

# BYF Session Curriculum




## Session 1: Concrete

### Materials:

- Note: students should be instructed to bring a vessel for their concrete mix with them that is wider at the top than at the bottom; however, if students did not do this, we have included materials they could use.
- Plastic cup for each student
  - Rope for students who choose to make a doorstep
  - Smaller cup and straw for those who choose to make a plant pot
- Variety of materials with which to inlay the molds
  - Lace, pipe cleaners, leaves, etc.

### Objectives:

- Students will gain an awareness of careers in civil construction.
- Students will create a mold, mix, and pour concrete into that mold to make something useful.

<p><b>Greeting Activity - 10min</b></p> 	<p>Slide 2</p> <p>Categories Game - Getting to know each other:</p> <ul style="list-style-type: none"> <li>• Divide students into teams of six. (Slide 2)</li> <li>• Round 1:                     <ul style="list-style-type: none"> <li>○ Tell the teams: <b>Put yourself in alphabetical order of your first name. But you cannot talk to each other! The first team done wins!</b> <ul style="list-style-type: none"> <li>▪ At the end of the round give the groups time to know each other's names.</li> </ul> </li> </ul> </li> <li>• Round 2:                     <ul style="list-style-type: none"> <li>○ Tell the teams: <b>Put yourself in alphabetical order according to your last name. Again, no talking and the first team done wins!</b> <ul style="list-style-type: none"> <li>▪ At the end of the round give the groups time to know each other's names.</li> </ul> </li> </ul> </li> <li>• Round 3:                     <ul style="list-style-type: none"> <li>○ Tell the teams: <b>Put yourself in order according to your birth date. Again, no talking and the first team done wins!</b></li> </ul> </li> </ul> <p>At the end of all three rounds, gather students into a circle and ask them to recite their names so that the other teams can learn them as well. Then have students take their seats.</p>
<p><b>Objective Preview - 10min</b></p>	<p>Open the PowerPoint provided and share with students the skills and objectives they'll accomplish this session.</p>



Life Skill: (Slide 3)

- Patience
  - Ability to wait for something without getting angry or upset.
  - **Concrete takes time to dry. You can't decorate or move on until you have allowed that time. We must learn to be patient.**
- Integrity
  - Doing what you are supposed to do when no one is looking.
  - **There will be a lot of waiting time when we use concrete. How will you choose to spend that time?**

Construction Skill:

- Concrete pouring (Slide 4-5)
  - Say:
    - **We are going to learn about civil construction today. These are the careers that help us build roads.**
    - **Watch this video and notice what kind of work you see the people doing to pour the concrete.**
  - Show the video to students:
    - <https://www.youtube.com/watch?v=v-aqazCa4So>
  - Call on a few student volunteers to share what they saw.
- Awareness of careers in civil construction (Slide 6-7)
  - **Good observations! Today we're going to learn about five different cement careers, four of them you saw in that video!**
  - Briefly give students an overview of the following careers using the PowerPoint slides provided
  - Cement Mason
    - Build structures from concrete
  - Cement pourer
    - Drives cement truck and oversees cement leaving the truck.
  - Cement laborer
    - In charge of distributing cement from the truck into the area of space.
  - Concrete finishers
    - Levels concrete
  - Operator Engineer
    - Operates heavy equipment needed to construct roads

**Pre-Teach - 10 min**

Talk the students through how to handle their materials and the expectations to help keep everyone safe.

Materials/Tool Handling:

- Concrete (Slide 8)



- **Concrete will set around your mold so before you mix your concrete you will have to design your mold.**
  - Do this by attaching any variety of things to the side of the mold vessel. This could be lace, leaves, twisted or braided pipe cleaners, etc.
- Put around 5 Tbsp. powdered concrete into your cup.
- Mix it with 3 Tbsp. water.
- Stir the concrete mix and water together until you get a thick substance about the consistency of sour cream or a thick milkshake.
  - Doorstop: fill your container nearly to the top with concrete. Form the rope into a handle that resembles an upside-down U shape. Place the ends into the concrete and put aside to set.
  - Planter: fill your container about  $\frac{3}{4}$  full of concrete, then insert the smaller cup into your mix until the concrete is level with the inside cup's top. Put aside to set.
- **Concrete takes a long time to dry, so we are going to start our activity and then move to something else while it dries, coming back at the end.**

Safety Expectation: (Slide 9)

- Everyone "on site" wears goggles
  - "On-site" refers to anyone working on completing the project
- Everyone is responsible for their own part of the project.
  - **Today that means that you are responsible for your concrete mold, but not anyone else's.**
  - **Keep your hands to yourself and your project.**

### Focus Activity - 1hour



Slide 10-12

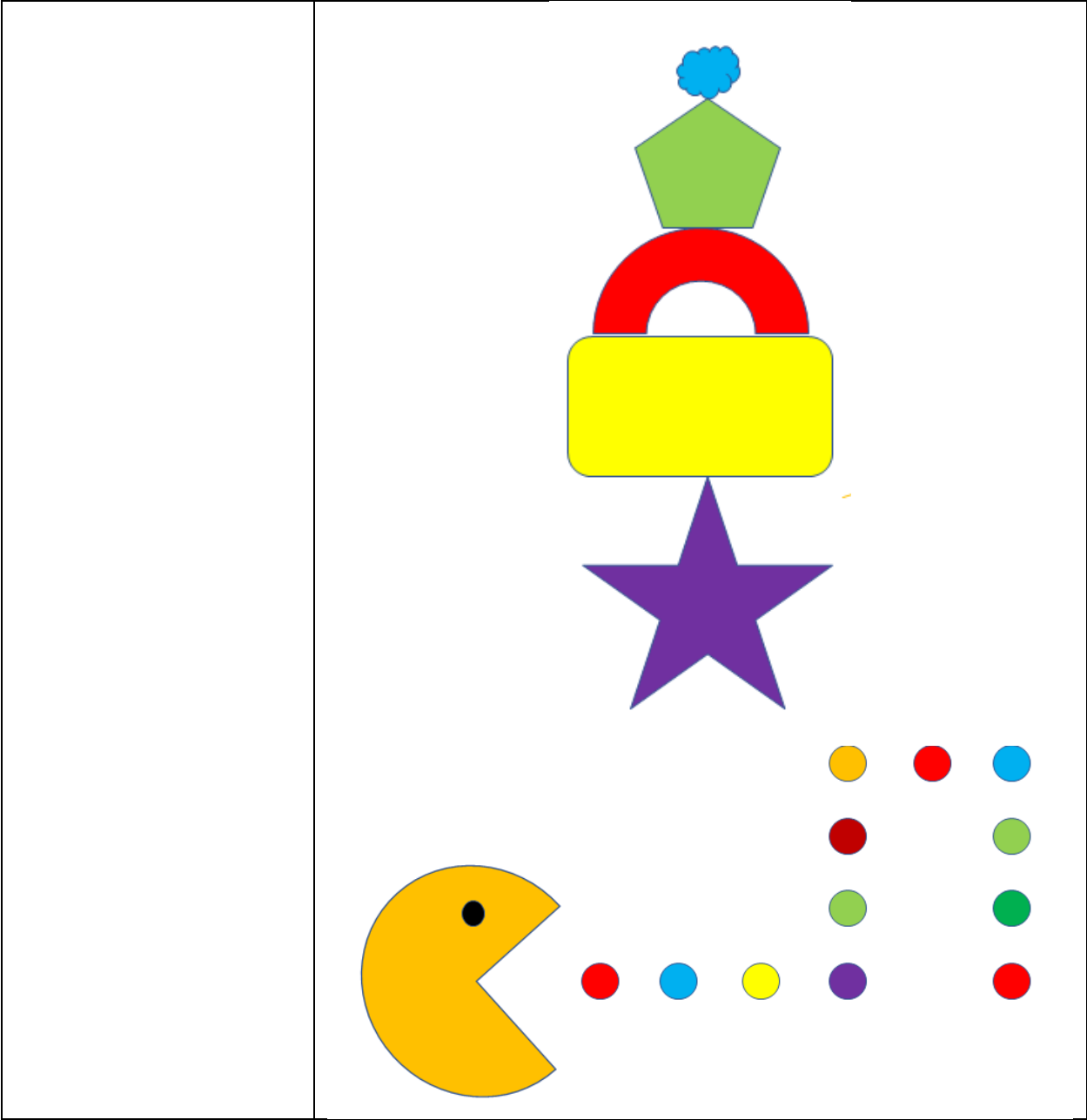
Allow students to work on mixing and pouring their concrete.

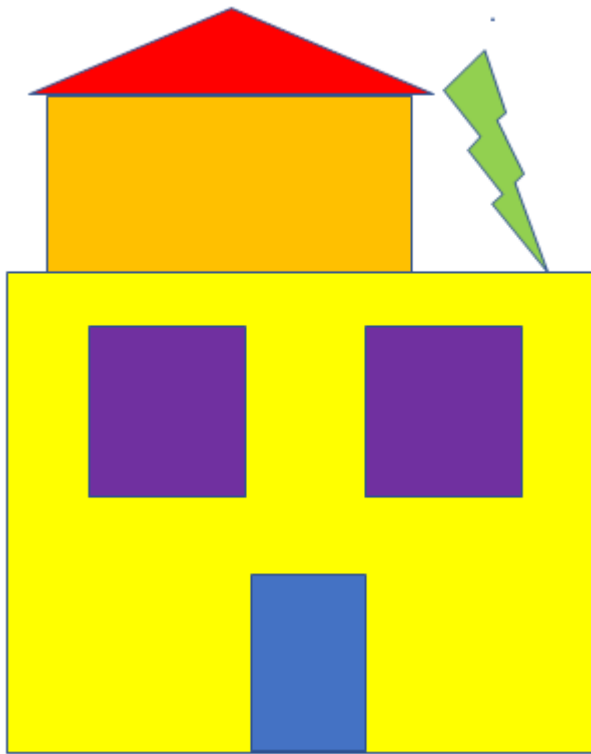
- Build in the sides of the mold
  - **Attach whatever decoration you would like to the side of your cup. The concrete will fill in around it like a stamp.**
- Stir concrete
  - **In a separate cup from your mold mix your concrete and water as demonstrated earlier.**
- Pour into the molds
  - Add the second cup or rope as desired.
- Set your mold to the side and allow to set
  - This will take at least 24 hours.

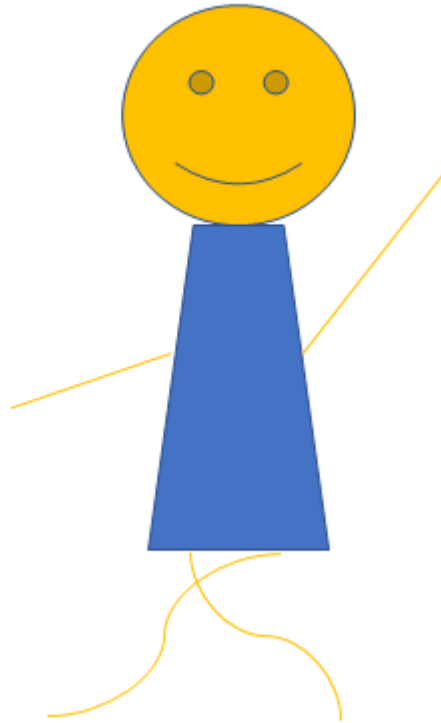
After all concrete is poured and while it sets:

- Take the career test on BYF Indiana (Slide 13)
  - <https://indiana.byf.org/>
    - Navigate to Menu, Career Quiz

- Note: At the end, students can skip putting in their contact information to see the results
- Results Discussion
  - Put students in groups of three (Slide 14)
  - Ask students to discuss these questions in their group:
    - **Share your results with your group.**
    - **Do any of you have jobs in common?**
    - **Were you surprised by any of your results? Why or why not?**
    - **Which job result are you most excited about? Why?**
  - Bring the discussion back to the whole class and ask groups to share out (Slide 15)
    - **What were your three most exciting jobs?**
    - **Why were they exciting?**
- Overview the coming weeks (Slide 16)
- Introduce the groups of three (Slide 17)
  - In each group there will be one project manager and two laborers.
    - Project Manager
      - Timekeeper
      - Read directions
      - Manages team
      - Get materials
      - Give final report
      - Head of “teamwork”
        - Choosing paint colors
    - Laborers
      - Check personal safety equipment
      - Monitor area
      - Monitor appropriate use of tools
      - Use tools
      - Paint
- Project Manager Game (slide 18)
  - **We are going to play three rounds of this game so that everyone gets a chance to practice being the project manager. Choose now who gets to go first, second, and third.**
  - Game instructions:
    - The project manager goes to get the vision from the club facilitator. They get to see the arrangement of colored shapes.
    - The project manager then returns to the group and must communicate that vision to their group without touching the materials. The group must draw a replica of the vision that is accurate in shape, arrangement, color, and size based on their project manager’s communication.







Note: If you need more time, have students take turns creating the vision for each other.

After the game, choose who will be the program manager for the string art, the bridge, and the picnic table

### Job Exploration - 20min



(Slides 19-25)

Civil Construction Focus

- **Civil construction is all about building roads and bridges. There are many good jobs and careers that are part of civil construction. We talked about cement masons, cement pourers, cement laborers, concrete finishers, and operator engineers briefly at the beginning of class.**
- **Does anyone remember what those jobs are?**
  - If students need refresher, play the video again and reidentify the roles.
- Have students turn and talk: **Can anyone think of how our activity today could connect to those jobs?**
  - Have a few partners share out.

**Now, let's hear from a real industry professional who can tell us about their career in civil construction!**

- Introduce a community partner if applicable.
- If no community partner can attend introduce the video.
- Show slide with general salary information on it.

- Open the floor for students to ask their own questions of the industry professional.
  - Note: If no industry professional is available ask students what their questions would be and make a list. Send this list to your Coordinator and they will try to get those questions answered.

Example questions for industry professionals:

- What soft skill are important in your job?
- What does your “office” look like? Work Environment?
- What education did you need to get this job?
- What is your favorite part of your job?
- What is some good advice to someone who wants to go into your field?

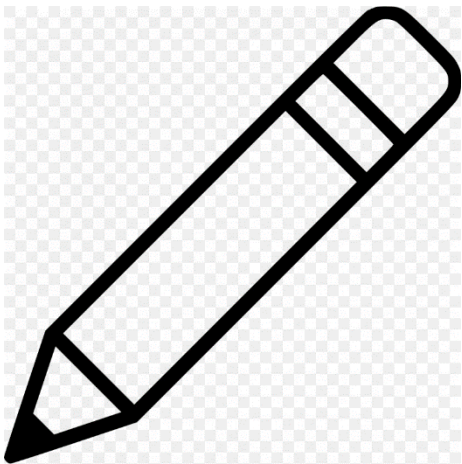
**Wrap-Up - 10 min**



**Slides 26-27**

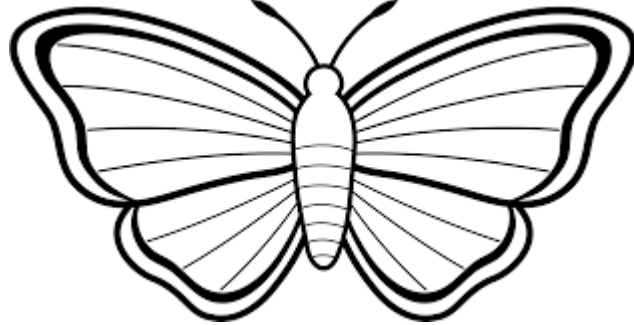
Notes for next class:

- Have students bring templates they might like to use for string art next session
  - **Next session we are going to use our construction skills to create string art! This can be something you keep for yourself or create as a gift for someone you appreciate. The trades are like that too – allowing us to make the world better not only for ourselves but to provide infrastructure for the people around us as well.**
- Talk through the following points:
  - Straight lines are easier to keep accurate. You can use curved lines but they are more difficult.
  - The less inner detail you print the more accurate your string art will stay. Adding inner detail is possible, but more difficult.



(Example of an easier template – mostly straight lines, small amounts of detail, string colors largely color blocked)





(Example of difficult template – all curved lines, very close inner detail, potential for lots of different colors)

Note: Students can choose whatever template they would like. However, the more detailed the template the less likely they are to finish within the class period.

As a wrap up activity have students fill out this google form:

<https://forms.gle/nw8x7npsGHwfmRVV8>

Send students home with NCCER swag – squishy hammer or stickers or tshirts?