

Name _____

Date _____

Master 1.1

Unit Rubric: Patterns and Equations

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|--|---|--|---|
| Conceptual Understanding | | | | |
| Shows understanding by explaining and/or demonstrating: - pattern rules - how each element in a pattern differs from the previous one - why a number is/is not the next element - predictions about subsequent elements - verification of predictions - using a variable to describe a pattern - using a variable to write equations | may be unable to demonstrate or explain: - pattern rules - how elements differ - why a number is/is not the next element - predictions about subsequent elements - verifying predictions - using a variable to describe a pattern - using a variable to write equations | partially able to demonstrate or explain: - pattern rules - how elements differ - why a number is/is not the next element - predictions about subsequent elements - verifying predictions - using a variable to describe a pattern - using a variable to write equations | able to demonstrate and explain: - pattern rules - how elements differ - why a number is/is not the next element - predictions about subsequent elements - verifying predictions - using a variable to describe a pattern - using a variable to write equations | in various contexts, appropriately demonstrates and explains: - pattern rules - how elements differ - why a number is/is not the next element - predictions about subsequent elements - verifying predictions - using a variable to describe a pattern - using a variable to write equations |
| Procedural Knowledge | | | | |
| Accurately: - identifies, describes, extends a given pattern - writes a mathematical expression to describe a pattern - solves a single-variable equation | limited accuracy; often makes major errors/omissions in: - identifying and describing patterns - extending patterns - writing expressions - solving equations | partially accurate; makes frequent minor errors/ omissions in: - identifying and describing patterns - extending patterns - writing expressions - solving equations | generally accurate; makes few errors/ omissions in: - identifying and describing patterns - extending patterns - writing expressions - solving equations | accurate; rarely makes errors/omissions in: - identifying and describing patterns - extending patterns - writing expressions - solving equations |
| Problem-Solving Skills | | | | |
| Solves and creates problems involving patterns, variable and equations by using: pattern rules, concrete/ visual representations, charts, tables and equations | does not use problem-solving strategies successfully, such as: - pattern rules - concrete or visual representations - charts or tables - solving equations | uses some problem-solving strategies with partial success including: - pattern rules - concrete or visual representations - charts or tables - solving equations | uses appropriate problem-solving strategies successfully, including: - pattern rules - concrete or visual representations - charts or tables - solving equations | uses appropriate, often innovative, problem-solving strategies with a high degree of success, including: - pattern rules - concrete or visual representations - charts or tables - solving equations |
| Communication | | | | |
| Records and explains reasoning and procedures clearly and completely, including appropriate terminology | does not record and explain reasoning and procedures clearly and completely | records and explains reasoning and procedures with partial clarity; may be incomplete | records and explains reasoning and procedures clearly and completely | records and explains reasoning and procedures with precision and thoroughness |

Master 1.3

**Performance Assessment Rubric:
Charity Fund-raising**

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|--|--|--|---|
| Conceptual Understanding | | | | |
| Shows understanding of patterns and relations by explaining patterns in the table and predictions about the total amount of money to be raised | shows very limited understanding by giving inappropriate explanations | shows limited understanding by giving appropriate but incomplete explanations | shows understanding by giving appropriate explanations | shows thorough understanding by giving appropriate and complete explanations |
| Procedural Knowledge | | | | |
| Constructs table correctly Calculates costs and profits accurately (may include solving equation) | completes table with major errors or omissions limited accuracy; major errors or omissions in calculating costs and profits | completes table with several minor errors or omissions somewhat accurate; several minor errors in calculating costs and profits | completes table with few minor errors or omissions generally accurate; few errors or omissions in calculating costs and profits | completes table with practically no minor errors or omissions accurate; very few or no errors in calculating costs and profits |
| Problem-Solving Skills | | | | |
| Chooses and carries out appropriate strategies (e.g., estimating, using tables, variable, equations) to relate costs and profits, and determine how much money will be raised | chooses and carries out a limited range of appropriate strategies, resulting in an incomplete or seriously flawed solution | chooses and carries out some appropriate strategies, with partial success | chooses and carries out appropriate strategies, resulting in a successful solution | chooses and carries out effective, and often innovative, strategies, resulting in a successful solution |
| Communication | | | | |
| Presents work and explanations clearly, using appropriate mathematical terminology | does not present work and explanations clearly, uses few appropriate mathematical terms | presents work and explanations with some clarity, using some appropriate mathematical terms | presents work and explanations clearly, using appropriate mathematical terms | presents work and explanations precisely, using a range of appropriate mathematical terms |

Master 1.6**To Parents and Adults at Home...**

Your child's class is starting a mathematics unit on patterns and equations. Patterns occur regularly in mathematics. As children learn to analyse patterns, they develop powerful reasoning skills that will help them make sense of mathematics. Knowing how to create equations helps your child to solve story problems.

In this unit, your child will:

- Analyse a number pattern and state the pattern rule.
- Pose and solve problems by applying a patterning strategy.
- Describe a pattern using an expression.
- Interpret a problem and select the best strategy.
- Express a problem as an equation.
- Create and solve equations using all four operations.

Here are some suggestions for activities that you can do at home:

- Look for visual patterns around your home on fabrics, clothing, wallpaper, etc. How do the patterns change?
- Often adults use tables to organize data. Talk with your child about how she or he uses tables to organize and analyze patterns.
- Talk about how you use patterns in your daily life.

Here's a game you can play with your child to help solve for an unknown.

Guess How Many I'm Hiding!

Place some objects such as coins or counters on a table top. Keep some hidden. Tell your child what the total is. Then, have your child guess how many you have hidden and write an equation, e.g., $17 + c = 34$, where c represents the hidden quantity. After playing a few rounds, ask your child to hide some of the objects while you guess the unknown quantity.

Master 2.1

Unit Rubric: Whole Numbers

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|--|---|---|--|---|
| Conceptual Understanding | | | | |
| Shows understanding by explaining and/or demonstrating: <ul style="list-style-type: none"> - the pattern of place positions (right to left) - the meaning of each digit in a given numeral - contexts for estimating - estimation strategies (sums and differences) - compatible numbers | may be unable to demonstrate or explain: <ul style="list-style-type: none"> - place positions - each digit in a given numeral - contexts for estimating - estimation strategies - compatible numbers | partially able to demonstrate or explain: <ul style="list-style-type: none"> - place positions - each digit in a given numeral - contexts for estimating - estimation strategies - compatible numbers | able to demonstrate and explain: <ul style="list-style-type: none"> - place positions - each digit in a given numeral - contexts for estimating - estimation strategies - compatible numbers | in various contexts, appropriately demonstrates and explains: <ul style="list-style-type: none"> - place positions - each digit in a given numeral - contexts for estimating - estimation strategies - compatible numbers |
| Procedural Knowledge | | | | |
| Accurately: <ul style="list-style-type: none"> - writes a given number with proper spacing (no commas) - expresses a given numeral in expanded notation - writes the numeral represented by expanded notation | limited accuracy; often makes major errors/omissions in: <ul style="list-style-type: none"> - writing a given number - expressing a given numeral in expanded notation - writing the numeral represented by expanded notation | partially accurate; makes frequent minor errors/ omissions in: <ul style="list-style-type: none"> - writing a given number - expressing a given numeral in expanded notation - writing the numeral represented by expanded notation | generally accurate; makes few errors/ omissions in: <ul style="list-style-type: none"> - writing a given number - expressing a given numeral in expanded notation - writing the numeral represented by expanded notation | accurate; rarely make errors/omissions in: <ul style="list-style-type: none"> - writing a given number - expressing a given numeral in expanded notation - writing the numeral represented by expanded notation |
| Problem-Solving Skills | | | | |
| Selects and uses appropriate estimation strategies for: <ul style="list-style-type: none"> - making predictions - checking reasonableness of an answer - determining approximate answers | does not select and use appropriate estimation strategies successfully, for: <ul style="list-style-type: none"> - making predictions - checking reasonableness - determining approximate answers | with limited help, selects and uses estimation strategies with partial success for: <ul style="list-style-type: none"> - making predictions - checking reasonableness - determining approximate answers | selects and uses appropriate estimation strategies successfully, for: <ul style="list-style-type: none"> - making predictions - checking reasonableness - determining approximate answers | selects and uses appropriate estimation strategies with a high degree of success, for: <ul style="list-style-type: none"> - making predictions - checking reasonableness - determining approximate answers |
| Communication | | | | |
| Records and explains reasoning and procedures clearly and completely, including appropriate terminology | does not record and explain reasoning and procedures clearly and completely | records and explains reasoning and procedures with partial clarity; may be incomplete | records and explains reasoning and procedures clearly and completely | records and explains reasoning and procedures with precision and thoroughness |

Name _____

Date _____

Master 2.3

Performance Assessment Rubric: Languages We Speak

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|--|---|--|--|---|
| Conceptual Understanding | | | | |
| Shows understanding by applying estimation strategies and explaining reasonableness of answers | shows very limited understanding of estimation; inappropriate explanations | shows limited understanding of estimation; gives appropriate but incomplete explanations | shows understanding of estimation; gives reasonable explanations | shows thorough understanding of estimation; gives effective and detailed explanations |
| Procedural Knowledge | | | | |
| Compares numbers Estimates and checks sums and differences Writes numerals correctly | limited accuracy; major errors or omissions in: - comparing numbers - estimating sums and differences - writing numerals | somewhat accurate; several minor errors in: - comparing numbers - estimating sums and differences - writing numerals | generally accurate; few errors or omissions in: - comparing numbers - estimating sums and differences - writing numerals | accurate; very few or no errors in: - comparing numbers - estimating sums and differences - writing numerals |
| Problem-Solving Skills | | | | |
| Chooses and carries out appropriate estimation strategies (e.g., front-end rounding; compatible numbers) to solve the problems (estimate sums and differences) Uses appropriate estimating and problem-solving strategies to create and solve a problem | chooses and carries out a limited range of appropriate estimation strategies, resulting in unsuccessful solutions for most parts of the problem does not adequately create and solve a problem | chooses and carries out some appropriate estimation strategies, resulting in successful solutions for some parts of problem partially successful in creating and solving a new problem (problem may be very basic or have some flaws) | chooses and carries out appropriate estimation strategies, resulting in successful solutions for most parts of the problem uses appropriate and successful strategies to create and solve a new problem | chooses and carries out effective estimation strategies, resulting in successful solutions for all or almost all parts of the problem uses effective, and often innovative, strategies to create and solve a relatively complex or challenging problem |
| Communication | | | | |
| Presents work and explanations clearly, using appropriate mathematical terminology | does not present work and explanations clearly, uses few appropriate mathematical terms | presents work and explanations with some clarity, using some appropriate mathematical terms | presents work and explanations clearly, using appropriate mathematical terms | presents work and explanations precisely, using a range of appropriate mathematical terms |

Master 2.6**To Parents and Adults at Home ...**

Your child's class is starting a mathematics unit on whole numbers. Your child will learn how to represent and describe whole numbers to 1 000 000 in a variety of ways. He or she will also develop strategies for estimating sums and differences with whole numbers, and learn when to apply these strategies in ways that are appropriate and effective.

In this unit, your child will:

- Recognize and read numbers to 1 000 000.
- Read and write numbers in standard, expanded, and written forms.
- Use place value to represent numbers.
- Estimate sums and differences, and select and use estimation strategies to determine if his or her calculations are reasonable.
- Pose and solve problems using whole numbers.

Students are encouraged to use a variety of estimation strategies to add and subtract depending on situation and context. Calculating with number sense means that children look at the numbers and operations involved and choose the most efficient strategy. Ask your child to show you some of the different estimation strategies that he or she uses. Here's a suggestion for an activity you can do at home:

Newspaper Numbers

Take a page each from a newspaper and circle all the numbers in the articles and advertisements on that page. Then talk about the circled numbers. Which are estimates? Which are not? How can you tell?

Next, both of you choose one number and describe it to one another in terms of its number of millions, ten thousands, thousands, hundreds, tens, and ones only. Then challenge your child to find your secret number while you identify her or his number.

Master 3.1

Unit Rubric: Multiplying and Dividing Whole Numbers

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|--|---|--|---|
| Conceptual Understanding | | | | |
| Shows understanding by explaining and/or demonstrating: <ul style="list-style-type: none"> – multiplication (2-digit by 2-digit) – partial products and the distributive property – division (3-digit by 1-digit) as equal sharing (with and without concrete materials) – why multiplying by 0 results in a product of 0 – interpretation of remainders – why division by 0 is not possible/undefined – personal strategies for multiplying and dividing | may be unable to demonstrate or explain: <ul style="list-style-type: none"> – multiplication – partial products; the distributive property – why multiplying by 0 results in a product of 0 – division – interpretation of remainders – why division by 0 is not possible/undefined – personal strategies for multiplying and dividing | partially able to demonstrate or explain: <ul style="list-style-type: none"> – multiplication – partial products; the distributive property – why multiplying by 0 results in a product of 0 – division – interpretation of remainders – why division by 0 is not possible/undefined – personal strategies for multiplying and dividing | able to demonstrate and explain: <ul style="list-style-type: none"> – multiplication – partial products; the distributive property – why multiplying by 0 results in a product of 0 – division – interpretation of remainders – why division by 0 is not possible/undefined – personal strategies for multiplying and dividing | in various contexts, appropriately demonstrates and explains: <ul style="list-style-type: none"> – multiplication – partial products; the distributive property – why multiplying by 0 results in a product of 0 – division – interpretation of remainders – why division by 0 is not possible/undefined – personal strategies for multiplying and dividing |
| Procedural Knowledge | | | | |
| Accurately: <ul style="list-style-type: none"> – recalls multiplication facts to 81 and related division facts – applies mental math strategies to multiply (e.g., annexing zero, halving, doubling, distributive property) – multiplies (2-digit by 2-digit) – divides (3-digit by 1-digit) | limited accuracy; often makes major errors/omissions in: <ul style="list-style-type: none"> – recalling multiplication facts to 81, and related division facts – applying mental math strategies for multiplication – multiplying (2-digit by 2-digit) – dividing (3-digit by 1-digit) | partially accurate; makes frequent minor errors/omissions in: <ul style="list-style-type: none"> – recalling multiplication facts to 81, and related division facts – applying mental math strategies for multiplication – multiplying (2-digit by 2-digit) – dividing (3-digit by 1-digit) | generally accurate; makes few errors/omissions in: <ul style="list-style-type: none"> – recalling multiplication facts to 81, and related division facts – applying mental math strategies for multiplication – multiplying (2-digit by 2-digit) – dividing (3-digit by 1-digit) | accurate; rarely make errors/omissions in: <ul style="list-style-type: none"> – recalling multiplication facts to 81, and related division facts – applying mental math strategies for multiplication – multiplying (2-digit by 2-digit) – dividing (3-digit by 1-digit) |
| Problem-Solving Skills | | | | |
| Solves and creates problems involving multiplication and division using personal strategies and estimation | does not use personal strategies and estimation to create and solve multiplication and division problems successfully | with limited help, uses personal strategies and estimation with partial success to create and solve multiplication and division problems | uses personal strategies and estimation to successfully create and solve multiplication and division problems | uses personal strategies and estimation with a high degree of success, to create and solve multiplication and division problems in a variety of contexts |
| Communication | | | | |
| Records and explains reasoning and procedures clearly and completely, including appropriate terminology | does not record and explain reasoning and procedures clearly and completely | records and explains reasoning and procedures with partial clarity; may be incomplete | records and explains reasoning and procedures clearly and completely | records and explains reasoning and procedures with precision and thoroughness |

Name _____ Date _____

Master 3.3

Performance Assessment Rubric: On the Dairy Farm

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|--|--|--|---|---|
| Conceptual Understanding | | | | |
| Shows understanding of whole numbers by choosing and explaining appropriate strategies and procedures | shows little understanding; does not choose or explain appropriate strategies and procedures | shows partial understanding; chooses and explains appropriate strategies and procedures for parts of the problem | shows understanding by choosing and explaining appropriate strategies and procedures for most parts of the problem | shows thorough understanding by choosing and explaining effective strategies and procedures for all parts of the problem |
| Procedural Knowledge | | | | |
| Accurately multiplies and divides with whole numbers (may also add and subtract) | makes frequent major errors/omissions in multiplying and dividing with whole numbers (may also add and subtract) | makes frequent minor errors/omissions in: multiplying and dividing with whole numbers (may also add and subtract) | generally accurate; few errors/omissions in multiplying and dividing with whole numbers (may also add and subtract) | accurate; rarely makes errors/omissions in multiplying and dividing with whole numbers (may also add and subtract) |
| Problem-Solving Skills | | | | |
| Selects and uses appropriate strategies to solve and create problems involving multiplication and division, and to check reasonableness of results | does not select and use appropriate strategies to: <ul style="list-style-type: none"> – solve problems – create a problem – check reasonableness of solutions | selects and uses some appropriate strategies with partial success to: <ul style="list-style-type: none"> – solve problems – create a simple problem – check reasonableness of solutions | selects and uses appropriate strategies successfully to: <ul style="list-style-type: none"> – solve problems – create an appropriate problem – check reasonableness of solutions | selects and uses effective, often innovative, strategies with a high degree of success to: <ul style="list-style-type: none"> – solve problems – create a relatively complex problem – check reasonableness of solutions |
| Communication | | | | |
| Presents work and explanations clearly, using appropriate mathematical terminology | does not present work and explanations clearly, uses few appropriate mathematical terms | presents work and explanations with some clarity, using some appropriate mathematical terms | presents work and explanations clearly, using appropriate mathematical terms | presents work and explanations precisely, using a range of appropriate mathematical terms |

Master 3.6**To Parents and Adults at Home ...**

Your child's class is starting a mathematics unit on multiplying and dividing whole numbers. Students will develop strategies for estimating products and quotients, and multiplying and dividing whole numbers. Throughout the unit, they learn when estimation and mental math strategies are appropriate and effective.

In this unit, your child will:

- Recall basic multiplication and division facts.
- Use different strategies to estimate products and quotients.
- Multiply and divide numbers mentally.
- Multiply a 2-digit number by a 2-digit number.
- Divide a 3-digit number by a 1-digit number.
- Pose and solve problems using whole numbers.
- Solve problems with more than one step.

Students are encouraged to use a variety of different strategies to multiply and divide whole numbers. Calculating with number sense means that children look at the numbers and operations involved, and choose the strategy that is most efficient. You may want to ask your child to show you some of the different strategies he or she uses.

Here is a suggestion for a game you can play at home:

Duelling Products

- Remove the jokers and face cards from a deck of playing cards. Use aces as 1 and tens as 0. Shuffle the cards and divide them equally between you.
- Each player turns over 2 cards and multiplies the numbers. The player with the greater product takes all the cards.
- If both players get the same product, leave the cards on the table. The winner of the next round takes all the cards.

The winner is the player with more cards after all the cards have been turned over.

Master 4.1

Unit Rubric: Measurement

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|--|--|---|--|
| Conceptual Understanding | | | | |
| Shows understanding of measurement concepts by explaining and/or demonstrating: <ul style="list-style-type: none"> – relationships among perimeter, shape and area – real-life contexts for use of various units, and for relationships between area and perimeter – the relationships among units of length – choice of referents – estimation of volume and capacity | may be unable to demonstrate or explain <ul style="list-style-type: none"> – relationships between perimeter, shape and area – real-life measurement contexts – the relationships among units of length – choice of referents – estimation of volume and area | partially able to demonstrate or explain: <ul style="list-style-type: none"> – relationships between perimeter, shape and area – real-life measurement contexts – the relationships among units of length – choice of referents – estimation of volume and area | able to demonstrate and explain: <ul style="list-style-type: none"> – relationships between perimeter, shape and area – real-life measurement contexts – the relationships among units of length – choice of referents – estimation of volume and area | in various contexts, appropriately demonstrates and explains: <ul style="list-style-type: none"> – relationships between perimeter, shape and area – real-life measurement contexts – the relationships among units of length – choice of referents – estimation of volume and area |
| Procedural Knowledge | | | | |
| Accurately: <ul style="list-style-type: none"> – constructs rectangles of given perimeter or area – measures and records volume (cubic centimetres or metres) and capacity (millilitres or litres) | limited accuracy; often makes major errors/omissions in: <ul style="list-style-type: none"> – constructing rectangles of given perimeter or area – measuring and recording volume and capacity | partially accurate; makes frequent minor errors/omissions in: <ul style="list-style-type: none"> – constructing rectangles of given perimeter or area – measuring and recording volume and capacity | generally accurate; makes few errors/omissions in: <ul style="list-style-type: none"> – constructing rectangles of given perimeter or area – measuring and recording volume and capacity | accurate; rarely makes errors/omissions in: <ul style="list-style-type: none"> – constructing rectangles of given perimeter or area – measuring and recording volume and capacity |
| Problem-Solving Skills | | | | |
| Solves and creates problems involving estimation and measurement of perimeter and area of rectangles; capacity and volume | does not use problem-solving strategies to solve problems involving estimation and measurement | with limited help uses problem-solving strategies with partial success to solve problems involving estimation and measurement | uses appropriate problem-solving strategies to successfully solve problems involving estimation and measurement | uses appropriate, often innovative problem-solving strategies with a high degree of success, to solve problems involving estimation and measurement |
| Communication | | | | |
| Records procedures and explains reasoning clearly and completely, using appropriate terminology | does not record and explain reasoning and procedures clearly and completely | records and explains reasoning and procedures with partial clarity; may be incomplete | records and explains reasoning and procedures clearly and completely | records and explains reasoning and procedures with precision and thoroughness |

Master 4.3

Performance Assessment Rubric: At the Zoo

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|---|--|---|--|
| Conceptual Understanding | | | | |
| <ul style="list-style-type: none"> Shows understanding of perimeter and area of rectangles, and their relationships by choosing appropriate procedures and creating a reasonable area for each animal (reflecting its size) | shows little understanding; may be unable to: <ul style="list-style-type: none"> choose appropriate procedures select reasonable dimensions and areas for each animal | shows partial understanding by: <ul style="list-style-type: none"> usually choosing appropriate procedures selecting reasonable dimensions and area for some animals | shows understanding by: <ul style="list-style-type: none"> choosing appropriate procedures, in most cases selecting reasonable dimensions and areas for most animals | shows thorough understanding by: <ul style="list-style-type: none"> choosing appropriate procedures selecting reasonable dimensions and areas for all animals |
| Procedural Knowledge | | | | |
| <ul style="list-style-type: none"> All regions are rectangles Measures and records the dimensions of each section Calculates and records the perimeter and area of each section, including units Represents the design on a map | limited accuracy; major errors or omissions in: <ul style="list-style-type: none"> creating rectangles measuring and recording dimensions calculating and recording perimeter and area representing the design on a map | partially accurate; frequent minor errors or omissions in: <ul style="list-style-type: none"> creating rectangles <ul style="list-style-type: none"> measuring and recording dimensions calculating and recording perimeter and area representing the design on a map | generally accurate; few minor errors or omissions in: <ul style="list-style-type: none"> creating rectangles <ul style="list-style-type: none"> measuring and recording dimensions calculating and recording perimeter and area representing the design on a map | accurate and precise; no errors or omissions in: <ul style="list-style-type: none"> creating rectangles measuring and recording dimensions calculating and recording perimeter and area representing the design on a map |
| Problem-Solving Skills | | | | |
| <ul style="list-style-type: none"> Uses appropriate strategies, including estimating, to design a petting zoo that provides appropriate sections, varied by size and shape, for each animal within the given dimensions | does not create an appropriate map; may omit features, exceed given size, or be unrealistic | designs a zoo that includes most of the required features and is close to fitting within the required dimensions; several sections may be of unrealistic size for the animal concerned | designs a zoo that includes the required features and fits within the required dimensions; some features may be of unrealistic size | designs a zoo that shows some innovation; includes required features (realistic size); fits within the required dimensions; may introduce some additional complexity |
| Communication | | | | |
| <ul style="list-style-type: none"> Presents work and explanations clearly, using appropriate mathematical symbols and terminology | does not present work and explanations clearly; uses few appropriate mathematical symbols and terms | presents work and explanations with some clarity, using some appropriate mathematical symbols and terms | presents work and explanations clearly, using appropriate mathematical symbols and terms | presents work and explanations precisely, using a range of appropriate mathematical symbols and terms |

Master 4.6**To Parents and Adults at Home...**

Your child's class is starting a mathematics unit on measurement.

In this unit, your child will:

- Estimate and measure length in millimetres and centimetres.
- Investigate the relationships between millimetres and centimetres, and between millimetres and metres.
- Explore rectangles with equal perimeters.
- Explore rectangles with equal areas.
- Construct different rectangles, given the area and/or perimeter.
- Estimate, measure, and record volume in cubic centimetres and in cubic metres.
- Estimate, measure, and record capacity in millilitres and litres.

Measurement provides a strong connection between what students learn in math and their life experiences. Measurement is a skill that is used in everyday life and in building, designing, and constructing any kind of project.

Here are some suggestions to help support your child's learning:

- Have your child draw a new floor plan for a room that indicates the positions of and measurements for each piece of rearranged furniture.
- If you are cooking or baking, have your child help measure the ingredients.
- If you are hanging a mirror or picture, have your child measure to find the best place for it on the wall.

Master 5.1

Unit Rubric: Fractions and Decimals

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|---|--|--|---|
| Conceptual Understanding | | | | |
| Shows understanding by describing, demonstrating or explaining: - sets of equivalent fractions - comparisons of fractions with like and unlike denominators - decimals (tenths, hundredths, thousandths) - relation of decimals to fractions - comparing and ordering decimals - predictions about sums and differences of decimals | may be unable to describe, demonstrate, or explain: - sets of equivalent fractions - comparisons of fractions - decimals - relation of decimals to fractions - comparing and ordering decimals - predictions about sums and differences of decimals | partially able to describe, demonstrate, or explain: - sets of equivalent fractions - comparisons of fractions - decimals - relation of decimals to fractions - comparing and ordering decimals - predictions about sums and differences of decimals | able to describe, demonstrate, or explain: - sets of equivalent fractions - comparisons of fractions - decimals - relation of decimals to fractions - comparing and ordering decimals - predictions about sums and differences of decimals | in various contexts, able to describe, demonstrate, or explain appropriately: - sets of equivalent fractions - comparisons of fractions - decimals - relation of decimals to fractions - comparing and ordering decimals - predictions about sums and differences of decimals |
| Procedural Knowledge | | | | |
| Accurately: - identifies equivalent fractions - orders fractions on a number line - represents decimals (concrete, pictorial, symbolic) - relates decimals to fractions - orders decimals - adds and subtracts decimals | limited accuracy; often makes major errors/omissions in: - identifying equivalent fractions - ordering fractions - representing decimals - relating decimals to fractions - ordering decimals | partially accurate; makes frequent minor errors/omissions in: - identifying equivalent fractions - ordering fractions - representing decimals - relating decimals to fractions - ordering decimals | generally accurate; makes few errors/ omissions in: - identifying equivalent fractions - ordering fractions - representing decimals - relating decimals to fractions - ordering decimals | accurate; rarely makes errors/omissions in: - identifying equivalent fractions - ordering fractions - representing decimals - relating decimals to fractions - ordering decimals |
| Problem-Solving Skills | | | | |
| Solves problems involving: - concrete and pictorial representations of fractions - adding and subtracting decimals (to thousandths) | does not use strategies successfully to solve problems involving: - concrete and pictorial representations of fractions - adding and subtracting decimals | uses some strategies with partial success to solve problems involving: - concrete and pictorial representations of fractions - adding and subtracting decimals | uses appropriate strategies successfully, to solve problems involving: - concrete and pictorial representations of fractions - adding and subtracting decimals | uses appropriate, often innovative, strategies with a high degree of success, to solve problems involving: - concrete and pictorial representations of fractions - adding and subtracting decimals |
| Communication | | | | |
| Presents work and explanations clearly, using appropriate mathematical terminology | does not present work and explanations clearly; uses few appropriate mathematical terms | presents work and explanations with some clarity, using some appropriate mathematical terms | presents work and explanations clearly, using appropriate mathematical terms | presents work and explanations precisely, using a range of appropriate mathematical terms |

Master 5.3

**Performance Assessment Rubric:
In the Garden**

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|--|---|--|--|--|
| Conceptual Understanding | | | | |
| Shows understanding of decimals and decimal operations by choosing and explaining appropriate strategies and procedures for each part of the task, and recognizing when results are reasonable | shows little understanding; may be unable to choose or explain appropriate strategies and procedures for most parts of the task; may not recognize that results are not reasonable | shows partial understanding by choosing and explaining (partially) appropriate strategies and procedures for some part of the task; recognizes when results are extremely unlikely | shows understanding by choosing and explaining appropriate strategies and procedures for most tasks; recognizes when results are not reasonable | shows thorough understanding by choosing appropriate strategies and procedures for all tasks and offering complete and effective explanations; recognizes when results are not precise |
| Procedural Knowledge | | | | |
| Accurately - represents and describes fractions and decimals as regions of a rectangle (using grid paper) - adds and subtracts decimals | major errors/omissions in: - representing and describing fractions and decimals as regions of a rectangle - adding and subtracting with decimals | frequent minor errors/ omissions in: - representing and describing fractions and decimals as regions of a rectangle - adding and subtracting with decimals | generally accurate; few errors/omissions in: - representing and describing fractions and decimals as regions of a rectangle - adding and subtracting with decimals | accurate; no errors in: - representing and describing fractions and decimals as regions of a rectangle - adding and subtracting with decimals |
| Problem-Solving Skills | | | | |
| Uses appropriate strategies to solve and pose problems involving fractions and decimals, including: - creating plans that satisfy guidelines for a garden - solving problems posed by classmates - creating story problems involving addition and subtraction with decimals | unable to use appropriate strategies to solve and create problems involving fractions and decimals, including: - creating garden plans - creating addition and subtraction problems - solving classmates' problems | uses appropriate strategies to successfully solve and create some problems involving fractions and decimals, including: - creating garden plans - creating addition and subtraction problems - solving classmates' problems | uses appropriate strategies to successfully solve and create most problems involving fractions and decimals, including: - creating garden plans - creating addition and subtraction problems - solving classmates' problems | uses appropriate, efficient, and often innovative strategies to successfully solve and create problems involving fractions and decimals, including: - creating garden plans - creating addition and subtraction problems - solving classmates' problems |
| Communication | | | | |
| Presents work and explanations clearly, using appropriate mathematical terminology | does not present work and explanations clearly; uses few appropriate mathematical terms | presents work and explanations with some clarity, using some appropriate mathematical terms | presents work and explanations clearly, using appropriate mathematical terms | presents work and explanations precisely, using a range of appropriate mathematical terms |

Master 5.6**To Parents and Adults at Home ...**

Your child's class is starting a mathematics unit on fractions and decimals.

In this unit, your child will:

- Model, compare, and order fractions and decimals.
- Explore equivalent fractions and decimals.
- Relate fractions to division and to decimals.
- Use decimals to record measurements.
- Estimate decimal sums and differences.
- Add decimals with tenths, hundredths, and thousandths.
- Subtract decimals with tenths, hundredths, and thousandths.
- Pose and solve problems involving fractions and decimals.

Fractions and decimals are used and encountered frequently in our world. For example, prices on grocery and other store advertising flyers typically show decimals and special sales announcements that include fractions. Encourage your child to look for such examples and to use fractions and decimals at home.

If you are dividing something into equal pieces, such as an orange, have your child name fractions that describe the pieces. For example, if the orange is divided into 8 equal pieces, each piece is one-eighth of the orange.

While shopping, encourage your child to look for decimals on price tags and labels. Have your child help you estimate the total amount of the items you intend to purchase, as well as how much change you should receive.

Master 6.1

Unit Rubric: Geometry

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|--|---|---|--|--|
| Conceptual Understanding | | | | |
| Shows understanding by explaining and/or demonstrating: - edges, faces, sides, and line segments that are parallel, intersecting, perpendicular, vertical, horizontal - attributes of quadrilaterals | may be unable to demonstrate or explain: - parallel, intersecting, perpendicular, vertical, horizontal - attributes of quadrilaterals | partially able to demonstrate or explain: - parallel, intersecting, perpendicular, vertical, horizontal - attributes of quadrilaterals | able to demonstrate and explain: - parallel, intersecting, perpendicular, vertical, horizontal - attributes of quadrilaterals | in various contexts, appropriately demonstrates and explains: - parallel, intersecting, perpendicular, vertical, horizontal - attributes of quadrilaterals |
| Procedural Knowledge | | | | |
| Identifies and draws parallel, intersecting, perpendicular, vertical, horizontal edges, faces, sides, and line segments Identifies and sorts rectangles, squares, trapezoids, parallelograms, rhombuses | limited accuracy; often makes major errors/omissions in - identifying and drawing specific edges, faces, sides - identifying and sorting quadrilaterals | partially accurate; makes frequent minor errors/omissions in: - identifying and drawing specific edges, faces, sides - identifying and sorting quadrilaterals | generally accurate; makes few errors/omissions in: - identifying and drawing specific edges, faces, sides - identifying and sorting quadrilaterals | accurate; rarely makes errors/omissions in: - identifying and drawing specific edges, faces, sides - identifying and sorting quadrilaterals |
| Problem-Solving Skills | | | | |
| Solves and creates problems involving 3-D objects and 2-D shapes | does not solve and create problems involving 3-D objects and 2-D shapes | partly solves and creates problems involving 3-D objects and 2-D shapes | successfully solves and creates problems involving 3-D objects and 2-D shapes | successfully solves and creates problems involving 3-D objects and 2-D shapes in a variety of contexts; often innovative |
| Communication | | | | |
| Records and explains reasoning and procedures clearly and completely, including appropriate terminology | does not record and explain reasoning and procedures clearly and completely | records and explains reasoning and procedures with partial clarity; may be incomplete | records and explains reasoning and procedures clearly and completely | records and explains reasoning and procedures with precision and thoroughness |

Master 6.3

**Performance Assessment Rubric:
Building Bridges**

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|--|---|--|---|--|
| Conceptual Understanding | | | | |
| Shows understanding by choosing appropriate procedures, discussing and explaining geometric attributes and relationships, and their application (e.g., in creating strong bridges) | shows little understanding; may be unable to choose appropriate procedures or offer reasonable explanations | shows partial understanding by choosing appropriate procedures and offering some reasonable explanation | shows understanding by choosing appropriate procedures and giving reasonable explanations | shows thorough understanding by choosing appropriate procedures and giving in-depth and insightful explanations |
| Procedural Knowledge | | | | |
| Uses appropriate procedures to accurately identify: – equal, parallel, perpendicular, horizontal, and vertical sides –lines of symmetry –rectangles, squares, trapezoids, parallelograms, rhombuses | limited accuracy; major errors/omissions in identifying: –given types of sides –lines of symmetry –specific quadrilaterals | somewhat accurate; frequent minor errors/omissions in: identifying –given types of sides –lines of symmetry –specific quadrilaterals | generally accurate; few errors/omissions in identifying: –given types of sides –lines of symmetry –specific quadrilaterals | accurate; rarely makes errors/omissions in identifying: –given types of sides –lines of symmetry –specific quadrilaterals |
| Problem-Solving Skills | | | | |
| Chooses appropriate strategies, (e.g., estimating, measuring, sketching) to create a bridge and determine the load it can support | designs a bridge that does not meet requirements; may be unable to find the load (sometimes because bridge will not stand up or bear any load at all) | designs a simple bridge that stands up and supports a load; may use a very light load (i.e., not approach maximum load bridge will bear) | designs a bridge that meets requirements and experiments to determine the load it will support | shows innovation; designs a relatively complex bridge that meets requirements; uses efficient and often innovative strategies to determine the load it will bear |
| Communication | | | | |
| Presents work and explanations clearly, using appropriate mathematical terminology | does not present work and explanations clearly, uses few appropriate mathematical terms | presents work and explanations with some clarity, using some appropriate mathematical terms | presents work and explanations clearly, using appropriate mathematical terms | presents work and explanations precisely, using a range of appropriate mathematical terms |

Master 6.6**To Parents and Adults at Home ...**

Your child's class is starting a mathematics unit on geometry. Geometric shapes are in the world all around us, and mathematics can help your child recognize important features of geometry. Recognizing geometric features and understanding geometric form are key steps in developing a higher level of mathematical thinking.

In this unit, your child will:

- Build, represent, and describe geometric objects and shapes
- Identify and sort quadrilaterals (that is, shapes with 4 sides)

Geometric shapes and objects can be found outside the classroom. Encourage your child to look for geometric shapes and objects around the home and neighbourhood, and talk about them.

Here are some suggestions for activities that you can do at home:

- Look for geometric shapes in buildings and street signs. For example, a stop sign has the shape of an octagon, and a yield sign has the shape of a triangle.
- Find objects around the house that have different shapes. For example, a tissue box or a cereal box has the shape of a rectangular prism. Ask your child to tell you the differences between the objects.

Master 7.1

Unit Rubric: Statistics and Probability

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|--|---|--|---|
| Conceptual Understanding | | | | |
| Shows understanding by explaining and/or demonstrating: <ul style="list-style-type: none"> – the difference between first-hand and second-hand data – conclusions that can be drawn from a given bar graph – the likelihood of a given outcome – relative likelihood of two outcomes | may be unable to demonstrate or explain: <ul style="list-style-type: none"> – the difference between first-hand and second-hand data – conclusions that can be drawn from a given bar graph – the likelihood of a given outcome – relative likelihood of two outcomes | partially able to demonstrate or explain: <ul style="list-style-type: none"> – the difference between first-hand and second-hand data – conclusions that can be drawn from a given bar graph – the likelihood of a given outcome – relative likelihood of two outcomes | able to demonstrate and explain: <ul style="list-style-type: none"> – the difference between first-hand and second-hand data – conclusions that can be drawn from a given bar graph – the likelihood of a given outcome – relative likelihood of two outcomes | in various contexts, appropriately demonstrates and explains: <ul style="list-style-type: none"> – the difference between first-hand and second-hand data – conclusions that can be drawn from a given bar graph – the likelihood of a given outcome – relative likelihood of two outcomes |
| Procedural Knowledge | | | | |
| Accurately: <ul style="list-style-type: none"> – identifies examples of first-hand and second-hand data – constructs double bar graphs including labels and legend – interprets bar graphs | limited accuracy; often makes major errors/ omissions in: <ul style="list-style-type: none"> – identifying examples of first-hand and second-hand data – constructing double bar graphs including labels and legend – interpreting bar graphs | partially accurate; makes frequent minor errors/omissions in: <ul style="list-style-type: none"> – identifying examples of first-hand and second-hand data – constructing double bar graphs including labels and legend – interpreting bar graphs | generally accurate; makes few errors/ omissions in: <ul style="list-style-type: none"> – identifying examples of first-hand and second-hand data – constructing double bar graphs including labels and legend – interpreting bar graphs | accurate; rarely make errors/omissions in: <ul style="list-style-type: none"> – identifying examples of first-hand and second-hand data – constructing double bar graphs including labels and legend – interpreting bar graphs |
| Problem-Solving Skills | | | | |
| Solves problems by constructing and interpreting a bar graph Designs and conducts probability experiments to demonstrate and investigate the likelihood of outcomes | does not use strategies successfully to: <ul style="list-style-type: none"> – solve problems by constructing and interpreting a bar graph – design and conduct probability experiments | with limited help, uses strategies with partial success to: <ul style="list-style-type: none"> – solve problems by constructing and interpreting a bar graph – design and conduct probability experiments | uses appropriate strategies successfully to: <ul style="list-style-type: none"> – solve problems by constructing and interpreting a bar graph – design and conduct probability experiments | uses appropriate, often innovative, strategies with a high degree of success to: <ul style="list-style-type: none"> – solve problems by constructing and interpreting a bar graph – design and conduct probability experiments |
| Communication | | | | |
| Presents work and explanations clearly, using appropriate mathematical terminology | does not present work and explanations clearly, uses few appropriate mathematical terms | presents work and explanations with some clarity, using some appropriate mathematical terms | presents work and explanations clearly, using appropriate mathematical terms | presents work and explanations precisely, using a range of appropriate mathematical terms |

Master 7.3

**Performance Assessment Rubric:
Weather Watch**

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|--|---|--|---|---|
| Conceptual Understanding | | | | |
| Shows understanding by applying and explaining concepts related to constructing and interpreting double bar graphs, and probability (likelihood of outcomes) | may be unable to apply or explain concepts related to: – double bar graphs – likelihood of outcomes | partially able to apply or explain: – double bar graphs – likelihood of outcomes | able to demonstrate and explain: – double bar graphs – likelihood of outcomes | in various contexts, appropriately demonstrates and explains: – double bar graphs – likelihood of outcomes |
| Procedural Knowledge | | | | |
| Accurately: – constructs double bar graphs (including title, legend and labelled axes) showing required data (Parts A & C) – interprets the graphs to answer questions (Parts B & C) | limited accuracy; several major errors/omissions in: – constructing double bar graphs including labels and legend – interpreting bar graphs | partially accurate; some errors/omissions in: – constructing double bar graphs including labels and legend – interpreting bar graphs | generally accurate; few errors/omissions in: – constructing double bar graphs including labels and legend – interpreting bar graphs | accurate; very few or no errors/omissions in: – constructing double bar graphs including labels and legend – interpreting bar graphs |
| Problem-Solving Skills | | | | |
| Solves problems by constructing and interpreting a bar graph Designs and conducts probability experiments to demonstrate and investigate the likelihood of outcomes | does not use strategies successfully to: – solve problems by constructing and interpreting a bar graph – design and conduct probability experiments | uses some strategies with partial success to: – solve problems by constructing and interpreting a bar graph – design and conduct probability experiments | uses appropriate strategies successfully to: – solve problems by constructing and interpreting a bar graph – design and conduct probability experiments | uses appropriate, often innovative, strategies with a high degree of success to: – solve problems by constructing and interpreting a bar graph – design and conduct probability experiments |
| Communication | | | | |
| Presents work and explanations clearly, using appropriate mathematical terminology (e.g., likely/unlikely) | does not present work and explanations clearly; uses few appropriate mathematical terms | presents work and explanations with some clarity, using some appropriate mathematical terms | presents work and explanations clearly, using appropriate mathematical terms | presents work and explanations precisely, using a range of appropriate mathematical terms |

Master 7.6**To Parents and Adults at Home...**

Your child's class is starting a mathematics unit on statistics (data analysis) and probability (chance and uncertainty). These important branches of mathematics help us make informed decisions in many aspects of everyday life, from playing games to choosing medical treatments.

In this unit, your child will:

- Learn the difference between first-hand and second-hand data
- Ask questions and decide whether the answer requires first-hand or second-hand data
- Find examples of second-hand data in print and electronic media
- Solve problems by constructing and interpreting double bar graphs
- Use words such as likely, unlikely, impossible, and certain
- Describe the probability of everyday events
- Compare the likelihood of two events

Data analysis and probability concepts can be practised at home as well as at school. Here are some suggestions for activities you can do at home:

- Watch for examples of tables and double bar graphs in newspapers, magazines, or on the World Wide Web. Ask your child what information the tables or graphs convey.
- Play board games and card games with your child. Compare games that depend on chance (for example, snakes and ladders) with games that depend on skill (for example, chess). Look for games that combine chance and skill.
- Encourage your child to discuss general ideas of randomness, luck, and chance. Is it true that some people are luckier than others? Can you improve your chances by wearing a lucky pair of shoes? What does it mean to say that something happens by chance? Rather than just looking for "correct" answers, enjoy the opportunity to discover more about your child's thinking as you explore these complex ideas together.

Master 8.1

Unit Rubric: Transformations

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|---|---|--|---|
| Conceptual Understanding | | | | |
| Shows understanding by demonstrating, drawing, and describing a translation, rotation, or reflection of a 2-D shape | may be unable to demonstrate, draw, and describe a translation, rotation, or reflection of a 2-D shape | partially able to demonstrate, draw, and describe a translation, rotation, or reflection of a 2-D shape | able to demonstrate, draw, and describe a translation, rotation, or reflection of a 2-D shape | in various contexts, appropriately demonstrates, draws, and describes a translation, rotation, or reflection of a 2-D shape |
| Procedural Knowledge | | | | |
| Accurately identifies: - a translation and the direction and magnitude of the movement - a rotation and the direction of a turn (clockwise or counterclockwise), the fraction of a turn, and the point of rotation - a reflection (and line of reflection) | limited accuracy; often makes major errors/omissions in identifying a: - translation - rotation - reflection | partially accurate; makes frequent minor errors/ omissions in identifying a: - translation - rotation - reflection | generally accurate; makes few errors/ omissions in identifying a: - translation - rotation - reflection | accurate; rarely makes errors/omissions in identifying a: - translation - rotation - reflection |
| Problem-Solving Skills | | | | |
| Solves problems involving transformations | unable to solve problems involving transformations | solves problems involving transformations with partial success | successfully solves problems involving transformations | successfully solves and creates problems involving transformations in a variety of contexts; often innovative |
| Communication | | | | |
| Records and explains reasoning and procedures clearly and completely, including appropriate terminology | unable to record and explain reasoning and procedures clearly and completely | records and explains reasoning and procedures with partial clarity; may be incomplete | records and explains reasoning and procedures clearly and completely | records and explains reasoning and procedures with precision and thoroughness |

Master 8.3

**Performance Assessment Rubric:
At the Amusement Park**

| | Not Yet Adequate | Adequate | Proficient | Excellent |
|---|--|--|---|---|
| Conceptual Understanding | | | | |
| Shows understanding by drawing and explaining transformations | does not show understanding of transformations in drawing and explanation | shows partial understanding of transformations in drawing and explanation | shows understanding of transformations in drawing and explanation | shows thorough understanding of transformations in drawing and explanation |
| Procedural Knowledge | | | | |
| Accurately represents and identifies two transformations | limited accuracy; major errors/omissions in representing and identifying transformations | partially accurate; some errors/ omissions in representing and identifying transformations | generally accurate; few errors/ omissions in representing and identifying transformations | accurate; very few or no errors/omissions in representing and identifying transformations |
| Problem-Solving Skills | | | | |
| Uses problem-solving strategies to design an amusement park ride that meets requirements | does not use appropriate strategies; does not design an appropriate ride | uses some appropriate strategies to design a ride with partial success | uses appropriate strategies to successfully design a ride | uses effective strategies to design a ride; innovative |
| Communication | | | | |
| Records and explains reasoning and procedures clearly and completely, including appropriate terminology | does not record and explain reasoning and procedures clearly and completely | records and explains reasoning and procedures with partial clarity; may be incomplete | records and explains reasoning and procedures clearly and completely | records and explains reasoning and procedures with precision and thoroughness |

Master 8.6**To Parents and Adults at Home ...**

Your child's class is starting a mathematics unit on motion geometry called transformations.

Your child will explore how shapes are moved or transformed.

In this unit, your child will:

- Describe and explore translations (slides), reflections (flips), and rotations (turns).
- Perform and identify translations, reflections, and rotations.
- Draw translations, reflections, and rotations.

Shapes can be moved in different ways to produce images.

Your child will learn to describe motion in the following ways:

A translation moves a shape horizontally (left or right), vertically (up or down), or along a slanted line, to produce a translation image.

A reflection produces an image after a reflection in a line of reflection.

A rotation turns a shape clockwise or counterclockwise, about a point of rotation, by a fraction of a turn.

Here are some suggestions for activities you can do with your child.

Have your child find objects at home that slide (for example, a drawer opening or closing), reflect (for example, a reflection in a mirror or other shiny surface), and turn (for example, the hands on a clock).