

# Math-in-CTE Lesson Plan Template

Lesson Title: Yahdage		Lesson # A-11
Author(s):	Phone Number(s):	E-mail Address(es):
Dean Whitman	(802) 222-5212	<a href="mailto:dwhitman@rbctc.org">dwhitman@rbctc.org</a>
Meredith Puffer	(802) 222-5212	<a href="mailto:mpuffer@rbctc.org">mpuffer@rbctc.org</a>
Occupational Area: Heavy Equipment		
CTE Concept(s): Finding yahdage		
Math Concepts: Volume and conversion of units (meters, yards and inches into feet and cubic feet to cubic yards), conversion facts		
Lesson Objective:	Students will understand basic calculation of area and volume and use that information to ordering certain materials.	
Supplies Needed:	Calculator, conversion information, paper and pencil, measuring tape	

THE "7 ELEMENTS"	TEACHER NOTES (and answer key)
<b>1. Introduce the CTE lesson.</b> <b>Students will be taken down to athletic field and told that we have been asked to build a long jump for track and field.</b> <b>They will be given a sheet with dimensions, they will measure and stake field accordingly.</b>	Introduce tomorrow's lesson by talking about the request from Oxbow to construct a practice runway for the long jump. What do we need to order for materials after we prepare the ground? Make sure they understand there are 27 cu. Ft. in a cubic yard.
<b>2. Assess students' math awareness as it relates to the CTE lesson.</b> <b>Prior to this assignment students have been given a work sheet that asks them to find volume of a cube AT-11 W1</b> <b>Worksheet was given to see where individual students stand with finding volume of a cube.</b>	Day before: Present each student with a simple volume of a block (rectangular prism) in the last 5-10 minutes of class. Looking for A) knowledge of volume formula B) recognition of different units that need to be converted.  2011-12 results show that 95% of students know to multiply $L \times W \times H$ but unit consistency and use of cubic units was less than 50%  (Because of results students were given work sheets with minimal conversions)
<b>3. Work through the math example <i>embedded</i> in the CTE lesson.</b> How much would the bucket of the 740-loader hold if the dimensions were 2.67 ydsx 4'x3'	Volume = $L \times W \times H$  Convert units so that they are uniform. Keep in mind where you want to end up (metric or standard).  Convert to the final units needed (cubic yards) Need to know that there are 27 cubic

	feet in a cubic yard.
<b>4. Work through <i>related, contextual math-in-CTE</i> examples.</b> See attached work sheet	Similar problems (in heavy equipment) as above for students to calculate. Worksheet AT-11 WS2 Answer sheet AT-11 ANS WS2
<b>5. Work through <i>traditional math</i> examples.</b> See work sheet attached	Volume, conversions.  AT-11 WS3
<b>6. Students demonstrate their understanding.</b> Students will break into pairs and measure the body of the C -70 dump truck to determine the capacity in cubic yards and present on job sheet  Students will be given different “materials” to find load price and present total cost on job sheet	Find the volume capacity of the C-70 in cubic yards.  Done in pairs. Students will be assigned different materials to “haul” and write the resulting load price on the board. Present results.
<b>7. Formal assessment.</b>  Students will determine compaction rate using chart in their binder	Practice runway is needed for the long jump at Oxbow. The dimensions must be 41 meters x 1 meter x 4” (but we need to pack it so we will calculate at 6”). How many yards of stay pack do we need to order for this project?  AT-11 FA Yahdage