

Measurement Toolkit Activity (Grade 5)

CULINARY, PIPE TRADES, WELDING, CARPENTRY, AUTOMOTIVE SERVICE TECHNICIAN, HEAVY-DUTY TECHNICIAN, AGRICULTURE TECHNICIAN, WIND TURBINE TECHNICIAN

GRADES	LEARNING OBJECTIVE	CONCEPTS
<ul style="list-style-type: none"> Grade 5 	Using the available tools, students will measure to the proscribed unit.	<ul style="list-style-type: none"> Place value Decimal Fraction Rounding Addition Subtraction

Curriculum Connections

GRADE 5 MATH

Guiding question 1: How can the infinite nature of place value enhance insight into number?

Learning outcome: Students analyze patterns in place value.

Skills and procedures:

- Relate the names of place values that are the same number of places to the left and right of the one's place
- Express numbers within 10 million, including decimal numbers to thousandths, using words and numerals
- Relate a decimal number to its position on the number line
- Determine a decimal number between any two other decimal numbers
- Compare and order numbers, including decimal numbers
- Express the relationship between two numbers, including decimal numbers, using $<<$, $>>$, or $==$
- Round numbers, including decimal numbers, to various places according to context

Guiding question 2: In what ways can the processes of addition and subtraction be articulated?

Learning outcome: Students add and subtract within 1 million, including decimal numbers to thousandths, using standard algorithms.

Skills and procedures:

- Add and subtract numbers, including decimal numbers, using standard algorithms
- Solve problems using addition and subtraction, including problems involving money

Guiding question 3: In what ways can fractions communicate numbers greater than one?

Learning outcome: Students interpret improper fractions.

Skills and procedures:

- Relate fractions, improper fractions, and mixed numbers to their positions on the number line
- Count beyond 1 using fractions with the same denominator
- Model fractions, including improper fractions and mixed numbers, using quantities, lengths, and areas
- Express improper fractions and mixed numbers symbolically
- Express an improper fraction as a mixed number and vice versa.
- Compare fractions, including improper fractions and mixed numbers to benchmarks of 0, $\frac{1}{2}$, and 1

Guiding question 4: How can the composition of fractions facilitate operating with fractions?

Learning outcome: Students add and subtract fractions with common denominators.

Skills and procedures:

- Compare strategies for adding or subtracting improper fractions to strategies for adding or subtracting mixed numbers
- Add and subtract fractions with common denominators within 100, including improper fractions and mixed numbers
- Solve problems requiring addition and subtraction of fractions with common denominators, including improper fractions and mixed numbers

Description

The measuring toolkit used for this activity contains various tools used by different trades professionals. Students will use the provided tools to compare, order, add and subtract fractions, examine mixed fractions, add and subtract decimals, and examine numbers based on place value. 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-duty, agriculture, and wind turbine technicians use the digital caliper to measure the thickness, depth, and lengths of objects. Automotive service and heavy-duty technicians use the tread depth gauge to measure the depth of tire tread. These technicians, along with agriculture 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 the nut and bolt fasteners are properly tightened. All these technicians use a tape measure to measure the length of materials and objects.

TIME

- 40–60 minutes

MATERIALS

- Measuring tapes
- 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 video resource so students are familiar with each tool. Note: Not every tool will apply to every lesson, subject or grade.

STEPS

1. Distribute the task cards, associated tools, and required 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

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