

Learn at Home Resource Packet – General Overview Grade 7

This New York State Next Generation Mathematics Learning Standards aligned packet of resources is designed for students and their caregiver(s) who wish to support in-school learning with activities that can be done independently and/or with a partner at home. This work is not intended to be used for assessment or evaluative purposes.

The packet includes ten activities that support the major mathematical work of the grade with a particular focus on ratio and proportional relationships. These activities should each take 40-60 minutes (although many can be extended) and may be completed in any order.

How to use this guide - For these activities, you will find:

- information about the standards both content and practice that the activity supports;
- a description and/or instructions for the activity;
- questions that will help deepen the learning of the activity;
- and in some cases, suggestions for extending or adjusting the activity.

Activity: Stained Glass

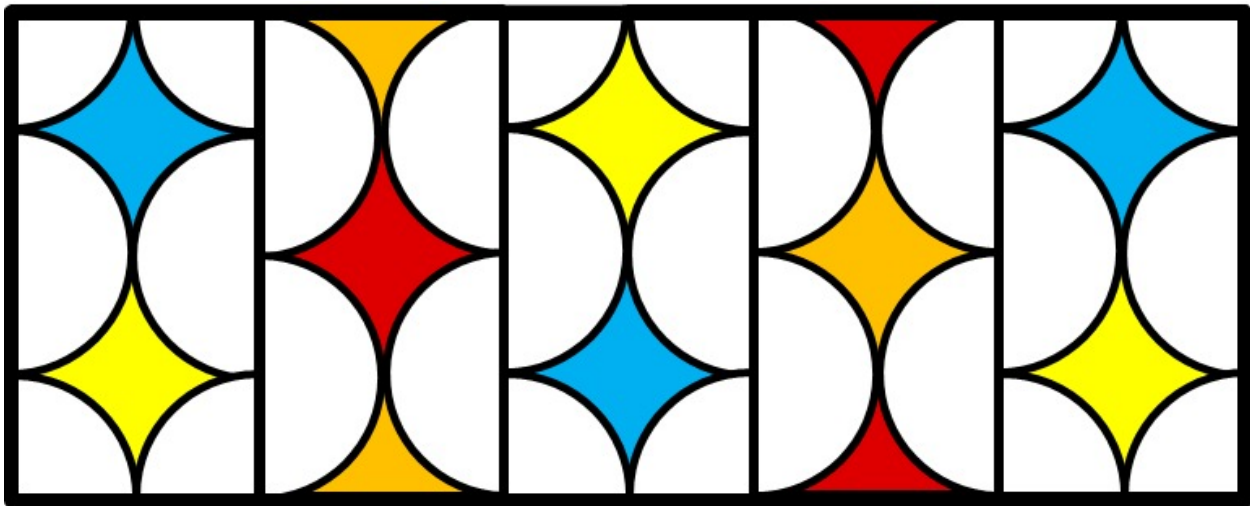
Description: In this task, students are asked to solve a problem using geometry.

Next Generation Mathematics Learning Standard (s): NY-7.G.4 Apply formulas for area and circumference to solve problems and NY-7.EE 3- Solve problems using numerical and algebraic expressions, equations and inequalities.

Mathematics Practice Standards: MP4 – Model with Mathematics

Adapted from: Illustrative Mathematics, www.illustrativemathematics.org

The students in Ms. Vargas's art class are designing a stained-glass window to hang in the school entryway. Stained glass is colored glass, usually designs or pictures, used to decorate spaces. The window will be 2 feet tall and 5 feet wide. They have drawn the design below:



They have raised \$100 for the materials for the project. The colored glass costs \$5 per square foot and the clear glass costs \$3 per square foot. The materials they need to join the pieces of glass together costs 10 cents per foot and the frame costs \$4 per foot.

- a. Do they have enough money to cover the costs of the materials they will need to make the window?
- b. Show how you know.




Activity: The 4's Game

Description: You can play this game with someone else.

Hint: write down the numbers 1- 20 and write a solution for each, crossing off the numbers as you find a solution.

Next Generation Mathematics Learning Content: Number Sense

Mathematics Practice Standards: MP1 - Make sense of problems and persevere in solving them. Call or text a friend to see what they come up with. Together, you can find all the number 1- 20?

Adapted from: You Cubed www.youcubed.org 

Task Instructions: Can you find every number between 1 and 20 using only four 4's and any operation? Here's an example $\sqrt{4} + \sqrt{4} = 4$ for the number 4.

Activity: Mug Wump

Description: The diagram below shows Mug Wump drawn on a coordinate grid.

Use this diagram to answer the following questions.

Next Generation Mathematics Learning Standard (s): NY-7.RP Analyze proportional relationships and use them to solve real-world math mathematical problems.

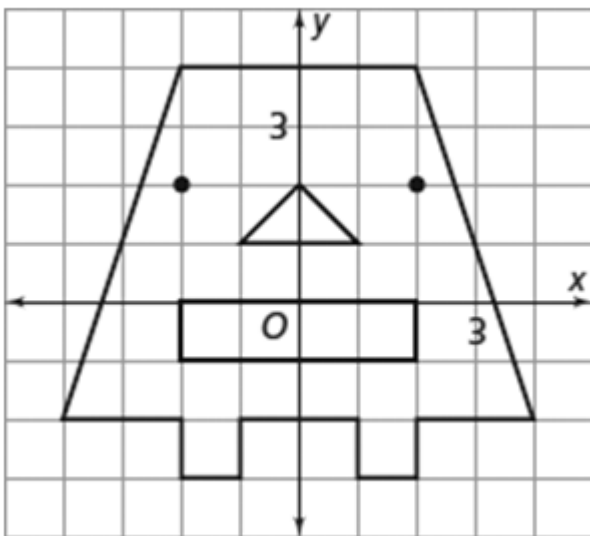
Mathematics Practice Standards:

MP 1: Make sense of problems and persevere in solving them.

MP 2: Reason abstractly and quantitatively.

MP 7: Attend to precision

Adapted from: Connected Mathematics Project – 3, Pearson Publishing.



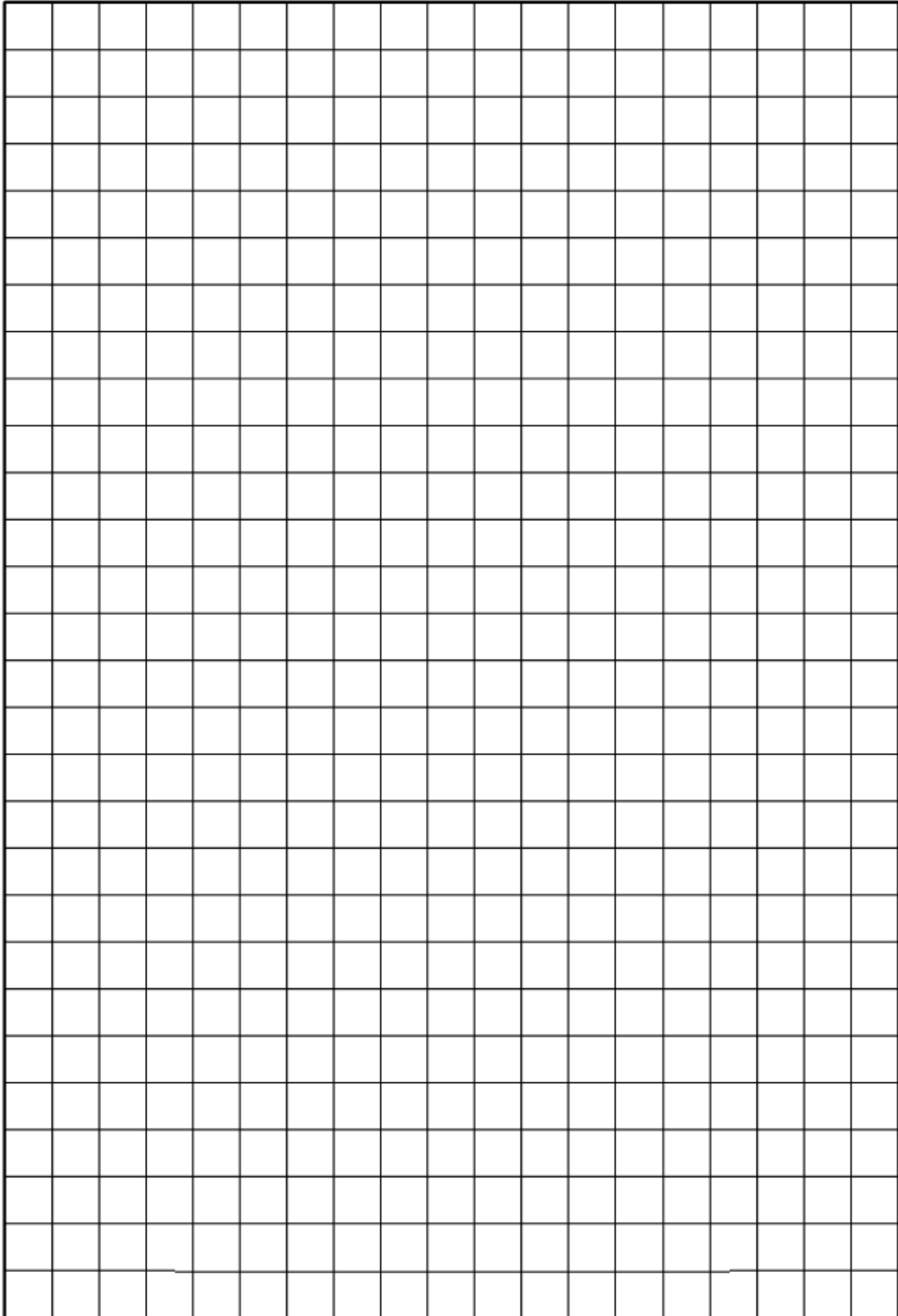
a. Use the diagram above. Complete the first column of a table like the one shown to record coordinates of key points needed to draw Mug. (You will need to determine the number of points needed for each body part.)

Coordinates for Mug and Variations

Rule	(x, y)	$(2x, 2y)$	$(-2x, -2y)$
Head Outline	$(-4, -2)$		
	$(-2, -2)$		
	$(-2, 3)$		
Nose	$(-1, 1)$		
Mouth	$(-2, -1)$		
Eyes	$(-2, 2)$		

b. Suppose you make scale drawings with rules $(2x, 2y)$ and $(-2x, -2y)$. Complete the table above to give coordinates for the images of Mug.

C. On graph paper, plot the images of Mug Wump produced by the new sets of coordinates in part (b).



D. Compare the length, width, and area of Mug's mouth to those of the figures drawn in part (c). Explain how you could have predicted those results by studying the coordinate rules for the drawings.

Activity: Walk-a-Thon Posters

Next Generation Mathematics Learning Standard (s): NY-7.EE Apply and extend previous understanding of arithmetic to algebra expressions.

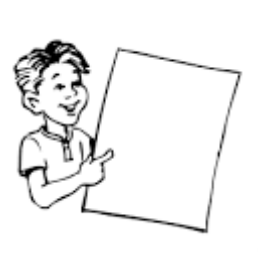
Mathematics Practice Standards:

MP 1: Make sense of problems and persevere in solving them.

MP 2: Reason abstractly and quantitatively.

MP 7: Attend to precision.

Adapted from: *Connected Mathematics Project – 3*



Task Directions: Ms. Chang’s class decides to order posters that advertise a walkathon to raise money for a local charity. Ichiro obtains quotes from two different companies.

Clear Prints charges \$2 per poster.

Posters by Sue charges \$15 plus \$.50 per poster.

- a. For each company, write an equation Ichiro could use to calculate the cost for any number of posters.

- b. For what number of posters is the cost the same for both companies? Explain.

- c. Which company do you think the class should buy posters from? Explain your reasoning.

- d. If Ms. Chang’s class has an \$18 budget for posters, which company do you think the class should buy posters from? If Ms. Chang donates an additional \$10 for ordering posters, does it impact the decision made? What factors influenced your decision?

- e. Use the information from parts (a)–(c) to find an ordered pair that makes the inequality $C < 20$ true for Clear Prints. Find an ordered pair that makes the inequality $C > 20$ true for Posters by Sue.

Resources

Hooda Math - <http://www.hoodamath.com/>

Fun online math games for grades k - 8. Also includes iPad Games and works on Kindle and Android - HTML5 games. Select by grade, category and subject!

Math Play - <http://www.math-play.com/Middle-School-Math-Games.html>

Fun Middle School Math games. Choose from a range of games to practice your skills and fluency.

Johnnie's Middle School Math -

<http://jmathpage.com/middleschoolmath/jmsmnumberoperations.html>

Interactive fun math games for grades middle school. Scroll down the page and see the games get more challenging. Games for Algebra, Number Sense, Geometry, Logic and Problem Solving and Statistics and Probability.

Calculation Nation, <http://calculationnation.nctm.org/>, is a free education service that uses the power of the Web to let students play games and challenge opponents from anywhere in the world. At the same time, students are able to challenge themselves by investigating significant mathematical content and practicing fundamental skills.

You Cubed - www.youcubed.org

Provides engaging mathematics puzzles and games for students of all ages.

Math Pickle - www.mathpickle.com

MathPickle.com is a free online resource of original mathematical puzzles, games and unsolved problems for K-12 teachers. It is supported by the American Institute of Mathematics.

Math 42 - <http://math-42.com/>

MATH 42 helps students from the 5th to the 12th grade with math.

Monkey in the Middle - <http://www.monkeyinthemiddleapps.com/>

Grades 6 -8. Play a cool game or practice your math skills. You can compete against your friends using Game Center leader boards and achievements. Can access tutorials and study notes too!

Figure This!, <https://figurethis.nctm.org/index.html>, demonstrates challenging middle school mathematics and emphasizes the importance of high-quality math education for each and every student. Find interesting math challenges that middle-school students can do at home with their families.

NCTM Games for Middle School

http://www.nctm.org/uploadedFiles/Conferences/Annual_Meetings/pdfs_for_jumpstarts/SarahNSarahMiddle.pdf

These games require paper and scissors. Games are great to play with friends and family. Grades 6 – 8.