Essential Question: How do people use systems?	Grade Level: 1

Unit Description: Students will be challenged to create a model town that will be able to meet all the needs of its residents. In order to do so they will learn about the basics of economic systems as well as how humans change their environments to get and supply resources to meet their needs. They will learn about money and addition and subtraction as they buy resources needed to develop the model town. They will investigate and engineer basic water systems. In literacy students will use non-fiction texts about these topics as a resource for shared research. Students will write non-fiction works to record what they have learned from their research.

Stage 1-Identify Desired Results

During this stage identify the essential understandings of the unit. Determine what students need to know and be able to do by the end.

KNOWINGS
What content do students need to know and do?

MATH/ SCIENCE WORKSHOP

PA Economics Standards
6.1.1.C - Identify choice based on needs versus wants.
6.3.1.A - Identify examples of goods and services.
6.4.1.A - Identify specialization of work in the community.
6.5.1.B - Identify different jobs and the purpose of each.
6.5.1.C - Identify businesses and their corresponding goods and service.
PA Early Learning Standards for 1st Grade
6.3.B. Identify and define wants and needs of different people in relation to limited resources
6.5.A. Explain the various reasons why people work
6.5.B. Identify different occupations
6.5.D. Define saving and explain why people save
6.1.B. Identify local employment in relation to PRODUCTS AND SERVICES
6.5.C. Describe businesses that provide PRODUCTS and businesses that provide SERVICES
6.4.C. Explain why some products are produced locally while others are not
6.4.B. Explain why PRODUCTS, SERVICES and RESOURCES come from all over the nation and the world
PA Math Standards
CC.2.2.1.A.1 - Represent and solve problems involving addition and subtraction within 20.
CC.2.1.1.B.2 - Represent amounts of tens and ones and to compare two digit numbers.
CC.2.1.1.B.3 - Use place value concepts and properties of operations to add and subtract within 100.

INTEGRATION

PA Ecology Standards
4.3.1.A - Identify some renewable resources used in the community.
4.3.1.B - Recognize the difference between renewable and nonrenewable resources.
4.5.1.A - Identify resources humans use from the environment.
NGSS
K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
K-ESS2-2.Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
K-ESS3-1.Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*
K-2-ETS1-1.Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

ESS2.E: Biogeology
  ● *Plants and animals can change their environment. (K-ESS2-2)*
ESS3.A: Natural Resources

- *Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)*

ESS3.C: Human Impacts on Earth Systems
- *Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)*

ETS1.B: Developing Possible Solutions
- *Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.(secondary to K-ESS3-3)*

ESS2.D: Weather and Climate
- *Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1)*

ESS3.B: Natural Hazards
- *Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2)*

Art standards!

What essential understandings will students learn?

-Everything comes from nature - humans change/move resources to make it easier to get them using systems.

-A system is made of many parts that are connected and work together/affect each other

-something made of connected parts that work together

  -affect each other

  -able to do something that the individual parts cannot

-People design a town's systems to provide things they want/need.

-Things people do to make their lives easier affect the environment, but we can make choices to reduce the harm we cause.

LITERACY

WRITING
1.4.1.B: Write informational pieces using illustrations when relevant.
1.5.1A: Identify and write about one specific topic
B: Develop content appropriate for the topic, write a series of related sentences with one certain idea
C: Organize writing in a logical order
D: Write using adjectives, precise nouns, and action verbs
E: Revise writing by adding details or missing information
F: Spell common, frequently used words correctly, use capital letters correctly, punctuate correctly, begin to use correct grammar and sentence formation
CC.1.4.1.C: Develop the topic with two or more facts
CC1.4.1.L: Demonstrate a grade appropriate command of the conventions of standard English grammar and spelling
CC.1.4.1.V: Participate in individual or shared research and writing projects.
CC.1.4.1.A: Write informative/explanatory tests to examine a topic and convey ideas and information.

READING
CC1.3.1.K Read and comprehend literature on grade level, reading independently and proficiently
CC1.2.1.I Identify basic similarities in and differences between two texts on the same topic
CC.1.5.1.A Participate in collaborative conversations with peers and adults in small and larger groups.
CC.1.5.1B Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood
CC1.5.1.F Add drawings or other visual displays when sharing aloud to clarify ideas, thoughts, and feelings.
CC.1.2.1.A: Identify the main idea and retell key details of text.
CC.1.2.1.E: Use various text features and search tools to locate key facts or information in a text.

	Connections:
	Children's Museum
	Alcosan
	Highland Park Reservoir
	Anywhere where we can see sewer pipes
	Field trip to the co-op
	-City Planner parents
Materials	**Vocabulary**

Wood scraps Rocks Clay Tubes Wire Mini wooden People Tubes Duct tape Small plastic farm animal Model magic Pop up tents Folders Journals	**system**- connected parts that work together **renewable** - a resource that can be replaced and used again, for example - trees, water, solar, wind, oxygen **nonrenewable** - resources that take too long to replace, ex - fossil fuels **natural resource** - materials from nature that humans use to do things **Electricity-** a kind of energy that moves through wires and makes things work **Reservoir-** a human made lake that holds extra water **Pollution-**anything that humans put into the water, air, or soil that makes it dirty/unhealthy **Transportation**- ways of getting around **Waterworks -** a place that cleans water to make it safe for people to drink **Solar-** having to do with the sun **Reflect-**to think deeply about an experience in order to learn from it **cause** is the thing that makes something happen **effect** is the thing that happens because of the cause **Complex**- complicated **products** - things that are ready to be used by people **goods** - products such as cars, computers, and even corn **services** - jobs done by one person for another person such as teaching and transportation - **bank account** - an agreement made with a bank for the bank to keep your money safe for you **deposit**- money put into a bank **withdraw** - money taken out of a bank **economy** - a system that includes money, natural resources, products, and services **taxes** - the way people pay for their government and its services **need** - something that you need to survive **want** - something you want but you don't have to have to survive Previously learned but relevant diagram model Engineer impact

DOINGS
What skills and practices will the students demonstrate?

-Understanding Complexity ----SYSTEMS- observing the multiple parts of something and seeing how they are **connected.** Creating concept webs or flow charts. **CAUSE AND EFFECT** - **reasoning** Using if → then statements. What would happen if….?

NGSS DOINGS
Cause and Effect
- Events have causes that generate observable patterns. (K-ESS3-3)Simple tests can be designed to gather evidence to support or refute student ideas about causes.
Systems and System Models
- Systems in the natural and designed world have parts that work together. (K-ESS2-2),(K-ESS3-1)
- Most things are made of parts, when the parts are put together they do things that they couldn't do by themselves, something may not work if some of its parts are missing or broken.
-Asking questions, plan and carry out investigations. (books internet as resources OR experiment as resource)
-Creating and using models

What thinking routines support the learning?

-Parts of the whole.

-Connected, New, Want to Know

-Cause/Effect, If → Then

-Concept Maps/Flow Charts - both observing and creating

BEINGS:
What values and attributes will students continue to develop?

Reflective.
-being reflective means that you think about something that happened and try to learn from it by asking why questions

-Say what you did that day. What can you learn from it. What happened and why? Using reasoning.

-What did you do today? Why did you do it? What happened today? Why do you think _____ happened? How did you feel about _____? Why did you feel that way?   What worked? Why do you think it worked? Why do you think _____ happened? THEN What did you learn from the experience? Can you connect it to any other situations or experiences?

Stage 2-Determine Assessment Evidence

During this stage consider evidence of learning. Determine the criteria for proficiency and how learning will be documented.

Performance Tasks:
Through what authentic performance tasks will students demonstrate the desired understandings?

-reflective drawing/writing
-notes on participation in simulation

By what criteria will performances of understanding be judged?

-rubrics (seed, sprout flower)

-checklists

Other Evidence:
Through what other evidence will students demonstrate achievement of the desired results?
-written assessments
-interview assessments

How will students reflect upon and self-assess their learning?

-students will do written reflections
-students will score their work using seed/sprout/flower

Documentation:
How will we document student learning and growth?
-take pics and videos of town
-keep map of town
-keep documentation of their choices, cause and effect, and scores

What pieces will we collect as artifacts?
-student reflective notebooks

How will we organize this documentation over the course of the unit?
-

Stage 3- Plan Learning Experiences and Instruction

During this stage consider key instructional moves that will support and enhance the learning experience.

How will we make learning both engaging and effective, given the goals and needed evidence?

-hands on play based learning!
-outdoor learning
-songs

How will we tailor instruction to different needs and interests?
-take students interest into account when choosing what to focus on
-division of labor when working on town
-students can choose jobs
-differentiate skill based work

How will we provide feedback and opportunities for revision?
-seed, sprout, flower rubric
-reteaching, revising

How will we incorporate technology to enhance the student experience?
-youtube videos to learn information, internet research