An excerpt from the new Life Sciences curriculum for Grade 11

STRAND: Environmental Studies
Organisms interact with other organisms and with the environments in which they live.

TOPIC: Population Ecology

CONTENT
Interactions in the Environment
Predation
- interspecific (for light, space, water, shelter, food).
- intraspecific (for food, access to mates, water, space, shelter).

Specialisation
- Competitive exclusion and resource partitioning; One example of coexistence in animals, one example in plants.

Parasitism
- (Organisms that obtain food and shelter from another living organism at the expense of the other.) Two examples from Southern Africa.

Mutualism
- (A form of symbiosis in which two organisms exist in a close relationship of mutual benefit.) Two examples from South Africa: both species benefit.

Commensalism
- (An association between two organisms in which one benefits and the other derives neither benefit nor harm.) Two examples from South Africa: one species benefits.

Social organisation
(mention only): Benefits of herds/flocks (avoidance); packs (hunting) dominance; division of tasks (castes).

Living together

The flagship article on p. 56 of this issue of Veld & Flora, ‘Sunburst: Colourful associations between sunbirds and flowers at Kirstenbosch’ by Johan Booyens, illustrates perfectly the concepts of mutualism and urban ecology. Kirstenbosch National Botanical Garden is by no means a pristine ecosystem, yet it protects and ‘showcases’ the splendours of our biodiversity. Anyone can visit Kirstenbosch and enjoy our indigenous plants and, for the more curious, take a closer look at the incredible interactions going on between the plants and animals (the biotic) and the soils and climate (the abiotic).

Such interactions are the subject of many studies, such as how the Cape Spiny Mouse, although it enjoys eating fynbos seeds, is also an important pollinator and disperser of seeds in the Fynbos Biome (p. 66) or how ants and scale insects have developed an amazing symbiotic relationship that enables them both to flourish and ensure that future generations survive (p. 64) even though the relationship might not involve a friendly exchange of food for protection, but just might be that the scale insects are being ‘farmed’ and eaten by the ants.

But if you are unable to visit a wilderness area or a botanic garden, these interactions are still taking place all around us. Step outside your front door, and you will encounter nature. Read the editorial of this issue, and if possible, get hold of the book The rambunctious garden by Emma Marris. It will add to your knowledge and understanding of our place in nature and inspire you and your class to become champions of nature in our changing world.

Science needs YOU

The editorial and many of the articles in this issue stress the need for all of us to get involved in looking after the biodiversity of the Earth. If you live in a city, your observations of the weeds, birds and insects that live on your pavement are as important to science as studies in wilderness areas. Get your class involved with observing, photographing and writing about nature wherever they find it. Send a poster or story on a study that your class has done on local ecosystems to the Editor of Veld & Flora (see address on page 49) and stand a chance to win a subscription to the Botanical Society of South Africa, which includes free copies of Veld & Flora for your school library. We will publish a selection of the work that you send in Veld & Flora.

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 complement the FET curriculum. The whole FET CAPS can be downloaded from http://www.education.gov.za/Curriculum/CurriculumAssessmentPolicyStatements/CAPSFETPhase/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.

Shapes and sizes

In the table opposite there are excerpts from the Life Sciences curriculum for Grade 11. The poster overleaf will assist in the teaching of ecosystems as it demonstrates how our indigenous trees have adapted to the biotic and abiotic factors in their environment. Our bushveld and forest trees occur in areas that have great potential for ecotourism.

Trees can be planted in your school garden but as they are rather slow growing, it would be more fun for your class to plant a miniature garden (see p. 73) that can mimic a larger ecosystem with all its associated interactions and feedbacks, but also provide interest and stimulation for creative young minds. Collect some lichens, fungi or mosses (from a nearby tree or the walls of your school) for the garden. These are wonderful for discussing mutualism as most of these organisms are in a symbiotic relationship. They are also great for investigative and creative writing. (See p. 74).

Come to the party. Miniature champagne glasses made from lichen fruiting bodies on the soil surface in renosterveld. See p. 75. Photo: Eugene Moll.