Framework

Assessment of Reading,
Writing and Mathematics,
Junior Division
(Grades 4–6)

December 2007 Edition

**Education Quality and
Accountability Office**

EQAO

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December 2007 Edition:

What's new in this framework

See page 2 to learn about changes in the December 2007 edition.

Introduction

This framework provides a detailed description of the EQAO Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6), which is conducted each year in Ontario. It also describes how the junior division assessment aligns with the expectations in *The Ontario Curriculum*.

Who is this framework for?

This framework has been prepared for

- educators;
- parents and
- members of the general public.

What is in the framework?

In this framework, you will find

Chapter 1: a brief introduction to EQAO, large-scale assessments in Ontario and the Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6), and information on the differences between large-scale and classroom assessment.

Chapter 2: a discussion of the purpose and benefits of the junior division assessment, a description of how results are reported as well as information about how EQAO assessments align with national and international testing.

Chapter 3: information on the language component and how it aligns with *The Ontario Curriculum* and with current research.

Chapter 4: information on the mathematics component and how it aligns with *The Ontario Curriculum* and current research.

Chapter 5: discussions of the assessment process, the content of language and mathematics assessment booklets, accommodations for students with special needs and the meaning of Ontario's achievement levels.

Chapter 6: the assessment blueprint and information on how EQAO assessments are aligned with curriculum expectations.

Chapter 7: information on how student responses to language and mathematics questions are scored.

Chapter 8: a discussion of how EQAO ensures that its assessments are comparable from year to year.

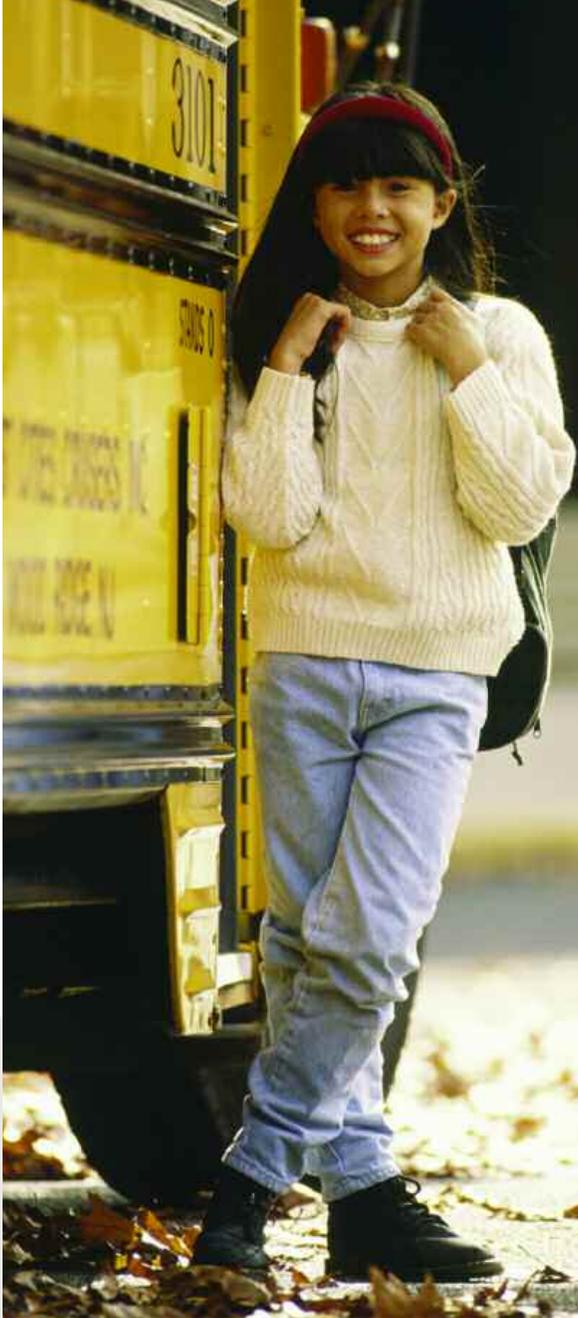## What's New in the December 2007 Edition

The December 2007 edition of the framework has been reorganized and rewritten to improve clarity and readability. It has also been redesigned to enhance the presentation of information in both text and chart form. This edition carries over a number of changes from the October 2006 edition and makes some new ones, as described below:

- The name of the assessment was changed from the Grade 6 Assessment of Reading, Writing and Mathematics to the Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6). This change reflects the important fact that EQAO assessments measure the cumulative knowledge and skills students acquire by the end of key stages of education.

- The assessment blueprint was updated as a result of the release of the revised *Ontario Curriculum, Grades 1–8: Language* (2006).

- The scoring rubrics for writing have been revised for the 2007–2008 assessment administration.

- What is EQAO?
- What is assessment?
- What assessments does EQAO conduct?
- What is the Assessment of Reading, Writing and Mathematics, Junior Division?

Insight: Differences between large-scale and classroom assessment

CHAPTER 1: About EQAO and Provincial Assessments

What is EQAO?

The Education Quality and Accountability Office (EQAO) is an arm's-length agency of the provincial government that measures the achievement of students across Ontario in reading, writing and mathematics, and reports the results to parents, educators and government. EQAO assessments are based on the expectations in *The Ontario Curriculum*.

EQAO results are reported at the provincial, school board and school levels. They are used by the Ministry of Education, district school boards and schools to improve learning, teaching and student achievement. An Individual Student Report is also provided by EQAO for each student who writes an EQAO assessment.

What is assessment?

Assessment is an important part of teaching and learning. For example, teachers use assessment in the classroom

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to gauge the skills and knowledge of their students. They use this information to plan their teaching and identify individual students who may need additional help. A traditional test is one kind of assessment, but student progress can be measured in many other ways. Reviewing a portfolio of student work is one example. Large-scale assessments, like those conducted by EQAO, measure student achievement across the province at critical times in students' school careers.

Insight:

Differences between large-scale and classroom assessment

EQAO's Large-Scale Assessments	Classroom Assessment
The purpose of EQAO's large-scale assessments is to provide comparable year-to-year data to give the public information on student achievement.	The purposes of classroom assessment are to improve student learning (using models such as Ministry exemplars to assess the quality of work), to report regularly on student achievement and to provide timely, constructive feedback for improvement.
EQAO's large-scale assessments provide reliable, objective and high-quality data that can inform school boards' improvement planning and target setting.	Classroom assessments encourage students to engage in self-evaluation and personal goal setting. They also provide parents with information on strengths and weaknesses that can be used to encourage improvement.
EQAO's large-scale assessment materials are created and scored "at a distance." The assessment scorers do not know the students personally.	Classroom assessment materials are usually created and marked by a teacher who knows the students personally.
EQAO's large-scale assessments are summative; they present a snapshot of student achievement or learning at the time the assessment is administered.	Classroom assessments are conducted in an instructional context and include diagnostic, formative and summative assessment. They are administered at regular intervals over time.
EQAO's large-scale assessments require students to demonstrate their knowledge and skills independently on standardized tasks and under standardized conditions, although some accommodations are allowed for students with special education needs.	A wide variety of supports (reminders, clarification) are often available to address students' special education needs and abilities.

EQAO's large-scale assessments measure achievement against expectations from the prescribed curriculum and contain tasks and items that sample from and represent the curriculum for the domain assessed.	Classroom assessments measure expectations from the curriculum and contain tasks and items that represent expectations, topics and themes that have been taught. The questions are written in language used regularly in the classroom by the teacher.
EQAO's large-scale assessments provide the same (in a given year) or psychometrically comparable items (from year to year) for all students.	Classroom assessments can provide modified items or tasks tailored to the special education needs of individuals or groups of students.
In order for students' results on EQAO's large-scale assessments to be comparable across the province, the assessments must be administered, scored and reported on in a consistent and standardized manner.	Results of classroom assessments across the province are not always comparable, because of the variation in administration procedures and time allowed, amount of teacher support, modification of items to suit student needs and teacher autonomy in marking.
For EQAO's large-scale assessments, all scorers use the same scoring guides and are trained and monitored to ensure objectivity and consistency.	The marking of classroom assessments is more subjective and is often influenced by contextual information about the students that is available to the teacher. Teachers use the achievement charts in the curriculum policy documents to guide assessment decisions.

What assessments does EQAO conduct?

EQAO conducts four provincial assessments each year. These are
• the Assessment of Reading, Writing and Mathematics, Primary Division (Grades 1–3);
• the Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6);
• the Grade 9 Assessment of Mathematics and
• the Ontario Secondary School Literacy Test.

What is the Assessment of Reading, Writing and Mathematics, Junior Division?

The Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6), which is the subject of this framework, evaluates the knowledge and skills of students at the end of Grade 6. *The Ontario Curriculum* sets out expectations for the knowledge and skills students are expected to have gained by the end of this grade. The assessment is used to determine how well students are achieving these expectations, and their level of achievement. See Chapter 5 for more information about Ontario's student achievement levels.

In This Chapter

• What is the purpose of the junior division assessment?
• What is reported?
• What are the benefits of the assessment?

Insight: Is the assessment consistent with national and international assessments?

CHAPTER 2:
The Junior Division Assessment

What is the purpose of the junior division assessment?

The purpose of the Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6) is to assess the level at which students are meeting curriculum expectations in reading, writing and mathematics at the end of the junior division (up to the end of Grade 6).

The results of this assessment are reported by
• individual student;
• school;
• school board and
• the whole province.

What is reported?

The Individual Student Report includes:
• the student's overall results for reading, writing and mathematics and
• comparative data showing the individual student's results in relation to school, board and provincial results.

School reports include
• overall school-level results for reading, writing and mathematics, with comparisons to board and provincial results;
• results by subgrouping, such as by gender and English-language learner and special needs status;

• contextual data on demographics and participation in the assessment;
• results over time;
• results of the student questionnaire accompanying the assessment;
• a Student Roster report that shows individual student results for each item on the assessment, with overall board and provincial results for comparison and
• profiles of strengths and areas for improvement in reading, writing and mathematics.

Board reports include
• overall board results for reading, writing and mathematics, with comparisons to provincial results;
• contextual data, results over time, reports by subgroup and questionnaire data and
• profiles at the board level of strengths and areas for improvement in reading, writing and mathematics.

Provincial reports include
• overall provincial results for reading, writing and mathematics, including results by board;
• contextual data, results over time, reports by subgroup and questionnaire data;
• instructional strategies for success and
• case studies (school success stories).

Note: In cases where the number of students being reported on for a school or board is small enough that individual students could be identified, EQAO does not release the reports publicly.

What are the benefits of the assessment?

EQAO provides the Ontario school system with valid, reliable and comparable year-to-year data on student achievement. Schools and boards can confidently use this data along with other contextual and assessment information (e.g., on demographics,

attendance and pass rates) to determine how well their improvement strategies, such as staff development or new learning resources, are working. Beyond specific reporting, EQAO's junior division assessment

• provides data to assist schools and boards in improvement planning and target setting;
• supports the successful implementation of the curriculum;

• improves understanding of assessment practices among educators across the province through capacity building (for example, by assisting teachers to understand the curriculum and to develop related classroom assessments) and
• improves understanding of assessment practices among the public.

Insight:

Is the assessment consistent with national and international assessments?

The definitions of reading, writing and mathematics for the junior division assessment are consistent with the definitions of these terms for other national and international assessments in which Ontario students participate.

The Pan-Canadian Assessment Program (PCAP) Assessments of Reading and Mathematics (13-year-old students) and the Student Achievement Indicators Program (SAIP) Assessments of Reading and Writing (13- and 16-year-old students), Administered by the Council of Ministers of Education, Canada (CMEC)

As of 2007, SAIP has been replaced by PCAP.

A student's reading fluency depends on the
• personal experience the student brings to the task,
• student's language base (vocabulary and language strategies),
• complexity of the textual information, and
• difficulty of the task….

Text complexity includes consideration of vocabulary, organization, rhetorical devices, syntax, ideas, and subject matter. In straightforward texts these features are uncomplicated, direct, concrete, and conventional. In more complex texts these features are relatively more complicated, more varied, indirect, and somewhat more abstract, but usually remain conventional.

In sophisticated texts the features are subtle, challenging, frequently abstract, and often innovative and unconventional. Students are asked to read texts at these three levels of complexity.…

Three types of questions are presented to students. Interpretive questions require students to demonstrate an understanding of the reading passages at literal and figurative levels. Evaluative questions ask students to make judgments about textual information and the author's purposes. Extension and extrapolation questions require the student to relate concepts in the texts to their personal experiences, explaining the links clearly (CMEC, 1999, p. 5).

The blueprint for the junior division assessment requires reading selections that are mostly "straightforward," occasionally "complex" and never "sophisticated" as defined by SAIP. The reading questions on the junior division assessment are mostly "interpretive," occasionally involve "extension" or are "interpolative" and are rarely "evaluative" as these terms are defined by SAIP.

Writing takes place within a specified context or situation.…This SAIP assessment will consider the writer's skill in integrating such elements as development of ideas, organization, language conventions and usage, and stylistic features in carrying out a purpose

....Writing is socially situated in that it is meant to be read. This social dimension calls for particular qualities such as clarity of communication and correctness of language (CMEC, 2003, p. 10).

The junior division assessment assesses writing for development of ideas, organization, language conventions and usage, clarity of communication and correctness of language and stylistic features.

SAIP assesses the reading, writing and mathematical knowledge and skills of 13- and 16-year-old students. SAIP assessments of reading, writing, mathematics and science are conducted under the auspices of the CMEC on a rotating schedule every four years in 12 Canadian provinces and territories.

In Ontario, over 4800 13- and 16-year-old students in approximately 360 randomly selected English- and French-language schools participate.

The SAIP/PCAP assessments help to determine how well education systems across Canada are meeting the needs of students and society and whether students across Canada reach similar levels of performance at about the same age.

The Progress in International Reading Literacy Study (PIRLS), Administered by the International Association for the Evaluation of Educational Achievement (Grade 4 students)

> Readers are regarded as actively constructing meaning and as knowing effective reading strategies and how to reflect on reading. . . . Meaning is constructed through the interaction between the reader and text in the context of a particular reading experience (Mullis, Kennedy, Martin and Sainsbury, 2006, pp. 3–4).

The junior division assessment shares this view of readers and how they construct meaning. PIRLS does not assess writing.

PIRLS assesses the reading skills of nine-year-old (Grade 4) students. It is conducted under the auspices of the International Association for the Evaluation of Educational Achievement every five years in over 40 countries around the world.

In Ontario, Grade 4 classes in 200 randomly selected schools participate.

The PIRLS assessments help to determine trends in children's reading literacy achievement and policy and practices related to literacy. Countries that participate collect valuable information about students' performance in reading, as well as home, school and classroom influences on that achievement.

Trends in International Mathematics and Science Study (TIMSS), Administered by the International Association for the Evaluation of Educational Achievement (Grades 4 and 8)

The mathematics assessment framework for TIMSS is framed by two organizing dimensions: a content dimension and a cognitive dimension. Each dimension has several domains. The mathematics content domains in TIMSS are Number, Algebra, Measurement, Geometry and Data, which are aligned with the content strands in *The Ontario Curriculum* and thus with those assessed by EQAO's junior division assessment. The cognitive mathematics domains in TIMSS include knowing facts and procedures, using concepts, solving routine problems and reasoning. These domains are detailed below.

Cognitive Mathematics Domains

Knowing Facts and Procedures: Having the factual knowledge (the basic language of mathematics and the essential mathematical facts and properties) and using it to solve routine problems.

Using Concepts: Making connections between mathematical concepts to judge the validity of mathematical statements and to create mathematical representations.

Solving Routine Problems: Solving problems similar to those encountered in mathematics textbooks.

Reasoning: Observing the facts and making conjectures to solve non-routine problems.

The mathematics component of the junior division assessment aligns with the content domains of the TIMSS assessments and considers mathematical processes and

the above cognitive domains in its design and development. It also recognizes that several of these domains are present in each problem-solving task and that they can not easily be separated. The junior division assessment does not assess every aspect of mathematics that is assessed by the Grades 4 and 8 TIMSS assessments, nor does TIMSS assess every aspect of *The Ontario Curriculum*. Notwithstanding, the junior division assessment is well aligned with the TIMSS assessments.

TIMSS assesses the mathematical learning of Grades 4 and 8 students in over 60 countries around the world, and it is conducted under the auspices of the International Association for the Evaluation of Educational Achievement.

In Ontario, over 7000 students in Grades 4 and 8 in randomly selected English- and French-language schools participate.

The TIMSS assessments are dedicated to improving the teaching and learning of mathematics and science for students around the world. TIMSS provides data about trends in mathematics and science achievement over time.

- What is the definition of language for the junior division assessment?
- Does the definition of language align with *The Ontario Curriculum*?
  - What is assessed in reading and writing?

  Insight: How the definition of language aligns with current research

CHAPTER 3:
Language Component

What is the definition of language for the junior division assessment?

Since language is the basis for learning, the concept of "success for all" in education means that all students must attain at least a minimum level of language knowledge and skill as part of their education. For the purpose of the junior division assessment, language constitutes the reading and writing skills required to understand reading selections and to communicate through written forms as expected in *The Ontario Curriculum* across all subjects up to the end of Grade 6.

In the reading component, students use reading strategies to interact with a variety of fiction and non-fiction reading selections to construct an understanding of the meaning of the texts. Students are asked to demonstrate their understanding of explicit (directly stated) and implicit (indirectly stated) meanings. They must also connect their understanding of the text to their personal knowledge and experience. The reading selections are representative of the materials students are expected to read and understand in all subject areas of *The Ontario Curriculum* up to the end of Grade 6.

In the writing component, students develop, support and organize ideas in order to communicate them clearly and correctly through a variety of written text forms. These forms are representative of those that students are expected to know how to write in all subject areas in *The Ontario Curriculum* up to the end of Grade 6.

Does the definition of language align with *The Ontario Curriculum*?

EQAO's junior division assessment is a standards-referenced large-scale assessment based on the *Ontario Curriculum* expectations and standards (levels of achievement) for student performance.

The Ontario Curriculum, Grades 1–8: Language (2006) states the following about reading:

> Reading is a complex process that involves the application of many strategies before, during, and after reading.… During reading, students may use "cueing systems"—that is, clues from context or from their understanding of language structures and/or letter-sound relationships —to help them solve unfamiliar words, and comprehension strategies to help them make meaning of the text. Comprehension strategies include predicting, visualizing, questioning, drawing inferences, identifying main ideas, summarizing, and monitoring and revising comprehension. After reading, students may analyse, synthesize, make connections, evaluate, and use other critical and creative thinking skills to achieve a deeper understanding of the material they have read.

The Ontario Curriculum, Grades 1–8: Language (2006) states the following

about writing:

> Writing is a complex process that involves a range of skills and tasks. Students need to become disciplined thinkers in order to communicate their ideas clearly and effectively....As they learn to select and organize their ideas, they must also keep in mind the purpose for which they are writing and the audience they are addressing. To communicate clearly and effectively, they need to learn to use standard written forms and language conventions.

What is assessed in reading and writing?

Reading is defined as the process of actively making meaning across a variety of fiction and non-fiction written texts that students are expected to understand according to the expectations in *The Ontario Curriculum* across all subjects up to the end of Grade 6. The junior division assessment focuses on three reading skills:
• understanding explicitly stated

information and ideas;
• understanding implicitly stated information and ideas (making inferences) and
• responding to reading by making connections between information and ideas in a reading selection and the reader's personal knowledge and experience (interpreting a reading selection by integrating its information and ideas with personal knowledge and experience).

Writing is defined as the constructive process of communicating in the written forms in which students are expected to write according to the expectations in *The Ontario Curriculum* across all subjects up to the end of Grade 6. The junior division assessment focuses on three writing skills:
• developing a main idea with sufficient supporting details;
• organizing information and ideas in a coherent manner and
• using conventions (spelling, grammar, punctuation) in a manner that does not

to create and communicate their own ideas to others. Additionally, through writing, students come to understand how texts are constructed and learn how ideas are presented within texts. This knowledge helps students to understand ideas and information and make inferences and predictions when they are reading.

The reading component of the Grade 6 assessment is based on the widely accepted view in research that reading comprehension is the goal of reading (Pearson & Johnson, 1978; Pressley, 2000). Comprehension is influenced by factors inside and outside the reader. Internal factors include the reader's experience; social and cultural identities; what the reader knows about language, about print and about the world; as well as the reader's interest, motivation, strategies, purpose, perspectives and repertoire of reading skills. External factors include the reading task; the text organization and format; the vocabulary and topic of the text; and the social and physical environment.

Evidence of students' reading comprehension is reflected in the scoring guides of the Grade 6 assessment reading component: (1) analyzing textually explicit information and ideas that are directly stated in one part of the text; (2) synthesizing textually explicit information and ideas that are found in more than one place in the text; (3) inferring or predicting textually implicit ideas using background knowledge and experience together with information in the text; and (4) providing scriptally implicit ideas and information by making personal connections with background knowledge and experience (Pearson & Johnson, 1978; Raphael, 1986).

The writing component of the Grade 6 assessment is framed by a widely accepted understanding of writing as communicating meaning using the conventions of print and texts for various purposes and audiences within various social contexts (Chapman, 1997). Writers draw on their background knowledge about print, text structures and communicative possibilities of various genres, as well as their experiences and knowledge about the world in general, to compose texts.

A cognitive processing model (Flower & Hayes, 1981) is used to understand how students compose the texts required in the Grade 6 assessment's writing component. Writers' writing processes are viewed as non-linear and dynamic, varying from writer to writer and according to the purpose, audience and social context for the writing. Generally, writing involves some form of planning (e.g., generating and organizing ideas and determining goals), composing and drafting, and monitoring and revising of the growing text. Editing of conventions occurs at any point in writers' writing processes.

Evidence of students' writing development (Moffett, 1968) is reflected in the scoring guides of the junior division assessment's writing component:

(1) Students' writing is more highly valued as it develops from the vague, where they address a distant, unknown audience, to the concrete, where they address a known audience. This dimension is demonstrated when writers become aware of the need to provide information for readers who may or may not share their perspectives and experiences. They also recognize that clarity of communication requires the use of conventional punctuation, spelling and grammar.

(2) Students' writing is more highly valued as it develops from a confusing presentation of ideas and information to a more clear and coherent presentation. This dimension is demonstrated when writers move away from written work containing hackneyed information and ideas and from the use of vague, colloquial language and limited syntactic choices to composing more effective texts that organize ideas and information clearly and use language and sentence structures with some effectiveness.

In This Chapter

• What is the definition of mathematics for the junior division assessment?
• Does the definition of mathematics align with *The Ontario Curriculum*?
• What is assessed in mathematics?

Insight: What does current research tell us about learning and assessing mathematical knowledge?

What is the definition of mathematics for the junior division assessment?

A number of sources have been used to construct the following definitions of mathematics.

> Mathematical literacy is an individual's capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgements and to use and engage with mathematics in ways that meet the needs of that individual's life as a constructive, concerned and reflective citizen (Organisation for Economic Co-operation and Development, 2003, p. 24).

> Achievement in mathematics goes beyond knowing mathematical facts and procedures; it also means being able to reason mathematically and to have the ability to interpret and solve mathematical problems (Artelt, Baumert, Julius-McElvany & Peschar, 2003).

Content Strands

Mathematics spans several content strands or domains. The mathematics content strands for the assessment align with Ontario's elementary strands:
• Number Sense and Numeration
• Measurement
• Geometry and Spatial Sense
• Patterning and Algebra
• Data Management and Probability

Mathematical Processes

Mathematics involves many different processes. It is often defined as having the following five components:
• *Conceptual understanding*—comprehension of mathematical concepts, operations and relations
• *Procedural fluency*—skill in carrying out procedures flexibly, accurately, efficiently and appropriately
• *Strategic competence*—ability to formulate, represent and solve mathematical problems
• *Adaptive reasoning*—capacity for logical thought, reflection, explanation and justification
• *Productive disposition*—habitual inclination to see mathematics as sensible, useful and worthwhile, coupled with a belief in diligence and one's own efficacy
> (Kilpatrick, Swafford & Findell, 2001)

These components are different aspects of a complex whole. They are interwoven and interdependent and cannot be easily separated.

Does the definition of mathematics align with *The Ontario Curriculum*?

EQAO's junior division assessment is a curriculum-based, standards-referenced large-scale assessment. It is developed in relation to the *Ontario Curriculum* expectations and standards (levels of achievement) for student performance. The descriptors of mathematical content and

processes below are found on pages 53–54 of *The Ontario Curriculum, Grades 1–8: Mathematics* (2005).

Mathematical Content Descriptors

The following are highlights of student learning in Grade 6 from *The Ontario Curriculum.* They are provided to give teachers and parents a quick overview of the mathematical knowledge and skills that students are expected to acquire in each strand in this grade. The expectations on the pages that follow outline the required knowledge and skills in detail and provide information about the ways in which students are expected to demonstrate their learning, how deeply they will explore concepts and at what level of complexity they will perform procedures, and the mathematical processes they will learn and apply throughout the grade.

Number Sense and Numeration: representing and ordering numbers to 1 000 000; developing the concept of place value to thousandths; comparing and ordering fractional amounts with unlike denominators; estimating 10%, 25%, 50%, and 75% of a quantity; adding and subtracting decimal amounts to thousandths; multiplying and dividing four-digit whole numbers by two-digit whole numbers; multiplying and dividing decimals to tenths by whole numbers and two-digit by two-digit whole numbers; dividing three-digit whole numbers by one-digit whole numbers; applying order of operations in expressions without brackets; relating simple fractions, decimals, and percents
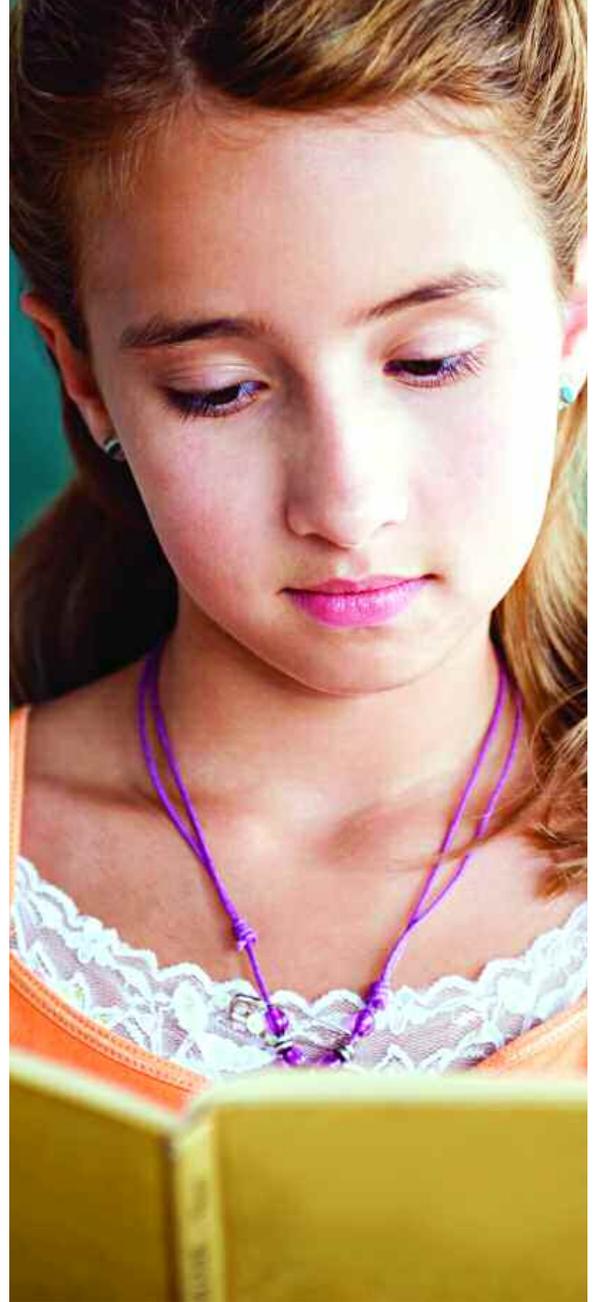
Measurement: measuring quantities using metric units; converting from larger to smaller metric units, including square metres to square centimetres; developing and applying area relationships for a parallelogram and a triangle; developing and applying the volume relationships for a triangular prism; determining and applying surface area relationships for rectangular and triangular prisms; relating square metres and square centimeters

Geometry and Spatial Sense: classifying quadrilaterals by geometric properties; sorting polygons by lines of symmetry and by rotational symmetry; measuring angles to 180° with a protractor; constructing polygons; representing figures using views and isometric sketches; performing and describing rotations; plotting points in the first quadrant

Patterning and Algebra: representing patterns using ordered pairs and graphs; describing pattern rules in words; calculating any term when given the term number; investigating variables as changing quantities; solving equations using concrete materials and guess and check

Data Management and Probability: collecting and organizing discrete and continuous data; displaying data using continuous line graphs; selecting appropriate graphical representations; using continuous line graphs and mean to compare sets of data; finding theoretical probabilities; predicting the frequency of an outcome based on the theoretical probability

Mathematical Process Descriptors

These mathematical process expectations from *The Ontario Curriculum* are to be integrated into student learning associated with all the strands.

Throughout Grade 6, students will

Problem Solving: develop, select, and apply problem-solving strategies as they pose and solve problems and conduct investigations, to help deepen their mathematical understanding.

Reasoning and Proving: develop and apply reasoning skills (e.g., classification, recognition of relationships, use of counter-examples) to make and investigate conjectures and construct and defend arguments.

Reflecting: demonstrate that they are reflecting on and monitoring their thinking to help clarify their understanding as they complete an investigation or solve a problem (e.g., by comparing and adjusting strategies used, by explaining why they think their results are reasonable, by recording their thinking in a math journal).

Selecting Tools and Computational Strategies: select and use a variety of concrete, visual, and electronic learning tools and appropriate computational strategies to investigate mathematical ideas and to solve problems.

Connecting: make connections among mathematical concepts and procedures, and relate mathematical ideas to situations or phenomena drawn from other contexts (e.g., other curriculum areas, daily life, sports).

Representing: create a variety of representations of mathematical ideas (e.g., by using physical models, pictures, numbers, variables, diagrams, graphs, onscreen dynamic representations), make connections among them, and apply them to solve problems.

Communicating: communicate mathematical thinking orally, visually, and in writing, using everyday language, a basic mathematical vocabulary, and a variety of representations, and observing basic mathematical conventions.

What is assessed in mathematics?

The mathematics component of the junior division assessment assesses key aspects of mathematics across the five strands in the mathematics curriculum:

- Number Sense and Numeration
- Measurement
- Geometry and Spatial Sense
- Patterning and Algebra
- Data Management and Probability

The assessment allows students to demonstrate that they can

- understand concepts;
- apply procedures;
- apply and adapt a variety of appropriate strategies to solve problems;
- use concrete materials to model mathematical ideas;
- make and investigate mathematical conjectures;
- select and use a variety of types of reasoning;
- communicate their mathematical thinking coherently;
- analyze the mathematical thinking of others;
- use appropriate mathematical language and conventions;
- connect mathematical ideas;
- recognize and apply mathematics in a variety of contexts;
- create and use representations to organize, record and communicate mathematically and
- use representations to model mathematical thinking.

(National Council of Teachers of Mathematics, 2000)

Insight:

What does current research tell us about learning and assessing mathematical knowledge?

The mathematics component of the EQAO junior division assessment is aligned with much of the current research in mathematics education. There is a strong match with curriculum content strands across most jurisdictions, and the mathematics component of the assessment includes mathematical processes and actions. The EQAO assessment is aligned with *The Ontario Curriculum*, and this alignment is well substantiated. Honouring the focus on problem solving in both the curriculum and this assessment component cannot be emphasized enough. Current research in mathematics teaching and learning recognizes that children learn more mathematics when instruction is based on their ways of thinking and engages them in problem solving (Yackel, 1997; Yackel & Cobbs,

1996; Zack & Graves, 2001). Children also appear to benefit from teachers assisting them in seeing the connections among various mathematical ideas (Boaler, 2002). Hence, mathematical concepts are not just transmitted but are the result of questioning, probing, making mistakes, reflecting and reworking. This is an active process in which the student plays a central role in trying to make sense of his or her experiences. These processes of constructing new learning can happen more easily and effectively if the students are working in a rich learning environment. In 1991, the National Council of Teachers of Mathematics (NCTM) presented a new vision of a mathematics class that is just as relevant today:

• Toward the classroom as a mathematics community and away from the classroom as simply a collection of individuals

• Toward logic and mathematical evidence as verification and away from the teacher as the sole authority for right answers

• Toward mathematical reasoning and away from mere memorizing procedures

• Toward conjecturing, inventing and problem solving and away from an emphasis on the mechanistic finding of answers

• Toward connecting mathematics, its ideas and its applications and away from treating mathematics as a body of isolated concepts and procedures

(Van de Walle, 2004)

Figure 1 shows the NCTM's suggestions for the emphasis on content strands across the grades.

As seen in this graphic, the balance of content strands is different at various grade levels. For instance, at Grade 6 there should be a stronger emphasis on Algebra than there was in Grade 3.

This agrees with research that suggests that a young child's ability to grapple with algebraic concepts is highly limited and therefore should receive little attention (Fischbein & Gazit, 1984). Given the NCTM suggestions of the distribution of mathematics topics, the balance among the strands in the junior division assessment reflects the curriculum and the important mathematics that students should know.

Figure 1: Varying emphasis of content strands across the grades (NCTM, 2000).
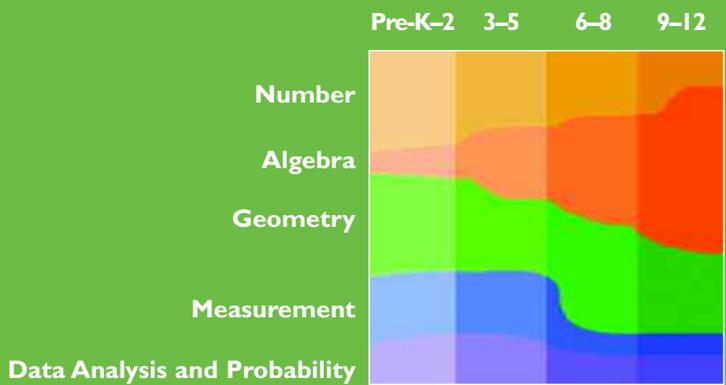
The content standards should receive different emphases across the grade bands.

CHAPTER 5:
The Assessment Process

What does the junior division assessment consist of?

The junior division assessment consists of three booklets: two language and one mathematics. Each booklet contains two sessions.

Administering the Assessments of Reading, Writing and Mathematics, Primary Division (Grades 1–3) and Junior Division (Grades 4–6) gives a suggested administration time for each session. These one-hour session lengths are general guidelines appropriate for most students. However, in acknowledgement of normal classroom practice, the assessments are designed to be untimed. Additional time should be provided to any student unable to complete a session in one hour. The amount of additional time per session will normally range from five to 20 minutes; however, students may take the time they need to complete the session as long as it is in one continuous sitting on the day on which the session is assigned.

What is in the language booklets?

There are two language booklets, each with reading and writing tasks. The language booklets contain both operational and field-test items.

The operational portion of the reading component contains one long reading selection (650–700 words) followed by 10 multiple-choice questions and two open-response questions. The reading component also contains four short reading selections (300–350 words) each followed by four multiple-choice questions and two open-response questions.

The operational portion of the writing component requires students to write one two-page and two one-page responses and to answer eight multiple-choice questions.

The language booklets contain embedded field-test items in the reading and writing components, which comprise fewer than 20% of the items.

Reading Component

Junior Division Assessment Reading Component: Approximate Number of Items by Type			
	Multiple-Choice Items	Open-Response Items	Total Items
Operational	26	10	36
Field Test	10 (or 4)	2	12 (or 6)
Total Reading Items for Each Student	36 (or 30)	12	48 (or 42)

Junior Division Assessment Reading Component: Approximate Number of Raw Score Points and Percentage of Total Raw Score Points by Item Type		
Operational Item Type	Number of Raw Score Points	Percentage of Total Raw Score Points
Multiple-Choice	26	39%
Open-Response	40	61%
Totals	66	100%

Note: Only students' responses to the operational items are used to determine their achievement on each component of the assessment.

Writing Component

Junior Division Assessment Writing Component: Approximate Number of Items by Type			
	Multiple-Choice Items	Writing Prompts	Total Items
Operational	8	3	11
Field Test	1	0 (or 1)	1 (or 2)
Total Writing Items for Each Student	9	3 (or 4)	12 (or 13)

Junior Division Assessment Writing Component: Approximate Number of Raw Score Points and Percentage of Total Raw Score Points by Item Type		
Operational Item Type	Number of Raw Score Points	Percentage of Total Raw Score Points
Multiple-Choice	8	28%
Writing Prompts	21	72%
Totals	29	100%

Note: Only students' responses to the operational items are used to determine their achievement on each component of the assessment.

What is in the mathematics booklet?

The operational portion of the mathematics booklet contains 28 multiple-choice and eight open-response questions. The eight open-response questions are distributed across the five strands (Number Sense and Numeration; Measurement; Geometry and Spatial Sense; Patterning and Algebra; and Data Management and Probability). The mathematics booklet also contains an embedded field-test component (about 20% of allotted time).

Mathematics Component

Junior Division Assessment Mathematics Component: Number of Items by Type			
	Multiple-Choice Items	Open-Response Items	Total Items
Operational	28	8	36
Field Test	4	1	5
Total Mathematics Items for Each Student	32	9	41

Junior Division Assessment Mathematics Component: Number of Raw Score Points and Percentage of Total Raw Score Points by Item Type		
Operational Item Type	Number of Raw Score Points	Percentage of Total Raw Score Points
Multiple-Choice	28	47%
Open-Response	32	53%
Totals	60	100%

Note: Only students' responses to the operational items are used to determine their achievement on each component of the assessment.

How does EQAO ensure that English-language learners and students with special education needs can participate fairly?

English-language learners are provided with special provisions and students with special education needs are allowed accommodations to ensure that these students can participate in the Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6) and can demonstrate the full extent of their skills. In cases where special provisions or accommodations will not address a student's needs, exemption from participation in the assessment is allowed.

Each year, EQAO reviews and updates these provisions and accommodations to ensure that they reflect new developments in supports for students. A separate document for students with special education needs and English-language learners outlines the policies and procedures for granting special provisions, accommodations and exemptions, ensuring the integrity of the assessment.

Insight:

Understanding Ontario's student achievement levels

EQAO uses the definitions for the Ontario Ministry of Education levels of achievement for the levels used on its assessments:

Level 1 identifies achievement that falls much below the provincial standard, while still reflecting a passing grade.

Level 2 identifies achievement that approaches the standard.

Level 3 represents the provincial standard of achievement.

Level 4 identifies achievement that surpasses the standard.

The characteristics given for Level 3 in the achievement charts in *The Ontario Curriculum* correspond to the provincial standard for achievement of the curriculum expectations. Parents of students achieving at Level 3 can be confident that their children will be prepared for work in the next grade.

It should be noted that achievement at Level 4 does not mean that the student has achieved expectations beyond those specified for a particular grade. It indicates that the student has achieved all or almost all of the expectations for that grade, and that he or she demonstrates the ability to use the knowledge and skills specified for that grade in more sophisticated ways than a student achieving at Level 3 (Ministry of Education, 2005, p. 19; Ministry of Education, 2006, p. 16).

After all items in a student's performance are scored, the data from the operational items are used to determine the student's level of performance. The Individual Student Report shows both the level and the range within the level at which the student performed. This enables parents and teachers to plan for improvement.

• How are curriculum expectations reflected in the junior division assessment?

CHAPTER 6: Curriculum Connections and the Blueprint

How are curriculum expectations reflected in the junior division assessment?

The junior division assessment blueprint in this chapter presents the expectations in clusters and gives the number and types of items on the assessment.

The blueprint also identifies which Grade 6 Ontario language and mathematics curriculum expectations are assessed and which are not assessed by the Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6).

Some expectations cannot be appropriately assessed within the limits of a large-scale pencil-and-paper assessment. For instance, it is difficult to measure mathematics expectations that require students to use concrete materials on a large-scale assessment. This kind of skill is best assessed by the teacher in the classroom, where it is possible to see whether the students are actually using the concrete materials. Students should still be encouraged to use concrete materials as support throughout the mathematics component of the assessment. (For a comparison of large-scale and classroom assessment, see the chart in Chapter 1.)

In the blueprint, on the following pages, the expectations and parts thereof that cannot be measured appropriately by a large-scale assessment appear in italics.

Although the main focus of the Assessment of Reading, Writing and Mathematics, Junior Division (Grades 4–6) is the Grade 6 Ontario language and mathematics curriculum expectations, some parts of the assessment relate to Grades 1–5 curriculum expectations.

Reading Component

#	**Grade 6 Reading Expectations**	Question Type by Reading Text					**Reading Raw Score Points**
		Long Narrative Texts (650–700 words)	Short Narrative Texts (300–350 words)	Poems (up to 300 words)	Non-Narrative Informational Texts (300–350 words)	Graphic Texts (up to 300 words)	
6RI.0	read and demonstrate an understanding of a variety of literary, graphic, and informational texts, *using a range of strategies to construct meaning*						
6RI.1	read a wide variety of texts from diverse cultures, including literary texts, graphic texts, and informational texts						
6RI.2	identify a variety of purposes for reading and *choose reading materials appropriate for those purposes*						
6RI.3	*identify a variety of reading comprehension strategies and use them appropriately before, during, and after reading to understand increasingly complex texts*						
6RI.4	demonstrate understanding of increasingly complex texts by summarizing and explaining important ideas and citing relevant supporting details	6 **MC**	2 **MC**	2 **MC**	2 **MC**	2 **MC**	14 x 1 + 7 x 4 = 42 score points or 64% of reading score
6RI.5	develop interpretations about texts using stated and implied ideas to support their interpretations	1 **OR**	1 **OR**	2 **OR**	2 **OR**	1 **OR**	
6RI.6	extend understanding of texts by connecting, comparing, and contrasting the ideas in them to their own knowledge, experience, and insights, to other familiar texts, and to the world around them						
6RI.7	analyse increasingly complex texts and explain how the different elements in them contribute to meaning						
6RI.8	make judgements and draw conclusions about ideas in texts and cite stated or implied evidence from the text to support their views						
6RI.9	identify the point of view presented in texts; determine whether they can agree with the view, in whole or in part; and suggest some other possible perspectives						

MC multiple-choice item   **OR** open-response item

#	Grade 6 Reading Expectations	Question Type by Reading Text					Reading Raw Score Points
		Long Narrative Texts (650–700 words)	Short Narrative Texts (300–350 words)	Poems (up to 300 words)	Non-Narrative Informational Texts (300–350 words)	Graphic Texts (up to 300 words)	
6R2.0	recognize a variety of text forms, text features, and stylistic elements and demonstrate understanding of how they help communicate meaning						
6R2.1	analyse a variety of text forms and explain how their particular characteristics help communicate meaning, with a focus on literary texts such as a myth, graphic texts such as an advertisement, and informational texts such as an editorial	2 MC 1 OR	1 MC 1 OR	1 MC	1 MC	1 MC 1 OR	6 x 1 + 3 x 4 = 18 score points or 27% of reading score
6R2.2	identify a variety of organizational patterns in a range of texts and explain how they help readers understand the texts						
6R2.3	identify a variety of text features and explain how they help readers understand texts						
6R2.4	identify various elements of style—including voice, word choice, and the use of hyperbole, strong verbs, dialogue and complex sentences—and explain how they communicate meaning						
6R3.0	use knowledge of words and cueing systems to read fluently						
6R3.1	automatically read and understand most words in a range of reading contexts						
6R3.2	predict the meaning of and rapidly solve unfamiliar words using different types of cues, including semantic (meaning) cues, syntactic (language structure) cues, and graphophonic (phonological and graphic) cues	2 MC	1 MC	1 MC	1 MC	1 MC	6 x 1 = 6 score points or 9% of reading score
6R3.3	read appropriate texts with expression and confidence, adjusting reading rate to match the form and purpose						
6R4.0	reflect on and identify their strengths as readers, areas for improvement, and the strategies they found most helpful before, during, and after reading						
6R4.1	identify the strategies they found most helpful before, during, and after reading and explain, in conversation with the teacher and/or peers, or in a reader's notebook, how they can use these and other strategies to improve as readers						
6R4.2	explain, in conversations with the teacher and/or peers or in a reader's notebook, how their skills in listening, speaking, writing, viewing, and representing help them make sense of what they read						
	MC multiple-choice item OR open-response item	10 MC 2 OR	4 MC 2 OR	4 MC 2 OR	4 MC 2 OR	4 MC 2 OR	Total reading raw score points = 66 or 100% of total score

#	Grade 6 Writing Expectations	Item Types	Writing Raw Score Points
6W1.0	generate, gather, and organize ideas and information to write for an intended purpose and audience		
6W1.1	identify the topic, purpose, and audience for a variety of writing forms		
6W1.2	generate ideas about a potential topic and identify those most appropriate for the purpose		
6W1.3	gather information to support ideas for writing, using a variety of strategies and a range of print and electronic resources		
6W1.4	sort and classify information for their writing in a variety of ways that allow them to view information from different perspectives and make connections between ideas		
6W1.5	**identify and order main ideas and supporting details and group them into units that could be used to develop a structured, multi-paragraph piece of writing, using a variety of strategies and organizational patterns**		
6W1.6	determine whether the ideas and information they have gathered are relevant, appropriate and adequate for the purpose, and do more research if necessary	1 **LWP** Long Writing Genres • opinion piece (argument to support a point of view) • friendly or formal letter • story • news report on a real or imagined event • biographical sketch	**LWP** 1 x 7 = 7 score points or 24% of writing score
6W2.0	draft and revise their writing, using a variety of informational, literary, and graphic forms and stylistic elements appropriate for the purpose and audience		
6W2.1	write longer and more complex texts using a wide range of forms		
6W2.2	establish a distinctive voice in their writing appropriate to the subject and audience		
6W2.3	use some vivid and/or figurative language and innovative expressions to enhance interest		
6W2.4	**create complex sentences by combining phrases, clauses, and/or simple sentences**		
6W2.5	identify their point of view and other possible points of view; determine, when appropriate, if their own view is balanced and supported by the evidence; and adjust their thinking and expression if appropriate		
6W2.6	identify elements in their writing that need improvement, selectively using feedback from the teacher and peers, with a focus on supporting details and precise language		
6W2.7	**make revisions to improve the content, clarity, and interest of their written work, using a variety of strategies**		
6W2.8	produce revised draft pieces of writing to meet identified criteria based on the expectations	2 **SWP** Short Writing Genres • personal or factual recount • friendly or formal letter • procedures, instructions, directions • informative, explanatory or descriptive report • script • advertisement	**SWP** 2 x 7 = 14 score points or 48% of writing score
6W3.0	use editing, proofreading and publishing skills and strategies, and knowledge of language conventions, to correct errors, refine expression, and present their work effectively		
6W3.1	**spell familiar words correctly**		
6W3.2	**spell unfamiliar words using a variety of strategies that involve understanding sound-symbol relationships, word structures, word meanings, and generalizations about spelling**		
6W3.3	confirm spellings and word meanings or word choice using a variety of resources appropriate for the purpose		
6W3.4	**use punctuation appropriately to communicate their intended meaning in longer and more complex sentences, with a focus on the use of: commas to separate words in a list or after an introductory word or phrase; quotation marks in dialogue; and some uses of the colon, semi-colon, and brackets**		
6W3.5	**use parts of speech correctly to communicate their meaning clearly, with a focus on the use of: personal subject and object pronouns (e.g., I, me); indefinite pronouns (e.g., someone, nobody); conjunctions; subordinate clauses, adverb phrases; and present, past, and future verb tenses**	8 **MC** (expectations in bold face)	**MC** 8 x 1 = 8 score points or 28% of writing score
6W3.6	proofread and correct their writing using guidelines developed with peers and the teacher		
6W3.7	use a range of appropriate elements of effective presentation in the finished product, including print, script, different fonts, graphics, and layout		
6W3.8	produce pieces of published work to meet identified criteria based on the expectations		
6W4.0	reflect on and identify their strengths as writers, areas for improvement, and the strategies they found most helpful at different stages in the writing process		
6W4.1	identify a variety of strategies they used before, during, and after writing, explain which ones were most helpful, and suggest further steps they can take to improve as writers		
6W4.2	describe how their skills in listening, speaking, reading, viewing, and representing help in their development as writers		
6W4.3	select pieces of writing that they think reflect their growth and competence as writers and explain the reasons for their choices		
		8 **MC** 1 **LWP** 2 **SWP**	**Total writing raw score points = 29 or 100% of total score**

MC multiple-choice item   **LWP** long writing prompt (two pages)   **SWP** short writing prompt (one page)

#	Grade 6 Mathematics Expectations	Item Types MC Total = 28 OR Total = 8	Mathematics Raw Score Points
	Mathematical Process Expectations Although the junior assessment does not measure the process expectations, students are required to apply the mathematical processes in order to demonstrate success on the assessment.		
6m1	**Problem Solving** develop, select, and apply problem-solving strategies as they pose and solve problems and conduct investigations, to help deepen their mathematical understanding		
6m2	**Reasoning and Proving** develop and apply reasoning skills (e.g., classification, recognition of relationships, use of counter-examples) to make and investigate conjectures and construct and defend arguments		
6m3	**Reflecting** demonstrate that they are reflecting on and monitoring their thinking to help clarify their understanding as they complete an investigation or solve a problem (e.g., by comparing and adjusting strategies used, by explaining why they think their results are reasonable, by recording their thinking in a math journal)		
6m4	**Selecting Tools and Computational Strategies** select and use a variety of concrete, visual, and electronic learning tools and appropriate computational strategies to investigate mathematical ideas and to solve problems		
6m5	**Connecting** make connections among mathematical concepts and procedures, and relate mathematical ideas to situations or phenomena drawn from other contexts (e.g., other curriculum areas, daily life, sports)		
6m6	**Representing** create a variety of representations of mathematical ideas (e.g., by using physical models, pictures, numbers, variables, diagrams, graphs, onscreen dynamic representations), make connections among them, and apply them to solve problems		
6m7	**Communicating** communicate mathematical thinking orally, visually, and in writing, using everyday language, a basic mathematical vocabulary, and a variety of representations, and observing basic mathematical conventions		
	Number Sense and Numeration		
6m8	**Number Sense and Numeration, Overall Expectation 1** read, represent, compare, and order whole numbers to 1 000 000, decimal numbers to thousandths, proper and improper fractions, and mixed numbers		
	Number Sense and Numeration, Specific Expectations for Overall 1: **Quantity Relationships**		
6m11	represent, compare, and order whole numbers and decimal numbers from 0.001 to 1 000 000, *using a variety of tools* (e.g., number lines with appropriate increments, base ten materials for decimals)		
6m12	demonstrate an understanding of place value in whole numbers and decimal numbers from 0.001 to 1 000 000, *using a variety of tools and strategies* (e.g., use base ten materials to represent the relationship between 1, 0.1, 0.01, and 0.001) (*Sample problem:* How many thousands cubes would be needed to make a base ten block for 1 000 000?)	2 **MC**	2 x 1 + 1 x 4 = 6 score points or 10% of mathematics score
6m13	read and print in words whole numbers to one hundred thousand, using meaningful contexts (e.g., the Internet, reference books)	1 **OR**	
6m14	represent, compare, and order fractional amounts with unlike denominators, including proper and improper fractions and mixed numbers, *using a variety of tools* (e.g., fraction circles, Cuisenaire rods, drawings, number lines, calculators) and using standard fractional notation (*Sample problem:* Use fraction strips to show that 1 1/2 is greater than 5/4.)		
6m15	estimate quantities using benchmarks of 10%, 25%, 50%, 75%, and 100% (e.g., the container is about 75% full; approximately 50% of our students walk to school)		
6m16	solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 1 000 000 (*Sample problem:* How would you determine if a person could live to be 1 000 000 hours old? Show your work.)		
6m17	identify composite numbers and prime numbers, and explain the relationship between them (i.e., any composite number can be factored into prime factors) (e.g., 42 = 2 x 3 x 7)		

MC multiple-choice item   **OR** open-response item

#	Grade 6 Mathematics Expectations	Item Types MC Total = 28 OR Total = 8	Mathematics Raw Score Points
6m9	**Number Sense and Numeration, Overall Expectation 2** solve problems involving the multiplication and division of whole numbers, and the addition and subtraction of decimal numbers to thousandths, *using a variety of strategies*		
	Number Sense and Numeration, Specific Expectations for Overall 2: **Operational Sense**		
6m18	*use a variety of mental strategies* to solve addition, subtraction, multiplication, and division problems involving whole numbers (e.g., use the commutative property: 4 x 16 x 5 = 4 x 5 x 16, which gives 20 x 16 = 320; use the distributive property: (500 + 15) ÷ 5 = 500 ÷ 5 + 15 ÷ 5, which gives 100 + 3 = 103)		
6m19	solve problems involving the multiplication and division of whole numbers (four-digit by two-digit), *using a variety of tools* (e.g., concrete materials, drawings, calculators) *and strategies* (e.g., estimation, algorithms)		
6m20	add and subtract decimal numbers to thousandths, *using concrete materials*, estimation, algorithms, and calculators		
6m21	multiply and divide decimal numbers to tenths by whole numbers, *using concrete materials*, estimation, algorithms, and calculators (e.g., calculate 4 x 1.4 using base ten materials; calculate 5.6 ÷ 4 using base ten materials)	4 **MC**	4 x 1 + 1 x 4 = 8 score points or 13% of mathematics score
6m22	multiply whole numbers by 0.1, 0.01, and 0.001 *using mental strategies* (e.g., use a calculator to look for patterns and generalize to develop a rule)		
6m23	multiply and divide decimal numbers by 10, 100, 1000, and 10 000 *using mental strategies* (e.g., "To convert 0.6 m^2 to square centimetres, I calculated in my head 0.6 x 10 000 and got 6000 cm^2.") (*Sample problem:* Use a calculator to help you generalize a rule for multiplying numbers by 10 000.)	1 **OR**	
6m24	use estimation when solving problems involving the addition and subtraction of whole numbers and decimals, to help judge the reasonableness of a solution		
6m25	explain the need for a standard order for performing operations, by *investigating the impact that changing the order has when performing a series of operations* (*Sample problem:* Calculate and compare the answers to 3 + 2 x 5 using a basic four-function calculator and using a scientific calculator.)		
6m10	**Number Sense and Numeration, Overall Expectation 3** demonstrate an understanding of relationships involving percent, ratio, and unit rate		
	Number Sense and Numeration, Specific Expectations for Overall 3: **Proportional Relationships**		
6m26	represent ratios found in real-life contexts, *using concrete materials*, drawings, and standard fractional notation (*Sample problem:* In a classroom of 28 students, 12 are female. What is the ratio of male students to female students?)		
6m27	determine and explain, *through investigation using concrete materials*, drawings, and calculators, the relationships among fractions (i.e., with denominators of 2, 4, 5, 10, 20, 25, 50, and 100), decimal numbers, and percents (e.g., use a 10 x 10 grid to show that 1/4 = 0.25 or 25%)		
6m28	represent relationships using unit rates (*Sample problem:* If 5 batteries cost $4.75, what is the cost of 1 battery?)		

MC multiple-choice item   **OR** open-response item

| #	Grade 6 Mathematics Expectations	Item Types MC Total = 28 OR Total = 8	Mathematics Raw Score Points
	Measurement		
6m29	**Measurement, Overall Expectation 1** estimate, measure, and record quantities, using the metric measurement system		
	Measurement, Specific Expectations for Overall 1: Attributes, Units, and Measurement Sense		
6m31	demonstrate an understanding of the relationship between estimated and precise measurements, and determine and justify when each kind is appropriate (*Sample problem:* You are asked how long it takes you to travel a given distance. How is the method you use to determine the time related to the precision of the measurement?)		
6m32	estimate, measure, and record length, area, mass, capacity, and volume, using the metric measurement system		
6m30	**Measurement, Overall Expectation 2** determine the relationships among units and measurable attributes, including the area of a parallelogram, the area of a triangle, and the volume of a triangular prism		
	Measurement, Specific Expectations for Overall 2: Measurement Relationships		
6m33	select and justify the appropriate metric unit (i.e., millimetre, centimetre, decimetre, metre, decametre, kilometre) to measure length or distance in a given real-life situation (*Sample problem:* Select and justify the unit that should be used to measure the perimeter of the school.)		
6m34	solve problems requiring conversion from larger to smaller metric units (e.g., metres to centimetres, kilograms to grams, litres to millilitres) (*Sample problem:* How many grams are in one serving if 1.5 kg will serve six people?)		
6m35	construct a rectangle, a square, a triangle, and a parallelogram, *using a variety of tools* (e.g., concrete materials, geoboard, dynamic geometry software, grid paper), given the area and/or perimeter (*Sample problem:* Create two different triangles with an area of 12 square units, using a geoboard.)		
6m36	determine, *through investigation using a variety of tools* (e.g., pattern blocks, Power Polygons, dynamic geometry software, grid paper) *and strategies* (e.g., paper folding, cutting, and rearranging), the relationship between the area of a rectangle and the areas of parallelograms and triangles, by decomposing (e.g., cutting up a parallelogram into a rectangle and two congruent triangles) and composing (e.g., combining two congruent triangles to form a parallelogram) (*Sample problem:* Decompose a rectangle and rearrange the parts to compose a parallelogram with the same area. Decompose a parallelogram into two congruent triangles, and compare the area of one of the triangles with the area of the parallelogram.)	7 **MC** 1 **OR**	7 x 1 + 1 x 4 = 11 score points or 18% of mathematics score
6m37	*develop the formulas for the area of a parallelogram (i.e., Area of parallelogram = base x height) and the area of a triangle [i.e., Area of triangle = (base x height) ÷ 2], using the area relationships among rectangles, parallelograms, and triangles (Sample problem: Use dynamic geometry software to show that parallelograms with the same height and the same base all have the same area.)*		
6m38	solve problems involving the estimation and calculation of the areas of triangles and the areas of parallelograms (*Sample problem:* Calculate the areas of parallelograms that share the same base and the same height, including the special case where the parallelogram is a rectangle.)		
6m39	determine, *using concrete materials*, the relationship between units used to measure area (i.e., square centimetre, square metre), and apply the relationship to solve problems that involve conversions from square metres to square centimetres (*Sample problem:* Describe the multiplicative relationship between the number of square centimetres and the number of square metres that represent an area. Use this relationship to determine how many square centimetres fit into half a square metre.)		
6m40	determine, *through investigation using a variety of tools and strategies* (e.g., decomposing rectangular prisms into triangular prisms; stacking congruent triangular layers of concrete materials to form a triangular prism), the relationship between the height, the area of the base, and the volume of a triangular prism, and generalize to develop the formula (i.e., Volume = area of base x height) (*Sample problem:* Create triangular prisms by splitting rectangular prisms in half. For each prism, record the area of the base, the height, and the volume on a chart. Identify relationships.)		
6m41	determine, *through investigation using a variety of tools* (e.g., nets, concrete materials, dynamic geometry software, Polydrons) *and strategies,* the surface area of rectangular and triangular prisms		
6m42	solve problems involving the estimation and calculation of the surface area and volume of triangular and rectangular prisms (*Sample problem:* How many square centimetres of wrapping paper are required to wrap a box that is 10 cm long, 8 cm wide, and 12 cm high?)		

MC multiple-choice item   **OR** open-response item

#	Grade 6 Mathematics Expectations	Item Types MC Total = 28 OR Total = 8	Mathematics Raw Score Points
	Geometry and Spatial Sense		
6m43	**Geometry and Spatial Sense, Overall Expectation 1** classify and construct polygons and angles		
	Geometry and Spatial Sense, Specific Expectations for Overall 1: Geometric Properties		
6m46	sort and classify quadrilaterals by geometric properties related to symmetry, angles, and sides, *through investigation using a variety of tools* (e.g., geoboard, dynamic geometry software) *and strategies* (e.g., using charts, using Venn diagrams)		
6m47	sort polygons according to the number of lines of symmetry and the order of rotational symmetry, *through investigation using a variety of tools* (e.g., tracing paper, dynamic geometry software, Mira)		
6m48	measure and construct angles up to 180° using a protractor, and classify them as acute, right, obtuse, or straight angles	2 **MC**	2 x 1 + 1 x 4 = 6 score points or 10% of mathematics score
6m49	construct polygons *using a variety of tools*, given angle and side measurements (*Sample problem:* Use dynamic geometry software to construct trapezoids with a 45° angle and a side measuring 11 cm.)	1 **OR**	
6m44	**Geometry and Spatial Sense, Overall Expectation 2** sketch three-dimensional figures, and construct three-dimensional figures from drawings		
	Geometry and Spatial Sense, Specific Expectations for Overall 2: Geometric Relationships		
6m50	*build three-dimensional models using connecting cubes, given isometric sketches or different views (i.e., top, side, front) of the structure (Sample problem: Given the top, side, and front views of a structure, build it using the smallest number of cubes possible.)*		
6m51	sketch, using a variety of tools (e.g., isometric dot paper, dynamic geometry software), isometric perspectives and different views (i.e., top, side, front) of three-dimensional figures built with interlocking cubes		
6m45	**Geometry and Spatial Sense, Overall Expectation 3** describe location in the first quadrant of a coordinate system, and rotate two-dimensional shapes		
	Geometry and Spatial Sense, Specific Expectations for Overall 3: Location and Movement	2 **MC**	2 x 1 + 1 x 4 = 6 score points or 10% of mathematics score
6m52	explain how a coordinate system represents location, and plot points in the first quadrant of a Cartesian coordinate plane		
6m53	identify, perform, and describe, *through investigation using a variety of tools* (e.g., grid paper, tissue paper, protractor, computer technology), rotations of 180° and clockwise and counter clockwise rotations of 90°, with the centre of rotation inside or outside the shape	1 **OR**	
6m54	create and analyse designs made by reflecting, translating, and/or rotating a shape, or shapes, by 90° or 180° (*Sample problem:* Identify rotations of 90° or 180° that map congruent shapes, in a given design, onto each other.)		

MC multiple-choice item   **OR** open-response item

#	Grade 6 Mathematics Expectations	Item Types MC Total = 28 OR Total = 8	Mathematics Raw Score Points
	Patterning and Algebra		
6m55	**Patterning and Algebra, Overall Expectation 1** describe and represent relationships in growing and shrinking patterns (where the terms are whole numbers), and investigate repeating patterns involving rotations		
	Patterning and Algebra, Specific Expectations for Overall 1: Patterns and Relationships		
6m57	identify geometric patterns, *through investigation using concrete materials* or drawings, and represent them numerically		
6m58	make tables of values, for growing patterns given pattern rules, in words (e.g., start with 3, then double each term and add 1 to get the next term), then list the ordered pairs (with the first coordinate representing the term number and the second coordinate representing the term) and plot the points in the first quadrant, *using a variety of tools* (e.g., graph paper, calculators, dynamic statistical software)		
6m59	determine the term number of a given term in a growing pattern that is represented by a pattern rule in words, a table of values, or a graph (*Sample problem:* For the pattern rule "start with 1 and add 3 to each term to get the next term", use graphing to find the term number when the term is 19.)		
6m60	describe pattern rules (in words) that generate patterns by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term (e.g., for 1, 3, 5, 7, 9, ..., the pattern rule is "start with 1 and add 2 to each term to get the next term"), then distinguish such pattern rules from pattern rules, given in words, that describe the general term by referring to the term number (e.g., for 2, 4, 6, 8, ..., the pattern rule for the general term is "double the term number")	6 **MC** 1 **OR**	6 x 1 + 1 x 4 = 10 score points or 17% of mathematics score
6m61	determine a term, given its term number, by extending growing and shrinking patterns that are generated by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term (*Sample problem:* For the pattern 5000, 4750, 4500, 4250, 4000, 3750, ..., find the 15th term. Explain your reasoning.)		
6m62	extend and create repeating patterns that result from rotations, *through investigation using a variety of tools* (e.g., pattern blocks, dynamic geometry software, geoboards, dot paper)		
6m56	**Patterning and Algebra, Overall Expectation 2** use variables in simple algebraic expressions and equations to describe relationships		
	Patterning and Algebra, Specific Expectations for Overall 2: Variables, Expressions, and Equations		
6m63	demonstrate an understanding of different ways in which variables are used (e.g., variable as an unknown quantity; variable as a changing quantity)		
6m64	identify, *through investigation,* the quantities in an equation that vary and those that remain constant (e.g., in the formula for the area of a triangle, $A = \frac{b \times h}{2}$, the number 2 is a constant, whereas b and h can vary and may change the value of A)		
6m65	solve problems that use two or three symbols or letters as variables to represent different unknown quantities (*Sample problem:* If $n + 1 = 15$ and $n + 1 + s = 19$, what value does the s represent?)		
6m66	determine the solution to a simple equation with one variable, *through investigation using a variety of tools and strategies* (e.g., modelling with concrete materials, using guess and check with and without the aid of a calculator) (*Sample problem:* Use the method of your choice to determine the value of the variable in the equation $2 \times n + 3 = 11$. Is there more than one possible solution? Explain your reasoning.)		

MC multiple-choice item   **OR** open-response item

#	Grade 6 Mathematics Expectations	Item Types MC Total = 28 OR Total = 8	Mathematics Raw Score Points
	Data Management and Probability		
	Data Management and Probability, Overall Expectation 1		
6m67	collect and organize discrete or continuous *primary data* and secondary data and display the data using charts and graphs, including continuous line graphs		
	Data Management and Probability, Specific Expectations for Overall 1: Collection and Organization of Data		
6m70	*collect data by conducting a survey (e.g., use an Internet survey tool) or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements*		
6m71	collect and organize discrete or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools) and display the data in charts, tables, and graphs (including continuous line graphs) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software)		
6m72	select an appropriate type of graph to represent a set of data, *graph the data using technology*, and justify the choice of graph (i.e., from types of graphs already studied, such as pictographs, horizontal or vertical bar graphs, stem-and-leaf plots, double bar graphs, broken-line graphs, and continuous line graphs)	3 **MC**	3 x 1 + 1 x 4 = 7 score points or 12% of mathematics score
6m73	determine, *through investigation*, how well a set of data represents a population, on the basis of the method that was used to collect the data (*Sample problem:* Would the results of a survey of primary students about their favourite television shows represent the favourite shows of students in the entire school? Why or why not?)	1 **OR**	
6m68	**Data Management and Probability, Overall Expectation 2** read, describe, and interpret data, and explain relationships between sets of data		
	Data Management and Probability, Specific Expectations for Overall 2: Data Relationships		
6m74	read, interpret, and draw conclusions from *primary data* (e.g., survey results, measurements, observations) and from secondary data (e.g., sports data in the newspaper, data from the Internet about movies), presented in charts, tables, and graphs (including continuous line graphs)		
6m75	compare, *through investigation*, different graphical representations of the same data (*Sample problem:* Use technology to help you compare the different types of graphs that can be created to represent a set of data about the number of runs or goals scored against each team in a tournament. Describe the similarities and differences that you observe.)		
6m76	explain how different scales used on graphs can influence conclusions drawn from the data		
6m77	demonstrate an understanding of mean (e.g., mean differs from median and mode because it is a value that "balances" a set of data—like the centre point or fulcrum in a lever), and use the mean to compare two sets of related data, *with* and *without the use of technology* (*Sample problem:* Use the mean to compare the masses of backpacks of students from two or more Grade 6 classes.)		
6m78	demonstrate, *through investigation*, an understanding of how data from charts, tables, and graphs can be used to make inferences and convincing arguments (e.g., describe examples found in newspapers and magazines)		

MC multiple-choice item   **OR** open-response item

#	Grade 6 Mathematics Expectations	Item Types MC Total = 28 OR Total = 8	Mathematics Raw Score Points
6m69	**Data Management and Probability, Overall Expectation 3** determine the theoretical probability of an outcome in a probability experiment, and use it to predict the frequency of the outcome		
	Data Management and Probability, Specific Expectations for Overall 3: Probability	2 **MC**	2 x 1 + 1 x 4 = 6 score points or 10% of mathematics score
6m79	express theoretical probability as a ratio of the number of favourable outcomes to the total number of possible outcomes, where all outcomes are equally likely (e.g., the theoretical probability of rolling an odd number on a six-sided number cube is 3/6 because, of six equally likely outcomes, only three are favourable—that is, the odd numbers 1, 3, 5)		
6m80	represent the probability of an event (i.e., the likelihood that the event will occur), using a value from the range of 0 (never happens or impossible) to 1 (always happens or certain)	1 **OR**	
6m81	predict the frequency of an outcome of a simple probability experiment or game, by calculating and using the theoretical probability of that outcome (e.g., "The theoretical probability of spinning red is 1/4 since there are four different-coloured areas that are equal. If I spin my spinner 100 times, I predict that red should come up about 25 times."). (*Sample problem:* Create a spinner that has rotational symmetry. Predict how often the spinner will land on the same sector after 25 spins. Perform the experiment and compare the prediction to the results.)		
		28 **MC** 8 **OR**	**Total mathematics raw score points = 60 or 100% of total score**

MC multiple-choice item   **OR** open-response item
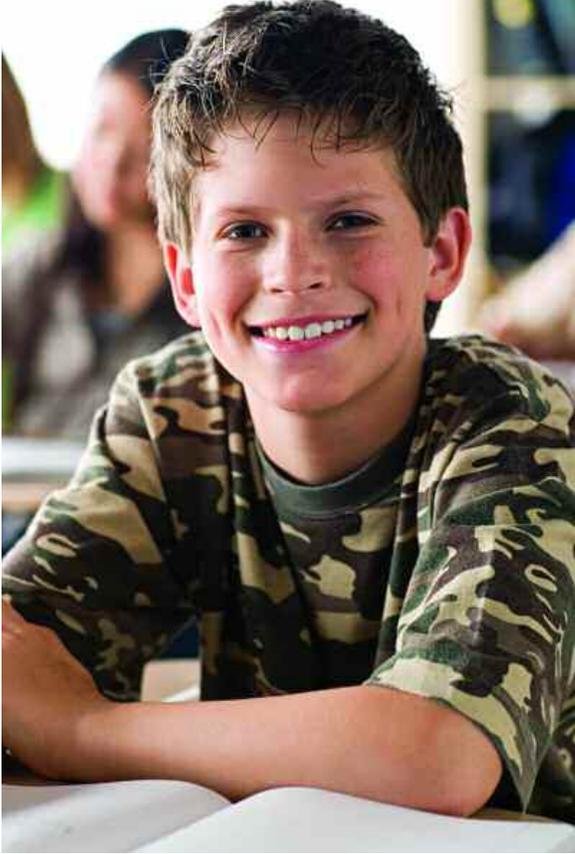
In This Chapter:

• How is the junior division assessment scored?

How is the junior division assessment scored?

Each open-response item on the assessment is scored according to a guide called an "item-specific rubric." The following are the general (or "generic") rubrics from which the item-specific rubrics are developed. Multiple-choice items are scored by machine.

Reading: Open-Response Questions

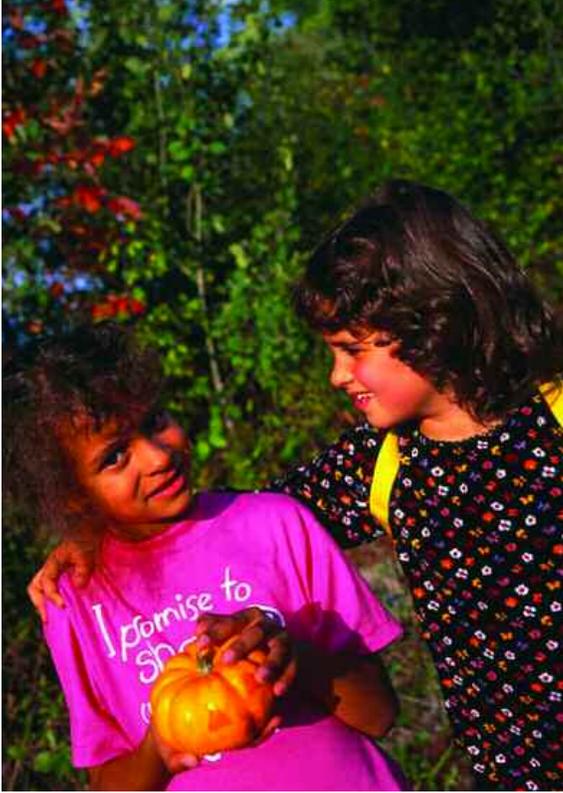| EQAO Generic Junior Division Assessment Rubric for Open-Response Reading Questions	
Code	**Descriptor**
Blank	• blank: nothing written or drawn in the space provided
Illegible/ Off topic	• illegible: cannot be read; completely crossed out/erased; not written in English • irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • off topic: no relationship of written work to the question
Code 10	• response is developed with irrelevant or inaccurate ideas and information from the reading selection • response is developed with personal knowledge and experience rather than with reference to the reading selection
Code 20	• response addresses only part of the question • response is developed with limited support; ideas and information from the reading selection are minimal or vague
Code 30	• response addresses the complete question • response is developed with some accurate, specific and relevant ideas and information from the reading selection; some ideas and information are inaccurate, vague and/or irrelevant
Code 40	• response addresses the complete question • response is developed with accurate, specific and relevant ideas and information from the reading selection

EQAO Generic Junior Division Assessment Rubric for Topic Development in Writing Tasks

Code	Descriptor
Blank	Blank: nothing written or drawn in the space provided
Illegible / Off topic	Illegible: cannot be read; completely crossed out/erased; not written in English **OR** Irrelevant content: does not attempt assigned prompt (e.g., comment on the task, drawings, "?", "!", "I don't know") **OR** Off topic: no relationship of written work to assigned prompt **OR** Errors in conventions prevent communication
Code 10	Response is not developed; ideas and information are limited and unclear. Organization is random with no links between ideas. Response has a limited relationship to the assigned task.
Code 20	Response is minimally developed with few ideas and little information. Organization is minimal with weak links between ideas. Response is partly related to the assigned task.
Code 30	Response has a clear focus, adequately developed with ideas and supporting details. Organization is simple or mechanical with adequate links between ideas. Response is clearly related to the assigned task.
Code 40	Response has a clear focus, well-developed with sufficient specific and relevant ideas and supporting details. Organization is logical and coherent with effective links between ideas. Response has a thorough relationship to the assigned task.

Writing: Writing Tasks

	EQAO Generic Junior Division Assessment Rubric for Use of Conventions in Writing Tasks
Code	**Descriptor**
Blank	Blank: nothing written or drawn in the space provided
Illegible/ Off topic	Illegible: cannot be read; completely crossed out/erased; not written in English **OR** Errors in conventions prevent communication
Code 10	Errors in conventions interfere with communication **OR** Insufficient evidence to assess the use of conventions
Code 20	Errors in conventions do not interfere with communication
Code 30	Conventions are used appropriately to communicate

Mathematics: Open-Response Questions

EQAO Generic Junior Division Assessment Rubric for Open-Response Mathematics Questions

Code	Descriptor
Blank	• blank: nothing written or drawn in response to the question
Illegible / Off topic	• illegible: cannot be read; completely crossed out/erased; not written in English • irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • off topic: no relationship of written work to the question

Code 10	• demonstration of limited understanding of concepts and/or procedures
	• application of knowledge and skills shows limited effectiveness due to
	  • misunderstanding of concepts
	  • incorrect selection or misuse of procedures
	• problem-solving process shows limited effectiveness due to
	  • minimal evidence of a solution process
	  • limited identification of important elements of the problem
	  • too much emphasis on unimportant elements of the problem
	  • no conclusions presented
	  • conclusion presented without supporting evidence

Code 20	• demonstration of some understanding of concepts and/or procedures
	• application of knowledge and skills shows some effectiveness due to
	  • partial understanding of the concepts
	  • errors and/or omissions in the application of the procedures
	• problem-solving process shows some effectiveness due to
	  • an incomplete solution process
	  • identification of some of the important elements of the problem
	  • some understanding of the relationships between important elements of the problem
	  • simple conclusions with little supporting evidence

Code 30	• demonstration of considerable understanding of concepts and/or procedures
	• application of knowledge and skills shows considerable effectiveness due to
	  • an understanding of most of the concepts
	  • minor errors and/or omissions in the application of the procedures
	• problem-solving process shows considerable effectiveness due to
	  • a solution process that is nearly complete
	  • identification of most of the important elements of the problem
	  • a considerable understanding of the relationships between important elements of the problem
	  • appropriate conclusions with supporting evidence

Code 40	• demonstration of thorough understanding of concepts and/or procedures
	• application of knowledge and skills shows a high degree of effectiveness due to
	  • a thorough understanding of the concepts
	  • an accurate application of the procedures (any minor errors and/or omissions do not detract from the demonstration of a thorough understanding)
	• problem-solving process shows a high degree of effectiveness due to
	  • a complete solution process
	  • identification of all important elements of the problem
	  • evidence of a thorough understanding of the relationships between all of the important elements of the problem
	  • appropriate conclusions with thorough and insightful supporting evidence

of multiple-choice and open-response questions on the assessment that measure each cluster of expectations.

Although questions on the junior division assessment are allocated to clusters of expectations as indicated in Chapter 6, they are developed to address a specific expectation in the cluster. From year to year, different specific expectations are addressed. Chapter 6 identifies expectations that cannot be assessed appropriately on large-scale assessments and consequently will never have questions mapped to them.

CHAPTER 8: Maintaining Comparability

In This Chapter

• How is the comparability of the assessment maintained from year to year?
• How is the assessment blueprint used?
• How are the assessments equated year to year?
• Why and how are items field tested?

How is the comparability of the assessment maintained from year to year?

It is critically important that EQAO assessments be comparable from year to year. A number of measures are taken to ensure year-to-year consistency, including

• use of an assessment blueprint;
• equating assessments from year to year and
• use of field-test items.

How is the assessment blueprint used?

EQAO has developed a blueprint so that the assessment has the same characteristics each year. The blueprint presents the expectations from *The Ontario Curriculum* in clusters. The blueprint gives the number

How are the assessments equated year to year?

Data on field tested items are used in the construction of each new version of the assessment, so that each year's assessment has the same level of difficulty as previous assessments. Equating is used to ensure that data at the school, board and provincial levels can be validly compared from year to year.

Why and how are items field tested?

Embedded field-test materials are used to try out new assessment items before they become operational to ensure they are fair for all students and to equate the assessment with those of previous years, so that results can be compared from one year to the next.

Field-test materials look like the operational part of the booklet. However, scores on field-test materials are not used in determining student, school, board or provincial results.

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