

# Grade 8 Mathematics and Science Syllabus

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## **Overview**

### Mathematics

In Grade 8 Mathematics, students continue to work on the five strands they are familiar with from Junior School:

- **Number Sense & Numeration**
- **Data Management & Probability**
- **Measurement**
- **Geometry**
- **Patterning & Algebra**

Though each strand is required to be reported on separately (four strands per term), we embed the strengthening of number sense skills and concepts throughout the whole year. Students engage in group, paired, whole class, and individual activities, and work on rich inquiry-based tasks where their problem solving skills are further developed. Students are encouraged to be independent thinkers, to ask good questions, and to notice patterns in numbers.

### Science

Learning goals focus on three main components:

1. to relate science and technology to society and the environment
2. to develop the skills, strategies, and habits of mind required for scientific inquiry and technological problem solving
3. to understand the basic concepts of science and technology

The four topics which are covered in Grade 8 are listed below with the main points.

#### **Understanding Life Systems – Cells**

- o Components of cells
- o Functions of cells

#### **Understanding Matter and Energy – Fluids**

- o Properties of fluids
- o How to use fluids to solve problems
- o Types of fluids used in a technological devices

#### **Understanding Earth and Space Systems – Water Systems**

- o Distribution of water over the surface of the earth in all three states of matter.
- o Properties depending on its purity or what is dissolved in it
- o Water's influence on climate, weather, geological features, and ecosystems

#### **Understanding Structures and Mechanisms – Systems in Action**

- o Energy transfer
- o Mechanical advantage
- o Force
- o Mechanical efficiency

## **Texts**

**Math Makes Sense 8** - Pearson Addison Wesley

Supplemental work is employed from a variety of sources such as the Ministry created EduGains, CEMS Waterloo, TIPS4RM, JUMP Math, Mathpower 7, and online resources.

***Investigating Science and Technology 8***, Pearson, will be used in the classroom.

## **Extra Help:**

Each teacher will post their availability for extra help sessions outside of their classrooms.

If students cannot see their own classroom teacher due to a scheduling conflict, they are encouraged to seek out a math teacher in the same grade team.

## **Technology:**

Teachers employ the use of SMARTBoard technology in the classroom.

**Google Classroom** is available to support student learning. It will provide links to videos, examples and extra work to complement and reinforce in-class activities.

## **Assessment and Evaluation**

Students will be observed daily, both individually and on their contributions to large and small group activities. They may be asked to explain an aspect of what the group is doing, or take on a leadership role. It is therefore very important that they are positively involved in their classroom community, come prepared with the materials and mindset for learning and being challenged, and ask good questions. Students are encouraged to maintain a considerate environment that is conducive to the whole class feeling free to ask questions, volunteer answers, and take risks.

Students will be given short and long-term assignments, and will regularly have in-class time to start their work. Any unfinished work should be completed at home. The consistent completion of homework is imperative, as it allows for reinforcement of concepts covered in class and the mastery of new concepts.

Students are encouraged to use their class time wisely, as this helps them manage their workload in all subject areas. Homework is taken up frequently, but is not checked on a daily basis. Spot checks will occur, and any students who appear to be struggling will be asked to meet with the teacher in order to get organized and formulate more effective goals and strategies.

## **Mathematics**

Math units may include pop quizzes, quizzes, homework assignments, tests, and unit problems.

## **Science**

Chapter quizzes - The Pearson textbook has 3 chapters for each unit, and there may be quizzes at the end of chapters to confirm understanding.

Unit test – Each test will consist of some short answer (multiple choice, fill in the blank, matching, etc.) as well as descriptive questions. If students are absent on the day the test is written, they will write it during the next class period or an alternate, mutually agreed-upon time.

Class Assignments - Students will complete a variety of activities on a regular basis. There will usually be one formal lab activity and report assigned to each unit. All of these must be completed and submitted. If a student is absent, he/she should seek assistance from the teacher or a homework buddy to ensure that all work is finished.

**Final grades** are determined in accordance with the Ministry of Education's *Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools*, 2010 document. All evidence collected through observations, conversations, and student products (tests, reports, assignments) will be used for evaluation. Formative feedback and summative assessment of student work will be provided according to the Ontario provincial achievement chart categories below as they relate to the curriculum expectations being evaluated.

- Knowledge and understanding
- Thinking - Processing and interpretation
- Communication - Interpretation and expression
- Application - Transfer of knowledge and skills to make connections

Determining a report card grade will involve teachers' professional judgement and interpretation of evidence, and should reflect the student's most consistent level of achievement, with special consideration given to more recent evidence.

Results from activities that meet expectations related to the STEM subjects (Science, Technology and Mathematics) will be shared among corresponding subject teachers and will be considered when determining the final mark for report cards.

## Learning Schedule (Subject to change)

### Grade 8 Mathematics

Term 1 (including Progress Report)	Term 2
<p><b>Number Sense</b></p> <ul style="list-style-type: none"> <li>• Prime and composite numbers</li> <li>• Prime factorization</li> <li>• Scientific notation</li> <li>• Powers of ten</li> <li>• Order of operations</li> </ul> <p><b>Measurement</b></p> <ul style="list-style-type: none"> <li>• Converting units of measure</li> <li>• Circumference and area of circles</li> <li>• Volume and surface area of cylinders</li> </ul> <p><b>Geometry</b></p> <ul style="list-style-type: none"> <li>• Quadrilaterals</li> <li>• Angle properties with intersecting and parallel lines</li> <li>• Angles in a triangle</li> </ul> <p><b>Data Management</b></p> <ul style="list-style-type: none"> <li>• Collect, organize, record data</li> <li>• Frequency tables and Histograms</li> <li>• Charts, tables, and graphs</li> <li>• Bias and inferences</li> <li>• Mean, median, mode</li> </ul>	<p><b>Number Sense</b></p> <ul style="list-style-type: none"> <li>• Fractions and decimals</li> <li>• Ratio and rate</li> <li>• Percent tax discount commission</li> <li>• Add, subtract, divide, and multiply integers</li> </ul> <p><b>Patterning and Algebra</b></p> <ul style="list-style-type: none"> <li>• Co-ordinate grid</li> <li>• Variables, expressions, equations</li> <li>• Translating statements</li> <li>• Like terms, distributive property</li> <li>• Solving linear equations</li> <li>• Representing a general term in a linear sequence</li> </ul> <p><b>Geometry</b></p> <ul style="list-style-type: none"> <li>• Measuring Squares</li> <li>• Pythagorean Theorem</li> <li>• Special Triangles</li> </ul> <p><b>Probability</b></p> <ul style="list-style-type: none"> <li>• Experimental and Theoretical Probability</li> <li>• Tree Diagrams</li> <li>• Simulations</li> </ul>

### Grade 8 Science

Term 1 (including Progress Report)	Term 2
<p><b>Term 1</b> Introduction and Safety</p> <p><b>Cells</b></p> <ul style="list-style-type: none"> <li>• Characteristics</li> <li>• Unicellular and Multicellular Cells</li> <li>• Cell Structure</li> <li>• Plant and Animal Cells</li> <li>• Cell Theory</li> <li>• Use of Microscope</li> <li>• Permeability and Cellular Transport</li> <li>• Diffusion and Osmosis</li> <li>• Cellular Reproduction</li> <li>• Cells, Tissues, Organs and Systems</li> <li>• Impact of Cell Biology</li> </ul> <p><b>Fluids</b></p> <ul style="list-style-type: none"> <li>• Particle Theory</li> <li>• Viscosity</li> <li>• Density</li> <li>• Mass and Volume</li> <li>• Pressure</li> <li>• Compression</li> </ul>	<p><b>Water Systems</b></p> <ul style="list-style-type: none"> <li>• Earth's Supply of Water</li> <li>• Usable Fresh Water</li> <li>• Watersheds</li> <li>• Heat Capacity</li> <li>• Filtration</li> <li>• Water Quality Factors</li> <li>• Water Treatment</li> <li>• Managing Water System</li> <li>• Sustainability</li> <li>• Saltwater</li> </ul> <p><b>Systems in Action</b></p> <ul style="list-style-type: none"> <li>• Mechanical Systems</li> <li>• Force, Work, Energy</li> <li>• Force of Gravity</li> <li>• Simple Machines</li> <li>• Mechanical Advantage</li> <li>• Mechanical Efficiency</li> </ul>

**Note: Modifications and accommodations will be made to the curriculum outline as outlined in a student's IEP.**