An excerpt from the new Life Sciences curriculum for Grade 10
TERM 4. STRAND 4: DIVERSITY, CHANGE AND CONTINUITY
Life exists in a huge array of forms and modes of life at present, which scientists organise according to man-made classification systems.

TOPIC: Biodiversity and classification

CONTENT
Enormous biodiversity (large variety of species, different ecosystems, genetic differences) on Earth at present.

Classification schemes: a way of organising biodiversity.

Brief history of classification: Scientists attempt to classify organisms based on shared features. As information increases classification changes.

One of the currently accepted classification systems is the Five-kingdom system.

Naming things in science: species concept and binomial system.

Linnæus (Carl von Linne) and his role in classification systems: why do we use Latin?

Differences between prokaryotes and eukaryotes

Principles of classification.


Why do scientific names change?

‘Rumour has it’ that the gardens of natural history museums are used for surreptitious burial of those intermediate forms between species which might disturb the orderly classifications of the taxonomist,’ wrote David Lambert Lack in 1947 in his book, *Darwin’s Finches*.

He could well have been writing about herbaria, where taxonomists practice their science of imposing orderly classifications on plants. As taxonomists study plants in closer detail, they may change their ideas about relationships between them. A genus may be split into two or more groups, or a plant can be moved from one genus to another. The cover article in this issue, *An intriguing Cape orchid: The distinctive* *Disa tenuis* *Lindl.*, by William Liltved and Greig Russell illustrates this dilemma very well. It is about a small orchid that has been assigned by taxonomists to the species *Disa tenuis*, but the authors feel that there are many characters (including, for example, difference in flowering time and appearance) for them to be fairly sure that *Disa tenuis* should really be three or four different groups or taxa and therefore needs to be reclassified.

Perhaps DNA analysis will disagree. Many botanists feel that there is a rift between molecular and genetic taxonomy and morphological (looking at shape and visible function) taxonomy. (See the informative letter, ‘Bad science?’ by Ashley Nicholas on page 94 of the June 2012 issue of *Veld & Flora.*) He feels that data from just one level is not sufficient to describe the higher plants that need data from many levels, including the genetic, in order to arrive at the correct classification. This is an interesting and new field of science, and molecular studies have certainly necessitated the reclassification of many plants!

One of the commonest reasons for name changes is misidentification. Plants can become familiar under an incorrect name before being corrected. Also, according to the set of rules for naming plants (the International Code for Botanical Nomenclature), if a plant has been described more than once, then the oldest name has priority. This does not always hold true as we have seen with the African acacias! (See ‘How we lost the African acacias’ on page 26 of the March 2012 issue of *Veld & Flora.*)

So, although these changes are inconvenient at the time, using the most up-to-date information about where a plant belongs increases our knowledge about a plant. An accurate name puts a plant in the correct place in the filing system of botanical classification. (See poster on page 120-121 for more about classification of biodiversity.)

INVESTIGATIONS

Principles of classification.


RESOURCES

Textbook Photographs Micrographs Selection of everyday objects Identification guides Keys Identification guides Keys

Why do we use Latin?

Latin is an international language used by scientists the world over for naming and describing life forms. It originates from the Latin of the Roman writers, notably Pliny the Elder (A.D. 23-79). The Swedish botanist Carolus Linnæus (1707-79) formally established the tradition that all plants should be given Latin names (or names of Latin form). This tradition of using Latin has continued even though Latin is a dead language, as the meanings of words do not change in the same way as those for living languages. Also, botanical Latin is very descriptive, with many terms for shape, texture and colour. However, Latin does not really translate into molecular science very well, and the International Code for Botanical Nomenclature has recently changed its rules to allow any language to name a plant.

Knowing the origins or meanings of names helps to make them more interesting, informative and memorable. Some names describe the plant, or a part of it. Others mention the region or habitat in which the plant grows. Some suggest medicinal or other uses, while others commemorate the name of its discoverer or a botanist who worked on it.

Why not get your class to research a local indigenous plant. There is lots to learn by just looking into the name! (In the book reviews on page 142 there is an interesting book that contains the derivations of Latin and Greek plant names.)

CAPS

In January 2012, a single comprehensive Curriculum and Assessment Policy Statement (CAPS) was put in place for each subject. As this section of *Veld & Flora* is specifically targeting the further education and training (FET) phase that incorporates grades 10 to 12, we will be highlighting sections in which *Veld & Flora* can be used as a resource to compliment the FET curriculum. The whole FET CAPS can be downloaded from http://www.education.gov.za/Curriculum/CurriculumAssessmentPolicyStatements/CAPSETPhase/tabid/420/Default.aspx.

Be informed

*Veld & Flora* updates teachers and learners on what is happening in the world of science, especially in Life Sciences and Geography. Even if an article is not directly about teaching the curriculum, it will widen your and your class’s general knowledge, and give you a step up the academic ladder. Download this fact sheet and the poster overleaf on the BotSoc website http://www.botanicalsociety.org.za.

Why do scientific names change?