

# Using Creative Technologies in Elementary Math



**New approaches to math  
fluency through the use of  
creative technology tools**

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# Making in Math

Build number sense and problem-solving with virtual manipulatives, art, play, and creative technology tools.



*“Limiting the use of creativity in the classroom reduces mathematics to a set of skills to master and rules to memorize. Doing so causes many children’s natural curiosity and enthusiasm for mathematics to disappear as they get older, creating a tremendous problem for mathematics educators who are trying to instill these very qualities.”*

*Hartwig Meissner, Creativity in Mathematics Education*

Most adults remember math instruction as listening to a teacher’s explanation followed by lots of rote practice. This focus on memorizing procedures without context and deep understanding resulted in an adult population that largely feels they are “bad at math.” This negative memory has resulted in a profound cultural dislike of math, contributing to our current situation of too few

students choosing to become much-needed mathematicians and engineers.

Changes elicited by new Common Core State Standards and the growing popularity of the Singapore Math approach have generated significant change to math instruction in the elementary classroom. Rather than an approach that focused on finding the answer to  $4+4$ , students are now asked to share many ways they can make the value 8.

While  $4+4$  will likely be the first option shared, it won’t take long for students to come up with other factors like  $2+6$ ,  $1+7$ , and  $3+5$ . Students may not be able to define the commutative property of addition, but they will realize that  $6+2$ ,  $7+1$ , and  $5+3$  are also valid responses.

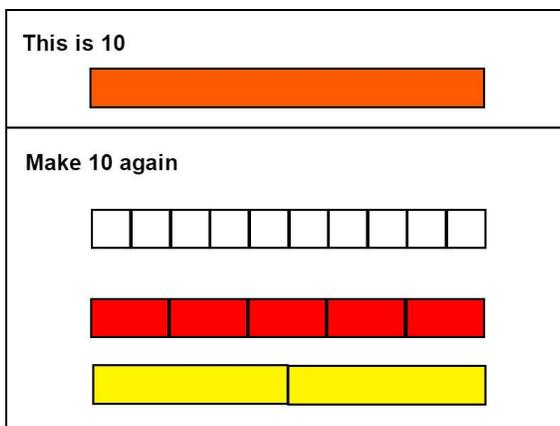
More time is required for students to begin producing responses like  $12-4$ , but instead of telling students what

to think, teachers now give them time to reason. As soon as an alternative to simple addition is suggested, the wave of new solutions grows almost exponentially.

A renewed focus on students explaining their work helps teachers determine whether learners understand concepts. Time that used to be spent on rote repetition of a procedure is now spent on arranging, rearranging, and thinking about a problem. The implicit message of “what’s another way” is accepted so long as students can demonstrate the mathematical thinking behind their suggestions.

### Using Virtual Manipulatives

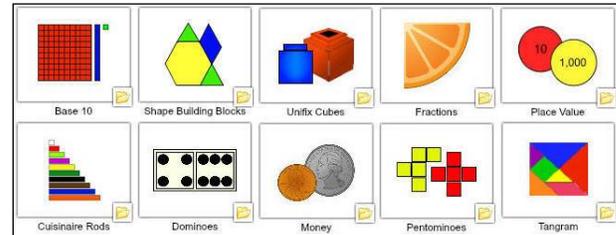
The use of base-ten blocks and Cuisenaire rods, created in the 1920’s, are not new. Their use in modern classrooms provides students a way to conceptualize numbers in a variety of ways. These tangible objects are called manipulatives.



If you are unfamiliar with the term, think about counting money. With money, each physical coin represents a value. Manipulatives like these provide a way for students to see and feel a mathematical concept by manipulating it. This hands-on, visual approach has been shown to have a positive effect on student achievement. (Ruzic & O’Connell , 2001)

The prevalence of technology in the classroom introduces the concept of virtual manipulatives. Although they are not tangible, digital manipulatives can still be grouped and regrouped to create models that help students see and internalize mathematical concepts.

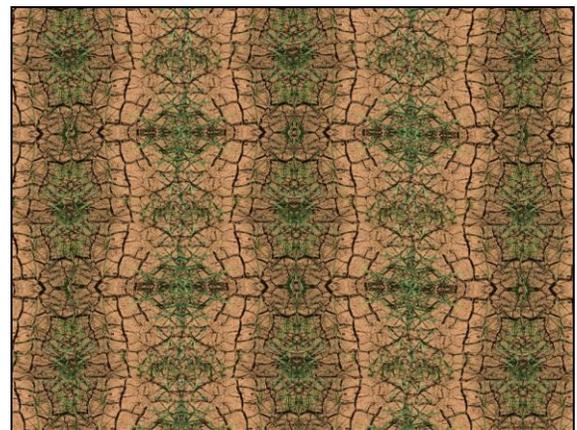
In the same way that student can move Cuisenaire rods on a table to form equal values; students can arrange representations to achieve the same effect using a computer. As they see and play with different ways to formulate the same value, they build stronger number sense and a better conceptual understanding of factors.



As students play with virtual manipulatives, they build cognitive models that teachers can actually see, allowing them to quickly perform formative assessments and identify misconceptions.

### Virtual manipulatives for play

Virtual manipulatives offer easy opportunities for constructing with shapes. As students participate in this type of play , they naturally sort, compare, match, and begin to create patterns, exactly the sort of mathematical thinking outlined in the Common Core State Standard for Mathematical Practice: 7. Look for and make use of structure.

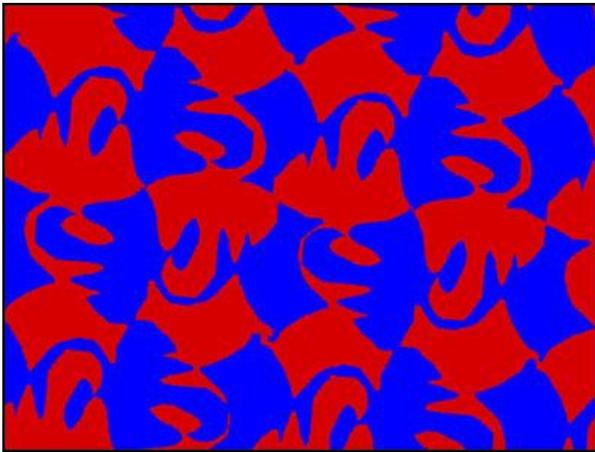


Dr. Walter Drew and Dr. Henry Olds found benefits to building mathematical thinking as students first build patterns with physical shapes and then continue their work with the resulting patterns on the computer where they experimented further “in an environment where the risk factor is substantially reduced.

Trying out ideas is faster and easier and mistakes or wrong turns are easily undone” when students work with virtual manipulatives. The resulting iconic pattern play helps students begin to understand how to apply elements of geometric patterns like rotation and reflection in a way that is both engaging and beautiful.

### Connecting math to art

Using art is a great way to help students see the beauty of math as well as help them connect math to the world around them. Most students have seen tessellations in tiled bathrooms, kitchens, or courtyards. Many are also familiar with the work of M.C. Escher. Students can use the paint tools in programs like Wixie to create tiling patterns as well as their own original tessellations.



Wixie’s paint tools also let students play with symmetry in photos and even paint using linear and radial symmetry.



As they play with math on the computer through art and virtual manipulatives, students begin to create and solve their own problems. Creative digital tools provide a safe place they can experiment and easily undo mistakes. This environment encourages learners to try new approaches and “fail forward” as they work to solve problems they create.

Creative technology tools can help us foster and support a classroom culture that values multiple approaches, questions more than answers, process more than product. Encouraging creativity in math instruction can help us develop mathematical thinkers who have the “resourcefulness, persistence, and desire to explore alternative methods of solution.” (Mann, 2005) In other words, we can create a generation of students who love to play with math.

### Citations

Mann, E. L. (2005). [Mathematical Creativity and School Mathematics: Indicators of Mathematical Creativity in Middle School Students](#). University of Connecticut.

Meissner, H. (2000, July-August). Creativity in mathematics education. Paper presented at the meeting of the International Congress on Mathematical Education, Tokyo.

Ruzic, R. & O’Connell, K. (2001). “[Manipulatives](#).” Enhancement literature review.

Piggott, J. (2011). [Cultivating Creativity](#). University of Cambridge.

# Visual Mathematics

*Concepts come to life with digital tools*

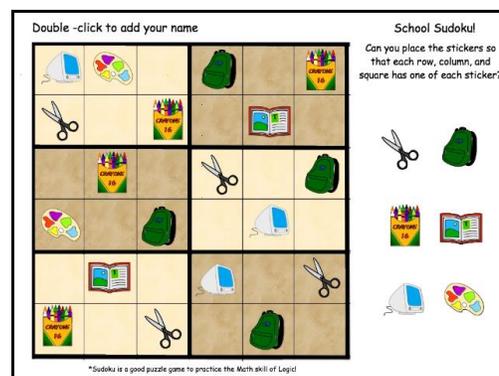
I love to teach math. Its varied techniques and real-world applications allow me to offer creative simulations that actively engage my students. Math is about numbers, but it can also be drawn, manipulated, interpreted, measured, and constructed.

Students are often called upon to look at visual representations of math concepts and interpret what they see. The more opportunities we can give our students to visualize math in different ways, the more prepared they'll be to comprehend new problems when tested. Tools like [Wixie](#) and [Pixie](#) provide students with tools and opportunities to visualize math concepts, helping them build solid foundations that will prepare them to take their math learning to the next level.

## Meeting Standards with Activities

Wixie, and Pixie, come chock full of ready-made activities, templates, and clip art images to help you save time and target standards. Explore the Math Activities in the tools or at the Trading Post and you'll

see projects created by classroom teachers. Of course, you and your students can create your own lessons to focus on the standards particular to your grade level.



In addition to existing activities and stickers, you can import photographs to demonstrate math concepts occurring in the real world. Students can take photos of their classroom, school, and community, and use the paint tools to draw directly on the photos to highlight angles, patterns, numbers, and more.

## Numbers and Operations

From counting to division, the tools and activities can be used to help students recognize the patterns and functions of numbers. Students can use the paint tools to draw representations of numbers, including place value, factors, fact families, and rounding. Students can use Math clip art including dominoes, dice, money, base-ten blocks, and (of course) numbers to explore number concepts. For example, using the hundreds charts, the 0-30 charts, and the paint bucket, students can visualize number patterns and concepts of place value, greater than and less than, factors, multiples, and skip counting.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

## Geometry

Students can use the shape stickers and all the paint tools to explore symmetry, congruency, and positions in space. The Geometry folder in the Stickers includes tangrams, pattern blocks and three-dimensional shapes that students can use to open up the worlds of area, perimeter, and coordinates. The geoboard activity template also lets your students explore geometry without the mess of rubber bands!

**What's My Perimeter?** Name [Double-click here to add text](#)

Calculate the perimeter of each shape and enter it below. Each square has a width of 1 unit and a height of 1 unit.

<a href="#">Double-click here</a>	<a href="#">Double-click here</a>
<a href="#">Double-click here</a>	<a href="#">Double-click here</a>

## Statistics and Probability

Even the youngest students work with statistics. They call it voting, or graphing, or noticing which tricycle is the most popular. To help students explore different ways they can interpret data, have them use graphic organizers and picture graphs to represent data. To expand even further, have pictures represent numbers greater than one. Students can also create basic bar graphs using the Paint Bucket tool to fill in a grid.

Look at the bag below to answer the questions. Use:  
Guaranteed Likely Not Likely Impossible

What are the chances that I will get  
Blue? \_\_\_\_\_  
Green? \_\_\_\_\_  
Red? \_\_\_\_\_  
Something to eat? \_\_\_\_\_

Write a fraction to show how many lollipops are colored  
Blue? \_\_\_\_\_ Red? \_\_\_\_\_  
Green? \_\_\_\_\_ Yellow? \_\_\_\_\_

Students can add the dice stickers to a picture to answer the question, "What are my chances?" Once stickers are glued to the canvas, students can re-color them to represent different probabilities.

## Algebra

Students can rotate, flip, and resize stickers to explore the attributes of various items, a precursor to more complicated algebraic concepts. Students can use the sorting activities and graphic organizer templates to sort items based on shape, color, size, angle, or whatever other attribute is appropriate.

**Finding Shapes** Name [Double-click here to add text](#)

Draw a line between the object and the shape that matches it.

<b>Circles</b>	<b>Rectangles</b>	<b>Triangles</b>

Students can also use pictures to visually represent the associative properties of number sentences, allowing them to substitute a letter or empty box for a picture.

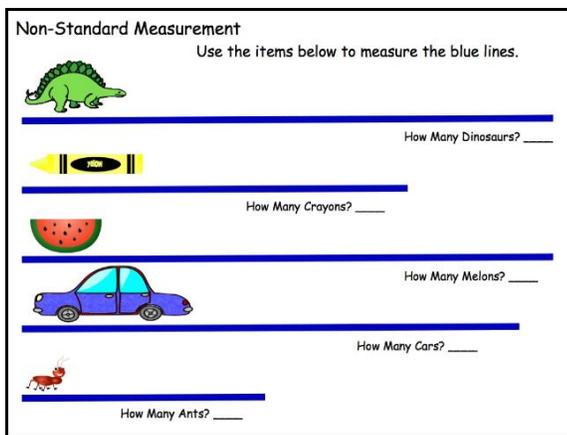
They don't know it, but they're learning the basics of algebra expressions!

Pictures can also be a creative way to look at algebra through the use of money amounts: "Which of these items can I buy with a quarter and get four cents back in change?" You can change the money amounts based on the level of your students.

## Measurement

Our world can be measured in many ways. Daily we deal with dates, time, fractions, and liquid and linear measurement. Because measurement begins with non-standard measuring, have students use the clip art images in Wixie and Pixie to measure all kinds of lines.

**Non-Standard Measurement**  
Use the items below to measure the blue lines.



How Many Dinosaurs? \_\_\_\_

How Many Crayons? \_\_\_\_

How Many Melons? \_\_\_\_

How Many Cars? \_\_\_\_

How Many Ants? \_\_\_\_

They can also use stickers as they practice estimation: "How many elephants will fit in this box?" Elephants in the real world represent weight, so you might also consider pairing this exercise with an activity that asks students to organize stickers according to weight.

While there are activities for telling time, I like to use the clock stickers to develop my own time manipulatives, asking students to show elapsed time, time of day, and activities for reading clocks. I use the

calendar templates to give students practice with interpreting time according to days, dates, and weeks.

**Elapsed Time** Name [Double-click here to add text](#)

Use the Paint tools to draw the correct end time in each row.  
Type this time in the box below the end time clock.

Start Time	Elapsed	End Time
 8:00 a.m.	1 hour 30 minutes	 Double-click
 10:30 a.m.	2 hours 10 minutes	 Double-click
 11:15 a.m.	5 hours 12 minutes	 Double-click
 5:45 p.m.	3 hours 55 minutes	 Double-click

Finding many ways to expose students to fractions and decimal equivalents will help them better understand their concrete meaning. Ask students to use the fraction bars, orange slices, and pieces of pizza to explore fractions as parts of a whole and even how they relate to probability.

## Solid Foundations

Math is unique. Even as students progress on through high school, the strands remain the same – each math skill growing on the one that preceded it. It is in the primary grades where students form the foundations that will support all their future math skills. Giving students an opportunity to visualize math increases their conceptual understanding of mathematical ideas. After all, math is all around us!

# Lesson Plans

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The following lesson plans provide specific, detailed examples of the ways creative technology tools can be applied in the elementary math curriculum to engage students and improve content knowledge and retention.

Each lesson includes:

- the **task** students will perform,
- ideas to **engage** students in the content,
- a description of what students will **create** with a technology tool,
- ways to **share** student work beyond the classroom walls, and
- tips for **assessing** student work.

# Exploring Line Symmetry

*Students will create original artwork and manipulate images to demonstrate understanding of line symmetry.*



**Apps:** [Wixie](#)® or [Pixie](#)®

## Task

You can study art mathematically by looking for different types of symmetry. An object that can be divided with one line, resulting in a mirror image on both sides of the line, has bilateral symmetry. Faces and butterflies are examples of objects with bilateral symmetry. An object made up of similar parts arranged around an axis, such as a starfish or a propeller, has radial symmetry. Symmetrical items can give a calming feeling to a piece of art.

## Engage

Write the word “symmetry” on the board. Ask your students if they can tell you what it means. Share some examples of real-world objects that are symmetrical. See if you can get students to define what makes these images symmetrical.

To help students grasp the concept of symmetry, distribute square handheld mirrors and have them practice making symmetry by holding the mirrors up to

various objects. Explain that this is called bilateral, or line, symmetry because the symmetry is along one axis. Go back to the example images of symmetry and ask students to identify the line of symmetry in each image. Then, share examples of symmetry from the second-grade symmetry web site listed in the resources.

Read and share Loreen Leedy’s great book, **Seeing Symmetry**, with your students.

## Create

### Activity 1: Symmetry in the World Around Us

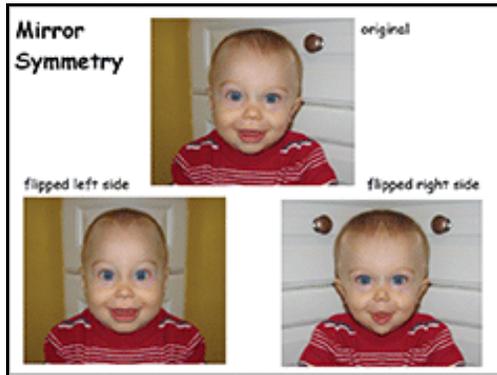
To give students a chance to practice and apply their skills, divide them into teams of three or four. Have each student use a digital camera to take a picture of a symmetrical object. Help each team transfer their images to the computer.

Have students import the images in Wixie or Pixie and use the Line tool to draw the line, or lines, of symmetry on each image. If you do not have a digital camera, have

students find images from the Clip Art or Pics4learning folder in the Library.

## Activity 2: Mirror Symmetry with Faces

Though our faces exhibit symmetry, they are not perfectly symmetrical. You can have students use [Wixie](#) to show how one side of their face is slightly different from the other.



Have students pair up to take a front view photograph of each other's faces. In Wixie, have them open the image as a sticker and resize it. Have the students glue the image to the background, select half of their face with the Rectangle Selector tool, and use the copy, paste, and flip buttons to show true symmetry with their faces. Students should do this for both sides of their face, resulting in a total of three images.

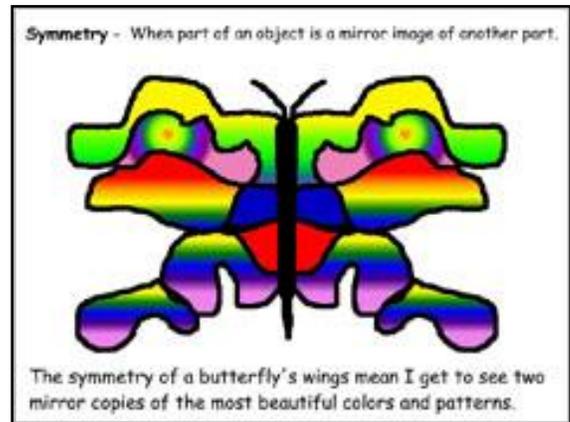
## Activity 2: Painting Symmetrical Objects

Butterflies are common symmetrical objects. Share a couple of images of butterflies and have students talk about their symmetry. Make sure they can identify the line of symmetry that runs directly through the body of the butterfly.

Have students use Wixie or Pixie to paint a butterfly with a vertical body and one wing. Then, have them use the same technique they used for their faces to create a complete butterfly by selecting half the butterfly, copying and pasting the selection, flipping it and moving it into position.

Next, test students' ability to think symmetrically by having them use the mirroring feature of the Paintbrush tool to draw another butterfly. Have students choose

the Paintbrush tool, check the Mirror box on the Editing panel, and choose 2 for line symmetry painting. Starting in the middle of the canvas, have students paint one wing; the other wing will paint at the same time. Remind them to click Undo if they need to try again.



Ask students to add narration to their pages to check for understanding of symmetry.

## Share

Print and post students artwork as a celebration of how symmetry can be used in art. After printing, have students work to sort the butterflies into groups, working to define attributes that make them similar or different.

Use the Import Pages feature to collect individual images into a class collection or book. Share this on your web site or export as a PDF or ePub to share with family and community.

## Assessment

As the students work on their line symmetry activities, assess each student's progress to ensure that they understand symmetry correctly prior to the final sharing process. The final set of activities will help you assess their ability to analyze symmetry and express it through the creative process.

## Resources

Loreen Leedy. **Seeing Symmetry**. ISBN: 0823427625

[Line Symmetry](#)

[Symmetry and Pattern](#)

[Images of symmetry on Pics4Learning](#)

# Now That's a Problem

*Students will improve multiplication skills by skip counting and creating their own multiplication word problems.*



**Apps:** [Wixie](#)® or [Pixie](#)®

## Task

Recent studies have shown that students who know their multiplication tables are much better at math later in school and life. The Mathematix Book Company wants to begin creating interactive storybooks that teach multiplication to the general public. It has asked your class to come up with prototype books for multiplication by 2's, 3's, 4's, 5's, and 6's.

## Engage

Introduce the concept of skip counting to your students. A fun way to get them excited about skip counting and to practice their skills is to play with a rubber ball. Have the students take turns bouncing the ball and counting off by 2's, 5's, 10's, etc.

Explain that skip counting is another way to multiply. Once the students have an understanding of skip counting, read **Bunches and Bunches of Bunnies** by

Louise Mathews. This book explains the concept of multiplication using pictures.

Ask your students to illustrate this word problem:

*There are four cats. Each cat has four legs.  
How many cat legs are there in all?*

Have the students share their pictures in small groups. Encourage them to notice that while the pictures are different, they still have the same numbers in them.

Next, have students practice identifying numbers in pictures and writing multiplication word problems. Project Wixie or Pixie on a screen and insert the rain cloud sticker.



*This cloud has four raindrops. If there were  $X$  clouds, how many raindrops would there be?*

Continue this process with a few other Stickers. As an entire class, brainstorm everyday objects that work for multiplication word problems.

Ask the students to find an object at home that could be part of a multiplication word problem. When you meet again, have each student share their object with the rest of the class. You may even want to ask them to bring the object to school.

## Create

Let students know they will be working small teams to create interactive storybooks that teach multiplication through word problems. Assign students to small groups and give each group a number series (2's, 3's, 4's) appropriate to their level.

Each team's book should have a page for each multiplication word problem. You might want students to create two pages for each problem, the first one containing the problem, and the second one containing the problem and the answer.

Give each team a four-pane storyboard to help them develop the pages of their book. Have students write a multiplication problem in each of the panes.

Next, have each team explore the Stickers library to find images they can use for each multiplication problem. Have them write down the name of the sticker (or a description) and write the text of their multiplication word problem in each box on their storyboard.

## Share

Once the students have completed their problems, have



each team print a copy of their book. Share the books with your school's librarian to place in the library for other students to use as reference material.

You can also use the Import Pages feature to collect all of the books into one file. Then, you might consider exporting as a PDF or ePub file to share as an electronic book.

## Assessment

Assess basic multiplication skills from students' skip counting ability and from other multiplication activities you use during the lesson. You can evaluate students' skill at visualizing multiplication using their illustrated word problems.

The stickers each team chooses, their storyboard, and the multiplication problem they create will give you insight into how well they understand that word problems are just different forms of math problems.

## Resources

Matthews, Louise. **Bunches and Bunches of Bunnies**. ISBN: 0590447661

Napoli, Donna J. and Richard Tchen. **Corkscrew Counts: A Story About Multiplication**. ISBN: 0805076646

[Counting by 2's](#)

[Counting by 5's](#)

# The 13 Days of Halloween

*Students will practice counting through the creation of a Halloween (or any holiday!) counting book.*



**Apps:** [Pixie®](#) or [Wixie®](#)

## Task

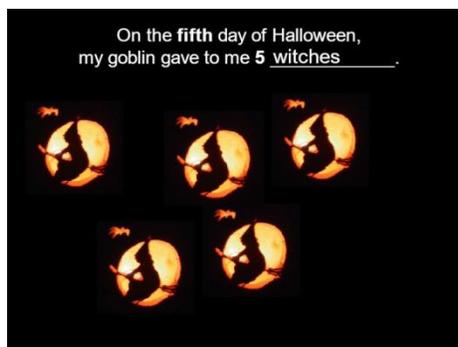
Goblins are coming, witches are getting out their brooms, and black cats are ready to cross your path. It must be close to Halloween!

As part of a Halloween celebration, practice your counting skills and create a 13 days of Halloween project. You will create one page showing a Halloween object “my goblin gave to me”. Your teacher will put all of the class pages together for a complete presentation.

## Engage

Read the story the **Two Little Witches** by Harriet Ziefert and Simms Taback to help students practice their counting skills, experience a repetitive story form, and

get them thinking about objects or characters commonly associated with Halloween.



Work as a class to brainstorm a list of these objects. Write them in a place all students can see.

Next, ask students if anyone knows the “12 Days of Christmas” carol. [Play it](#) so they can all remember or experience it for the first time.

## Create

Tell students that they are going to create a similar project, but instead of Christmas, this project will focus on the “13 Days of Halloween.”

For example, “On the fifth day of Halloween, my goblin gave to me 5 witches.”

Explain to students that they will use Wixie to each create a page that includes a specific number of Halloween characters based on the song. Assign each student a specific number.

If your students have their own devices or are technology power users, assign them a template with all 13 days!

You can find a template for this in the Wixie Activities folder that you can assign to students. When students open this activity, the Library panel automatically shows the Halloween stickers library.

If your students are new to Wixie, demonstrate how to add objects to a page, type text, and record their voice. You might also ask them to create their own pictures using paint tools.

Have each student choose the Halloween object they wish to count on their page. Have a parent, aide, or school buddy work with each student at a center in your classroom to develop their page, or have the entire class work on their pages at the same time in the computer lab.



[View this sample online](#)

## Share

Use the Import Pages feature in the Wixie menu to combine student work into a single class book. Share the book in its interactive form on a classroom web site or present it from a local computer. You can also export the file as an ePub or PDF to send home with students to read with their families.

You could also print copies of each student's page as trading cards or comics. Have students cut them out, trade them, and then work to put them in the correct sequence to make their own set of Halloween cards to take home.

## Assessment

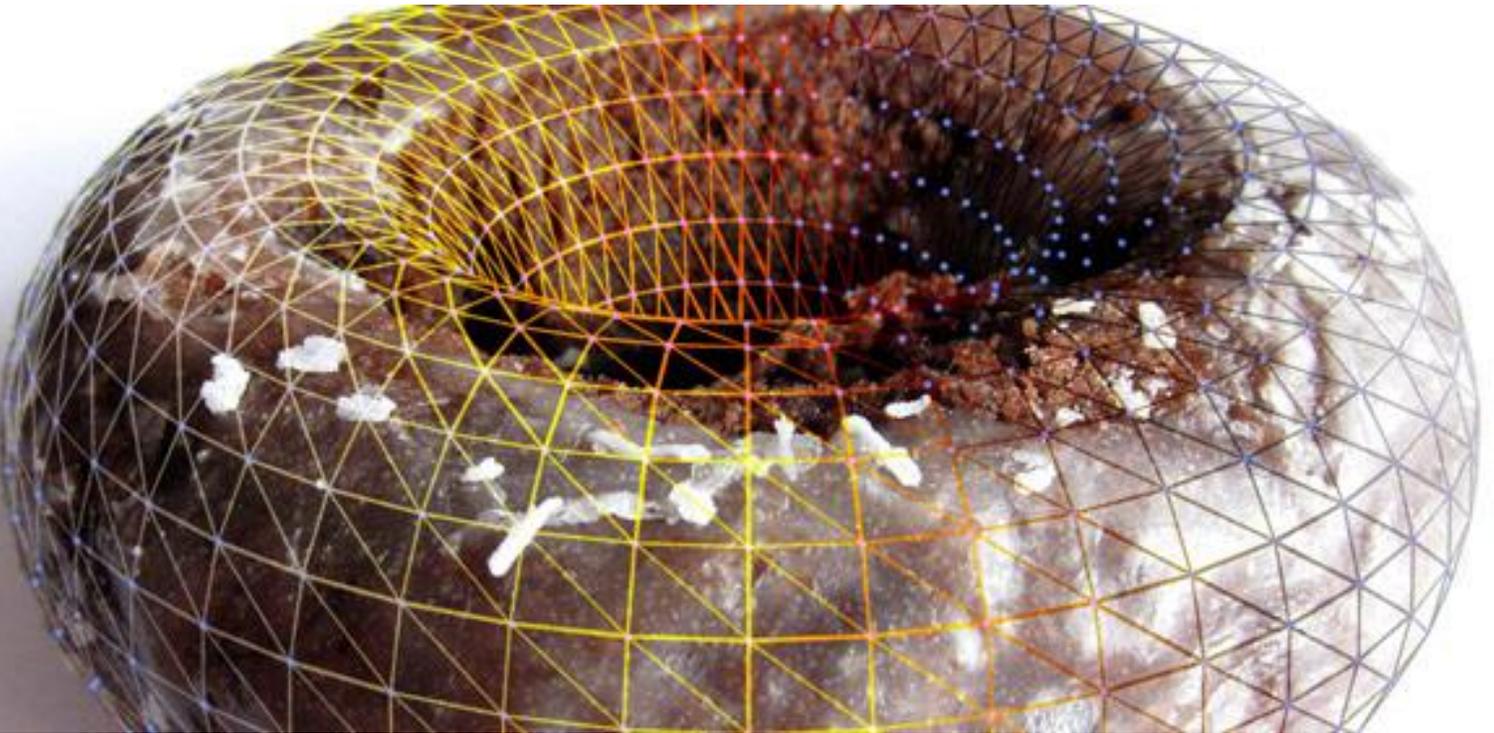
This fun project is designed to apply basic counting and number sense. At a glance you can assess student ability. Printing out pages at small size so students can order and organize provides additional opportunity to evaluate number sense.

## Resources

Ziefert, Harriet and Taback, Simms. **Two Little Witches: A Halloween Counting Story**. ISBN: 0763618942

# The Shape of Things

*After reading [The Shape of Things](#), students will compose images from shapes, write a sentence to describes their composition, and create their own version of the book.*



**Apps:** [Wixie](#)® or [Pixie](#)®

## Task

The world around you is made of amazing shapes. The clock in your classroom is probably round, but the one by your bed may be a square or rectangle. In this project, you will think of the shapes in objects around you, draw a picture and complete a shape sentence to make your own version of the book.

## Engage

Ask students to find shapes around your classroom. While the clock is probably round and the whiteboard is probably a rectangle, see if students find shapes that are part of a group of shapes.

For example, your pencil sharpener will have a hole where you insert the pencil, but the entire shape of the sharpener may be a rectangle or oval. As students call

out shapes, highlight ones that are part of a group of shapes, and challenge them to find groups of shapes in your classroom.

Read the story the **The Shape of Things** by Dayle Ann Dodds and Julie Lacombe. This rhythmic story showcases the basic shapes in common objects. As you read each page, have students look at the illustrations and name all of the shapes that they find.

After reading this story, tell the students that they will work in small groups to create their very own Shape of Things book.

Group the students together to form small teams. Assign each student a basic shape like circle, square, triangle, rectangle, oval, and so on.

Explain to students that each team member will create a page for the assign that includes an illustration made from a combination of shapes. Each student will then complete the following sentences:

A \_\_\_\_\_ (shape) is just a \_\_\_\_\_ (same shape) until you add \_\_\_\_\_. Then it becomes a \_\_\_\_\_!

For example: A circle is just a circle until you add a hole. Then it becomes a donut.

## Create

Demonstrate how to use the Wixie Paint tools and type text. Be sure to demonstrate how to use the shape tool to draw both shape outlines and filled shapes. You may want to create a template that already includes

the sentences above, so that students simply have to illustrate and complete the sentences. Post the words for common shapes so that students can easily see how to spell them.

You can let students draw whatever shape they want, but some may find it easier to see a picture in a shape that you have assigned. In any case, have students start by drawing the main, or largest shape first. Then add details to transform it into a special character, object, or location.

Be sure to have each student record their voice reading their sentences. Encourage them to practice before recording for the final time, or to preview the sound and try again. Have students save their files to a team folder. If one student finishes first, have them create the title page.

Use the Import Pages feature in Wixie to combine all student pages into team, or even class, project.

## Share

Use the Import Pages feature to combine all individual student pages into one team project. Print a copy of the book so that students can read and share with their families.

You may also want to export the book as a PDF or ePub file to share as an electronic book. These can include

sound and are a prized keep sake for student families.

Share this version from your classroom web site or present it from a local computer.

## Assessment

Evaluation begins during your initial conversation about shapes in the classroom. Can students see and identify the shapes? How many

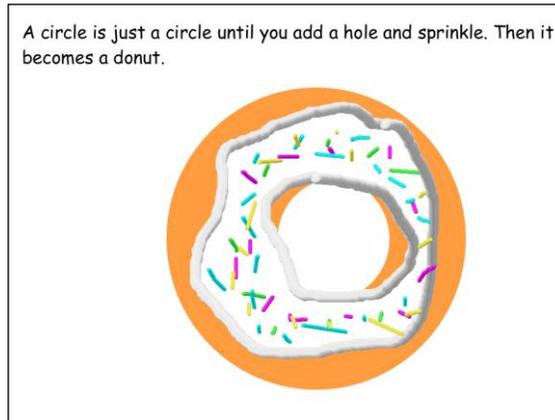
different two-dimensional shapes can they identify and define? You can continue evaluating student learning as you read *The Shape of Things* to the class and have them find and identify shapes in the book.

As students work to write their initial sentence, work with individuals to help them visualize and describe. Encourage students to work together to think of details and descriptive words. You can evaluate their comprehension (and fine motor skills!) as you explore their illustration. Their recording, and practice before recording, will help build and assess reading fluency.

## Resources

Dodds, Dayle Ann and Julie Lacome. **The Shape of Things**. ISBN-10: 0613000560

[Children's literature for great math projects](#)



# Dream Room Design

*Students explore length, width, perimeter, and surface area, convert measurements, and work with 2-D representations of 3-D objects.*



**Apps:** [Wixie®](#) or [Pixie®](#)

## Task

Are you satisfied with the design of your bedroom? Have you seen advertisements for posters, TVs, or a bed you just have to have? Your parents are never going to give you your dream room, unless you can accurately describe the items in it and why they are necessary. Using measurement skills, create your own dream bedroom design!

## Engage

Introduce the concepts of length, width, and perimeter to your students. Make sure that they know how to determine the surface area for simple rectangular shapes (width x length).

Have students practice their measurement skills in your classroom, determining the dimensions of your

classroom and objects in it, such as your desk, student desks, and any chairs, tables, and bookcases.

If you are working with older students, teach them how to find the area of polygons by breaking them into component shapes and estimating.

Assign students to take some basic measurements in their rooms at home and calculate the square footage. Have them measure some common bedroom elements such as beds and dressers.

Brainstorm with your class the elements a bedroom might have, such as bed, dresser, and television. Which items are needs and which are desires? What should a bedroom do for the occupant? If it contains a bed, do all beds have to be exactly the same?

## Create

Have students begin by creating a paper sketch of their dream room. You might create a worksheet that has a 12 x 12 room with gridlines every 6 inches.

The designs should include major elements that make it obvious this is a bedroom, like a place to sleep and a place to store clothes. Encourage them to think about accurate or appropriate space between objects.

You may also ask them to add architectural details such as power outlets, doors, windows, cable access, and telephone access. How will they designate these items in their drawing? How will they show them to scale? Have students develop a key for their design using shapes and color.

Once students have a general idea of their room's layout, have them launch Wixie to complete their design to scale. They can begin from a grid template to more easily create accurate and appropriately sized representations of objects like rugs, dressers, beds, and desks.

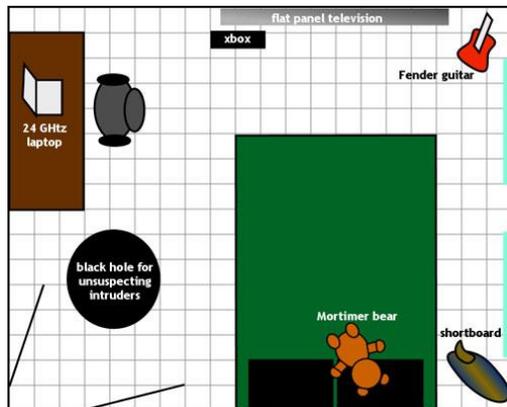
Encourage them to use colors and add text descriptors for clarification. When their visual design is complete, have students add a page, or pages that includes a description of their dream room and the objects in it.

If students are new to descriptive writing, talk about putting together a descriptive paragraph. You can use the burger analogy: the meat, or main idea, of their paragraph, surrounded by juicy details, held together by the bun of introductory and concluding sentences.

## Share

Have students use the text in their descriptive essay, along with a picture of their dream room, to share their

design ideas with the rest of the class. After all the students have presented, discuss the ideas you liked the best. If you have adequate time, let students duplicate the page with their design and make adjustments based on other student's ideas and feedback.



Return to your brainstorm about what makes a bedroom. Compare what the students have included in their designs to the elements they came up with on their list. Have the students' opinions changed about what a bedroom should contain or be?

## Assessment

Use the students' measurements of their room to determine if they understand how to take measurements and determine surface area.

Use the design sketch and finished Wixie project to evaluate students' ability to convert measurements, draw objects to scale, create 2-D representations of 3-D objects.

Evaluate their room description for the use of descriptive adjectives, voice, and organization.

## Resources

Hallam, Linda. **Decorating Kids' Rooms: Nurseries to Teen Retreats**. ISBN: 069620729X.

Brunetto, Carolyn Ford. **MathART Projects and Activities**. ISBN: 0590963716

[Writing with Writers](#)

[Unique Furniture Designs](#)

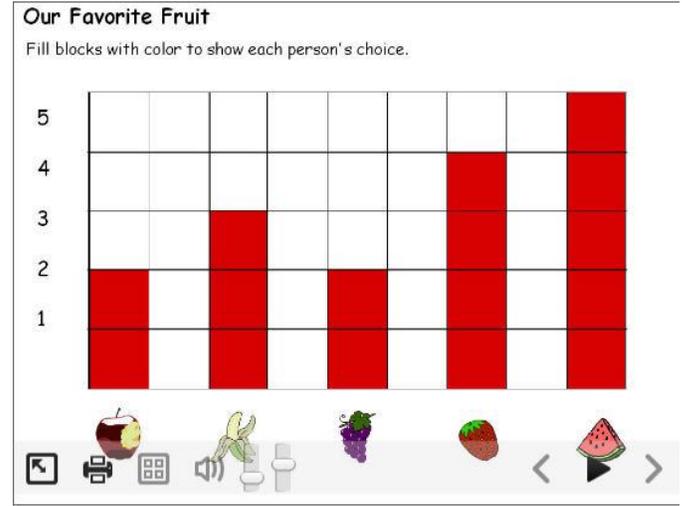
# Additional ideas from real student projects

## Comics and Flipped Classroom Videos



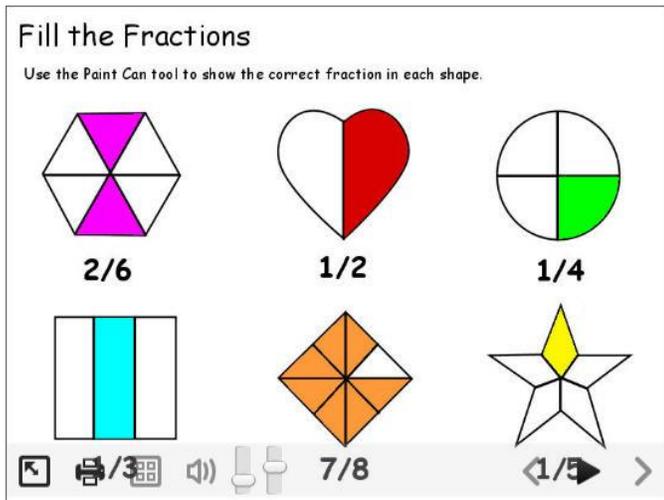
Create comics to explain procedures and/or create tutorials. [See the sample online.](#)

## Graphing



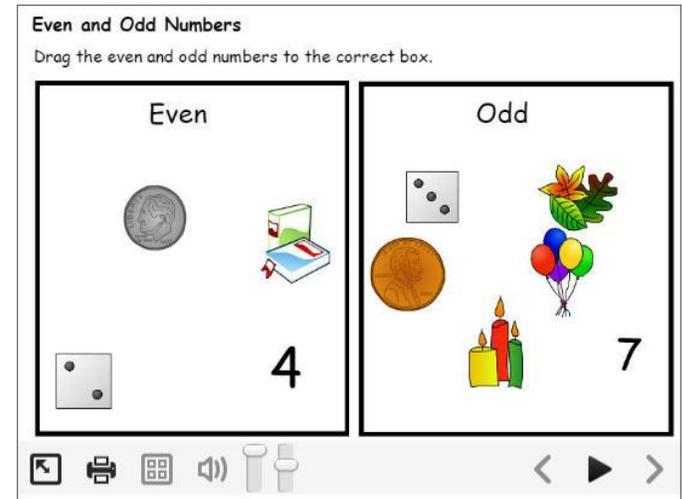
Create a graph to visually represent data you find in a class survey or other research.

## Fractions



Students can use Wixie's paint tools to show understanding of fractions. There are also stickers of orange segments and other math manipulatives.

## Formative Assessments



Wixie includes many activities to help you assess student understanding of various math concepts and catch misconceptions quickly.

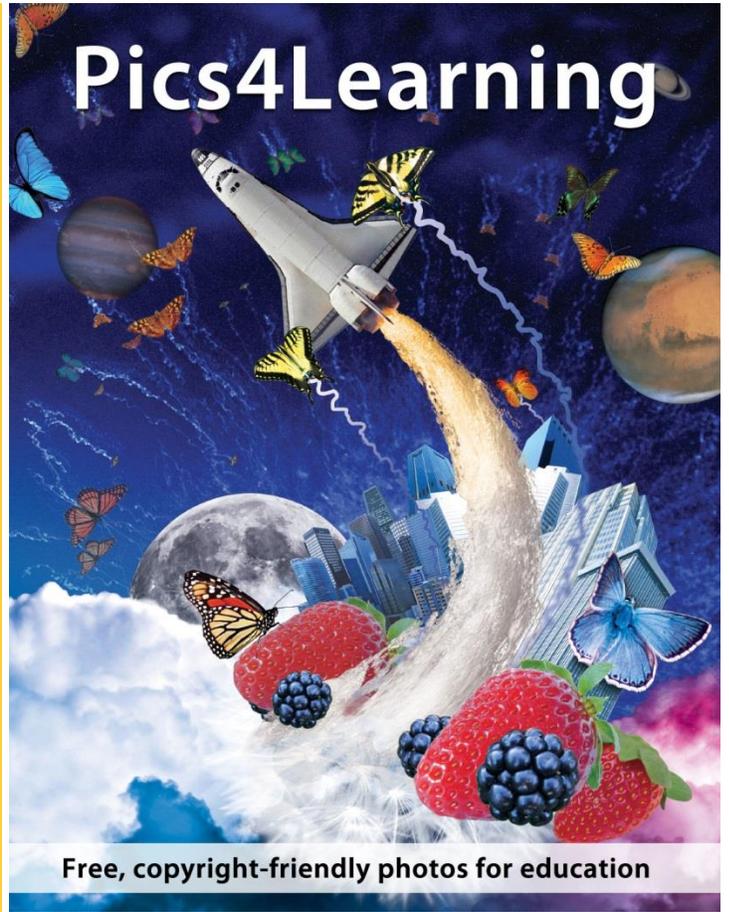
# Wixie

Wixie is an online publishing and creativity platform that lets students share what they know through **their writing, their voice, and their art.**



Give Wixie a Try

# Pics4Learning



Free, copyright-friendly photos for education