Quick-View Material from the Presentation and Beyond

<table>
<thead>
<tr>
<th>Related NGSS Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K-2-ETS1-3 Engineering Design</strong> <em>(Grades K-2)</em></td>
</tr>
<tr>
<td>• Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.</td>
</tr>
<tr>
<td><strong>3-5-ETS1-3 Engineering Design</strong> <em>(Grades 3-5)</em></td>
</tr>
<tr>
<td>• Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</td>
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<tr>
<td><strong>2-PS1-2 Matter and Its Interactions</strong> <em>(Grades K-2)</em></td>
</tr>
<tr>
<td>• Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.</td>
</tr>
<tr>
<td><strong>5-PS1-3 Matter and Its Interactions</strong> <em>(Grades 3-5)</em></td>
</tr>
<tr>
<td>• Make observations and measurements to identify materials based on their properties.</td>
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<tr>
<td><strong>TECHNOLOGY ISTE 3a</strong> Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.</td>
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<tr>
<td><strong>VISUAL ART TEKS Arts §117.108. Art, Grade 2 (b)</strong> The student is expected to</td>
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</table>
(1) (B) identify the elements of art, including line, shape, color, texture, form, and space, and the principles of design, including emphasis, repetition/pattern, movement/rhythm, and balance.

(3)(C) analyze how art affects everyday life and is connected to jobs in art and design; and

(D) relate visual art concepts to other disciplines.

Common Core

- E.g., MATHEMATICS CCSS.Math.Content.3.MD.B.4
  - Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

- E.g., LANGUAGE ARTS CCSS.ELA-Literacy.RL.3.10
  - By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2-3 text complexity band independently and proficiently.

SOCIAL STUDIES NCSS Theme 3: People, Places, and Environments

- The study of people, places, and environments enables us to understand the relationship between human populations and the physical world.

Websites for Teacher Background Knowledge/Lesson Prep

Bridges as Art
Elements of Art
NSTA – What Kinds of Engineers Build Bridges?
Types of Bridges: The 7 Main Types

Websites to Use During the Lesson

Display examples of bridges from around the world (photos)
Popular Mechanics – These are the 30 Most Impressive Bridges in the World (photos)
What Makes Bridges So Strong? (video)

Safety Note

After planning and designing a bridge using the Engineering Design Process chart and sketching it on paper, depending on the age group, older children could work with pliers and metal wires from the hardware store to construct bridges.

Be sure to provide:
- goggles
- gloves
- instructions and
- guidance/supervision.

### Paintings/Art

<table>
<thead>
<tr>
<th>Artist</th>
<th>Title</th>
<th>Year, Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claude Monet</td>
<td>The Japanese Footbridge</td>
<td>1899, oil/canvas</td>
</tr>
<tr>
<td>Vincent Van Gogh</td>
<td>Fishing in Spring</td>
<td>1887, oil/canvas</td>
</tr>
<tr>
<td>Vincent Van Gogh</td>
<td>Bridges across the Seine at Asnieres</td>
<td>1887, oil/canvas</td>
</tr>
<tr>
<td>Katsushika Hokusai</td>
<td>Fireworks in the Cool of Evening at Ryogoku Bridge in Edo</td>
<td>1789, woodblock print</td>
</tr>
</tbody>
</table>
### References

Blockley, D. (2010). *Bridges: The science and art of the world’s most inspiring structures*. Oxford University Press.


### Resources


