



## Column: Elementary Explorations Linking Art and Science

Kristen Poindexter

### Abstract

There are so many ways to bring art into science in the elementary classroom. That can be as simple as sketching a diagram of something a student notices in an outdoor space to designing and building models that show how a science topic works. As you look through the NGSS, there are many examples of this across the K-5 spectrum. Included are examples of NGSS standards that show where opportunities for art can be included along with several classroom examples.

There are many ways to bring art into science in the elementary classroom. It can be as simple as sketching a diagram of something a student notices in an outdoor space to designing and building models that show how a science topic works. As you look through the Next Generation Science Standards (NGSS), there are examples of this across the K-5 grade levels. Scientists, across all disciplines, create models and representations daily in their work. The NGSS were designed for students to engage in the role of being a scientist by creating their own representations.

Model building and design also live outside the Engineering Design standards, so when looking for opportunities to bring in some options for art to your classroom, be sure to look at other areas as well. For example, standard 4-PS4-2 asks students to model light reflecting, you could provide students with opportunities to explore with flashlights and mirrors. Exploring with these items first allows students to give input on how the final model could look. Standard 3-LS1-1 would be an opportunity to give students a variety of materials to build models of organism lifecycles and compare them with their peers. Here are a few examples listed with their grade or grade bands and indicators:

### [2-ESS2-2 Earth's Systems](#)

Develop a model to represent the shapes and kinds of land and bodies of water in an area. Grade: K-2, 2

### [K-2-ETS1-2 Engineering Design](#)

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. Grade: K-2, K, 1, 2

### [3-LS1-1 From molecules to Organisms: Structures and Processes](#)

Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction, and death. Grade: 3-5, 3

### [4-PS4-1 Waves and Their Applications in Technologies for Information Transfer](#)

Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. Grade: 3-5, 4

### [4-PS4-2 Waves and Their Applications in Technologies for Information Transfer](#)

Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. Grade: 3-5, 4

### [4-LS1-2 From Molecules to Organisms: Structures and Processes](#)

Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. Grade: 3-5, 4

### [5-PS1-1 Matter and Its Interactions](#)

Develop a model to describe that matter is made of particles too small to be seen. Grade: 3-5, 5

### [5-PS3-1 Energy](#)

Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. Grade: 3-5, 5

Full listing of authors and contacts can be found at the end of this article.



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In my classroom, when students studied weather, one student noticed that there usually seemed to be a hexagon in the middle of each snowflake we studied. Students asked if they could use materials from around the classroom to create their own snowflakes! In this case, students used materials from our Loose Parts baskets and mimicked the symmetry they noticed in snowflakes. Even though they noticed the hexagon in the middle of the snowflakes we studied, most students focused on the symmetry and included 7 or more branches in the first models they made of snowflakes. This activity helped us transition into discussing K-ESS3-2, Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to severe weather.

When hovering over the first part of the linked standard (asking questions to obtain information) more information about how this might look or sound pops up (Figure 1). These pop-up areas are some of the most helpful, as they break down what a student might do or how the teacher can respond with an activity that would help students understand.

As I observe students create their own snowflakes, I take observational notes of the design on each snowflake, including the number of branches it has and if it is symmetrical. I am also noting the students' ability to ask questions about the snowflakes; anything that



Figure 2. Snowflake building activity.

might clue me into what they would like to know more about and what information they already know. This snowflake building opportunity was a way that students could explore the art side of science while still learning about the factual weather content (Figure 2).

In spring, when we studied flowers, seeds, and pollinators, students created representations of flowers that included ways that flowers could disperse seeds or attract pollinators. Several students also included details that showed what needs plants have (sun, water, soil). Most examples included the basic parts of a plant as well. In addition to demonstrating their knowledge, they were also able to engage in creating art using found and recycled objects. The standards listed below, K-ESS3-1 and 2-LS1-2 both allow for art and science to be combined. Students can use art materials to create models of the relationships between plants and animals or use materials to create a model that shows one way seeds are dispersed by animals or how plants are pollinated. Each activity would allow students to be creative in their model making and demonstrate their understanding of how ecosystems work at a developmentally appropriate level. (Figures

**K-ESS3-1 Earth and Human Activity**

Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live. Grade: K-2, K

**2-LS1-2 Ecosystems: Interactions, Energy, and Dynamics**

Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.\*Grade: K-2, 2

Students who demonstrate understanding can:	
<b>K-ESS3-2.</b>	<b>Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.*</b>
[forms of severe weather.]	
The performance	ing elements from the NRC document
<b>Science</b>	<b>Engineering</b>
<b>Asking Questions and Defining Problems</b>	<b>Obtaining, Evaluating, and Communicating Information</b>
Asking questions and defining problems in grades K-2 builds on prior experiences and progresses to simple descriptive questions that can be tested.	Obtaining, evaluating, and communicating information in K-2 builds on prior experiences and uses observations and texts to communicate new information.
<ul style="list-style-type: none"> <li>Ask questions based on observations to find more information about the designed world.</li> </ul>	<ul style="list-style-type: none"> <li>Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.</li> </ul>
<b>Crosscutting Concepts</b>	<b>Connections to Engineering, Technology, and Applications of Science</b>
<b>Cause and Effect</b>	<b>Interdependence of Science, Engineering, and Technology</b>
<ul style="list-style-type: none"> <li>Events have causes that generate observable patterns.</li> </ul>	<ul style="list-style-type: none"> <li>People encounter questions about the natural world every day.</li> </ul>
	<b>Influence of Engineering, Technology, and Science on Society and the Natural World</b>
	<ul style="list-style-type: none"> <li>People depend on various technologies in their lives; human life would be very different without technology.</li> </ul>
<b>Connections</b>	
<b>K.ETS1.A</b>	
<b>2.ESS1.C</b>	
<b>Common Core ELA/Literacy</b>	

Figure 1. Practices in an NGSS Standard





**Figure 3.** Student representation of flowers



**Figure 4.** Student representation of flowers



**Figure 5.** Student representation of flowers

In the older elementary grades, it may prove to be more difficult to make time for extended art projects, however, it is so important that students have the time, when possible, to create models and diagrams so they can further demonstrate their understanding of topics. We have all had students who may not readily volunteer answers in a large or even small group setting, but they shine when given the opportunity to create art or detailed entries in a science notebook. Including sketches and drawings in science notebooks helps students increase their understanding of topics and it gives them a resource to refer to as needed.

Next time you review the science standards, be sure to look for words that invite art in; model, design, build, create, show. We have been given a gift in these standards, the gift to allow our students to replicate the work practicing scientists are doing in their own work. Don't forget to pass on this gift to your students and allow them the time to create art during science!

Kristen Poindexter is a veteran Kindergarten teacher in Indianapolis, Indiana. Her passion is Science and she loves to share that love with her Kindergarten students. Kristen is the recipient of the 2014 National Shell Science Teaching Award and the recipient of the Presidential Award for Excellence in Math and Science Teaching. She is a frequent presenter at district, state, and national conferences and shares how she incorporates Science into her Kindergarten classroom. Kristen uses lots of technology in her classroom and integrates it into all subject areas.

### Author

Kristen Poindexter (kpoindexter@msdwt.k12.in.us) is a Kindergarten teacher in MSD Washington Township, Indianapolis, Indiana, USA.