

# Quadrilateral Nutcrackers

## Math + Art + Holidays = Fun Learning for Kids!

by Jenny Knappenberger

**A**s an art teacher, I am always trying to find ways of avoiding the infamous “turkey hands” for our holiday projects, and looking to find ways of integrating art with the core subjects to help support our students’ comprehension whenever possible.

One year, I decided to take a popular lesson I had developed on quadrilateral robots and rework it for the holidays. Voilà! Quadrilateral nutcrackers! I thought if math and art were fun, then math, art and the holidays would be even more fun—and it was. The impact these lessons had on the classroom teachers in my school was something I’ll never forget. They were so grateful that I would help our students by reinforcing quadrilaterals through our art projects.

I often give my students “challenges” where there are certain rules the children have to follow—sort of Sol LeWitt style (he often gave himself boundaries for his work). For this lesson, I set the challenge that students could only use quadrilateral shapes; squares, rectangles, rhombuses, parallelograms, trapezoids and kites to create a two-dimensional holiday nutcracker.



I often give my students “challenges” where there are certain rules the children have to follow—sort of Sol LeWitt style (he often gave himself boundaries for his work). For this lesson, I set the challenge that students could only use quadrilateral shapes; squares, rectangles, rhombuses, parallelograms, trapezoids and kites to create a two-dimensional holiday nutcracker.

**For display, I added definitions of quadrilateral shapes in the form of “gifts.”**

### LEARNING OBJECTIVES

#### Elementary students will ...

- identify quadrilateral shapes.
- cut construction paper to create quadrilateral shapes.
- design an original nutcracker using only quadrilateral-shaped construction paper.
- identify connections between the visual arts and math.

### NATIONAL ART STANDARDS

- **CREATING:** Conceiving and developing artistic ideas and work.
- **PRESENTING:** Interpreting and sharing artistic work.
- **RESPONDING:** Understanding and evaluating how the arts convey meaning.
- **CONNECTING:** Relating artistic ideas and work with personal meaning and external context.

### MATERIALS

- 12" x 18" dark construction paper
- Pencils, rulers
- 6" x 9" construction paper in a variety of colors
- Glue sticks or white glue, scissors



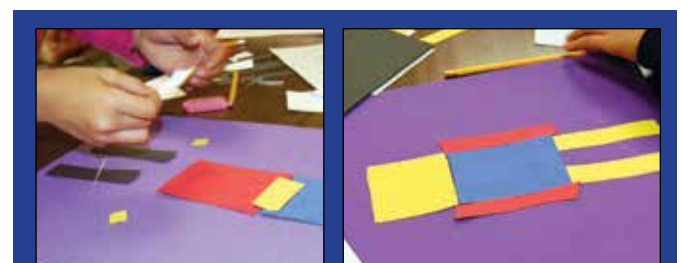
**OUR PROJECT** I brought to class my collection of actual holiday nutcrackers for my students to observe and talk about. We discussed all the things we noticed—shapes (quadrilaterals), colors, lines and even how each nutcracker seemed to have a theme.

I used this informal pre-assessment to gauge where each class was with their understanding of quadrilaterals. As we discussed the shapes, I started to draw squares, rectangles, trapezoids, rhombuses, parallelogram and kites onto the white board.

I then started to dig deeper to see what they really knew about quadrilaterals beyond simply identifying them. For example, a square has four sides of equal length and each corner is a 90-degree angle. You’ll be shocked how much they know about quadrilaterals—I certainly was.

**HERE ARE SOME DEFINITIONS** that might help out a little bit in the discussions:

- **Trapezoid:** *A shape with four sides. It has only one pair of parallel sides.*
- **Kite:** *A shape with four sides. It has adjacent sides of*   
*see **QUAD** on page 18*



**Give students time to work through their design. When they are absolutely sure of their design, they may glue down the pieces.**



Go to [artsandactivities.com](http://artsandactivities.com) and click on this button for a list of Common Core Math Standards related to this lesson.

## QUAD

continued from page 12

equal length.

- Parallelogram: A shape with four sides.

Its opposite sides are of equal length, and parallel, and its opposite angles are the same.

- Rhombus: A shape with four sides of equal length. Its opposite sides are parallel and its opposite angles are the same.
- Rectangle: A shape with four sides. It has opposite sides of equal length and opposite sides that are parallel. Each corner is a right angle (90 degrees).
- Square: A shape with four sides of equal length. Its opposite sides are parallel and each corner is a right angle.

**CREATING THEIR ARTWORK!** Each student received a 12" x 18" sheet of dark purple construction paper for their background, so the colors of their nutcracker could really “pop” off the page. I then provided each group of students with a variety of colored construction paper (don’t get tempted to pre-cut the shapes). If you want, you can choose a color scheme for the nutcrackers. For example, the nutcrackers could be created of only primary colors or they could use only secondary colors. If you are working with older students then, of course, you could make the color scheme more complex—or let them choose.

Some students liked to draw the quadrilateral shapes with a pencil first and then cut them out and others liked to cut the shapes directly out from the paper. One issue that always comes up during this lesson is proportions. Students quickly learn that if they make the first shape of their nutcracker really large then the entire design will be large—possibly too large to fit the paper and vice versa if the first shape is too small.

Hold off on giving out the glue—

you don’t want students to glue until they’ve had some time to play around and design their quadrilateral nutcrackers. Give them plenty of time to work through their design with some planning and thought. When they are absolutely sure of their design, they can start gluing down the pieces.

I always walk around and talk with my students as they create their art. This lesson is really neat because when students realize that their art teacher also knows a bit about math they are pretty surprised—a great real-world example of art integration at work! As I walk around I asked deep thinking questions like, “Is a rectangle a square?” Then I just walked away and let them discuss this as they worked.

### BENDING THE RULES JUST A LITTLE

... I was a stickler for the rules of the “challenge” for this project—only using quadrilateral shapes to create the nutcracker. However, I did bend a little on the hair of the nutcracker because it’s so distinct. I couldn’t help it—the kids begged me! You know how that goes.

**ENHANCEMENT** To help make this lesson even more memorable, I played a recording of Tchaikovsky’s “Nutcracker Suite” while the students made their art. A few of my kids recognized this from their music class, which enabled a whole new line of relevant conversation.

I hope your students enjoy this as much as mine did. Children love to make connections between art and their core subjects. ■

*Jenny Knappenberger has taught art to middle school, elementary and gifted children in Virginia and Arizona. Visit her website at [www.jennyknappenberger.com](http://www.jennyknappenberger.com).*

