Creating an Abstracted Design Principle (ADP)

Facilitator "Cheat Sheet"

Information and Language: https://toolbox.biomimicry.org/methods/abstract/

The goal of creating a design strategy is to make it easier to translate lessons from biology into design solutions. Design strategies describe how the biological strategy works without relying on biological terms. This makes cross-disciplinary collaboration easier because a design strategy focuses on function and mechanism without the baggage of potentially unfamiliar biological terms.

Note: Abstracting design strategies is one of the most difficult steps in biomimicry. So don't be discouraged if you stumble at first. With practice it will become second nature.

EXAMPLES:

1-

Polar Bear strategy & mechanism: (biology underlined)

The polar bear's fur has an external layer of hollow, translucent (not white) guard hairs that transmit heat from sunlight to warm the bear's skin, while a dense underfur prevents the warmth from radiating back out.

Polar Bear Abstracted Design Principle: (re-written without biological terms)

A covering keeps heat inside by having many translucent tubes that transmit heat from sunlight to warm the inner surface, while next to the inner surface, a dense covering of smaller diameter fibers prevents warmth from radiating back out.

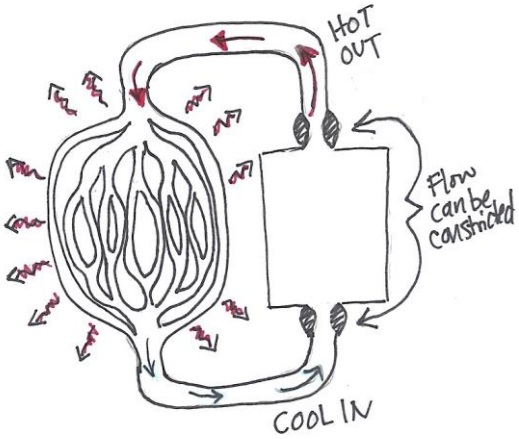
2-

Jackrabbit biology strategy & mechanism:(biology underlined)

The jackrabbit's large ears provide an expansive surface area of exposed skin with blood vessels vasodilate when in shade to circulate cooler blood throughout the body and maintain homeostasis.

Jackrabbit Abstracted Design Principle: (re-written without biological terms)

System is able to cool or heat quickly due to high surface area with a network of small tubes on exterior that can become wider or smaller and circulate liquid near the surface, so outside air cools or heats liquid.



The illustration on the right depicts the same working principles of the jackrabbit strategy (left) as the mechanical diagram, removing references to biological features.