# **Main Units**

### **CCL Design Studio: Landscape Architecture**

CCL Design Studio: Landscape Architecture	2nd Grade
Content Area:	Timeline:
What is the core subject area?	How long will this unit last?
Design Thinking/STEAM	16 weeks
Rationale/Purpose:	

One of the best ways that young children learn is through free, creative play in nature. They need the freedom of unstructured, natural play to learn to take risks at their own pace. This freedom also allows them to develop creativity, problem-solving, and collaboration, all of which are critical 21st-century skills. Playing in nature also allows children to make discoveries about the world around them: how a spider spins a web in a spiral, how the pattern of a tree branch can lead to more efficient solar panels, and how unique the properties of different rocks can be. This natural learning environment provides fertile soil for a sense of wonder that can spark a child's lifelong love of learning.

In today's world of electronics, organized sports, and hypersensitive media, children do not often get the opportunity to play freely in nature. Most of their play time is spent indoors and much of their time outdoors is spent in structured play such as organized sports. To provide safe places for children to explore nature freely, a movement has begun to create outdoor classrooms, natural playgrounds, and nature playscapes. These areas provide open, natural areas in more urban and suburban areas that are planned with play and learning in mind. Because they are designed with safety in mind, they give parents more peace of mind than just sending their children out to play in the woods.

The purpose of this unit is twofold: to help students find joy and discovery as they develop a connection to nature through play and to empower students through the process of analyzing information to communicate facts to increase nature play among children. Students will learn more strategies for analyzing and using facts and for communicating better, which they will use to help other children discover the power of nature exploration. As students discover the world around them through a variety of ways, they will realize how powerful time spent in nature can be and they will learn how to share these natural experiences with other children.

### Description:

In CCL Design Studio: Landscape Architecture, students will be researching and exploring why kids need to play outside and how the amount of time children spend playing outside now has changed from when their parents and grandparents were children. Students will learn what landscape architects do and how they can encourage more children to play in nature by designing nature playscapes, which provide a safe place for children to play in natural spaces. Students will explore the nature playscape in Forest Park and will research other nature playscapes to consider criteria for determining what makes the best nature playscape. Students will use these criteria to

design their nature playscape area, which is part of a larger nature playscape designed by their class.

Enduring Understandings:

- EU 1.1 Decision-making requires a process of gathering, analyzing, and applying information and ideas.
- EU 1.2 The decisions that we make impact others. It is important to consider the implications and consequences of personal actions.
- EU 1.3 The development of critical thinking skills and dispositions is a life-long endeavor.
- EU 1.5 Through practice, we can grow in our ability to develop and communicate effective solutions to problems

**Essential Questions:** 

- EQ 1.1 How do I make and defend a well-thought-out and reasonable decision?
- EQ 1.25 How do I collect and determine relevant data?
- EQ 1.6 How do I communicate my ideas effectively to an appropriate audience?

Overarching Question: How can we communicate facts to increase nature play among children?

MOGLO:

### Assessed:

- CR.A.1 Analyze data to independently identify elements of issues. (Analyzing Information)
- CR.C.2 Use facts to support ideas, decisions and opinions (Using Facts)
- CR.I.1 Communicate complex ideas to reach an intended audience (Communication)

### Supported:

- CR.A.2 Identify the main pattern of information needed to understand an issue
- C.R.C.1 With guidance, differentiate the quality of possible responses to issues and explain reasoning
- C.R.F.1 With guidance, discuss the impact of student-generated solutions on the impacted community
- CR.I.2 With guidance, offer constructive feedback and incorporate suggestions for improvement

Know:

- Persuasive techniques
- Graphs, databases, and statistics
- Technology (Google Docs, Google Forms)
- Native plants and what they attract
- Landscape design

- What the facts are and how they differ from opinions
- Scale in a map
- Criteria
- Gross motor skills, loose parts, open-ended, textures, 5 senses, coordination and balance, observation skills, dramatic play

Understand:

Overarching Understanding:

• We can increase nature play among children by communicating appropriately important facts about nature play.

Specific Understandings:

- Decision-making requires a process of gathering, analyzing, and applying information and ideas.
- The decisions that we make impact others. It is important to consider the implications and consequences of personal actions.
- The development of critical thinking skills and dispositions is a life-long endeavor.
- Through practice, we can grow in our ability to develop and communicate effective solutions to problems

### Do:

- Analyze survey results and compare nature play among different generations.
- Research facts about the importance of nature play.
- Create a poster to communicate to a specific audience why nature play is important.
- Collaborate with others to design a Nature Playscape that encourages children to spend more time exploring nature.
- Create (to scale) a landscape design plan and 3D model of their nature playscape.
- Research different outdoor classrooms, nature playscapes, and other outdoor areas designed for play and learning.
- Analyze different ideas for their nature playscape and determine which criteria are most important to include in their nature playscape.
- Communicate effectively and persuasively to a specific audience about their nature playscape.

## **CCL Design Studio: Mechanical Mastermind**

CCL Design Studio: Mechanical	2nd Grade Gifted
Masterminds	
Content Area:	Timeline:
What is the core subject area?	How long will this unit last?
Science/STEAM	1 semester
Rationale/Purpose:	

Today's second-grade students could successfully pursue a STEAM career, and the *Design Studio: Mechanical Masterminds* unit introduces many STEAM concepts in a motivating environment with minds-on, hands-on activities about a topic fascinating to students – robots. In addition, students develop skills in analyzing information, problem-solving, and systems thinking as they wrestle with the question, "How can we use technology (like robots) to solve real-world problems?" Embedded within the unit is the development of robotic programming skills.

### Description:

Students will analyze the differences between machines and robots and how the different systems of robots work together to make the robot work. Our work will include:

- Hands-on exploration of the LEGO Spike Essential engineering kits, including programming.
- Learning to break down the programming elements to find bugs and learn to solve them.
- Designing a robot to solve a real-world problem using the Engineering Problem Solving Process.
- Communicating their robot design to others.

Enduring Understandings:

- EU 1.1 Decision-making requires a process of gathering, analyzing, and applying information and ideas.
- EU 1.4 There are different processes and strategies for solving problems. Being able to apply these processes and strategies may increase the probability of developing a successful outcome.
- EU 1.5 Through practice, we can grow in our ability to develop effective solutions to problems.

Essential Questions:

- EQ 1.2 How do I use different strategies to effectively generate solutions that solve problems?
- EQ 1.3 Why is it important to be able to solve problems and explain my reasoning?
  EQ 1.5 How can I transfer my knowledge and skills to new situations?

Overarching Question: How can we use technology (like robots) to solve real-world problems? MOGLO:

### Assessed:

- CR.A.1 Analyze data to independently identify elements of issues. (Analyzing Information/Computational Thinking)
- CR.B.1 With guidance, identify (a) possible solution(s) to problems. (Problem-Solving)
- CR.G.1 Identify the parts of the system and explain connections within that system. (Systems Thinking)

Supported:

- CR.B.2 With guidance, identify success criteria for problem solutions.
- CR.B.3 With guidance, evaluate the possible effectiveness of proposed solutions to

### problems.

- CR.C.1 With guidance, differentiate the quality of possible responses to issues and explain reasoning.
- CR.D.1 With guidance, employ a teacher-selected problem-solving strategy (Engineering Design Process).
- CR.E.1 With guidance, develop and test prototypes and discuss what items could be improved in future designs.
- CR.F.1 With guidance, discuss the impact of student-generated solutions on the impacted community.
- CR.F.2 Identify your role and the consequences within issues.
- CR.I.2 With guidance, offer constructive feedback and incorporate suggestions for improvement.

#### Know:

- What is a 'real' robot?
- Jobs robots do best (dull, dirty, dangerous, extra-clean, precise, impossible for human)
- Robotic parts (subsystems): computer (simple programming), movement (gears and motors, pneumatics), power (electricity: wind, solar, battery), and sensors (touch, light, sound, ultrasonic)
- Programming syntax, loops, sensors, and switches
- Problem solving process and various strategies that can be used
- How robots are (and could be) used in the real world to solve problems
- The Engineering Design Process: 1. Problem 2. Concept 3. Preliminary Design 4. Model 5. Communicate 6. Final Design
- What the parts of a robot are and how they work together
- Strategies for improving written, verbal, and visual communication

### Understand:

Overarching Understanding:

• Problem solving can help us design solutions that impact the world.

Specific Understandings:

- Decision making requires a process of gathering, analyzing, and applying information and ideas.
- The decisions that we make impact others. It is important to consider the implications and consequences of personal actions.
- The development of critical thinking and problem solving skills is a life-long endeavor.
- Through practice, we can grow in our ability to develop and communicate effective solutions to problems

Do:

• Gather information about robots and analyze their systems to determine interconnections

- Apply information about robots and programming to solve problems
- Develop positive collaboration skills as an active member of a Robot Design Team
- Use technology: LEGO Spike Essentials
- Communicate ideas clearly and persuasively to others
- Gather, organize, analyze, and apply information related to robotics.
- Recognize and solve problems through robotics.
- Think critically about how robotics can impact problems.
- Explain how the LEGO Spike Essentials computer program is a system.
- Use the Engineering Design Process to take an idea from conception to full working prototype.
- Communicate effectively through writing, verbal expression, and visual presentations to convey ideas and information about robotics.
- Work responsibly as individuals, group members, and leaders as they use EDP to develop robotic solutions to a real world problem.