Life’s Principles are design lessons from nature. Based on the recognition that Life on Earth is interconnected and interdependent, and subject to the same set of operating conditions, Life has evolved a set of strategies that have sustained over 3.8 billion years. Life’s Principles represent these overarching patterns found amongst the species surviving and thriving on Earth. Life integrates and optimizes these strategies to create conditions conducive to life. By learning from these deep design lessons, we can model innovative strategies, measure our designs against these sustainable benchmarks, and allow ourselves to be mentored by nature’s genius using Life’s Principles as our aspirational ideals.
### EVOLVE TO SURVIVE
Continually incorporate and embody information to ensure enduring performance.

**Replicate Strategies that Work**
Repeat successful approaches.

**Integrate the Unexpected**
Incorporate mistakes in ways that can lead to new forms and functions.

**Reshuffle Information**
Exchange and alter information to create new options.

### ADAPT TO CHANGING CONDITIONS
Appropriately respond to dynamic contexts.

**Incorporate Diversity**
Include multiple forms, processes, or systems to meet a functional need.

**Maintain Integrity through Self-Renewal**
Persist by constantly adding energy and matter to heal and improve the system.

**Embody Resilience through Variation, Redundancy, and Decentralization**
Maintain function following disturbance by incorporating a variety of duplicate forms, processes, or systems that are not located exclusively together.

### BE LOCALLY ATTUNED AND RESPONSIVE
Fit into and integrate with the surrounding environment.

**Leverage Cyclic Processes**
Take advantage of phenomena that repeat themselves.

**Use Readily Available Materials and Energy**
Build with abundant, accessible materials while harnessing freely available energy.

**Use Feedback Loops**
Engage in cyclic information flows to modify a reaction appropriately.

**Cultivate Cooperative Relationships**
Find value through win-win interactions.

### INTEGRATE DEVELOPMENT WITH GROWTH
Invest optimally in strategies that promote both development and growth.

**Self-Organize**
Create conditions to allow components to interact in concert to move toward an enriched system.

**Build from the Bottom Up**
Assemble components one unit at a time.

**Combine Modular and Nested Components**
Fit multiple units within each other progressively from simple to complex.

### BE RESOURCE EFFICIENT (MATERIAL AND ENERGY)
Skillfully and conservatively take advantage of resources and opportunities.

**Use Low Energy Processes**
Minimize energy consumption by reducing requisite temperatures, pressures, and/or time for reactions.

**Use Multi-Functional Design**
Meet multiple needs with one elegant solution.

**Recycle All Materials**
Keep all materials in a closed loop.

**Fit Form to Function**
Select for shape or pattern based on need.

### USE LIFE-FRIENDLY CHEMISTRY
Use chemistry that supports life processes.

**Break Down Products into Benign Constituents**
Use chemistry in which decomposition results in no harmful by-products.

**Build Selectively with a Small Subset of Elements**
Assemble relatively few elements in elegant ways.

**Do Chemistry in Water**
Use water as solvent.

**Use Feedback Loops**
Engage in cyclic information flows to modify a reaction appropriately.

**Cultivate Cooperative Relationships**
Find value through win-win interactions.

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