



Explanatory Metaphor

# STEM Ecosystem

A metaphor for the integral role of informal learning experiences in STEM education



The story you're telling:

Out-of-school learning opportunities function as an essential part of the STEM learning ecosystem.



Strategically redirects thinking away from patterns such as:

- Attention Battery (Children Need to Recharge) • Cultural Differences • Individualism
- Naturalism • Out-of-School Learning Is Inessential



## Concepts and ideas included in this frame element:

- **Children’s STEM learning happens within a complex ecosystem of formal and informal education experiences:** Redefines STEM learning as a rich, complex activity that occurs both in and out of the classroom.
- **Just as an ecosystem’s functionality depends on the inter-reliant roles of the plants and animals within it, STEM education works best when informal and formal learning work together:** Builds understanding of the interdependent relationship of different kinds of learning opportunities.
- **Out-of-school learning opportunities, such as afterschool clubs or summer camps, act like pollination points within the STEM learning ecosystem:** Defines informal STEM learning as important and essential to children’s development of STEM knowledge and skills.
- **High-quality out-of-school STEM programs are part of a thriving learning ecosystem:** Connects the amount of access to strong informal STEM learning opportunities to disparities in children’s education outcomes.



## Original research iteration:

- Out-of-school learning is an essential part of the ecosystem of education for Science, Technology, Engineering, and Math—what is called “STEM.” Just as an ecosystem depends on all the plants and animals that make up the system playing their role, STEM education depends on in-school and out-of-school learning playing their roles and being connected. Out-of-school environments like afterschool clubs and summer camps are pollination points within the learning ecosystem—essential locations that children need to grow STEM knowledge and skills. Quality out-of-school STEM programs are part of a thriving learning ecosystem for all young people.