

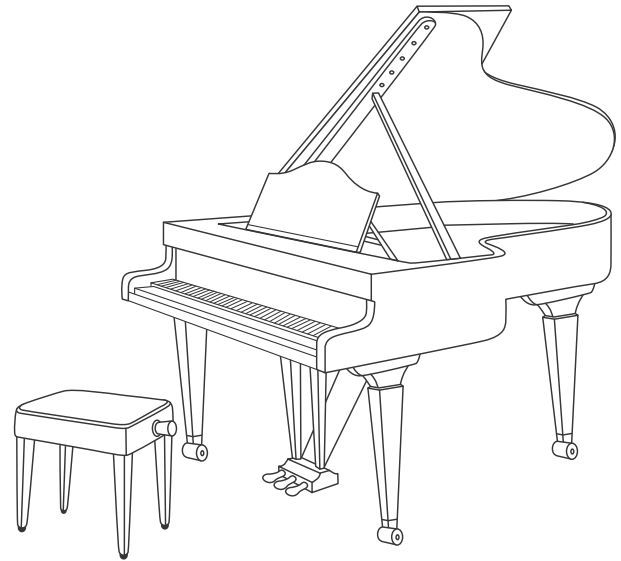
Name _____

Pick a Project

Project 15A

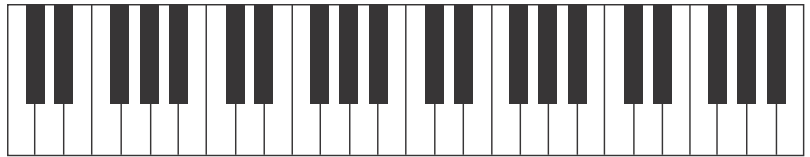
Piano Keyboards

Some of the most beautiful music in the world is played on the piano. Modern pianos come in a variety of shapes and sizes. The largest piano is called a grand piano. Standard grand pianos used in concerts are usually about 5 feet wide and 9 feet long. The large size helps create the variety of rich sounds it makes.



When you look at any kind of piano, one of the first features you see is the set of black and white keys. When a musician pushes down on a key, a small hammer hits a string to make the sound. There are 230 strings that make the full range of piano sounds.

The set of piano keys is known as a keyboard. The keyboard was reversed when Bartolomeo Cristofori first invented the piano around 1700. It had black keys with smaller white keys between them. They were switched because the black keys blended together. It made it hard to pick out the right key.



Your Project Learn More About Keyboards

No matter what the size of the piano, there is a pattern that relates the number of black keys to the number of white keys. Use a piano keyboard or research a picture of one. Look for a pattern. Make a chart that relates the number of black keys to different numbers of white keys. Figure out how often the pattern repeats.

Now do some research on xylophones, harpsichords, and marimbas. Find out what makes them like piano keyboards and what makes them different.

Summarize your findings in a report. Be sure to include drawings or pictures.

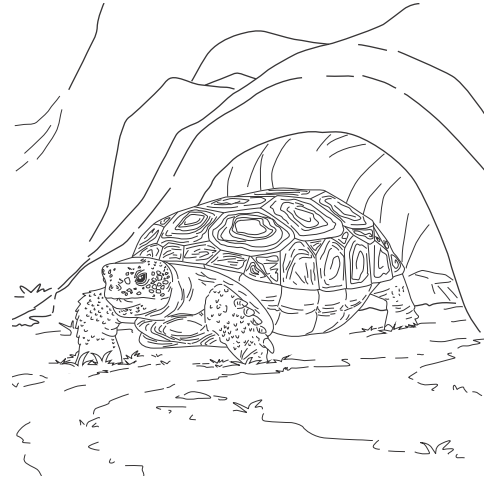
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Project 15B

Gopher Tortoises

If you catch sight of a slow-moving shell coming out of a hole in the ground, you might have found a gopher tortoise. A gopher tortoise is a reptile that lives in dry-land habitats throughout Alabama, Florida, Georgia, Louisiana, Mississippi, and South Carolina. They dig deep tunnels, or burrows, in the ground. The tortoises use the tunnels to stay safe from predators, which are animals that want to eat them. The tunnels also keep them safe from storms and sunlight.



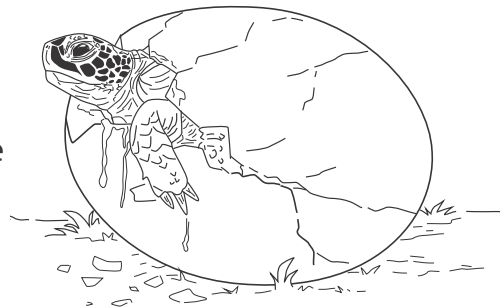
Many other animals also live in the burrows the tortoises dig. These animals could not survive without the gopher tortoise. This makes the gopher tortoise very important to other living things in its environment.

The gopher tortoise is considered threatened. That means that the number of tortoises is decreasing, but they are not yet in danger of totally disappearing. State and federal laws protect gopher tortoises. For example, in Florida, gopher tortoises must be moved to a new home before the land where they live can be cleared for building. Homeowners must have a permit before capturing tortoises.

Your Project Use Information to Write Problems

A lot is known about the gopher tortoise. Research more about them, such as how their shells were used, the lengths of the burrows the tortoises dig, or how their size changes from birth to adult.

Use the facts you find about gopher tortoises to write 1-2 interesting problems that involve patterns. Exchange your problems with a classmate and see if your problems are clear and solveable. Make changes as needed.



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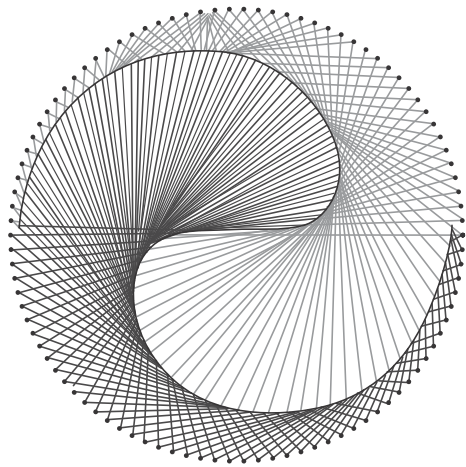
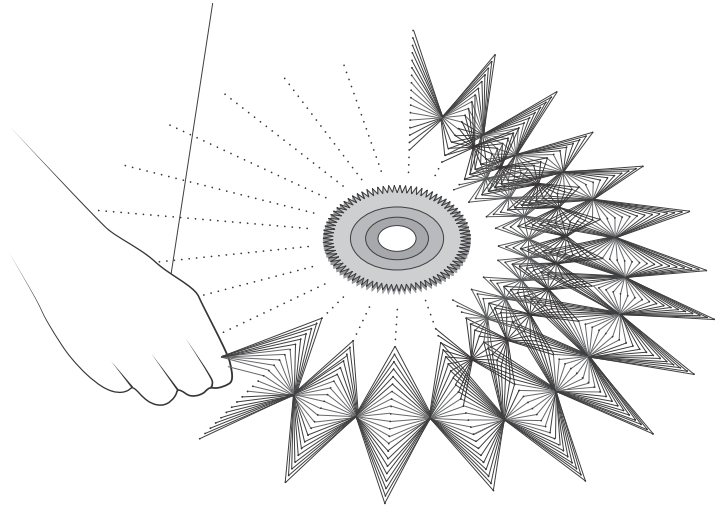
Pick a Project

Project 15C

String Art

Have you ever heard of string art? It is a form of art that uses colored string to make images. The strings are wound around nails, pins, or pegs to create amazing patterns.

Some artists use string art to show pictures of animals or plants. Some make other objects, such as boats and cars. Still others use string art to show patterns in math. String art can use combinations of straight lines to create curves. The artist follows a pattern to wind the string so it overlaps.



String art did not start out as art at all. In the early 1900s, an English teacher named Mary Everest Boole used it to teach mathematics to children. Several mathematicians then described the patterns of the curves. One even applied them to designing cars. Later, the American artist John Eichinger was inspired by the math curves to create modern string art.

Your Project Create a Work of String Art

Using a paper plate or a square piece of cardboard, cut an even number of small slots (about quarter-inch) evenly spaced around your plate or piece of cardboard. On the backside, number the slots starting with 1. Decide on a pattern for connecting your numbered slots with string or yarn. Continue your pattern until you see a design.

Share your work with the class. Describe the pattern you used.