

Modelling learning

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Thank you for
having faith
in me



In traditional school curricula, science education is often lackadaisical in accentuating the innate brilliance of the natural world. Education that is delivered within the current subject-based (biology, chemistry, physics, math) organization of knowledge presents students with a rather disjointed understanding of nature. Being a biologist by training I was seeking a biology-based resource that would facilitate understanding beyond conventional textbook content (but not unrelated to it), something that would connect classroom biology teaching with the real world outside. The Biomimicry Education Network (BEN) could be one such resource. BEN is a global community of educators trying to integrate biomimicry in their teaching.

About biomimicry

The term 'biomimicry' comes from ancient Greek and means 'to imitate life'. Also known as biomimetics, it refers to the imitation of nature's structures, processes, and systems with the objective of solving human challenges. The basic idea is that human beings are still a young species on earth. Other life forms, such as plants, animals, and microbes have evolved over a period of approximately 4 billion years to acquire their current well-adapted forms through natural selection. The various features of these living organisms can be the source of inspiration for

from life

innovative solutions to the many challenges human beings face, be it efficient transportation, healthcare, energy-sufficiency, sustainable building infrastructure or information technology. For example, mussel secretions have led to the creation of non-toxic glues for flooring, while humpback whale fins are credited for the innovative designs of energy efficient turbines as well as ceiling fan blades.

Why teach biomimicry

In traditional science curriculum we learn 'about' nature. With biomimicry there is an opportunity to learn 'from' nature. It offers educators a way to engage students not only with biology but to demonstrate its interrelations with other disciplines. Biomimicry incorporates immense potential to promote inquiry and can serve as a tool to enhance creativity and problem-solving through design and project-based activities. The National Curriculum Framework, 2005, recommends "a softening of subject boundaries so that students can get a taste of integrated knowledge and a joy of understanding." With biomimicry there are opportunities for this kind of holistic learning.

About BEN

The BEN site has resources for educators' professional development as well as for classroom use. BEN provides an online professional development course – Fundamentals of Biomimicry for Formal and Informal Youth Educators. It provides a comprehensive understanding of biomimicry, its importance and the broad pedagogical considerations of how the subject can be taught. It gives an insight into how biomimicry can relate to teaching general science, biology, physics, chemistry, sustainability, design, engineering, educational standards, etc. The course can be taken completely online, on payment of a fee, at any time. A certificate of completion is available for printing on successful completion of the course.

The BEN website provides its members with lesson plans, curricula and resources that can be downloaded on registration. The material is available

for free for non-commercial purposes as long as due credit is given to the original author or developer. If one wishes to use the BEN resources for fee-based educational products, then the site can facilitate the same. The site also invites members to offer any resources they may have developed so that others may benefit from their use.

The curricula are categorized under 'Fundamentals', 'Youth Curricula' and 'University Curricula'. Biomimicry fundamentals incorporate resources to promote nature observation sensibilities in students. It also has resources to facilitate exploring the concept of function. There is a flagship Global Design Challenge for students as well as professionals to compete for prizes and mentorship to support bringing solutions to market. The Youth Curricula include several toolkits and activities suitable for grade levels through elementary, middle, and high school. For instance, there is resource that facilitates hands-on illustration of biomimetic solar cells inspired by photosynthetic plants. University Curricula include resources like Biomimicry DesignLens, DesignLens Supplement, Biomimicry Thinking Approaches, Life's Principles and many others that provide a deeper understanding of the way life works, survives and thrives on earth sustainably. It provides glimpses into application of nature's genius to inform human design.

In conclusion, the BEN site is a useful resource, which can enable educators to integrate disciplines and demonstrate to students their role in the world. It seems possible to easily incorporate some instances of biomimicry in the existing curricula and bring to biology as well as science and maths some fun as well as relevance.

Reference: <http://ben.biomimicry.net/>

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