OVERVIEW

A quick view of the K-12 Cross Curricular Literacy Learning Progressions with a **GRADE SPECIFIC** focus

They highlight what a thinking or communication skill may look like for a proficient student across all learning areas, emphasizing their **CROSS-CURRICULAR** nature.

Each ASPECT represents a set of transferrable		NUMERACY LEAR	RNING PROGRESSIONS – GRADE 1 PROFICIENCY DE	ESCR	
thinking or communication skills	→ Aspect	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be			
A proficient student must	→ Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem		
develop, practice, and demonstrate each aspect to become a Literate	Descriptor	Makes personal connections with aspects of the problem	Identifies a significant fact and gathers other information from the problem	Ide pro	
Learner	-	personal connections: experiences and prior knowledge		par	
All aspects are important when building Literacy	Aspect	Applies – The student applies mathematical vocabulary, tools, and symbols and develops a plan of approach to solve the pro-			
skills	Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols		
Each SUB-ASPECT further defines the transferrable skills within each aspect	Descriptor	Recognizes the mathematical competencies and content needed to solve the problem content: refer to <u>Math curriculum</u>	Represents the mathematical problem, using concrete materials and diagrams	Dev kno	
	Aspect	Solves – The student implements a plan to solve the mo	athematical problem and checks their solution		
The DESCRIPTOR is grade specific and describes what	Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Che	
proficient student learning looks like at the end of the year/term	Descriptor	Estimates the scope of the answer	Finds a solution, using play, concrete materials, or models	Со	
	Aspect	scope : e.g., range, size, shape, time	of their solution; evaluates alternative approaches and solutions,	and	
	Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Re	
	Descriptor	Identifies a reasonable solution in relation to the original problem/scenario	Identifies an alternative approach	Exp the	
	Aspest	Communicator . The student represents evolving an	approach: own approach, peer- or teacher-driven approach	ario	
	Aspect		d defends their approach and solution within the problem's scenc	ario	
	Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	Cle	
	Descriptor	Represents the problem-solving process, using words, numbers, pictures, symbols, and/or manipulatives	Outlines their problem-solving approach	Ou	

RIPTORS

Identifies parameters and limitations *Recognizes reasonable factors, conditions, limitations that define the problem*

dentifies a clearly defined **parameter** needed to solve the problem

parameter: factors and conditions that define the problem

Develops a plan of approach

Thinks of and outlines various approaches to solve a mathematical problem

Develops a straightforward plan of approach, using prior nowledge and mathematical tools and strategies

Verifies accuracy of the mathematical solution *Checks their solution based on similar problems, others' solutions, or their estimate*

Compares their solution with those of their teacher and/or peers

Revises approach as needed Revises their approach based on checking with others' solution and/or approach

Experiments with a recommended alternative approach to solve he problem

Defends decisions and assumptions

Clearly justifies and defends the decisions and assumptions made in their approach and/or solution

Outlines one problem- solving decision



Sub-Aspect – the skills that support the development of the Aspect

	NUMERACY LEARNIN	NG PROGRESSIONS – KINDERGARTEN PROFICIENC	(DESCRIPTORS		
Aspect	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved				
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Identifies parameters and limitations Recognizes reasonable factors, conditions, limitations that define the problem		
Descriptor	Makes a personal connection with one aspect of the problem	Identifies a significant fact about the problem	Understands that problems have parameters		
	personal connection: experiences and prior knowledge		parameters: factors and conditions that define the problem		
Aspect	Applies – The student applies mathematical vocabulary	r, tools, and symbols and develops a plan of approach to solve th	e problem		
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Develops a plan of approach Thinks of and outlines various approaches to solve a mathematical problem		
Descriptor	Recognizes the mathematical competencies and content needed to solve the problem	Represents the mathematical problem, using concrete materials and/or pictures	Experiments with problem solving using prior knowledge		
	content: refer to <u>Math</u> <u>curriculum</u>				
Aspect	Solves – The student implements a plan to solve the mathematical problem and checks their solution				
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies accuracy of the mathematical solution Checks their solution based on similar problems, others' solutions, or their estimate		
Descriptor	Estimates the scope of the answer	Finds a solution, using play, concrete materials, or models	Compares their solution with those of their teacher and/or peers		
Aspect	scope: range, size, shape, time Analyzes – <i>The student reflects on the reasonableness</i>	of their solution; evaluates alternative approaches and solutions,	and revises approach		
	Reflects on the reasonableness of the solution in context				
Sub-Aspect	Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises approach as needed Revises their approach based on checking with others' solution and/or approach		
Descriptor	Identifies a reasonable solution in relation to the original problem/scenario	Identifies an alternative approach	Experiments with a recommended alternative approach to solve the problem		
Aspect	Communicates – The student represents, explains, and	approach: own approach, peer- or teacher-driven approach d defends their approach and solution within the problem's scena	rio		
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	Defends decisions and assumptions Clearly justifies and defends the decisions and assumptions made in their approach and/or solution		
Descriptor	Represents the problem-solving process, using numbers, pictures, and/or manipulatives	Identifies one step of their problem-solving approach	Identifies one problem-solving decision		



Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.





Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

Aspect	Interprets – The student accesses and identifies releval	nt information in order to understand the real-world problem to i	he solved	
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Iden Recognizes reasonab	
Descriptor	Makes personal connections with aspects of the problem	Identifies a significant fact and gathers other information from the problem	Identifies a clearly problem	
	personal connections: experiences and prior knowledge		parameter: factors a	
Aspect	Applies – The student applies mathematical vocabulary	ν, tools, and symbols and develops a plan of approach to solve th	e problem	
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outline	
Descriptor	Recognizes the mathematical competencies and content needed to solve the problem	Represents the mathematical problem, using concrete materials and diagrams	Develops a straight knowledge and ma	
	content: refer to <u>Math</u> <u>curriculum</u>			
Aspect	Solves – The student implements a plan to solve the ma	athematical problem and checks their solution		
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution ba	
Descriptor	Estimates the scope of the answer	Finds a solution, using play, concrete materials, or models	Compares their sol	
• ·	scope: e.g., range, size, shape, time		, .	
Aspect	Analyzes – The student reflects on the reasonableness of	of their solution; evaluates alternative approaches and solutions,	and revises approact	
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approach	
Descriptor	Identifies a reasonable solution in relation to the original problem/scenario	Identifies an alternative approach	Experiments with a the problem	
	Commence The student way was not a surface and	approach: own approach, peer- or teacher-driven approach		
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario			
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	Def Clearly justifies and defe	
Descriptor	Represents the problem-solving process, using words, numbers, pictures, symbols, and/or manipulatives	Outlines their problem-solving approach	Outlines one proble	



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Develops a plan of approach *lines various approaches to solve a mathematical problem*

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solution with those of their teacher and/or peers

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Revises approach as needed ach based on checking with others' solution and/or approach

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Defends decisions and assumptions

defends the decisions and assumptions made in their approach and/or solution

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Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

Aspect	Interprets – The student accesses and identifies releva	nt information in order to understand the real-world problem to	be solved		
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Iden Recognizes reasonab		
Descriptor	Makes personal connections to explore the problem personal connection: experiences and prior knowledge	Identifies and gathers most of the significant information from the presented problem to assist in solving it	Identifies some of t solve the problem parameters: factors		
Aspect	Applies – The student applies mathematical vocabulary	y, tools, and symbols and develops a plan of approach to solve th	e problem		
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outline		
Descriptor	Identifies the mathematical competencies and content needed to solve the problem	Represents the mathematical problem, using concrete materials and diagrams	Develops a basic pl tools and/or strateg		
	content: refer to <u>Math</u> <u>curriculum</u>		basic: could be one si familiar: previously s		
Aspect	Solves – The student implements a plan to solve the mo	athematical problem and checks their solution			
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution ba		
Descriptor	Estimates reasonably within known parameters, using benchmarks benchmarks : e.g., 25, 50, 100, distance, rhythm, pattern	Finds a solution, using mathematical tools and/or strategies strategies: e.g., play, concrete materials, models	Verifies the accurac variety of proofs/ch		
Aspect		of their solution; evaluates alternative approaches and solutions,	and revises approact		
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approach		
Descriptor	Reflects on the reasonableness of a solution in relation to the original problem/scenario	Explores an alternative approach approach: own approach, peer- or teacher-driven approach	Selects an alternati		
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario				
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	Def Clearly justifies and defe		
Descriptor	Represents the problem-solving process, using familiar tools familiar tools: e.g., manipulatives, symbols, graphic organizers, charts	Outlines their problem-solving approach, using familiar mathematical language mathematical language: refer to <u>Math curriculum</u>	Describes one prob		



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Develops a plan of approach

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es accuracy of the mathematical solution n based on similar problems, others' solutions, or their estimate

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Revises approach as needed ach based on checking with others' solution and/or approach

native approach to solve the problem

Defends decisions and assumptions defends the decisions and assumptions made in their approach and/or solution

roblem-solving decision and a supporting reason



Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

		RNING PROGRESSIONS – GRADE 3 PROFICIENCY DE	SCRIPTORS		
Aspect	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved				
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Iden Recognizes reasonab		
Descriptor	Makes personal connections to explore the problem personal connections: experiences and prior knowledge	Identifies and gathers most of the significant information from the presented problem to assist in solving it	Identifies most of t solve the problem parameters: factors		
Aspect		y, tools, and symbols and develops a plan of approach to solve th			
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outline		
Descriptor	Identifies the mathematical competencies and content needed to solve the problem	Represents the mathematical problem, using concrete materials, diagrams, and/or some familiar equations	Develops a basic pl tools and/or strateg		
	content: refer to <u>Math</u> <u>curriculum</u>	familiar equations: previously seen or modelled e.g., 2 digit addition	basic: could be one st		
Aspect	Solves – The student implements a plan to solve the mathematical problem and checks their solution				
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution ba		
Descriptor	Estimates reasonably within identified parameters, using benchmarks and information from the scenario	Finds a solution by applying familiar mathematical tools and/or strategies	Verifies the accurat strategies and/or b		
	benchmarks: e.g., up to 1000, distance, rhythm, pattern	strategies: e.g., play, concrete materials, models			
Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approact		
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approach		
Descriptor	Reflects on the reasonableness of a solution in relation to the original problem/scenario	Explores alternative approaches approach: own approach, peer- or teacher-driven approach	Selects an alternati		
Aspect	Communicates – The student represents, explains, an	d defends their approach and solution within the problem's scenc	nrio		
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	Def Clearly justifies and defe		
Descriptor	Represents processes and solution by selecting and using reasonable tools tools: e.g., table, manipulative, graphic organizer, array, model	Describes their problem-solving approach, using familiar mathematical language	Describes their pro reasons		



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Revises approach as needed

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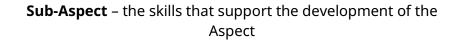
native approach to solve the problem

Defends decisions and assumptions

defends the decisions and assumptions made in their approach and/or solution

problem-solving decisions and supporting





Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

	NUMERACY LEAF	RNING PROGRESSIONS – GRADE 4 PROFICIENCY DE	SCRIPTORS		
Aspect	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved				
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Ident Recognizes reasonable		
Descriptor	Makes general connections to understand the problem in context general connection: personal, or to similar problems	Gathers relevant information from the presented problem to assist in solving it	Identifies all clearly problem parameters: factors a		
Aspect	Applies – The student applies mathematical vocabulary	y, tools, and symbols and develops a plan of approach to solve th	e problem		
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	D Thinks of and outlines		
Descriptor	Applies the mathematical understanding needed to partially translate a familiar scenario into a mathematical problem	Represents the mathematical problem, using concrete materials, diagrams, and/or some familiar equations	Develops a sequence tools and/or strateg		
Aspect	mathematical understanding: refer to Math curriculum familiar: previously seen or modelled such as using an array Solves – The student implements a plan to solve the mathematical problem and checks their solution Familiar: previously seen or modelled such as using an array				
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies ac Checks their solution bas		
Descriptor	 Estimates reasonably within identified parameters, using benchmarks and relevant information from the scenario benchmarks: up to 10 000, fractions, decimals, distance, colour, rhythm, pattern 	Finds a solution by applying familiar mathematical tools and/or strategies strategies: e.g., equations, play, concrete materials, models	Verifies the accuracy and other familiar n		
Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approach		
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	R Revises their approach b		
Descriptor	Reflects on the reasonableness of a solution in relation to the original problem/scenario	Compares and contrasts alternative approaches approaches: own approach, peer- or teacher-driven approach	Identifies and exper the problem		
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario				
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	Defe Clearly justifies and defe		
Descriptor	Represents processes and solution by selecting and using reasonable tools tools: e.g., model, chart, map, table, graph, array	Describes their problem-solving approach, using familiar mathematical language mathematical language: refer to <u>Math curriculum</u>	Explains their proble		



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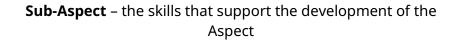
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blem-solving decisions and supporting reasons





Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

NUMERACY LEARNING PROGRESSIONS – GRADE 5 PROFICIENCY DESCRIPTORS					
Aspect	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved				
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Iden Recognizes reasonabl		
Descriptor	Makes general connections to understand the problem in context general connections: personal, or to similar problems	Gathers relevant information from the presented problem to assist in solving it	Identifies all clearly problem parameters: factors a		
Aspect	Applies – The student applies mathematical vocabulary	، tools, and symbols and develops a plan of approach to solve th	e problem		
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	I Thinks of and outline		
Descriptor	Applies the mathematical understanding needed to partially translate a familiar scenario into a mathematical problem mathematical understanding: refer to <u>Math curriculum</u>	Represents the mathematical problem, using concrete materials, diagrams, and/or equations	Develops a logical s mathematical tools familiar: previously se		
Aspect	Solves – The student implements a plan to solve the mathematical problem and checks their solution				
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution bas		
Descriptor	Estimates reasonably within identified parameters, using benchmarks and relevant information from the scenario benchmarks: e.g., up to 1 000 000, fractions, decimals, distance, colour, rhythm, pattern	Finds a solution by applying familiar mathematical tools and/or strategies strategies: e.g., equations, play, concrete materials, models	Verifies the accurac and other familiar r		
Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approach		
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	F Revises their approach		
Descriptor	Reflects on the reasonableness of a solution in relation to the original problem/scenario	Compares and contrasts alternative approaches approaches: own approach, peer- or teacher-driven approach	Identifies and expe the problem		
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario				
Sub-Aspect	Represents processes and solution <i>Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols</i>	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	Def Clearly justifies and defe		
Descriptor	Represents processes and solution by selecting and using reasonable tools reasonable tools: e.g., model, map, table, graph, array	Describes their problem-solving approach, using familiar mathematical language mathematical language: refer to <u>Math curriculum</u>	Explains their probl		



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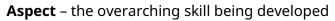
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Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

Aspo <u>st</u>	Interprets The student accesses and identifies relevant information in order to understand the real world problem to be solved			
Aspect	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved			
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Iden Recognizes reasonab	
Descriptor	Makes relevant connections to understand a real-world problem	Extracts relevant information from the presented problem as needed to solve it	Identifies only rele the problem	
. <u></u>	real-world problem: contextual, relevant, related to current learning, personally/locally/globally meaningful		parameters: factors	
Aspect	Applies – The student applies mathematical vocabulary	y, tools, and symbols and develops a plan of approach to solve the	e problem	
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outline	
Descriptor	Applies the mathematical understanding needed to translate a familiar scenario into a mathematical problem	Accurately represents the mathematical problem, using a variety of models	Develops an organi applies appropriat	
	mathematical understanding: refer to Math curriculum	models: e.g., concrete materials, diagrams, equations	appropriate: refer to	
Aspect	Solves – The student implements a plan to solve the mo	athematical problem and checks their solution		
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution bo	
Descriptor	Estimates reasonably within the context and parameters of the scenario, using benchmarks	Finds a solution, using appropriate strategies	Verifies the accurative reasonable estimation	
	benchmarks: e.g., thousandths to billions, fractions, decimals, area, rhythm, pattern	strategies: e.g., using a tool (calculator), picture, graph, equations, concrete materials, and/or models	familiar strategies: calculator	
Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approac	
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approach	
	Reflects on the reasonableness of their solution within the context of the problem	Describes the benefits and limitations of alternative approaches	Refines approach, alternative approac	
Descriptor	reasonableness: rationality, practicality context of the problem: e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback	approaches: own approach, peer- or teacher-driven approach	refines: improves th	



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through small changes





Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario				
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	De Clearly justifies and de		
Descriptor	Represents the complete process and solution by selecting and using appropriate tools	Accurately explains their problem-solving approach	Presents a rationa assumptions		
•	appropriate tools: e.g., model, chart, map, table, graph, array	approach: e.g., process: making a model; tool: manipulatives; strategy: using an equation			



Defends decisions and assumptions

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nale for their problem- solving decisions and





Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

	NUMERACY LEAF	RNING PROGRESSIONS – GRADE 7 PROFICIENCY DE	SCRIPTORS
Aspect	Interprets – The student accesses and identifies releva	nt information in order to understand the real-world problem to l	be solved
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Iden Recognizes reasonab
Descriptor	Makes relevant connections to understand a real-world problem	Extracts relevant information from the presented problem as needed to solve it	Identifies only relevent the problem
	real-world problem: contextual, relevant, related to current learning, personally/locally/globally meaningful		parameters: factors
Aspect	Applies – The student applies mathematical vocabulary	y, tools, and symbols and develops a plan of approach to solve the	e problem
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outline
Descriptor	Applies the mathematical understanding needed to translate a familiar scenario into a mathematical problem	Accurately represents the mathematical problem, using a variety of models	Develops a logical a mathematical tools
	mathematical understanding: refer to Math curriculum	models: e.g., concrete materials, diagrams, equations	appropriate: refer to strategies: e.g., usin
Aspect	Solves – The student implements a plan to solve the mo	athematical problem and checks their solution	
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution bo
Descriptor	Estimates reasonably within the context and parameters of the scenario, using benchmarks	Finds a solution, using appropriate strategies	Verifies the accuration verifies the accuration vertices the second seco
Descriptor	benchmarks: e.g., thousandths to billions, fractions, decimals, area, rhythm, pattern	strategies: e.g., using a tool (calculator), picture, graph, equations, concrete materials, and/or models	familiar: previously alternate algorithm,
Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approac
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approach
	Reflects on the reasonableness of their solution within the context of the problem	Describes the benefits and limitations of alternative approaches	Refines approach, alternative approa
Descriptor	reasonableness: rationality, practicality context of the problem: e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback	approaches: own approach, peer- or teacher-driven approach	refines: improves th



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Develops a plan of approach *tlines various approaches to solve a mathematical problem*

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r to <u>Math curriculum</u> sing a tool (calculator), picture, graph, equation

es accuracy of the mathematical solution n based on similar problems, others' solutions, or their estimate

rracy of their results and/or solution, using nates and other **familiar strategies**

sly seen or modelled e.g., using a tool [calculator], m, picture, graph

bach

Revises approach as needed ach based on checking with others' solution and/or approach

ch, using the benefits and limitations of oaches to solving the problem

through small changes





Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario			
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	D Clearly justifies and d	
Descriptor	Represents the complete process and solution by selecting and using appropriate tools	Accurately explains their problem-solving approach	Presents a rationa assumptions	
	appropriate tools: model, chart, map, table, graph, array, equation	approach: e.g. process: making a model; tool: calculator; strategy: using an equation		



Defends decisions and assumptions

defends the decisions and assumptions made in their approach and/or solution

nale for their problem- solving decisions and





Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

	NUMERACY LEAF	RNING PROGRESSIONS – GRADE 8 PROFICIENCY DE	SCRIPTORS		
Aspect	Interprets – The student accesses and identifies releva	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved			
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Iden Recognizes reasonab		
	Makes relevant connections to fully understand the real- world problem in context	Extracts relevant information from the presented problem and other resources as needed to solve the problem	Identifies relevant needed to solve the		
Descriptor	real-world problem: contextual, relevant, related to current learning, personally/locally/globally meaningful		parameters: factors limitations: reasona context		
Aspect	Applies – The student applies mathematical vocabulary, tools, and symbols and develops a plan of approach to solve the problem				
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outline		
Descriptor	Applies the mathematical understanding needed to translate an unfamiliar scenario into a mathematical problem	Clearly represents the mathematical problem by choosing an appropriate model(s)	Uses mathematical plan that applies ap strategies		
	mathematical understanding: refer to <u>Math curriculum</u> unfamiliar scenario: previously unseen or unmodelled	appropriate: refer to <u>Math curriculum</u> models: e.g., concrete materials, diagrams, equations	appropriate: refer to strategies: e.g., using		
Aspect	Solves – The student implements a plan to solve the mo	athematical problem and checks their solution			
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution ba		
Descriptor	Estimates reasonably within the context and parameters of the scenario, using appropriate benchmarks	Solves the mathematical problem, using effective strategies as needed	Verifies the accurate reasonable estimate factors that could a		
Descriptor	benchmarks: e.g., perfect squares, volume; Arts: rhythm, pattern; Science: trend, frequency; Language Arts: pattern; ADST: area, volume, materials needed	strategies: e.g., using a tool (calculator), picture, graph, equations, concrete materials, and/or models	familiar strategies: [calculator], alternate		



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Develops a plan of approach *tlines various approaches to solve a mathematical problem*

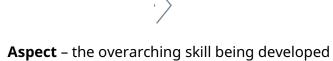
cal reasoning to develop a logical and organized appropriate mathematical tools and/or

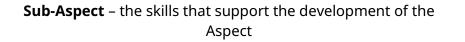
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iracy of their results and/or solution, using nates and other **familiar strategies**; identifies ld affect accuracy of results

es: previously seen or modelled (e.g., using a tool nate algorithm, picture, graph)





Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approac
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approach
	Reflects on the validity of their solution within the context of the problem	Evaluates the benefits and limitations of alternative approaches	Revises approach, alternative approa
Descriptor	validity: accuracy in context context of the problem: e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback	approaches: own approach, peer- or teacher-driven approach	revises: reflects and
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario		
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	De Clearly justifies and defe and/or solution
Docarintor	Effectively represents the complete process and solution, using appropriate presentations	Accurately explains their problem-solving approach , identifying its limitations and assumptions	Presents a logical a assumptions
Descriptor	appropriate presentations: e.g., bulleted explanation, equation, graph, model, map, table, array	approach: e.g., process: making a diagram; tool: calculator; strategy: using an equation	



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Revises approach as needed

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Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

	NUMERACY LEAF	RNING PROGRESSIONS – GRADE 9 PROFICIENCY DE	SCRIPTORS	
Aspect	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved			
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Ider Recognizes reasonat	
	Makes relevant connections to fully understand the real- world problem in context	Extracts relevant information from the presented problem and other resources as needed to solve the problem	Identifies relevant needed to solve th	
Descriptor	real-world problem: contextual, relevant, related to current learning, personally/locally/globally meaningful		parameters: factors limitations: reasona context	
Aspect				
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outline	
Descriptor	Applies the mathematical understanding needed to translate an unfamiliar scenario into a mathematical problem	Clearly represents the mathematical problem by choosing an appropriate model(s)	Uses mathematical plan that applies a strategies	
	mathematical understanding: refer to <u>Math curriculum</u> unfamiliar scenario: previously unseen or unmodelled	appropriate: refer to <u>Math curriculum</u> models: e.g., concrete materials, diagrams, equations	appropriate: refer to strategies: e.g., usin	
Aspect	Solves – The student implements a plan to solve the mo	athematical problem and checks their solution		
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution bo	
Descriptor	Estimates reasonably within the context and parameters of the scenario, using appropriate benchmarks	Solves the mathematical problem, using effective strategies as needed	Verifies the accurative reasonable estimation factors that could a	
Descriptor	benchmarks: e.g., perfect squares, volume; Arts: rhythm, pattern; Science: trend, frequency; Language Arts: pattern; ADST: area, volume, materials needed	strategies: e.g., using a tool (calculator), picture, graph, equations, concrete materials, and/or models	familiar strategies: [calculator], alternate	



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Develops a plan of approach *tlines various approaches to solve a mathematical problem*

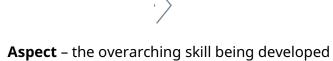
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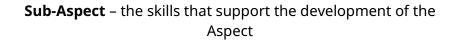
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iracy of their results and/or solution, using nates and other **familiar strategies**; identifies ld affect accuracy of results

es: previously seen or modelled e.g., using a tool nate algorithm, picture, graph





Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approa
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approac
	Reflects on the validity of their solution within the context of the problem	Evaluates the benefits and limitations of alternative approaches	Revises approach approaches to sol
Descriptor	validity: accuracy in context context of the problem: e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback	approaches: own approach, peer- or teacher-driven approach, comparison with research- based approaches	revises: reflects and
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario		
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	De Clearly justifies and def and/or solution
	Effectively represents the complete process and solution, using appropriate presentations	Accurately explains their problem-solving approach , identifying its limitations and assumptions	Presents a logical assumptions
Descriptor	appropriate presentations: e.g., bulleted explanation, equation, graph, model, map, table, array	approach: e.g., process: making a diagram; tool: calculator; strategy: using an equation	



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Revises approach as needed

bach based on checking with others' solution and/or approach

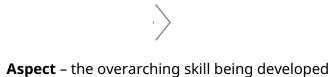
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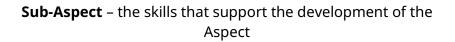
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Defends decisions and assumptions

defends the decisions and assumptions made in their approach

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Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

	NUMERACY LEAR	NING PROGRESSIONS – GRADE 10 PROFICIENCY DI	ESCRIPTORS	
Aspect Interprets – The student accesses and identifies relevant information in order to understand the real-world problem			be solved	
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Ider Recognizes reasonab	
Descriptor	Makes connections necessary to understand the context and implications of the real-world problem	Extracts and organizes relevant information from the presented problem and a variety of other external resources to solve the problem	Identifies relevant limitations neede	
	real-world problem: contextual, relevant, related to current learning, personally/locally/globally meaningful		parameters: factors limitations: reasona context	
Aspect	Applies – The student applies mathematical vocabulary, tools, and symbols and develops a plan of approach to solve the problem			
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outlin	
Descriptor	Applies the mathematical understanding needed to translate an unfamiliar scenario into a mathematical problem	Clearly and accurately represents the problem by strategically choosing an effective model(s)	Uses mathematical effective plan that a and/or strategies	
Descriptor	mathematical understanding: refer to <u>Math curriculum</u> unfamiliar scenario: previously unseen or unmodelled	models: e.g., concrete materials, diagrams, equations	appropriate mather strategies: e.g., usin Social Studies/Scienc	
Aspect	Solves – The student implements a plan to solve the mathematical problem and checks their solution			
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution bo	
	Estimates reasonably in context, within parameters, and considering limitations	Solves the mathematical problem by following a logical plan and using efficient strategies as needed	Verifies the accura reasonable estima	
Descriptor		and using endent strategies as needed	how factors affect	
		strategies: e.g., using a tool (calculator), algorithm, picture, graph; Social Studies/Science: evidence from text	familiar strategies: [calculator], alternate	



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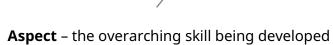
cal reasoning to develop a logical, organized, and at applies **appropriate mathematical tools** es

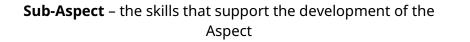
hematical tools: refer to <u>Math curriculum</u> sing a tool (calculator), algorithm, picture, graph; ence: evidence from text

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iracy of their results and/or solution, using nates and other **familiar strategies**; describes ect accuracy of results

es: previously seen or modelled (e.g., using a tool nate algorithm, picture, graph)





Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approac
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approach
	Reflects on the validity of their solution , identifying contextual factors that may affect their answer	Evaluates the efficiency and effectiveness of alternative approaches	Revises approach, alternative approa problem
Descriptor	validity: accuracy in context solution: e.g., lab results, map, product, model contextual factors: e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback	approaches: own approach, peer- or teacher-driven approach, comparison with research- based approaches	' revises: reflects and
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario		
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	De Clearly justifies and defe and/or solution
Descriptor	Represents complex processes and solutions, using a variety of presentations in a manner that is suitable to the context	Explains their problem-solving approach , describing any limitations and assumptions	Presents a valid, lo the selected appro of these choices
	presentations: e.g., bulleted explanation, equation, graph, model, map, table, diagram	approach: e.g., process: making a flowchart; tool: calculator; strategy: using a familiar algorithm or evidence from text	



Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

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Revises approach as needed

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Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

	NUMERACY LEAR	NING PROGRESSIONS – GRADE 11 PROFICIENCY D	ESCRIPTORS	
Aspect	Interprets – The student accesses and identifies releva	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved		
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Ider Recognizes reasonal	
Descriptor	Makes connections necessary to investigate and understand new contexts and implications of real-world problems	Extracts and organizes relevant information from the presented problem and a variety of other external resources to solve the problem	Identifies explicit a needed to solve th	
	real-world problem: contextual, relevant, related to current learning, personally/locally/globally meaningful		parameters: factors limitations: reasona context	
Aspect	Applies – The student applies mathematical vocabulary	y, tools, and symbols and develops a plan of approach to solve th	e problem	
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outlin	
Descriptor	Applies the mathematical understanding needed to translate a complex, unfamiliar scenario into a mathematical problem	Clearly and accurately represents the problem in context by strategically choosing an effective model(s)	Uses mathematical effective multi-step tools and/or strate	
	mathematical understanding: refer to <u>Math curriculum</u> unfamiliar scenario: previously unseen or unmodelled	models: e.g., concrete materials, diagrams, equations	appropriate mather strategies: e.g., usin Social Studies/Scienc	
Aspect	Solves – The student implements a plan to solve the mathematical problem and checks their solution			
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution be	
Descriptor	Estimates reasonably in context, within parameters, and considering limitations; explains reasoning for estimate	Solves the mathematical problem by following a logical, multi- step plan and using efficient strategies as needed	Verifies the accura reasonable estima and evaluates how	
		strategies: e.g., using a tool (calculator), algorithm, picture, graph; Social Studies/Science: evidence from text	familiar strategies: [calculator], alternat	



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Develops a plan of approach *tlines various approaches to solve a mathematical problem*

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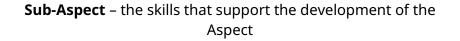
hematical tools: refer to <u>Math curriculum</u> sing a tool (calculator), algorithm, picture, graph; ence: evidence from text

es accuracy of the mathematical solution n based on similar problems, others' solutions, or their estimate

iracy of their results and/or solution, using nates and other **familiar strategies**; compares ow factors affect accuracy of results

es: previously seen or modelled (e.g., using a tool nate algorithm, picture, graph)





Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approa
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approact
	Reflects on the validity and reliability of their processes and solutions and describes how contextual factors may affect their answer	Evaluates the efficiency and effectiveness of alternative approaches and possible improvements	Redesigns approa of solution to the
Descriptor	validity: accuracy in context reliability: reproducibility of results contextual factors: e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback	approaches: own approach, peer- or teacher-driven approach, comparison with research- based approaches	redesigns: iterativel
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario		
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	De Clearly justifies and defe and/or solution
	Represents complex processes and solutions; chooses a presentation that suits the purpose, context, and audience	Explains their problem-solving approach accurately and in detail, evaluating the effect of any assumptions or limitations	Presents a valid, lo the selected appro their choices
Descriptor	presentation: e.g., proof, model, equation, graph, model, map, table, diagram	approach: e.g., process: making a flowchart; tool: calculator; strategy: using an algorithm or evidence from text evaluating: assessing the implications	evaluating: assessi



Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

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Revises approach as needed

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Sub-Aspect – the skills that support the development of the Aspect

Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

	NUMERACY LEAR	NING PROGRESSIONS – GRADE 12 PROFICIENCY D	ESCRIPTORS	
Aspect	Interprets – The student accesses and identifies releva	Interprets – The student accesses and identifies relevant information in order to understand the real-world problem to be solved		
Sub-Aspect	Understands the real-world problem Makes connections to a problem to aid understanding	Extracts relevant information Extracts key information, data, facts in order to solve a problem	Ider Recognizes reasonal	
Descriptor	Makes connections necessary to investigate and understand new contexts and implications of real-world problems	Extracts and organizes relevant information from the presented problem and a variety of other external resources to solve the problem	Identifies explicit a needed to solve th	
	real-world problem: contextual, relevant, related to current learning, personally/locally/globally meaningful		parameters: factors limitations: reasona context	
Aspect	Applies – The student applies mathematical vocabulary	y, tools, and symbols and develops a plan of approach to solve th	e problem	
Sub-Aspect	Translates the scenario into a mathematical problem (mathematizes) Translate a scenario into a problem using mathematical vocabulary	Represents the mathematical problem (visualizes) Visually represents a problem with mathematical tools, visual representations, or mathematical symbols	Thinks of and outline	
D	Applies the mathematical understanding needed to translate a complex, unfamiliar scenario into a mathematical problem	Clearly and accurately represents the problem in context by strategically choosing an effective model(s)	Uses mathematical effective multi-step tools and/or strate	
Descriptor	mathematical understanding: refer to <u>Math curriculum</u> unfamiliar scenario: previously unseen or unmodelled	models: e.g., concrete materials, diagrams, equations	appropriate mather strategies: e.g., usin Social Studies/Science	
Aspect	Solves – The student implements a plan to solve the mathematical problem and checks their solution			
Sub-Aspect	Estimates reasonably in context Uses the information provided to support a best guess solution	Solves the mathematical problem Uses various approaches to find a solution to the problem	Verifies a Checks their solution bo	
Descriptor	Estimates reasonably in context, within parameters, and considering limitations; explains reasoning for estimate	Solves the mathematical problem by following a logical, multi- step plan and using efficient strategies as needed	Verifies the accurative reasonable estimation and evaluates how	
		strategies: e.g., using a tool (calculator), algorithm, picture, graph; Social Studies/Science: evidence from text	familiar strategies: [calculator], alternate	



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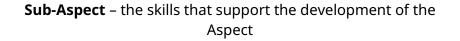
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es accuracy of the mathematical solution n based on similar problems, others' solutions, or their estimate

iracy of their results and/or solution, using nates and other **familiar strategies**; compares ow factors affect accuracy of results

es: previously seen or modelled (e.g., using a tool nate algorithm, picture, graph)





Aspect	Analyzes – The student reflects on the reasonableness	of their solution; evaluates alternative approaches and solutions,	and revises approa
Sub-Aspect	Reflects on the reasonableness of the solution in context Looks back on the reasonableness of the solution within the context of the problem (Does this make sense?)	Evaluates alternative approaches Checks on the reasonableness of others' approaches to solve the problem	Revises their approact
	Reflects on the validity and reliability of their processes and solutions and describes how contextual factors may affect their answer	Evaluates the efficiency and effectiveness of alternative approaches and possible improvements	Redesigns approa of solution to the
Descriptor	validity: accuracy in context reliability: reproducibility of results contextual factors: e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback	approaches: own approach, peer- or teacher-driven approach, comparison with research- based approaches	redesigns: iterativel
Aspect	Communicates – The student represents, explains, and defends their approach and solution within the problem's scenario		
Sub-Aspect	Represents processes and solution Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols	Explains the approach taken Clearly explains their problem-solving approach and solution with mathematical vocabulary	De Clearly justifies and defe and/or solution
	Represents complex processes and solutions; chooses a presentation that suits the purpose, context, and audience	Explains their problem-solving approach accurately and in detail, evaluating the effect of any assumptions or limitations	Presents a valid, lo the selected appro their choices
Descriptor	presentation: e.g., proof, model, equation, graph, model, map, table, diagram	approach: e.g., process: making a flowchart; tool: calculator; strategy: using an algorithm or evidence from text evaluating: assessing the implications	evaluating: assessi



Descriptor – defines what a proficient understanding or display of the skill looks like at that grade level.

bach

Revises approach as needed

bach based on checking with others' solution and/or approach

roach to improve efficiency of process or accuracy e problem

vely reflects and adjusts

Defends decisions and assumptions defends the decisions and assumptions made in their approach

, logical argument to justify their decisions about proach, **evaluating** assumptions and the effects of

ssing the implications