

Masonry

STORM DRAIN

Subject: Masonry
Date 11
11-2-09

Grade Levels: 10-12

LESSON PURPOSE

To give the student an understanding of the process, the tools, materials and knowledge required to add a drain line to an area that is subsequent to flooding.

To incorporate a better understanding of the importance that reading, writing, math, English (communication), social skills, commitment, accountability and critical thinking have in the out come of a work project.

Materials Included in this Lesson

- Worksheets
- Books
- Ditto sheets
- Material cost out sheet
- Forman binder

Other Materials for this Lesson

- 3" ABS pipe, fittings, drain screens, primer, glue, ABS saw
- #3, #4 rebar, tie wire, form lumber, concrete, screws.
- Shovels, picks, axe, measuring tape, line level, line, torpedo level, 2' level, Increment level, rebar cutter, cordless drill.
- 4' level, mixer, brooms, spade fork, mortar, trowels, stone brush,

Skills the Student will Learn

- Importance of team work
- Tool recognition
- Ability to use many tools
- Communication skills
- Critical thinking skills
- Career opportunities
- Health and safety

Student Deliverables

- Inspection of work performed on project.
- Each foreman and crew is assessed through out length of project.
- Each crew must turn in a material cost out form at the end of the project.
- Self assessment form completed by

- Math
 - Reading
 - Writing
- each student.
 - On-line student survey

Class fifty five min.: 20 days

Activity Day One

Explanation of what the project is. What the final purpose of the project is. Work crews assigned and purpose of the crew. Three crews, with one foreman per crew. Site inspection. Brain storming of what will be needed for each crew to accomplish there portion of the project.

Activity Day Two

Discuss as a group what each crew came up with as to what tools, and what work needs to be done to accomplish the task before them. Emphasize the importance of team work and crew safety. Go to work project and work. One crew is assigned to permanently barricade the entire work site for safety during the work project.

Activity Day Three

Teacher lecture on terminology and procedures required for each crew. Discuss as a group any issues, questions that need to be addressed. Remind students of work safety. Then to work project.

Activity Day Four

Crews assemble tools and equip. for their project and go to work.

Activity Day Five

Go over work project terminology, safety. Crew issues, problems. What career opportunities can come from this one project? Go to work on project.

Activity Day Six

Discuss crew issues, problems Then to work project

Activity Day Seven

Discuss safety. Crews assemble tools and equip. for there project and go to work on project.

Activity Day Eight

Crews assemble tools and equipment and go to work on project. One crew is also assigned the task of building a river rock drain water catch basin, at the bottom of the roof drain.

Activity Day Nine

Group discussion of what different career opportunities pertain to the project they are working on. Discuss as a group any issues that need addressing on the work project. Overview of job terminology, procedures that are being implemented on the work project.

Activity Day Ten

Remind work crews on the importance of safety. Go to work project and work

Activity Day Eleven

Start in class with lecture on what, how, why to set concrete forms. How far apart the supports for the drain line needs to be (10') How to find the equal spacing between 2 6x6 drain vents, from point A-B Start ch.13 in class book Residential Construction Academy: Masonry. Answer all questions at the end of Ch.

Activity Day Twelve

Finish up Ch. 13 Book work turned in for grading and points. Group discussion on project questions, issues, work procedures. Go to work projects to allow students to set drain pipes, set concrete forms, shadow pipes. Remind foreman's to fill out materials used on their crew, on the cost out sheet before drain lines or any other type work is buried.

Activity Day Thirteen

Go to work project to work

Activity Day Fourteen

Group discussion on any safety concerns, work issues, questions on work procedures. Go to work on project.

Activity Day Fifteen

Group discussion and teacher feedback on how to use cement mixer to mix the concrete, proper safety procedures and safety gear required when mixing concrete. Teacher lead group discussion at white board on the math formula of how to know how much concrete will be needed on the pour. Foremen complete the material list sheet.

Activity Day Sixteen

Pipe and drain setting crews to work project. Over view of proper mixer safety to concrete crew. Concrete crew starts to mixing and transporting concrete to work site, then all crews assist on the concrete pour and finishing of the concrete.

Activity Day Seventeen

Group discussion of the day's prior work, any work issues or problems. Teacher lecture on the importance of pulling the concrete forms properly to prevent any concrete fracturing Crews sent to work project to pull concrete forms, and begin final grading on work site.

Activity Day Eighteen

Class group discussion of what has been learned during this project, what career pathway possibilities now exist to them, with the new knowledge they have gained. Hand out a ditto of the student survey to prepare them for the on-line student survey they will be doing and have them fill them out by hand prior to going to the computer lab.

Activity Day Nineteen

In class all crews begin to do the final cost out sheet for there portion of the project with the assistance of the teacher. All crews then tabulate on the white board what the final material cost was on the project.

Activity Day Twenty

Two crews are sent to the work project to finalize any final grading or clean-up of the work project. One crew is sent to the computer lab to do the on line student survey. When a student is finished with the survey he comes back to the work project and trades places with one of the workers that has not done the survey.

By the end of the class, student survey and the storm drain project are complete.

Activity Day Enrichment Suggestions

Each day extra points giving to the crew that focused the best and worked the smoothest as a team.

Each day the crew that had the least amount of missing workers, gain additional points.

Student Resources

Plumbing book, Ditto sheets, Class masonry book

State Standards Met

- Foundational standards 2.0,3.0, 5.0,6.0,7.0, 8.0, 9.0
- Math 1.1, 1.2, 1.3
- Reading 2.1, 2.2
- Written / oral 2.3, 1.4
- CTE: D1, D2, D2.1, D2.2, D1.3, D1.4, D1.5,

Lesson Plan Relevance to Externship

This lesson plan pulls from the knowledge that I learned from working with a plumbing crew from Beutlar Corp. Plumbing division. For three days I assisted on doing the rough plumbing drain system on four residential homes. The process, terminology, and tools that I worked with on this work crew were the same as my students working on installing a new storm drainage system.

Rubric for the (storm drain) Project

Student Deliverables	1 Exceeds Expectations	2 Meets Expectations	3 Approaches Expectations	4 Fails to meet Expectations
Worked steady				
Quality of work				
Team work				
Followed directions				