

## Data + Design

Forget bar graphs and pie charts!  
Data recorded as design creates a STEAM-y  
relationship between art and science.

(art + science, art + math)

In a time when information is so plentiful that it's nearly overwhelming, some artists are inspired by data and brandish it as an artistic tool. A 21st century artist, surrounded by the unprecedented knowledge that technology provides, has the power to collect, organize, translate, and express that knowledge according to their own unique ideas.

Artist Nathalie Miebach translates scientific data related to astronomy, ecology, and meteorology into woven sculptures and also musical scores. She creates a basket-like armature that functions as a grid for data points in a 3-dimensional space.

David McCandless is an artist and author of "Information is Beautiful" and other books — all with the theme of visualizing data. Often referred to as "infographics," his designs compress a complex amount of data into a visual statement that can be easily processed by the viewer's eye. "What I love," says McCandless, "is finding hidden patterns; I love being a data detective."

As a lesson in developing and assigning patterns, students can select a set of data that interests them, and then create designs on graph paper that reflect the different data points. Once multiple patterns reflecting data have been created, the patterns can be assembled into a puzzle-like presentation or collage.

Whether or not the viewer is able to "read" the data is a decision that must be made by the artist. The completed piece might include text to bridge the information with the design and clearly communicate the data to the viewer. Or the artwork might be an entirely visual expression of patterns, colors, and shapes.

Whichever approach is taken, each "data detective" will collect information, design patterns, create arrangements, and develop a piece of visual communication.

**GRADES 5-12** Note:  
Instructions and materials are  
based upon a class size of 24  
students. Adjust as needed.

### Preparation

1. Collect data sets. Each student should collect multiple data sets, or subsets within a particular theme. For example, a weekly weather forecast would include data for temperature highs and lows, precipitation, humidity, wind speed, and other data.



### Materials (required)

[Beinfang Gridded Paper](#), 4 x 4 Grid, 11" x 17" (10613-1016); plan on two sheets per student

[Sargent Art Dual Tip Markers](#), set of 24 (00876-1024); share six sets across class

[Elmer's X-treme School Glue Stick](#), 1.4 oz (23894-1014); share one between two students

[Pacon Railroad Board](#), 6-ply, 50 sheet assortment, 11" x 14" (13105-0659)

[Fiskars Sparkle Softgrip Non-Stick Student Scissors](#), 7" (57666-1007); need one pair per student

[Blick Aluminum Ruler](#), 12" (55430-1012); need one per student

### Materials (optional)

[Scratch-Art 3D-O's](#), package of 400 (14904-1003)

[Staedtler Triangular Colored Pencils](#), set of 24 (22452-1249)





## Preparation, continued

Some ideas for data collection:

- **Research** records, statistics, and documentation. Scientific, medical, historical, social, and cultural data is abundant and can be easily discovered by searching online, or in books or magazines.
- **Observe** surrounding environment and record findings. Look for behaviors, occurrences, or specific things that can be counted.
- **Interview** others to collect opinions or experiences, or ask for responses through a survey.

## Process

1. Begin with a single set of data such as temperature high readings over a week. Using markers, pens, or colored pencils on gridded paper, create a simple pattern that represents the high temperature for the first day recorded. Make the pattern large, at least 2" on one side, although it doesn't need to be confined to a square or rectangle. Try not to think in terms of bar graphs.

If the high temperature was 80°F on the first recording, the pattern could be designed simply as this:



The pattern doesn't necessarily indicate anything about the data, it just records it using a visual symbol.

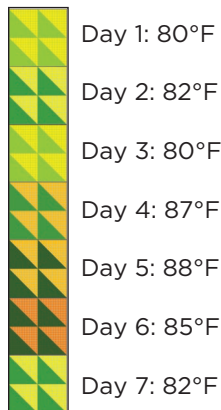
2. Move to the second recording and repeat the pattern. If the data changes, alter the pattern in some way to represent a change. For example, if the high temperature on Day 2 was 82°F, the color, direction, or structure of the pattern might change to this:



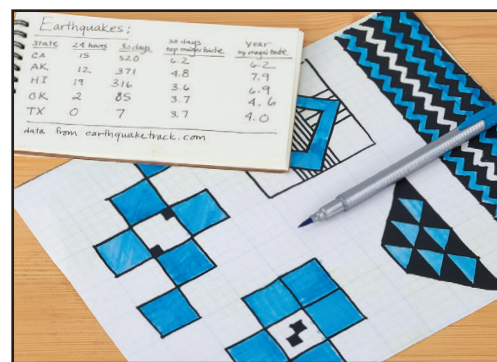
The pattern remains similar, because it is representing the same data set (temperature highs), but it changes because the data has changed.

If Day 3 has a data recording of 80°F again, the original pattern repeats. If the data has changed, the pattern is changed.

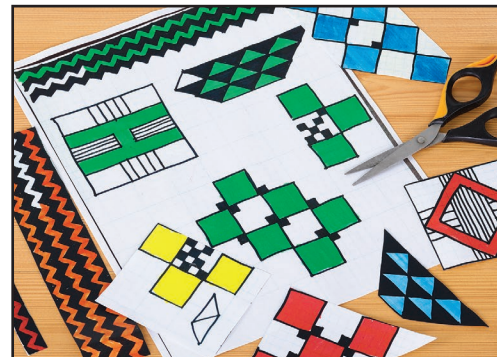
This example shows a pattern representing a week's data:



3. Create a new pattern for the next set of data in the same way. For this example, the next set might be the daily low temperatures. Continue until patterns are designed for all data sets.
4. Cut out, arrange, and glue patterns onto rigid cardstock or posterboard. As an option, use folds or 3-D O's to make pop-out sections.



**Step 1:** Collect data and design a pattern to represent each data set.



**Step 2:** Repeat the pattern for each data recording, altering it slightly for each recording that is different.



**Step 3:** Glue the graph paper designs onto rigid board and arrange the data sets into a cohesive, collage-like artwork.

## National Core Arts Standards - Visual Arts

### Creating

**Anchor Standard 1:** Generate and conceptualize artistic ideas and work.

### Connecting

**Anchor Standard 10:** Synthesize and relate knowledge and person experiences to make art.

### Responding

**Anchor Standard 7:** Perceive and analyze artistic work.

**Anchor Standard 8:** Interpret intent and meaning in artistic work.