

Wixie Curriculum Guide

Elementary Math



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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.

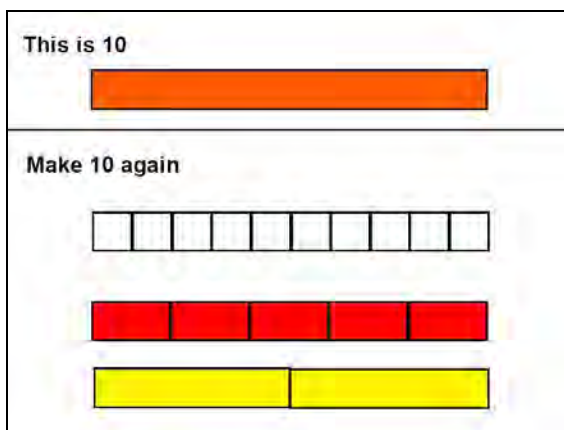
More time is required for students to begin producing responses like $12-4$, but instead of telling students what

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

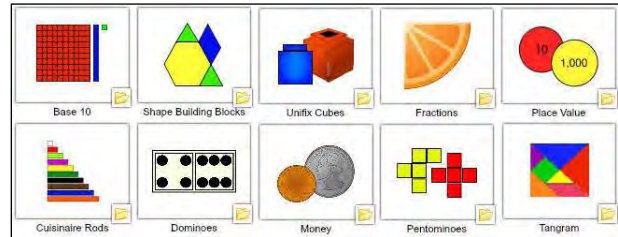
The use of base-ten blocks and Cuisenaire rods, created in the 1920’s, are not new. Their use in modern classrooms provides students a way to conceptualize numbers in a variety of ways. These tangible objects are called manipulatives.



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.

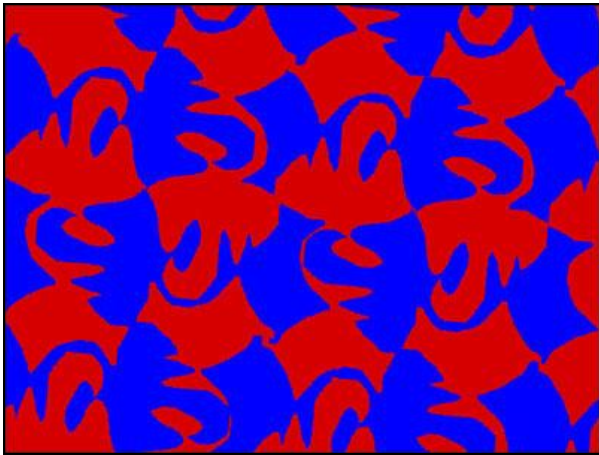


Dr. Walter Drew and Dr. Henry Olds found benefits to building mathematical thinking as students first build patterns with physical shapes and then continue their work with the resulting patterns on the computer where they experimented further “in an environment where the risk factor is substantially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

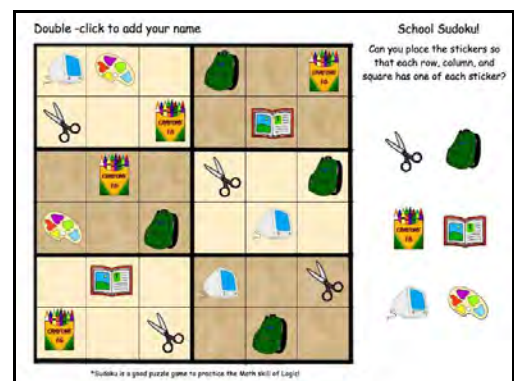
I love to teach math. Its varied techniques and real-world applications allow me to offer creative simulations that actively engage my students. Math is about numbers, but it can also be drawn, manipulated, interpreted, measured, and constructed.

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.

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.

Circles	Rectangles	Triangles

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!

Using Math Curriculum from Wixie's Library

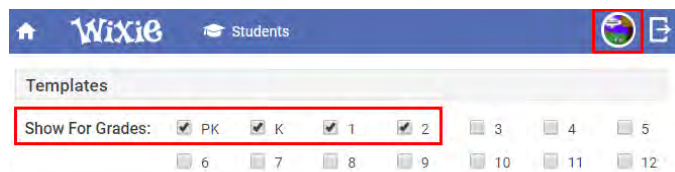
Use templates and activities from Wixie's curriculum library to explore, practice, reinforce, and evaluate math learning

Wixie includes hundreds of standards-based templates designed to support math learning in the primary grades. Use these templates for formative assessments and to support performance tasks.

To find, edit, and assign an existing Wixie template, log in to your teacher account.

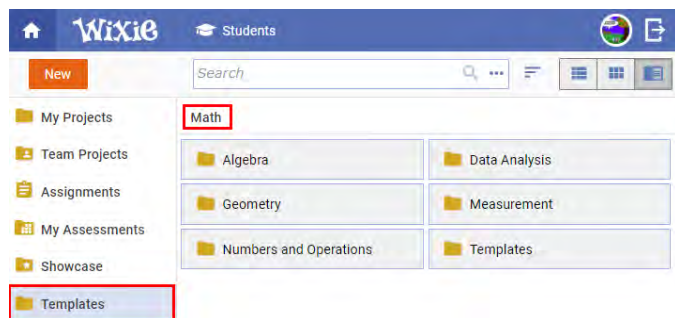
Select your profile icon and choose Settings from the drop-down menu.

Scroll to the Template area and select the box for your grade as well as the boxes either side for additional templates you can use for differentiation.



Use the Home button to return to your home page. Your grade level settings will be saved automatically.

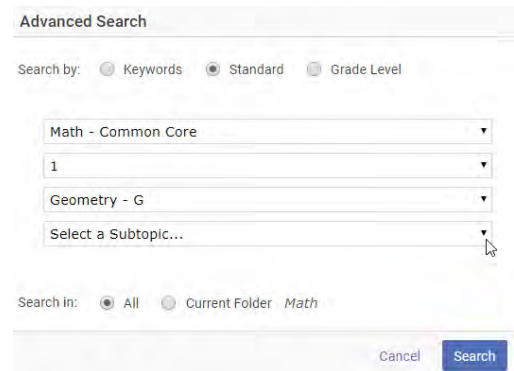
Open the Templates folder to browse the Math folder and sub-folders.



Use the field at the top to search for templates using a keyword. Type your keyword and click the magnifying glass on the right to search.

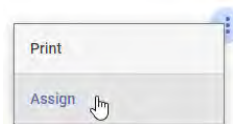


Click the three dots to the right of the field to display more search options and find templates based on standards, grade level, and additional criteria.

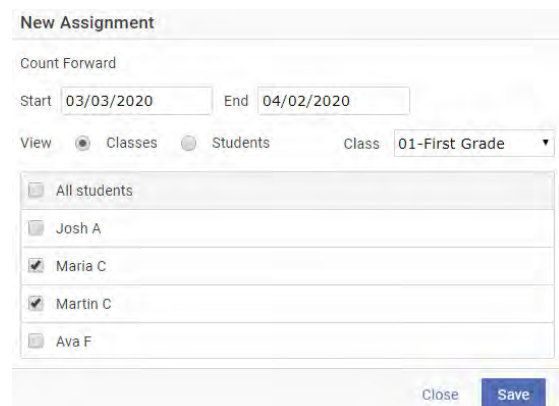


*This screenshot shows Common Core State Standards for Math. If you are in Maryland, Virginia, or Texas, you will see the CCR, SOL or TEKS standards.

When you find a template you want to use, use the three dots next to the file to choose Assign.



At the Assign dialog, choose how long you want it available for students to begin, as well as exactly which classes, and which students you want to use the template.



Sample Wixie Templates for 3rd-grade Math

Understand the relationship between multiplication and division.

Measure time, money, temperature, and volume.

Develop understanding of fractions as numbers.

Measure length, perimeter and area.

Represent and Interpret Data.

Reason with shapes and their attributes.



Sample Wixie Templates for 4th-grade Math

Use place value and properties of operations to solve problems.

Multiplication
Show commensurate events

$12 \times 16 = 192$

From [www.k5.com](#)

Let's Play!
Use the number of balloons to solve the word problem.
1. How many balloons can they buy if they have \$25.00?
2. If they have \$21.25, how many can they buy?
3. How many balloons can they buy if they have \$10.00?
4. How many balloons can they buy if they have \$15.00?

Use the place value chart to help you solve the problem. Write your answer in the box.

Why?
New York: 20,300 ft.
New Mexico: 10,200 ft.
New Jersey: 10,200 ft.

Use the place value chart to help you solve the problem. Write your answer in the box.

Generate and analyze patterns.

Number Patterns
1, 3, 2, 4, 5, 7, 6,
0, 1, 1, 2, 3, 5, 8,
1, 2, 5, 14, 41,
14 9 122 13 141 8

Complete the Pattern

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Number Patterns 13 12 18 9

Patterns:
3, 4, 5, 6, 7, 8, ____ Rule: Double each term to add two
0, 2, 4, 6, 8, 10, ____ Double each term to add four
0, 3, 6, 9, 12, 15, ____ Double each term to add two
1, 3, 5, 7, 9, 11, ____ Double each term to add two

Identify and draw lines of symmetry.

Line Symmetry

Alphabet Symmetry

A B C D E F G
H I J K L M N
O P Q R S T
U V W X Y Z

Where are our birthdays?

Represent and interpret data.

2018 Slang Use

Where are our birthdays?

Order, compare, and decompose fractions and decimals.

Compare Fractions and Decimals

$\frac{1}{2} > \frac{1}{3}$	$\frac{1}{4} < \frac{1}{2}$	$\frac{1}{5} < \frac{1}{10}$
$\frac{2}{3} > \frac{1}{4}$	$\frac{3}{4} > \frac{1}{2}$	$\frac{1}{2} > \frac{1}{5}$
$\frac{1}{3} > \frac{1}{5}$	$\frac{1}{4} < \frac{1}{3}$	$\frac{1}{2} > \frac{1}{10}$
$\frac{2}{3} > \frac{1}{4}$	$\frac{1}{5} < \frac{1}{3}$	$\frac{1}{2} > \frac{1}{10}$

Problem 2
Use the number lines for each and show your work. Use one of the place value charts.

1. Compare $\frac{1}{2}$ and $\frac{1}{3}$.
2. Compare $\frac{1}{4}$ and $\frac{1}{5}$.
3. Compare $\frac{1}{3}$ and $\frac{1}{4}$.
4. Compare $\frac{1}{2}$ and $\frac{1}{5}$.
5. Compare $\frac{1}{3}$ and $\frac{1}{10}$.
6. Compare $\frac{1}{4}$ and $\frac{1}{10}$.
7. Compare $\frac{1}{2}$ and $\frac{1}{10}$.
8. Compare $\frac{1}{3}$ and $\frac{1}{10}$.

Measure angles, area, and perimeter.

What's My Area?

Measure the Angles

What's My Perimeter?

Classify shapes by their properties.

Classify Triangles

acute	obtuse	isosceles	right	equilateral
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Quadrilaterals

Square	Rectangle	Rhombus	Trapezoid
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Quadrilateral Sort



Sample Wixie Templates for 5th-grade Math

Classify shapes by their properties.

Work with and create a coordinate plane.

Utilize sophisticated measurements, conversions, and data analysis.

Day	Time	Distance	Speed	Time	Distance	Speed
Day 1	1:00	1.00	1.00	1:00	1.00	1.00
Day 2	1:00	1.00	1.00	1:00	1.00	1.00
Day 3	1:00	1.00	1.00	1:00	1.00	1.00
Day 4	1:00	1.00	1.00	1:00	1.00	1.00
Day 5	1:00	1.00	1.00	1:00	1.00	1.00
Day 6	1:00	1.00	1.00	1:00	1.00	1.00
Day 7	1:00	1.00	1.00	1:00	1.00	1.00
Day 8	1:00	1.00	1.00	1:00	1.00	1.00
Day 9	1:00	1.00	1.00	1:00	1.00	1.00
Day 10	1:00	1.00	1.00	1:00	1.00	1.00

Perform operations with multi-digit numbers and decimals.

Search by standard

Use the more dots next to the search bar at your Wixie home page to find more templates like these.

Choose the standard (ELA, math, science, etc.), then select grade, category, and standard and choose Search to find Wixie activities you can use to help students practice and demonstrate mastery of this learning goal.



Lesson Plans

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

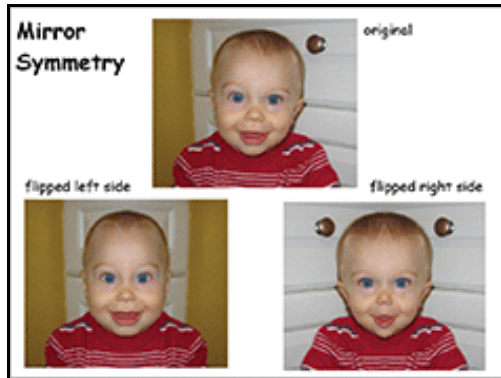
To give students a chance to practice and apply their skills, divide them into teams of three or four. Have each student use a digital camera to take a picture of a symmetrical object. Help each team transfer their images to the computer.

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.

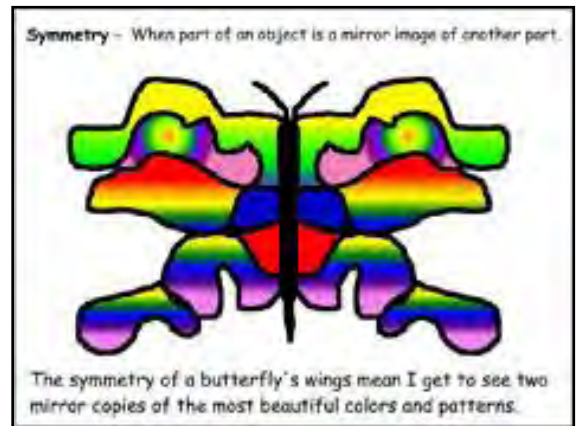
Activity 2: Painting Symmetrical Objects

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.

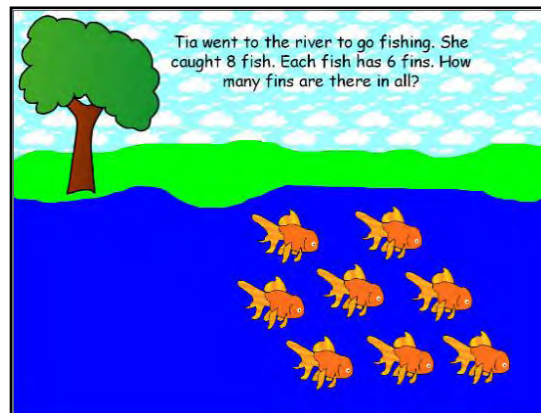
Resources

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](#)



Spring Into Fractions

*After reading **Full House: An Invitation to Fractions**, students will write and illustrate a spring-inspired short story including fractions they find in nature or their local community.*



Apps: [Wixie®](#) or [Pixie®](#)

Task

By spring, you have likely shared several literature books with math topics. Now that you have been reading these books with students, let them know it is time for them to publish their own math stories.

Engage

Manipulatives like oranges or paper slices of pizza are common ways to help students understand the idea of “parts of a whole.” You could even give students squares of a chocolate bar to work with as you read *The Hershey's Milk Chocolate Bar Fractions Book* by Jerry Pallotta and Rob Bolster.

To introduce the project, read a story about fractions such as **Full House: An Invitation to Fractions** by Dale Ann Dodds. Talk to your students about the way fractions are part of the story.

Let your students know they will be creating a similar fraction story, using the spring season as the subject.

What are some of the activities students enjoy doing in the spring? Work together to brainstorm activities such as flying kites, using an umbrella, and watching out for new bunnies.

Ask your students to share the things they see in spring. Depending on where you live, the first signs of spring may be crocuses or the return of the robin. Work as a class to create a list of things they see in spring.

Choose an example or two and see how you can represent it as fractions. For example, a daffodil has six leaves; a kite may have differently colored panels.

To help students practice recognizing fractions, you can also work together to find fractions in this image or make a sample as a group.

Create

Before they begin writing, have students choose three spring objects or activities to use in their story. To help them focus on fractions, have them write a description of how each object can be divided fractionally and draw a simple picture that illustrates the fraction.

Have students think about their story in these three parts, with one fraction appearing in the beginning, one in the middle, and one at the end.

Fold a blank sheet of paper in half, and then fold it in half again. Open the sheet and use it as a four-pane storyboard. Have students determine a title for their story in the first pane and then use the rest to illustrate or describe the beginning, middle, and end.

Now that students have a visual example of each fraction and an idea of what will happen in the story, have them write a first draft. Encourage students to include clear descriptions of color, size, and shape to help readers visualize the fraction.

Have students share their stories with a partner. The partner should listen carefully and make suggestions. After sharing, students should make revisions. Have them read again, revise, and then share with you before they begin the publishing process.

Have students build their stories in Wixie. They can add text to share their writing and use the Paint tools and media library to add illustrations. Students can also use the voice recording tool to narrate each page.

This process focuses on writing and editing before working on the computer. If your students are more comfortable editing with a word processor, consider working on the rough draft on the computer. Other students may find that drawing pictures first can help them identify more accurate and descriptive words to use in their writing.

Wixie allows you to review and edit student work from your account. You can even leave comments to encourage them and give advice throughout the writing process.

Share

Once the stories are created, it is time to share. Students can easily print their stories as booklets to share with other students and to take home.

If you have iPads, or students have them at home, share student work from Wixie as an ePub. Then, email the files home so students can add them to their iBooks library.

You can also post the ePubs to a shared Dropbox or Google Drive folder making it easy to move the stories to devices in your classroom or the school media center. You can also make these folders publically accessible so other students and teachers can access and download the stories.

If you don't have ready access to eReaders, you can export the finished work as PDF files for easy sharing. You can also link to student's stories from your classroom web site or embed them on a blog.

Assessment

The final story and the work during the process will help you evaluate student understanding of fractions.

Their initial choice of objects for their story, along with the descriptions and illustrations, will help you identify misconceptions. Use this as a check point to determine if you need to provide further instruction on fractions with the entire class, small groups, or individuals.

The storyboard will help you identify students' ability to translate ideas into a story.

As students begin illustrating their projects, prompt them with questions that will encourage them to add more details and create more complete and specific illustrations. Each student's voice narration will give you insight into oral proficiency and reading fluency.

Resources

Dodds, Dayle Ann. **Full House: An Invitation to Fractions**. ISBN-10: 0763641308

[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.

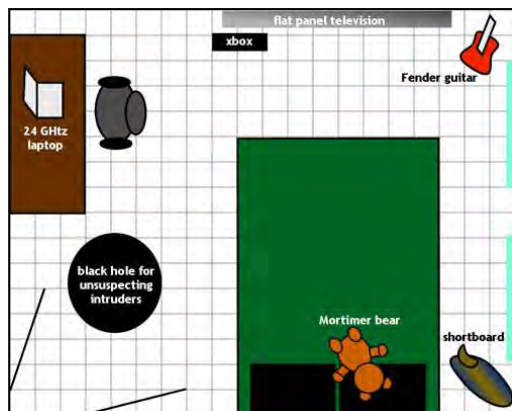
Encourage them to use colors and add text descriptors for clarification. When their visual design is complete, have students add a page, or pages that includes a description of their dream room and the objects in it.

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

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