



EVERYTHING'S CONNECTED

Understanding systems

SYSTEMS THEORY

What is a system?

What makes up a system?

What is a perturbation?

What is a forcing?

What is a stable vs. unstable equilibrium?

PHYTOPLANKTON FEEDBACK LOOP

Ocean acidification will lead to increased global warming by killing off sea creatures that help to cool the planet



AN EXAMPLE — HOW WOLVES CHANGE RIVERS



THE GAME

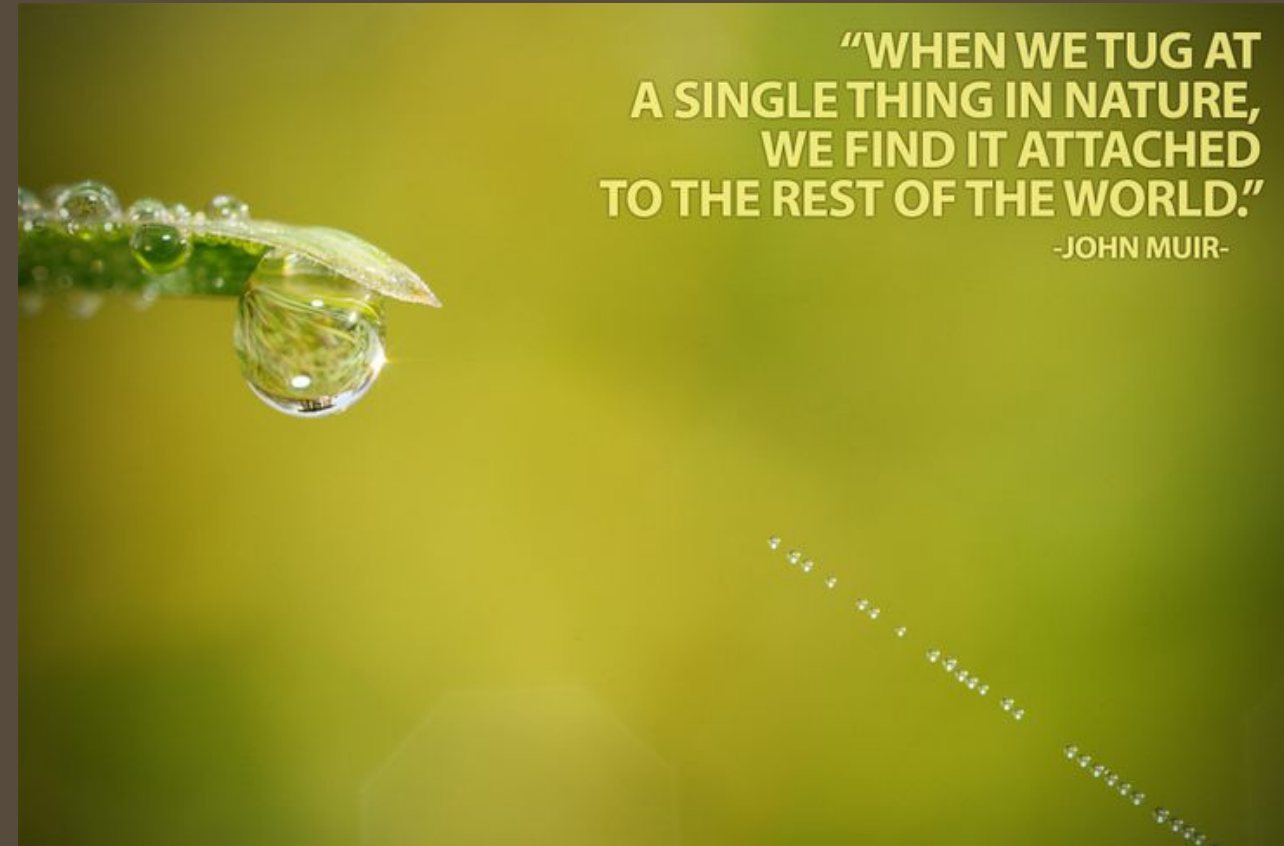
Each block represents a component

The whole tower → a system

Movement of the blocks → perturbation (change)

Playing the game

- 1 person is the recorder
- 1st person to go names a component of the Earth system
- Next person names a component connected to the first and so on
- Recorder writes down each component
- Winning team – the one with the most components



REFLECTION

“We cannot interfere in one area of the ecosystem without paying due attention to the consequences of such interferences in other areas.” St. John Paul II – via *Laudato Si*, 39, 131

“When we speak of the ‘environment’, what we really mean is a relationship existing between nature and the society which lives in it. Nature cannot be regarded as something separate from ourselves or as a mere setting in which we live. We are part of nature, included in it and thus in constant interaction with it.” *Laudato Si*, 41, 139

Our industry has
warmed oceans, air, lands - changed rains
melted ice - raised seas.

Gregory Johnson,
NOAA oceanographer

CLIMATE
HAIKU

REFLECTION

“Our efforts at education will be inadequate and ineffectual unless we strive to promote a new way of thinking about human beings, life, society, and our relationship with nature.”

Laudato Si, 62, 215

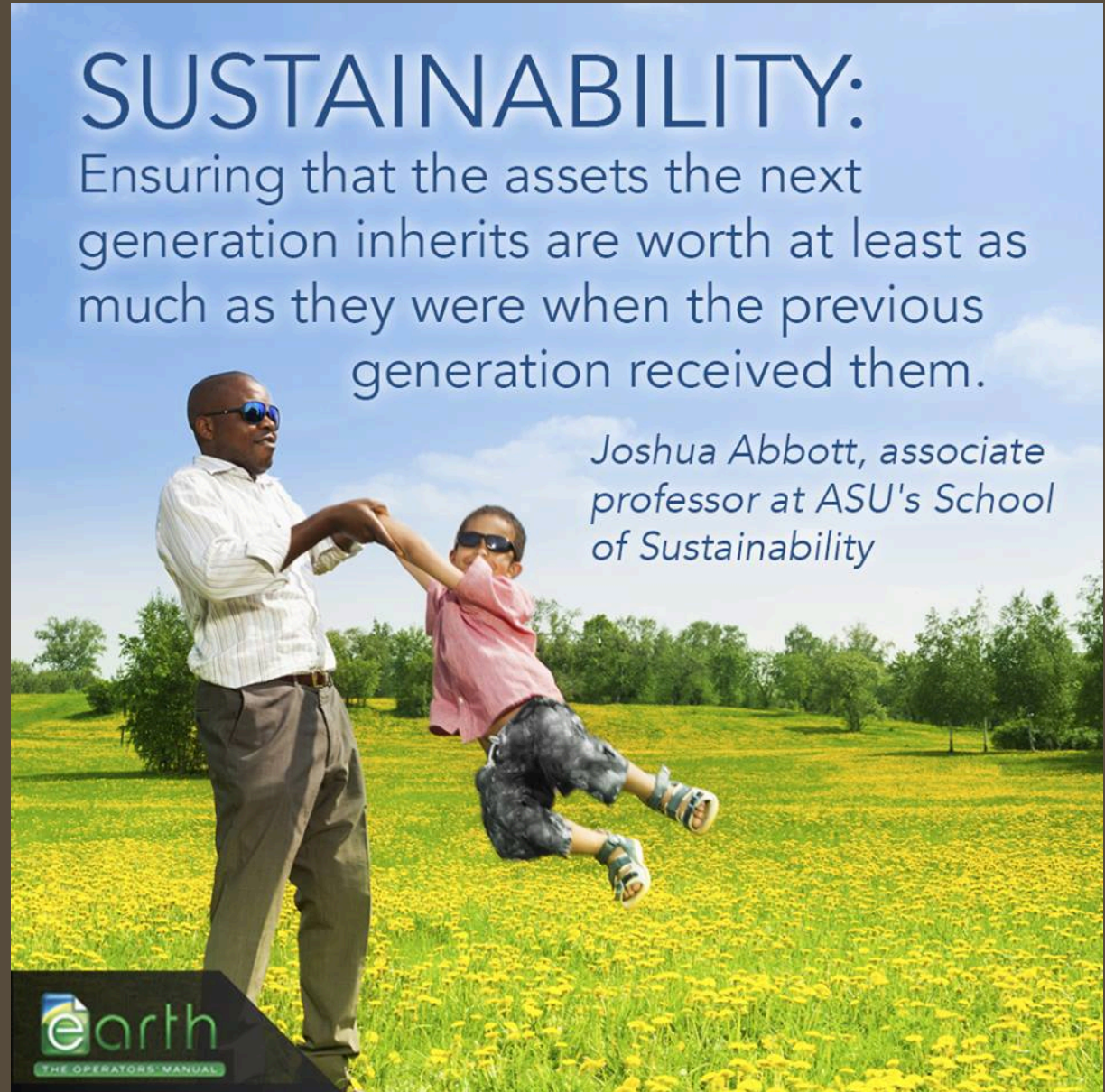
“Our goal is not to amass information or to satisfy curiosity, but rather to become painfully aware, to dare to turn what is happening to the world into our own personal suffering and thus to discover what each of us can go about it.” –

Laudato Si, 6, 19

SUSTAINABILITY:

Ensuring that the assets the next generation inherits are worth at least as much as they were when the previous generation received them.

Joshua Abbott, associate professor at ASU's School of Sustainability



FURTHER INFO

Reflection questions

- How did the system change visually as the blocks were moved?
- How did the equilibrium of the system change as the blocks were moved?
- How are you connected to the environment? Is your impact positive or negative?
- Are you aware of your environmental impact? How can you help others become aware?
- How can we have conversations about the environmental challenges we are facing, the human roots and the concern and affects on all of us?

Other resources

- Docan, T. "Using JENGA to Teach System Theory," *Communication Teacher*, 20(1), 2006.

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