Systems-Based Thinking

Facilitation Protocol

Standards

Understanding Causal Relations, Along with Correspondences Between the Past, the Present, and the Future; particularly: a proper comprehension of occurring dependencies, and understanding of how change and the continuation process happen, along with their relation to the present and the future.

Format

This lesson is designed for small group, and/or full class discussions to occur over 1-2 50-minute sessions.

SDG Connection: 9, 11, 12, 14, 15

Materials

- Issues cards; node cards

Purpose

Systems-based thinking is the art of analyzing situations in hyper complex ways, recognizing that our decisions rarely lead to one outcome. In the real world, we don't do "x" to get "y." Instead, when we do "x", it impacts "y" as well as "a" "b" "c" "d" and so on. For example, [the Butterfly Theory](#) suggests that very small changes can have a massive impact on the world around us. Oftentimes, these impacts are untended. To look at systems, we consider how we can change fundamental processes about how we design our world as opposed to thinking linearly about solving a problem. In this lesson, we'll practice systems-based thinking.

Introduction

To think in systems, we must consider how all actions one takes has a reverbing impact on many people and things. When we use linear thinking, one thing leads directly to another thing (a straight line). For example, if we feed a bird at the park, a linear way of thinking would be:

> Feed the bird at the park. -> Bird is fed.

It is true that the bird has now eaten (and probably appreciates the food!), but this is only a *small* part of the overall system. When thinking in systems, we'd also consider:

> Feed the bird at the park…
- ➔ The bird is fed.
- ➔ More birds may appear in the future.
- ➔ Birds may become overpopulated, leading to a population imbalance.
- ➔ Other animals may be deterred by additional birds, or may cohabitate with birds and come for food.
- ➔ A bird's typical prey may become overpopulated as birds are more likely to be fed.
- ➔ Other people may see birds being fed and be more inclined to feed birds themselves.

(And many, many more.) Most of these impacts are unintended, and many may not even occur. But in systems-based thinking, we are aware of potential impacts and design for change at scale. This is how we make decisions such as: Should we allow people to feed birds at the park? Is this dangerous? Or vice versa, should we encourage people to feed birds at the park? Is it beneficial?

Narrow it Down

Consider how systems-based thinking would impact a simple scenario, as shown above. Remember, our goal is to demonstrate the **linear** vs the **circular**. As in, it isn't *one simple result* but *many overlapping outcomes*.

Unlike linear thinking, which is where one thing leads directly to another thing, circular thinking is seeing how one thing leads to *many* other things. These could be intended consequences or unintended consequences.

The action one takes...
I feed a bird at the park.
The linear result...
The bird is fed.
The many overlapping outcomes...
More birds may appear in the future.
Birds may become overpopulated, leading to a population imbalance.
Other animals may be deterred by additional birds, or may cohabitate with birds and come for food.
A bird's typical prey may become overpopulated as birds are more likely to be fed.
Other people may see birds being fed and be more inclined to feed birds themselves.

Diving Deeper

At this point, pass out the issue and node cards. Each individual or group should have a full stack of each. Feel free to create your own issue or node cards to add additional complexity.

Let's consider the concept of systems-based thinking by using a simple card game. Card and board games are frequently used by planners, developers, and creatives to brainstorm solutions.

In front of you are two piles of cards:
1) One pile has *issue* cards. These are cards with problems in your community.
2) One pile has *node* cards. Nodes are people, places, or things that are somehow affected by these problems.

In this activity, you'll link how these different issues impact these nodes. The activity takes place in three steps:

1) Shuffle and draw an issue and 3 node cards.
2) Establish a link between each node card, the issue, and *between* the node cards.
3) Record your thoughts, then reshuffle and draw.

For example, you may draw *Rising Crime* as an issue, and *The Elderly, Local Wildlife, and Police Officers* as your node cards. There's an obvious link between two of these and the issue: the elderly are a vulnerable population and crime would concern them more-so than the average citizen, and police officers' jobs consist of combating crime. Local wildlife is more of a stretch, but we can link that littering is a crime.

Then, we'd find links *between* the node cards. For example, the Elderly interact with the Police directly to inform and report crimes. Police enforce littering and park services for local wildlife. Local Wildlife support the ecosystem that the Police and Elderly inhabit.

Repeat this process three times.

Issue Card Drawn:	How is this node impacted by the issue?	How is this node connected to Node Card #1?	How is this node connected to Node Card #2?	How is this node connected to Node Card #3?
Node Card #1				
Node Card #2				
Node Card #3				

Issue Card Drawn:	How is this node impacted by the issue?	How is this node connected to Node Card #1?	How is this node connected to Node Card #2?	How is this node connected to Node Card #3?
Node Card #1				
Node Card #2				
Node Card #3				

Issue Card Drawn:	How is this node impacted by the issue?	How is this node connected to Node Card #1?	How is this node connected to Node Card #2?	How is this node connected to Node Card #3?
Node Card #1		░░░░░░░		
Node Card #2			░░░░░░░	
Node Card #3				░░░░░░░

Now, let's consider…

Why would it matter to think about systems as opposed to linear problems and solutions?

E.g. It allows us to look at issues in a more nuanced way so that we can predict if there are unintended consequences of our actions.

Can you think of a way that this could be applicable to something you've done recently, or a problem you want to solve?

How is this connected to understanding our past, present, and future? As in, how does history play into systems-based thinking? How could it improve future outcomes?

E.g. In order to understand systems, we need to be familiar with what other perspectives may exist, including historical perspectives. This ensures we can make a plan that we can adequately predict the future of.

Reflect

How would you rate your understanding of this concept? *Place an "X" in the corresponding box below.*				

How has your understanding of this concept changed as a result of this lesson?

Which individual or community actions could this activity inspire?

No matter what change we make, we won't only change what we're expecting...but other things as well. What's an example of this?

Take it Further

Take Action	Take Action	Community Connection
Utilizing games can help us make sense of complex ideas. In business and nonprofit work, it is common to develop simple trading card ideas to think abstractly and come to solutions. Develop your own board or trading card game which has the goal of teaching something.	Infographics help us make sense of complicated ideas through visuals and seen connections. Research how infographic designers understand and work through complex problems, then design your own infographic to convey information about an idea.	Analyze the systems of your own community. What is an issue that exists that needs to be solved? How many people are connected to that issue? How can they be brought together? Make a [systems-thinking map](#) to analyze a solution.

Media

[Design Systems Change Handbook](#) (eBook)	[Blog of Harold Jarche](#) (Blog)	[Thinking in Systems](#) (Book)
"The movement toward a circular and regenerative economy is well underway, and this handbook is here to help anyone discover how they, too, can design systems change for a positive future."	"Harold Jarche has been described as "*a keen subversive of the last century's management and education models*". Clients appreciate Harold for his extensive experience and network. His internationally renowned blog is "*a beacon of light in the dark landscape of organizational learning.*"	"This is a primer that brings you to a tangible world and shows you how to develop systems thinking skills. The problems facing the world – war, hunger, poverty, global warming can not be solved by fixing one piece in isolation, because seemingly minor details can have big impacts."

Extend

Language Arts	Mathematics
Let students brainstorm issues in their community, then analyze the game played in this lesson. How could it be modified,	Consider how math presents itself in real life. Although we commonly address problems through *word problems*, these are often linear

improved, and transformed? Write new instructions and explain to each other how to play, including the new issues as additional cards.	expressions on what are much more complicated issues. What would a math problem look like that's more holistic, addressing a real problem in the community? Offer examples and brainstorm how many questions you'd need to solve.
Science Scientists are frequently making discoveries that have a wide-ranging impact on society. [Consider all of the accidental discoveries that scientists have made](). How has this impacted the systems of our society?	**Social Studies** Governments are vast systems that are upheld entirely by a social contract: people listen and act according to a series of laws they choose to uphold. How easy would it be to break these laws? Why is it that people decide to go along with them? Consider how laws are enforced, why people follow them, and what impact would be made if people introduced unreasonable laws or enforcement mechanisms.
Art Consider systems through mediums: how can art display itself in a variety of mechanisms: through illustration, digital design, music, video, dance, and more. How can the same concept be portrayed in these styles, and what impact does each style have? Are there advantages and disadvantages in each medium?	**Physical Education** What systems impact our health? What about systems beyond individual control? We often consider diet and exercise as mainstream ways to improve our health, but what about societal factors? Consider other concepts like air and water pollution, access to gym and outdoor spaces, use of cars and public transportation, city design, safety, and more — and consider how your community could be a healthier system.