Lesson Plan 15

Measuring in Metric and Imperial

CLB Level(s): 4-6
CLB Skill(s): Speaking, Reading
Essential Skill(s): Numeracy, Document Use

Objective(s)

- To estimate measurements in metric and imperial units and then confirm more exact figures using conversion tables

Audience

- Learners needing to be familiar with measurement systems used in the Canadian workplace

Grammar/Language Focus

- Expressions for approximating
- Modals: might, may
- Questions using count and non-count n nouns, i.e. How much, how many
- Idioms

Time Required

1 1/2 hours plus the time needed to do the online quiz

Vocabulary

- The terms used in metric and imperial systems, such as pounds, inches, metres, kilograms.

Materials

- Website: **http://www.metric-conversions.org/metric-conversion-table.htm** along with the printouts of the conversion tables available free of charge at this site
- Real measuring tools; rulers, graded containers, maps with miles and kilometres, weights, a scale etc
- Calculators
- Appendix for Additional Activities

Workplace Culture

Learners become aware of the continued use of multiple systems in Canada and the importance of being able to estimate as well as calculate conversions.

Learning Activities

Activity 1: Assess Learners' Previous Knowledge of the Systems Used in Canada

1. Reproduce the column below on the board.…

Topic* (What we are measuring)	Measurement and unit of measurement	Estimated Conversion	Actual Conversion
Height			
Weight			
Travel Distance			
Run, Bike, or Swim			

* These topics are just ideas. Any topic can be used provided they reflect common measurements.

2. Ask a few questions involving common measurements to become familiar with learners' level of comfort using units of measurement. Use the questions below as prompts or create your own. Write the learners' answers on the board in the Measurement column and in whichever system (metric or imperial) they feel most comfortable. Leave the other two columns blank for now.

   How tall are you?

   How much do you weigh?

   How far do you travel from home to school?

   What is the longest distance you can run, bike or swim?

3. Introduce the idea of converting. Ask learner questions involving common conversion to determine which kinds of conversions students have already explored. Use a variety of examples.

   How many feet are there in a metre?

   How much water is there in a quart?

   Show me a distance of a yard with your hands.

   Which is farther, a kilometre or a mile?

4. Have volunteers demonstrate the calculation of conversions that are familiar to them. Notice which students are not comfortable with calculations.

Activity 2: Guessing, Estimating and Stating

1. Bring rulers and a tape measure to the class. Ask learners to guess the measurements of several things in the room. For example, the length of the room, the height of the windows, the width of the door. Ask them to record their guesses.

Learning Activities

2. Brainstorm expressions used to *guess* and write them on the board. For example,

   I guess it would be about…..
   It might be around…..
   I would say it's about……
   My guess would be…..
   This is a wild guess….
   I'm just guessing!

3. Have learners *estimate* the dimensions by using arm spans and toe-to-heal foot steps. Do they feel more confident about their accuracy than when they guessed?

4. Write on the board expressions that reflect their estimations.

   It's about….
   It's around…
   It would be about…
   My estimate is…..

5. Have volunteers use the tape or ruler to accurately measure and record the measurements of the examples. Ask them to make statements about their findings. Write their results on the board. Note the change in the language used as confidence increases.

   It's x metres long.
   It's exactly x centimetres wide.

6. Discuss the difference between guessing, estimating, and accurately measuring and the language used to record and report measurements. Review expressions like, *wild guess, a good guess, ballpark figure, not far wrong, right on, away off!*

Activity 3: Converting Approximately

1. Return to the table on the board from Activity 1.

2. Have students complete the next column by estimating the conversion.

3. Have learners handle the examples of containers, weights, etc. that you have brought to help them *get a feel for* the measurements that are new to them.

4. Have them guess the weight in whatever system they are most comfortable using. Have them estimate the conversion.

Learning Activities

5. Ask learners to consider how they can improve their ability to estimate and convert (e.g. reading labelling on packages, memorizing certain frequently used measurements, using conversion tables until they are able to memorize basic conversions). Why is it important to be able to estimate?

6. What kinds of mistakes can be made when you estimate badly? Ask them to consider the consequences when they find they have bought 3 kilograms of meat instead of 3 pounds; set out on a journey of 800 kilometres miles and discover that it is 800 miles; measured carpet for a room in feet and ignored the inches.

Activity 4: Using Conversion Tables

1. From the Google website **http://www.metric-conversions.org/metric-conversion-table.htm** print the conversion tables most relevant to what the learners have been estimating to date, i.e. distance, volume, length… If possible, use the website in the classroom.

2. Divide the class into small groups and give each group a set of conversion tables. Look briefly at each table and have students highlight some significant items.

3. Have students complete the column Actual Conversion in the table from Activity 1 and have them check each others answers.

4. Discuss with the class whether or not their estimates were relatively accurate.

Activity 5: Create Quizzes Using Conversion Tables

1. In small groups, have students create their own "conversion quizzes". Ask them to choose items that they need to use themselves at home or at work. For example,
   - How many fluid ounces are there in a litre?
   - How many ounces are there in a kilogram?
   - How many inches are there in a metre?

2. Have groups exchange and do the quizzes, aloud if time permits. If an item is unusual have students explain why they chose to include it.

Learning Activities

Additional and/or Extended Learning Activities

- Introduce and review conversion tables for temperatures and cups
- Try using the quick conversion table provided in the Additional Activities handout.
- For more exercises on converting, go to **http://mathmaniax.com/assignments/Grade%2011%20College/Unit%207/Sec7.1A.pdf** (Grade 11 test)
- Use conversion tables in areas that are applicable to the interest of your learners, i.e. Fahrenheit and Celsius for tourism, pounds and grams for cooks, kilometres and miles for car mechanics etc.

Reflective Evaluation

- Test learners individually by asking them to find equivalents on any one of the conversion tables.

Debriefing/Wrap-up

- What measurements are needed in your field? Are they usually given in metric or imperial?

Skill Descriptors

Canadian Language Benchmarks Skill(s)	Essential Skill(s)
Speaking Performance Indicators (suasion) ■ Provides required information/description of item. (CLB 4) (Information: Interaction in a group) ■ Expresses opinions. (CLB 5) What the Person Can Do (Information: Presentations) ■ Describes a simple process. (CLB 6)	**Document Use** Complexity of the Document ■ Document is very simple. Brief text combined with uncomplicated structure. (ES 1) Complexity of Information ■ Limited analysis required. (ES 2) Complexity of Finding/Locating Information (Thinking Process) ■ A low-level of inference is required. (ES 2) ■ Information needed is fairly evident. (ES 2) (Information Entry) ■ Entering few pieces of information (ES 1)
Reading What the Person Can Do (Business/service texts) ■ Find information in formatted texts: forms, tables, schedules, directories. (CLB 4) Performance Conditions ■ Tasks are in standard format: with items to circle, match, fill in a blank, complete a chart, etc. (CLB 5)	**Numeracy** ■ Take measurements through a one-step process and record the results, e.g. clerk weighs mail and records the results in the mailbook. (ES 1)

Centre for Canadian Language Benchmarks 803 – 200 Elgin Street Ottawa, ON K2P 1L5
Ph. (613) 230-7729 Fax: (613) 230-9305 info@language.ca

Additional Activity

Quick Conversion Table

Convert by multiplying:

- inches by 25.4 to find millimetres
- feet by 0.3048 to find metres
- yards by 0.9144 to find metres
- miles by 1.60934 to find kilometres
- square yards by 0.836127 to find square metres
- acres by 0.404687 to find hectares
- cubic yards by 0.764555 to find cubic metres
- quarts by 1.1365 to find litres
- ounces by 28.3495 to find grams
- pounds by 0.45359237 to find kilograms
- degrees Fahrenheit by 5/9 after subtracting 32 to find degrees Celsius

(Compiled by Measurement Canada)