Measurement Toolkit Activity (Grade 6)

COOK, BAKER, PIPE TRADES, WELDING, CARPENTRY, AUTOMOTIVE SERVICE TECHNICIAN, HEAVY EQUIPMENT TECHNICIAN, AGRICULTURE EQUIPMENT TECHNICIAN, WIND TURBINE TECHNICIAN, PARTS TECHNICIAN

GRADES	LEARNING OBJECTIVE	CONCEPTS
• Grade 6	Using the available tools, students will measure to the proscribed unit.	• Place value • Magnitude • Positive and negative • Decimals • Fractions • Multiplication and division • Addition and subtraction

Curriculum Connections

GRADE 6 MATH

Guiding question 1: How can the infinite nature of the number line broaden the perception of number?

Learning outcome: Students investigate magnitude with positive and negative numbers.

Skills and procedures:

- Relate magnitude to the distance from zero on the number line
- Compare and order positive and negative numbers

Guiding question 2: How can the processes of multiplication and division be applied to decimal numbers?

Learning outcome: Students apply standard algorithms to multiplication and division of decimal and natural numbers.

Skills and procedures:

- Explain the standard algorithms for multiplication and division of decimal numbers
- Multiply and divide up to 3-digit natural or decimal numbers by 2-digit natural numbers, using standard algorithms

Guiding question 3: How can the addition and subtraction of fractions be generalized?

Learning outcome: Students add and subtract fractions with denominators within 100.

Skills and procedures:

- Add and subtract fractions
- Solve problems involving addition and subtraction of fractions

Guiding question 4: How can an understanding of multiplication be extended to fractions?

Learning outcome: Students interpret the multiplication of natural numbers by fractions.

Skills and procedures:

- Multiply a natural number by a fraction.
- Multiply a fraction by a natural number.

GRADE 6 SCIENCE

Guiding question: In what ways can interactions lead to physical change?

Learning outcome: Students analyze forces and relate them to interactions between objects.

Skills and procedures:

- Conduct investigations to answer questions about the effects of external and internal forces on objects during an interaction
- Identify forces that act on an object during an interaction
- Use materials, tools, and equipment safely while experimenting with forces in interactions

Description

The measurement toolkit used for this activity contains various tools used by different trades professionals. Students will use the provided tools to compare multiple and divide decimals, add and subtract fractions, explore positive and negative numbers, and examine forces. This activity has students (or groups) rotating from one tool to another where they will examine each tool and complete the related task. Students will record their responses on their data sheet.

These tools are used by many trades professionals. Culinary professionals use measuring cups to measure ingredients. Welding, pipe trade, automotive service, heavy equipment, agriculture, and wind turbine technicians use the digital caliper to measure the thickness, depth, and lengths of objects. Automotive service, parts and heavy equipment technicians use the tread depth gauge to measure the depth of tire tread. These technicians, along with agriculture equipment technicians, use the tire gauge to measure tire pressure. These same technicians use the feeler gauge to measure spark plug gap, valve clearance and cylinder head warpage. They also use a beam torque wrench to ensure that nut and bolt fasteners are properly tightened. All these technicians regularly use a tape measure to measure the length of materials and objects.

TIME	MATERIALS
• 60 minutes	• Measuring tape • Feeler gauge • Tread depth gauge • Measuring cups and spoons • Tire gauge • Digital caliper • Beam torque wrench

Procedure

PREPARATION

- Lay the measurement tools out on a table to make sure they're all accounted for. Ensure that the digital caliper has working batteries and is properly zeroed.
- If you're using the task card template to create tasks associated with each tool, ensure that task cards are filled out in a way that is easy for students to follow. Also make sure that task cards are printed and cut out and that required tools/materials are available at each station. Ensure that each student has a copy of the recording sheet. This is a scoot-style activity where students move from one task to another, recording their answers to the questions on the cards on their recording sheet.

- Prior to this activity, be sure to watch the tool overview and use the video resources so students are familiar with each tool. Note: Not every tool will apply to every lesson, subject, or grade.
- Measurement Kit: Tool Overview Video
- Measurement Kit: Demonstration Video
- Measurement Kit: Activity Overview Video

STEPS

1. Distribute the task cards, associated tools and needed materials around the classroom. Desks and tables can be used as stations for each task.
2. Provide students with a copy of the recording sheet and instruct students to record their answers on the recording sheet.
3. Assign students a starting task and, if desired, a rotation schedule or allow students to rotate freely from one unoccupied task to another after completing the initial task.

Assessment suggestions

PERFORMANCE TASK

Collect response sheets and check for students' understanding.

STUDENT CONFERENCE

Place a task card at your desk or table and check in with each group as they progress through the activity. This could be an opportunity to review or teach a new concept.

Extension

Have students create a task card for a peer.

Contributors

Warren Anderson