



SDG 9: Industry, Innovation and Infrastructure - Biomimicry: Design Inspired by Nature

Topic Overview	Learning Objectives
<p>Biomimicry is the practice of creating innovative solutions learned and mimicked from the strategies found in nature to solve human design challenges. Biomimicry is key practice in sustainable growth and innovation.</p>	<ul style="list-style-type: none"> • Describe the usage of biomimicry in solving human issues for innovation and design. • Analyze how biomimicry could benefit climate action and sustainable development. • Identify examples of biomimicry in action. • Develop an SDG solution using the biomimicry principles.
Resource Summary	
<p>Benyus, J. (2005, February). <i>Biomimicry’s Surprising Lessons from Nature’s Engineers</i>. TED Institute. https://bit.ly/37Q2wCW</p> <p><u>Summary:</u> Janine Banyus, an expert on biomimicry, gives a TedTalk introducing the science of Biomimicry and describes how we can use nature to inspire innovation.</p>	
<p>Farnsworth, M. (2020). Chapter 2: On Mountain Goats and Citizenship – the Nike Story of Biomimicry. <i>Biomimicry and Business: How Companies Are Using Nature’s Strategies to Succeed</i> (pp. 11-22). Routledge. https://doi-org.ezproxy.library.uvic.ca/10.4324/9781003092605</p> <p><u>Summary:</u> This chapter uses Nike as a case study on the early days of how the company used bio-inspiration and biomimicry to improve their shoes, and discusses the strategies used to gain support from executives to designers at Nike.</p>	
<p>The Biomimicry Institute (2019, September 10). <i>The Future of Innovation is Here: 8 Inventions from Nature’s Laboratory</i>. https://biomimicry.org/the-future-of-innovation-is-here-8-inventions-from-natures-laboratory/</p> <p><u>Summary:</u> The article provides 8 biomimicry inventions, including the problem solved, nature’s solution, and market readiness of each invention.</p>	
<p>Natural Geographic. (2018, May 29). <i>See How Termites Inspired a Building That Can Cool Itself: Decoder</i>. [Video] YouTube. https://youtu.be/620omdSZzBs</p> <p><u>Summary:</u> The video provides a quick and in-depth example of biomimicry in action of building and cooling a large scale building</p>	



Discussion and Exam Questions

1. Discuss how biomimicry can be used to work towards the sustainable development goals.
 - To solve problems (cleaning water, providing more food, reducing carbon in the atmosphere)
 - As a design process (looking at nature first when contemplating problems)
2. Discuss some of the major challenges and road blocks of biomimicry
 - Takes time
 - Requires expertise (specialized engineering knowledge and skills)
 - Requires investment (some technologies may not currently be available and need to be made)
 - Competition in the field means you are likely racing another team to a solution
3. What is the practice of creating innovative solutions learned and mimicked from the strategies found in nature to solve human design challenges? (Answer: Biomimicry)

Additional Resources

[Designlens: Life's Principles, Biomimicry 3.8](#)

[Asknature](#)

[Biomimicry Institute Examples](#)

[Biomimicry Toolbox](#)

Related Business Topics

- Innovation
- Design thinking
- Entrepreneurship
- Critical thinking and problem solving
- Strategy and competitive advantage

Related Sustainable Development Goal Targets

[SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation](#)

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending