4th Grade Enhanced Math Unit 2

Exploring Real-life Phenomena through Patterning & Algebraic Reasoning

Standards

4.PAR.3 Generate and analyze patterns, including those involving shapes, input/output diagrams, factors, multiples, prime numbers, and composite numbers.

4.MDR.6: Measure time and objects that exist in the world to solve real-life, mathematical problems and analyze graphical displays of data to answer relevant questions.

Learning Goals

- I can explore, analyze, and extend growing patterns using shapes.
- I can create and extend growing shape patterns that follow a rule and explain why the pattern continues as it does.
- I can explore, analyze, and extend numerical patterns.
- I can use input-output tables and charts to represent patterns, find relationships and solve authentic problems.
- I can identify factors of whole numbers in the range 1-100.
- I can find multiples of single-digit numbers up to 100.
- I can use factor reasoning to determine if a product is a multiple of a term.
- I can identify composite numbers and explain what makes a number composite.
- I can identify prime numbers and explain what makes a number prime.
- I can explain the relationship between prime and composite numbers.
- I can analyze data sets and find patterns in them.
- I can create and carry out a statistical investigation.
- I can create an appropriate graphical representation of the data collected.

Unit 2 Major: Tuesday, October 17th

date is tentative



Multiplication

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Input-Output Tables

Input-output tables are sometimes called function tables or pattern tables. The function or pattern is the rule. The rule helps you understand the relationship between the two columns or rows. If you know the rule you can complete any input-output table.

Kids	Cans of soda
1	2
2	4
3	6
4	8

The rule for this table is **kids x 2 = number** of cans of soda. You can use the same rule to figure out the number of cans of soda needed for 10 kids.

	Х	Y						
	4	11						
	8	15						
	12	19						
	16	23						
[he	The rule for this tab							

The rule for this table is X + 7 = Y. You can use the same rule to figure out future rows added to the chart. If X = 20 then Y = 27(X+7 = 27)

Input	output
25	5
35	7
65	13
80	16

The rule for this table is **input** \div **5** = **output**. You can use the rule and the inverse of the rule to figure out future rows of the chart. If output = 20 then input = 100. (20x5 = 100)

Set A	4	6	9	13
Set B	10	14	20	28

Sometimes input-output tables have a two part rule. Can you figure out what the rule is for this function table?

When you think you have figured out the rule for the function table, you want to make sure it works with every set of numbers! Make sure you always double check each set.



4th Grade Enhanced Math Unit 3

Reasoning through Multiplication and Division

Standards

4.NR.2: Using part-whole strategies, solve problems involving addition and subtraction through the hundred-thousands place, as well as multiplication and division of multi-digit whole numbers presented in real-life, mathematical situations.

4.MDR.6: Measure time and objects that exist in the world to solve real-life, mathematical problems and analyze graphical displays of data to answer relevant questions.

Learning Goals

- I can demonstrate simple multiplicative relationships using concrete materials, drawings and equations.
- I can solve mathematical problems involving multiplicative comparisons.
- I can distinguish between additive (the difference of two quantities) and multiplicative comparisons (one group being a multiple of another).
- I can multiply a number 2 by 1, 3 by 1, 4 by 1, and 2 by 2 whole number whole numbers using strategies based on place value and the properties of operations.
- I can illustrate and explain multiplication using dot arrays and equations with an understanding of place value and properties of operations.
- I can understand, interpret, and solve real-life problem-solving situations in the context of word problems.
- I can solve real-life division problems involving up to 4-digit dividends and 1-digit divisors without remainders (whole number quotients).
- I can use mental computation and estimation strategies to justify the reasonableness of solution
- I can estimate and measure capacity using appropriate tools.
- I can estimate and measure mass using appropriate tools
- I can solve elapsed time problems to the nearest hour, half-hour, quarter-hour, to the nearest five minutes, and to the nearest minute.
- I can draw an open number line and solve elapsed time problems by determining when something begins, ends, or how long the event lasts (duration).
- I can use the given information to help solve problems related to time and how it connects to everyday life



Multiplication Strategies

E	Box Me	thod	Standard Method				
	23 x 4 20	Step I: 	154 232	Multiply the top number by the digit in the ones place.			
40 + 2	$20 \times 40 =$ 800 $20 \times 2 =$	$3 \times 40 =$ 120 $3 \times 2 =$	Step 2:	154 <u>28</u> 232	Put a zero as a place holder.		
Ster fac	800 + 120 + p 1: Expand e tors you are n	Step 3:	0 154 232 .080	Multiply the top number by the digit in the tens place.			
Stej abc Stej in tl Stej pro the	 p 2: Set up the boxes p 3: Multiply the rows and comparison p 4: Add all of ducts found in boxes to get 	Step 4: 	154 <u>28</u> , 232 ,080 ,312	Add the numbers together.			

Division Strategies

Box Method



Step 1: What can I multiply the divisor by to get as close to my dividend without going over?
Step 2: Subtract the product from the divined.
Step 3: Take the difference and move it to the next column.

Step 4: Repeat the steps until you get a 0 or a number less than your divisor.

Standard Algorithm for Long Division

An algorithm is a set of steps or rules that you can follow to solve a basic mathematical problem. These are the steps for the standard algorithm for long division.

	_	_
Standard divis 8 7 8	set up for ion ■ ● 7	Set up for long division 7 8 28
0,20	1 7 /	
Dad divide	<mark> , 8</mark> 7 8,28	3 Step 1: Divide 8 by 7. 8÷7 = 1
Mom	7	Step 2: Multiply 7 by 1. 7 x 1 = 7
multiply Sister	12	Step 3: Subtract 7 from 8. 8 – 7 = 1
subtract	58	Step 4: Bring down the
Brother oring down	<u> </u>	in this case it is the 2.
Rover repeat		21 Step 5: Repeat Steps 1-5 with the remaining digits

Conversions	Elapsed Time
MassGrams (g) the weight of a paperclip.Kilograms(kg) The weight of a pineapple.KilogramGram 111000 222,000 101010,000 121212,000 505050,000Liters(L) The amount of ilquid in a bottle of soda.LitersMillilliters 111,000 222,000 101010,000 121010,000 121010,000 121212,000 101010,000 121212,000 101212,000 101212,000 121212,000 121310,000 121410,000 121550,000	Hunse Hu
Videos to Support Learning at Home: Dultiplication: Area Model https://youtu.be/qiwJQxMvPMM Standard Method https://www.youtube.com/watch?v=od- tHGrudcA&list=PLiT3pCvK_cfW6bAJ19WELI1xYqG Gi9Lri&index=3 Division: Standard Method https://youtu.be/ITpzAicMmqo?si=TgI5x4xgoo5m Q7jc Elapsed Time: https://youtube.com/playlist?list=PLlu3HXXXgocR ad0hGbl_yNnoLLUzw1j9E&si=-ZbFwePOYir7D3Yu	the amount of time that passes the amount of time that passes between one time and another on a number line Start: 8:30 AM. Stop: 9:47 AM. I hour, 12 minutes after 9:45 10:57 1 hour 10 min 10 min 10 min 8:30 9:30 9:40 9:45 9:47 1 hour 10 min 10 min 10 min 9:30 9:40 9:45 9:47 1 hour 12 minutes after 9:45 10:57 Carlos gets to class at 9:08 a.m. the has to complete his morning Nork before math begins at 9:30 a.m. tomplete his work before math begins? 1 to the to

4th Grade Enhanced Math Unit 4 Part A

Investigating Fractions

Standards

4.NR.4: Solve real-life problems involving addition, subtraction, equivalence, and comparison of fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 100 using part-whole strategies and visual models.

Learning Goals

- I can describe how the number and size of the parts differ even though the fractions are equivalent.
- I can generate equivalent fractions.
- I can identify a fraction greater than 1.
- I can generate equivalent fractions with fractions greater than 1.
- I can use fraction diagrams to compare fractions.
- I can recognize that comparisons are valid only when the two fractions refer to the same whole.
- I can record the results of comparisons with symbols >, =, or and justify the conclusions.
- I can recognize that comparisons are valid only when the two fractions refer to the same whole.
- I can compare fractions with different numerators and/ or different denominators to common benchmarks (0, 1/2 and 1).
- I can join (compose) and break apart (decompose) whole numbers and fractions as the sum of unit fractions.
- I can decompose a fraction into a sum of fractions with the same denominator using visual representations and write an equation to justify my work.
- I can justify my reasoning using visual fraction representations.
- I can compose and decompose mixed numbers in more than one way using visual representations.
- I can flexibly add and subtract fractions and mixed numbers with the same denominator in word problems using different strategies as they relate to everyday life.

Unit 4 Part A Major: Wednesday, December 13th

date is tentative



Equivalent Fractions

Equivalent fractions are fractions that have the same value. When looking at models of equivalent fractions, they have to be the same shape and size.



These models all show equivalent fractions. The same amount is shaded on each rectangle.

Drawing a model can help you identify equivalent fractions, but you can also find equivalent fractions by multiplying or dividing.

Find Equivalent Fractions	Find Equivalent Fractions
by Multiplying	by Dividing
$\frac{1}{2} \times \frac{4}{4} = \frac{4}{8}$	$\frac{2}{4} + \frac{2}{2} = \frac{1}{2}$
You can find an equivalent	You can find an equivalent
fraction by multiplying the	fraction by dividing the
numerator and denominator	numerator and denominator
by the same number.	by the same number.



Decomposing Fractions

When you decompose a fraction you break it down into smaller parts. You can decompose fractions in a variety of ways. When you decompose a fraction, the denominator stays the same, you just break apart the numerator.



You can also decompose a fraction as a series of unit fractions. A unit fraction will always have 1 in the



4th Grade Enhanced Math Unit 4 Part B

Investigating Fractions and Decimals

Standards

4.NR.5 Solve real-life problems involving addition, equivalence, comparison of fractions with denominators of 10 and 100, and comparison of decimal numbers as tenths and hundredths using part-whole strategies and visual models.

5.NR.4: Read, write, and compare decimal numbers to the thousandths place, and round and perform operations with decimal numbers to the hundredths place to solve relevant, mathematical problems.

4.MDR.6 Measure time and objects that exist in the world to solve real-life, mathematical problems.

Learning Goals

- I can measure objects to the nearest 1/8 of an inch.
- I can collect measurement data and explain how data is collected.
- I can ask and answer questions based on gathered information.
- I can determine the most appropriate graph to use to display the data.
- I can write a fraction with denominators of 10 equivalent to fractions with denominators of 100.
- I can use concrete materials and visual models to show fractions (Including Mixed numbers) and decimals.
- I can read, write and represent decimal values.
- I can explain the relationship between decimals and fractions.
- I can determine equivalent fractions with denominators of 10 and 100.
- I can add two fractions with the denominators of 10 and 100.
- I can read fractions with denominators of 10 or 100 using decimal notation, and decimal numbers to the hundredths place as fractions.
- I can reason about the size of decimals when comparing decimals.
- I can order and compare decimal fractions to the hundredths using <, > and =.

Unit 4 Part A Major: Wednesday, February 14th

date is tentative

ade up of 10 dimes. There are 10 dimes in in one dollar. Su can also make a one dollar. One dime is penny is one one tenth of a dollar. In undredth ot	is is one dollar. It is There are 100		represents 1 whole. represents 1 whole. represents 1 whole. represents 1 whole. represents 1 tenth. 1 hundr			hundredtt who	1 dollar 1 dime \$0.0 there are 10 tenths 1 per in one whole there are	1 0.1 Hundr \$1.00 \$0.10 0.0	One Whole One Tenth On	hole numbers can be broken down in to smaller parts. V eak a whole number into groups of tens or hundreds it b decimal. You can represent decimals using visuals and	Decimals
a dollar.) pennies	.25	ares is .2 .2 edth.	s split into Decimals	$\frac{6}{10} = .6$ and	le Fractions can be writ	$.3 = \frac{3}{10}$ and	edth Decimals can be wri		When you ecomes a Decimals and fractions	
<u>68</u> 100	6 10	25 100	$\frac{2}{10}$	Fractions	$\frac{18}{100}$ = .18	tten as decima	$.45 = \frac{45}{100}$	itten as fractior	iole.	s both name o	

5

numbers 12.4 > 12.39 12.4 is greater than 12.39 To order a group of numbers, you complete steps 1-3 with more Start here	Follow these steps to compare two numbers. Step 1: Line up the numbers according to place value. 12.4 12.39 Step 2: Compare the numbers in each place starting with the Start here	Comparing & Ordering DecimalsAll numbers have value. You can compare the value of two numbers by using the following symbols:Greater Than >Less Than Less Than Equal To Equal To
A chef collects data to display how many cups of Sugar he uses in a variety of recipes. He data on a line plot to show how frequently he Uses each amount.	Each X represents me recipe that uses that X X X X X X X X X	Ine plots show how frequently something