


Complexity
{ Review of complex systems



- ⌘ A set of elements standing in interrelations
- ⌘ "The whole is greater than the sum of its parts"

System

1. Simple
2. Periodic
3. Chaotic
4. Complex

Systems can be:

Complex systems are fascinating in that they demonstrate:

- ☞ Robustness
- ☞ Novelty
- ☞ Unpredictability
- ☞ Large events
- ☞ Emergence

Complex systems

When a system demonstrates appropriate amounts of:

- ☞ Diversity
- ☞ Interdependence
- ☞ Connectedness
- ☞ Adaptation

Complexity

An occurrence at one element affects the others

Too much or too little interdependency reduces complexity

Complexity happens at the "interesting in-between"

Interdependency

- ‡ Elements are connected to each other
- ‡ Too much or too little connectedness isn't actually helpful
- ‡ Complexity occurs at the "interesting in-between"

Connectedness

- ‡ The elements have differences
- ‡ Again, too much diversity = chaos
- ‡ Too little diversity = homogeneity
- ‡ Complexity at the interesting in-between

Diversity

- ‡ The elements change in response to change
- ‡ Interesting in-between

Adaptation

- Order arising from the interrelationships of parts
- Emergence is always "bottom up"

Emergence

- Some things can only be described by the relationships between the parts
- They are "not reducible"
- To reduce further loses the very meaning trying to be described

Irreducibility

- Describe how an ecosystem would be a complex system finding examples of each of the 4 qualities.
- Describe how an economy would be a complex system finding examples of each of the 4 qualities.
- Describe how the bodymindspirit would be an example of a complex system.

Checkpoint
