It's All Greek to Me!

Why we use scientific names for plants and animals

We're all comfortable with using common names for familiar plants and animals. After all, that's all we need most of the time. So why do we use scientific names? Why say *Corethrogyne filaginifolia* (kore-eh-THRAH-jin-ee fil-a-jin-i-FOL-ee-a) when we can say daisy instead? Well, most of the time it's just fine to say daisy, but sometimes we need to be more precise. For one thing, common names may vary around the world, sometimes even within the state or county where you live. A daisy to someone in San Francisco may be quite different from a daisy to someone in New York. Did you know that there are hundreds of kinds of plants with flowers that share the name 'daisy'? In addition, while one common name can refer to hundreds or even thousands of different organisms, sometimes a single organism can have several, or even hundreds of different common names! For instance, fall aster, New England daisy and Michaelmas daisy are all the same member of the daisy family, *Aster novae-angliae*. This is its one and only scientific name, recognized in any country in the world, no matter which language is spoken.

We use Latin, and sometimes ancient Greek, as the basis for a universal scientific language, and occasionally, words from other languages. We use these 'dead' languages because the word meanings don't change the way they sometimes do in English and other modern languages. You may be thinking "Who wants to learn another language? I can call a tiger a 'tiger' and everybody knows what I mean!" Maybe scientific names seem long, unpronounceable and even intimidating, but try saying these out loud: *Tyrannosaurus*, *Pteradactyl*, and *Chrysanthemum.* You probably didn't even hesitate – yet those are all scientific names. Other scientific names are just as easy once you know some basics. Because scientific names come from dead languages, no one is absolutely sure how they are pronounced, although we do have some generally accepted rules. So go ahead and give it a try. Maybe your way is the right way, we'll never know for sure.

You'll find that when you know some word roots, you can not only understand the language of biology, but also chemistry, geology, physics and other sciences. Additionally, word roots will also help you to understand our own English language better, and can improve your spelling. You may be surprised to find out that you already know a lot of Latin. That's because a lot of English words are from Latin roots.

For instance, what do you think these words mean?

gigantea	*familiaris*	*mississipiensis*	*flora*
intermedia	*officinale*	*atlanticus*	*horribilis*

When naming organisms, scientists use the *binomial system of nomenclature*, originally devised by Carl Linnaeus. He also established the familiar kingdom, phylum, class, order, family, genus, and species system of classifying organisms. In the 18th century, he published two books, one for plants, and one for animals, to introduce his new system. Until Linnaeus, scientists used long phrases to describe living things, but his system used just two words, the *genus* (plural genera) and the *specific epithet*, which described that particular member of the

genus. Together, the genus and specific epithet describe the *species*. (Occasionally, you may see a third word; the subspecies or variety.) You can use just the genus name alone, or the genus and specific epithet together, but never just the specific epithet by itself. The scientific name often describes the organism in some way. After the species name, you may also see the name of the person who first described the organism. We continue to use the convenient binomial system today for naming new organisms. However, Linnaeus's novel method of naming as well as his early plant classification have both changed dramatically as we learn more about how organisms are related through new techniques such as genetic analysis. You will often hear the word *taxa* (*taxon*, singular) used to describe a group – a word which can refer to species, family, order or other levels of organization.

Sometimes, what we think of as the common name is actually the scientific name, or very close to it. You probably already know what these organisms are:

Gorilla	*Rhododendron*	*Citrus*	*Octopus*	*Magnolia*
Bison	*Hippopotamus*	*Rhinoceros*	*Giraffa*	*Velociraptor*

Often, scientific names are assembled from fairly common word roots. For instance, combine *rubri* (red) with *flora* (flower), to get *rubriflora*, which describes a red flower. The more word roots we know the meaning of, the easier it is to figure out what scientific names (and other words) mean. Often, the name of an animal or plant describes the appearance or behavior of an organism. Can you guess something about what sorts of organisms are described here?

Acrobates pygmaeus	*Chaos chaos*	*Canis familiaris*

The common name for *Acrobatus pygmaeus* is feathertail glider, a small, agile marsupial that lives in trees in Australia. The giant amoeba *Chaos chaos* is an organism so small you can barely see it with the naked eye! It's called *Chaos chaos* because its ever- changing shape doesn't have a recognizable pattern, and it is called the giant amoeba because it *is* big – for an amoeba! And what do you think a familiar canine is? That's right, our friend the dog.

Some scientific names are just fun to say. *Naja naja naja* is the king cobra. *Bufo bufo bufo* is the European toad. *Gorilla gorilla gorilla* is the western lowland gorilla. Some other creative names are *Bla nini, Bathymaster, Aha ha* and *Stupidogobius*. As you can see, scientists aren't always serious, and sometimes like to have fun when naming new organisms.

A scientist named Norman Platnick placed several spiders he was describing in the genus *Nops*, but later found out they each needed to be in their own genera. He named these new genera *Notnops, Taintnops, and Tisentnops*. In Greek, *ch* is pronounced like a *k*. George Kirkaldy, an English entomologist who worked in Hawaii, used his knowledge of Greek to name several genera of true bugs he was describing *Ochisme, Dolichisme, Florichisme, Elachisme, Marichisme, Nanichisme, Peggichisme and Polychisme*. Many years went by before other scientists noticed how these words were pronounced! He was in trouble with his more serious-minded colleagues, but the names are still in effect. Some recently named organisms are *Pieza kake, Pieza pi and Pieza rhea*. *Bittium* and *Ittibittium,* and

Abracadabrella, and *Verae peculya* are all fun to say!

This is probably a good time to mention that most, but not all, scientific names accurately describe the organism in question. The rules for giving and changing names are very complicated, and it's extremely difficult to change an organism's name once it has been finalized once it has been finalized, so sometimes the binomial description is just plain wrong! For instance, *Nasturtium* (nose twisting) is the scientific name for watercress, not the familiar garden flower. A *Platypus* isn't the strange animal from Australia that we know as the duck-billed platypus (*Ornithorhynchus anatinus)*, but a beetle. Some plants and animals were given geographical specific epithets such as *chinensis*, but were later discovered to be from somewhere else. Most of the time, however, the scientific name gives us useful information.

Lots of organisms are named after people, sometimes the person who first described it or someone they admire. You probably know who these are named for:

Lewisia	*Darthvaderum*	*Cyclops*	*Montypythonoides*
Clarkia	*Draculoides*	*Gollum*	*Smeagol*

Some names tell you where an organism originated.

Alligator mississipiensis *Gazella arabica* *Camellia japonica*

Lots of names come from ancient mythology:

Adonis	*Aphrodite*	*Chronos*	*Daphne*	*Diana*
Eros	*Hermes*	*Mars*	*Pandora*	*Pluto*
Venus	*Polyphemus*	*Poseidon*	*Zeus*	*Narcissus*

Now it's time for you to have some fun. Following is a list of word roots. Take a look at it and you will see many familiar looking words. Pretend you're a scientist who has just discovered a new organism, and now you need to name it. It can be anything you like: a plant, an animal, a mushroom, or a fantastical invention of your own. Write a brief description of your new organism (what it looks like, eats, lives, where or how you found it, etc . . .) and draw a picture of it. Be as creative as you like. Write the species name under the organism; remember to include both the genus and the specific epithet. Remember to add your own name to the end of the binomial as the describer of the new organism.

There are lengthy and complicated books of rules for scientists who are naming organisms. Here are a couple rules you may find helpful when naming yours. In a binomial the genus is usually a noun (*Canis*), and is always capitalized. The second word is usually an adjective, and isn't capitalized (*familiaris*). We always use *italics* when we type a binomial, and when handwriting, we <u>underline</u> it in order to set it apart. To give a species a place name, add "*ensis"* at the end of the name, for instance *oregonensis*. If the word ends in a vowel, you can drop the vowel before adding "*ensis*", for instance *nevadensis*. If you are naming a species after a friend, add an *i* to the end of boys' names, such as *carli*, or an *ae* to girls' names, such

as s*usanae*. Drop any final vowel on your friend's name if you need to, before adding the ending. Even if your new organism's name doesn't follow all the rules of nomenclature, it will be close enough to sound real. To put several roots together, you may need to add vowels between them to be able to pronounce them. Just experiment a bit – since you don't have to follow all the rules of international nomenclature, you can't go wrong!

Color: *chromo, colori*

Black: *nigri*
Blue: *cerule, cyano*
Brown: *brunne*
Green: *viridi*
Purple: *purpur*
Red: *rubri, rubra*
White: *alba*
Yellow: *lute, flav*

Size

Dwarf: *nano*
Equal: *equi*
Gigantic: *giganto, colosso, titano*
Heavy: *gravi*
Large: *grandi, macro, mega*
Largest: *maxim*
Less than: *sub*
Light in weight: *levi*
Long: *longi*
Short: *brevi, curti*
Small: *micro, minut*
Smallest: *minim*
Tall: *alti*

Shape: *forma*

Angled: *anguli*
Curled: *crisp*
Cylindrical: *cylind*
Flat: *plani*
Hollow: *cavi*
Long: *longi*
Pointed: *cuspi*
Round: *circuli, cyclo, gyro, rotundi*
Sharp: *acuti*
Slender: *gracil*
Spiral: *spirali, helix*
Square: *quadrat*
Thick; *crassi, pachy*
Twisted: *strepto*
Wavy: *undulat*
Wide: *lati*

Texture

Bare: *nudi*
Firm: *solid*
Furrowed: *striat*
Hairy: *hirsut, pili*
Hard: *duri, duro*
Moist: humid
Rough: *scabr*
Smooth: *glabr, levi, lubric*
Soft: *molli*
Spiny: *spini*
Spotted: *macula*
Stiff: *rigid*
Thick: *crass, dens, gross*
Wide: *lati*
Woolly: *lani, pexi*
Wrinkled: *corrugat*

Direction and Position

Above: *hyper, super*
Across: *trans*
Against: *anti, contra*
Apart: *dis*
Around: *circum*
Before: *ante, pre*
Behind: *post, postero*
Below: *hypo*
Between: *inter, enter, inter*
Beyond: *ultra, extra*
Far: *tele*
First: *proto*
Inner: *endo*
Middle: *medi, medio*
Near: *proxim*
Northern: *arctic*
Opposite: *anti, contra, counter*
Outside: *ecto, exo, externa*
Side: *latero*
Southern: *austral*
Turning: *gyro*
Under: *hypo, sub*
Western: *occidental*

Within: *ento*

Numbers

One-half: *semi, hemi*
One: *mono, uni*
Two: *bi, di, duo*
Three: *tri*
Four: *quadri, tetra*
Five: *pento, quinque*
Six: *hexa, sexa*
Seven: *septem*
Eight: *octo*
Nine: *novem*
Ten: *deca, decim*
One hundred: *centi*
One thousand: *kilo, milli*

Quantity

All: *omni, pan*
Alone: *solo*
Common: *commun*
Equal: *equi*
Empty: *vacu*
Full: *pleni*
Many: *multi, poly*
More: *pluri*
Part: *parti*
Simple: *simplici*
Whole: *integri*

Activities

Creep: *reptili*
Dance: *choreo*
Eat: tropho, vora
Motion: *cine, cinemato, moti*
Noisy: *garrul, vocifer*
Sleep: *dorm, hypno, somni*
Slow: *tardi*
Sound: *phono*
Swift: *celeri, tachy, veloci*
Swim: *nata* Turn: *trop*
Walk: *ambulat*

Animal Parts

Arm: *brachi*
Back: *dorsi*
Belly: *ventro*
Body: *corporo*
Bone: *ossi, osteo*
Digit: *dactylo, digiti*
Ear: *auri*
Eye: *oculi*
Face: *faci*
Food: *pedi, podo*
Hair: *capill, pili*
Hand: *mani, chiro*
Head: *capit, cephala*
Leg: *crur*
Mouth: *ora, stomato*
Nose: *nasi, rhino*
Sense organ: *sensor*
Skin: *derm, cuti*
Skull: *cranio*
Spine: *spini*
Stomach: *gastor*
Tail: *caud*
Thigh: *femor*
Tooth: *denti, odonto*
Wing: *ala, ptero*

Plant Parts

Bark: *cortici*
Berry: *acini*
Branch: *clado, rami*
Bud; *gemm*
Flower: *antho, flora*
Fruit: *carpo, fructi*
Leaf: *foli, phyllo*
Nut: *nuci, caryo*
Root: *radici, rhizo*
Seed: *blasto, semini*
Stalk or stem: *cauli, petiol*
Thorn, spine: *spina, spini*

Habitats

Cave: *caverni*
Dry: *arid*
Field: *agri, agro*
House: *eco* I
sland: *insular*
Mountain: *montan, oreo*
River: *amni, fluvia*
Sea: *marin, maritim, oceano*
Water: *aqua, hydro*

Miscellaneous

Alike: *identi, homo, simili*
Ancient: *archaeo, palaento*
Backward: *retro*
Beautiful: *bella, calo*
Creeping: *repen*
Different: *hegero, vari*
Earth: *geo*
Edible: *edibil*
Elegant: *décor*
False: *falsi, pseudo*
Feed: *nutri*
Fierce, wild: *feroc*
Good: *bon*
Hero: *hero*
Hidden: *crypto*
Hot: *cald*
Laughable: *ridicul*
Legend: *myth*
Lessen: *dimin*

Miscellaneous

Life: *bio*
Light up: *illumina*
Live: *residen*
Machine: *machina*
Man: *anthropo, homi*
Moon: *luni*
Music: *harmoni*
Nearly: *quasi*
New: *neo, novi*
Night: *noct*
Piece: *segment*
Power: *dynamo*
Secret: *secret*
Silly: *frivol*
Smell: *odor*
Star: *stella, astro*
Strong: *fort*
Sun: *helio, sol*
Terrible: *horrib*
Time: *chrono, tempor*
True: *veri*
Various: *diversi*
Winding, zigzag: *meandr*
With, together: *con*

Lists of word roots come from various sources, most notably *Dictionary of Word Roots and Combining Forms*, by Donald J. Borror