

Core Primitives

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Primitive Invariant Set (with Cross-Domain Expressions)

1. Threshold Invariant

No system changes state without crossing a threshold.

Physics

A phase change (ice → water) only occurs once temperature crosses a critical point.

Biology

Neurons fire only when membrane potential crosses the activation threshold.

Psychology

Insight or emotional shift occurs only when internal tension crosses a tipping point.

Economics

Markets shift regimes (bull → bear) only when pressure crosses a confidence threshold.

Ecology

Ecosystems collapse only when stressors exceed resilience thresholds.

2. Stabilizer Invariant

No system recovers without a stabilizing condition.

Physics

A pendulum returns to rest because gravity provides a stabilizing force.

Biology

Homeostasis restores balance through stabilizing feedback loops.

Psychology

Emotional repair requires safety, grounding, or relational stability.

Economics

Recessions recover only when stabilizing policies or confidence floors are restored.

Ecology

Ecosystems rebound only when keystone species or stabilizing conditions return.

3. Slack Invariant

No generativity occurs without surplus capacity.

Physics

Work requires available energy beyond what is needed for maintenance.

Biology

Growth and reproduction occur only when organisms have surplus nutrients.

Psychology

Creativity and learning require cognitive slack — not being overloaded.

Economics

Innovation emerges when there is surplus capital, time, or labor.

Ecology

Biodiversity flourishes only when ecosystems have surplus resources and space.

4. Distinction Invariant

No structure exists without difference.

Physics

Fields and forces exist because of gradients — differences in potential.

Biology

Cells differentiate because gene expression patterns diverge.

Psychology

Concepts form only when the mind distinguishes one thing from another.

Economics

Markets exist because goods and services differ in value and function.

Ecology

Ecosystems form through niche differentiation among species.

5. Cost Invariant

No transformation is free.

Physics

Energy is required for any change in state or motion.

Biology

Metabolic cost accompanies every biological process.

Psychology

Changing beliefs, habits, or identities requires emotional and cognitive cost.

Economics

Every transaction has opportunity cost.

Ecology

Adaptation and evolution require energetic and ecological cost.

6. Coupling Invariant

No system is independent of its conditions.

Physics

Particles behave differently depending on fields, forces, and boundary conditions.

Biology

Organisms adapt to environmental conditions; phenotype is context-dependent.

Psychology

Thoughts, emotions, and behaviors are shaped by context and environment.

Economics

Markets are coupled to policy, culture, resources, and global conditions.

Ecology

Species are interdependent; no organism exists outside its ecological web.

7. Duality Invariant

Every process has a paired opposite that defines it.

Physics

Wave \leftrightarrow particle

Potential \leftrightarrow kinetic

Action \leftrightarrow reaction

Biology

Growth \leftrightarrow decay

Symbiosis \leftrightarrow competition

Activation \leftrightarrow inhibition

Psychology

Expansion \leftrightarrow contraction

Hope \leftrightarrow fear

Insight \leftrightarrow confusion

Economics

Boom \leftrightarrow bust

Inflation \leftrightarrow deflation

Risk \leftrightarrow reward

Ecology

Succession \leftrightarrow disturbance

Predation \leftrightarrow prey defense

Stability \leftrightarrow variability

8. Conservation Invariant

Systems conserve something across transformations.

Physics

Energy, momentum, and charge are conserved.

Biology

Genetic information and metabolic pathways persist across generations.

Psychology

Identity, core beliefs, and narrative coherence persist through change.

Economics

Value, incentives, and structural patterns persist across cycles.

Ecology

Nutrient cycles conserve matter through transformation.





Primitive Cycle Elements (with Cross-Domain Expressions)

1. Starting State

Every cycle begins from a baseline, condition, or context.

Physics

A system begins in an initial state (temperature, position, energy level).

Biology

A cell or organism begins in a homeostatic or resting state.

Psychology

A person begins in a current mood, belief, or cognitive frame.

Economics

A market begins in a prevailing condition (growth, stagnation, equilibrium).

Ecology

An ecosystem begins in a stable configuration of species and resources.

2. Trigger / Activation

Something initiates movement into the cycle.

Physics

A force is applied, pushing the system out of equilibrium.

Biology

A stimulus activates a pathway or response.

Psychology

A thought, event, or emotion triggers a shift in attention or behavior.

Economics

A shock (policy change, innovation, crisis) activates a new market cycle.

Ecology

A disturbance (fire, flood, predator arrival) initiates ecological change.

3. Transformation Phase

The system undergoes structured change.

Physics

Energy transfers, motion accelerates, or fields interact.

Biology

Cells divide, signals propagate, metabolism shifts.

Psychology

Beliefs update, emotions intensify, learning occurs.

Economics

Prices adjust, incentives shift, resources reallocate.

Ecology

Species adapt, populations fluctuate, niches reorganize.

4. Saturation / Limit Point

The system reaches an internal limit where continuation is no longer possible.

Physics

A system reaches maximum capacity (heat saturation, velocity limit).

Biology

A pathway saturates (enzyme limits, nutrient depletion).

Psychology

Cognitive load maxes out; emotional intensity peaks.

Economics

Markets hit saturation (demand plateau, resource limits).

Ecology

Carrying capacity is reached; growth slows or stops.

5. Collapse / Release

The old form gives way; accumulated tension is released.

Physics

A structure breaks, a field collapses, or energy discharges.

Biology

A cell ruptures, a population crashes, or a system fails.

Psychology

A belief collapses, a breakthrough occurs, or burnout hits.

Economics

A bubble bursts, a recession begins, or a correction occurs.

Ecology

A species declines, a food web collapses, or a regime shift occurs.

6. Recovery / Reorganization

The system rebuilds or stabilizes into a new configuration.

Physics

A system returns toward equilibrium or redistributes energy.

Biology

Healing, regeneration, or re-stabilization occurs.

Psychology

Integration, grounding, or emotional repair takes place.

Economics

Markets stabilize, confidence returns, new structures form.

Ecology

Ecosystems reorganize, species recolonize, balance re-emerges.

7. Return / Integration

The system arrives at a new baseline, different from the starting state.

Physics

A new equilibrium is established.

Biology

A new physiological or developmental state emerges.

Psychology

A new understanding, identity, or emotional baseline forms.

Economics

A new market condition or equilibrium is reached.

Ecology

A new ecological balance or species composition stabilizes.

8. Re-entry Path

The cycle contains the seeds of its next iteration.

Physics

Residual energy or configuration sets up the next state change.

Biology

Feedback loops or genetic programs prepare the next cycle.

Psychology

Insights, habits, or emotional residues shape the next cycle.

Economics

Trends, expectations, or structural changes set up the next cycle.

Ecology

Nutrient cycles, species interactions, or disturbances prepare the next phase.