OALCF Tasks for the Apprenticeship Goal Path: Prepared for the Project, *Developing Best Practices for Increasing, Supporting and Retaining Apprentices in Northern Ontario (2014)*

OALCF Task Cover Sheet

Task Title: Calculate volumes of concrete required

Learner Name:	
Date Started:	**Date Completed:**
Successful Completion: Yes___ No___	
Goal Path: Employment ✓ Apprenticeship ✓ Secondary School___ Post Secondary ___ Independence___	
Task Description: Carpenters calculate volumes of window sills, thrust blocks and columns to determine the amount of concrete required. *Tasks 1, 3, & 4 'C3' tasks are higher than Level 3 OALCF *Task 3 has been identified as authentic to this particular trade and may need some prior knowledge of the trade to complete	
Competency: A: Find and Use Information C: Understand and Use Numbers D: Use Digital Technology	**Task Group(s):** A2: Interpret documents C3: Use measures C4: Manage data
Level Indicators: A2.1: Interpret very simple documents to locate specific details C3.3: Use measures to make multi-step calculations; use specialized measuring tools C4.1: Make simple comparisons and calculations D2: Perform well-defined, multistep digital tasks	
Performance Descriptors: see chart on last page	
Materials Required: • Pencil • Calculator • Concrete Building Objects diagram	

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Carpenters calculate volumes of window sills, thrust blocks and columns to determine the amount of concrete required. They usually use calculators to ensure accuracy.

Learner Information and Tasks:

The carpenter calculates the volume (V) of concrete required for building objects. Use the Concrete Building Objects drawings provided for Tasks 1, 3 and 4.

For square or rectangular objects: V = L x W x D, where V = volume, L = length, W = width and D = depth.

For round objects: $V = \pi r^2 \times H$, where V = volume, $\pi = 3.14$, r = radius of circle* and H = height

* Radius is ½ of the diameter (diameter = distance across the circle)

Review the Concrete Building Objects drawing.

Task 1: Calculate the volume (V) of concrete required for the Window Sill in cubic feet (ft^3).

Task 2: A garage floor measures 12′ 6″ by 13.75′. The concrete pad will be 4″ deep. The cement truck contains 1 cubic yard of concrete. Will you need to order more concrete to complete the garage floor? Concrete can be ordered by ½ and full cubic yards.

Task 3: Calculate the volume of concrete required for the Thrust Block, in cubic yards (yd^3). The Thrust Block is an odd shape. Consider it as a rectangle (13’ x 14’ 1” x 26’3”) plus half of another rectangle ((29’6” – 13’) x 14’ 1”x 26’ 3”).

Task 4: Calculate the volume of concrete required for 8 Columns, in cubic yards (yd^3); 1 ft^3 = 0.037 yd^3). (A2.1, C3.3, D2)

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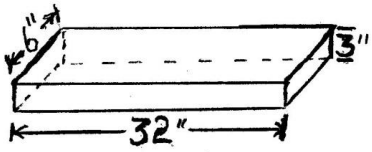
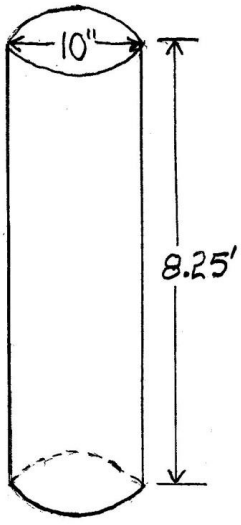
Concrete Building Objects Diagram



WINDOW SILL

THRUST BLOCK



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Answer Key

Task 1: V = L x W x H
Convert measurements to feet
32" = 32 / 12 = 2.67'
6" = .5'
3" = .25'
V = 2.67" x .5" x .25"
V = .334 cubic feet (or .334 ft^3)

Task 2: V = L x W x H
Convert measures to feet.
12' 6" = 12.5'
4" = .33'
V = 13.75 x 12.5 x .33
V = 56.2 ft^3
1 yd^3 = 27 ft^3
56.2 / 27 ft^3 = 2.08 yd^3
Yes, you will need to order more concrete.

Task 3: This is one method of solving the problem. The Thrust Block will be viewed as two geometric figures: a rectangle and a triangle (1/2 a rectangle).

V = L x W x H (Rectangle)

V= 13' x 26' 3" x 14' 1"

V = 13' x 26.25' x 14.08'

V = 4804.8 ft^3

V = (L x W x H) / 2

L = 29.5' – 13'

L = 16.5'

V = (16.5' x 26.25' x 14.08') / 2

V = (6156. 48 ft^3) / 2

$V = 3078.24\ ft^3$

The volume of the Thrust Block is $4804.8 + 3078.24 = 7883.04\ ft^3$

Convert $7883.04\ ft^3$ to yd^3

$7883.04 / 27\ ft^3 = 291.964\ yd^3$

The volume of the Thrust Block is 291.964 yd^3.

Task 4: $V = \pi r^2 \times H$

$V = 3.14 \times 5"^2 \times 8.25'$

Convert 5" to a fraction of a foot

5/12 = .417

$V = 3.14 \times .417ft^2 \times 8.25'$

$V = 1.309\ ft^2 \times 8.25'$

$V = 8.572\ ft^3$

To convert ft^3 to yd^3:

$1\ ft^3 = 0.037\ yd^3$

$V = 8.572 \times 0.037$

$V = 0.317\ yd^3$ (for one Column)

Total concrete required for 8 Columns is $8 \times 0.317\ yd^3$ or **2.537 yd^3**.

(Note: some rounding has been done so the answer provided is approximate.)

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Performance Descriptors		Needs Work	Completes task with support from practitioner	Completes task independently
A2.1	• Scans to locate specific details			
	• Interprets brief text and common symbols			
C3.3	• Calculates using numbers expressed as whole numbers, fractions, decimals, percentages and integers			
	• Calculates the radius, diameter and circumference of circles			
	• Understands and uses properties of angles and triangles to solve problems			
	• Understands and uses formulas for finding the perimeter, area and volume of non-rectangular, composite shapes			
	• Chooses and performs required operations; makes inferences to identify required operations			
	• Selects appropriate steps to solutions from among options			
	• Interprets, represents and converts measures using whole numbers, decimals, percentages, ratios and fractions			
	• Uses strategies to check accuracy (e.g. estimating, using a calculator, repeating a calculation, using the reverse operation)			
C4.1	• adds, subtracts, multiplies and divides whole numbers and decimals			
	• identifies and compares quantities of items			
	• identifies and performs required operation			
	• interprets and represents values using whole numbers, decimals, percentages and simple, common fractions (e.g. ½, ¼)			
	• follows apparent steps to reach solutions			

D2	• selects and follows appropriate steps to complete tasks			
	• locates and recognizes functions and commands			

This task: was successfully completed___ needs to be tried again___

Learner Comments

_____ _____

Instructor (print) **Learner Signature**