### **Alternative to Stadium Tour: Stadium Design (2 hr)**

**Summary:** With the stadium tour, the goal is to give the students a set of questions to think about or actually fill out on paper during the tour, emphasizing the topics covered throughout the week, **especially focused on material choice and sustainability.**  These questions should guide them into the next activity, where they will recommend improvements that could be made to make soccer a more sustainable enterprise (this could be related to concessions, souvenirs, uniforms, etc.). With the stadium design, there are similar questions which will be prompted as the students are asked to design and present a sustainable stadium. To make it more engaging and fun, there will basically be a “how much weight can the bridge hold” competition of their stadium. The general idea for the presentation and build was created from competitions like <https://www.scarce.org/sustainable-design-2/> and the excitement of the sustainable packaging competition inspired the implementation of the bridge stress test aspect.

**ILOs:**

1. Identify various types of polymer materials in a real world situation and how design choices can be made to increase sustainability
2. Analyze waste systems to determine how effective it is to encourage sustainable practices and what should be implemented in a sustainable design
3. Develop implementation and improvement strategies for sustainability.

**Equipment list:**

We will need to following materials:

* Cardboard for poster -could potentially provide section headers for the students to have a guide - they should make a name/title for their stadium and poster though
* Paper for sketches/writing information
* Markers/pens/pencils - colored tape may also be fun for poster decoration!
* Tape - masking
* String
* Basically unlimited popsicle sticks - 100 per group plus construction cardboard in 2024
* Toothpicks
* The long wood skewer sticks - just a few per activity
* Heavy things

**Intro:**

See Slides for A15\_Alternative Activity

**Procedure:**

Part 1: The sustainability design - ~45 min total - 30 min for research and design, 15 for discussion/presentation

Present the areas where sustainability could be important and pose guiding questions

1. Emphasize that the students should be creative - they may have other areas of considerations and ideas on what they should implement within their categories
2. There are three main categories, and then a long term implementation/emphasis question. Each group should develop a proposal in **ONE** of the areas and present using a visual aid. In 2024 at UNICAMP, we had a chalk board and chalk available to us, so the students could draw/make their visual aid in a section of the board. Posters could otherwise be used.
3. Hand out the lab handout (copy of questions for consideration, one per group of ~4) The guide has questions from all categories which is to simplify the materials- they should only use the guiding questions for their area.

Have students present their sustainability considerations and discuss their ideas

Part 2: The Build Competition! 60 min - 10 for design, 30 for build (with 5 min to get them to stop), 15 for testing and discussion

The builds need to have two rules: 1- it must hold weight (maximum possible - but this means we also need to be able to stack weight) and 2- there must be a field space - they can’t just fill the thing solid!

1. Hand out paper and pencils and supplies, allow for design time.
2. After 10 minutes - insist that groups start building if they haven’t!
3. Give a 5 min warning to get them to start finishing. Then be prepared to pull them away from their builds.

Allow for build time and design. Have mentors working with each group (but not helping too much!) to ensure that they are on track/remembering all the parts of the activity during a rather unstructured block of time.

1. Do the bridge weight test!
2. Discuss what build designs worked well, etc.

**Discussion questions/debrief:**

What do you think would be the most important ideas to implement in a stadium to quickly improve sustainability?

**Lab handout needed?**

Yes