

# 26 LIFE PRINCIPLES & 26 Examples in the Ecosystem of a Tree

PART 2

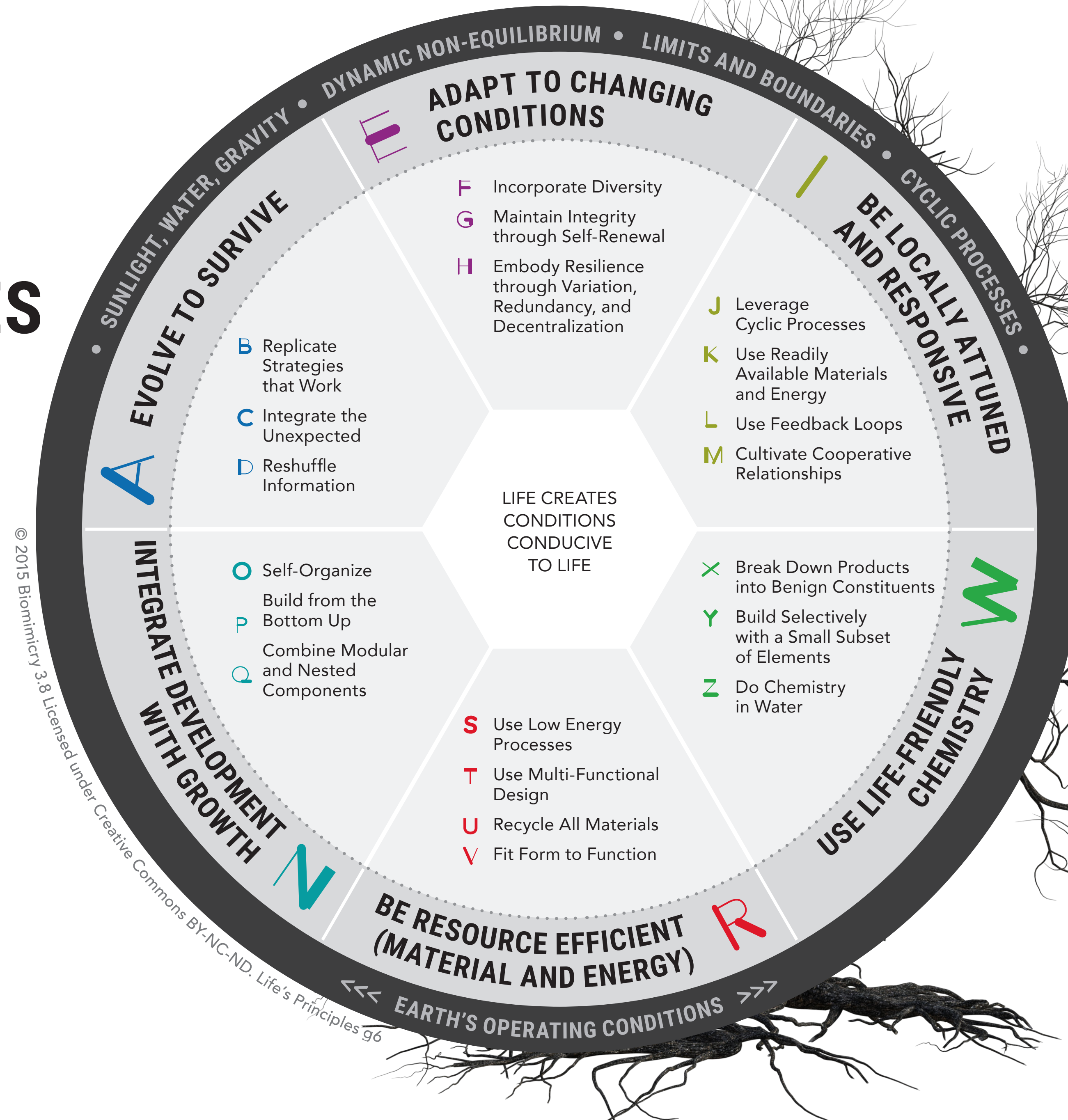
## CHANGE



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# 26 LIFE PRINCIPLES



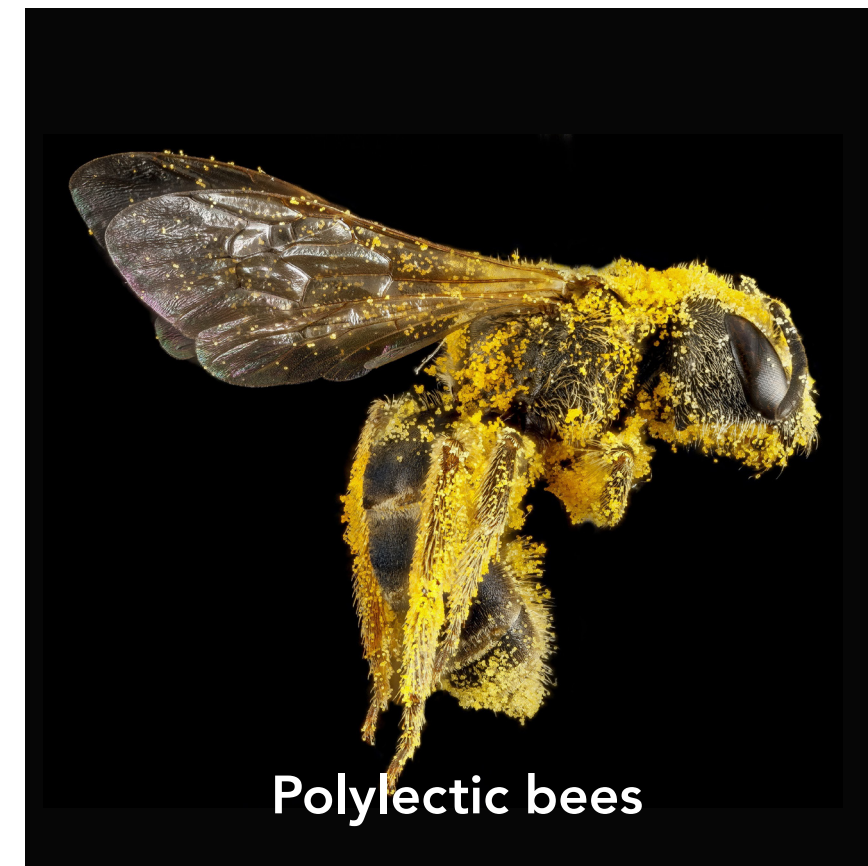


## PART 2

# ADAPT TO CHANGING CONDITIONS



Geotropism



Polylectic bees

Incorporate  
Diversity



The tree hollow system

Maintain Integrity  
through Self-Renewal



Soil system

Embody Resilience  
through Variation,  
Redundancy, and  
Decentralization



## Master Life's Principle

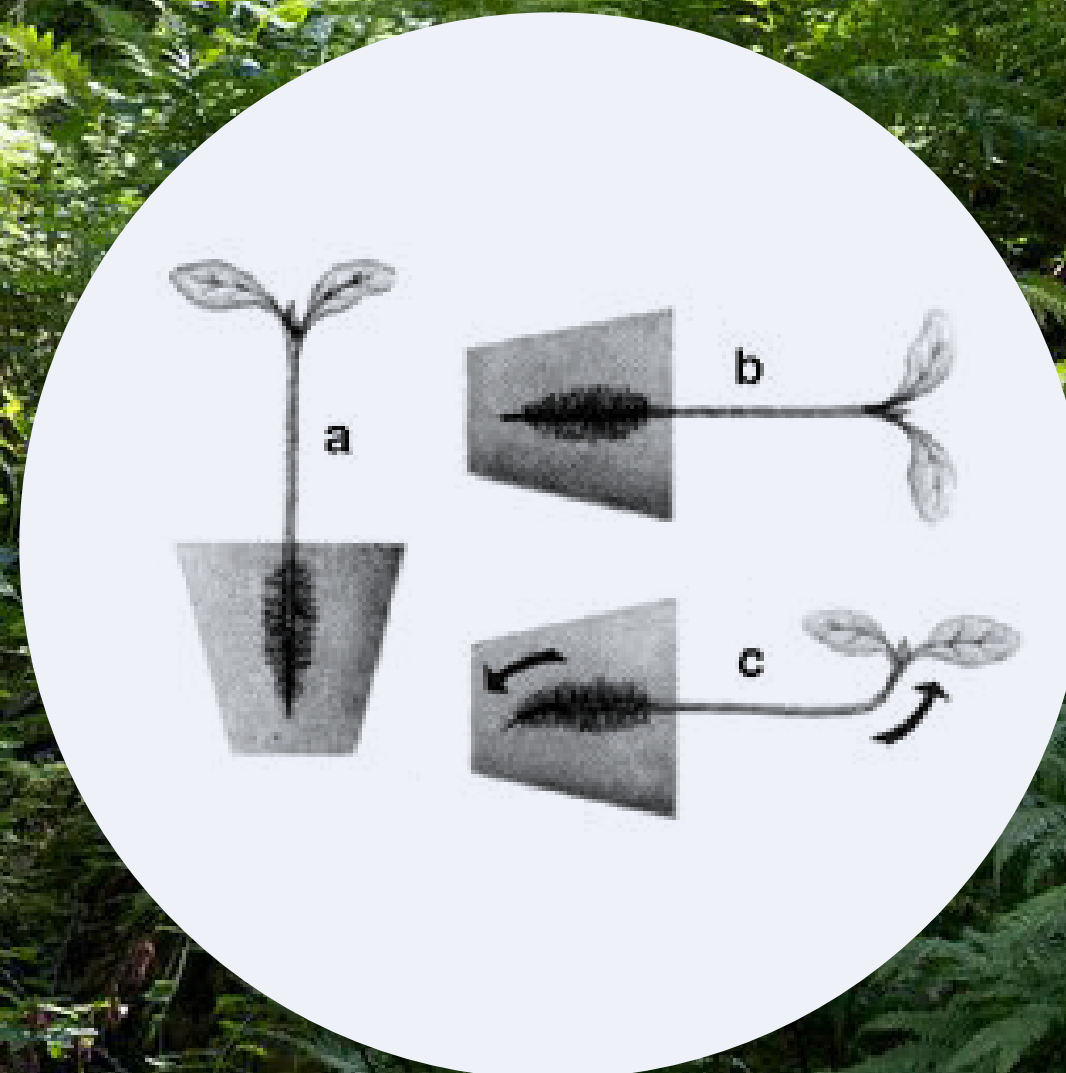
# Adapt to Changing Conditions

## Example in Nature

### Tree

#### Positive and negative geotropism

Trees are perceptive of many different environmental stimuli and react to changed conditions therein. When a tree tends to grow in an oblique position for instance because of underground shifts, the tree corrects its growth direction by orienting itself on the Earth's gravitation. The main trunk of the tree accordingly grows away from the Earth centre (negative geotropism) and the main root grows towards it (positive geotropism).



## Design Guideline

**Appropriately respond to dynamic contexts.**







## Life's Principle

# Incorporate Diversity

## Example in Nature

### Polylectic bees

### Diversity and co-evolution

Polylectic bees (poly: many, legere: gather), particularly the honey bee, are capable of gathering pollen from a great diversity of flowers from many different plant families, which gives them multiple options when the nutritional options change or bottlenecks develop.

## Design Guideline

**Integrate multiple forms, processes and systems to fulfil functional demands.**





## Life's Principle

# Maintain Integrity through Self-Renewal

## Example in Nature

### The tree hollow system

#### Micro-life community

Tree hollows develop because of broken branches or are hollowed out by fauna and fungus. They are settled by specialised tree-hollow residents and the detritus (decaying biomass) serves the complex tree-hollow community as nourishment and habitat. An attractive milieu thrives for other fauna like owls, woodpeckers, songbirds, dormice, martens, bats and paper wasps, which move in temporarily. This produces nest material, food and waste material in the hollow. This permanent supply from outside preserves the micro-climate, and the community thrives.

## Design Guideline

**Preserve, repair and improve the system by constantly adding energy and material.**







## Life's Principle

# Embody Resilience through Variation, Redundancy, and Decentralization

## Example in Nature

### Soil system (*Pedosphere*) Countless living creatures

Natural soils are complex configurations teeming with life, having developed over millennia. High-level diversity and extreme concentration of individual types of soil-inhabiting fauna and flora pervade all soil levels (**variation**). The number of small fauna (mesofauna) can attain a value of 1 million individuals per square metre. Faunal, unicellular creatures and tiny thread worms surpass this value hundredfold and the number of microorganisms cannot be gauged. In 1 cm<sup>3</sup> of soil, mushroom threads can be found making up a total length of one kilometre (**redundancy**). The most important functions in the soil system are secured through different organisms (**resilience**), and the **decentralisation** of all cyclic processes guarantee the maintenance of living conditions in times of crisis.

## Design Guideline

**In disruptions, maintain life functions by integrating multiple and similar forms, processes and systems, whose existence is not mutually dependent on one another.**





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## BIOMIMICRY

»Biomimicry — from the Greek, *bios*, meaning “life”, and *mimesis*, meaning “to imitate”, is an emerging discipline with an ancient practice«.

**Dayna Baumeister** — Co-founder of Biomimicry 3.8

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