Title: Converting Units, Metric and Standard

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Overview / Description:
In this lesson, students will be learning to convert Inches to centimeters and millimeters.

Subject(s):
Technology Education, Construction, Machining, Math

Grade Level(s):
Grades 9-10

Learning goals/objectives:
After completing this activity, students should be able to:
- Convert inches to centimeters
- Convert centimeters to inches

Type of Activity:

- Individual

Teaching Strategies:

- Discussion
- Use of Technology
- Real life situations

Content Standards:
WIsconsin Standards for Technology and Engineering
Content Area: AC/Architecture and Construction
> **Standard AC1.b.13.h** - Convert scaled blueprint drawings measurement to full dimension for a given construction project

Content Area: MNF/Manufacturing:
> **Standard: MNF1.a.9.h** - Select and apply the appropriate units and scales for situations involving measurement

Content Area: CD/Career Development

      Standard: CD2.b - Assess attitudes and skills that contribute to successful learning in school and across the life span.

Length of Time and length of class periods: 1 Hour

Materials List (linked if online resource please):
- Technology: Simple calculator, cell phone, Chromebook
- [Converting Inches to Centimeters worksheet](#)
- https://www.inches-to-cm.com/
- https://www.rapidtables.com/convert/length/inch-to-cm.html

Directions (Step-by-Step):
- "In construction and manufacturing, workers sometimes have to convert standard U.S. measurements to centimeters (CM) and millimeters (MM). In this lesson, we'll be learning the mathematical formula to convert inches to CM or MM and also how to convert CM or MM to inches. We'll also be investigating some online resources to do the conversion, but if you work in construction, sometimes you may be working in areas that don't have cell reception. In those cases, you need to know how to do the conversions yourself using math formulas."
- Have students think about other scenarios when they might not be able to use technology to do conversions and share with the class.
- Share the formula students should use to convert Inches to centimeters or CM to inches: 1 inch = 2.54 CM
- Review this formula for converting inches to centimeters and examples.

Step 1: Set up formula Whole and Part	Step 2: Multiply diagonally	Step 3: Take take answer and divide it by the other "Whole" in formula
Example 1		
1 Inch 1.5 Inch ----------- X ------------- 2.54 CM ?	2.54 x 1.5 = 3.81	3.81 divided by 1 = 3.81 **Answer: 3.81cm**
Example 2		
1 Inch ? Inch --------- X -------------- 2.54CM 3.81 CM	1 x 3.81 = 3.81	3.81 divided by 2.54 = 1.5 **Answer: 1.5 Inch**

     Tip - Keep the Inches on top and the CM on the bottom for all parts of the formula
     Tip - Remember 1 inch = 2.54cm

- Hand out worksheet and go over the first two problems with students. Have students complete the worksheet using the formula above.
- Share with students the conversion websites https://www.inches-to-cm.com/ and https://www.rapidtables.com/convert/length/inch-to-cm.html. Have them check their answers on the worksheet using the websites.

Wrap-Up:

Discuss corrected sheets, going over any problems students did not get correct to check for understanding.

Formative/Summative Assessment:

- Formative assessment - [Converting Inches to Centimeters worksheet](). The teacher could also create and distribute a 3-question entrance ticket for the next day asking students to convert using the formula above to check for retention of the process.

- Summative assessment - Have students take three measurements in inches on a project they are currently working on in Tech. Ed. On paper, have students record the measurements in inches, calculate the conversions to CM, and explain two reasons they might need to know how to calculate conversions on paper.

Extension Activity for differentiation:
- The handout was for inches to CM. As an extension, the teacher could explain that to convert from CM to MM, students would move the decimal place over one place to the right and 2.54 becomes 25.4. Now the formula is for MM. Teacher could ask students to do additional conversions to MM.

- Special Ed: If needed, students can go straight to the websites to complete the worksheets, which would reinforce the student's ability to find the correct website or app and use it correctly for conversion.

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