UNIT 1

Measurement

General Outcome

Develop spatial sense and proportional reasoning.

Specific Outcomes

M1 Solve problems that involve linear measurement, using:
- SI and imperial units of measure
- estimation strategies
- measurement strategies.

M2 Apply proportional reasoning to problems that involve conversions between SI and imperial units of measure.

M3 Solve problems, using SI and imperial units, that involve the surface area and volume of 3-D objects, including:
- right cones
- right cylinders
- right prisms
- right pyramids
- spheres.

M4 Develop and apply the primary trigonometric ratios (sine, cosine, tangent) to solve problems that involve right triangles.

General Outcome

Develop algebraic reasoning and number sense.

Specific Outcome

AN3 Demonstrate an understanding of powers with integral and rational exponents.

***Mathematics 10*, pages 2–5**

Suggested Timing

30–40 min

Blackline Masters

BLM U1–1 Unit 1 Project
BLM U1–2 Unit 1 Project Checklist

What's Ahead

In Unit 1, students investigate and apply their knowledge of linear measurement, surface area, and volume using units in the SI and imperial measurement systems. Students examine the SI and imperial measurement systems and learn how to convert within and between the two systems. They learn how to estimate linear measurements using personal referents; solve problems using measuring instruments; calculate the surface area and volume of 3-D objects, including right prisms, right cylinders, right cones, right pyramids, spheres, and composite 3-D objects; and explore right-triangle trigonometry, including the Pythagorean theorem and the primary trigonometric ratios.

Planning Notes

Introduce Unit 1 by pointing out the measurement organizer on page 2 of the student resource. This concept map shows how the topics in this measurement unit—SI and imperial systems of measurement, surface area and volume, and trigonometry—are related. The concept map is repeated at the beginning of each chapter and is shaded to show which topics are covered in that particular chapter.

The Looking Ahead box at the bottom of page 3 identifies the types of problems students will solve throughout the unit. You may wish to reactivate students' knowledge of these topics.

Unit 1 Project

The Unit 1 project focuses on the real-world application of mathematics in music. The project is continuous in nature and is explicitly divided by chapters.

Introduce the Unit 1 project by reading and discussing the introductory notes on page 4 of the student resource as a class. Consider distributing **BLM U1–1 Unit 1 Project** to inform students about how the project develops throughout the unit. This master provides an overview of the project as well as the requirements for completing the Unit 1 project.

You may wish to point out the questions related to the Unit 1 project. These are identified throughout Chapters 1 to 3 with a project logo. Note that these questions are not mandatory but are recommended because they provide some of the background and research needed to complete the Unit 1 project. The questions are also available on masters, one for each chapter. You may decide to use these masters to create a student booklet and have students record their finalized answers in the booklet either after they have completed their in-class work, during assigned project work time, or in conjunction with chapter assignments. Alternatively, you may wish to provide students with **BLM U1–2 Unit 1 Project Checklist**, which lists *all* of the related questions for each chapter. Students can use the checklist to monitor their progress and prepare their presentation and report. Have students collect all their work for the Unit 1 project in a portfolio.

For additional information on the Unit 1 Project, see the Unit 1 Connections on page 140 in the student resource or TR pages 103–104.

Career Connection

Use the collage of photographs to direct a discussion about career opportunities within the digital music world and how each career might use mathematics. Students may mention that the individuals operating the equipment for recording and editing music are audio technicians, often referred to as audio engineering professionals or audio engineering producers. Another aspect of the digital music industry is broadcasting. Broadcast technicians operate the equipment to route radio and television broadcasts through transmitters and networks. Ask students what they know about how each of these careers involves math.

WWW Web Link

For information about careers within the digital music industry and where to get training, go to www.mhrmath10.ca and follow the links.