

DESE Model Curriculum

GRADE LEVEL/COURSE TITLE: Agricultural Structures, Unit IV - Concrete

Course Code:

Agricultural Structures

Unit IV — Concrete

Student Handout

Pouring a Concrete Patio Block

Objective: Pour concrete to make a patio block.

Materials and Equipment:

Wood and screws for forms

Tape measure

Drill

Shovel or spade

Container for mixing concrete

Gravel

Sand

Portland cement

Water

Oil

Hand trowel or wood float

Safety goggles*

Latex gloves

Face mask

Calculator

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**Everyone participating in or observing this procedure must wear the proper eye protection. Safety practices should be followed at all times while in the shop area.*

Procedure:

1. The purpose of this activity is to build a concrete patio block. To complete the project, you will need to make a form for the patio block; determine the volume of the form; calculate and mix the correct amount of gravel, sand, Portland cement, and water to fill the form; and cure the project.
2. Construct a form using the materials provided by your instructor. Build the form so that the patio block will be 3 1/2" x 18" x 18" when it is completed. Be sure to use screws so the form can be removed more easily after the concrete has set.
3. Using a calculator, determine the volume of the form.

Volume of the form _____

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4. Using the mixture ratio 1:2:3:6, determine the amount of Portland cement, sand, gravel, and water needed. Confirm the amounts with your instructor before proceeding.

Cement	_____
Sand	_____
Gravel	_____
Water	_____

5. Lightly coat the inside of the form with oil to prevent the form from sticking to the block.
6. After you have determined the amount of ingredients needed, mix the concrete thoroughly. When the concrete is ready, begin pouring the concrete into the form. Pour until the form is filled halfway and then use a hand trowel to work up and down through the concrete, especially around the edges. This will remove air bubbles and move the aggregate away from the edges to create a smoother finish.
7. Pour the concrete to the top of the form. Using a hand trowel, work the concrete that was added to the form to remove air pockets.
8. Using a straight board as a screed, work the top until the entire surface is level and even.
9. Allow the concrete to begin to set.
10. Once the surface of the concrete starts to dry and no water is standing on top of the poured concrete, take a small hand trowel and smooth the surface of the block.
11. Allow the patio block to cure for at least 3 to 4 days or preferably up to 1 week for maximum strength.
12. After the concrete has set completely, remove the block from the form.
13. Perform assigned cleanup procedures. Return materials and equipment to their proper places.
14. Turn your completed patio block in to the instructor for grading.

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Use the Project Completion Checklist and Project Evaluation Checklist to track the progress of your project.

Project Completion Checklist

Procedure	Date Due
Master all competencies necessary to complete the project.	
Receive instructor approval to build the project.	
Review safety precautions for equipment and materials to be used. You can lose points for not following safety precautions and other assigned procedures.	
Complete project construction.	
Use the Project Evaluation Checklist to perform a quality control inspection of the project following completion.	
Turn in the completed project. Your final assessment score will be based on the overall quality of the work and your ability to safely and correctly complete the project within the available time.	

Project Evaluation Checklist

Quality Control and Shop Procedures	Criteria
Quality of Work	<ul style="list-style-type: none">• Form was properly constructed.• Volume of the form was figured correctly.• Amounts of cement, sand, gravel, and water were figured correctly.• Concrete was mixed to the proper consistency.• Concrete is properly finished.• Project is good enough to sell.• Work was completed on time.
Safety and Work Habits: Observe these safety procedures whenever you are in the shop.	<ul style="list-style-type: none">• Know how to use the tools and materials before you attempt to use them. Only use tools and materials the instructor has approved you to use.• Wear appropriate personal protective equipment.• Follow safety guidelines from your instructor and safety information on labels, equipment, and signs in the work area.• Follow assigned setup and cleanup procedures.• Return equipment and materials to their assigned places.