CROSS-CURRICULAR NUMERACY LEARNING PROGRESSIONS – GRADE LEVEL PROFICIENCY DESCRIPTORS								
ASPECT	**SUB-ASPECT**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Interprets *Accesses and identifies relevant information in order to understand the real-world problem to be solved*	**Understands the real-world problem** *Makes connections to a problem to aid understanding*	Makes relevant connections to understand a real-world problem ***real-world problem:*** *contextual, relevant, related to current learning, personally/locally/globally meaningful*	Makes relevant connections to understand a real-world problem	Makes relevant connections to fully understand the real-world problem in context	Makes relevant connections to fully understand the real-world problem in context	Makes connections necessary to understand the context and implications of the real-world problem	Makes connections necessary to investigate and understand new contexts and implications of real-world problems	Makes connections necessary to investigate and understand new contexts and implications of real-world problems
	Extracts relevant information *Extracts key information, data, facts in order to solve a problem*	Extracts relevant information from the presented problem as needed to solve it	Extracts relevant information from the presented problem as needed to solve it	Extracts relevant information from the presented problem and other resources as needed to solve the problem	Extracts relevant information from the presented problem and other resources as needed to solve the problem	Extracts and organizes relevant information from the presented problem and a variety of other external resources to solve the problem	Extracts and organizes relevant information from the presented problem and a variety of other external resources to solve the problem	Extracts and organizes relevant information from the presented problem and a variety of other external resources to solve the problem
	Identifies parameters and limitations *Recognizes reasonable factors, conditions, limitations that define the problem*	Identifies only relevant explicit parameters needed to solve the problem ***parameters:*** *factors and conditions that define the problem*	Identifies only relevant explicit parameters needed to solve the problem	Identifies relevant explicit parameters and limitations needed to solve the problem ***limitations:*** *reasonable constraints in a real-world problem or context*	Identifies relevant explicit parameters and limitations needed to solve the problem	Identifies relevant explicit parameters and infers implicit limitations needed to solve the problem	Identifies explicit and implicit parameters and limitations needed to solve the problem	Identifies explicit and implicit parameters and limitations needed to solve the problem

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Applies *Applies mathematical vocabulary, tools, and symbols and develops a plan of approach to solve the problem*	**Translates the scenario into a mathematical problem (mathematizes)** *Translate a scenario into a problem using mathematical vocabulary*	Applies the mathematical understanding needed to translate a familiar scenario into a mathematical problem ***mathematical understanding:*** *refer to Math curriculum* ***familiar:*** *previously seen or modelled*	Applies the mathematical understanding needed to translate a familiar scenario into a mathematical problem ***mathematical understanding:*** *refer to Math curriculum*	Applies the mathematical understanding needed to translate an unfamiliar scenario into a mathematical problem ***mathematical understanding:*** *refer to Math curriculum* ***unfamiliar:*** *previously unseen or unmodelled*	Applies the mathematical understanding needed to translate an unfamiliar scenario into a mathematical problem ***mathematical understanding:*** *refer to Math curriculum*	Applies the mathematical understanding needed to translate an unfamiliar scenario into a mathematical problem ***mathematical understanding:*** *refer to Math curriculum*	Applies the mathematical understanding needed to translate a complex, unfamiliar scenario into a mathematical problem ***mathematical understanding:*** *refer to Math curriculum*	Applies the mathematical understanding needed to translate a complex, unfamiliar scenario into a mathematical problem ***mathematical understanding:*** *refer to Math curriculum*
	Represents the mathematical problem (visualizes) *Visually represents a problem with mathematical tools, visual representations, or mathematical symbols*	Accurately represents the mathematical problem, using a variety of models ***models:*** *e.g., concrete materials, diagrams, equations*	Accurately represents the mathematical problem, using a variety of models	Clearly represents the mathematical problem by choosing an appropriate model(s) ***clearly:*** *immediately demonstrating understanding* ***appropriate:*** *refer to Math curriculum*	Clearly represents the mathematical problem by choosing an appropriate model(s) ***appropriate:*** *refer to Math curriculum*	Clearly and accurately represents the problem by strategically choosing an effective model(s) ***effective:*** *fits the student's understanding and ability*	Clearly and accurately represents the problem in context by strategically choosing an effective model(s) ***in context:*** *the representation is appropriate to the problem or scenario*	Clearly and accurately represents the problem in context by strategically choosing an effective model(s)
	Develops a plan of approach *Thinks of and outlines various approaches to solve a mathematical problem*	Develops an organized and intentional sequence of steps that applies appropriate mathematical tools and/or strategies ***appropriate:*** *refer to Math curriculum*	Develops a logical and organized plan that applies appropriate mathematical tools and/or strategies ***plan:*** *an intentional sequence of steps with an end goal* ***appropriate:*** *refer to Math curriculum* ***strategies:*** *e.g., using a tool (calculator), picture, graph, equation*	Uses mathematical reasoning to develop a logical and organized plan that applies appropriate mathematical tools and/or strategies ***appropriate:*** *refer to Math curriculum*	Uses mathematical reasoning to develop a logical and organized plan that applies appropriate mathematical tools and/or strategies ***appropriate:*** *refer to Math curriculum*	Uses mathematical reasoning to develop a logical, organized, and effective plan that applies appropriate mathematical tools and/or strategies ***strategies:*** *e.g., using a tool (calculator), algorithm, picture, graph; Social Studies/Science: evidence from text*	Uses mathematical reasoning to develop a logical, organized, and effective multi-step plan that applies appropriate mathematical tools and/or strategies	Uses mathematical reasoning to develop a logical, organized, and effective multi-step plan that applies appropriate mathematical tools and/or strategies

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Solves *Implements a plan to solve the mathematical problem and checks their solution*	**Estimates reasonably in context** *Uses the information provided to support a best guess solution*	Estimates reasonably within the context and parameters of the scenario, using benchmarks ***benchmarks:*** *e.g., thousandths to billions, fractions, decimals, area, rhythm, pattern*	Estimates reasonably within the context and parameters of the scenario, using benchmarks ***benchmarks:*** *e.g., thousandths to billions, length, area; Arts: rhythm, pattern; Science: trend, frequency; Language Arts: pattern; ADST: area, materials needed*	Estimates reasonably within the context and parameters of the scenario, using appropriate benchmarks ***benchmarks:*** *e.g., perfect squares, volume; Arts: rhythm, pattern; Science: trend, frequency; Language Arts: pattern; ADST: area, volume, materials needed*	Estimates reasonably within the context and parameters of the scenario, using appropriate benchmarks ***benchmarks:*** *e.g., perfect squares, volume; Arts: rhythm, pattern; Science: trend, frequency; Language Arts: pattern; ADST: area, volume, materials needed*	Estimates reasonably in context, within parameters, and considering limitations	Estimates reasonably in context, within parameters, and considering limitations; explains reasoning for estimate	Estimates reasonably in context, within parameters, and considering limitations; explains reasoning for estimate
	Solves the mathematical problem *Uses various approaches to find a solution to the problem*	Finds a solution, using appropriate strategies ***strategies:*** *e.g., using a tool (calculator), picture, graph, equations, concrete materials, and/or models*	Finds a solution, using appropriate strategies	Solves the mathematical problem, using effective strategies as needed	Solves the mathematical problem, using effective strategies as needed	Solves the mathematical problem by following a logical plan and using efficient strategies as needed ***strategies:*** *e.g., using a tool (calculator), algorithm, picture, graph; Social Studies/Science: evidence from text*	Solves the mathematical problem by following a logical, multi-step plan and using efficient strategies as needed	Solves the mathematical problem by following a logical, multi-step plan and using efficient strategies as needed
	Verifies accuracy of the mathematical solution *Checks their solution based on similar problems, others' solutions, or their estimate*	Verifies the accuracy of their results and/or solution, using reasonable estimates and other familiar strategies ***familiar:*** *previously seen or modelled*	Verifies the accuracy of their results and/or solution, using reasonable estimates and other familiar strategies ***familiar:*** *previously seen or modelled (e.g., using a tool [calculator], alternate algorithm, picture, graph)*	Verifies the accuracy of their results and/or solution, using reasonable estimates and other familiar strategies; identifies factors that could affect accuracy of results	Verifies the accuracy of their results and/or solution, using reasonable estimates and other familiar strategies; identifies factors that could affect accuracy of results	Verifies the accuracy of their results and/or solution, using reasonable estimates and other familiar strategies; describes how factors affect accuracy of results	Verifies the accuracy of their results and/or solution, using reasonable estimates and other familiar strategies; compares and evaluates how factors affect accuracy of results	Verifies the accuracy of their results and/or solution, using reasonable estimates and other familiar strategies; compares and evaluates how factors affect accuracy of results

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Analyzes *Reflects on the reasonableness of their solution; evaluates alternative approaches and solutions, and revises approach*	**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?)*	Reflects on the reasonableness of their solution within the context of the problem ***reasonableness:*** *rationality, practicality* ***context of the problem:*** *e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback*	Reflects on the reasonableness of their solution within the context of the problem	Reflects on the validity of their solution within the context of the problem ***validity:*** *accuracy in context*	Reflects on the validity of their solution within the context of the problem	Reflects on the validity of their solution, identifying contextual factors that may affect their answer ***solution:*** *e.g., lab results, map, product, model*	Reflects on the validity and reliability of their processes and solutions and describes how contextual factors may affect their answer ***reliability:*** *reproducibility of results* ***contextual factors:*** *e.g., Social Studies/Science: evidence from text; Arts: soliciting feedback*	Reflects on the validity and reliability of their processes and solutions and describes how contextual factors may affect their answer
	Evaluates alternative approaches *Checks on the reasonableness of others' approaches to solve the problem*	Describes the benefits and limitations of alternative approaches ***approaches:*** *own approach, peer- or teacher-driven approach*	Describes the benefits and limitations of alternative approaches	Evaluates the benefits and limitations of alternative approaches	Evaluates the benefits and limitations of alternative approaches ***approaches:*** *own approach, peer- or teacher-driven approach, comparison with research- based approaches*	Evaluates the efficiency and effectiveness of alternative approaches	Evaluates the efficiency and effectiveness of alternative approaches and possible improvements	Evaluates the efficiency and effectiveness of alternative approaches and possible improvements
	Revises approach as needed *Revises their approach based on checking with others' solution and/or approach*	Refines approach, using the benefits and limitations of alternative approaches to solving the problem ***refines:*** *improves through small changes*	Refines approach, using the benefits and limitations of alternative approaches to solving the problem	Revises approach, using the benefits and limitations of alternative approaches to solving the problem ***revises:*** *reflects and adjusts*	Revises approach based on their evaluation of alternative approaches to solving the problem	Revises approach, using the benefits and limitations of alternative approaches to compare alternative solution(s) to the problem	Redesigns approach to improve efficiency of process or accuracy of solution to the problem ***redesigns:*** *iteratively reflects and adjusts*	Redesigns approach to improve efficiency of process or accuracy of solution to the problem

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Communicates *Represents, explains, and defends their approach and solution within the problem's scenario*	**Represents processes and solution** *Effectively communicates the thinking and/or understanding in their approach and/or solution using visual representations or mathematical symbols*	Represents the complete process and solution by selecting and using appropriate tools ***appropriate tools:*** *e.g., model, chart, map, table, graph, array*	Represents the complete process and solution by selecting and using appropriate tools ***appropriate tools:*** *e.g., model, chart, map, table, graph, array, equation*	Effectively represents the complete process and solution, using appropriate presentations ***appropriate presentations:*** *e.g., bulleted explanation, equation, graph, model, map, table, array*	Effectively represents the complete process and solution, using appropriate presentations ***appropriate presentations:*** *e.g., bulleted explanation, equation, graph, model, map, table, diagram*	Represents complex processes and solutions, using a variety of presentations in a manner that is suitable to the context	Represents complex processes and solutions; chooses a presentation that suits the purpose, context, and audience	Represents complex processes and solutions; chooses a presentation that suits the purpose, context, and audience
	Explains the approach taken *Clearly explains their problem-solving approach and solution with mathematical vocabulary*	Accurately explains their problem-solving approach ***approach:*** *e.g., process: making a model; tool: manipulatives; strategy: using an equation*	Accurately explains their problem-solving approach ***approach:*** *e.g., process: making a model; tool: calculator; strategy: using an equation*	Accurately explains their problem-solving approach, identifying its limitations and assumptions ***approach:*** *e.g., process: making a diagram; tool: calculator; strategy: using an equation*	Accurately explains their problem-solving approach, identifying its limitations and assumptions	Explains their problem-solving approach, describing any limitations and assumptions ***approach:*** *e.g., process: making a flowchart; tool: calculator; strategy: using a familiar algorithm or evidence from text*	Explains their problem-solving approach accurately and in detail, evaluating the effect of any assumptions or limitations	Explains their problem-solving approach accurately and in detail, evaluating the effect of any assumptions or limitations
	Defends decisions and assumptions *Clearly justifies and defends the decisions and assumptions made in their approach and/or solution*	Presents a rationale for their problem-solving decisions and assumptions	Presents a rationale for their problem-solving decisions and assumptions	Presents a logical argument and justifies their decisions and assumptions	Presents a logical argument and justifies their decisions and assumptions	Presents a valid, logical argument to justify their decisions about the selected approach and assumptions, and describes the effects of these choices	Presents a valid, logical argument to justify their decisions about the selected approach, evaluating assumptions and the effects of their choices ***evaluating:*** *assessing the implications*	Presents a valid, logical argument to justify their decisions about the selected approach, evaluating assumptions and the effects of their choices ***evaluating:*** *assessing the implications*