

**Construction Management Role Simulation**

**By Lynn Hurtado,**

**hurtadl@crc.losrios.edu**

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**Educational Goals:** To learn four different roles in construction management and how they interrelate. To build teamwork and communication.

**Description:** This activity is a competition among teams of four students; each assigned a role as a laborer, safety manager, quality control manager and overall project manager. Each member of the team must operate according to defined rules. The object of the competition is for teams, in the safest and most time- and cost-efficient ways, to complete a “construction” project that most closely meets a specification. The project involves mixing yellow and blue colored water to make a shade of green matching a control batch (prepared by the mentor before the class session).

**Time:** Approximately one hour

**Materials Needed**

*Each group of four students will need the following:*

* Aluminum foil baking tray (approximately 13” x 9”)
* Four ounces (1/2 cup) of each of the blue and yellow solutions, previously prepared by the mentors
* 3 ***clear*** plastic drinking cups. Two cups, for the blue and yellow solutions, should be at least 6-7 ounces. The third cup, used for mixing the blue and yellow solutions into a shade of green, should be 16 or more ounces in size.
* Blindfold (a large bandana, folded, perhaps)
* Waterproof table coverings

*Mentors will need:*

* Measuring cup, 16-ounce (2 cup) size is preferable
* 2 containers (e.g., empty large [2 liters] soda bottles), one container for the blue solution and one for the yellow
* 1 container in which to mix the control batch of green
* Small cups (one for each team’s quality control manager) to be used for the control batch of green color
* Tap water
* Food colors (yellow and blue)
* Evaluation sheet
* Pencil or pen for Mentor use
* Files needed from the storage stick---
  + - ***Const-Mgmt Role Competition.pps***
    - ***CM Role Evaluation Sheet.pdf*** – (this sheet has enough space for evaluating 9 teams of four…if you have more than 36 students, bring multiple copies)

**Preparation**

1. Students should be divided into teams of four each, and each member of the team should be assigned a role – Project Manager, Quality Control Manager, Safety Manager, and Laborer. In the ideal layout, each team should be gathered around a small four-sided table, covered by some sort of waterproof material.
2. The aluminum foil baking tray is placed in the middle of the table. An empty ***clear*** plastic cup, 16-20 ounces in volume, is situated in the center of the tray.
3. Before the activity starts, mentors should mix, in a quantity sufficient for each team to receive:
   * A blue solution (1/2 cup or 4 ounces). Use the food coloring and tap water to mix the solution.
   * A yellow solution (1/2 cup or 4ounces). Use the food coloring and tap water to mix the solution.

**NOTE:** Extra amounts of the blue and yellow solutions should be mixed in case teams wish or need to “purchase” additional amounts.

* + A “control” mixture combing the yellow and blue solutions so that they made a shade of green (depth of color is up to the mentors). They quality control manager for each team should be given 3-4 ounces of the green “control” solution in a small sized, ***clear,*** plastic cup.

**Competition**

The rules of the competition should be explained to the students (Use the ***Const-Mgmt Role Competition.pps*** and also see below). Each team is to be given exactly the same amount of blue and yellow solutions. At the option of each team’s Project Manager, additional amounts of blue and/or yellow solutions may be “purchased,” but this will affect the project’s overall budget, as measured by the total amount of colored solutions that are used. The maximum time allowed is 20 minutes.

1. ***The objectives of the competition are****:*
   1. Most closely match the shade of the “control” solution – responsibility of the **Quality Control Manager**.
   2. Spill as little as possible of the blue and yellow solutions in the aluminum tray – responsibility of the **Safety Manager**.
   3. Be the quickest team to complete the task, using the least amount of the blue and yellow solutions – responsibility of the **Project Manager**.
   4. Perform the work skillfully and correctly – **Laborer**.
2. ***Each member of the team must operate under these defined constraints****:*
   1. **Safety Manager**
      * Can communicate verbally with just the Laborer.
      * Can give only the following instructions:

Move hand to the left/right, forward back

Change to blue/yellow solution

Pour or Stop

* 1. **Quality Control Manager**
     + Can communicate verbally with only the Project Manager.
     + Can only give direction to the Project Manager to use more/less of the blue or yellow solution.

**NOTE:** *The Quality Control Manager should be the only member of the team to be able to see the control solution.*

* 1. **Laborer**
     + Is blindfolded
     + May only use one hand to pour either the blue or the yellow solution.
     + Pours solution to match the control shade according to directions of the Safety Manager and Project Manager.
  2. **Project Manager**
     + Bears responsibility for overall success of the project, especially as regards to time and budget.
     + Can override the directions of the Safety and Quality Control Managers.
     + Has the authority to “purchase” additional amounts of blue /yellow solutions if needed.

At the expiration of the prescribed 20 minutes, or sooner if all the teams have completed their projects, the mentors evaluate each team’s performance based on a four point scale (4 points for best, 1 point for worst) in each of these four categories:

* **Safety** – least liquid spilled in the tray.
* **Quality Control** – closest match to the control shade of green
* **Schedule** – first to complete the project.
* **Budget** – least amount of blue and yellow solutions used. At the end of the competition, mentors should measure the amount of green liquid made and then calculate the amount of yellow and blue solutions used in the process.

Award prizes accordingly.

**Mentor Notes**