	Diocese of Erie	
	Mathematics	
	Third Grade	
Unit of Study		Weeks: 4
Unit 1: Collecting/Displaying Data	, Number and Operations in	
Base Ten		
Purpose: Students will be able to	add, subtract, and write numbers u	p to one
hundred thousand. They will be a	ble to use numbers up to one hund	red
thousand in real world contexts, s	such as scaled bar graphs and word	
problems.		
Essential Questions:		
 How can data be organize quantities? 	ed and represented to provide insig	ht into the relationship between
 Can graphed data be used information? (how many 	t to answer one-and-two step math more or how many less)	problems to compare
– How can numbers be com	posed, decomposed or regrouped	to show place value?
Standards:		
3.MD.6 Draw a scaled picture gra	ph and a scaled bar graph to repres	ent a data set with several
categories.		
3.MD.7 Solve one-and-two step	"how many more" and "how many	less" problems using information
presented in the scaled bar graph	s.	
3.NBT.1 Identify, recognize, and v	vrite numbers through the hundred	I thousand place value.
3.NBT.2 Record whole numbers u	sing words.	
3.NBT.3 Compare and order whol	e numbers.	
3.NBT.4 Use place value understa	nding to round whole numbers to t	he nearest 10 or 100.
3.NBT.5 Fluently add and subtract	t within 1000 using strategies and a	lgorithms based on place value,
properties of operations, and/or t	he relationship between addition a	and subtraction.
Standards Reinforced:		
3.MD.13 Draw a picture graph and a bar graph (with single unit scale) to represent a data set with up		
to four categories		
3.MD.14 Extend repeating pattern	าร	
3.MD.15 Solve simple put-togethe	er, take apart, and compare proble	ms using information presented
in a bar graph		
2.NBT.1 Fluently add and subtract	t within 100 using strategies based	on place value
2.NBT.13 Add and subtract within 100 using concrete models or drawings and strategies based on		
place value; relate to written method		
Vocabulary:	linear	pictograph
addend	minuend	place value
bar graph	ones, tens, hundreds,	regroup
data	thousands	tally chart
graph	pattern	
Authentic Performance Assessment:		

Students will generate data by choosing an activity from a brainstorming session to create a Pictograph or Bar Graph.

Place Value:

The teacher will provide 3 and 4 digit numbers for student to model using base ten blocks; the students will write the number of ones, tens, hundreds and thousands to correspond with their model and the number given. (Standard and expanded form)

Students use decks of playing cards (face cards are removed); the class might choose to give the Ace a specified value or use it as a WILD CARD. Students turn over 3 or 4 cards and create and number; their partner does the same. Students record their numbers and write as a comparing problem using >,<.

Students turn over 3 or 4 cards and record the greatest number or least number that can be formed with their cards.

Computation Skills:

addition and subtraction through 1,000

Thinking and Reasoning Skills:

compose and decompose numbers through 1,000 using standard, expanded and written form analyzing results/information to solve problems from graph data (E.g. What are different ways that we can tell someone about the information on the graph? How would that change people's ideas and conclusions about the data? How does the graph change if we change the scale? Is there another way we can organize the information on the graph?)

comparing rows of data

Make connections to place value mastered in Grade 2

Create a class or individual graphs

representations or models to show place value (e.g., base ten blocks or drawings)

Discuss when it would be easier to compare or express quantities using numbers (342 and 370) than models (snap cubes or drawings) and why

making connections between number lines and rounding

representations using number lines

using number patterns for rounding

Real World Problems & Application/Catholic Identity:

Identify gifts/talents/abilities God has given you and/or future goals and brainstorm how these mathematical skills will help you be successful with those gifts/goals.

Identify times when students would need to count, add or subtract large numbers.

Identify times when adults need to count, add or subtract large numbers.

Name places where graphs and numbers written out in word form are used in adult life

Reading and Writing in Math:

recording data drawing charts labeling graphs writing story questions writing numbers (standard, word, and expanded form) <u>Teaching with a Mountain View</u> is a blog which includes interactive notebook activities, anchor charts, and lesson ideas for place value and rounding. *The Great Graph Contest,* by Loreen Leedy Math World Making Graphs, by Bridget Heos

Technology/Manipulatives:

Manipulatives:

- Computer to create bar graph
- Items appropriate to individual students' collection of data (colored buttons, erasers, shapes, name tags) or to build graphs
- Dice
- Number cards
- Base ten blocks
- rulers

Websites

- <u>XtraMath</u> Skills practice for addition, subtraction, multiplication and division. Free login required and provides parents and teachers a detailed summary of practice, including days practiced and item analysis, in a weekly email report.
- First in Math paid subscription and login required. Students practice math facts and problems targeted to standards or brushing up on computation skills. They are able to compete with other students in their grade level through scores reported to the teacher/principal.
- <u>IXL Math</u> Math skills practice organized by skill. Click the skill and work through the problems. Free login required for more than 10 questions of practice.
- <u>Math Playground</u> hosts games for second graders, organized by mathematical topic and tagged by specific skill.

Online Tools

- Plickers is a QR reader tool that allows teachers to formatively assess quickly and easily using an app on their phone (Android or Apple)/iPad. For a short video of what Plickers looks like in an elementary classroom, you can click <u>here</u>.

Accommodations/Acceleration/Differentiation:

Teacher or peer assistance as necessary

Premade graph/table for students with fine motor or perceptual difficulty

Enrichment:

Option to create a line graph

Activities to incorporate unit skills using/relating to money in more challenging contexts

Diocese of Erie		
	Mathematics	
Linit of Churchen	Grade 3	Weeker C
Unit of Study:		weeks: 6
Unit 2: Multiplication and Division	With Factors 1, 2, 3, 4, 5, and 10	
Purpose: Fluently multiply and div	lide with factors 1, 2, 3, 4, 5, and 10	
Essential Questions:		
 What strategies/mathematical properties can be used when mastering multiplication and division facts? 		
 How can we use skip cour 	nting to help learn multiplication fac	ts?
- How can we use what we	know about repeated addition and	subtraction, equal sharing, and
forming equal groups to s	olve multiplication and division pro	blems?
- Can we identify/use patte	erns to assist with multiplication and	l division?
Standards:		
3.OA.1 Interpret products of who	le numbers.	
3.OA.2 Interpret whole-number of	uotients of whole numbers.	
3.OA.3 Use multiplication and div	ision within 100 to solve word prob	lems in situations involving equal
groups, arrays and measurement	quantities.	C .
3.OA.4 Determine the unknown v	, whole number in a multiplication or	division equation relating three
whole numbers.		
3.OA.5 Apply properties of operation	tions as strategies to multiply and d	ivide.
3.OA.6 Know formal names of the	e properties of multiplication and div	vision.
3.0A.7 Understand division as an	unknown-factor problem.	
3.0A.8 Eluently multiply and divid	le within 100, using strategies such	as the relationship between
multiplication and division.		
3.0A.9 By the end of Grade 3, kno	ow from memory all products of two	one-digit numbers
3.04.10 Solve two-step word pro	blems using all four operations Reg	present these problems using
equations with a letter standing for	or the unknown quantity	siesent these problems using
3 OA 12 Identify arithmetic natte	rns (including patterns in the addition	on table or multiplication table)
and explain them using properties	s of operations	in table of multiplication table),
and explain them using properties of operations.		
Standards Reinforced:		
Standards Reinforced:		
2.0A.7 Use addition to find the to	ess an even number as a sum of two	equal addenus.
2.0A.7 Use addition to find the to	or a number of objects arranged in the	ectangular arrays with up to 5
rows and up to 5 columns.		
2.OA.8 Write an equation to express the total number of objects in a rectangular array as a sum of		
equal addends.		
2.0A.9 Explore basic multiplication facts.		
vocabulary:		
array	equation	quotient*
associative property	factor*	repeated addition/subtraction
commutative property	identity property*	related facts/fact family
divide*	multiply*	zero property*
dividend*	product*	
Authentic Performance Assessme	ent: (designed as a paper and pencil	task)

Carrie, Susan and Robert each have a prayer group. They would like to invite friends to be part of their prayer groups. The three friends are in the same classroom, and there are 15 students TOTAL. Carrie thinks they will each have 4 members in their groups. Is Carrie correct? Next, show how many friends will be in each person's prayer group if they want to have an equal number of prayer group members. Can you solve using multiplication or division?

Write to explain, and draw or show the math to determine that your answer is correct. (To be used as a culminating activity demonstrating acquired skills addressed in 3OA.1,2,3,8,10)

Computation Skills:

Addition and repeated addition Addition with doubles subtraction multiplication division algebra

Thinking and Reasoning Skills:

Analyze problems and solutions.

Compare arrays with other methods of counting.

Use algebra problems to apply skills to find the missing product or quotient.

Compare strategies to determine the best strategy for fluency.

Justify a strategy to determine if multiplication or division is best.

Relate skip counting patterns to multiplication or division facts.

Organize amounts to show equal sharing or grouping.

Recognize patterns to assist with fluency.

Self-reflection

Real World Problems & Application/Catholic Identity:

- God calls us to help others in our community. Raising money and offering food are two ways that students can help those in need in our community. Use problem solving skills (multiplication and division) to determine how much money is needed to feed 20 people using the following costs: Beverage: \$1.00/person Sandwich:\$3.00/person Dessert:\$2.00/person Hot meal: \$6.00/person Write about what you choose to serve the 20 people, and show the math you use to calculate the cost for fundraising.
- Divide money, candy, and pizza using the situations outlined <u>here</u>.
- Use a movie theater to see how multiplication and division are related.

Reading and Writing in Math:

Read Aloud: Each Orange Had Eight Slices by Paul Giganti, Jr.

Create charts/diagrams of multiplication strategy options to use as reference

Draw a model for given multiplication facts.

Labeling arrays and models

Constructed response to teacher created prompt. <u>Methods</u> for teaching students how to write well-formed constructed responses

Writing math problems using vertical and horizontal organization to show answer is the same Writing word problems requiring multiplication/division to solve

Creating a multiplication mini-book: <u>www.123homeschool4me.com/free-multiplication-mini-book_8</u>

Questions/Discussion Strategies:

Name some activities that you might use arrays for.

Which strategy helped you learn the multiplication facts quickest?

Did the same strategy help you learn the division facts quickly?

Can we create a chart to list multiplication facts whose products are odd or even?

Is there more than one fact that will give a product? (e.g., 6 x2 =12, 1 x 12, 4 x 3) *(this can also be used as a Performance Task)

When might we use multiplication and division in our lives as children? As adults? What jobs might require you to use multiplication or division?

Technology/Manipulatives:

- Flashcards/triangle flashcards to show corresponding number combinations and fact families
- Dice
- Dominoes
- Small items to count/arrange in arrays (counters, mini-erasers, etc.)
- Array workmat
- Multiplication foldables (TeacherspayTeachers.com)
- Interactive Notebook

Website

- The <u>Elementary Math Maniac</u> blog lists several books on math topics. Scroll down to the ones on multiplication and division.
- <u>Total Recall: Helping Our Students Memorize Multiplication Facts</u> an article with game links and techniques to help students become fluent at their facts.
- <u>Rock, Paper, Scissors Division</u> is a combination of the card game war and rock paper scissors which focuses on fact fluency. It is available at Teachers Pay Teachers for three dollars.
- <u>Division Bump Games</u> are fluency practice games available for free on Teachers Pay Teachers.
- First in Math paid subscription and login required. Students practice math facts and problems targeted to standards or brushing up on computation skills. They are able to compete with other students in their grade level through scores reported to the teacher/principal.
- <u>IXL Math</u> Math skills practice organized by skill. Click the skill and work through the problems. Free login required for more than 10 questions of practice.
- <u>Math Playground</u> hosts games for second graders, organized by mathematical topic and tagged by specific skill.
- <u>Mad Minute Math</u> is an online fluency practice that reports correct/incorrect answers given in one minute.
- Youtube <u>Math Vocabulary</u> video.
- Properties of multiplication <u>task cards</u> from Teachers Pay Teachers
- Apps: Montessori Multiplication
 - Understanding Math Times Tables Llama Drama

Accommodations/Acceleration/Differentiation:

Accommodations: Teacher/peer assistance as needed Opportunities for small group re-teach or practice Rocket Math program for mastery Reflex math Enrichment: Opportunities to apply skills to money Opportunity to explore 2-digit times one-digit multiplication using designated factors Opportunity to create two-step word problems which require use of both multiplication and division

Opportunity to create analogies (e.g., 2x4 is to 1x8, as 2x5 is to 1x 10)

	Disease of Exis	
	Diocese of Erie	
	Mathematics	
	Third Grade	
Unit of Study		Weeks: 6
Unit 3: Multiplication and Divisior	n with Factors of 6, 7, 8, 9 (11 and 1	2
can be added)		
Purpose: Fluently multiply and div	vide with factors 6, 7, 8, 9 (11 and 1	2
can be added)		
Essential Questions:		
 What strategies/mathem 	atical properties aid in mastering m	ultiplication and division facts?
 How does skin counting let 	ad to understanding multiplication	facts?
How are repeated addition	and subtraction orginal sharing a	ad forming equal groups usoful in
- How are repeated addition	n and subtraction, equal sharing, a	in forming equal groups user in in
solving division problems	ſ	
Standards:		
3 0 1 interpret products of who	le numbers	
2 OA 2 Interpret products of who	untionts of whole numbers	
3.0A.2 Interpret whole number q	uotients of whole numbers.	
3.0A.3 Use multiplication and div	ision within 100 to solve word prob	iems in situations involving equal
groups, arrays, and measurement	quantities.	
3.OA.4 Determine the unknown v	whole number in a multiplication or	division equation relating three
whole numbers.		
3.OA.5 Apply properties of operation	tions as strategies to multiply and d	ivide.
3.OA.6 Know the formal names of	f the properties of multiplication an	d division.
3.OA.7 Understand division as an	unknown-factor problem.	
3.OA. 8 Fluently multiply and divid	le within 100. using strategies such	as the relationship between
multiplication and division		
3 OA 9 By the end of Grade 3 kn	ow from memory all the products o	f two one-digit numbers
3 OA 10 Solve two-step word pro	blems using all four operations. Be	present these problems using
S.OA.10 Solve two-step word pro	or the unknown quantity	present these problems using
equations with a letter standing in	or the unknown quantity.	
3.0A.12 Identify arithmetic patte	rns (including patterns in the addition	ion table or multiplication table),
and explain them using properties of operations.		
Standards Reinforced:		
2.OA.6 Write an equation to expr	ess and even number as a sum of tw	vo equal addends.
2.OA.7 Use addition to find the to	tal number of objects arranged in r	ectangular arrays with up to 5
rows and up to 5 columns.		
2.OA.8 Write an equation to expr	ess the total number of objects in a	rectangular array as a sum of
equal addends		
2 OA 9 Explore basic multiplication facts		
Vocabulary:		
Arrav	divide dividend	auotient
associative property	factor	repeated addition/subtraction
commutative property	identity property	zero property product
distributive property	multiply	
distributive property	пипру	

Our class is making mini-pizzas and will give them give them away so that we can help a local soup kitchen. Let's think about baking the mini-pizzas and putting them into boxes. **PART A - Baking**

1. When we bake the mini-pizzas, we place them on a baking sheet in neat rows and columns. What are two different ways that we could arrange the mini-pizzas on the baking sheet if each sheet holds 12 mini-pizzas, or a dozen? Draw a picture to show your plan.

2. Our class bakes 14 dozen mini-pizzas. There are 12 mini-pizzas in a dozen. Figure out how many mini-pizzas we bake. Explain how you found your answer using pictures, number sentences and/or words.

3. Next, our class will share the mini-pizzas with the soup kitchen, so we must put them into small boxes. If we baked 2 dozen mini-pizzas and have 8 boxes, how many mini-pizzas will go into each box? Explain how you found your answer using pictures, number sentences and/or words.

4. If we baked 72 mini-pizzas and packed 8 in each box, how many boxes would we use? Explain how you found your answer using pictures, number sentences and/or words.

Part B- Fundraising

5. If we plan to have a mini-pizza fundraiser, use the information to solve for the following questions:

**12 mini-pizzas fit on a baking sheet

- ** We have enough ingredients to bake 60 mini-pizzas
- ** Each box must have an equal share of pizzas and have more than one pizza in it
- ** Each box will cost \$5

5. How many baking sheets will our class

need?

6. Find 3 different ways to put the mini-pizzas in boxes.

_____ boxes with _____ mini-pizzas in each box

_____ boxes with _____ mini-pizzas in each box

_____ boxes with _____ mini-pizzas in each box

7. Explain your plan for making the most money to the principal by writing a letter to him/her.

Computation Skills:
adding
dividing
multiplying
subtracting
Thinking and Reasoning Skills:
Applying strategies to determine the product or quotient of a whole number
Analyzing information to determine strategies used to multiply and divide
Arranging arrays to show equal groups; explain if/why arrays are helpful in counting larger numbers
Calculating equations to determine answers

Comparing strategies to determine which is best for fluency

Justifying by explaining your work

Sorting information to create a solution plan

Real World Problems & Application/Catholic Identity:

You and your friends are planning to buy rosaries. A blue rosary costs \$6. A red rosary costs 3 times as much as the blue rosary. How much does the red rosary cost? Show and explain your work. The rosaries are in boxes. There are 4 rosaries in each box. If 7 boxes are bought, how many rosaries will the class have? Show how you solved this problem.

The teacher would like to have 64 rosaries for your class and another class. If there are 4 rosaries in each box, how many boxes should the teacher purchase? Is there more than one way to solve this problem?

Make your own multiplication or division problem using rosaries!

Name times when students would need to divide equally.

When would it be important for adults to multiply?

What kind of careers would use multiplication regularly?

Are there places that use arrays that we do not normally think of? (Christmas tree farms? Planning for cell phone SIM cards? Windows on a sky scraper? Etc.)

What types of jobs need workers to use multiplication or division skills?

Reading and Writing in Math:

Amanda Bean's Amazing Dream: A Mathematical Story by Cindy Neuschwander

The Great Divide by Suzanne Slade

Divide and Ride (Part of the MathStart: Level 3 Series) by Stuart J. Murphy and George Ulrich

List of books for teaching division

Sentence writing to create story problems using multiplication and division

Writing equations using multiplication and division

Create charts/diagrams to show or compare strategies for solving multiplication and division Writing a letter

Questions/Discussion Strategies:

Identify patterns that you see

When might you use multiplication or division at home? In school? Are there any other times you can use these skills?

Were you able to use the multiplication and division facts 0 thru 5 to help you learn the facts for 6-9? Are there facts that we use more often?

Why is it important to memorize facts when so many adults have cell phones with calculators? What types of jobs need workers to use multiplication or division skills?

How did you figure out that answer? What proves this is true?

Does a classmate's answer make sense? Why or why not?

Technology/Manipulatives:

- Work mats for array organization
- Small objects to arrange in arrays
- Flashcards/ triangle flashcards to practice number combinations
- <u>Mad Minute Math</u> is an online fluency practice that reports correct/incorrect answers given in one minute.

- First in Math paid subscription and login required. Students practice math facts and problems targeted to standards or brushing up on computation skills. They are able to compete with other students in their grade level through scores reported to the teacher/principal.
- Rocket Math, a subscription only online game/worksheet site for repeated practice
- Xtramath.org (fact fluency practice)
- Refer to Unit 2 resources for additional websites and apps.

Accommodations/Acceleration/Differentiation:

Accommodations

- Teacher/peer assistance
- Small group or individual opportunities/activities for re-teach

Enrichment:

- apply learned facts and strategies money
- explore multiplying with 2 digits
- develop story problems
- explore 2 digit or 3-digit multiplication/division
- create a board game (using file folder) to practice facts
- create a "word search" style puzzle with answers hidden to given multiplication/division problems

Diocese of Erie		
	Nathematics	
	Inird Grade	
Unit of Study		Weeks: 6
Unit 4: Fractions		
Purpose: Explain fractions as a pa	rt of a whole, using number lines	
and pictures to represent their va	lue. Find equivalent fractions and	
compare and contrast inequivaler	nt fractions.	
Essential Questions:		
 How can the fraction of a 	whole group be identified and reco	orded?
 What types of models (co 	ncrete materials and drawings) can	be used to show fractional parts,
and how they might be co	ombined or separated?	
 Can whole numbers and f 	fractions be compared on a number	line?
 How can the numerator a 	nd denominator or a fraction be ex	plained, and used to represent
and compare fractions?		
Standards:		
3.NF.1 Understand a fraction 1/b	as the quantity formed by 1 part w	hen a whole is partitioned into b
equal parts; understand a fractior	n a/b as the quantity formed by par	ts of size 1/b.
3.NF.2 Understand a fraction as a	number on the number line; repre-	sent fractions on a number line
diagram.		
2a . Represent a fraction 1/b on a	number line diagram by defining th	e interval from 0 to 1 as the
whole and partitioning it into b ec	qual parts. Recognize that each par	t has size 1/b and that endpoint
of the part based at 0 locates the	number 1/b on the number line.	
2 b Represent a fraction a/b on a number line diagram by marking off "a" lengths $1/b$ from 0		
Becognize that the resulting inter	val has size a/h and that its endnoir	t locates the number a/h on the
number line		it locates the number ay bon the
3 b Recognize and generate simpl	le equivalent fractions Explain why	the fractions are equivalent
a.g. by using a visual fraction mo	dol	
e.g., by using a visual fraction mod	uei. atiana and racariza fractions that	
3.c Express whole numbers as training	ctions, and recognize fractions that	are equivalent to whole numbers
3.d Compare two fractions with the	ne same numerator or the same de	nominator by reasoning about
their size. Recognize that compar	risons are valid only when the two f	ractions refer to the same whole.
Record the results of comparison	with the symbols $<, >, =$. Justify the	e conclusions, e.g., by using a
visual fraction model.		
Standards Reinforced:		
2.G.3 Partition a rectangle into rows and columns of same-size squares and count to find the total		
number of them.		
2.G.4 Partition circles and rectangles into two, three, or four equal shares. Describe the shares using		
the words, halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds,		
four fourths. Recognize that equal shares of identical wholes need not have the same shape.		
Vocabulary:	fraction	sat
denominator*	fraction	scu simplest form*
agual parte	numerator*	whole number*
equal parts	numerator	whole number*

part

whole

equivalent*

God calls us to help others. Here is a chance to help people in the community. Read the problem and think of ways to find solutions.

#1-Sixteen (16) St. *School Name Here* students will clean up the neighborhood. Five students will rake leaves. Write the fraction.

#2- Four other students will put the leaves in bags. Write the fraction.

#3- The last seven students will collect litter. Write the fraction.

#4- The students will have a snack at a picnic table when they are done. The picnic table is a rectangle shape. Make a drawing to divide the table into equal parts that show how many students can sit on each side.

Challenge: If each student uses 1 trash bag for their job, what is ½ of the number of bags used?

This Inside mathematics performance assessment called <u>Leapfrog Fractions</u> addresses several third grade fraction standards.

Computation Skills:

addition division multiplication subtraction

Thinking and Reasoning Skills:

analyzing information to determine the whole and the parts comparing strategies; comparing fractions estimating determine the best strategies geometry skills to partition shapes equally justifying to explain strategy choices and math work making connections (relating) to different number operations problem solving to generate equivalent fractions proving the solution is correct reasoning to represent fractions on a number line

Real World Problems & Application/Catholic Identity:

Sally is earning service hours at the parish daycare. One of the children has brought a birthday cookie-cake to share. Sally will cut the cookie-cake into 10 pieces. Each child has one piece.

They eat 7/10 of the cookie-cake. How many children are sharing the cookie-cake?

How much of the cookie-cake is left?

Write the fraction that shows 1 whole cookie-cake. Write an equivalent fraction for 5/10. What jobs use fractions?

Do you think that teachers use fractions? What about parents?

How might you or an adult use fractions to make dinner?

How are fractions and money related?

Find items in your home that are parts of a whole (a toy box that is partially full, a door that opens halfway, etc.) and relate them to fractions.

<u>Internet for Classrooms</u> lists several math tasks that require critical thinking. <u>CPalms</u> math tasks with multimedia links for fractions. Consider: In what fraction of our lives is God present? What fraction of our lives is spent praying, and only praying? What is meant by the Scripture where Paul tells us to pray always? Are there different kinds of prayer? What fraction of our lives is take up with "praying with our actions" or "praying by being aware of God with us"?

Reading and Writing in Math:

math journal to respond to teacher prompt interactive notebook labeling fractional parts of shapes drawing shapes and fraction bars creating a match game of equivalent fractions reading/writing word problems Book selections:

- <u>Elementary Math Maniac</u> links to a list of books, divided by topic, that address math themes. Scroll down to fractions

Questions/Discussion Strategies:

Identify other math skills we use when working with fractions.

What strategies/models/tools makes working with fractions easier? Do you agree with _____? Name some jobs that would require you to use fractions.

When might you use fractions at home?

When are equal shares important?

When are fractions important for communication? What would the world be like if there were no fractions?

Technology/Manipulatives:

Manipulatives

- Counters

- graph paper/grid charts
- fraction strips/manipulatives with fractional parts
- fraction table
- fraction tower linking <u>cubes</u>
- fraction circles
- fraction tiles
- pattern blocks
- rulers

Website

- <u>Kahn Academy</u> video about locating fractions on a number line
- The <u>Elementary Math Maniac</u> includes YouTube videos of songs to teach and review fraction concepts.
- <u>Visual method</u> for teaching fractions of an inch.
- Using Legos as a visual model of fractions
- Various <u>hands-on</u> and visual models for teaching fractions
- <u>List of Apps</u> for practicing fractions

Accommodations/Acceleration/Differentiation:

Teacher/peer assistance as needed

Opportunity for individual or small group re-teach

Walk a number line on the floor Enrichment: challenge students to create their own problems for classmates to solve challenge students to determine if other fractional parts can be used in the Real World/Catholic Identity story problem apply fractional parts to money

Diocese of Frie		
Mathematics		
	Third Grade	
Unit of Study		Weeks: 5
Unit 5: Problem Solving with Mas	s, Time, Capacity, Length and Mone	Y
Purpose: Accurately measure or s	olve one-step problems concerning	
time, money, mass, length and vo	lume using standard units.	
Essential Questions:		·
 How are digital and analo 	g clocks used to tell time to the nea	arest minute?
 How do we determine the 	e duration of time intervals in minu	tes?
 Can a model be used to set 	olve problems by representing, add	ing, subtracting, multiplying or
dividing amounts of mone	ey?	
 What tools and units (or r 	non-standard units), are used to me	asure the attributes (mass,
capacity or length) of an o	object?	
Standards:		
3.MD.1 Tell and write time to the	nearest minute.	
3.MD.2 Measure time intervals in	minutes.	
3.MD.3 Solve word problems invo	olving addition and subtraction of ti	me intervals in minutes, eg., by
representing the problem on a nu	mber line.	
3.MD.4 Measure and estimate vo	lume of liquids, mass and/or length	of objects using standard units
3.MD.5 Add, subtract, multiply or	divide to solve one-step word prob	plems involving masses or
volumes that are given in the sam	e units, eg., by using drawings to re	epresent the problem.
Standards Reinforced:		
2.MD.1 Measure the length of ar	object by selecting and using appr	opriate tools such as rulers,
yardsticks, meter sticks, and meas	suring tapes.	
2.NID.3 Estimate lengths using un	its of inches, feet, centimeters, and	meters.
2.ND 9 Tall and write the time from	hate unit of measurement.	accreat five minutes using a m
2.WD.9 Tell and write the time ind	om analog and digital clocks to the i	hearest live minutes, using a.m.
and p.m.	whing dollar hills, quarters, dimas	nickels, and nonnies using t and
2.WD.10 Solve word problems inv	olving dollar bills, quarters, dimes,	nickels, and pennies using \$ and
2 MD 12 Concrete moscuremen	t data by managing langths of sour	ral objects to the pearest whole
2.WD.12 Generate measurement	romonts of the same object. Show	the measurements h making a
line plot, where the herizontal se	le is marked off in whole number i	
Vocabulary:		
analog*	gram*	nints
halance	inch	pounds
capacity*	intervals*	quarts
centimeter	liter*	standard unit*
cups	kilogram*	volume*
digital*	mass*	weight
feet	mile*	vard
gallons	ounce	

Last week your parent (s) finally said yes to allowing you to purchase a pet fish. They usually get home between 5:30 pm and 5:45 pm and told you to be ready today, homework finished, to go to the pet store. Make up the time they got home today and show what it looks like on an analog clock and a digital clock.

Your next job is to describe to your parents the kind of fish you should purchase and the size of tank you would need. A successful description will use standard units to describe the size of your fish and the height, length, and width of the tank as well as a plan to estimate the volume of the tank. It will tell why this tank would be a good fit for your fish and a good fit for your home. You may use words, drawings, and/or models in your description.

<u>Time to Get Clean</u> from Inside Mathematics assess student knowledge in measuring time. <u>Pocket Change</u> From Inside Mathematics assesses student knowledge in making change.

Computation Skills:

addition subtraction multiplication division measuring

Thinking and Reasoning Skills:

analyzing information to compare units calculate elapsed time to the minute comparing tools and units of measurement connecting number skills/operations modeling with manipulatives reasoning to explain and self-reflect

Real World Problems & Application/Catholic Identity:

At home, when would we measure capacity? length? mass?

What tools can we use at school to measure capacity, length or mass?

Give examples from nature to practice measuring capacity, length or mass. (Eg., rocks, creek water, rain water, tree branch, leaf)

Give examples of when telling time accurately is important.

How can your parents see if the new furniture they bought will fit through the door? Make a list of how our school and church spend money.

Is the Christmas tree you picked at the tree farm going to be too tall for your house? Too fat? (<u>Mr.</u> <u>Willowby's Christmas Tree</u>)

Game created by <u>Bridges Math Learning Center</u> called "Make Change", which includes directions, prompts for learning conversations, task cards, and response sheets.

Our Catholic school encourages students to give service to their community. If you volunteer at the Parish daycare beginning at 3:30 on Wednesdays, and you finish volunteering at 5:15, how much time has passed? If you volunteer for 2 Wednesdays every month, for 6 months, how many hours and minutes have you spent giving service to the daycare? Show your math and tell what operations or strategies you used to solve this word problem.

Interactive methods for measuring volume

Teacher Pay Teacher telling time math centers

Reading and Writing in Math:

<u>The Best Children's Books</u> is a listing of children's books on measurement. Clicking on the book will provide a summary, preview, Lexile information, and purchasing information.

<u>Lucky Little Learners</u> blog page contains eleven books on measurement with links and one paragraph review.

Interactive notebook ideas at Teacher Pay Teacher (free)

Teacher Pay Teacher supplements on Mass and Capacity – metric

Create/write word problems and solve

Math journaling

Questions/Discussion Strategies:

How do we use measurement in our daily life?

What careers/jobs might require you to use measurement?

When do we need to tell time to the nearest minute?

What might happen if we were not able to measure to see if things would fit correctly? What things in life fit together? Did anyone need to measure them to make sure they would fit before putting them together?

Technology/Manipulatives:

Manipulatives

- analog clocks
- balance
- containers (pint, quart, gallon)
- digital clocks
- liquid measuring cups
- rulers
- weights
- Objects to measure length, weight, mass
- Calculators
- Geometric solids/ fillable geometric solids

Fluency games for units of measurement

- Turtle Diary
- Splash Math

Other websites

- High engagement and hands-on ways to help students explore mass and capacity
- Strategies for finding elapsed time

Accommodations/Acceleration/Differentiation:

Teacher/peer assistance for struggling students

Small group re-teach opportunities

Independent practice/review as needed

	Diocese of Frie		
Mathematics			
Unit of Study		Weeks: 5	
Unit 6: Multiplication and Area			
Purnose: Students fluently explain	estimate and calculate the area		
of rectangles			
Essential Questions:			
When is it is appropriate t	o ostimato vorsus calculato?		
- When is it is appropriate i	r stratogy appropriate for a given to	vek2	
	i strategy appropriate for a given ta	15K !	
 – why does what we mean 	asure influence now we measure	f 	
 In what ways are the mat 	hematical attributes of objects or p	rocesses measured, calculated	
and/or interpreted?			
 How precise do measurer 	nents and calculations need to be?		
Standards:			
3.MD.9 Recognize area as an attri	bute of plane figures and understa	nd concepts of area	
measurement.			
3.MD.9a A square unit with side lo	ength 1 unit, called "a unit square",	, is said to have "one square unit"	
of area, and can be used to measu	ire area.		
3.MD.9b A plane figure which can	be covered without gaps or overla	ps by n unit squares is said to	
have an area of n square units.			
3.MD.10 Measure areas by count	ing unit squares (square cm, square	em, square ft., and improvised	
units).			
3.MD.11 Relate area to the opera	tions of multiplication and addition	l.	
3.MD.11a Find the area of a recta	ngle with whole=number side leng	ths by tiling it and show that the	
area is the same as would be four	d by multiplying the side lengths.		
3.MD.11b Multiply side lengths to	o find areas of rectangles with who	le-number side lengths in the	
context of solving real world and I	mathematical problems.	-	
3.MD.11c Use tiling to show in a c	concrete case that the area of a rec	tangle with whole number side	
lengths a and b + c is the sum of a	x b and a x c. Use area models to r	represent the distributive	
property in mathematical reasoni	ng.		
3.MD.11d Recognize area as additive. Find areas of rectilinear figures by decomposing them into			
non-overlanning parts, applying this technique to solve real world problems			
non overlapping pures, apprying this teeningue to solve real world problems.			
Standards Reinforced:			
2.MD.6 Use addition and subtract	ion within 100 to solve word proble	ems involving lengths that are	
given in the same units, e.g., by us	sing drawings (such as drawings of	rulers and equations with a	
symbol for the unknown number to represent the problem)			
3 OA 5 Apply properties of operations as strategies to multiply and divide			
3.04.5 Apply properties of operations as strategies to multiplication and division			
2 OA 9 By the and of Grade 2, know from momenty all products of two one digit numbers			
Vocabulary:			
area*	model	rows	
columns	multiply	square unit*	
commutative property	product	tiling	
	p. 00000	oo	

distributive property	rectangle	unit squares*	
factors	rectangular array	width	
length	represent		
Authentic Performance Assessm	ent:		
Use a rubber band to create a red	ctangle on your geoboard. Then co	unt the squares to find the area.	
Write and equation to match you	Ir work. Create a square and find the	ne area. Explain your work.	
Area and Perimeter task cards ca	n be found at the <u>Curriculum Corne</u>	er for an alternate assessment.	
Computation Skills:			
addition			
counting			
measuring			
multiplication			
Thinking and Reasoning Skills:			
making sense of problems (look f	or and make use of structure-ded	uctive reasoning)	
modeling with mathematics			
identifying patterns			
,			
Real World Problems & Applicat	ion/Catholic Identity:		
God has provided us with opport	unities to help others meet their ne	eds: food. clothing. and shelter.	
The game room of a local womer	n and children's shelter is in need of	carpet so that the families can	
spend time together comfortably. Your school will raise money to purchase the new carpeting. Draw			
a rectangle to represent the gam	e room. Label the rectangle with si	des that are 18 feet, and 20 feet.	
Think about the length and width of the room. Determine how much carnet is needed to cover the			
area of the game room. Show you	ur work.	··· .	
Area and perimeter lessons that	include ideas for real-world uses.		
Wrapping paper needed to cover	<u>Area and perimeter</u> lessons that include ideas for real-world uses.		
Amount of mulch needed to cover an area of the playground			
Area and Perimeter math problem	m word sort		
Area and renneter math problem			
Reading and Writing in Math			
Reading word problems			
Writing equations			
Drawing rectangles and labeling side lengths			
	Side lengths		
Perimeter Area and Volume: A Monster Book of Dimensions by David A. Adler: on Voutube here			
Sir Cumference and the Isle of Im	meter print and on Youtube	ia A. Adiel, on routube <u>mere</u>	
	inclui, print and on <u>routube</u> .		
Questions/Discussion Strategies	•		
Can we determine area by count	• ing unit squares? What units can w	euse? Are there non-standard	
units that can be used?		e use. And there non standard	
Will the distributive property alw	avs work when solving for area?		
What strategy works best for you			
what shalegy works best for you	::		

Tell the steps you have used to this point in your problem-solving. What information is given in the problem?

Can you draw or make a model of this problem?

Technology/Manipulatives:

- 1-inch colored plastic tiles
- geoboards and rubber bands
- rulers

Websites

- <u>CCSS Math</u> Performance tasks
- Teachers Pay Teachers Perimeter and Area assessment/review free

Accommodations/Acceleration/Differentiation:

Teacher or peer assistance as needed.

Reteach or extended practice as needed.

Enrichment:

Opportunities for students to design a home with rectangular and square rooms (a flat drawing) and determine the area of each room.

Opportunities for students to create their own story problems using area.

Diocese of Frie			
	Mathematics		
Third Grade			
Unit of Study		Weeks: 4	
Unit 7: Word Problems with Geor	netry and Measurement		
Purpose: Identify and use propert	ies of polygons to solve real-world		
problems involving area and perir	meter.		
Essential Questions:			
 Why does "what" we mea 	asure influence "how" we measure?)	
 In what ways are the mat 	hematical attributes of objects or p	rocesses measured. calculated.	
– and/or interpreted?	······································	,	
 How precise do measurer 	ments and calculations need to be?	How are relationships	
represented mathematica	ally?		
 How can expressions, equ 	uations, and inequalities be used to	quantify, solve, model and/or	
 analyze mathematical situ 	lations?		
Standards:			
3.MD.1 Solve real world and mat	hematical problems involving perim	eters of polygons, including	
finding the perimeter of polygons	, including finding the perimeter give	ven the side lengths, finding an	
unknown side length, and exhibit	ing rectangles with the same perime	eter and different areas or with	
the same area and different perin	neters.		
3 G 1 Understand shapes in different categories (e.g. rhombuses rectangles and others) may share			
attributes (e.g., having four sides)	and that the shared attributes can	define a larger category (e.g.,	
guadrilaterals).	,		
3.G.2 Recognize rhombuses, recta	angles, and squares as examples of	guadrilaterals, and draw	
examples of quadrilaterals that do	o not belong to any of these subcate	egories.	
3.G.3 Partition shapes into parts v	with equal areas. Express the area of	of each part as a unit fraction of	
the whole.	·····		
3.OA.10 Solve two-step word pro	blems using the four operations. Re	epresent these problems using	
equations with a letter standing for the unknown quantity.			
Standards Reinforced:			
2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a			
given number of equal faces.			
2.G.2 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes			
Vocabulary:	pentagon	quadrilateral	
area	perimeter	rectangle	
equal/equivalent	polygon*	rhombus*	
octagon	properties*	square	

You are designing a new amusement park with at least four rides. You need to plan the layout of the park and determine how many square feet of pavement or other material you need to put under your rides. A successful planner will pick different shapes for the base of each ride, based on the kind of rides you choose to have, and explain the dimensions of the perimeter of each ride space. The planner would also provide a visual representation of how the rides would go together into one park

and calculate how many square feet of pavement or other material would be needed to cover the space under the park rides.

Computation Skills:

addition multiplication measuring

Thinking and Reasoning Skills:

Determine the correct strategy

Develop perseverance through discussion and self-reflection

Classify or Identify categories of shapes and which shapes can belong based on like attributes Recognize patterns

Creative Math Prompts can help begin deeper thinking conversations

Real World Problems & Application/Catholic Identity:

The school Principal has asked your class to design rosary holders. Each holder will be made from wood. Each holder should be a rectangle that can hold 24 rosaries. The area of the holders will be 24 inches. Create 2 possibilities –draw and label your rectangles. Show and tell how your chose the number of inches for the sides.

Worksheets from <u>Inside Mathematics</u> that include higher order questions in real world context. Worksheets from <u>Engage NY</u> that include higher order questions in real world context.

NCEA math Lesson Plan – click on the geometry lesson.

Reading and Writing in Math:

Reading word problems/clues

Writing to explain the strategy used to arrive at the solution

List of books that address geometry concepts

Questions/Discussion Strategies:

Can you name jobs that might need these skills?

What helped you decide on a strategy? Were there clue words to help you?

Can you solve the problem another way? Is there more than one answer?

Is there a connection between perimeter and area? What is the difference between the two? How are the attributes (properties) of these two shapes the same?

Do the shapes of this category share attributes?

Are there shapes that are more related than you may think at first, just by looking at them? What could you do if you forgot how to find the area or perimeter of a shape? Is there a way you could "make up" the formula yourself?

How do you think mathematicians find formulas for relationships like length, width, and area?

Technology/Manipulatives:

Manipulatives:

- plastic shapes
- area tiles
- geoboards
- rulers
- graph paper

- math journals/interactive notebooks to use as reference

Accommodations/Acceleration/Differentiation:

Teacher and peer assistance as needed

Reteach opportunities as needed

Provide resources/charts/notebook to assist with problem-solving

Enrichment:

Ask students to show shapes for given areas.

Explore area and perimeter with composite shapes

Provide opportunities for students to generate word problems using multiplication with area and measurement.