REDESIGNING LEARNING TO PREPARE STUDENTS FOR SUCCESS IN LIFE

BEN GREY
CCSD59 ASSISTANT SUPERINTENDENT
A straw is placed into a rectangular box that is 3 inches by 4 inches by 8 inches, as shown in the accompanying diagram. If the straw fits exactly into the box diagonally from the bottom left front corner to the top right back corner, how long is the straw, to the nearest tenth of an inch?
PREPARING STUDENTS TO BE SUCCESSFUL FOR LIFE

OUR MISSION
PREPARING STUDENTS TO BE SUCCESSFUL FOR LIFE

LEARNING IN CCSD59

DISTRICT LEARNING OUTCOMES
BELIEFS/CONDITIONS

What we want all students to be able to do upon leaving D59
What do we believe about learning?
Under what conditions does deep and powerful learning occur?

LEARNING MAPS
IMPLICATIONS FOR DAILY PRACTICE

Structure Autonomy Resources
What instructional practices and structures will be present in our classrooms?

APPLIED CONTENT OUTCOMES
COMMITMENTS

How are the broad learning outcomes applied in various subject areas, programs, and at various levels?
Given our beliefs, what do we commit to that will drive our instruction, our support for staff, and be reflected in our learning maps.
http://tinyurl.com/greyice17
UNDER WHAT CONDITIONS DOES DEEP AND POWERFUL LEARNING OCCUR?
DISTRICT MISSION
PREPARING STUDENTS TO BE SUCCESSFUL FOR LIFE

OVERVIEW
Implementing our district mission means equipping each child with the skills necessary to thrive in the modern world. CCSD59 has identified nine outcomes which we believe are the foundational skills for success no matter what future path a student may choose or how the world and the workplace might change.

Overview
Access, Analyze, and Apply Information
Civic and Global Responsibility
Collaboration
Communicate Effectively
Creativity
Critical Thinking
Determination and Perseverance
Problem Solving
Self-awareness
## CREATIVITY

### DEFINITION
Process by which ideas are generated, developed, and transformed

### ELEMENTS

<table>
<thead>
<tr>
<th>Use personal understanding and experience to encourage innovation and transformation</th>
<th>PRE K-1</th>
<th>2-3</th>
<th>4-5</th>
<th>6-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognize personal experiences have value</td>
<td>Recognize value in the diverse experiences of others</td>
<td>Recognize value in the diverse experiences and perspectives of others</td>
<td>Collaborate to share and synthesize their experiences and perspectives with others to generate insight</td>
<td></td>
</tr>
<tr>
<td>Use understanding and experience to generate a process and/or product</td>
<td>Use understanding and experience to generate an innovative process and/or product</td>
<td>Reflect and identify what can be learned from various experiences</td>
<td>Reflect and identify what can be learned from various experiences</td>
<td></td>
</tr>
<tr>
<td>Understand how creativity impacts the world</td>
<td>Understand creativity can impact their immediate surroundings</td>
<td>Understand creativity can impact their local community</td>
<td>Use understanding and experience to generate multiple innovative processes and/or products</td>
<td></td>
</tr>
<tr>
<td>Understand creativity can impact the local community</td>
<td>Recognize creativity allows people to develop and share ideas and innovation</td>
<td>Recognize creativity allows people to develop and share ideas and innovation</td>
<td>Use understanding and experience to generate multiple innovative processes and/or products</td>
<td></td>
</tr>
<tr>
<td>Create worthwhile ideas and artifacts</td>
<td>Generate ideas and artifacts from models and prototypes</td>
<td>Generate unique ideas and artifacts from models and prototypes</td>
<td>Create and test prototypes of ideas and products</td>
<td></td>
</tr>
<tr>
<td>Generate ideas and artifacts from models and prototypes</td>
<td>Recognize their ideas and artifacts are meaningful</td>
<td>Recognize their ideas and artifacts are meaningful</td>
<td>Utilize feedback and self-reflection when creating</td>
<td></td>
</tr>
<tr>
<td>Acknowledge feedback</td>
<td>Acknowledge feedback and applies it to work</td>
<td>Anticipate obstacles to the idea/artifact creation process with support</td>
<td>Anticipate and troubleshoot obstacles to the idea/artifact creation process</td>
<td></td>
</tr>
<tr>
<td>Have the courage to explore</td>
<td>Take risks in an unfamiliar setting or situation</td>
<td>Show confidence to take risks in an unfamiliar setting or situation</td>
<td>Take calculated risks and adapt plans</td>
<td></td>
</tr>
<tr>
<td>Take risks in an unfamiliar setting or situation</td>
<td>Show confidence to take risks in an unfamiliar setting or situation</td>
<td>Persevere when facing challenges or setbacks</td>
<td>Show confidence and ability to take calculated risks and adapt plans</td>
<td></td>
</tr>
<tr>
<td>Persevere when facing challenges or setbacks with support</td>
<td>Persevere when facing challenges or setbacks with support</td>
<td>Display and maintain curiosity and flexibility</td>
<td>Persevere when facing challenges or setbacks</td>
<td></td>
</tr>
<tr>
<td>Display curiosity and flexibility</td>
<td>Display curiosity and flexibility</td>
<td>Display and maintain curiosity and flexibility</td>
<td>Display and maintain curiosity and flexibility</td>
<td></td>
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</tbody>
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APPLIED CONTENT OUTCOMES
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How are the broad learning outcomes applied in various subject areas, programs, and at various levels?
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LEARNING MAPS
IMPLICATIONS FOR DAILY PRACTICE

Structure
Autonomy
Resources

What instructional practices and structures will be present in our classrooms?
SCIENCE APPLIED CONTENT OUTCOMES

● USING OBSERVATIONS TO GENERATE QUESTIONS AND DEFINE PROBLEMS
● DEVELOPING AND USING MODELS
● PLANNING AND CARRYING OUT INVESTIGATIONS
● ANALYZING AND INTERPRETING DATA
● USING MATHEMATICS AND COMPUTATIONAL THINKING
● CONSTRUCTING EXPLANATIONS AND DESIGNING SOLUTIONS
● ENGAGING IN ARGUMENT FROM EVIDENCE
<table>
<thead>
<tr>
<th>Use observations to generate questions and define problems</th>
<th>PreK - 1</th>
<th>2-3</th>
<th>4-5</th>
<th>6-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Use senses to explore their environment</td>
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<tr>
<td>● Share observations</td>
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<tr>
<td>● Demonstrate curiosity</td>
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<tr>
<td>● Connect observations to personal experiences</td>
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<td></td>
<td></td>
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<tr>
<td>● Share and describe observations</td>
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<tr>
<td>● Ask questions based on observations</td>
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<tr>
<td>● Connect observations to a scientific understanding</td>
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<tr>
<td>● Ask relevant science questions</td>
<td></td>
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<tr>
<td>● Discuss potential problems based on observations</td>
<td></td>
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<tr>
<td>● Apply observations to scientific understandings</td>
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<tr>
<td>● Revise questions when needed</td>
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</tr>
<tr>
<td>● Identify and define a problem that can be researched or investigated</td>
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</table>
SCIENCE UNDERSTANDINGS

- PATTERNS (Observed patterns in nature guide and prompt questions about relationships)
- CAUSE AND EFFECT
- SCALE, PROPORTION, & QUANTITY
- SYSTEMS & SYSTEM MODELS
- FLOWS, CYCLES, & CONSERVATION
- STRUCTURE & FUNCTION
- STABILITY & CHANGE
## Observed patterns in nature guide and prompt questions about relationships

<table>
<thead>
<tr>
<th>Patterns</th>
<th>Pre-K-2</th>
<th>3-5</th>
<th>6-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>● There are patterns all around us. <em>(examples: nature, designs, classroom environment, life cycles, sun comes up in the day and moon in the night, dark clouds for rain, leaves fall off the trees and flowers grow each spring, shadows and sun, rings on trees, etc.)</em></td>
<td>● Scientists investigate changes in patterns that are observed over time. <em>(examples: Sea levels, flooding in coastal areas, erosion, sun-earth-moon patterns, patterns in changes in animal behavior and habitat, nocturnal, animal formations)</em></td>
<td>● Patterns are related to the natural world both macroscopically <em>(patterns in the solar system/weather)</em> and microscopically <em>(organisms, genetics)</em>.</td>
<td></td>
</tr>
<tr>
<td>● Scientists carefully observe to discover patterns, describe events, and make predictions.</td>
<td>● Similarities and differences in patterns can be used to sort, classify, communicate and analyze</td>
<td>● Patterns in data can provide information about systems.</td>
<td></td>
</tr>
<tr>
<td>● Scientists often use patterns as evidence of change.</td>
<td>● Patterns of change can be used to make predictions and can be used to support an explanation. <em>(examples: Seed germination, what if you manipulate or change pattern - what will happen?)</em></td>
<td>● Patterns can be used to identify cause and effect relationships.</td>
<td></td>
</tr>
<tr>
<td>● Graphs, charts and images can be used to identify patterns in data.</td>
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CCSD59
Science 1st Grade Learning Experience 1

District Created  Subject: Science  Grade: 1  Duration: 8+ weeks  Learning Experience: 1

Overview

District Outcomes

- Creativity

Applied Outcomes

- Plan and Carry Out Investigations

Understanding

- Structure and Function

Summative Assessment

Students will plan and carry out a new investigation by using creativity and will explain their findings at the end of their investigation. (ex: Building a bridge, etc.)

Summative Assessment Rubric
# Science 1st Grade Learning Experience 1

**District Created**  |  **Subject:** Science  |  **Grade:** 1  |  **Duration:** 8+ weeks  |  **Learning Experience:** 1

## Overview

### District Outcomes
- Creativity

### Applied Outcomes
- Plan and Carry Out Investigations

### Understandings
- Structure and Function

## Essential Questions

How does the way an object is shaped or structured determine many of its properties and functions?

How are discoveries made through trial and error?

## Experience at a Glance

Experience focusing on trial and error, primarily through engineering, through the science lens of structure and function. Students will begin by carrying out an investigation on paper airplanes, and then they will move to creating and investigating boats. From boats students will apply their learning to creating parachutes to protect hard boiled eggs during an egg drop. The summative assessment will combine all elements and provide students choice in creating an object with chosen structure to perform a specified task.

*Language Learner Considerations and Elements*

## Lesson Sequence
<table>
<thead>
<tr>
<th>LESSON 1</th>
<th>LESSON 2</th>
<th>LESSON 3</th>
<th>LESSON 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper Airplane Investigation</td>
<td>What Scientists Do</td>
<td>Exploring Materials: Sink or Float</td>
<td>Scientist Make a Plan for Their Investigation</td>
</tr>
<tr>
<td>View Lesson</td>
<td>View Lesson</td>
<td>View Lesson</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LESSON 5</th>
<th>LESSON 6</th>
<th>LESSON 7</th>
<th>LESSON 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientist Make Predictions and Carry Out Investigations</td>
<td>Scientist Carry Out Investigations: Focusing on Trial/Error</td>
<td>Scientist understand each structure has a function</td>
<td>Trial/Error Day: How does the structure of your model help it to float?</td>
</tr>
<tr>
<td>View Lesson</td>
<td>View Lesson</td>
<td>View Lesson</td>
<td>View Lesson</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>LESSON 9</th>
<th>LESSON 10</th>
<th>LESSON 11</th>
<th>LESSON 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition Day</td>
<td>Reflection: Scientists reflect on their findings. Compare predictions with observations.</td>
<td>Launch Day: Building Parachutes</td>
<td>Building Day: Carry on investigation; build and test models.</td>
</tr>
<tr>
<td>View Lesson</td>
<td>View Lesson</td>
<td>View Lesson</td>
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</tbody>
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<thead>
<tr>
<th>LESSON 13</th>
<th>LESSON 14</th>
<th>LESSON 15</th>
<th>LESSON 16</th>
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</table>
**LESSON OUTCOME**

Plan and carry out investigation with paper airplanes to launch overall learning experience.

**LESSON EVENTS**

**Connection:** Before I, (ex: throw a party, take a trip, write a story, cook a new recipe) I need to make a plan.

**Teach (inquiry):** “Today I want to teach you that scientists plan and carry out investigations. We are going to design paper airplanes that are able to fly from the starting line to the finish line.”

**Oracy - el plan, los científicos, las investigaciones, diseñar/el diseño, el modelo, la observación. Plan, scientists, investigations, design, model, and observation.**

Begin the anchor chart: What Do Scientists Do? (Add plan and carry out investigations)
Active Engagement: Discuss experiences with paper airplanes. “How did you learn how to a paper airplane? Turn and share with a partner all you know about making paper airplanes.”

Link: “Before you make your airplane, you will need to make a plan. As you go off, think about how you can plan the best possible airplane that will fly from the starting line to the finish line.

Purposeful Practice: Students plan their airplane models by drawing, researching, or discussing with friends. (They can make more than 1 prototype.) Teacher observes the process and uses rubric to pre-assess outcomes.

Students take turns launching their airplanes from a starting line to a finish line. Group can record how many made it to the finish line vs. how many did not.

Share: Students take turns launching their airplanes from a starting line to a finish line. Group can record how many made it to the finish line vs. how many did not.

**Sentence Frame**

I tried _________ and observed _________.

Yo probé _________ y observé _________.

*Important Note: Send home letter asking for materials for the boat creation that will start in lesson 5. You can use the letter here as a template.*

**Evidence of Understandings**

Students plan their airplane models by drawing, researching, or discussing with friends. (They can make more than 1 prototype.) Teacher observes the process and uses rubric to pre-assess outcomes.
DEMO
(MAYBE)