

Numeracy

GRADE 3

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Numeracy in Grade 3

In Grade 3, many mathematical activities involve numeracy. Students are expected to apply mathematical concepts and skills to a variety of real-life tasks and simulations provided by their teachers.

Often, all or part of the numeracy task is completed collaboratively. When students do work independently, they have had previous opportunities to observe and complete similar tasks with the support of the teacher and peers. The following briefly describes typical Grade 3 numeracy tasks. For quick reference, these have been grouped according to purpose. In fact, a single task or problem may address several purposes.

MONEY TASKS

- ◆ Determine which package size to purchase in order to acquire 900 marbles and have the fewest marbles left over.
- ◆ Clip items from flyers, categorize into price ranges, glue pictures on paper, and calculate change.
- ◆ Choose an advertisement that involves money. Create and solve two problems based on the ad.
- ◆ Show three arrangements of coins that could be used to pay for a \$1.49 can of juice.

CHANCE TASKS

- ◆ Write questions to which the expected answers are “impossible,” “unlikely,” “likely,” “fair chance,” “probable,” and “expected.”
- ◆ Identify the number of ways two different colours (represented by counters) can land when they are spilled by drawing the answer and then comparing the drawings with those of classmates. Predict which colour combination would appear most often if the colours were spilled ten times, and conduct an experiment to check the prediction.

DATA ANALYSIS

- ◆ Survey two other classes to find their favourite movies/videos. Record findings on a tally chart, then make a bar graph and a pictograph. Use the results to predict which five movies/videos would be the favourites in their own class. Conduct a survey and determine whether the tally matches the prediction. Explain the results.

- ◆ Record the amount of time spent each day on eating, sleeping, school, playing, watching TV, and other; then present results by colouring an hour rectangle on the template provided for each whole or part hour spent on each activity. Explain results.

MEASUREMENT AND OTHER APPLICATIONS OF SHAPE AND SPACE

- ◆ Choose three containers. Estimate and then compare their capacity using manipulatives. Devise other ways of comparing their capacity.
- ◆ Pick seven classroom items; estimate, choose a tool, measure, and record results; then list the items from smallest to largest and describe the findings.
- ◆ Write or draw what might be worn, eaten, or done at three outdoor temperatures provided by the teacher.
- ◆ Choose 10 objects that they estimate to be approximately 20 cm. (e.g., “I spy something that is 20 cm.”) Circle the one that they think is closest to 20 cm, then measure, record, and list objects from largest to smallest.
- ◆ Write clues for various 3-D solids for a guessing game with classmates.
- ◆ Estimate how many sheets of newspapers it would take to cover the floor of the classroom for a messy art project. Try to use only one sheet of newspaper to actually measure the floor.
- ◆ Go on a kilogram hunt. Take a 1 kg weight and search for various objects that have a 1 kg mass.
- ◆ Decide which of four given shapes are triangles, and explain reasoning.

PATTERN

- ◆ Create codes using number patterns.

Quick Scale: Grade 3 Numeracy

This Quick Scale is a summary of the criteria described in detail in the Rating Scale that follows. These criteria may apply at any time of the year, depending on when specific skills or concepts are introduced.

Aspect	Not Yet Within Expectations	Meets Expectations (Minimal Level)	Fully Meets Expectations	Exceeds Expectations
SNAPSHOT <i>Note: the snapshot can be used alone as a holistic scale for marking some assignments.</i>	<i>The student is unable to complete the task in a reasonable amount of time without one-to-one help.</i>	<i>The student completes most parts of the basic task correctly if the task resembles one recently explored in class, but work is flawed or incomplete. May need some assistance.</i>	<i>The student completes all parts of the basic task accurately in a familiar situation and explains the result. May need occasional consultation.</i>	<i>The student completes all parts of the task accurately and efficiently and explains the result; may develop an extension or alternative method.</i>
CONCEPTS AND APPLICATIONS* <ul style="list-style-type: none"> recognizing mathematics (e.g., money, measurement, chance, data) selecting and applying concepts and skills estimates, predictions 	<ul style="list-style-type: none"> has difficulty applying mathematical concepts to everyday problems needs one-to-one support to select and apply appropriate concepts, skills, and strategies estimates and predictions are often guesses; may be wildly illogical 	<ul style="list-style-type: none"> with prompting, identifies ways to apply mathematics to everyday problems similar to those previously explored for problems similar to those recently experienced, selects and applies some appropriate concepts, skills, and strategies in familiar situations, most estimates and predictions are within the bounds of logic 	<ul style="list-style-type: none"> can identify ways to use mathematical concepts and skills to solve everyday problems for problems similar to those recently experienced, selects and applies appropriate concepts, skills, and strategies in familiar situations, makes logical estimates and predictions 	<ul style="list-style-type: none"> may independently find ways to apply mathematics to everyday problems selects and applies appropriate concepts, skills, and strategies to solve problems; efficient; may take an innovative approach makes logical estimates and predictions in both familiar and novel situations
STRATEGIES AND APPROACHES <ul style="list-style-type: none"> procedures analyze problems verify solutions (estimates, calculators, inverse operations, mental math) 	<ul style="list-style-type: none"> requires ongoing help to follow modelled procedures and complete tasks unable to analyze simple problems to develop a plan unable to verify answers 	<ul style="list-style-type: none"> attempts to follow modelled procedures, but may confuse order or make an inappropriate choice may need help to analyze simple problems and make a plan needs help to verify answers 	<ul style="list-style-type: none"> follows modelled procedures analyzes problems to develop a plan with prompting, verifies answers or results using mental math, calculators, estimation, or inverse operations 	<ul style="list-style-type: none"> follows modelled procedures; may find an alternative procedure analyzes problems to develop an efficient plan independently verifies answers or results using mental math, calculators, estimation, or inverse operations
ACCURACY <ul style="list-style-type: none"> calculations using tools (e.g., standard and nonstandard measures) recording (e.g., measures, patterns) 	<ul style="list-style-type: none"> unable to perform basic calculations needs extensive help to obtain accurate results when using tools major recording errors 	<ul style="list-style-type: none"> some calculation errors some accurate results when using tools some recording errors 	<ul style="list-style-type: none"> calculations may include minor errors generally accurate results when using tools; minor errors recording is generally accurate 	<ul style="list-style-type: none"> calculations are accurate; often uses mental math to arrive at a correct answer quickly accurate results when using tools recording is accurate
REPRESENTATION AND COMMUNICATION <ul style="list-style-type: none"> representing numbers presenting work demonstrating procedures; explaining results 	<ul style="list-style-type: none"> difficulty reading and writing numerals over 100 work may be unclear, confusing unable to explain or demonstrate tasks 	<ul style="list-style-type: none"> reads and writes numerals to 1000; some errors work is hard to follow in places with prompting, repeats parts of explanations or demonstrations 	<ul style="list-style-type: none"> reads and writes numerals to 1000 work is generally clear and easy to follow explains processes and results in own words; may repeat demonstrations the teacher has given 	<ul style="list-style-type: none"> fluently reads and write numerals over 1000 work is clear, detailed, and well-organized explains processes and results in own words, using mathematical language; demonstrates strategies and processes

* You may want to list key curriculum concepts or skills for a particular task.

Rating Scale: Grade 3 Numeracy

These criteria may apply at any time of the year, depending on when specific skills or concepts are introduced.*

Aspect	Not Yet Within Expectations	Meets Expectations (Minimal Level)
SNAPSHOT <i>Note: the snapshot can be used alone as a holistic scale for marking some assignments.</i>	<i>The student is unable to complete the task in a reasonable amount of time without one-to-one help.</i>	<i>The student completes most parts of the basic task correctly if the task resembles one recently explored in class, but work is flawed or incomplete in some way. May need some assistance.</i>
CONCEPTS AND APPLICATIONS** <ul style="list-style-type: none"> recognizing mathematics (e.g., money, measurement, chance, data) selecting and applying concepts and skills estimates, predictions 	<ul style="list-style-type: none"> has difficulty applying mathematical concepts to everyday problems needs one-to-one support to select and apply appropriate rules, operations, tools strategies, or methods to solve simple problems (e.g., comparing perimeters of differently shaped forms) estimates and predictions are often guesses; may be wildly illogical 	<ul style="list-style-type: none"> with prompting, identifies ways to apply mathematics to everyday problems similar to those previously explored in situations similar to those recently experienced, can select and apply some appropriate rules, operations, tools, strategies, or methods to solve simple problems (e.g., comparing perimeters of differently shaped forms) in familiar situations, most estimates and predictions are within the bounds of logic; may need prompting to use number and spatial sense and recognition of patterns
STRATEGIES AND APPROACHES <ul style="list-style-type: none"> procedures analyze problems estimate to verify solutions 	<ul style="list-style-type: none"> requires ongoing help to follow modelled procedures and complete tasks unable to analyze simple problems to develop a plan unable to verify the answer by using estimation or a calculator 	<ul style="list-style-type: none"> attempts to follow modelled procedures, but may confuse order or make an inappropriate choice may need help to analyze simple problems and make a plan needs help to use estimation or a calculator to verify the answer; independent estimations may be illogical
ACCURACY <ul style="list-style-type: none"> calculations using tools (e.g., standard and non-standard measures) recording (e.g., attributes, numbers, measures, patterns) 	<ul style="list-style-type: none"> unable to perform basic calculations accurately (+/- to 1000; x/+ to 50) needs extensive help to obtain accurate results when using tools often includes major errors in recording 	<ul style="list-style-type: none"> some calculation errors (+/- to 1000; x/+ to 50) obtains some inaccurate results when using tools some recording errors
REPRESENTATION AND COMMUNICATION <ul style="list-style-type: none"> representing numbers presenting work demonstrating procedures; explaining results 	<ul style="list-style-type: none"> has difficulty reading and writing numerals over 100; frequent errors work may be unclear, confusing, or presented in an inconsistent format unable to explain or demonstrate how to complete most or all parts of the task 	<ul style="list-style-type: none"> reads and writes numerals to 1000; may work slowly with larger numbers and make some errors work is generally clear; parts may be somewhat hard to follow with prompting, repeats explanations or demonstrations the teacher has given about parts of the task

* Student performance that falls within the wide range of expectations for Grade 3 generally matches the Level 2/3 descriptions in the reference set Evaluating Mathematical Development Across Curriculum.

**Some of the curriculum concepts and skills students are expected to apply in completing numeracy tasks are specific to the type of task. The shaded charts below the Rating Scale show some of the concepts and skills most likely to apply in Grade 3.

MONEY TASKS

- represent a given value of money in several ways
- skip count by 10s and 25s
- sort coins using two or more attributes

CHANCE TASKS

- describe the likelihood of an outcome using terms such as *more likely*, *less likely*, *chance*
- conduct probability experiments, choose a recording method, draw conclusions from the results, and make predictions

PATTERN

- identify, describe, and extend patterns
- make and justify predictions based on patterns

	Fully Meets Expectations	Exceeds Expectations
	<i>In familiar situations, the student completes all parts of the basic task accurately and explains the result. May need occasional consultation.</i>	<i>The student completes all parts of the task accurately and efficiently and explains the result; may develop an extension or alternative method.</i>
	<ul style="list-style-type: none"> • can identify ways to use mathematical concepts and skills to solve everyday problems • in situations similar to those recently experienced, selects and applies appropriate rules, operations, tools, strategies, or methods to solve simple problems (e.g., comparing perimeters of differently shaped forms) • in familiar situations, makes logical estimates and predictions, using number and spatial sense and recognition of patterns 	<ul style="list-style-type: none"> • may independently find ways to apply mathematics to everyday problems • selects and applies appropriate rules, operations, tools, strategies, or methods to solve simple problems (e.g., comparing perimeters of differently shaped forms); efficient; may take an innovative approach • makes logical estimates and predictions applying number and spatial sense and recognition of patterns to both familiar and novel situations
	<ul style="list-style-type: none"> • follows modelled procedures • analyzes problems to develop a plan • with prompting, verifies answers or results using mental math, a calculator, estimation, or inverse operations 	<ul style="list-style-type: none"> • follows modelled procedures; may find an alternative procedure or shortcut • analyzes problem to develop a efficient plan • independently verifies answers or results using mental math, a calculator, estimation, or inverse operations
	<ul style="list-style-type: none"> • calculations are generally accurate but may include minor errors (+/- to 1000; x/\div to 50; fluent +/- to 18) • obtains generally accurate results when using tools; may make minor errors • recording is generally accurate 	<ul style="list-style-type: none"> • calculations are accurate; often uses mental math to arrive at a correct answer quickly (+/- to 1000; x/\div to 50; fluent +/- to 18) • obtains accurate results when using tools • recording is accurate
	<ul style="list-style-type: none"> • reads and writes numerals to 1000 • work is generally clear and easy to follow • explains processes and results in own words; may repeat demonstrations the teacher has given 	<ul style="list-style-type: none"> • fluently reads and writes numerals beyond 1000 • work is clear, detailed, and well-organized • explains processes and results in own words, using appropriate mathematical language; demonstrates strategies and processes used

DATA ANALYSIS

- use a variety of instruments to collect data to solve a problem or answer a question
- display and order data in one of a variety of graphic organizers
- display the same data in more than one way
- analyze data to make predictions and inferences, and draw conclusions about the displayed data

MEASUREMENT

- select an appropriate standard unit for estimating or measuring length
- estimate, measure, record, compare, and order shapes, objects and containers, using standard and non-standard units
- construct a variety of regular shapes with the same area
- length (cm, m, km), mass (g, kg), volume (L)
- time (seconds, minutes, hours, days, months, years; digital and analog)
- temperature (degrees C)

OTHER APPLICATIONS OF SHAPE AND SPACE

- communicate and apply terms of direction (e.g., north, south) and relate to maps
- trace a path on a labelled grid or map following oral or written instructions
- graph whole number points on a horizontal or vertical number line

Sample 1: Creating Problems from Advertisements (Money)

CONTEXT

This class had completed a variety of money explorations and tasks designed by the teacher. The teacher now wanted students to develop their own money tasks.

MATHEMATICAL CONCEPTS

- ◆ read, write, and order numerals to 1000
- ◆ represent a given value of money in several ways
- ◆ demonstrate and describe the processes of addition and subtraction to 1000 concretely, pictorially, and symbolically
- ◆ develop fluency with basic addition and subtraction facts to 18
- ◆ demonstrate and describe the processes of multiplication and division concretely, pictorially, and symbolically, with maximum products and dividends to 50
- ◆ analyze problems to develop a plan
- ◆ verify that solutions to problems are correct and reasonable
- ◆ communicate an understanding of a problem, the process used to solve it, and the justification of the solution

PROCESS

Students were given store flyers and asked to choose an advertisement that involved money and then create and solve two problems based on the advertisement. The teacher also asked each student to explain his or her mathematical thinking orally and recorded observations about their explanations as well as assessing their pencil-and-paper work.

NOTE:

The teacher provided direct support to students who struggled with the task.

NOT YET WITHIN EXPECTATIONS

Teacher's Observations

Although this student was able to pose a problem based on purchasing Furby babies, she was not able to devise a logical strategy for solving her problem. She was unable to explain her equation, or to explain the 39s in her work, saying only that it was the 39 in the ad. The teacher suggested rounding 39 up to 40 so she could estimate and helped her use a calculator to add four 40s.

	Not Yet	Meets	Fully	Exceeds
SNAPSHOT				
CONCEPTS				
STRATEGIES				
ACCURACY				
REPRESENTATION				

- ◆ has difficulty applying mathematical concepts to everyday problems
- ◆ needs one-on-one support to select and apply appropriate rules, operations, tools, strategies, or methods to solve simple problems
- ◆ requires ongoing help to complete tasks
- ◆ unable to analyze simple problems to develop a plan
- ◆ unable to perform basic calculations accurately
- ◆ unable to explain or demonstrate how to complete most or all parts of the task

Teacher's Observations

Although this student was able to pose a problem based on purchasing Furby Babies, she was not able to devise a logical strategy for solving her problem. When I first looked at her work, she had written the problem, which included two questions - 1) "how much did we use" and 2) "how much did we have left". She had not expressed an answer to either question. She did have the "equation" that started with 120, followed by successive "addition" and "subtraction" of 39, resulting in the bottom number, "100".

When I asked her to explain this "equation", she was unable to do so. I attempted to probe her thinking, to determine whether she really did use a process that seemed logical to her at the time. I asked her to tell me "about the 39's" in her workings, but all she could tell me was that it was the 39 in her ad. I attempted to scaffold her thinking by asking her to round up the 39 to 40, so we could get an estimate, and we used a calculator to add four "40's", and then she came up with the "10" in answer to her second question.

Thus:

•the student was unable to complete the task in a reasonable amount of time without one-to-one help; she...

- ~had difficulty applying mathematical concepts to everyday problems
- ~needed one-to-one support to select and apply appropriate operations, tools or methods to solve her problem
- ~was unable to explain or demonstrate how to complete most ... parts of the task.

MEETS EXPECTATIONS (MINIMAL LEVEL)

Teacher's Observations

This student was able to create subtraction equations that represent the differences between the original prices and the final prices. He was not able to express the problems in words, but through discussion with him, the teacher was able to determine that he did understand the contents of his ads. Even after talking the problems through with his teacher, he was unable to write about the problems independently.

	Not Yet	Meets	Fully	Exceeds
SNAPSHOT				
CONCEPTS				
STRATEGIES				
ACCURACY				
REPRESENTATION				

- ♦ in situations similar to those recently experienced, can select and apply some appropriate rules, operations, tools, strategies, or methods to solve simple problems
- ♦ may need help to analyze a simple problem
- ♦ work is generally clear; parts may be somewhat hard to follow

Teacher's Observations

This student was able to create subtraction equations which represent the differences between the original prices and the final prices. He wasn't able to express the problems in words, and it was only through discussion with him that I was able to determine that he really understood the contexts of his ads. Even though we talked together about the problems that his equations solved, he was unable to write about these problems after I left him.

This student . . .

- in situations like those recently modelled in class, can select and apply most appropriate rules . . . and methods to solve simple problems (although the problem was implicit in his equations, rather than explicitly stated)
- produced work that is generally clear, but confusing to follow in some places (specifically in terms of expressing the problem in the context of his ad)

FULLY MEETS EXPECTATIONS

Teacher’s Observations

This student recognized that the first advertisement she chose did not allow her to create a problem involving addition or subtraction. She told the teacher it was “too hard.” Her written problem based on the second advertisement was logical and clearly expressed. Her solution was accurate, and her method was efficient. *Note: She wrote her solution upside down to model the puzzles she has seen in children’s magazines.*

	Not Yet	Meets	Fully	Exceeds
SNAPSHOT				
CONCEPTS				
STRATEGIES				
ACCURACY				
REPRESENTATION				

- ◆ can identify the ways mathematical concepts and skills can be used to solve everyday problems
- ◆ in situations similar to those recently experienced, selects and applies appropriate rules, operations, tools, strategies, or methods to solve simple problems
- ◆ calculations are generally accurate
- ◆ work is generally clear and easy to follow
- ◆ explains processes and results in own words

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EXCEEDS EXPECTATIONS

Teacher’s Observations

This student created two problems from the advertisement he chose without any prompting from the teacher. His first problem was solved through division, which had not yet been formally introduced to the class. He used mental arithmetic to multiply 4 by 18 to “make an interesting problem,” and then he proved his answer through the reciprocal division process. He then created a complex second problem involving a four-digit number and used long multiplication—which had not been taught in class—rather than addition to solve it.

	Not Yet	Meets	Fully	Exceeds
SNAPSHOT				
CONCEPTS				
STRATEGIES				
ACCURACY				
REPRESENTATION				

- ◆ may independently find ways to apply mathematics to everyday problems
- ◆ selects and applies appropriate rules, operations, tools, strategies, or methods to solve simple problems; efficient; may take an innovative approach
- ◆ may find an alternative procedure or shortcut
- ◆ independently verifies answers or results using mental math, estimation, or reverse operations
- ◆ calculations are accurate; often uses mental math to arrive at a correct answer quickly
- ◆ work is clear, detailed, and well-organized
- ◆ explains processes and results in own words, using appropriate mathematical language; demonstrates strategies and processes used

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- INSTALLATION
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OLD ONE
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1. If this water tank holds 40 gallons, and cost \$435, how many tanks would you need to contain 720 gallons?

$$\begin{array}{r} 18 \\ 40 \overline{) 720} \\ \underline{40} \\ 320 \\ \underline{320} \\ 0 \end{array}$$

2. If the water tank holds 40 and you wanted to buy enough tanks to contain 1440 gallon how many tanks would you have to buy and how much would it cost?

$$\begin{array}{r} 36 \\ 40 \overline{) 1440} \\ \underline{120} \\ 240 \\ \underline{240} \\ 0 \end{array}$$

$$\begin{array}{r} 36 \\ \times 435 \\ \hline 180 \\ 1080 \\ 1440 \\ \hline \$15660 \end{array}$$

Sample 2: Creating Codes (Pattern)

CONTEXT

Students in this class had completed a number of tasks in which they were required to identify, describe, and extend non-numerical and numerical patterns. The teacher designed this task to provide students with a practical application for numerical and non-numerical patterns and an opportunity to devise their own.

MATHEMATICAL CONCEPTS

- ◆ identify, describe, and extend numerical patterns
- ◆ identify, describe, and extend non-numerical patterns
- ◆ make and describe predictions based on arithmetic patterns

PROCESS

Students were asked to create two codes for a secret club—an easier one and a harder one. Classmates could become club members by solving the easier code and could become “special members” by solving the harder one. Students recorded their attempts in their notebooks. The teacher imposed a time limit for the task.

NOT YET WITHIN EXPECTATIONS

Teacher's Observations

This student was unable to finish the task in the allotted time. He required some prompting from the teacher to develop his own patterns and was not always able to explain the rule he was using to extend the patterns. He was not able to extend any of the patterns devised by classmates.

- ◆ needs one-on-one support to select and apply appropriate rules or methods to solve simple problems
- ◆ predictions are often guesses; may be wildly illogical
- ◆ unable to explain or demonstrate how to complete most or all parts of the task

	Not Yet	Meets	Fully	Exceeds
SNAPSHOT				
CONCEPTS				
STRATEGIES				
ACCURACY				
REPRESENTATION				

CODES ↓	ANSWERS ↓	EXPLAIN THE RULE
My easy code: 100 200 —	300	It's more up
My harder code: 0 0 □ 00 —	□	With fore corners
An easy code I solved:		
A harder code I solved:		
△ 0 △ 00 △	0000	It's the same
A code I couldn't solve:		

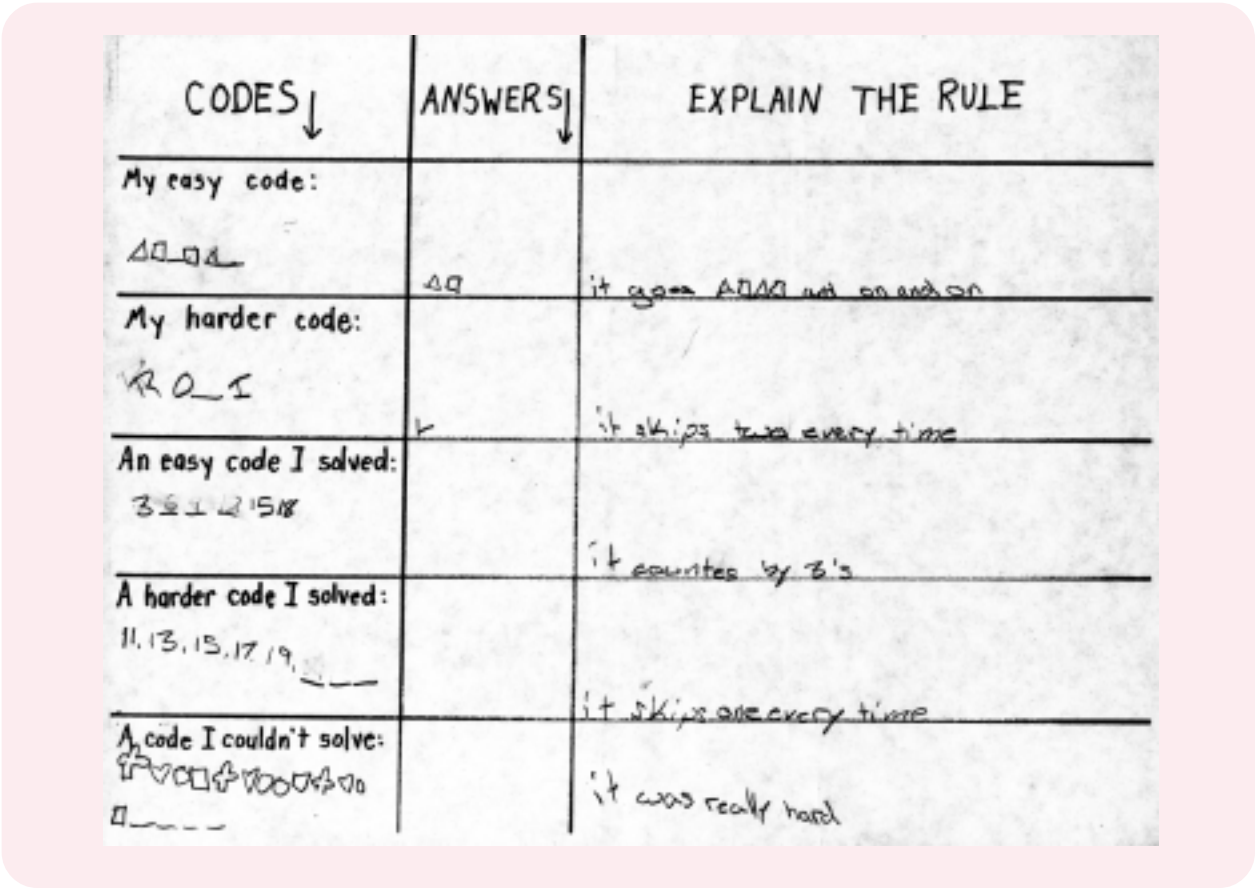
MEETS EXPECTATIONS (MINIMAL LEVEL)

Teacher's Observations

This student completed all the basic parts of the task in the allotted time. He was able to extend his own codes and easy ones from classmates. However, he had difficulty explaining his reasoning, even with prompting from the teacher.

	Not Yet	Meets	Fully	Exceeds
SNAPSHOT				
CONCEPTS				
STRATEGIES				
ACCURACY				
REPRESENTATION				

- ◆ in situations similar to those recently experienced, can select and apply some appropriate rules or methods to solve simple problems
- ◆ work is generally clear; parts may be somewhat hard to follow
- ◆ with prompting, repeats explanations the teacher has given about parts of the task



FULLY MEETS EXPECTATIONS

Teacher's Observations

This student was able to complete all parts of the task in the time allotted and explain each rule. However, his easier and harder patterns are very similar.

- ◆ in situations similar to those recently experienced, selects and applies appropriate rules or methods to solve simple problems
- ◆ work is generally clear and easy to follow
- ◆ explains processes and results in own words

	Not Yet	Meets	Fully	Exceeds
SNAPSHOT				
CONCEPTS				
STRATEGIES				
ACCURACY				
REPRESENTATION				

CODES ↓	ANSWERS ↓	EXPLAIN THE RULE
My easy code: 004000400001	00000	you are one 0 more every time.
My harder code: 3, 6, 9, 12, 15, 18, 21, 24 27, 30, 33, 36, 39	33, 36, 39	you are counting by 3's
An easy code I solved: 3, 7, 11, 15, 19, 23, 27, 31	27, 31	counting by 4's
A harder code I solved: 3, 6, 9, 12, 15, 18, 21, 24	18, 21, 24	Counting by 3's
A code I couldn't solve: Δ 07 - - -	7, 0, Δ	Same but in a different order

EXCEEDS EXPECTATIONS

Teacher's Observations

This student completed all parts of the task accurately and efficiently. He developed a harder code with a very complex pattern that he could nonetheless explain fully in words. He correctly explained that another student's code he couldn't solve lacked a pattern.

	Not Yet	Meets	Fully	Exceeds
SNAPSHOT				
CONCEPTS				
STRATEGIES				
ACCURACY				
REPRESENTATION				

- ◆ selects and applies appropriate rules or methods to solve simple problems; efficient; may take an innovative approach
- ◆ recognizes patterns in both familiar and novel situations
- ◆ work is clear, detailed, and well-organized
- ◆ explains processes and results in own words

CODES↓	ANSWERS↓	EXPLAIN THE RULE
My easy code: 1□203ΔL	□ 20	1□203Δ1□203Δ and you keep doing it.
My harder code: AZCXEVO-----	TIKPM	1 letter, last letter, 2 letters, next letter to the front, skip one, next number from 100 back.
An easy code I solved: 1421--	42--	142142142142142...
A harder code I solved: AKUEO1--3	YIS	10 in between A and K, 10 in between K and U, 10 in between U and I, 10 in between E and O...
A code I couldn't solve: AEOHIR---		I + didn't make sense.