

Grade 8 Math Course Outline

Credit Value: Grade 8 Course (Math 8)

McCreary School
Course Code: 0080
Grade 8
Semester 1 & 2

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Room 10

Prerequisites – The acquisition of the grade seven math course is suggested.

Math Credit – The acquisition of the grade eight math course is suggested to successfully learn grade nine math outcomes.

Course Description/Overview

Mathematics 8 builds on key mathematical concepts from grades 4-7. Students are expected to develop and refine solving math problems. Students will work to acquire and build upon the material discussed below.

Grade 8 students solve a variety of mathematical problems involving elements such as surface area, volume, the Pythagorean theorem, percents, ratios, and rates. They multiply and divide fractions and integers and are introduced to square roots. They also create, graph and use algebraic equations in order to solve problems.

There are four areas in Grade 8 math: the Number strand, the Patterns and Relationships strand, the Shape and Space strand and the Statistics and Probability strand.

- In the Number strand, your child solves problems using square numbers and square roots, percents, rate and ratio, fractions, integers and rational numbers; multiplies and divides fractions and integers using a variety of strategies.
- In the Patterns and Relationship strand, your child models, solves and graphs linear equations.
- In the Shape and Space strand, your child solves problems involving surface area, volume and the Pythagorean theorem draws different views of 3-D shapes; observes and models how shapes can combine to tessellate a surface.
- In the Statistics and Probability strand, your child analyzes the advantages and disadvantages of how different graphs show data.

In the four strands, children:

- communicate what they are thinking and learning
- connect math to everyday situations and other subjects
- estimate and use mental math strategies
- learn through problem solving
- reason and explain their thinking
- use technology to enhance their learning
- use visual images to describe their thinking

Topics Covered

Grade 8 students focus on units from the Math Links textbook.

The course will be divided into the following Units:

- a. Review
- b. Integers
- c. Fraction Operations
- d. Solving Linear Equations
- e. Linear Relations
- f. Pythagorean Relationship
- g. Ratio, Rates, and Proportional Reasoning
- h. Surface Area
- i. Volume
- j. Understanding Percent
- k. Representing Data
- l. Probability
- m. Tessellations

Focus and Purpose of the Course

During the last half-century, there has been a tremendous increase in mathematical knowledge. This is due to the collective influence of the growth of technology, the expansion of applications of mathematics, and the steady transition from an industrial to an information society. Consequently, there is a need for a change in the goals of mathematics education for all students.

In order to meet the challenges of society, high school graduates must be mathematically literate. They must understand how mathematical concepts permeate daily life, business, industry, government, and our thinking about the environment. They must be able to use mathematics not just in their work lives, but also in their personal lives as citizens and consumers.

The grade 8 Mathematics curriculum is designed to support and promote the understanding that mathematics is

- a way of learning about our world
- part of our daily lives
- both quantitative and geometric in nature, with both aspects being equally important in the development of mathematical literacy.

In addition, mathematics and its study encourages the development of

- creative thinking
- logical thinking
- problem-solving skills
- data analysis skills
- co-operative interaction.

Objectives

Students will work towards the following goals:

- Goal 1: Mathematical Communication. Students will read and write in mathematical contexts.
- Goal 2: Mathematical Reasoning. Students will analyze, synthesize, and interpret texts, images, experiences, or other information mathematically.
- Goal 3: Mathematical Modeling. Students will formulate and apply mathematics to solve a broad spectrum of complex problems.
- Goal 4: Mathematical Research. Students will conduct research, collaboratively or independently, using methods and tools that are appropriate to the mathematics.
- Goal 5: Interdisciplinary Knowledge. Students will achieve a depth of knowledge in mathematics and breadth of knowledge through study in the sciences, social sciences, humanities, histories, languages and the arts.

Resources

- Grade 8 Mathematics: Support Document for Teachers
- Math Links Text book
- Math Links Practice Booklet

Required Materials

- Binder
- Two coil notebooks (or loose leaf)
- Pencil
- Red pen
- Calculator
- Geometry set
- USB Memory Stick

You are asked to acquire the above materials as quickly as possible and bring them with you to EVERY class. Should you not have already done so, please ensure that your Internet user agreement has been signed, thus allowing you to access the computers.

Classroom Rules and Expectations

All members of the classroom will:

- Commit to making the classroom a safe space, including respecting the opinions, ideas, and culture of all others.
- Respect the right of all others to learn in an environment that is free of distractions.
- Use only technology that is allowed in the class (no personal electronic devices permitted in class), and in a relevant and respectful manner.
- Attend class regularly, on time, and prepared for all classes.

Grade 8 Topics, Schedule and Pacing (Tentative schedule that is subject to change)

September	Bridging Grade 7 content	
	1 - Integers Multiplication and Division	Chapter 8: Integers Page 282-327
October	1 - Integers: Multiplication and Division	Chapter 8: Integers Page 282-327
	2 - Fraction Operations: Multiplication and Division	Chapter 6: Fraction Operations Page 194-241
	3 - Algebra	Chapter 10: Solving Linear Equations Page 366-405
November	3 - Algebra	Chapter 10: Solving Linear Equations Page 366-405
	4 - Linear Relations	Chapter 9: Linear Relations Page 328-365
December	5 - Squares, Square Roots and Pythagorean Relationship	Chapter 3: Pythagorean Relationship Page 76-117
January	6 - Ratio and Rates	Chapter 2: Ratio, Rates, and Proportional Reasoning Pages 42-75
	7 - 2-D and 3-D Surfaces	Chapter 5: Surface Area Pages: 160 - 193
February	7 - 2-D and 3-D Surfaces	Chapter 5: Surface Area Pages: 160 - 193
	8 - Volume	Chapter 7: Volume Page 242-281
March	8 - Volume	Chapter 7: Volume Page 242-281
	9 - Percent	Chapter 4: Understanding Percent Pages: 118-159
April	9 - Percent	Chapter 4: Understanding Percent Pages: 118-159
	10 - Data Presentations	Chapter 1: Representing Data Pages: 2 - 41
May	11 - Probability	Chapter 11: Probability Pages: 406-441
	12 - Tessellations	Chapter 12: Tessellations Pages: 442 - 475
June	12 - Tessellations	Chapter 12: Tessellations Pages: 442 - 475

Summary of Units

1 - Integers Multiplication and Division

What students will learn

- To multiply and divide integers using concrete materials, diagrams, and symbols
- To solve problems using integers

2 - Fraction Operations: Multiplication and Division

What students will learn

- To multiply and divide fractions and mixed numbers using manipulatives, diagrams, and symbols.

3 – Algebra

What students will learn

- To use linear equations to model problems
- To solve problems involving linear equations.

4 - Linear Relations

What students will learn

- To recognize patterns and analyze data in a table of values
- To graph two-variable linear relations
- To solve problems using linear relations

5 - Squares, Square Roots and Pythagorean Relationship

What students will learn

- To find the squares and square roots of whole numbers
- To estimate square roots of whole numbers
- To determine whether a triangle is a right triangle
- To apply the Pythagorean relationship to find missing dimensions of triangles and to solve problems

6 - Ratio and Rates

What students will learn

- To express ratios using different notations
- To use ratios and rates in real-life examples
- To solve problems involving rates, ratios, and proportional reasoning

7 - 2-D and 3-D Surfaces

What students will learn

- To label and draw views of 3-D objects
- To draw and build nets for 3-D objects
- To calculate the surface area for prisms and cylinders
- To solve problems using surface area

8 – Volume

What students will learn

- To calculate the volume of a cube
- To calculate the volume of a right prism
- To calculate the volume of a right cylinder

9 – Percent

What students will learn

- To describe a situation where a percent may be more than 100%, may be between 0% and 1%, or contains a fractional portion
- To use grids to represent percents that are between 0% and 1%, and those that are greater than 100%
- To find the percent represented by a given shaded region on a grid and record it in decimal, fraction, and percent form
- To convert between percents, fractions, and decimals
- To solve problems involving percents and combined percents

10 - Data Presentations

What students will learn

- To compare how different graphs represent the same data
- To identify the advantages and disadvantages of different graphs
- To explore how data can be misrepresented
- To justify using a specific graph to represent data

11 – Probability

What students will learn

- To calculate probabilities for several events occurring together
- To develop quicker ways to calculate probability

12 – Tessellations

What students will learn

- To describe and create tessellations
- To explore and describe tessellations in the environment

Activities/Themes

Within each of the math topics studied, students will practice mental math, inquiry activities, and course work to meet the outcomes within each of the aforementioned units. The acquisition of these outcomes will improve knowledge and understanding, mental math and estimation, and problem solving for each of the units covered.

Academic Evaluation and Assessment

Assessment will be based on a variety of activities that cater to the various learning styles of students. Individual and group research presentations, textbook exercises, tests, quizzes, assignments, daily assignments, class discussion, and math activities will be part of the evaluation of the course. Both peer and self-assessment will be used on a number of assignments throughout the year. A checklist will be used for both formative and summative assessment.

For each task, you will be given a set of evaluation guidelines in order to help you put forth your best work. It is your responsibility to examine the guidelines & assignment criteria in advance to ensure you have the opportunity to ask any/all questions. Remember, if you need clarification on an assignment, chances are, that a number of your peers have the same questions, so PLEASE ASK! Late assignments will be dealt with in accordance to school policy.

Should you be absent for whatever reason, it is your responsibility to check the missed assignment folder, take responsibility for all missed work, and take down any missed notes. Regular attendance is crucial for success in this course.

Assessment will be ongoing and will include participation in daily classroom activities, homework checks, quizzes, unit tests, and projects. Please refer to the evaluation format below.

Evaluation Methods and Specific Assessment

Students will receive formative assessments and summative assessments for each of the above mentioned units. The work in this course will reflect the cumulative compilation of each of the units covered. The approximate evaluation breakdown for each unit will be 70% on unit tests, 15% on mental math assessment and 15% for problem solving and inquiry projects. There will be no final exam.

*** This assessment is an tentative approximation that may change to meet the needs of students. ***

Manitoba Provincial Report Card Policy and Guidelines Evaluation

As per **section 4.3** of the Manitoba Provincial Report Card Policy and Guidelines Evaluation document, a 1-4 *ordinal scale* is used to report on achievement in each subject category. The *percentage scale* is used to report overall subject grades.

I encourage you to come see me or email me at any point with your questions relating to this course. I will be available to provide extra help or answer any questions upon special arrangement. Just Ask!

Academic Integrity and Honesty

Students guilty of cheating (copying, plagiarizing, etc.) will receive a **zero** and their parents will be notified.

Incomplete Work / Late Assignments / Homework Policy

Incomplete work and late assignments may be deducted in marks, as per McCreary School's late policy, developed in accordance with the Provincial Assessment Policy.

The guidelines for late assignments are as follows:

1. Teachers will set and communicate reasonable timelines for assignments
2. Teachers will share timelines and reminders with students through various formats (ex. course outline, email, post in classroom, etc.)
3. Teachers will assist students to meet timelines – monitor progress, check-ins
4. Students who struggle will require additional support from the teacher
5. Extensions will be granted at the teacher's discretion, for valid and legitimate reasons only (ex. Illness)
6. Teachers will communicate with parents or set up parent/teacher/student conferences to discuss late / incomplete assignments
7. Teachers will make an arrangement with student to complete the work
8. Teachers will create alternative assignments for diverse learning needs

Where the above guidelines have been followed and assignments are not fully completed or handed in by the given due date, a deduction in marks will apply. Upon teacher discretion a maximum of 5% may be deducted for every day the assignment is not turned in. If the assignment is not turned in after two weeks or at the start of a new unit, the assignment will receive a mark of **zero**.

Student Support and Attendance Policy

The teacher will be available for additional student support outside of the classroom hours and it is the responsibility of the student to arrange a time with the teacher. Students will be responsible to catch up on work they miss in the case of their absence (of which the teacher must be informed in advance, where possible). Students who do not attend class regularly will be referred to the Learning to 18 Coordinator.

Use of Technology Policy

Turtle River School Division recognizes that Information and Communication Technologies (ICT) plays an important role in today's learning environment. Technology provided to both students and teachers are unique and powerful ways to enhance the way they teach/learn. Turtle River School Division's objective is to ensure student/staff members interact in a positive manner when using ICT both at school and in the community.

Successful operation of the network requires that account holders regard Turtle River file servers and computers as shared resources. It is important that members conduct themselves in a responsible manner while using the network. Refer to page 134 of TRSD Instructional policy document for more information on guidelines and consequences for inappropriate use.

There are no cell phones to be used by students during class time. Students are to keep cell phones in their lockers as per Turtle River school division policy. Please refer to TRSD Instructional policy document for more information.

Behavioural Assessment

Students will be assessed as per the guidelines from the Manitoba provincial report card, in the areas as follows:

Personal Management Skills

- Organizes material, uses class time productively, works independently, completes all work on time, persists when faced with challenges, seeks help when needed, demonstrates a strong work ethic, shows patience, demonstrates on-task behaviour, sets personal management goals

Active Participation in Learning

- Shows interest, asks questions, takes initiative, self-assesses work quality based on criteria, uses feedback to improve learning, uses criteria to provide feedback, uses a variety of media for communication, investigates questions, hypothesizes, analyzes

Social Responsibility

- Works and interacts well with others, is welcoming and positive, shares resources and equipment with others, respects school values, respects and follows classroom routines, takes an equitable share in group work, is courteous, respects the need for safety, sets personal management goals

**The course outline may be changed due to unforeseen circumstances. **

Please sign and return the following form, indicating that you have read and understand the course and classroom expectations.

Student's Name: _____

Student's Signature: _____ Date: _____

Parent's Name: _____

Parent's Signature: _____ Date: _____