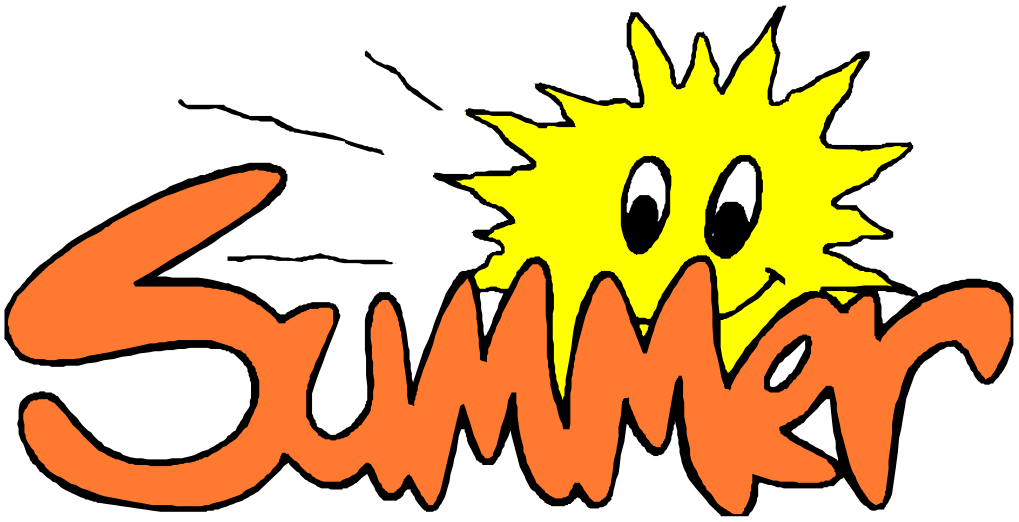


MATH PACKET

for

Compacted Math Students Entering the **Fifth Grade**

INTRODUCTION

Welcome to the summer math packet for students completing fourth grade. The design of the activities is meant to support instruction in the new curriculum in both its content and presentation. Therefore the activities are not to be done as independent problems, but to be worked on with a parent, guardian or older brother or sister. Talking about the problem is an important part of completing each activity.

In Fourth Grade, students explored math concepts based on five standards. The ten activities in this summer math packet reflect the content of those five standards.

Summer Packet Content:

<u>Standard 1: Operations and Algebraic Thinking</u>
Purchasing Popsicles (4th grade task)
Macaroni Math (5th grade task)

<u>Standard 2: Number and Operations in Base Ten</u>
Beach Towel Area Models (4th grade task)
Diving for Decimals (5th grade task)

<u>Standard 3: Number and Operations—Fractions</u>
Build a Beach House (4th grade task)
Fraction Beach Balls (5th grade task)

<u>Standard 4: Measurement and Data</u>
Summer Skate Park (4th grade task)
Packing Blocks (5th grade task)

<u>Standard 5: Geometry</u>
Flower Garden Geoboards (4th grade task)
Growing Tharshalls (5th grade task)

Operations and Algebraic Thinking-4th Grade

Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

Purchasing Popsicles

Some local stores are selling popsicles for the summer. You LOVE popsicles and want to buy enough for the whole year! Answer the questions below using the chart.

Target	Sam's Club
3 popsicles per box	180 popsicles per box
2 popsicles per box	90 popsicles per box
4 popsicles per box	120 popsicles per box

Adapted from: Smith, Margaret Schwan, Victoria Bill, and Elizabeth K. Hughes. "Thinking Through a Lesson Protocol: Successfully Implementing High-Level Tasks." Mathematics Teaching in the Middle School 14 (October 2008): 132-138.

How many different ways can you buy 360 popsicles?

What patterns do you notice? Explain your answer.

Challenge:

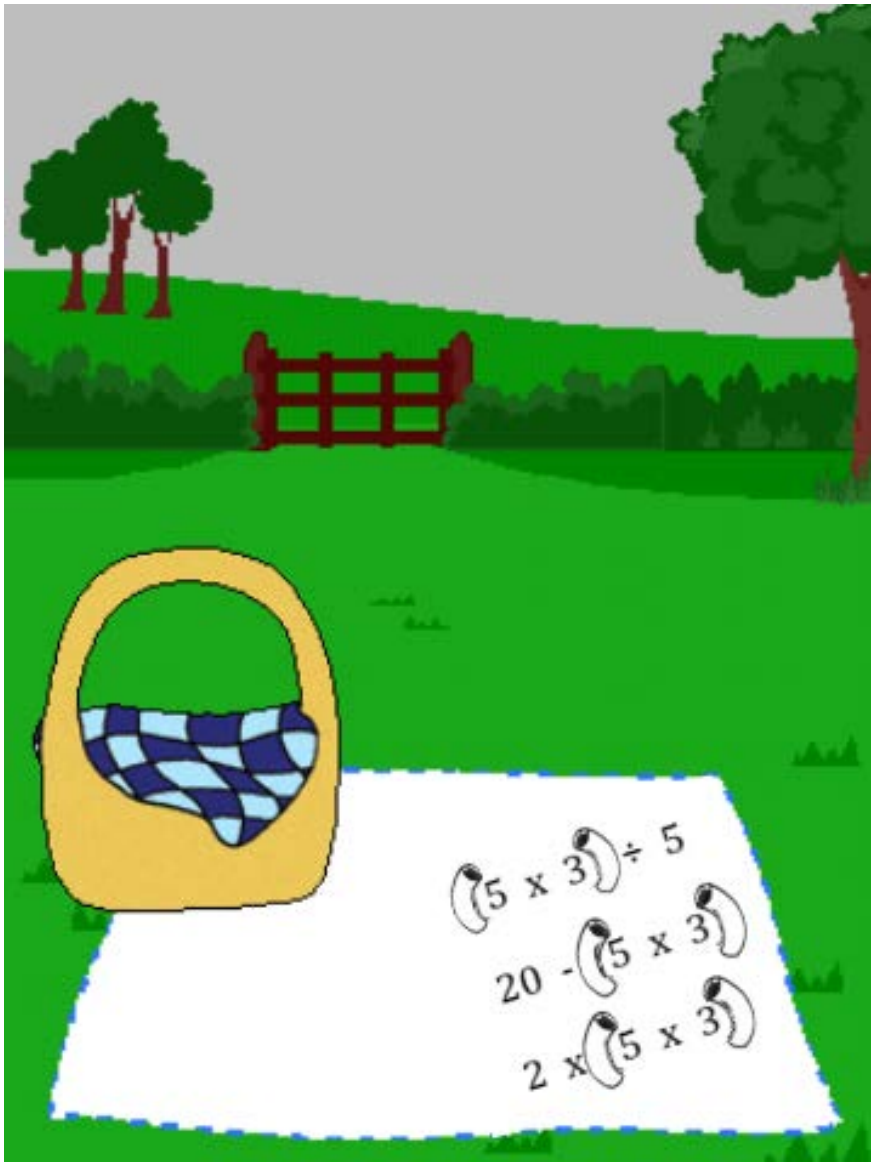
If you need half as many popsicles, how many different ways can you buy that many popsicles?

Operations and Algebraic Thinking—5th Grade

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Macaroni Math

Aunt Mina's cold macaroni salad is delicious on a hot summer day. It's also great for helping to figure the value of mathematical expressions. Decide each value and place the expressions on the chart.



$2 \times \frac{1}{2} \times (5 \times 3)$

$(5 \times 3) \div 6$

$1 \times (5 \times 3)$

$(5 \times 3) \div 5$

$20 - (5 \times 3)$

$2 \times (5 \times 3)$

$\frac{1}{4} \times (5 \times 3)$

$(5 \times 3) \times (8 - 7)$

Less than 15	Equal to 15	Greater than 15

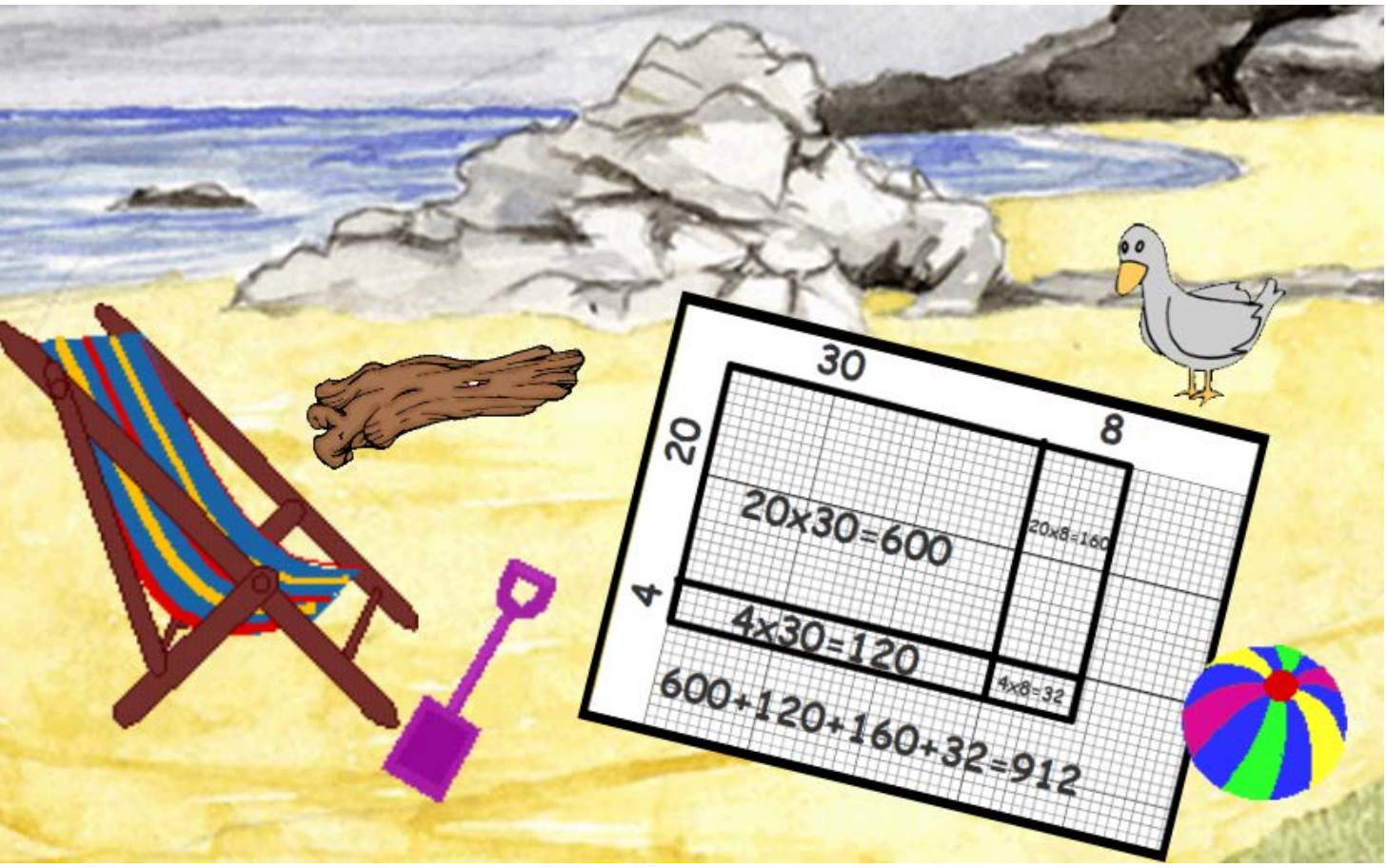
Number Operations in Base Ten—4th Grade

Beach Towel Area Models

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

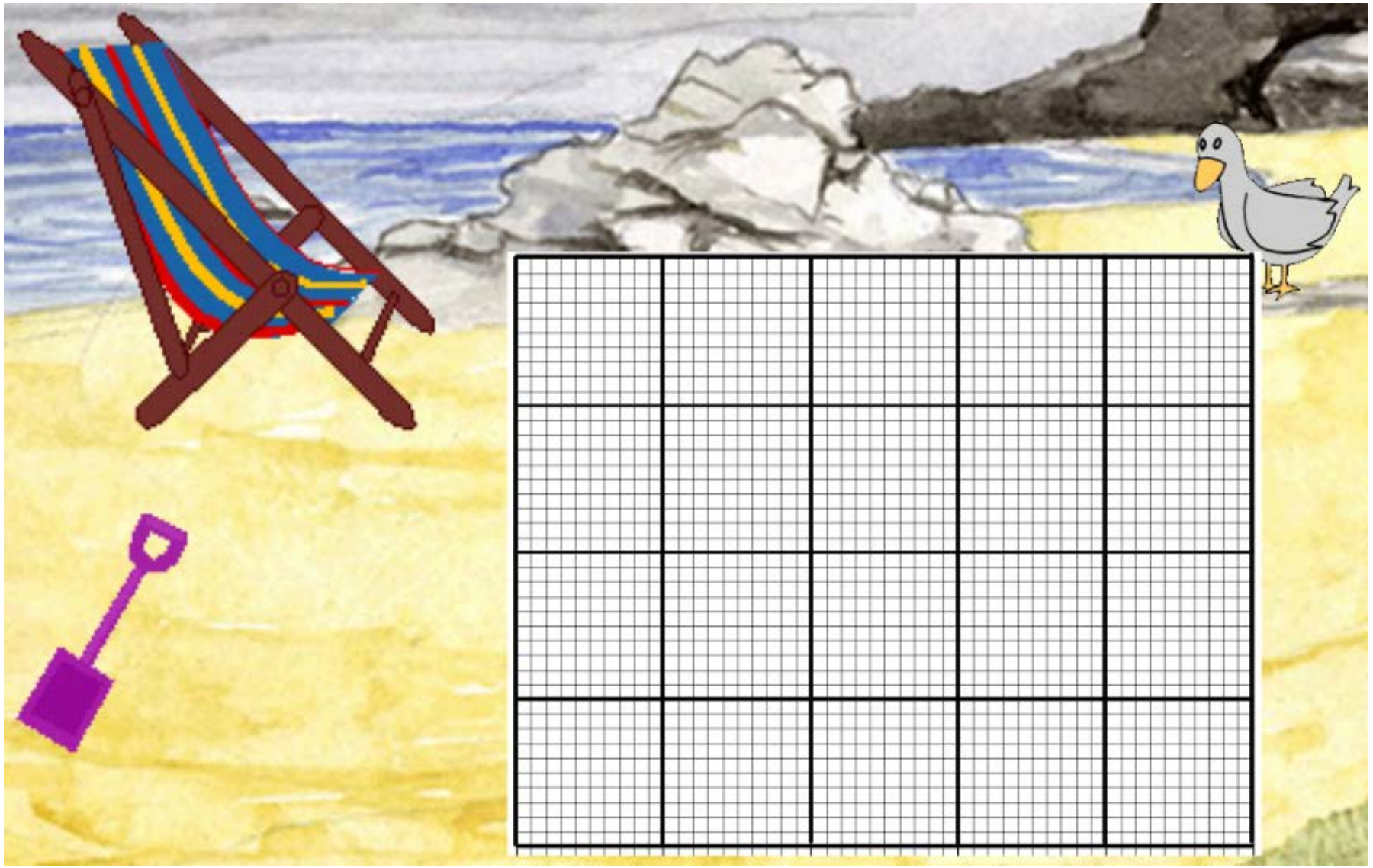
The Thurgood Marshall PTA is selling beach towels to help students remember their area models for multiplication. They have asked students to design a beach towel similar to the one below.

38 x 42

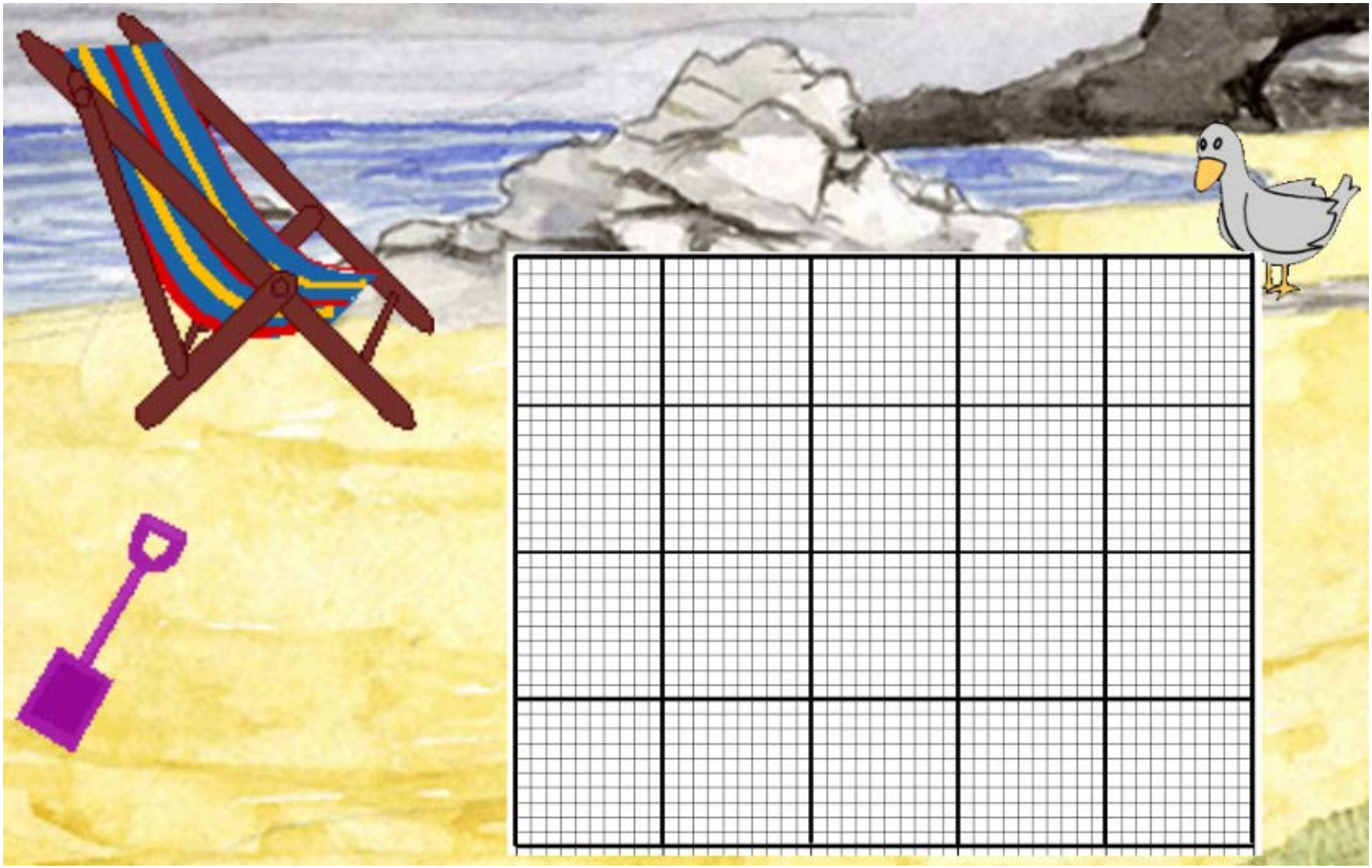


Use the following page to design a beach towel of an area model to represent 42 x 36. Be sure to include partial products and their equations.

42 x 36



Challenge: Design a beach towel with dimensions that you choose. Draw the beach towel on the grid and include partial products and their equations.



Number Operations in Base Ten—5th Grade

Diving for Decimals

Understand the place value system.

- Read, write, and compare decimals to thousandths.
- Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
- Compare two decimals to thousandths based on meanings of the digits in each place using >, =, and < symbols to record the results of comparisons.

Each player gets a set of number and decimal cards.

"Diving Board" cards get placed face-down in the center.

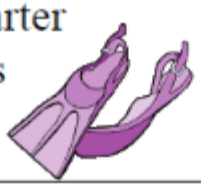
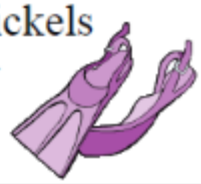
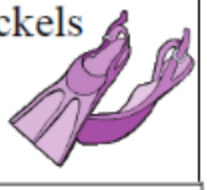
1. Each player chooses a card from the pile and builds a number that fits the clue.
2. Each player shares with his or her partner.
3. Work together to build a number that fits both clues.

If it is impossible to build a number that meets both clues, explain why.

Play until all cards have been drawn!

Adapted with permission from: http://maccss.ncdpi.wikispaces.net/file/view/CCSSMathTasks-Grade5.pdf/375611936/CCSSMathTasks-Grade5.pdf

●	0	1	2	3	4
●	5	6	7	8	9
●	0	1	2	3	4
●	5	6	7	8	9

Build a number greater than the value of two dimes	Build a number less than the value of one nickel
Build a number less than the value of a quarter and two dimes 	Build a number greater than the value of three nickels and one penny 
Build a number between the value of a quarter and two dimes	Build a number between the value of three nickels and one dime 
Build a number with an odd digit in the hundredths place	Build a number with a digit in the tenths place that is less than 5

Build a number greater than 0.75	Build a number where the digit in the ones place is half the size of the digit in the tenths place.
Build a number with an 8 in the thousandths place	Build a number that is between one and two
Build a number in which the digit in the tenths place is larger than the digit in the thousandths place	Build a number where the digit in the hundredths place is three times the digit in the ones place
Build a number less than two where the sum of the digits is 9	Build a number with an even digit in the thousandths place

NUMBER & OPERATIONS/Fractions—4th Grade

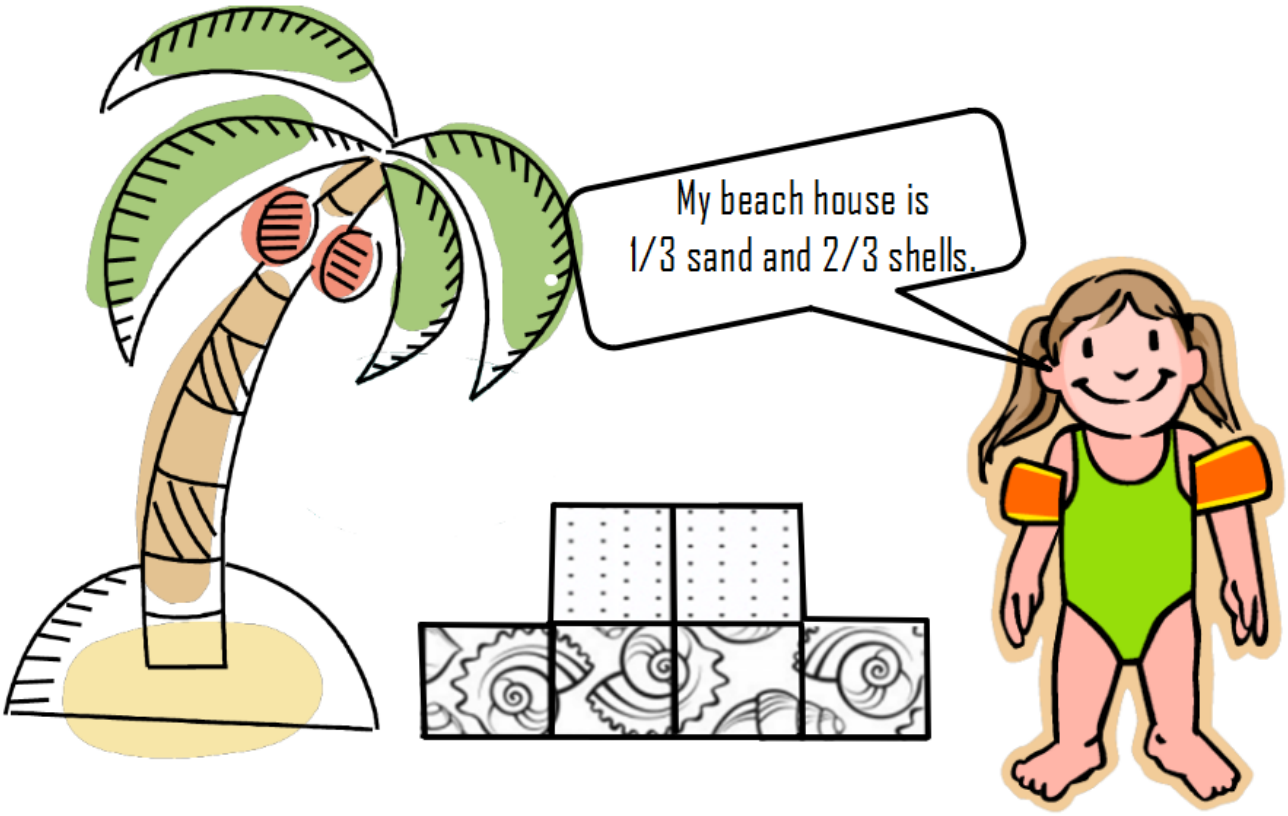
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. **

1.4.D.3 Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$.

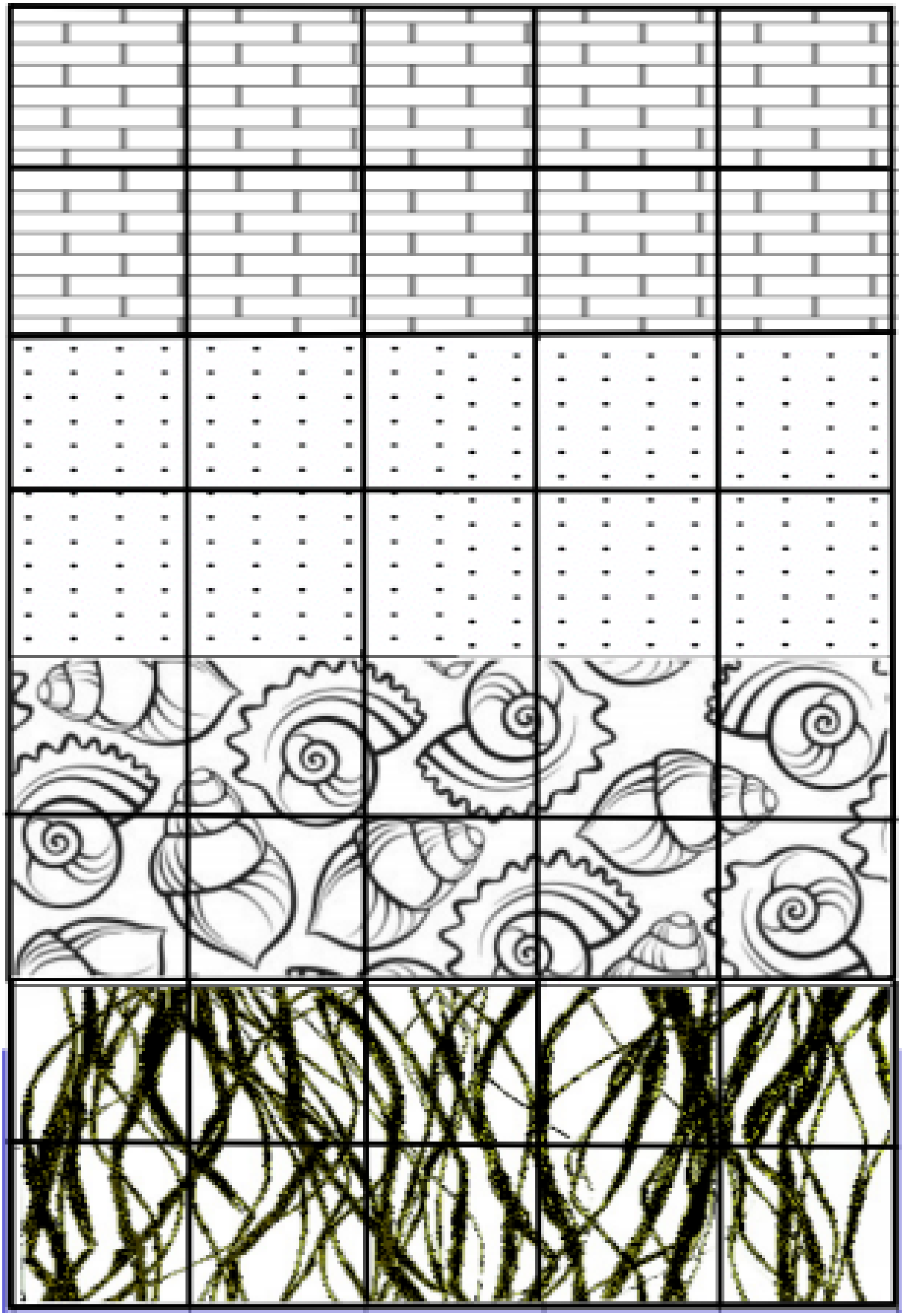
- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.
  Examples: $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$.

Build a Beach House

Cut out the 40 tiles on the next page. Use the tiles to construct a beach house given the criteria on each activity cards.



(adapted from http://maccss.ncdpi.wikispaces.net/file/view/4thGradeUnit.pdf/295313404/4thGradeUnit.pdf)



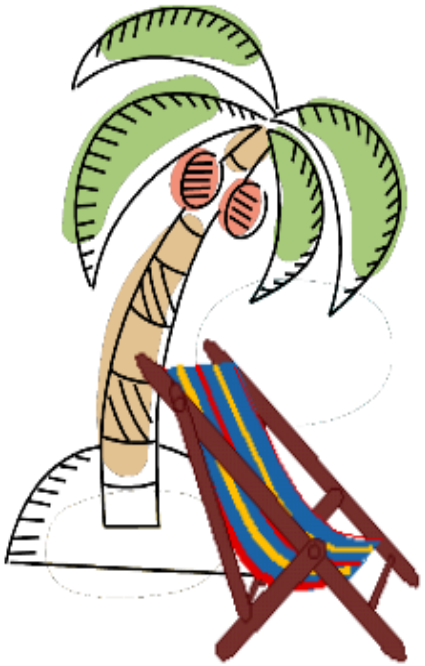
CARD A	CARD B
Build beach house that is… • One fourth brick • One fourth seaweed	Build beach house that is… • Two thirds sand

Blank page

CARD C Build beach house that is… • One eighth sand • Four eighths seaweed	CARD D Build beach house that is… • One third shells • Two thirds brick
CARD E Build beach house that is… • One half brick • One fourth sand	CARD F Build beach house that is… • Five twelfths shells • One sixth brick • Two sixths seaweed
CARD G Build beach house that is… • One fifth brick • Four tenths seaweed • Two fifths shells	CARD H Build beach house that is… • One third sand • One sixth brick • One half seaweed

Blank page

Build your beach house here.



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NUMBER & OPERATIONS/Fractions—5th Grade

Use equivalent fractions as a strategy to add and subtract fractions
Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)

Fraction Beach Balls

Will your family trip to the beach be a washout? When it starts to rain you scramble under your beach umbrella and play a fraction game. Hopefully the rain will stop soon so that you can play again.

Directions:
1. This game provides practice for adding fractions.
2. You should play in pairs or groups of 3.
3. Each player spins both beach ball spinners and records the fractions in the chart. Record the sum of the two fractions.
4. After each player takes five turns, each should add their five sums to get a Final Score. Most Final Scores can be represented as mixed numbers.
5. The player with the largest Final Score wins the game. Play the game twice.

Adapted with permission from: http://maccss.ncdpi.wikispaces.net/file/view/CCSSMathTasks-Grade5.pdf/375611936/CCSSMathTasks-Grade5.pdf

Fraction 1	Fraction 2	Total for this turn

Directions: On each turn spin both spinners. Then add both fractions. After 5 turns, add all your totals to get your Final Score. The winner is the person with the largest Final Score.

FINAL SCORE: _____

Fraction 1	Fraction 2	Total for this turn

Directions: On each turn spin both spinners. Then add both fractions. After 5 turns, add all your totals to get your Final Score. The winner is the person with the largest Final Score.

FINAL SCORE: _____

Fraction 1	Fraction 2	Total for this turn

Directions: On each turn spin both spinners. Then add both fractions. After 5 turns, add all your totals to get your Final Score. The winner is the person with the largest Final Score.

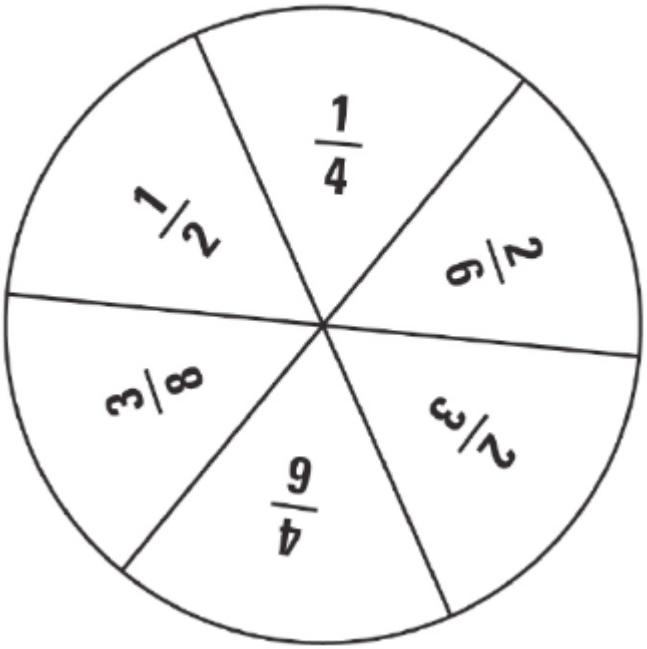
FINAL SCORE: _____

Fraction 1	Fraction 2	Total for this turn

Directions: On each turn spin both spinners. Then add both fractions. After 5 turns, add all your totals to get your Final Score. The winner is the person with the largest Final Score.

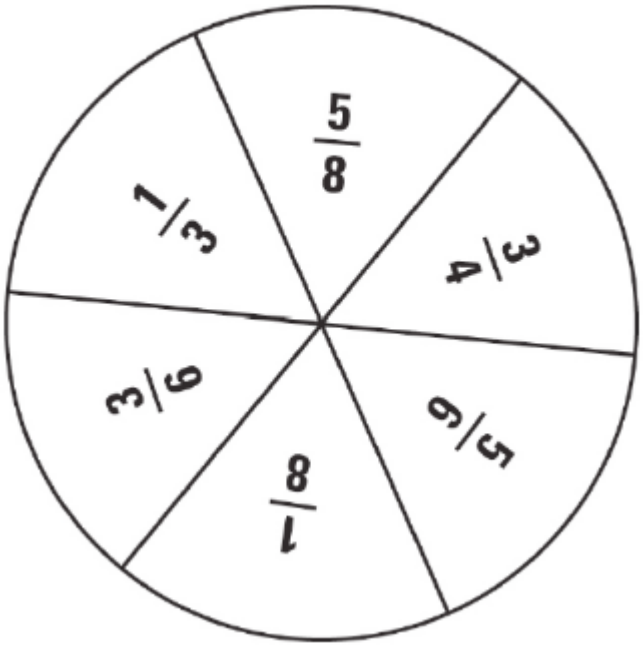
FINAL SCORE: _____

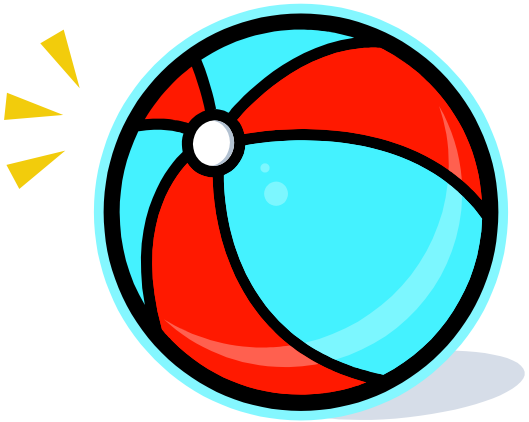
Beach Ball Spinner 1



To use the spinners, you will need a paper clip and a pencil. Put the paper clip down with one end on the center of the spinner. Put the point of the pencil inside the paper clip at the center. Use your fingers to spin the paper clip.

Beach Ball Spinner 2

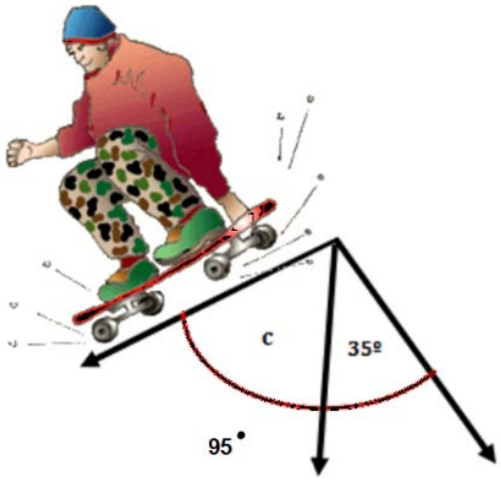




Measurement and Data—4th Grade

Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Summer Skate Park



What is the value of angle c? _____

Explain how you found your answer.

Kevin set a goal to learn to do a 360º turn on his skateboard. On his first attempt he manages to turn 90º. How many more degrees does he need to turn to meet his goal? Justify your solution.

https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.MD.7

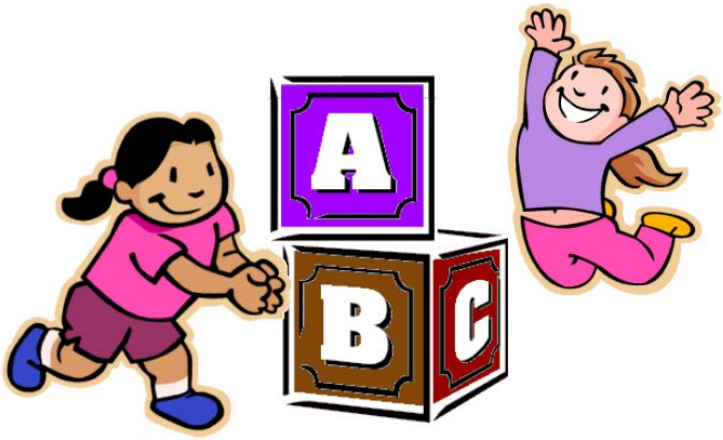
Summer Skate Park Challenge

Jennifer left home at 3:50 p.m. When she reached the grocery store, she noticed that the minute hand on the clock had moved 90 degrees clockwise. What time did she reach the grocery store?

Measurement and Data--5th Grade

Packing Blocks

Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.



Tami and Natasha make baby toys for a local toy manufacturer. They are packing some baby blocks into a shipping box. The shipping box has a **volume of 1,536 cubic inches.** The dimensions of the blocks they are packing in the box are provided on the next page.

They must pack all of the same sized blocks into one box. Tami and Natasha want to decide before they actually pack the box. Which blocks might fit into the box with no space left over? Can you help Tami and Natasha decide which blocks could be packed into each box?

- Correctly match the "Dimension of Block" cards with the correct "Volume of Box" cards.
- Then match the "Maximum Number of Blocks."
- You may need a calculator.
- Match the cards to find which blocks can be packed into Tami and Natasha's box with no space left over, (no remainder)?

Adapted with permission from: http://maccss.ncdpi.wikispaces.net/file/view/5thgrade_GAMES_3.31.14.pdf/499871788/5thgrade_GAMES_3.31.14.pdf

Dimensions of Block 1 **6 in by 6 in by 6 in**	The Volume of Box **V = 125 cubic inches**	Maximum Number of Blocks **7 blocks**
Dimensions of Block 2 **5 in by 5 in by 5 in**	Maximum Number of Blocks **24 blocks**	The Volume of Box **V = 27 cubic inches**
Dimensions of Block 3 **4 in by 4 in by 4 in**	Maximum Number of Blocks **192 blocks**	The Volume of Box **V = 64 cubic inches**
Dimensions of Block 4 **3 in by 3 in by 3 in**	The Volume of Box **V = 8 cubic inches**	Maximum Number of Blocks **12 blocks**
Dimensions of Block 5 **2 in by 2 in by 2 in**	The Volume of Box **V = 216 cubic inches**	Maximum Number of Blocks **56 blocks**

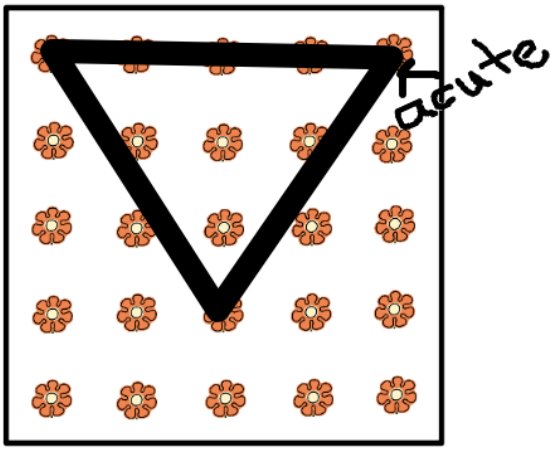
Geometry—4th Grade

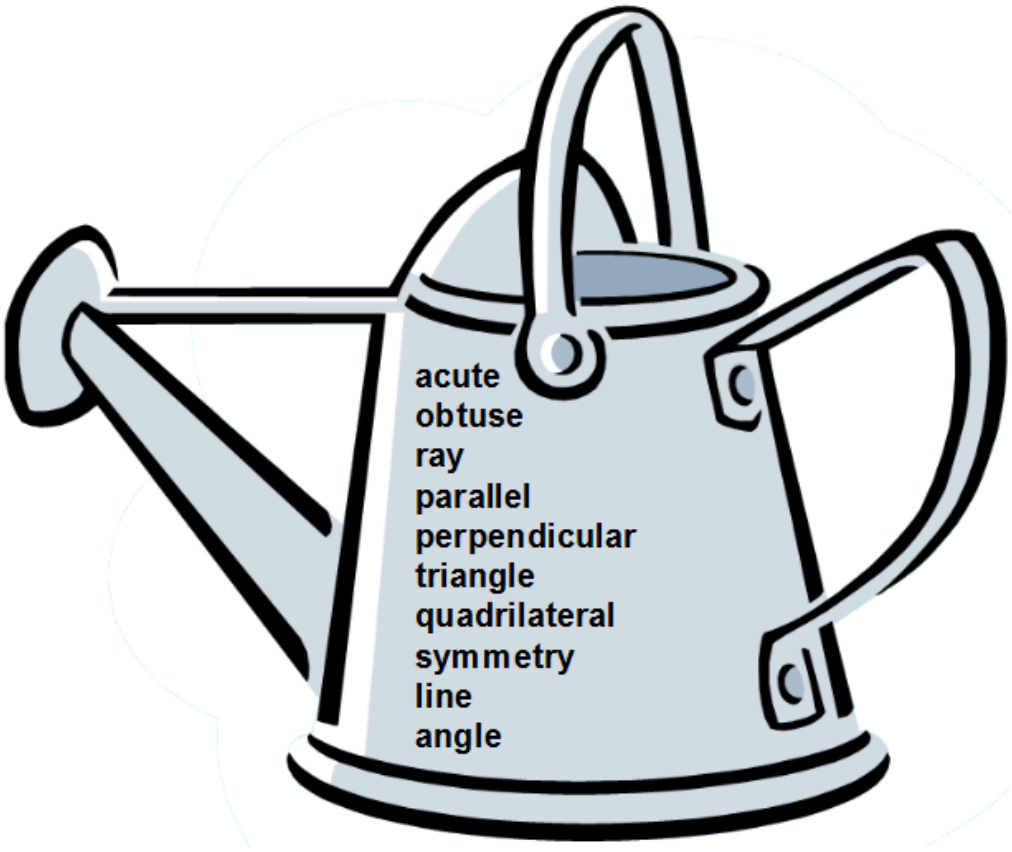
Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

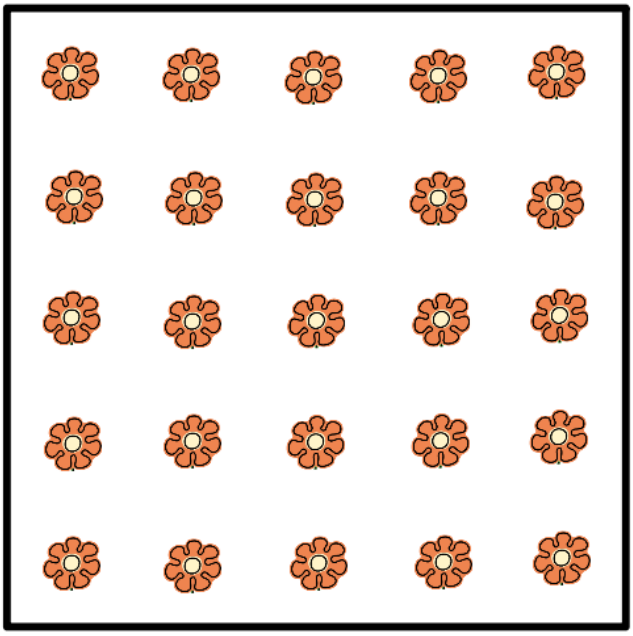
3.4.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

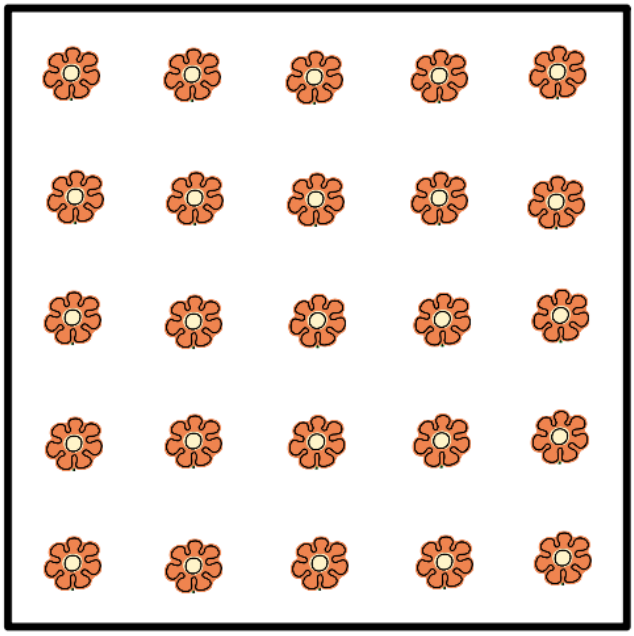
Flower Garden Geoboards

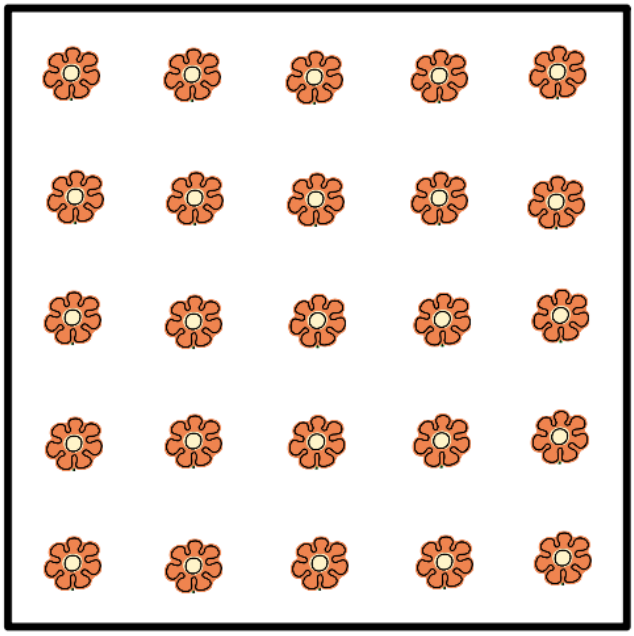
Look at the list of geometry terms on the watering can. Using a straight edge, draw on the flower gardens. Label your drawings. Make sure you use all the terms provided. Multiple terms can be used on a drawing.

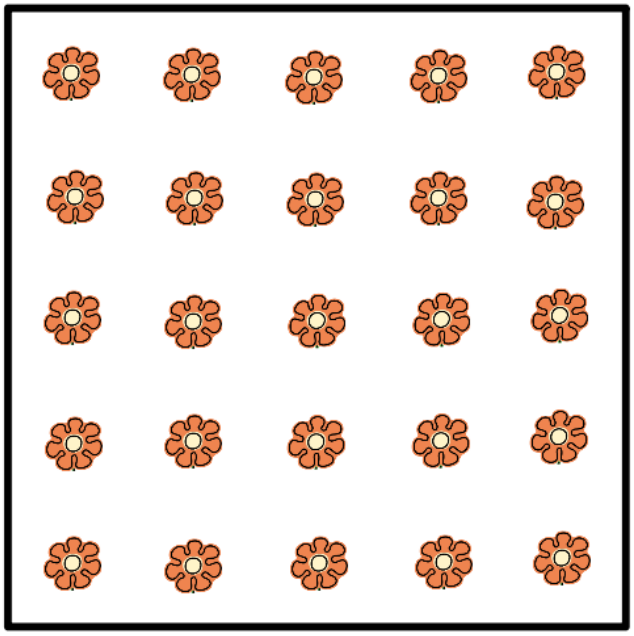


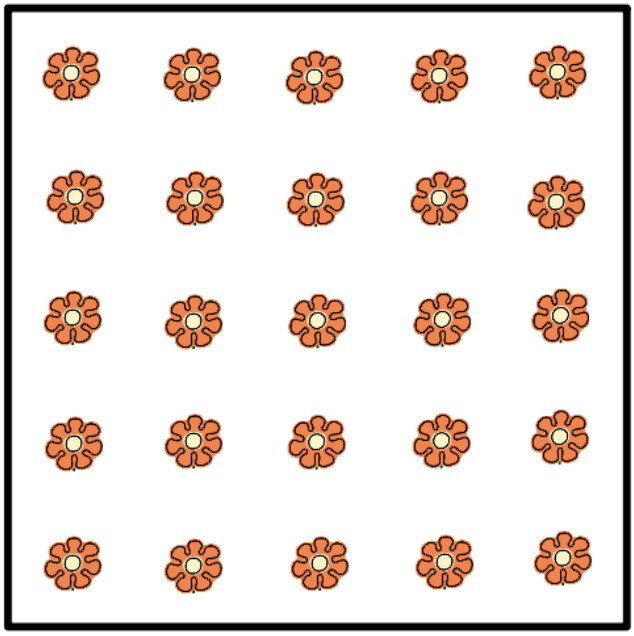


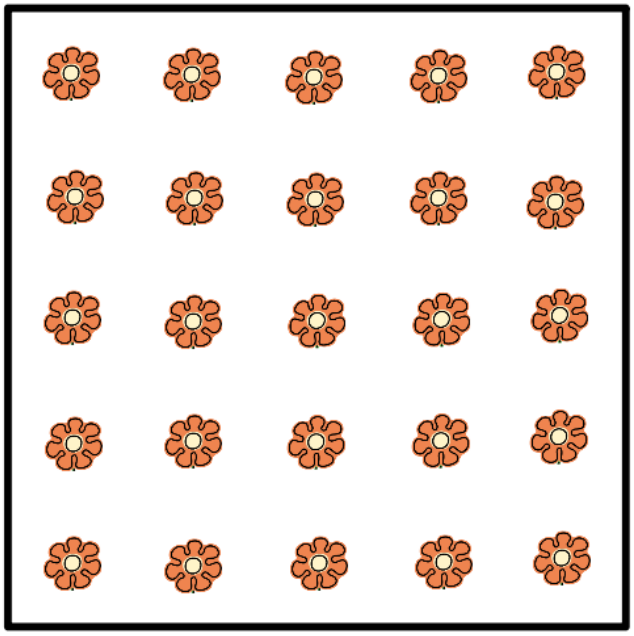


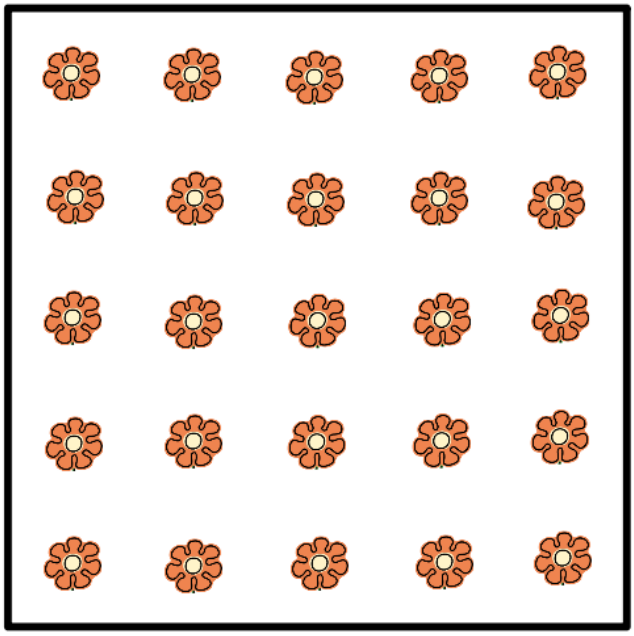


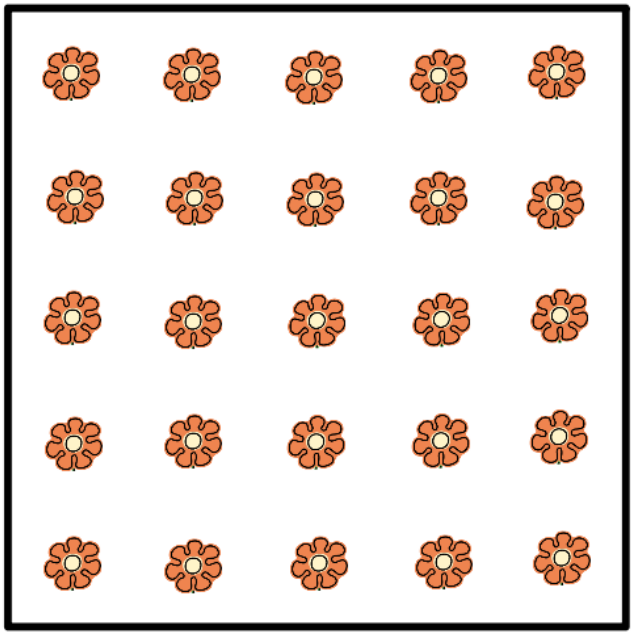












Geometry—5th Grade

Graph points on the coordinate plane to solve real-world and mathematical problems.

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Growing Tharshalls

While playing at the park you and your friends discover a new creature. You decide to name it a *"Tharshall"* after your school, Thurgood Marshall.

This is your *Tharshall* at 1 year old.

You decide to observe the growth of your *Tharshall* over the next four years.

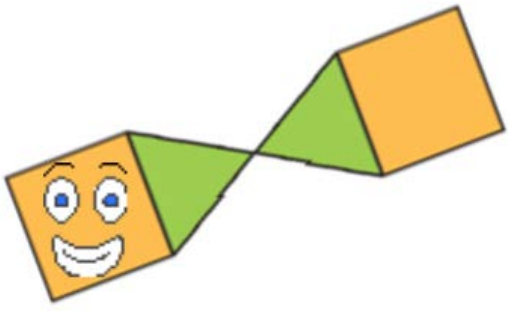
2 years old

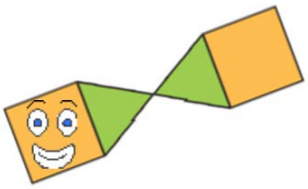
3 years old

4 years old

A local newspaper would like to write an article about the *Tharshall*. They have asked you to consider the following questions. Plan out your responses by completing the chart.

Based on this pattern, draw and extend the Tharshall for two more years. **Five years** **Six years**
Use words to describe the pattern.
Create a function table to describe the pattern.
Draw and describe the 10th stage of the pattern.
Write a rule for this pattern.



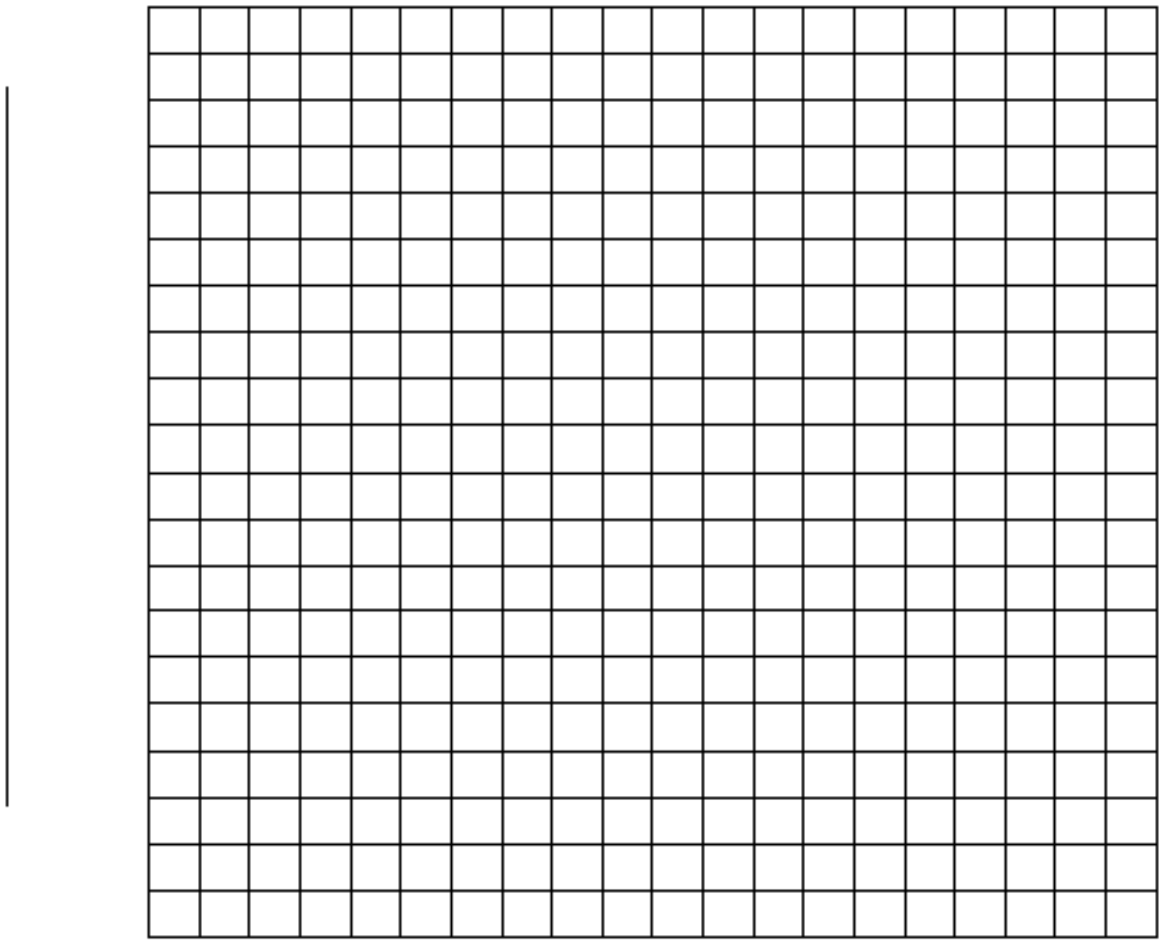


Growing Tharshalls

Use the table to write the coordinate points for this pattern:

Plot the coordinate points on the graph below. Should these points be connected to form a line graph? How do you know?

Title _____



_____

$\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 0 \\ \hline \end{array}$
$\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 1 \\ \hline \end{array}$
$\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 2 \\ \hline \end{array}$
$\begin{array}{r} 2 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 3 \\ \hline \end{array}$

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$\begin{array}{r} 4 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$
$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$
$\begin{array}{r} 5 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$
$\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$

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$\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 1 \\ \hline \end{array}$
$\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$
$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$
$\begin{array}{r} 7 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$

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$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$
$\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 1 \\ \hline \end{array}$
$\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$
$\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 9 \\ \hline \end{array}$

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$2 \div 2 =$	$4 \div 2 =$	$6 \div 2 =$	$8 \div 2 =$
$10 \div 2 =$	$12 \div 2 =$	$14 \div 2 =$	$16 \div 2 =$
$18 \div 2 =$	$20 \div 2 =$	$3 \div 3 =$	$6 \div 3 =$
$9 \div 3 =$	$12 \div 3 =$	$15 \div 3 =$	$18 \div 3 =$

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21÷3=	24÷3=	27÷3=	30÷3=
4÷4=	8÷4=	12÷4=	16÷4=
20÷4=	24÷4=	28÷4=	32÷4=
36÷4=	40÷4=	5÷5=	10÷5=

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35÷5=	40÷5=	45÷5=	50÷5=
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8÷8=	16÷8=	24÷8=	32÷8=

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40÷8=	48÷8=	56÷8=	64÷8=
72÷8=	80÷8=	9÷9=	18÷9=
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63÷9=	72÷9=	81÷9=	90÷9=

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