



LAUNCH NEBRASKA



Summer Learning and Beyond *Supporting Independent Science* *Learning* *June 11, 2020*



Welcome and Thank You!

- Tuesday's webinar is posted including slides, tools, and templates.
 - Leveraging Assessment for Fall Instruction
- Eight hours of FREE virtual professional learning is currently available!
 - <https://www.launchne.com/professional-learning-and-resources/>

Summer Learning and Beyond: Professional Learning Series

- A webinar series designed to provide **clear, actionable information** for school districts/school systems.
- Aligned with **Continuity of Learning** Plans.
- Our first focus is preparing for **summer learning**.
- Later, we'll focus on preparing for the **coming school year**.

Our partner: SchoolKit



Session Focus

*This session will explore how “**learning in places**” can support science engagement beyond the classrooms and how to leverage **out-of-school science learning** as a way to promote the **development of complex systems thinking**.*

Meet Sara Cooper

- Science Guru
- Former NDE Science Education Specialist
- Former UNL-ENVR Coordinator
- Former HS Teacher
- Future ESU 5 Science & HAL Coordinator
- I have >200 sand samples from around the world

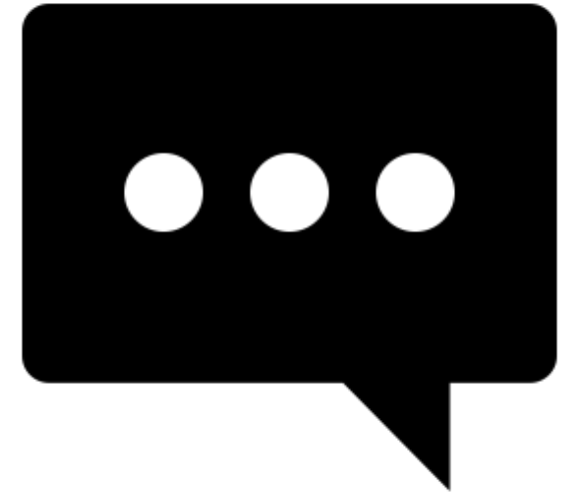


Session Norms:

- Use the Q & A feature if you have questions about technology or logistics
- Go to “View Options” to exit full screen to access the links in your web browser.
- Recorded session and this PPT deck will be available at www.launchne.com.

Chat Feature

Use “Chat” when
prompted to respond



Today's Learning Journey

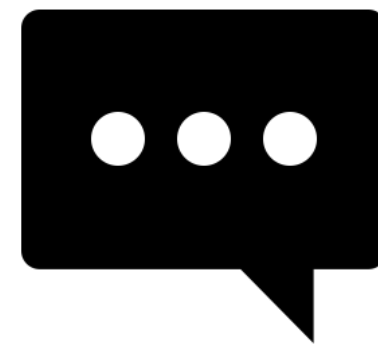
Topic	Length
Setting Context	5 minutes
Systems Thinking and Science	25 minutes
Learning Spaces and Places	20 minutes
Next Steps	5 minutes

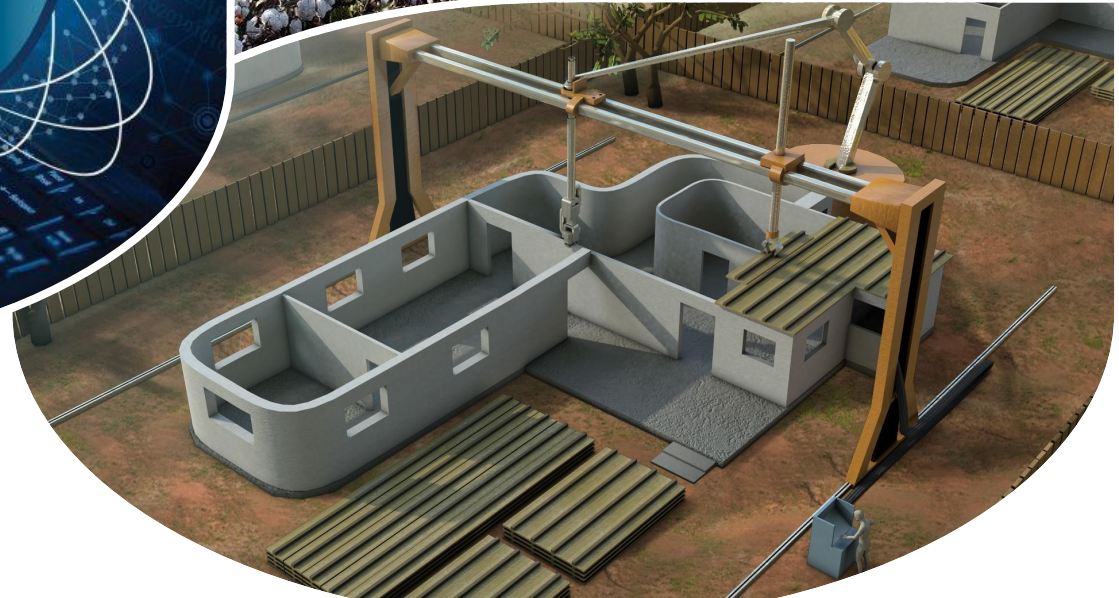


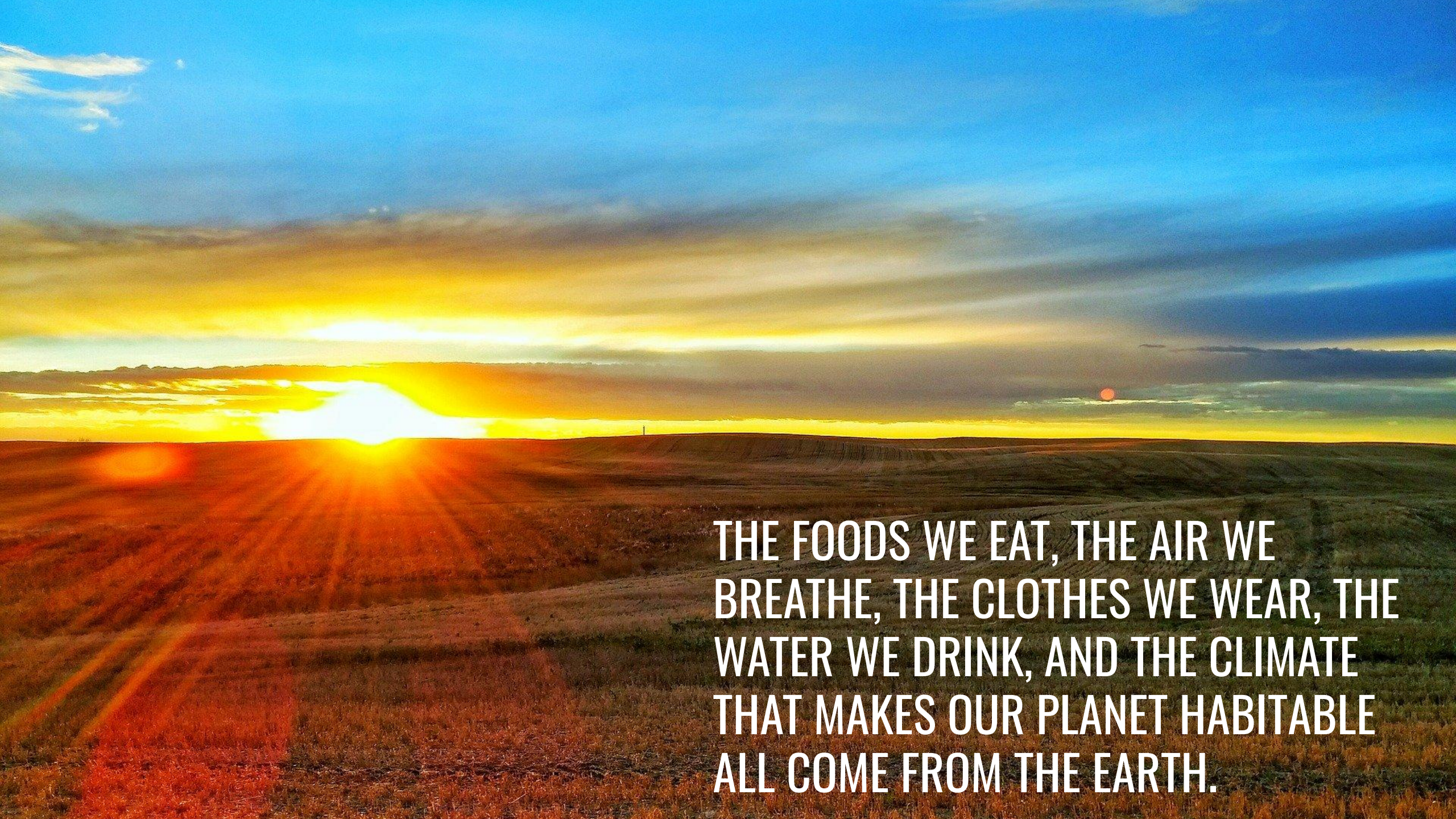
What are the unintended consequences if students don't have the opportunity to learn science?



Why?





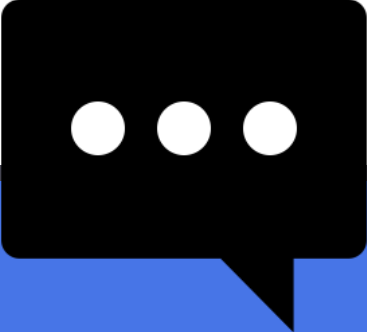


THE FOODS WE EAT, THE AIR WE
BREATHE, THE CLOTHES WE WEAR, THE
WATER WE DRINK, AND THE CLIMATE
THAT MAKES OUR PLANET HABITABLE
ALL COME FROM THE EARTH.

Today's Learning Journey

Topic	Length
Setting Context	5 minutes
Systems Thinking and Science	25 minutes
Learning Spaces and Places	20 minutes
Next Steps	5 minutes



- 
- *What* is systems thinking?
 - *Why* is it important?
 - *Who* needs it?



PATTERNS



**SYSTEMS & SYSTEM
MODELS**



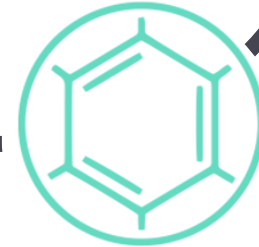
**STABILITY &
CHANGE**



**SCALE, PROPORTION
& QUANTITY**



**STRUCTURE &
FUNCTION**



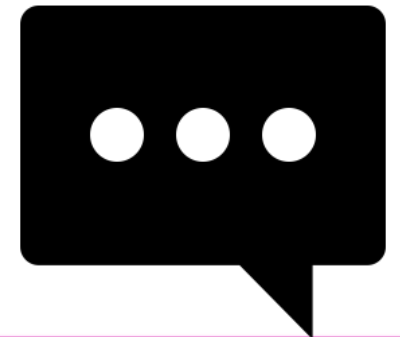
CAUSE & EFFECT



ENERGY & MATTER



**Crosscutting
Concepts**

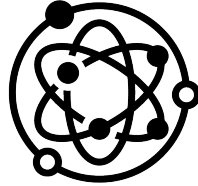


Science & Engineering Practices

**ASKING QUESTIONS
& DEFINING
PROBLEMS**



**DEVELOPING &
USING MODELS**



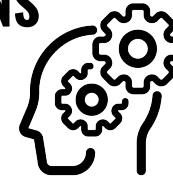
**PLANNING &
CARRYING OUT
INVESTIGATIONS**



**ANALYZING &
INTERPRETING
DATA**



**CONSTRUCTING
EXPLANATIONS &
DESIGNING
SOLUTIONS**



**ENGAGING IN
ARGUMENT FROM
EVIDENCE**



**USING MATHEMATICS
& COMPUTATIONAL
THINKING**

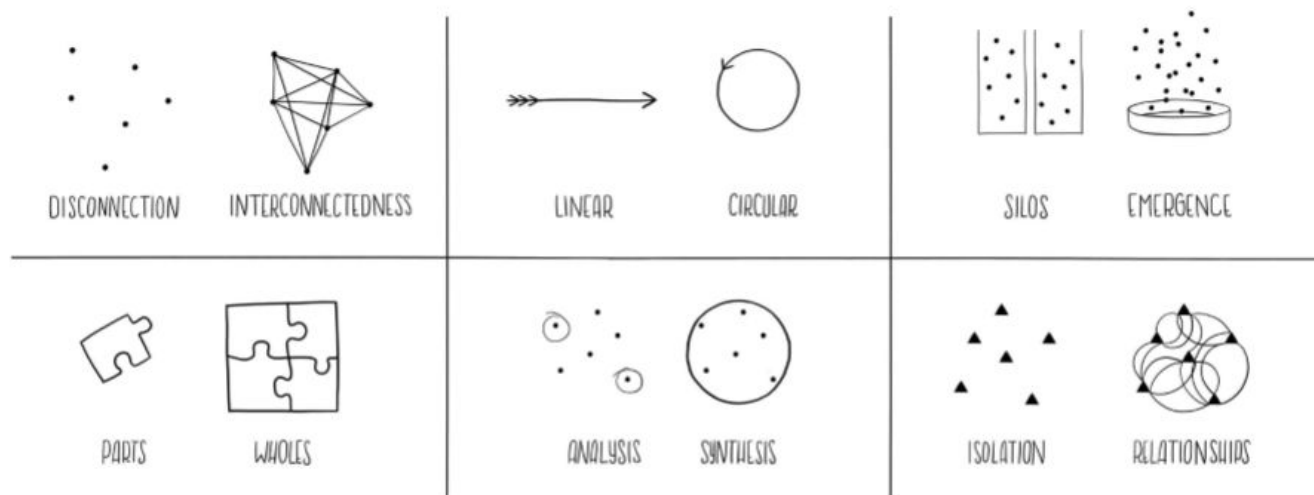


**OBTAINING,
EVALUATING, &
COMMUNICATING
INFORMATION**

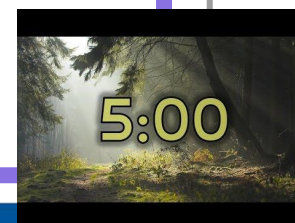


“The tools used in systems thinking overlap with tools used by scientists and engineers.”

TOOLS OF A SYSTEM THINKER



Tools for Systems Thinkers: The 6 Fundamental Concepts of Systems Thinking



Crosscutting Concepts

Science and Engineering Practices

PATTERNS

ASKING QUESTIONS & DEFINING PROBLEMS

CAUSE & EFFECT

DEVELOPING & USING MODELS

SCALE, PROPORTION, & QUANTITY

PLANNING & CARRYING OUT INVESTIGATIONS

SYSTEMS & SYSTEM MODELS

ANALYZING & INTERPRETING DATA

ENERGY & MATTER

USING MATHEMATICS & COMPUTATIONAL THINKING

STRUCTURE & FUNCTION

CONSTRUCTING EXPLANATIONS & DESIGNING SOLUTIONS

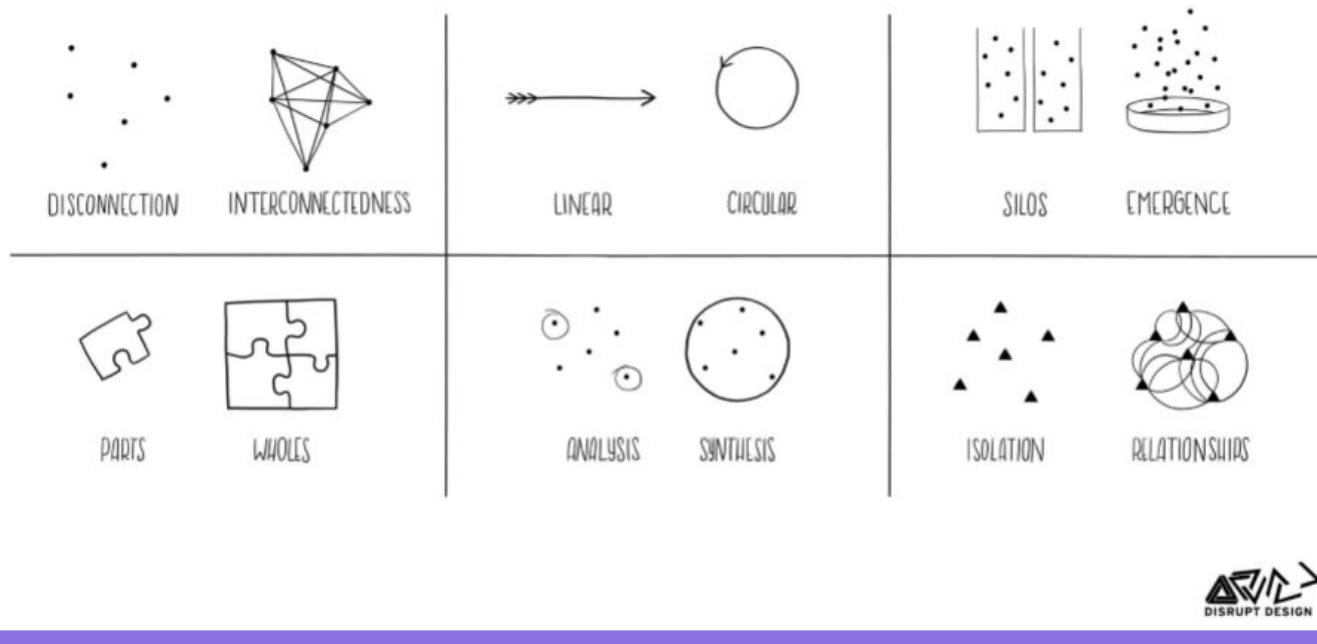
STABILITY AND CHANGE

ENGAGING IN ARGUMENT FROM EVIDENCE

OBTAINING, EVALUATING, & COMMUNICATING INFORMATION

“The tools used in systems thinking overlap with tools used by scientists and engineers.”

TOOLS OF A SYSTEM THINKER



DISRUPT DESIGN

Crosscutting Concepts

Science and Engineering Practices

PATTERNS

ASKING QUESTIONS & DEFINING PROBLEMS

CAUSE & EFFECT

DEVELOPING & USING MODELS

SCALE, PROPORTION, & QUANTITY

PLANNING & CARRYING OUT INVESTIGATIONS

SYSTEMS & SYSTEM MODELS

ANALYZING & INTERPRETING DATA

ENERGY & MATTER

USING MATHEMATICS & COMPUTATIONAL THINKING

STRUCTURE & FUNCTION

CONSTRUCTING EXPLANATIONS & DESIGNING SOLUTIONS

STABILITY AND CHANGE

ENGAGING IN ARGUMENT FROM EVIDENCE

OBTAINING, EVALUATING, & COMMUNICATING INFORMATION

What are the unintended consequences if students don't have the opportunity to learn science?



Today's Learning Journey

Topic	Length
Setting Context	5 minutes
Systems Thinking and Science	25 minutes
Learning Spaces and Places	20 minutes
Next Steps	5 minutes



Where does science learning take place?

Where do students spend their time?

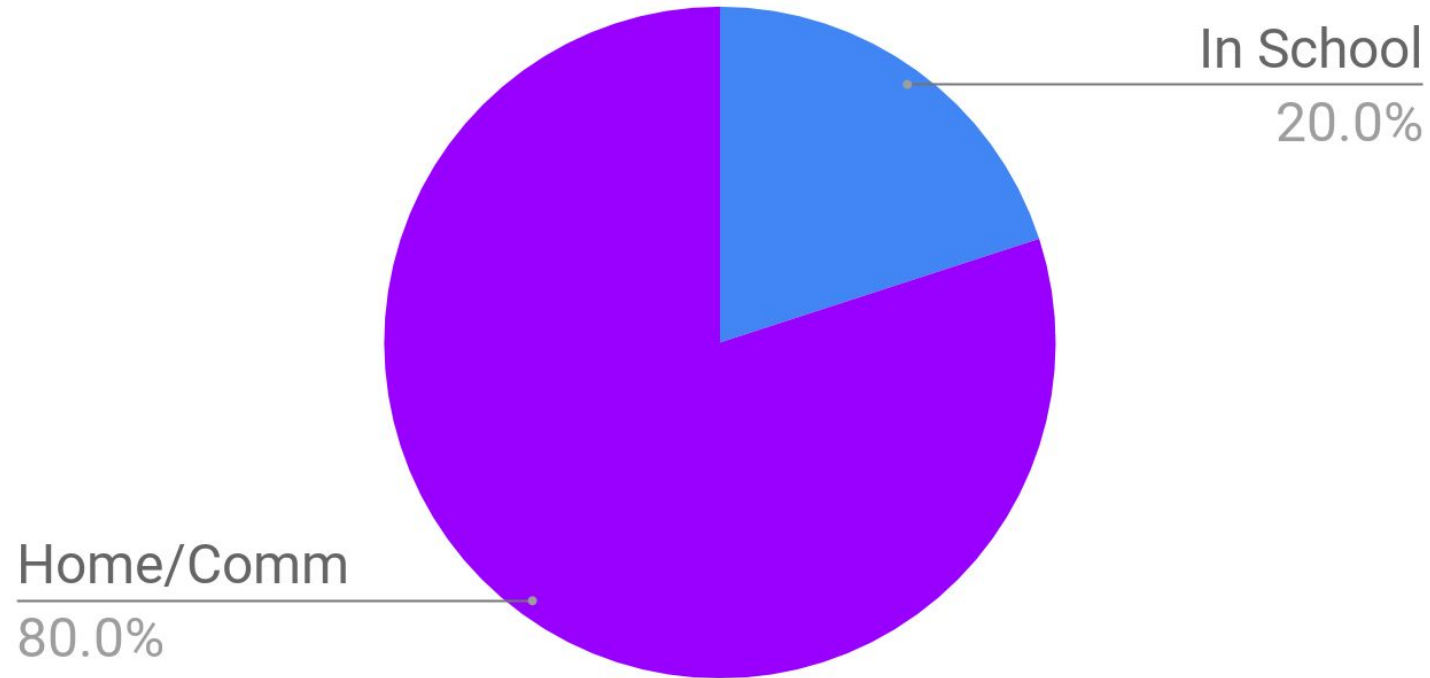


Table 1: Goals for Student Learning

Goals
<p>Students...</p> <ul style="list-style-type: none">• use science ideas and practices to make sense of real-world phenomena and problems.• are scientifically literate consumers of information, who see the relevance of science to their daily lives and the needs and priorities of their communities.• are self-directed, self-aware, life-long science learners.• are empowered and confident users of science to make changes in their lives and communities.• connect science learning to other content areas as a coherent set of ways to navigate the world.• are prepared for a post-secondary world that is increasingly dependent on scientific approaches.

Table 2: Key Features of Learning Experiences

Essential Features
<p>Learning experiences...</p> <ul style="list-style-type: none">• Are developmentally-appropriate opportunities to engage:<ul style="list-style-type: none">○ with relevant and meaningful phenomena and problems that build toward learning goals.○ regularly with peers and adults in social sense-making, productive challenging of ideas, and feedback cycles.○ in self-reflection and metacognition.• Use productive uncertainty to drive student inquiry toward deeper learning.• Provide access to sufficient materials, resources, and expertise to engage in meaningful, coherent learning experiences.• Provide supportive physical and social-emotional environments that allow students to prioritize and be present in learning.



Table 3: Learning Roles.

	Roles in learning look more like...	Roles in learning look less like...
Students	<ul style="list-style-type: none"> • Being actively engaged in learning experiences. • Engaging with peers to advance their own and others' learning. • Playing an increasingly active role in directing their own learning. 	<ul style="list-style-type: none"> • Memorizing and restating information. • Learning by themselves, in isolation from peers.
Teachers	<ul style="list-style-type: none"> • Creating, selecting, and/or adapting instructional materials and experiences to be meaningful, relevant, and engaging to all learners. • Providing opportunities for students to connect their science learning to their interests and identities. • Expert classroom implementation with an eye to building coherence and progressive sense-making with peers and individually; • Providing appropriate feedback and guidance mechanisms to move student thinking. • Designing instructional experiences that encourage students to direct their own learning. 	<ul style="list-style-type: none"> • Lecturing students "about" content. • Devoting significant instructional time to learning experiences that lie outside of common learning goals. • Providing childcare
Families and communities	<ul style="list-style-type: none"> • Supporting their children. • Offering examples of process, phenomena, and problems from their own experiences. • Providing thought-partnership to their children; acting as a co-learner. • Offering expertise and varied perspectives. • Supplementing school-based science with home- and community-based learning experiences that connect with students' interests. 	<ul style="list-style-type: none"> • Designing or selecting science instructional materials or experiences. • Leveraging research-based pedagogy to support science learning. • Mimicking school at home during closures or extended absences.
Leaders	<ul style="list-style-type: none"> • Designing systems that attend to all learners, particularly those at the margins. • Establishing space, time, and norms within which students and teachers operate. • Establishing appropriate expectations and feedback systems to support the diversity of students, teachers, and families represented by the school community. • Providing vision, leadership, priorities, and support. 	<ul style="list-style-type: none"> • Advocating for systems or policies that work for many but not all learners. • Establishing and enforcing expectations that run counter to effective teaching and learning practices.



Table 4: Roles family members or other learning partners can play in students' learning experiences.

Encourager: provide positive feedback and support to students	Resource Connector: work with students to find materials and resources they need for an investigation or challenge	Collaborator & Learner: collaboratively work with student(s) on an investigation or challenge; make their learning process visible to students
Interest Supporter: talk to student(s) about their interests and how to pursue them	Storyteller: show how an idea or practice relates to another situation (e.g., a shared family experience)	Organizer of Collaboration: help coordinate the group learning process within the family
Knowledge Holder: communicate what they know about a topic or idea in ways that support students "figuring out" phenomena	Audience Member: friendly critic engaging with student products or presentations of an investigation or challenge	Learning Broker: connect learners to follow-on learning experiences that make sense, building on student interests and curiosities

This is adapted from work by Brigid Barron (Stanford University) and Nichole Pinkard (Northwestern University) by Bell, 2015, 2020.





Supporting Equitable Home-Based
Science Teaching and Learning During
Extended COVID-19 School Closures.





HOME

ABOUT THE PROJECT ▾

SEASONAL STORYLINE ▾

CORE CONCEPTS & RESEARCH

CONTACT US

Learning in Places

LEARN MORE

<http://learninginplaces.org/>



Resource HUB

Resources for Supporting Independent Science Learning

Resources to Support Independent Science Learning

Webinar Featured Resources

Supporting Students' Science Learning During COVID-19 School Closures

During the COVID-19 crisis, many families are looking for helpful educational resources. There are many opportunities to engage in safe, meaningful science learning in your home and neighborhood. Science teachers, district science coordinators, and other science education leaders are working to provide advice and resources to support families. These resources might be useful to educators, families, and educational leaders.

<http://stemteachingtools.org/news/2020/guidance-for-supporting-science-learning-during-covid-19>

Learning in Places

Despite the growing awareness of socio-ecological challenges facing humans in the 21st century, science learning still mostly takes place inside the classroom, disconnected from the natural world. The University of Washington Bothell Goodlad Institute for Educational Renewal, Northwestern University School of Education and Social Policy, Tilth Alliance and Seattle Public Schools are partnering to change this status quo and create more culturally and community relevant, field-based learning opportunities for students. Funded by a \$2.9 million grant from the National Science Foundation, the project will build outdoor learning gardens and draw upon local communities and green spaces at several Seattle schools while developing a robust curriculum for K-3 educators to engage students in complex ecological reasoning and decision-making.

<http://learninginplaces.org/> <http://learninginplaces.org/for-families/>

NGSS Phenomena-Virtual Science Learning

How to leverage student engagement with everyday phenomena.

<https://www.ngssphenomena.com/virtual-science-education>

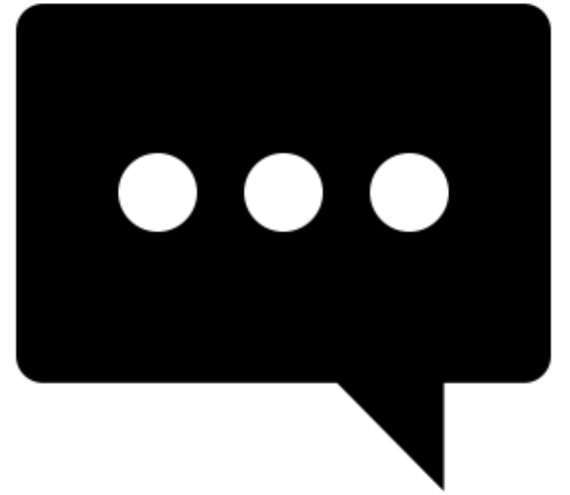
<https://tinyurl.com/NDEscihub>



Today's Learning Journey

Topic	Length
Setting Context	5 minutes
Systems Thinking and Science	30 minutes
Learning Spaces and Places	15 minutes
Next Steps	5 minutes





What are the unintended consequences if students don't have the opportunity to learn science?

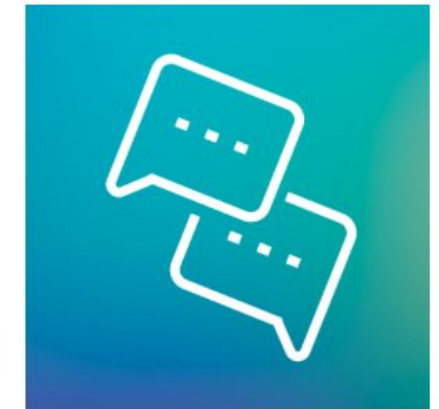






Upcoming Professional Learning:

- Tuesday, June 16 @4:30 p.m.
 - PLANNING TO PIVOT: SUPPORT FOR THE FALL
- Archived Sessions available at <https://www.launchne.com/professional-learning-and-resources/>



Resources to Support Science



<https://www.education.ne.gov/science/>

- Nebraska's Vision for Science Education
- Supporting Science Learning During COVID-19
- Professional Learning Opportunities
- Parent Guides



Resources to Support Instruction

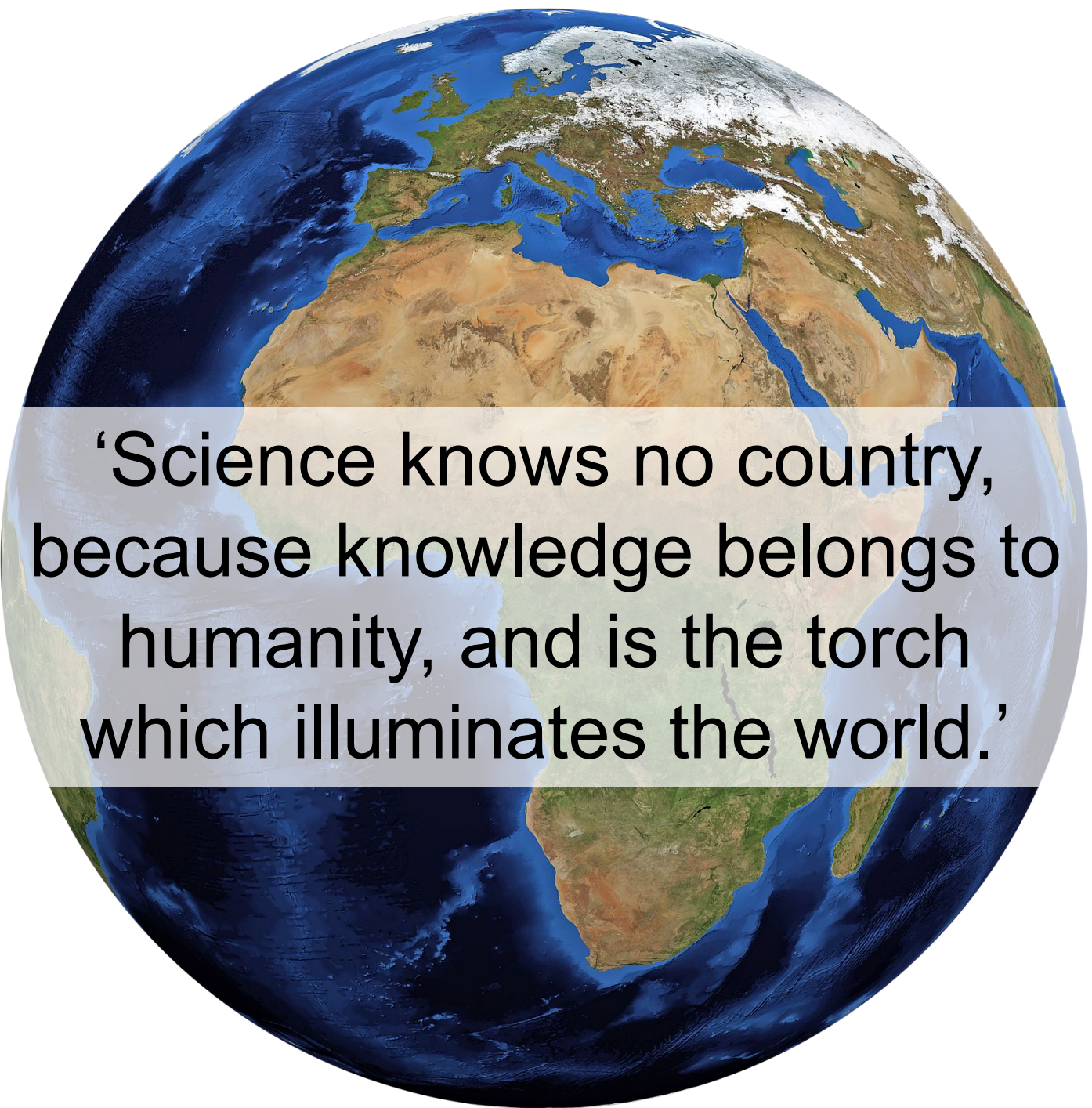
- Nebraska-specific academic guidance (mid/late June):
 - Core content and considerations for assessment, instructional materials, and professional learning
 - Will be available on Launch Nebraska (www.launchne.com).



<https://tinyurl.com/NDEsurvey9>

THANK YOU





‘Science knows no country,
because knowledge belongs to
humanity, and is the torch
which illuminates the world.’