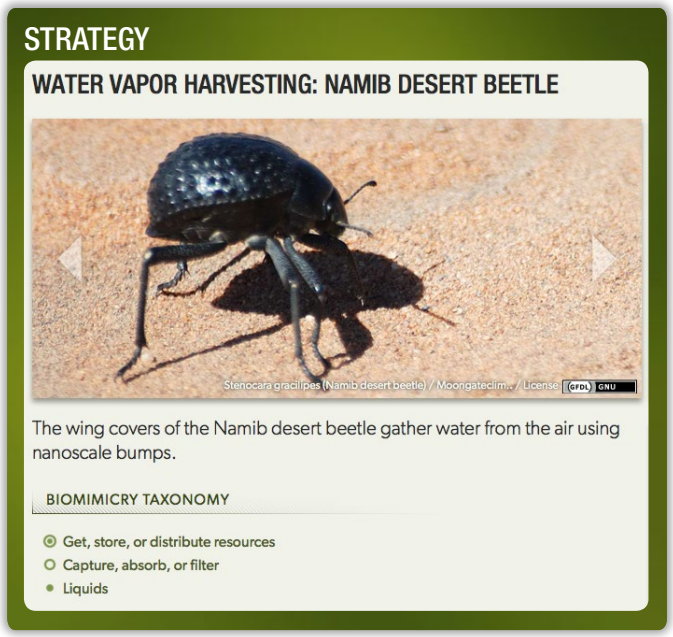
THE BIOMIMICRY TAXONOMY:
Biology Organized by Function

What Is the Biomimicry Taxonomy?
A taxonomy is a system of classification. The Biomimicry Taxonomy is a classification system developed by the Biomimicry Institute to organize biological content on the website AskNature. The taxonomy categorizes the different ways that organisms and natural systems meet functional challenges.

On AskNature, the ways that organisms and systems have adapted in response to functional challenges are called *strategies*. The Biomimicry Taxonomy organizes these biological strategies by *function*, that is, by what the strategy *does* for the organism or living system. Organizing biological content by function is valuable because it allows us to look for potential solutions to similar challenges we face as humans.



How Strategies appear on AskNature.

Here is an example showing how AskNature expresses a strategy and a related function within the Biomimicry Taxonomy. In the taxonomy, functions are organized in a nested hierarchy. The top level, "Group," represents a broad function performed in nature, the second level a "Sub-Group" of functions, and the third level a specific "Function." In total, the taxonomy features eight groups comprised of 30 sub-groups that contain more than 160 functions.

Organism	**What is the organism?**	Namib desert beetle
Challenge	**What challenge must it address?**	Capturing water in a very arid climate
Strategy	**How does the organism address this challenge?** (strategy)	The beetle's wing covers gather water from the air using nanoscale bumps. **View this strategy page on AskNature**.
Function	**Why does the organisms need this strategy?**	To capture liquid This is represented by the Biomimicry Taxonomy as: ➤ **Group**: Get, store, or distribute resources ➤ **Sub-group**: Capture, absorb, or filter • **Function**: Liquids

Using the Biomimicry Taxonomy on AskNature

AskNature and the Biomimicry Taxonomy provide a novel way to approach your innovation challenges. Look to the taxonomy as a tool when you first approach your design challenge, using its framework to identify questions you can "ask"nature. For example, if you're trying to make less toxic pigments, "ask" how nature creates color. If you want to manufacture tough, lightweight building materials without unsustainable high pressures and temperatures, "ask" how nature manages structural forces.

AskNature offers two ways for you to ask questions of nature: Search and Explore. Using the Search bar on the home page, you can ask questions like those posed above, for example: "How does nature stay dry?" Clicking on the **Explore** button enables you to quickly find strategies by function using a table of contents organized by the Biomimicry Taxonomy.

Using the Biomimicry Taxonomy As a Critial Thinking Tool

The Biomimicry Taxonomy is useful not just because it will help you navigate better on AskNature, but because it provides a framework that may help you understand your challenge differently. Here's an example of how you could use the Taxonomy to help solve your next innovation challenge.

Innovation Challenge: You're designing a building in an area of low rainfall. To ensure an adequate water supply, you want your building to capture rainwater and store it for future use.

Approach #1: Identify verbs that directly define your challenge. Use the Biomimicry Taxonomy for ideas that help you shift from predetermined thoughts of how or what you'll design to *why* you're designing (in other words, your design's purpose or the outcomes it must accomplish). Use verbs that describe functions (such as: move, break down, distribute, etc.). In this example, the questions you pose might be: How does nature…

- Capture water?
- Store water?

Approach #2: Consider concepts that go beyond your exact challenge but are related enough to why you're designing that they may have similar solutions. In this example, you may consider that some organisms (like the Namib beetle) live in areas that experience little to no rain, yet they still get all of the water they need. Use the Biomimicry Taxonomy to spark ideas of new verbs, and also think about related nouns or synonyms. In this example, questions to pose might include: How does nature…

- Absorb water?
- Capture fog?
- Manage humidity?
- Move water?

Approach #3: Turn your question completely around. Instead of asking how nature stores water, think about how it protects against excess water or keeps water out. Although counterintuitive, sometimes asking the opposite of your original question can provide new insights to your real challenge. The Biomimicry Taxonomy is a great resource for ideas of verbs that represent opposites. In this example, you might ask: How does nature…

- Remove water?
- Stay dry?