MINISTRY OF EDUCATION, YOUTH & INFORMATION
Every Child Can Learn, Every Child Must Learn

MATH COUNTS

NATIONAL MATHEMATICS PROGRAMME

Grade 3 – Number Unit Plan

Topics/Objectives	Main Concepts	Teaching/learning activities	Assessment/Homework Activities
Express numbers in tens and ones Interpret 2 digit numerals 11 –99 Compare size of groups or sets	Greater than, less than, fewer, more than, larger, largest, smaller, smallest	**Activity 1:** Have students decompose numbers using base ten pieces or ten-frames (or other available resources like fudge sticks, etc.). Have students represent varying sets of values using the base ten pieces and compare the pieces and values, using words such as fewer, more, equal etc. Have students represent two non-identical numbers such as 13 & 31 using base ten pieces and justify why 13 is smaller than 31 and vice versa. **Activity 2:** Give students the task of collecting more than 10 items but less than 20 from a jar to create their own sets. , Facilitate discussion of the sets collected making reference to: least, most, fewer,	Allow students to complete hundred chart using representations of base ten pieces. See attached sample sheet in the supporting document. **Math Journal**: Mark is comparing two numbers: 53 and 35. He did the following: 53 < 35. Is Mark correct? If yes or no, explain.

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		more, greater than and less than. Choose two students to represent their values using the base ten pieces or ten-frames. Ask students to use the hundred chart in making a comparison of given numbers. Use base ten pieces to assist clear up any misconceptions. **(**Students should realise that moving to the right, from the 12 to the 18 they added 6 more singles, hence making the 18 more than the 12. Students should realize that moving downwards on the chart; from the 12 to the 22 they added 10 more singles which is 1 rod.**)**	
Define equivalent sets Identify equivalent sets	Equivalent	**Activity 1:** Give different types of items to organize into at least three sets of varying items, such as bottle covers, straws, crayons, etc. At least two of the sets they create should have the same number of items. Teacher should facilitate discussion about the sets the students formed, guiding them to recognize similarities and differences among the sets and by extension identifying the property which makes sets equivalent. **Questions for discussion:** Can you identify any differences and similarities among the sets formed? What are they?	**Math Journal** Let students write in their journal, a letter to a classmate explaining what they know about equivalent sets. They should include illustrations and also non-examples of equivalent sets.

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		Activity 2: <u>Suggested Activity Pizza Pizza</u> Students will be placed in groups of five. Each group will be given a large circle made from cartridge paper. The groups will also be provided with 7 different coloured paper of various shapes representing toppings: pepperoni, jerk chicken, mushroom, ham, pineapple, bar-b-q chicken and sweet pepper. Students will be asked to create their own pizza using any five of the seven toppings (each pizza would have five toppings) A discussion will proceed where students will demonstrate their understanding of equivalence set through explanations or answers to given questions.	
Estimate large number of objects for e.g. a bag of sweets, persons at a function, etc.	Estimating	**<u>Estimating quantities</u>** Begin with a small quantity of objects and allow students to visualize what that small quantity looks like, and then use that quantity as a reference point for estimating a large quantity of the same object. For example show students a set of 10 counters and allow them to estimate a quantity of 50 then 300 then 500 and so on. (N.B. Any available	**<u>Assessment</u>** Show students empty containers of various sizes and an object for example a counter or a selected number of sweets and ask them to estimate and record in a table, their estimates of how many of the

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		objects can be used.) Progressively increase the quantity of items. Use pictures for larger quantities. **<u>Suggested questions</u>** How many? How do you know? What strategy did you use?	selected object will fill a selected container. (*See resource document page 5 for table)* Other examples include: *Number of persons in a room/at a function.* *The number of cars in a parking lot.* **<u>Homework</u>** Allow students to observe large quantities of items in their environment and describe and discuss their estimate giving reasons for their answers. For example: Students will visit the market/ supermarket/ shop and estimate the number of tins of milk on a selected section of the shelf.
Tell the worth of a set of		**<u>Telling the value of a set of notes</u>**	**<u>Rows of Coins Activity</u>**

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notes and coins using combination up to $500 or $1000 notes		Engage students in a discussion which focuses on the purchasing power of the notes/coins. For example, $200 can buy the same thing that two $100 notes can buy. Allow students to explore the part-whole relationship among various amounts of money by composing (putting together) and decomposing (taking apart) each type of coin/note. For example students use sample notes to partition $500 into a variety of ways.	This is a problem solving activity which allows students to explore finding the value of a set of coins using various combinations and hence determining the change if one of the combinations is removed. *(see resource document page 7)* Allow students to create a 'How much is my money worth portfolio'. They should be given different values eg. $300. They should show how to use different notes/coins to make the given value.
• Round 2 digit numbers to nearest ten • Use rounded numbers to estimate answer for addition or subtraction problems • Mentally recall addition and subtraction of 2 digit numbers • Use given information to construct addition and subtraction problems	• Rounding • Digits • Estimate • Approximate • Mid-point • Benchmark • Multiples	**<u>Rounding to the nearest ten</u>** **Use number line to help students develop the concept of rounding two digit numbers to the nearest ten**. a. Allow students to identify on a number line: i. a given umber, ii. the two closest multiples of ten which the number lies between, iii. and the midpoint for the range of numbers bounded by the two tens. *For example:* Given the number 27, the benchmark numbers are 20 and 30, and the midpoint is 25.	• Allow students to determine suitable sizes of objects for which an approximate value is appropriate. For example: On planet Tucar, skirts are designed to be worn from the waist to the ankle or as close as possible. If the lengths of skirts only come in multiples of ten. Determine a suitable length skirt to be bought for each of the following girls

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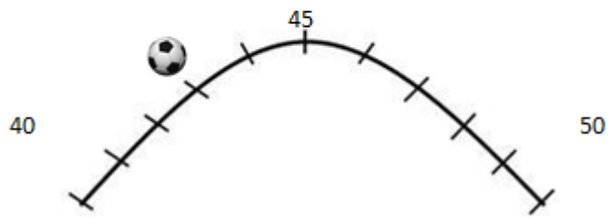
		 b. Allow students to determine the multiple of ten that is closer to 27. c. Show students the curved number line, below. Discuss with students where a ball would end up if it is released from various points along the number line. Allow students to record the multiple of ten at which the ball stops in each event. Ask students to create two categories, numbers rounded to the lower multiple and those rounded to the higher multiple of ten. Say what they notice about the numbers. *Simulated number line* 	<table><tr><td>Name</td><td>Measure from waist to ankle</td><td>Length skirt</td></tr><tr><td>Tola</td><td>59 cm</td><td></td></tr><tr><td>Nola</td><td>82 cm</td><td></td></tr><tr><td>Pola</td><td>61 cm</td><td></td></tr></table> • Allow students to use the empty number line idea and model where given numbers would fall on the continuum and hence give the number rounded to the nearest ten. Give students a list of various lunch items along with the various prices and allow them to give an

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		2. <u>Using rounded numbers to estimate the answers for addition or subtraction problems</u> *a)* Give students an estimation problem and allow them to tell their solution method. *For example:* "Juan estimated that **139 + 43 is about 200."** How do you think he came up with 200? Was that a good approach? Is the estimate larger or smaller than the actual answer? How do you know? How should it be adjusted? Why might someone select 150 instead of 140 as a substitute for 139? b) Allow students to use numbers that are easy to compute with to estimate answers for given addition and subtraction problems, and justify solution. *For example:* Anthony collects sports cards. He has 17 football cards and 28 cricket cards. About how many cards does he have in all? Give students a variety of addition and subtraction number	approximate sum for various pre-determined 'combos' □ Allow students to work in groups of 4 or 5. Ask students to determine from a lunch list with given prices, the amount of money they will need to purchase a combo. The money stated should be an amount rounded to the nearest ten. Allow the students to determine whether they will be able to purchase the combo or not. This should be done on the basis of rounding numbers. Ensure students determine meals which are balanced (main course, drink, fruit) • Provide students with lists of numbers and have then apply the associative property of addition by determining which pairs of numbers they would add. They should give reasons for

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		sentences and allow them to select the most appropriate estimate as the response. For example: Where would my answer lie in? **1. 52 + 94** a. Between 0 and 50 b. Between 50 and 100 c. Between 100 and 150 d. Between 150 and 200 **2. 102 – 57** a. Between 0 and 50 b. Between 50 and 100 c. Between 100 and 150 d. Between 150 and 200 **Mentally recall addition and subtraction of 2 digit numbers.** 1) Use combination facts for 10 to help students understand how to add and subtract numbers like 18 and 12, for example. If they know that 8 + 2 gives 10, then they may quickly see that 18 + 2 = 20, then 20 + 10 is 30, so then 18 + 12 = 30.	their choice/s after finding the sum. Example: **1. 3 + 8 + 7 + 5** **2. 63 + 29 +17+ 11** **3. 16 + 35+ 24** • Give students a variety of numbers to decompose in many different ways

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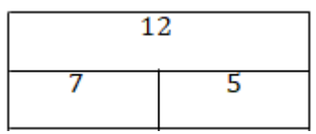
		2) Engage students in activities which allow them to decompose numbers in a variety of ways. Example: **432** **a. 4 hundreds , 3 tens and 2 ones =400 +30+2** **b. 4 hundreds and 32 ones = 400+32** **c. 4 hundreds, 1 ten and 12 ones =400+10+12**	
• Add or subtract numbers and check answers using reverse operations • Use inverse operations to check answers • Add whole numbers with up to 6 digits	• Addition • Subtraction • Inverse • Estimate • Reasonableness	**<u>Using inverse operations to check answers to addition and subtraction problems</u>** • Allow students to explore addition and subtraction using the bar models shown in the diagram below.  • Allow them to explore the relationships that exist among the three numbers. For Example: 7+ 5 = 12, 5+ 7 = 12, 12 – 5 = 7 and 12 - 7 = 5 • Allow students to determine the number represented by the question mark in each bar model.	• Ask students to write a poem entitled "*Why I believe my subtraction/addition problem is correct*." Give students numbers to decompose in a variety of ways. **Worksheet A**- Activities which require students to use inverse operations to check answers

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		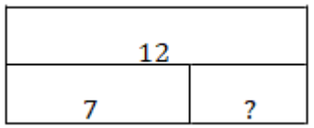 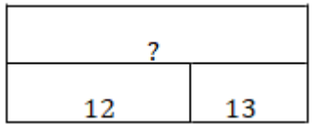 • Give students a series of addition and subtraction tasks, where they will use reverse operation to check results. • Use Dienes blocks (base ten pieces) to explore addition of whole numbers (with and without renaming). Place emphasis on regrouping concept. • Use the idea of the empty number line to help students explore invented strategies for addition of multiple digit whole numbers. For example: 5,539 + 4,257	

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		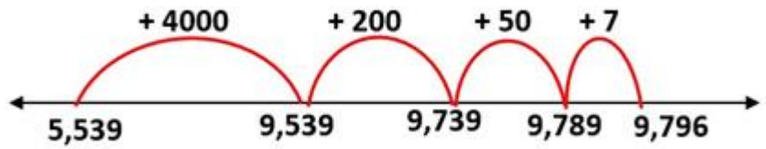	
• Name part (s) of same object using halves through tenths • Identify numerator and denominator • Place unit fractions in serial order • Identify 12 objects as 1 dozen • Identify commodities sold by the dozen • Identify ½ and ¼ dozen	• Fraction • Numerator • Denominator • Unit • dozen	• Allow students to explore the naming of fractional parts from halves through to tenths using the o area/ region model (fraction circles, tiles, paper) o length or measure model (fraction strips, number lines) o set model the following: (counters) Reinforce the idea that in fraction symbolism, the *numerator enumerates or counts* the *type of fractional parts (denominator).* • Give students examples of area model for them to identify wholes divided into equal fractional parts. • Have students investigate, compare and order unit fractions thereby make the connection between the size of the denominator and the fractional part. Therefore, 10 smaller equal pieces make a whole whereas only 4 larger one quarter (¼) pieces are required for the same sized whole. Hence this process can be approached using: o Fraction circles. fraction tiles, fraction strips, fraction towers and counters o Number lines • Let students explore the idea of a dozen by pulling on their experience with set model using various whole numbers of objects to represent the whole. Focus on 12 objects as the whole. Link the area with the set model to reinforce equality. Through activities, involving counters	• In groups, ask students to label fraction circles using blank template provided. • Create a Unit Fraction book. The book would include a representation of unit fractions from halves through tenths, using the area model. • Students could also design steps to a doorway using fraction strips noting where the largest and the smallest pieces would be. For example: Create a price list of items in a shop/store that can be sold by the dozen. Include the cost for one dozen of each item, half dozen and quarter dozen.

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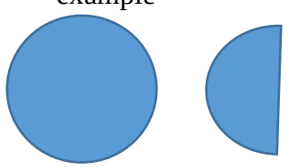
		steeped in real-life context, students explore ¼ and ½ of a dozen. *This lesson could be extended to include $^{3}/_{4}$.*	**Item** | **1 dz** | **½ dz** | **¼ dz** Bun | $12 | $6 | $3
• Identify mixed numbers • Identify equivalent fractions	• Mixed numbers • Equivalent fractions	**Identify mixed numbers – Introduction** • Engage students in discussion about the various fraction types; those less than a whole and those greater than a whole. Give students fraction pieces (circular as well as strips) for them to manipulate and represent numbers greater than a whole. For example  Have students discuss the features of the mixed numbers written and that is the same as **1 + ½** • In groups, give students the same fractional parts to form mixed number given. For example use halves, thirds, fourths or sixths etc. to form two and a third. Allow students to write the number of parts used, as well as the equivalent mixed number. For example  Seven thirds or two wholes and one third Allow students to examine the fraction number line. Begin by exploring proper fractions on the number line. For example where would $^{3}/_{7}$ fall on the given number line?	**Mixed Number Task** See the resource booklets for details on completing the *How many ways can you show? Task*. **Equivalent Fractions** Investigate equivalent fractions using the activity on equivalent fractions in the resource document.

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		Locate fractions on number line Extend the number line to include mixed numbers and ask students to locate mixed numbers on the number line with demarcations. • **Exploring Equivalence** Use the area, set and linear model to explore basic equivalent fractions. Notice patterns that exist among equivalent fractions and examine the relationship that exists between the numerator and denominator of these fractions.	
Make the connection between repeated addition and multiplication	Multiples Repeated addition Multiplication	**Making the connection between repeated addition and multiplication** Allow students to write addition sentences using multiples within their surroundings. For Example: • Multiples of 2: pairs of hands, feet, ears, eyes. For example: the hands of five students 2+2+2+2+2 • Multiples of 3: tricycle wheels, sides of a triangle, triplets etc. For example the sides of four triangles 3+3+3+3 • Or with groups of natural objects such as pebbles, shells etc., or mathematical objects such as counters, cubes, beads. Ask questions such as: i. How many eyes are in the classroom altogether since each child	**Scrap book – repeated addition** Allow students to identify other groups within their environment. For example: Five cars with four wheels; Six flowers with five petals each. These items may also be selected from printed media. The students should show the repeated addition and corresponding multiplication sentences for each item used.

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		has a pair? ii. How many students' legs are in the room if I counted five students? (Students would represent this using repeated addition.)	
Use models to represent multiplications	Modelling multiplication	**Use Models To Represent Facts of Multiplication** • Allow students to use multiple strategies like sets, bar diagrams, hundred charts and number lines to explore the multiplication facts.	**Letter writing** Write a letter to a friend explaining your favourite way of representing multiplication.
Use array to discover and represent multiplication and addition facts		**Using array to discover and represent multiplication and additions facts** Pose a problem situation and allow students to use array to represent/solve the problem. For example : *"Amy's uncle has a large stamp collection. Her uncle displayed all his stamps from Jamaica on a large sheet of paper.* *Amy noticed that there were 16 stamps. How many different ways could Amy's uncle arrange the 16 stamps in equal rows/columns?"*	**Array Task** Allow students to find as many ways as they can to arrange a specific number of items in equal rows/columns. For example: 18 = 18 x 1; = 1 x 18 = 2 x 9; = 9 x 2 = 6 x 3; = 3 x 6
Identify pairs of related multiplication facts		**Identify pairs of related multiplication facts** • Use the doubling strategy to identify pairs of multiplication related facts • Allow students to explore and observe patterns on a multiplication chart.	**Report on the following:** Did any of the multiplication facts that you observe have more than one related pairs? Why do you think so? Did you notice any pattern(s) as you worked?
Discover, memorize and		**Discover, memorize and recall multiplication facts**	**Multiplication Game**

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recall multiplication facts		• Allow students to use the hundred charts to identify patterns
		• Allow students to play a game to reinforce the concept. A few games are included in the resource document:
		  ○ Multiplication Madness
		  ○ Rollin' with multiplication Facts
			Create a multiplication game using the concept of your favourite board game.

Use the terms multiply, product and factors correctly		**Use the terms multiply, product and factors correctly** ***(N.B. This can be done throughout the any given lessons.)*** Create a Math Word wall and include the main concepts explored for this concept along with the terms: multiply, product and factors. If necessary include the definition for these terms. Reinforce these vocabulary words using such formative assessments as the Frayer model. Have students populate the diagram with their understanding of the concept. A sample diagram is included in the resource document.	**Journal Entry** Allow students to make a journal entry, writing in their own words what they understand by the terms multiply, product and factors.
Find unknown factors and product	• Factors • Products • Multiplication • Equal groups • Times/groups of • Greater • Lesser	**Finding unknown factors and products in multiplication:** • Allow students to use the hundred chart to investigate and discover unknown factors or products in multiplication situations.	Give students a hundred chart and allow them to determine the missing product in each given multiplication situations. For example: $4 \times 5 = n$
Multiply any number by zero and one		**Multiplying by zero:** Present real life scenarios to students to discover the zero Property' For	**Multiplying by zero:** On index cards, write a multiplication

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		example: To represent 6 x 0 =0. There are six rows of chairs with no student in each chair. How many students are seated? To represent 0 x 6 =0, there are zero rows of chairs for six persons to be seated. How many seats are available? **<u>Multiplication by one</u>** Allow the students to investigate what happens when a number is multiplied by one by comparing examples and non-examples presented in real life scenarios for example: Six children arrived at a class party and each child received a lollipop. How many lollipops in all were given to the six children?	sentence, such as 2 x 0=___. On another card, write its related addition sentence, such as 0+0=____. Give an index card to each student and have everyone mingle around the room to find their related partner. Then have the partners solve the number sentence together. Represent a number times 1 in different ways (pictorially, symbolically…). Justify why each is a true representation.
Multiply a 2 or 3 digit number by 2, 3, or 4 without renaming (*Check by adding , answer for multiplication problems*)		**<u>Multiply a 2 digit number by 2, 3, or 4 without renaming</u>** Have students count objects in an array and write multiplication sentences to represent array shown. For example to solve 2 x 13 (2 rows by 13 columns) ********** ********** Have students continue sequence up to 4 rows. Reinforce the concept using scenarios. For example: ***P.T.A. meeting will be held tomorrow. The principal is expecting 50***	**<u>Create Multiplication tasks (multiply by 2,3 or 4)</u>** Your teacher is ill and she asks you to help her create five tasks for your classmates to solve. She gives you the following rule: The numbers must be between 10 and 99. When multiplied by 2, 3 or 4 the number in the ones position is not more than 9. In class you used partial products to multiply 24 by 2. Suppose the number was

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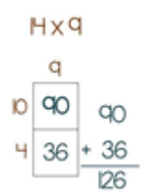
		parents. He plans to arrange them in 4 rows with 12 chairs each. ***a. How many chairs will there be altogether?*** b. ***Will there be enough chair?*** **Note:** Have students use various methods to represent array arrangement, for example: diagrams, draw on grid paper, square tiles, blocks, etc. **Using Partial Products** Have students decompose numbers using base ten blocks and apply the distributive property as they multiply by the multiplier. Students will pull apart the double digit number (using place value), multiply the decomposed numbers by the multiplier and add their products. For example in the expression '12 x 3', the double digit number 12 can be decomposed into 10 + 2. These parts are then multiplied by 3. 10 × 3 = 30 2 × 3 = 6 Finally, the products are added: 30 + 6 = 36 It can be shown graphically, as below:	larger, like 224, could you use the same process to find the answer? Justify your answer. **Partial Products** Paul used the diagram below to show his answer to the task: 14 x 9  Can you explain what he did? What do you think about the method that he used?

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		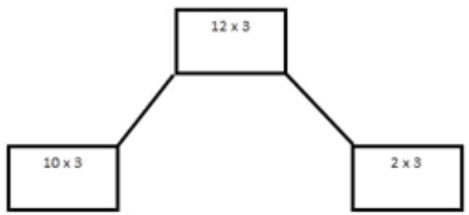 30 + 6 = 36 **Check by addition, answer for multiplication problems** As students work on task, ask them to suggest a means of checking their answer. Encourage students to 'check' their work before submission (evidence may be placed in the margin).	
Use the terms multiply, product and factors correctly		**<u>Use the terms multiply, product and factors correctly</u>** ***(N.B. This can be done throughout any given lessons with multiplication)***	
Multiply 2 or 3 digit by 1 digit with or without renaming *(Check by addition, answer for multiplication problems)*	• Multiply • Greater • Lesser • Rounding • Commutative • Product	**<u>Multiply 2 or 3 digit by 1 digit</u>** Allow students to review multiplication of 2 digit numbers by 2, 3 or 4 using the decomposition method. Extend the learning session to include other 1-digit number.	**<u>Multiply 3 digit by 1 digit number</u>** Develop another method (other than those used in your classroom) of multiplying a three digit number by a one digit number. Prepare to defend your strategy.

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	• Factor	Have students explore multiplying 2 or 3 digit numbers by 1 using base ten pieces and representing this graphically (area models).	
Identify greater and lesser product(use symbols)		**Compare products** Provide students with real-life multiplication tasks which require that the chosen product is compared to another. For example, Twenty-five girls bought 4 books each, while twenty girls bought5 books each. Which set of girls had more books?	**Compare products** Create a Multiplication Comparison game. The player will select two cards from his pack and estimate the larger of the two. The player will then check to verify that his/ her answer is correct.
Use rounded number to estimate products		**Product estimation** Engage students in real-life scenarios where estimation is used. Narrow the examples to quantities of items such as those purchased at a store/shop or found in a garden/farm. Review the process of rounding using the number line. Use the rounding process to estimate the product of friendly numbers.	**Product estimation** Have two piles of cards, one with three-digit numbers and the other with a single digit number. Have students select one card from each pack and estimate the product. Award students based on their defence and the validity of the response
Use the commutative property of multiplication		**Commutative property** Allow students to use the area model to explore the commutative property of multiplication	**Commutative (Flip flop) assignment** Write a poem or a song or design a poster on the commutative property. The poster may include examples and non-examples of the commutative property. For example

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			I have a number sentence *I write two factors down* *When they're multiplied together,* *A product can be found!* *Now flip flop these factors,* *And what do you see?* *The answer is still the same because I just did the commutative property.*
Partition sets and use division to find number associated with partition	• Arrays	**<u>Partitioning</u>** Have students explore arrays in partitioning sets into equal portions.	**Home Work** Using suitable materials to create a flower garden with an array of flowers. The number of flowers should be enough for each member of your family to receive four. **In your books**: Share the flowers among the members of your family by giving each person two flowers, then three flowers, then four flowers. (draw the flowers in each case)
Use division to tell how many members are in each set.	• Fair share	**<u>Members of a set</u>** Allow students to explore fair sharing using the **Fair Sharing Form**. ***See***	**<u>Members of a set – Open Task</u>** A cat caught 32 fish from a fish tank to

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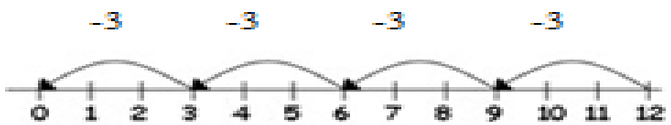
		Resource Document For Fair Sharing Form Allow students to use base ten pieces to explore fair sharing**.**	feed her kittens. If she shares the fish among the kittens so that they all get an equal amount, how many kittens could she have had?
Solve problems involving division Show division as repeated subtraction	• Divide • Share equally • Repeated subtraction • Number line • Division	**<u>Solving problems involving division</u>** Have students solve division tasks using the number line.  Start from 12 and count back by groups of 3's until you get to zero. Allow students to explore the idea of repeated subtraction as they engage in division tasks. **See the attached lesson plan.**	**<u>Number line task</u>** Sam divided one number into another and his answer was 6. What might the numbers be? Can you represent this on a number line? **<u>Repeated Subtraction</u>** **Task 1** Let students use the activity 'Long Distance Race', to formulate the concept of repeated subtraction as dividing. **Task 2** Nicky used repeated subtraction to complete a division task. She repeatedly subtracted 6 from a number **until she got 0**. If her dividend is between 16 and 32, what might it be? What might her answer have

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			been?
Use known division facts to find unknown factors Recall related division and multiplication facts with one factor being 2, 3, 4 or 5	• Division • Factors • Multiplication • Subtraction	**<u>Review Multiplication Facts</u>** Have students review *targeted (a set that you wish to explore in the division task: for example, 34 and 5 times table)* multiplication facts. Have students explore the components in a multiplication number sentence: 'factor × factor = multiple' in preparation for the next activity. **<u>Explore the components of a Division task</u>** ***See resource document for this task*** **<u>Link Division to Multiplication</u>** Have students explore the following division statement: 21 ÷ 3 = 7 *Suggested questions* • How can I rearrange this sentence in order to form a multiplication task? Does it always work? • Have students try other examples to determine if a rule could be developed (division is the inverse of multiplication). Can I rearrange the numbers in the number sentence in a way that uses up the numbers 18, 6 and 3? (18 ÷ 6 = 3) • What about this statement: **3 x 4 = 12?**	**<u>Division 'Time' Table</u>** Create a division (time) table chart. The chart could include time tables from 2 to 6 (or as desired by the teacher) and the two related division tasks. For example: **3 x 5 = 15** 15 ÷ 3 = 5 15 ÷ 5 = 3 **<u>Create Scenarios</u>** Create division tasks (the quantity will be determined by the teacher). The task should require that students find an unknown factor. **<u>Create a Missing Factor Game</u>** Have students work in groups of four to build a division game. Using the game "I Have, Who Has", have

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		• Can you rearrange this task so that it becomes a division task? • Does it always work? • Can the numbers be rearranged to form a true statement? *Provide students with a variety of experiences which will allow them to be able to link division and multiplication sentences thus seeing one as the reverse of the other.* **Finding Unknown Factors** Provide students with a division task that has a missing factor. Have them use their knowledge of multiplication as they work. **See resource document for a sample task**	the students find the missing factor, given the dividend and one factor. ***See the resource document for an example.*** Ask students to extend the game to twenty pieces using the conditions above.
Use subtraction to check for division examples		**Review the Relationship between Division and Subtraction** Provide students with division tasks that they can check using subtraction (introduced last month). **Using scenarios – Model Think Aloud Strategy** Provide students with real life scenarios. For example: *Show how you would share 20 mangoes among 5 persons. Explain your thinking.* I can use what I know of multiplication to find the answer to this task. 20 divided by 5 is four. Let me write it as a number sentence20 ÷ 5 = 4	**Is there another way to check your answer?** You have learnt that subtraction can be used to check your division tasks.; can you think of another way of checking the answer to your division task? Could you have used addition or multiplication? Write a friend telling him or her of your opinion on this.

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		Now I check to see if this is correct. I can use my classmates to help me. Since my calculations show that each person received 4 mangoes, let me give each of my classmates 4 mangoes. If after sharing these mangoes I have none left, then my calculation was correct. After giving Person One 4 mangoes , I now have 16 After giving Person Two 4 mangoes, I now have 12 After giving Person Three 4 mangoes, I now have 8 After giving Person Four 4 mangoes, I now have 4 After giving Person Four 4 mangoes, I now have 4 **See sample lesson plan for reference.**	
Organize multiplication facts on a chart		**Building the Multiplication Fact Chart** Have students create multiple pair factors of given composite numbers to create multiplication facts. For example: Pair factors of 12 are 12 and 1; 6 and 2; 3 and 4). Help students see the connection between the pair factors and their product in algebraic form. For example: Give students 12 counters and have them create groups of 3s. Their task is to find the unknown factor. Hence, how many groups of 3 are contained in 12.	**Multiplication Fact Cards** Have students work in groups to create multiplication fact cards. The teacher will cards. The teacher will determine how far they will go (for example start at 2× and go up to 6×). Each group will be given a number (for example 2×) and will create cards with a multiplication task on the front and the corresponding answer at the back. Each group has the option of using a set of objects or symbols to represent the answers on the reverse side of their fact cards.

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			<u>Multiplication Fact Chart</u> **See Resource document for a sample task.**
Divide any number by one	• Divide • Fraction • Part • Set	**<u>Divide by one – Exploration</u>** Provide students with practical experiences using manipulatives as they explore the concept of division by one. Have them develop their own theory based on their experience. ***See resource document for a sample task.***	**<u>Dividing by One Speech</u>** You are invited to a Division forum where you are asked to write a speech on the following: *The quotient is always the same as the dividend when the divisor is 1.*
Use a fractional number to represent a part of a number (Divide whole number by a unit fraction : 4 ÷ ½)		**<u>Dividing a whole number by a unit fraction</u>** Have students use fraction pieces (use drawings) to explore the concept of dividing a whole number by a unit fraction. ***See the resource document for a suggested activity.*** **<u>Use paper folding to divide a whole number by a fraction</u>** Have students fold a square sheet of paper into two halves. Instruct them to shade each half in a different colour. Ask them to state the number of halves found in total. Repeat this activity for other friendly fractions that can be easily folded or use outlines (partitions already formed and student are able to fold along the partition lines for difficult to fold fraction like thirds and fifths).	**<u>Create a Fraction Scrap Book</u>** Provide students with the following task: Divide one whole Ask students to first predict the quantity of each fraction that they think would be in a whole. Then allow them to experiment to verify their answers. Ask them to write a short journal entry on their experience – have them state: whether their initial estimates were the same as the answer. What were the differences (if any)?

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		<u>Divide a whole number by a unit fraction: Using the bar model method</u> Allow students to use the bar model method to divide whole numbers by fractions. ***See resource documents for a suggested activity.***	Would they make any adjustments? If any state the adjustments.
Use division to find the number in a part of a set of objects represented by fractional number		**<u>Objects in a set</u>** Provide students with a set of objects and have them partition the set in halves, quarters and thirds. ***See resource document for sample activity.*** **<u>Using the bar model</u>** Have students complete problem solving tasks using the area model. ***See resource document for sample activity.***	**<u>Use bar model</u>** Provide students with a set of objects. Mark has some mangoes. He gave away five mangoes which is a quarter of the mangoes. Use the bar model to help you determine the total number of mangoes that Mark had at first. Create and solve five division related to things you do in your everyday life. For example: sharing cookies with a friend.
Differentiate between the use of multiplication, division, addition and subtraction in a problem situation	• Multiplication • Division • Subtraction • Addition	Engage students in simple authentic word problems to help them identify /interpret key words in order to determine which mathematical operation to use in solving the word problems. **See Resource document for sample questions.** Provide opportunities for students to engage in mathematical discourse to explain how the derived at the answer and identifying key words.	Allow students sort word problems on an Operations Organizer. **See resource document for more details.**

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		Allow students to brainstorm keywords that belong under the four mathematical operation categories. *As a guide for students give the different key words in the context of simple word problems.*	
Solve problems involving division Write pairs of × and ÷ fact from an array or given product and factors	• Multiplication • Divide • Factor • Factor pairs • Array • Product	Discuss division terms that the students already have been using. Allow students to find all the factor pairs for each given number. Example **(See resource document for sample)** Use questioning to elicit thinking if students identify no more than one or some factor pair for each number. **For example:** ***"Can you think of two other numbers that multiply to 18?*** ***What number divides into every number?*** ***What number divides into every even number?"*** Give students the opportunity to review divisibility rules for two, three, and five. Demonstrate for the student how to use both their knowledge of multiplication facts and divisibility to find factors of numbers. Encourage students to list factor pairs in an organized way; writing first factor in each pair so that the first factor in each pair is arranged in	Write pairs of × and ÷ fact from an array or given product and factors.

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		ascending order. Ensure students understand that 1 is a factor of every number and every number is a factor of itself and therefore should be listed among factor pairs. Additionally 2 is a factor of all even numbers. Allow students to use different methods for finding all of the factor pairs of a given number; T chart, arrays (**See resource document for example).** Engage students in using manipulatives to build arrays for smaller numbers in order to find factors. This useful in illustrating and modelling the inverse relationship between division and multiplication. After the students are able to find the factor pairs for smaller numbers, allow them to practice on numbers of larger values.	
Recall multiplication and division facts, used to find unknown factors or products in multiplication or division sentences	• Factors • Product • Divisor • Quotient • Dividend • Divided by	**Revising Multiplication and Division Facts:** Use a variety of strategies (doubling the timetable, number grid, factorizing) and activities (stepping stones, number trio cards) to revise and explore missing products, factors and/or other missing parts in multiplication and division situations. Use multiplication and division games to revise multiplication and division facts.	**Filling in the Unknown Multiplication and Division Facts** Worksheet #1 – This worksheet allows students to determine the missing parts of a multiplication or division situation. **(See the resource document)** **Making Facts Flashcards**

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			Allow students to use images (of grouping or a set to be divided) to make their own flashcards with multiplication and division facts. **<u>Missing Details Task</u>** Give scenarios with missing details and allow students to solve each task using multiplication or division. Then have them write journal entries sharing their experiences. For example: *Mrs. Bent, the Math Coach of Positive Primary, took 24 Grade 3 students on a math trip. _____ number of vehicles were used. All the vehicles had the same number of students. That means _____ students went in each bus.*
Transfer data from one problem situation to another in order to solve the problem.		**<u>Transferring Data</u>** Provide students with separate scenarios that are related. Help the students to transfer what they have gathered from the first situation and use it in the second. **For example:**	**<u>Transfer Data</u>** Solve the following task: Mr. GRay sells mangoes for $240 per dozen. Mark has $300, how many mangoes can he purchase?

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		Marcia plants 280 corns each week. She reaps 140 corns each week. How many corns does she have left on the farm each week? If Marcia increased her sales to 210 per week, how much would she have left on the farm after 3 weeks? Notice that the students would need the information from the first scenario in order to solve the task in the second scenario. Allow students to use various problem solving techniques to solve the tasks including the use of manipulatives, drawings, and guess and check.	Mark received $600 for lunch. He decides to purchase mangoes for himself and his friends. If he purchases them from Mr. Gray and shares them equally among his friends, how many friends does he have?
Write story problems and solve Use multiplication to verify answers for division problems		**Writing Story Problems** Provide students with a set of scenarios and as a whole group, have them decide on the types of operations that could be used to solve the problems. Guide the conversations such that the students focus on using multiplication and division, not only repeated addition and repeated subtraction. Place students in pairs and have them solve the scenarios discussed earlier, using multiplication. Then have them check their responses using division. Have them report on their experience as they use both operations in the same task.	**Real World Challenges** Have students explore their home and community for instances where multiplication or division can be applied. Have students create scenarios based on their observations. *For example, At a shop, a customer orders 25 packs of biscuit. Each pack costs $30. Using multiplication to find out how the customer paid for the 25 packs of biscuits.* **Checking Division**

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			This worksheet allows students to determine if quotients are correct using multiplication facts. **(See the resource document)**