Math Program of Inquiry
Draft Spring 2018

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
PYP1 How the World Works	Concept			Time		Sequence
	Lines of Inquiry			Time can be measured in different ways Time can be described in various lengths Time is sequential		Sequence in numbers occur in patterns Sequence can attribute the value assigned to a digit
	Skills			1. Use calendar language – days of weeks, months, day before and day after		1. Count forward by ones, twos, fives and tens to 100 (using objects?) from various starting points 2. Identify number patterns by twos, fives, and tens 3. Count backward by ones from 30 4. Recognize, describe, extend, and create a variety of growing and repeating patterns. 5. Use numbers 1-20 to identify

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						position in a sequence
	Integrated in the unit?			yes		1-4 – yes 5 - No
PYP1 How We Express Ourselves	Concept	Procedures		Value		
	Lines of Inquiry	Procedures can be described by symbols Procedures can lead to outcomes Procedures can have patterns		Value can be described in monetary terms Value can be described in numbers		
	Skills	1. Identify half of a whole 2. Identify the symbol for addition, subtraction, and equality 3. Can solve simple addition and subtraction problems 4. Can write number sentences		1. Identify value of Norwegian coins 2. Identify the characteristics of Norwegian coins 3. Count Norwegian coins whose total value is 100		

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		5. Can recall doubles to 20 6. Can recall basic addition with sums of 10 or less and corresponding subtraction facts				
	Integrated in the unit?	No		No		
PYP1 How We Organize Ourselves	Concept	Function	Data			
	Lines of Inquiry	Function can occur in a pattern	Data can be collected and measured Data can be represented visually			
	Skills	1. Identify even and odd numbers to 20 2. Determine if a set has an even or odd number of objects	1. Tell time and match the written time to the half hour on an analogue and digital clock. 2. Collect, identify, and describe various forms of data using tables, picture graphs, and object graphs.			

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			3. Interpret data on a picture or object graph using more, less, fewer, and equal.			
	Integrated in the unit?	Yes	Yes			
PYP1 Sharing the Planet	Concept	Value		Preparation		
	Lines of Inquiry	Value changes with addition and subtraction.		Preparation can involve measurement		
	Skills	1. Solve simple addition and subtraction, using strategies such as recall, counting on, counting objects, drawing a picture, doubles, counting forward 2. Write number sentences 3. Recall doubles to 20		1. Compare and describe units using the words empty, full, nearly empty, nearly full, half full, heavy, and light 2. Compare and order units using capacity and mass 3. Use language to explain which unit holds more or which is heavier		

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		4. Recognize number bonds to 10 5. Recall addition and subtraction facts to 10 6. Demonstrate an understanding of equality using the equal sign.		4. Use non-standard units to measure and compare capacity and mass		
	Integrated in the unit?	No		Yes		
PYP1 Where We Are in Place and Time	Concept	Place		Connection	Form	
	Lines of Inquiry	Place can indicate value		Connection between objects can be described	Form can be identified and described.	
	Skills	1. Show and identify place value of each digit in a number up to 100		1. Compare and order at least three objects 2. Describe objects as longer thank shorter than 3. Use non-standard units to measure length	1. Name and describe a triangle, square, and rectangle 2. Sort shapes 3. Describe objects in the environment as geometric shapes	

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	Integrated in the unit?	No		Yes	Yes	
PYP1 Who We Are	Concept	Function			Classification	
	Lines of Inquiry	Function is determined by place and value			Classification is determined by characteristics	
	Skills	1. Count forward by ones to 20 from any starting point. 2. Read and write numerals from 0-20 3. Locate and order numbers on a number line 4. Order numbers from 1-20 5. Show numbers using tens frames, pictures, tally marks, and numerals 6. Identify a number as one more or one less from 1-20			1. Sort objects using one attribute including color, size, shape, and thickness	

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	Integrated in the unit?	Yes			No	
PYP1 Morning Meeting	Concept			Function		
	Lines of Inquiry			Function can be measured by time		
	Skills			1. Use calendar language for names of months and days of week 2. Use the calendar to determine the day, week, month, and year 3. Record day of the week and month		
	Integrated in the unit?			No		
PYP2 How the World Works	Concept				Form	
	Lines of Inquiry				Differences in form can be observed, identified, and described.	
	Skills				1. The student will	

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					a) draw a line of symmetry in a figure; and b) identify and create figures with at least one line of symmetry. 2. The student will identify, describe, compare, and contrast plane and solid geometric figures (circle/sphere, square/cube, and rectangle/rectangular prism).	
	Integrated in the unit?				Yes	
PYP2 How We Express Ourselves	Concept	Causation				
	Lines of Inquiry	Changes in place value causes an effect on numbers				
	Skills	1. Read, write, and identify the place value				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		of each digit in a three-digit numeral, using numeration models; 2. Round two-digit numbers to the nearest ten; and 3. Compare two whole numbers between 0 and 999, using symbols (>, <, or =) and words (greater than, less than, or equal to).				
	Integrated in the unit?	Yes				
PYP2 How We Organize Ourselves	Concept	Function	Function	Systems		
	Lines of Inquiry	Function can be a relationship between inputs and outputs	Function can be seen in data collection, organization and analysis	Money systems help economies to operate		
	Skills	1. Create and solve one- and two-step addition and subtraction problems,	1. Create tables and picture graphs 2. Record data in tables and picture graphs	1. Count and compare coins and bills whose total value is 500 NOK or less		

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		using data from simple tables and picture graphs	3. Analyze data displayed in simple tables and picture graphs	2. Correctly use the Øre (cents), NOK, and comma (,)		
	Integrated in the unit?	Yes	Yes	Yes		
PYP2 Sharing the Planet	Concept	Change				Change
	Lines of Inquiry	Change can be estimated or calculated				Change can be recognized and described by relationships
	Skills	1. Recognize the symbols for equal to and not equal to 2. Estimate the sum (99 or less) of two whole numbers 3. Estimate the difference of two whole numbers (99 or less each) 4. Solve problems by completing numerical sentences with basic facts for addition and subtraction				1. Find the sum and difference using various methods of calculation 2. Recognize, describe, and use related facts, including the relationship between addition and subtraction

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		5. Create mathematical story problems				
	Integrated in the unit?	Yes				Yes
PYP2 Where We Are in Place and Time	Concept	Evidence		Evidence		
	Lines of Inquiry	Evidence can be reliable and unreliable Evidence allows us to draw conclusions		Evidence allows us to draw conclusions		
	Skills	1. Estimate the difference of two whole numbers (99 or less each) 2. Solve problems by completing numerical sentences with basic facts for addition and subtraction 3. Create mathematical story problems 4. Recall addition facts with		1. Tell and write time to the nearest minute on a digital and analogue clock 2. Estimate and measure length to the nearest centimeter		

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		sums to 20 or less and corresponding subtraction facts, using strategies such as double facts, double plus one, counting on, ten friends				
	Integrated in the unit?	Yes		Yes		
PYP2 Who We Are	Concept	Connection			Connection	
	Lines of Inquiry	Connection can be a relationship between numbers			Connection can be seen and described in patterns	
	Skills	1. The student will recall addition facts with sums to 20 or less and the corresponding subtraction facts. 2. Reading and representing numbers using tally marks,			1. The student will identify, create, and extend a wide variety of patterns. 2. The student will a) count forward by twos, fives, and tens to 100, starting at various	

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		objects, word form, number form 3. Identify 10 more and less and 1 more and less			multiples of 2, 5, or 10; b) count backward by tens from 100; and c) recognize even and odd numbers	
	Integrated in the unit?	Yes			Yes	
PYP2 Morning Meeting	Concept	Form		Function		
	Lines of Inquiry	Form can consist of patterns Form can be represented by numbers		Function can be measured by time		
	Skills	1. Identify ordinal positions 1-20 2. Write the ordinal numbers		1. Identify past and future days of the weeks. 2. Identify specific days and dates on a calendar.		
	Integrated in the unit?	No		No		
PYP3	Concept			Connection		

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
How the World Works	Lines of Inquiry			Connections can be identified and measured.		
	Skills			1. The student will estimate and use metric units to measure a) length to the nearest ½ inch, inch, foot, yard, centimeter, and meter; b) liquid volume in cups, pints, quarts, gallons, and liters; c) weight/mass in ounces, pounds, grams, and kilograms		

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				2. The student will identify equivalent periods of time, including relationships among days, months, and years, as well as minutes and hours. 3. The student will read temperature to the nearest degree from a Celsius thermometer 4. Real thermometers and physical models of thermometers will be used.		
	Integrated in the unit?			Yes		
PYP3 How We Express Ourselves	Concept	Fraction				
	Lines of Inquiry	Fraction is a portion of a whole				
	Skills	1. The student will				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		a) name and write fractions represented by a model; b) model fractions write the fractions' names; and c) compare fractions having like denominators, using words and symbols (>, <, or =). 2. The student will recall multiplication facts through the twelves table, and the corresponding division facts. 3. The student will a) investigate the identity and the commutativ				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		e properties for multiplication; and b) identify examples of the identity and commutative properties for multiplication. 4. The student will represent multiplication and division, using area, set, and number line models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.				
	Integrated in the unit?	No				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
PYP3 How We Organize Ourselves	Concept	Function		Change		
	Lines of Inquiry	Function can be aided by inverse relationships.		Change can be measured in time.		
	Skills	1. Recognize and use the inverse relationships between addition/subtraction to complete basic fact sentences. The student will use these relationships to solve problems.		1. Tell time to the nearest minute, using analog and digital clocks; and determine elapsed time in one-hour increments over a 12-hour period.		1. The student will a) investigate the identity and the commutative properties for addition; and b) identify examples of the identity and commutative properties for multiplication.
	Integrated in the unit?	Yes		Yes		Yes
PYP3 Sharing the Planet	Concept	Function	Consequences			Causation
	Lines of Inquiry	Function can be aided by inverse relationships.	Consequences can be predicted and analyzed Consequences can be charted			Causation is not always influenced by order of property Causation can be the result of a pattern
	Skills	1. The student will recognize	1. Investigate and describe the			1. Recognize and describe a variety

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		and use the inverse relationships between addition/subtraction and to complete basic fact sentences. The student will use these relationships to solve problems.	concept of probability as chance and list possible results of a given situation. 2. Collect and organize data, using observations, measurements, surveys, or experiments; 3. Construct a line plot, a picture graph, or a bar graph to represent the data; and 4. Read and interpret the data represented in line plots, bar graphs, and picture graphs and write a sentence analyzing the data.			of patterns formed using numbers, tables, and pictures, and extend the patterns, using the same or different forms.
	Integrated in the unit?	Yes – Continued from How We organize Ourselves	Yes			Yes

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
PYP3 Where We Are in Place and Time	Concept	Form			Form	
	Lines of Inquiry	Patterns are a type of form Factors can influence form			Form has recognizable features that can be named, described, and compared.	
	Skills	1. Recall multiplication facts through the twelves table 2. Solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.		1. The student will a) measure the distance around a polygon to determine perimeter; and b) count the number of square units needed to cover a given surface to determine area.	1. Identify, describe, compare, and contrast characteristics of plane and solid geometric figures (circle, square, rectangle, triangle, cube, rectangular prism, square pyramid, sphere, cone, and cylinder) by identifying relevant characteristics, including the number of angles, vertices, and edges, and the number and shape of faces,	

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
					using concrete models. 2. Identify and draw representations of points, line segments, rays, angles, and lines. 3. Identify and describe congruent and noncongruent plane figures.	
	Integrated in the unit?	Yes			Yes	
PYP3 Who We Are	Concept	Value		Function		
	Lines of Inquiry	Value can be determined by place or position		Function can require individual parts of a whole that can be compared, divided, and added		
	Skills	1. Read and write six-digit numerals and identify the place value and value of each digit; 2. Round whole numbers,		1. Determine, by counting, the value of a collection of bills and coins whose total value is 500 NOK or less, compare the value of the bills		

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		9,999 or less, to the nearest ten, hundred, and thousand; and 3. Compare two whole numbers between 0 and 9,999, using symbols (>, <, or =) and words (*greater than, less than*, or *equal to*).		and coins, and make change.		
	Integrated in the unit?	No		Yes		
PYP4 How the World Works	Concept	Connection				
	Lines of Inquiry	Connection consists of individual parts that affect each other				
	Skills	1. Demonstrate fluency with multiplication facts through 12x12, and				

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		the corresponding divisions facts 2. Estimate and determine sums, differences, and products of whole numbers, 3. Estimate and determine quotients of whole numbers, with and without remainders 4. Create and solve single-step and multistep practical problems involving additions, subtraction, and multiplication, and single step practical problems involving division with				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		whole numbers.				
	Integrated in the unit?	No				
PYP4 How We Express Ourselves	Concept	Form				Form
	Lines of Inquiry	Form has recognizable features Form can be abstract, described or categorized				Form has recognizable features Form can be abstract, described or categorized
	Skills	1. Read, write, and identify the place and value of each digit in a nine-digit whole number. 2. Compare two whole number expressed through millions using symbols. 3. Rounding whole numbers, expressed through millions.				1. Identify, describe, create, and extend patterns found in objects, pictures, numbers, and tables. 2. Recognize and demonstrate the meaning of equality in an equation 3. Predict the likelihood of an outcome of a simple event and represent probability as a number between 0 and 1, inclusive.

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
						4. Create a model or practical problem to represent a given probability.
	Integrated in the unit?	No				Yes
PYP4 How We Organize Ourselves	Concept	Function				
	Lines of Inquiry	Function has a purpose Function is the way things work.				
	Skills	1. Read, write, represent, compare and identify decimals expressed through tenths 2. Round decimals the nearest whole number and tenth, 3. Add and subtract with decimals. 4. Solve single step and multistep practical				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		problems involving addition and subtraction with decimals.				
	Integrated in the unit?	No				
PYP4 Sharing the Planet	Concept		Change	Change		
	Lines of Inquiry		Change can be manmade	Change happens for a reason		
	Skills		1. Collect, organize, represent, and interpret data in bar graphs and line graphs. 2. Compare two different representations of the same data (chart/line, chart/graph, etc.)	1. Estimate and measure weight/mass and describe the results in metric units. 2. Estimate and measure length and describe the results in the metric system. 3. Estimate and measure liquid volume and describe results in the metric system. 4. Identify equivalent measurements		

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
				of one unit, identify equivalent measures of length, weight/mass, and liquid volume in the metric system. 5. Determine elapsed time in hours and minutes with a 12 -hour period.		
	Integrated in the unit?		Yes	Yes?		
PYP4 Where We Are in Place and Time	Concept				Space	
	Lines of Inquiry				Position, shape, and direction of objects visualize the structure of space	
	Skills				1. Identify and describe representations of points, lines, line segments, rays, and angles, including	

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
					endpoints and vertices 2. Identify representations of lines that illustrate intersection, parallelism, and perpendicularity 3. Sort, describe and model regular and irregular polygons. 4. Identify, describe, compare, and contrast plane and solid figures according to their characteristics (number of angles, vertices, edges, and the number and shape of faces) using concrete models and pictorial	

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
					representations 5. Classify quadrilaterals as parallelograms, rectangles, squares, rhombi, and/or trapezoids 6. Solve practical problems that involve determining perimeter and area in metric units.	
	Integrated in the unit?				No	
PYP4 Who We Are	Concept	Value				
	Lines of Inquiry	Value can be determined by place or position				
	Skills	1. Compare and order fractions. 2. Add and subtract fractions having like				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		and unlike denominators 3. Determine common multiples and factors, including least common multiple and greatest common factor. 4. Solve single-step and multistep practical problems involving addition and subtraction with fractions				
	Integrated in the unit?	No				
PYP5 How the World Works	Concept			Change Connection		Variable
	Lines of Inquiry			Change can occur in patterns and cycles Change can be measured		Variable can change outcome

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
				Connections between parts and systems can identified and described.		
	Skills			1. Identify and describe the diameter, radius, chord, and circumference of a circle. 2. Determine an amount of elapsed time in hours and minutes with in a 24-hour periods 3. Measure right, acute, obtuse, and straight angles		1. Describe the relationship found in a number pattern and express the relationship. 2. Investigate and describe the concept of variable 3. Write an open sentence to represent a given mathematical relationship, using a variable 4. Model one-step linear equations in one variable, using addition and subtraction 5. Create a problem situation based on a given open sentence, using a single variable

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	Integrated in the unit?			Yes		No
PYP5 How We Express Ourselves	Concept	Equations				
	Lines of Inquiry	Equations are true when the values of the variable are equal				
	Skills	1. Create and solve single-step and multistep practical problems involving multiplication and division with and without remainders of whole numbers. 2. Find the product and quotient of two numbers expressed as decimals through thousandths (divisors with				

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		only one nonzero digit) 3. Create and solve single-step and multistep practical problems involving decimals.				
	Integrated in the unit?	No				
PYP5 How We Organize Ourselves	Concept	Structure				Structure
	Lines of Inquiry	Structure varies based upon its intended problem-solving task				Structure has intended outcomes
	Skills	1. The student will create and solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division with and without remai				1. Student will evaluate whole numerical expressions, using the order of operations limited to parentheses, addition, subtraction, multiplication and division

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		nders of whole numbers. 2. Student will create and solve single-step and multistep practical problems involving addition and subtraction with and without remainders of whole numbers 3. Student will recognize and name fraction in their equivalent decimal form and vice versa and compare and order fractions and decimals in a given set from least to greatest and greatest to least.				

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	Integrated in the unit?	Yes				Yes
PYP5 Sharing the Planet	Concept		Data			
	Lines of Inquiry		Data represents findings Data can occur in patterns Data can be organized based on characteristics			
	Skills		1. The student will make predictions and determine the probability of an outcome by constructing a sample space. 2. The student, given a problem situation, will collect, organize, and interpret data in a variety of forms, using stem-and-leaf plots and line graphs. 3. The student will a) describe mean, median, and			

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
			mode as measures of center; b) describe mean as fair share; c) find the mean, median, mode, and range of a set of data; and d) describe the range of a set of data as a measure of variation.			
	Integrated in the unit?		Yes			
PYP5 Where We Are in Place and Time	Concept				Space	
	Lines of Inquiry				Position, shape, and direction of objects visualize the structure of space	
	Skills				1. Find perimeter, area, and volume in standard units of measure; 2. Differentiate among perimeter,	

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
					area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation; 3. Identify equivalent measurements within the metric system; 4. Estimate and then measure to solve problems, using U.S. Customary and metric units 5. Choose an appropriate unit of measure for a given situation involving measurement using U.S. Customary and metric units.	

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
					6. Classify angles as right, acute, obtuse, or straight; and 7. Triangles as right, acute, obtuse, equilateral, scalene, or isosceles. 8. Using plane figures (square, rectangle, triangle, parallelogram, rhombus, and trapezoid), will 9. Develop definitions of these plane figures; Investigate and describe the results of combining and subdividing plane figures	
	Integrated in the unit?				No	
PYP5 Who We Are	Concept	Form				
	Lines of Inquiry	Form consists of individual parts				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		who value can be determined by place Form has characteristics that can be described				
	Skills	1. Given a decimal through thousandths, will round to the nearest whole number, tenth, or hundredth. 2. Represent and identify equivalencies among decimals, with and without modes 3. Compare and order decimals in a given set from least to greatest and greatest to least 4. Identify and describe the characteristics of prime and				

Units	Curriculum	Number	Data Handling	Measurement	Shape & Space	Pattern & Function
		composite numbers 5. Identify and describe the characteristics of even and odd numbers.				
	Integrated in the unit?	Yes				