clivus*)
* pro-CLIV-ity; de-CLIVE, a lower or descending part; CLIVUS, a slope; post-CLIV-al, the fissure behind the clivus of the cerebellum

## CUSPID-

* 'point' (*cuspis*)
* CUSP, a pocket or fold in the wall of the heart or a major blood vessel that fills and distends if the blood flows backwards, so forming part of a valve; a cone-shaped prominence on the surface of a tooth; a sharp rigid point of a leaf; bicuspid, having two cusps or points; a tooth with two cusps, especially a human premolar tooth; bi-CUSP-id, having two cusps, as bicuspid teeth, or as the mitral valve of the heart

## FASCI-

* 'band' (*fascia*)
* FASCIA, a thin sheath of fibrous tissue enclosing a muscle or other organ; FASCI-ated, showing abnormal fusion of parts or organs, resulting in a flattened ribbon-like structure; FASCI-ola, a narrow colour-band; FASC-itis, inflammation of a fascia

## FERR-

* 'iron' (*ferrum*)
* FERR-ic, relating to iron; FERR-ule, a ring or cap, typically a metal one, which strengthens the end of a handle, stick, or tube and prevents it from splitting or wearing; FERR-ous, containing or consisting of iron; FERRI-HAEMO-GLOB-in, haemoglobin in which the iron is normally in a ferrous state

## FLAGELL-

* 'whip', 'whip-like appendage' (*flagellum*)
* FLAGELL-ate; FLAGELL-um, a slender thread-like structure, especially a microscopic whip-like appendage which enables many protozoa, bacteria, spermatozoa, etc. to swim; FLAGELL-in, the structural protein of bacterial flagella

## GLABR-

* 'hairless', 'smooth' (*glaber*)
* GLABR-ous, free from hair or down, smooth (chiefly of the skin or a leaf); GLAB-ella, the smooth part of the forehead above and between the eyebrows

## LIEN-

* 'spleen' (*lien*)
* LIEN-al, pertaining to the spleen (applies to an artery, vein, or nerve plexus); GASTRO-LIEN-al, pertaining to the stomach and spleen

## LONG-

* 'long' (*longus*)
* LONGI-tude; LONGI-CORN, having long antennae, former term for longhorn beetle; LONGI-MAN-ous, long-handed

## NAS-

* 'nose' (*nasus*)
* NAS-al; NAS-al-ize; NASO-GASTR-ic, reaching or supplying the stomach via the nose; NASO-PHARYNX, the upper part of the pharynx, connecting with the nasal cavity above the soft palate

## NUC-

* 'nut' (*nux*)
* NUC-leus; NUC-le-ase, an enzyme that cleaves the chains of nucleotides in nucleic acids into smaller units; NUC-ellus, the central part of an ovule, containing the embryo sac; NUC-le-olus, a small dense spherical structure in the nucleus of a cell during interphase.

## OS-, OR-

* 'mouth' (*os*)
* OR-al; OS-culum, a large aperture in a sponge through which water is expelled; OS-CUL-ate, to kiss; OS-CUL-ar, relating to kissing (or to an osculum)

## PALLI-

* 'mantle', 'covering' (*pallium*)
* PALLI-um, (in zoology) the mantle of a mollusc or brachiopod, (in anatomy) the outer wall of the mammalian cerebrum, corresponding to the cerebral cortex; PALLI-ate, to make (a disease or its symptoms) less severe without removing the cause; PALLI-at-ive, relieving pain without dealing with the cause of the condition

## PRON-

* 'inclined', 'face-down' (*pronus*)
* prone, lying flat, especially face downwards; PRON-ator, a muscle whose contraction produces or assists in the pronation of a limb or part of a limb.

## SAC(C)-

* 'bag', 'sac' (*saccus*)
* SACC-ate, dilated to form a sac; SACC-ule (SACC-ulus), a small sac, pouch, or cyst

## SIN(U)-

* 'curve', 'hollow', 'cavity' (*sinus*)
* in-SINU-ate, suggest or hint in an indirect and unpleasant way; SINUS, a cavity within a bone or other tissue, especially one in the bones of the face or skull connecting with the nasal cavities; SINU-ate, having a wavy or sinuous margin; with alternate rounded notches and lobes; SINU-ous, having many curves and turns; SINUS-oid, a small irregularly shaped blood vessel found in certain organs, especially the liver

## STA-, STAT-

* 'to stand'
* circumstance; distant; extant; instant; status; substance; STA-ble, not liable to undergo chemical decomposition, radioactive decay, or other physical change; STA-bile, stationary; DI-ST-al, situated away from the centre of the body or from the point of attachment

## VITR-

* 'glass' (*vitrum*)
* VITR-eous, like glass in appearance; VITR-esc-ent, capable of or susceptible to being turned into glass; VITR-eous HUM-our, the transparent jelly-like tissue filling the eyeball behind the lens (cf. aqueous humour); VITR-ectomy, the surgical operation of removing the vitreous humour from the eyeball

# Roots, Part III

## CALC-, CALCANE-

* 'heel' (*calx; calcaneus*)
* CALC-aneus (pl. calcanei), the large bone forming the heel; CALC-aneal, pertaining to the heel bone; CALC-aneo-CAVUS, a type of talipes (a deformity of the foot)

## CERVIC-

* 'neck' (*cervix*)
* CERVIC-al, relating to the narrow neck-like passage forming the lower end of the womb (or simply relating to the neck); CERVIC-itis, inflammation of the neck of the womb; CERVICO-BRACHI-ALG-ia, condition in which pain extends from the cervical region to arms or fingers

## CORP-, CORPUS-, CORPOR-

* 'body' (*corpus*)
* CORPOR-al; in-CORPOR-al; CORPS; in-CORPOR-ate; CORPUS-cle, a minute body or cell in an organism, especially a red or white cell in the blood of vertebrates

## COX-

* 'hip', 'hip joint' (*coxa*)
* COXA, (in anatomy) the hip bone or hip joint; (in entomology) the first or basal segment of the leg of an insect); COX-ALG-ia, pain in the hip joint; EPI-COX-ite, a small process at the end of the toothed part of the coxa in insects

## FIBUL-

* 'clasp', 'brooch' 'outer bone of the leg' (*fibula*)
* FIBULA (pl. fibulae), the outer and usually smaller of the two bones between the knee and the ankle; in-FIBUL-ation, the controversial practice of excising the clitoris and labia of a girl or woman and stitching together the edges of the vulva to prevent sexual intercourse; para-FIBUL-ar, pertaining to an accessory element outside the fibula

## FREN-

* 'rein', 'bridle' (*frenum*)
* FREN-ulum or FREN-um, (in anatomy) a small fold or ridge of tissue which supports or checks the motion of the part to which it is attached, in particular a fold of skin beneath the tongue, or between the lip and the gum; (in entomology, applying to some moths and butterflies) a bristle or row of bristles on the edge of the hindwing which keeps it in contact with the forewing; FREN-ate, having a frenulum
* NB: 'frenzy', 'frenetic' are from Greek PHREN-.

## FURC-

* 'fork' (*furca*)
* FURC-ate; TRI-FURC-ate, to divide into three branches or forks; furca (pl. furcae, an ingrowth of the thorax of many insects; FURC-ula, the wishbone of a bird.

## FUS-

* 'spindle' (*fusus*)
* FUSE-LAGE; FUS-illi, spindle-shaped pasta; FUS-arium, a mould of a large genus which includes a number that cause plant diseases, especially wilting; FUS-ee, a conical pulley or wheel, especially in a watch or clock
* NB: Not to be confused with FUND-, FUS- (pour, melt), as in 'fusion', 'fuse'.

## FUSC-

* 'dark', 'brown', 'tawny' (*fuscus*)
* ob-FUSC-ate, make obscure, unclear, or unintelligible; FUSC-ous, dark and sombre in colour; FUSC-in, a brown pigment in the retinal epithelium

## GEMM-

* 'bud' (*gemma*)
* GEM; GEMMA, a small cellular body or bud that can separate to form a new organism; GEMM-ation, asexual reproduction by the production of gemmae; budding; GEMM-ule, a tough-coated dormant cluster of embryonic cells produced by a freshwater sponge for development in more favourable conditions

## GEN(U)-

* 'knee' (*genu*)
* GENU-ine (with reference to the Roman custom of a father acknowledging paternity of a newborn child by placing it on his knee); GENU-FLECT; GENU, the knee; (in Anatomy and Biology) a part of certain structures resembling a knee, in particular a bend in the corpus callosum of mammals; GENI-cul-ate, bent at a sharp angle

## GERM-, GERMIN-

* 'sprout', 'bud', 'germ' (*germen*)
* GERM; GERM-ane; GERMIN-ate; GERM-icide, an agent that kills germs; GERMI-DUCT, the obiduct of a trematode (a parasitic flatworm)

## MAL(E)-

* 'bad' (*malus*)
* MALE-FACT-or; MALE-VOL-ent; MAL-FEAS-ance; MALE-DICT-ion; MAL-IGN; MAL-IGN-ant; MAL-PRACT-ice; MAL-ING-er, to pretend to be ill in order to escape duty or work; MAL-OCCLUS-ion, imperfect positioning of the teeth when the jaws are closed

## NAR-

* 'nostril' (*naris*)
* NARES, the nostrils; NARI-CORN, the horny part of the nostrils in Turbinares; NARI-form, shaped like nostrils

## PAPILL-

* 'nipple' (*papilla*)
* PAPILLA, a small rounded protuberance on a part or organ of the body; PAPILL-oma (pl. papillomas or papillomata), a small wart-like growth on the skin or on a mucous membrane, derived from the epidermis and usually benign

## PECTIN-

* 'comb' (*pecten*)
* PECTEN (pl. pectens or pectines), any of a number of comb-like structures occurring in animal bodies; PECTIN-ella, a comb-like membranella of some infusoria

## PINN-, PENN-

* 'feather', 'wing', 'fin' (*pinna; penna*)
* pen; pinnacle; PINNA (in anatomy and zoology) the external part of the ear in humans and other mammals; the auricle; (in botany) a primary division of a pinnate leaf, especially of a fern; (in zoology) any of a number of animal structures resembling fins or wings; BI-PENN-iform, feather-shaped, with sides of a vein of equal size; PINN-ule, a secondary division of a pinnate leaf, especially of a fern; (in zoology) a part or organ like a small wing or fin, especially a side branch on the arm of a crinoid

## PULMO(N)-

* 'lung' (*pulmo*)
* PULMON-ary or PULMON-ic, relating to the lungs; GASTO-PULMON-ary, pertaining to the stomach and the lungs

## RAD-, RAS-, RAZ-

* 'to scrape'
* RAZE; RAZ-or; e-RAS-er; RAD-ula, (in a mollusc) a rasp-like structure of tiny teeth used for scraping food particles off a surface and drawing them into the mouth; RAST-er, a rectangular pattern of parallel scanning lines followed by the electron beam on a television screen or computer monitor

## VAGIN-

* 'sheath' (*vagina*)
* VAGINA, any sheath-like structure, especially a sheath formed round a stem by the base of a leaf; e-VAGIN-ate, (with reference to a tubular or pouch-shaped organ or structure) to turn or be turned inside out