REPUBLIC OF TRINIDAD & TOBAGO

MINISTRY OF EDUCATION

ASSESSMENT FRAMEWORK

FOR THE

SECONDARY ENTRANCE ASSESSMENT

2019-2023

Ministry of Education
Education Tower, #5 St Vincent Street, Port of Spain

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Foreword

The Assessment Framework for the Secondary Entrance Assessment (SEA) 2019-2023 specify the purpose, components, format and content of the SEA. The thinking processes to be assessed in the examination are based on outcomes outlined in the English Language Arts and Mathematics Curriculum Guides (2013) The specific English Language Arts skills to be assessed are English Language Arts Writing, Spelling, Grammar, Punctuation, Capitalisation and Reading Comprehension. In Mathematics, Number, Measurement, Geometry and Statistics are assessed.

The Secondary Entrance Assessment facilitates the transition from primary to secondary school. The Assessment Framework for SEA 2019 - 2023 is intended to assist teachers and all those involved in the preparation of students for secondary school. It is anticipated that the specifications for each paper will allow teachers to better assist students in understanding the format and requirements of the Secondary Entrance Assessment.

It is hoped that through use of a student-centred approach to teaching, with a focus on the development of a range of skills at different levels of thinking, our students will be better prepared for the opportunities available at the secondary level and life in general.

There are changes that teachers and other stakeholders are asked to note. These include the:

- reduction in the number of items in the Mathematics and English Language Arts papers
- introduction of explicit levels of thinking for the objectives that are assessed for Reading Comprehension and Mathematics
- assessment of spelling, punctuation and grammar in context (short passages)
- incorporation of money as a component under the number strand in Mathematics
- use of prose/fictional passages as part of the comprehension
- increased emphasis on Reading Comprehension

Components of Secondary Entrance Assessment 2019-2023

The Ministry of Education is pleased to present to teachers, the Assessment Framework for the Secondary Entrance Assessment (SEA) 2019 - 2023. The SEA is a public examination that facilitates placement of students in secondary schools in Trinidad and Tobago based on the following criteria:

- Parents' choices
- Students' performance by order of merit
- Principals' 20% selection (Denominational schools)
- Gender
- Residence
- Multiple births

The Secondary Entrance Assessment comprises three papers that all candidates must attempt:

1. English Language Arts Writing
2. Mathematics
3. English Language Arts (Spelling, Punctuation, Capitalisation, Grammar, and Reading Comprehension)

The duration of each paper is indicated in Table 1.

Table 1: Duration of SEA Papers

Paper	**Time Allotment**
English Language Arts Writing	Fifty (50) minutes
Mathematics	Seventy-five (75) minutes
English Language Arts	Seventy-five (75) minutes

The schedule of the working time, the total time for the administration of the assessment and the number of items in each test are shown in Table 2. The total time for the administration of the assessment is approximately 4 hours 30 minutes while the actual working time for the candidates is 3 hours 20 minutes.

Table 2: Working Time, Total Administration Time and Number of Items for the SEA Papers

Activity	**Time (Minutes)**					**Number of Items**
	Distribution of Booklets	**Reading of Directions**	**Working Time**	**Collection of Booklets**	**Total Time**	
Completion of the English Language Arts Writing Test	5	3	**50**	5	63	**1**
Completion of the Mathematics Test	5	3	**75**	5	88	**45**
B R E A K					**3 0**	
Completion of the English Language Arts Test	5	3	**75**	5	88	**43**
TOTAL	15	9	**200**	15	239	**89**

Weighting of Papers and Placement in Secondary Schools

The weighting of the Mathematics, English Language Arts and ELA Writing papers is 100:60:40**.** Students' scores in each paper will be converted to standard scores and weighted as shown in Table 3. The weighted scores will then be combined and the combined score (composite score) used for placement of students in secondary schools. Standard scores utilise the variance in each paper and therefore allow the student's relative standing (position) in each paper to be maintained when they are combined, thus ensuring fairness in the placement process.

Table 3: Weighting of SEA Papers

Paper	**Weighting**
Mathematics	100
English Language Arts	60
English Language Arts Writing	40

English Language Arts (ELA) Writing Paper

The English Language Arts Writing paper will contain three items randomly assigned in any one year:

Either (i) Three (3) narrative items

Or (ii) Three (3) expository items

Students will be asked to respond to one item which will be scored by two persons. Each response will be scored based on the following criteria:

- Content
- Language Use
- Grammar and Mechanics
- Organisation

General Assessment Objectives for ELA Writing

Students will:

- Demonstrate knowledge of narrative and expository writing
- Write stories and simple reports (expository)
- Use descriptive language and sensory details appropriate to stories
- Use figurative language appropriate to stories
- Use factual details appropriate to reports
- Use formal language and tone appropriate to reports
- Express written ideas clearly and coherently
- Generate a variety of sentence types
- Demonstrate accurate use of grammar, spelling and mechanics
- Demonstrate effective organisation of ideas

ELA - Spelling, Punctuation, Capitalisation, Grammar, and Reading Comprehension

The English Language Arts assessment will comprise Spelling, Punctuation, Capitalisation Grammar, and Reading Comprehension. The assessment objectives are taken from Standards Three, Four and Five as specified in the National Primary School Curriculum (2013). This is built on the understanding that many of the foundation skills developed during Infant and Junior school act as building blocks.

The English Language Arts paper is designed to assess spelling, punctuation, capitalisation and grammar in context. This means that discrete sentences will be replaced by short continuous text to which students will be required to respond. The reading comprehension section will assess different levels of thinking. Passages will be complemented by simple visuals designed to reflect authentic reading material. Additionally, prose material, introduced for the first time, will be alternated with the other type of texts. **Vocabulary will be assessed in context; that is, in the Reading Comprehension component of Section II**. Table 4 displays the changes to the English Language Arts format for SEA 2019 - 2023 in comparison with SEA 2016.

Table 4: Comparison of SEA 2016 and SEA 2019 - 2023

Components of SEA 2016	**Components of SEA 2019 - 2023**
Section 1: • Grammar Skills: (22 items) - Nouns: 4 items - Part of Speech: 3 items - Verbs: 3 items - Direct speech: 2 items - Active voice: 2 items - Correct form of words: 3 items - Conjunctions: 2 items - Grammatical error: 3 items Section II: • Vocabulary: 6 items • Spelling: 3 items • Punctuation: 4 items Section III: • Non-fiction text: 5 items; (includes two parts (a) and (b) • Fiction (poetry): 5 items; (includes two parts (a) and (b) • Graphic: 5 items (includes two parts (a) and (b)	Section 1: ▪ Spelling: 6 items ▪ Punctuation and Capitalisation: 6 items ▪ Grammar Skills: 6 items Section II: ▪ Non-fiction Text **or** Fiction Text: 10 items ▪ Poetry: 10 items ▪ Graphic Text: 5 items

The English Language Arts Paper consists of forty-three (43) items and assesses the following language skills from the Republic of Trinidad and Tobago Primary School Curriculum - English Language Arts (2013).

- Spelling
- Punctuation and Capitalisation
- Standard English Grammar
- Reading Comprehension
  - Extract of non-fiction text **or** fiction text
  - Poetry
  - Graphic text

The English Language Arts Paper will be scored out of a total of eighty (80) marks (Table 5). Items in Section I (Spelling, Punctuation, Capitalisation, and Grammar) will be worth thirty (30) marks, while items in Section II (Reading Comprehension) will be worth fifty (50) marks.

Table 5: Distribution of English Language Arts Items

(Section I) **Language Focus**	**No. of Items**	**No. of Marks**
Revision of spelling within context	6	12
Revision of punctuation and capitalisation within context	6	6
Revision of grammar within context	6	12
(Section II) **Reading Comprehension**	**No. of Items**	**No. of Marks**
Non-fiction text **or** fiction text	10	20
Poetry	10	20
Graphic text	5	10
TOTAL	**43**	**80**

Assessment Objectives for the English Language Arts Paper: Comprehension

The SEA English Language Arts assessment objectives are embedded in the Republic of Trinidad and Tobago Primary School Curriculum - English Language Arts (2013).
Educators are directed to the English Language Arts programmes for Standards Three, Four and Five. Based on the comprehension purposes and levels, the SEA will assess students' ability to understand the following:

- Non-fiction text or fiction text
- Poetry
- Graphic text

It should be noted that "all texts are not equal and can vary with regard to length, syntactic complexity, abstractness of ideas, and organizational structure" (Mullis, Martin, Sainsbury, 2016, p. 18). However, all passages will be selected based on the appropriate readability levels.

Reading Comprehension Thinking Processes

The SEA will assess three types of reading comprehension thinking processes within each of the three texts, these are:

- Literal
- Inferential
- Evaluation and appreciation

Table 6 displays the Reading Comprehension Processes and percent associated with each type of text. The Processes are more specific to comprehension, unlike Bloom's Taxonomy which was used in the previous SEA Guidelines.

Table 6: Reading Comprehension Processes by Text Type

Text Type	Reading Comprehension Processes		
	Literal	**Inferential**	**Evaluation/Appreciation**
1. Non-fiction	30%	40%	30%
2. Fiction	30%	40%	30%
3. Graphic	40%	40%	20%

Literal

This involves giving attention to information explicitly stated by the author. In this process, readers seek to understand the straightforward meaning of the text, such as facts, vocabulary, dates, times and locations (Day & Park, 2005). Such questions can be answered directly and explicitly from the text. A more complex task might be the recognition or recall or a series of facts or the sequencing of incidents in a reading selection. For example: *Where did the story take place?*

Inferential

Making inferences involves more than just a literal understanding. Students may initially have difficulty with responses to these questions because the answers are in the text but are not explicitly stated (Day & Park, 2005) and thus the connections need to be inferred (Mullis, Martin & Sainsbury (2016). Skilled readers are often able to make these connections automatically (West & Stanovich, 2000). According to Mullis, Martin & Sainsbury (2016), "With this type of processing, readers typically focus on more than just word, phrase, or sentence-level meaning. While the focus may be on local meaning residing within one part of the text, the focus also may be on more global meaning, representing the whole text" (p.20). For example: *What might have happened if Rapunzel did not have long hair?*

Evaluation/Appreciation

As readers evaluate the content of the text, the focus shifts from constructing meaning to critically considering the text itself (Mullis, Martin & Sainsbury, 2016). In terms of appreciation, readers connect emotionally and aesthetically with the text. It is an emotional response to the literary techniques, forms, styles, and structures. While no such responses are incorrect, they cannot be unfounded; they must relate to the content of the text and reflect a literal understanding of the material (Day & Park, 2005). For example, "*What do you like or dislike about this passage?"* Students will have to use both their literal understanding and their own knowledge to respond.

Objectives and Reading Comprehension Processes for Non-fiction Text (Content Area)

Objectives	Processes
1. Identify main idea from text	Literal
2. Identify supporting details from text	Literal
3. Determine the contextual meaning of words and phrases in factual texts	Literal
4. Demonstrate an understanding of supporting details and show their relationship within text	Inferential
5. Use pictures, words, definitions and context clues to infer meanings in context	Inferential
6. Analyse simple details and represent in graphic organisers	Inferential
7. Explain cause and effect relationships in texts	Inferential
8. Evaluate texts by making explicit and inferential reference to texts	Evaluation and Appreciation
9. Identify the connotative meanings of familiar and new words contextually	Inferential
10. Express preferences and support their views by reference to texts	Evaluation and Appreciation
11. Support personal views with reference to text	Evaluation and Appreciation
12. Understand that texts have purposes and are written for audiences.	Evaluation and Appreciation

Objectives and Reading Comprehension Processes for Literary Texts (Poems and Stories)

Objectives	Processes
13. Retrieve information that is stated explicitly	Literal
14. Use context-clues (word structure clues, definition clues) and background knowledge to determine the meaning of words or phrases	Inferential
15. Explore the mood of a literary piece	Evaluation and appreciation
16. Identify words/language used to create specific moods	Inferential
17. Identify words/language used to appeal to the senses	Literal
18. Identify figures of speech in literary texts (simile, metaphor, personification)	Literal
19. Identify imagery in literary texts	Inferential
20. Examine the writer's and the reader's points-of-view	Evaluation and appreciation
21. Draw conclusions (about characters, setting and events) based on evidence provided in literary text.	Inferential

Objectives	Processes
22. Infer meaning (cause and effect) as they relate to literary texts	Inferential
23. Offer solutions to major conflicts in the text	Evaluation and Appreciation
24. Identify tone in poems and prose	Inferential
25. Make judgements on the behaviour of characters	Evaluation and Appreciation
26. Judge the nature of characters with supporting evidence	Evaluation and Appreciation
27. Make connections between literature and real-life situations	Inferential

Objectives and Reading Comprehension Processes for Graphic Texts

Objectives	Processes
28. Comprehend content (message, in print text and visual media.)	Inferential
29. Explain the purpose of selected media texts	Inferential
30. Identify implied messages in selected media texts based on elements of design	Inferential
31. Identify overt messages in selected media texts based on elements of design	Literal
32. Recognize that different media forms use particular language styles and techniques in their construction	Inferential
33. Analyse selected media to understand how information/ messages are presented to audiences	Evaluation and appreciation
34. Evaluate techniques used in media texts	Evaluation and appreciation

Grammar in context

1. Use parts of speech with correct verb tense and concord in writing
2. Ensure noun and pronoun concord
3. Ensure agreement of subject and verb and subject and pronoun
4. Use Nouns: common, proper, collective and abstract in sentences
5. Use Adjectives: comparative and superlative degree
6. Use Pronouns: Personal, Possessive, Reflexive and Relative Pronoun.
7. Use Adverbs: comparative and superlative forms
8. Use Prepositions in context
9. Use Conjunctions to combine ideas and sentences
10. Use nouns, subject pronouns, verbs, adjectives and conjunctions to form compound sentences

11. Use a conjunction to join a main clause and subordinate clause to form a complex sentence
12. Use verbal forms: simple present, past, future, present continuous tense, past perfect tense
13. Use the correct form of the verb in writing
14. Use regular and irregular verb forms
15. Choose verbs to agree with subjects in number
16. Ensure concord in sentences that contain parenthetical phrases
17. Use modals: can, may, should, would, could, might
18. Use participles-past and present
19. Use adverbs: comparative and superlative forms
20. Make new words by adding prefixes and suffixes to root words
21. Use prepositions in context.
22. Recognize the function of prepositions, adverbs, adjectives, nouns, verbal forms and conjunctions in context
23. Revise concord, choice of vocabulary and spelling in own sentences

Spelling and Vocabulary

1. Apply spelling rules when writing. Produce the following correctly:
   - plural forms in which 'y is changed to 'i' and 'f' to 'v' before adding an "es" ending
   - words that double the final consonant before adding endings
   - words that drop the final 'e' before an ending
   - 'ie' and 'ei' words
   - words with hard and soft 'c' and 'g'
   - words with silent letters
   - common homophones
2. Use spelling rules in writing. Produce the following correctly:
   - convert compound words into plural forms
   - when a word ends in a silent '-e', drop the '-e' before adding -ing
   - for action words that end in '-ie', change the '-ie' to a '-y' before adding 'ing'
   - when the suffix -full is added to the end of a base word, drop one '-l'

- double the last letter of words ending in a short vowel followed by a single consonant before adding a '-y' e.g. bag - baggy
- add a '-y' to words ending with two consonants to form describing words e.g. dirt-dirty
- for words ending in a silent '-e', drop the '-e' before adding '-y' e.g. ice-icy

3. Make new words by adding prefixes and suffixes to root words
4. Use the different types of vocabulary in context across content areas: technical terms; synonyms; antonyms; homophones; homographs; words with multiple-meanings
5. Discover and correct misspelt words

Capitalisation and Punctuation

1. Use punctuation marks and capital letters correctly in writing
2. Use the colon and quotation marks for dialogue, titles and direct speech
3. Use the following punctuation marks in sentences: full stop, question mark, exclamation mark, apostrophe in contractions and possessives, quotation marks, colons and commas
4. Use capital letters in sentences for: first word in a quotation; title of books, chapters, poems; title of proper names; important words in headlines, subject heading
5. Edit capitalisation and punctuation in sentences

Mathematics Paper

The Mathematics paper consists of 45 items and encompasses the four strands of the syllabus.

- Number
- Measurement
- Geometry
- Statistics

Money has now been incorporated into the number strand.

The SEA will assess three types of thinking processes within each of the four strands. These processes – knowing, applying and reasoning – have incorporated those currently used in the Republic of Trinidad and Tobago Primary School Curriculum- Mathematics (2013) and are in conformity with international best practices (Grønmo, Lindquist, Arora, & Mullis, 2015).

Distribution of Marks by Section

The paper is divided into three sections as displayed in Table 7. Details in terms of the allocation of marks and items by strands and sections are identified at Tables 8a and 8b, respectively. Sections I and II remain unchanged in terms of the number of items and the score for each. **However, Section III comprises 5 items each worth 4 marks, instead of 6 items each worth 5 marks as detailed in the previous Secondary Entrance Assessment Guidelines.**

Table 7: Distribution of Mathematics Items and Marks by Section

Section	No. of Items	Marks per Item
Section I	20	1
Section II	20	2 or 3
Section III	5	4

Table 8a: Distribution of Marks by Strands and Sections

Strands	Section I	Section II	Section III	Total Marks
Number	10	25	8	**43**
Measurement	4	10	4	**18**
Geometry	3	7	4	**14**
Statistics	3	8	4	**15**
Total	**20**	**50**	**20**	**90**

Table 8b: Distribution of Items by Strands and Sections

Strands	Section I	Section II	Section III	No. of Items
Number	**10**	10	2	**22**
Measurement	4	4	1	**9**
Geometry	3	3	1	**7**
Statistics	3	3	1	**7**
Total	**20**	**20**	**5**	**45**

Mathematical Thinking Processes

The SEA will assess three types of mathematical thinking processes within each of the four strands, these are:

- Knowing
- Applying
- Reasoning

Table 9 displays the thinking processes and percentages associated with each strand. Such processes are designed to indicate what students are able to do with the content. The Mathematical Thinking Processes are more specific to Mathematics and reflect a more contemporary approach unlike that which was used in the previous SEA Guidelines.

Distribution of Marks by Strands and Thinking Processes

Table 9: Number of Items by Thinking Processes

Strands	No. of Items	Knowing	Applying	Reasoning
Number	22	40%	40%	20%
Measurement	9	40%	40%	20%
Geometry	7	40%	40%	20%
Statistics	7	40%	40%	20%

Knowing

The ability to use or apply mathematical reasoning and problem solving is premised on the understanding that the student has a level of familiarity with mathematical concepts and fluency in mathematical skills (Grønmo, Lindquist, Arora, & Mullis, 2015). Grønmo et al. (2015) further assert that knowing enables "easy recall of the language and basic facts and conventions of number, symbolic representation, and spatial relations". There are several aspects of knowing, including recall, recognize, classify/order, compute, retrieve and measure.

Recall	Recall definitions, terminology, number properties, units of measurement, geometric properties, and notation.
Recognize	Recognize numbers, expressions, quantities, and shapes. Recognize entities that are mathematically equivalent (e.g., equivalent familiar fractions, decimals, and percents; different orientations of simple geometric figures).
Classify/Order	Classify numbers, expressions, quantities, and shapes by common properties.
Compute	Carry out algorithmic procedures for +, –, ×, ÷, or a combination of these with whole numbers, fractions, and decimals.
Retrieve	Retrieve information from graphs, tables, texts, or other sources.
Measure	Use measuring instruments; and choose appropriate units of measurement.

Applying

The applying domain involves the application of mathematics in a range of contexts (Grønmo, et al., 2015). In some items aligned with this domain, students need to apply mathematical knowledge of facts, skills, and procedures or understanding of mathematical concepts to create representations. Representation of ideas form the core of mathematical thinking and communication, and the ability to create equivalent representations is fundamental to success in the subject. Problem solving is central to the applying domain, with an emphasis on more familiar and routine tasks. Problems may be set in real-life situations, or may be concerned with purely mathematical questions involving, for example, numeric expressions, geometric figures, or statistical data sets. Various aspects of applying are further explained below.

Determine	Determine efficient/appropriate operations, strategies, and tools for solving problems for which there are commonly used methods of solution.
Represent/Model	Display data in tables or graphs; geometric figures, or diagrams that model problem situations; and generate equivalent representations for a given mathematical entity or relationship.
Implement	Implement strategies and operations to solve problems involving familiar mathematical concepts and procedures.

Reasoning

Reasoning mathematically involves logical, systematic thinking (Grønmo, et al. 2015). It includes intuitive and inductive reasoning based on patterns and regularities that can be used to arrive at solutions to problems set in novel or unfamiliar situations. Such problems may be purely mathematical or may have real-life settings. Both types of items involve transferring knowledge and skills to new situations; and interactions among reasoning skills usually are a feature of such items. Reasoning involves the ability to observe and make conjectures. It also involves making logical deductions based on specific assumptions and rules, and justifying results. Various aspects of reasoning are highlighted below.

Analyse	Determine, describe, or use relationships among numbers, expressions, quantities, and shapes.
Integrate/Synthesize	Link different elements of knowledge, related representations, and procedures to solve problems.
Evaluate	Evaluate alternative problem-solving strategies and solutions.
Draw Conclusions	Make valid inferences on the basis of information and evidence.
Generalize	Make statements that represent relationships in more general and more widely applicable terms.
Justify	Provide mathematical arguments to support a strategy or solution.

Assessment Objectives for the Mathematics Paper

Objectives and Thinking Processes for Number Strand

Objectives	Processes
Whole Numbers	
1. Represent any number up to one million using numerals or word names.	Knowing
2. Represent whole numbers to 1000 000 using multiple models and connect to numerals and number names.	Knowing
3. Represent a number up to 1 million concretely, pictorially, symbolically.	Applying
4. State the value or place value of a digit in any whole number up to one million.	Knowing
5. Express a whole number up to one million using expanded notation.	Knowing
6. Write the numeral represented by a given expanded notation.	Knowing
7. Order whole numbers to one million.	Knowing
8. Compare whole numbers to one million	Knowing
9. Round whole numbers to the nearest thousand.	Knowing
10. Solve problems in addition (sum less than 10 000) and subtraction (minuend less than 10 000)	Applying
11. Multiply two, three and four digit numbers by one or two-digit multipliers.	Knowing
12. Divide two, three and four digit numbers by one or two digit divisors with and without remainder.	Knowing
13. Use estimation strategies in problem solving contexts with whole numbers.	Reasoning

Objectives	Processes
14. Use estimation skills to check solutions to problems and determine reasonableness of answer.	Reasoning
15. Solve one-step word problems involving any one of the four basic operations on whole numbers.	Applying
16. Solve multi-step words problems involving any combination of the four basic operations on whole numbers.	Reasoning
17. Explain or demonstrate how an answer was obtained when solving problems.	Reasoning
18. Calculate the square of a number	Knowing
19. Differentiate between factors and multiples and prime and composite numbers and identify square numbers.	Applying
20. Calculate the square root of a perfect square.	Knowing
21. List square numbers up to 144.	Knowing
22. Explore patterns involving square numbers up to 144 and square roots up to 12.	Reasoning
23. Explore patterns involving square roots up to 12.	Reasoning
24. Solve problems involving the use of number patterns.	Reasoning
25. Explore repeating, increasing and decreasing patterns.	Reasoning
26. Calculate the unknown in number sentences involving the four operations and explain procedures used.	Applying
27. Interpret the remainder in relation to the context of word problems.	Reasoning
28. Explain why a remainder is obtained for some division problems.	Reasoning
29. Identify the missing numbers in an ordered sequence or on a number line.	Reasoning
30. Use a pattern rule to determine missing elements for a given pattern and to extend or predict subsequent elements in patterns.	Reasoning
Fractions	
31. Represent a fraction using pictorial and symbolic representations.	Applying
32. Generate equivalent fractions using a variety of models.	Applying
33. Order proper fractions with unlike denominators using equivalent forms.	Reasoning
34. Demonstrate an understanding of proper fractions, improper fractions and mixed numbers.	Reasoning
35. Express improper fractions as mixed numbers.	Knowing
36. Express mixed numbers as improper fractions.	Knowing
37. Add and subtract fractions involving same denominator.	Knowing
38. Add and subtract fractions involving one denominator as a multiple of the other.	Knowing
39. Subtract a fraction from a whole number.	Applying
40. Add a fraction to a whole number.	Applying

Objectives	Processes
41. Subtract two fractions (including whole/mixed numbers).	Applying
42. Calculate fractions of a collection or set.	Knowing
43. Express one quantity as a fraction of another.	Knowing
44. Calculate the whole given a part as a unit fraction.	Knowing
45. Solve problems involving the multiplication of a fraction by a whole number.	Applying
46. Solve problems involving the multiplication of a fraction by a fraction	Applying
47. Solve problems involving the multiplication of a fraction by mixed numbers.	Applying
48. Divide a whole number by a fraction.	Applying
49. Divide a fraction by a whole number.	Applying
50. Divide a fraction by a fraction.	Applying
51. Multiply fractions by whole numbers.	Applying
52. Solve one-step problems involving fractions.	Applying
53. Solve multi-step problems involving fractions.	Reasoning
54. Solve real-life problems involving fractions and using the algorithms developed.	Reasoning
Decimals	
55. State the place value of digits in decimal fractions up to hundredths.	Knowing
56. Explore the place value of decimals to hundredths including expanded notation.	Applying
57. State the value of digits in decimal fractions up to hundredths.	Knowing
58. Compare and order decimals up to hundredths.	Applying
59. Express decimal fractions using expanded notation.	Knowing
60. Convert expanded notation to decimal fractions.	Knowing
61. Arrange decimal fractions in ascending and descending order (up to hundredths).	Knowing
62. Round decimals to the nearest whole number and tenths.	Knowing
63. Solve problems involving the addition and subtraction of decimals including money.	Reasoning
64. Solve problems involving the multiplication of a decimal by a whole number.	Applying
65. Solve problems involving the multiplication of tenths by tenths.	Applying
66. Relate decimals to fractions and money.	
67. Solve problems involving the division of a decimal fraction by a whole number (dividend up to 2 decimal places).	Reasoning

Objectives	Processes
68. Use a number of strategies to solve routine and non-routine problems involving decimals.	Reasoning
69. Express decimals as common fractions.	Knowing
70. Use decimal notation as another form of writing base ten fractions (tenths, hundredths).	Knowing
71. Solve real-world problems involving the addition and subtraction of decimals to hundredths using the algorithm.	Reasoning
Percent	
72. Calculate simple percent of quantities e.g.10% of $200 = 1/10 of $200 = $20.	Knowing
73. Express percentages (e.g. 50%, 25%, 20% and 10%) as fractions (e.g. ½, ¼, 1/5, 1/10).	Knowing
74. Express percentages (e.g. 50%, 25%, 20% and 10%) as decimals (e.g. 0·5, 0·25, 0·2 and 0·1).	Knowing
75. Order fractions, decimals and percentages.	Applying
76. Express quantities as percentages of other quantities.	Applying
77. Solve one – step problems involving percentages (**no gain and loss per cent, no calculation of whole quantities given parts expressed as percent and no calculations of part of quantities given another part expressed as a per cent**).	Applying
78. Solve multi – step problems involving percentages (**no gain and loss percent, no calculation of whole quantities given parts expressed as per cent and no calculations of part of quantities given another part expressed as a per cent**).	Reasoning
79. Identify coins, bills, their value and the value of a set of coins/bills (up to 100 cents and $100).	Knowing
80. Determine the possible combinations of coins/bills, which are equal to given amounts (up to 100 cents and $100).	Reasoning
81. Record money values using decimals.	Knowing
82. Calculate total cost and the change in money transactions.	Applying
83. Solve real-life, one-step problems involving whole numbers, (including profit and loss, best buy, discount, savings, salaries, wages, loans, simple interest, VAT).	Applying
84. Solve real-life, multi-step problems involving whole numbers, (including profit and loss, best buy, discount, savings, salaries, wages, loans, simple interest, VAT).	Reasoning
85. Solve problems involving direct proportions.	Reasoning
86. Solve problems involving unequal sharing (**not including the use of ratio**).	Reasoning

Objectives and Thinking Processes for Measurement Strand

Objective	Processes
Linear Measure	
87. Select and use the most appropriate standard unit for measuring various lengths/distances.	Knowing
88. Convert linear measure from one form to the other (millimetres, centimetres, metres, kilometres).	Knowing
89. Apply decimal knowledge to record measurements. e.g. 123cm = 1.23m	Applying
90. Solve computational problems involving the metre and the centimetre by using the relationship between them.	Reasoning
91. Write and explain the formulae for finding the perimeter of any given rectangle and square.	Reasoning
92. Calculate and compare perimeters of squares and rectangles.	Applying
93. Construct or draw two or more rectangles for a given perimeter in a problem-solving context.	Reasoning
94. Find the perimeters of simple composite figures that may be dissected into rectangles and squares.	Applying
95. Solve problems in real-life contexts involving perimeter.	Reasoning
96. Solve problems involving length.	Reasoning
97. Solve problems involving perimeter of compound shapes.	Reasoning
Area	
98. Select the appropriate unit of measure when measuring surfaces of varying sizes and explain the suitability of the unit.	Knowing
99. Write and explain the formula for finding the area of squares and rectangles.	Reasoning
100. Compare and order area of surfaces and explain reasoning using appropriate vocabulary.	Reasoning
101. Approximate the area of surfaces to the nearest square metre or square centimetre	Reasoning
102. Estimate and verify the area of shapes using square metres and centimetres, and determine reasonableness of answer.	Reasoning
103. Develop and use formula to calculate the area of squares and rectangles.	Reasoning
104. Draw different shapes of a given area on grids.	Reasoning
105. Calculate area of shapes drawn on a grid with unit squares.	Applying

Objective	Processes
106. Calculate the areas of compound shapes that may be dissected into rectangles and squares.	Applying
107. Solve problems involving area and perimeter of plane shapes	Reasoning
108. Solve problems in real-life contexts involving area.	Reasoning
Volume and Capacity	
109. State the relationship between the litre and millilitre and convert from one to the other.	Knowing
110. Identify the cubic centimetre and cubic metre (cm^3 and m^3) as the standard units for measuring volume.	Knowing
111. Measure the volume of boxes by stacking and packing cubic blocks into them and counting to determine the volume.	Reasoning
112. Calculate the volume of cubes and cuboids.	Applying
113. State the relationship between the metric units of volume and capacity (e.g.1L = 1000 cm^3).	Knowing
114. Solve problems involving capacity, number and money.	Reasoning
115. Solve problems involving volume/capacity.	Reasoning
Mass	
116. Measure and compare the masses/weights of objects in kilograms and grams using a set of scales.	Knowing
117. Convert kilograms to grams and vice versa.	Knowing
118. State the relationship between the kilogram and gram	Knowing
119. Determine the most appropriate standard unit for measuring mass/weight.	Knowing
120. Calculate unknown mass/weight on a balance (including the use of algebraic reasoning).	Reasoning
121. Solve problems involving different units of mass/weight (e.g. Find the total mass/weight of three items weighing 50g, 750g and 2.5kg.	Reasoning
122. Solve computational and real-life problems involving grams and kilograms	Reasoning
123. Solve real-life problems involving mass/weight, number and money.	Reasoning
Time	
124. Tell time in five minute intervals using the digital and analog clocks.	Knowing
125. State the time after given intervals on analog and digital clocks.	Knowing
126. Match times shown on standard digital clocks, 24 hour digital clocks and analog clocks to the minute, and record the time.	Knowing

Objective	Processes
127. Calculate the duration of events using starting and finishing times (elapsed time).	Applying
128. Convert minutes to hours.	Knowing
129. Convert hours to minutes.	Knowing
130. Interpret simple time schedules (e.g. the calendar).	Knowing
131. Solve computational and real-life problems involving hours and minutes.	Reasoning
132. Solve problems involving time and other related concepts (using proportional reasoning).	Reasoning

Objectives and Thinking Processes for Geometry Strand

Objective	Processes
Solids and Plane Shapes	
133. Recognize solids from pictorial representations.	Knowing
134. Draw the faces of solids and explore their properties.	Applying
135. Describe the properties of solids in relation to number and types of faces, edges and vertices.	Knowing
136. Name the solids with uniform cross-sections.	Knowing
137. Solve problems involving solids.	Reasoning
138. Recognize plane shapes from pictorial representations.	Knowing
139. Investigate the properties of solids by examining their cross-sections, base, height and angles.	Applying
140. Solve problems involving plane shapes.	Applying
141. Construct and draw regular and irregular polygons given their properties using the principles of parallel and perpendicular lines, angles and number of sides.	Applying
142. Differentiate between regular and irregular polygons (triangles, quadrilaterals, pentagons, hexagons, octagons).	Knowing
143. Describe the properties of specific quadrilaterals (rectangle, square, trapezium, parallelogram and rhombus)	Knowing
144. Describe a given pattern (repeating, increasing or decreasing)	Applying
145. Determine the pattern rule and extend the pattern using concrete materials or pictorial representation.	Applying
146. Classify and compare quadrilaterals according to their attributes (no. of sides and angles, no. of equal sides, no. of pairs of parallel sides, no. of	Applying

Objective	Processes
perpendicular sides).	
147. Classify triangles (same, similar or different) based on properties of sides and angles.	Applying
148. Identify and name triangles as scalene, right angled, isosceles and equilateral.	Knowing
149. Compare and describe the properties of the sides and angles of the scalene, right angled, isosceles and equilateral triangles.	Applying
150. Create repeating, increasing and decreasing patterns using solids or plane shapes (concrete and pictorial) and explain the pattern rule.	Reasoning
151. Insert the missing elements in given patterns (concrete or pictorial) and explain the reasoning.	Reasoning
Symmetry	
152. Determine whether plane shapes, letters and numerals are symmetrical.	Knowing
153. Complete a symmetrical shape given half of the shape and a line of symmetry.	Applying
154. Determine the number of lines of symmetry in plane shapes – (regular, irregular and curved) and in numerals and letters.	Applying
155. Create symmetrical shapes	Reasoning
156. Solve problems involving line symmetry.	Reasoning
Angles	
157. Describe an amount of turn (e.g. whole turn, three quarter turn, half turn or quarter turn).	Applying
158. Recognize an angle as an amount of turn.	Knowing
159. Identify angles on faces of solids or plane shapes that are right angles, greater than right angles or smaller than right angles.	Knowing
160. Investigate angles (right angles, angles greater than and smaller than right angles) in regular and irregular polygons and faces of solids.	Applying
161. Describe an angle as a measure of turn and name the quarter turn as a right angle or the angle formed when perpendicular lines meet.	Knowing
162. Draw shapes with angles of various sizes and describe the angles.	Reasoning

Objectives and Thinking Processes for Statistics Strand

Objective	Processes
163. Represent data using tally charts, frequency tables and graphs (pictographs, block graphs, bar graphs) using various scale factor	Applying
164. Interpret the findings displayed in the tables, charts (including tally charts, no pie charts) and graphs (pictographs, block graphs, bar graphs).	Reasoning
165. Compare the effectiveness of different representations of the same data.	Reasoning
166. Determine a suitable scale for data and record the scale in a key.	Reasoning
167. Use analysed data to solve problems, draw conclusions and make decisions.	Reasoning
168. Communicate findings and decisions made using appropriate vocabulary associated with statistics. Determine the mode of a given set of data.	Reasoning
169. Apply findings from analysis of data to solve problems.	Applying
170. Evaluate decisions made based on analysis of data represented in tables, charts and graphs.	Reasoning
169. Calculate the mean of a given set of data.	Knowing
170. Solve problems involving mean/average.	Reasoning

References

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