

Math-in-CTE Lesson Plan Template

Lesson Title: Calculating Elevations		Lesson #C13
Author(s):	Phone Number(s):	E-mail Address(es):
L Williams	364-3764	lloydw@region9school.org
M Antel	824-2136	antelm@sad44.org
Occupational Area: Building Construction		
CTE Concept(s): Use of the builders level to determine elevations. Changing decimal parts of a foot to fractional parts of an inch.		
Math Concepts: Conversion of fractions		
Lesson Objective:	Change decimal fractions of a foot to inches and common fractions of an inch	
Supplies Needed:	Text, Builders rod, Engineers (Philadelphia) rod, A set of plans, Hand outs, Tape measure	

THE "7 ELEMENTS"	TEACHER NOTES (and answer key)
<p>1. Introduce the CTE lesson.</p> <p>Now that we have learned to set up and take readings with the Builders Level, today we are going to talk about the differences between how Engineers and Builders measure things like distance or elevations.</p>	<p>Show the two types of rods side by side showing the inch marks and the 10th of a ft. mark.</p>

<p>2. Assess students' math awareness as it relates to the CTE lesson.</p> <p>Please do the 10 examples in the handout.</p>	<p>Pass out handout #1</p>
<p>3. Work through the math example <i>embedded</i> in the CTE lesson.</p> <p>Explain the difference between 1 inch and 1/10 of a foot.</p> <p>Show the elevations given on a plot plan in the text or set of prints</p> <p>Have the students add and or subtract some of the elevations and show the results on the engineer's rod, and then measure that with a tape measure.</p> <p>Discuss the difficulty of doing this on the job site.</p>	<p>Use the conversion table of INCHES TO DECIMALS OF A FOOT to show the differences.</p> <p>You might try the web site – weldingweb.com/tools.shtml</p> <p>Examples- NCCER 4.6 Carp. Fundamentals level one</p> <p>NAHB- Basic Principles for Construction Appendix B</p> <p>Goodheart/Willcox - Modern Carpentry pg. 102</p>

Now lets change the decimal fraction of a foot to inches by multiplying the decimal by twelve because there are 12 inches in 1 foot. Remember, it does not matter if it is a whole foot or a part of a foot the process is the same. You may come up with whole inches or whole with a decimal.

Change the decimal fraction of the inch to 16ths by multiplying it by 16 because there are 16 /16th in one inch. Then round off any finial fraction because we aren't going any smaller than 16ths.

4. Work through *related, contextual* math-in-CTE examples.

Point to several elevations on the Philadelphia rod and have the students read them in feet and tenths of a foot, then convert the readings to feet and inches to the nearest 16th.

You may want to refer to **THOMSON/Delmar Learning PRACTICAL PROBLEMS IN MATHEMATICS FOR CARPENTERS** page 57 problems 27-33

5. Work through *traditional math* examples.

To be updated

<p>6. Students demonstrate their understanding.</p> <p>Use hand out number 2</p>	<p>To be updated</p>
<p>7. Formal assessment.</p> <p>Have the students take the builders level out into the shop with the engineers rod and take readings at specified areas and convert them to feet and inches to the nearest 16th.</p>	<p>Created by teacher</p>

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