Adan Escobedo
EDUC 612

Building an Inclusive Space Lesson

Normalcy and ableism threaten diversity and equality in the classroom, as students that may not fall within the definition of normal may feel ostracized. The US education system is implicit in promoting deficit thinking and the medical model of disability (Baglieri & Lalvani, 2019). The role of an educator is to be an agent of change for their students, transforming the classroom to be equitable and eventually reflect the world outside the classroom (McLaren, 2020). Dialogue between teachers and students on transformational change is always welcomed but praxis proves more beneficial (Freire, 2005). One such form of praxis is "crippin the classroom" (McKinney, 2016), which involves using disability as a method to disrupt notions of normalcy in the classroom. One way to engage in "crippin the classroom" is by applying disability as a cultural lens (Ware, 2020), which positions educators to tap into cultural wealth of disability and informing one's pedagogy on transformative needs.

For this project, the students will take on the role of engineers, architects, and educators. The goal of this lesson is to use the Engineering Design Process to have students create an inclusive classroom/space. Students are expected to consider inclusive space with ADA requirements, but it is the job of the teacher to encourage students to think outside ADA and use DSE. Not all aspects of an inclusive space mean serving people with disabilities, and by connecting with Ware's (2020) notion of disability as a cultural lens, educators can push students to consider intersectional issues as well. If a teacher utilizes Ware's disability lens in their

teaching of this lesson, then students will come to understand that not all-inclusive needs are physical; Crippin this lesson will not only put students in the role of the educator but also allows the educator to look at other lessons and apply them for real world change for people with disabilities.

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Title of Lesson: Building an inclusive space, Part 1

Date of Creation: 11/20/2022	**Creator of the Lesson:** Adan Escobedo	
Grade Level: 7-8	**Subject:** Design and Modeling	**Time Duration:** 50 Minutes

Summary of Lesson:
Students are introduced to 3D modeling by using TinkerCAD website and will be asked to design a space that is inclusive to all students. Students will be put into teams to define what inclusive means and figure out what inclusive spaces look like. This lesson is part of a weeklong project in which students will define, sketch, 3D models, and prototype a space. Students will present a group presentation in which they present all aspects of the lessons and connect them with the Engineering Design Process. Guided inquiry should lead students to consider inclusivity outside of just ADA requirements. This step is students setting definitions of inclusive spaces.
Description of Need for Project: Create more accessible and inclusive spaces while teaching students about access and inclusivity

NGSS:
MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
HS-ETS1-2: Engineering Design- Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-PS4-2: Evaluate questions about the advantages of using digital transmission and storage of information.

NCAS:
VA:Cr1.1.4a: Brainstorm multiple approaches to a creative art or design problem.
VA:Pr5.1.4a: Analyze the various considerations for presenting and protecting art in various locations, indoor or outdoor settings, in temporary or permanent forms, and in physical or digital formats.

DSE Alignment:
promote social justice, equitable and inclusive educational opportunities, and full and meaningful access to all aspects of society for people labeled with disability/disabled people.
assume competence and reject deficit models of disability by having students see how devices can pivot from calling on superheroes to supporting students with disabilities.

Lesson Objectives and Assessments:

Objective 1: Students will define "inclusive space".
Assessment 1: After brainstorming demographics that are affected by inaccessibility**,** Students will discuss with their group what defines an inclusive space and set a list of standards to the building they will create for the final space

Adan Escobedo
EDUC 612

Teacher Guide: Encourage students to use all resources. This is a great moment for students to learn how to engage in research to prepare for a discussion. There are several websites and videos that you can guide students to use such as:
https://www.cdc.gov/ncbddd/disabilityandhealth/disability-inclusion.html
https://www.aia.org/articles/6540249-truly-inclusive-spaces-are-designed-for-ac
https://www.architectmagazine.com/practice/a-case-for-inclusive-design_o

Remind students who benefits from inclusivity and how to serve those that benefit from it. Students should recognize that inclusivity does not only mean accessible and but also means welcoming. How does one feel welcomed and included? Does being welcomed mean also being safe?

Anticipatory Set (Prior to beginning of the Lesson):
Students will answer three essential questions:
Why is inclusivity something to strive for?
What happens when spaces have barriers?
How do students benefit from more accessible spaces?

Lesson Progression (Will the lesson unfold/develop?):

- **Students will define inclusivity.** Begin with an example of a need to renovate a campus space (in fact the school is from the 60s and there are many spaces that need renovation). We can use CTE resources and bring in engineers or architects with disabilities. Also, we can politely ask students, staff, or people in the community to provide end-user perspective.
- What can we do to make these spaces more accessible? Then ask if accessibility is the same as inclusivity. Students should then be tasked to join groups for a project in which they will be tasked to build an inclusive space. The first task is to agree as a group, what is inclusivity.
- Students will be challenged by asking them about competing access, when different people need different things.
- Students will sketch the inclusive space.
- Students will 3D model their inclusive space.
- Students will prototype their building. Must build a miniature model.
- Students will present their work - Google slides or science fair poster events.

Closure (How will the lesson be wrapped up?):

- **Submission:** The lesson will be wrapped up by asking students to submit their definition of inclusivity and what requirements an inclusive space needs.
  Discussion: Prior to class ending, a discussion among the entire class should take place with educator guiding notions of inclusivity. A discussion is effective because it allows all groups to hear others' positions and arguments for inclusivity and in turn allow for richer information to be shared within the class.
  Self-Reflection: Ask students to reflect on a time they did not feel included.

Adan Escobedo
EDUC 612

Required Materials/Equipment:

PLTW Design Process SP

Design Process Step	(A) What you did	(B) What you could have done
Define a Problem		
Generate Concepts		
Design a Solution		
Build and Test Solution		
Evaluate Solution		
Present Solution		

Student should fill the TEAM design

Extensions/Practice (Continuation of Engagement):
-For practice or quick finishers, students can do further research on films and texts that better represent disability and identify what makes them a better marker for disability representation. Consider Ware's viewing of disability as a cultural lens (2020): students can ask themselves when was the first time they felt represented in media or text? Now how would people with disabilities feel seeing themselves represented? Are there bad examples of representation?

Adan Escobedo
EDUC 612

Title of Lesson: Building an inclusive space, Part 2		
Date of Creation: 11/20/2022	**Creator of the Lesson:** Adan Escobedo	
Grade Level: 7-8	**Subject:** Design and Modeling	**Time Duration:** 50 Minutes

Summary of Lesson:
Students are introduced to 3D modeling by using TinkerCAD website and will be asked to design a space that is inclusive to all students. Students will be put into teams to define what inclusive means and figure out what inclusive spaces look like. This lesson is part of a weeklong project in which students will define, sketch, 3D models, and prototype a space. Students will present a group presentation in which they present all aspects of the lessons and connect them with the Engineering Design Process. Guided inquiry should lead students to consider inclusivity outside of just ADA requirements. This step is having students make sketches of all aspects of the proposed space - inside and out.

NGSS:
MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
HS-ETS1-2: Engineering Design- Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-PS4-2: Evaluate questions about the advantages of using digital transmission and storage of information.

NCAS:
VA:Cr1.1.4a: Brainstorm multiple approaches to a creative art or design problem.
VA:Pr5.1.4a: Analyze the various considerations for presenting and protecting art in various locations, indoor or outdoor settings, in temporary or permanent forms, and in physical or digital formats.

DSE Alignment:
promote social justice, equitable and inclusive educational opportunities, and full and meaningful access to all aspects of society for people labeled with disability/disabled people.
assume competence and reject deficit models of disability by having students see how devices can pivot from calling on superheroes to supporting students with disabilities.

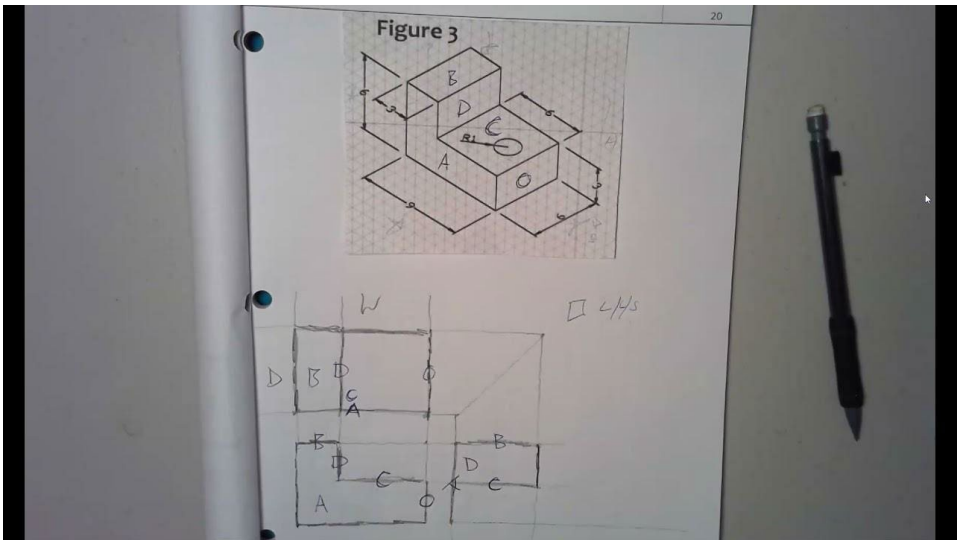
Lesson Objectives and Assessments:

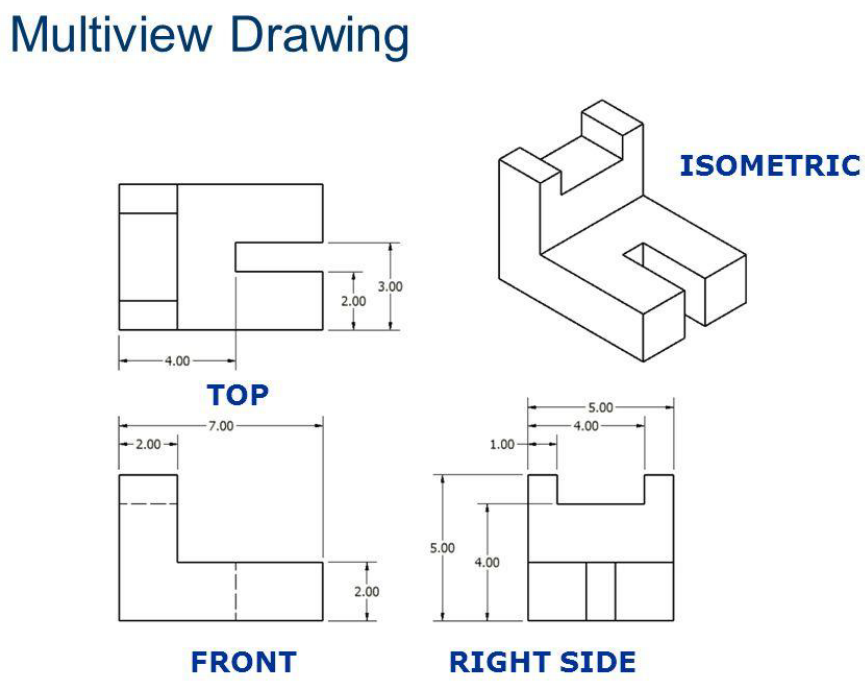
Objective 1: Groups will work together to come up with sketches of the internal and external aspect of their inclusive space.
Assessment 1: Sketches submitted should include top front left and isometric perspectives.

Teacher Guide: Remind students to use calipers and rulers and to sketch on orthographic and isometric paper.

Adan Escobedo
EDUC 612

PLTW Types of Sketches





Anticipatory Set (Prior to beginning of the Lesson):
Students will answer two essential questions:
Why do we need to see multiple sides of a building?
What purpose does a blueprint serve?

Lesson Progression (Will the lesson unfold/develop?):

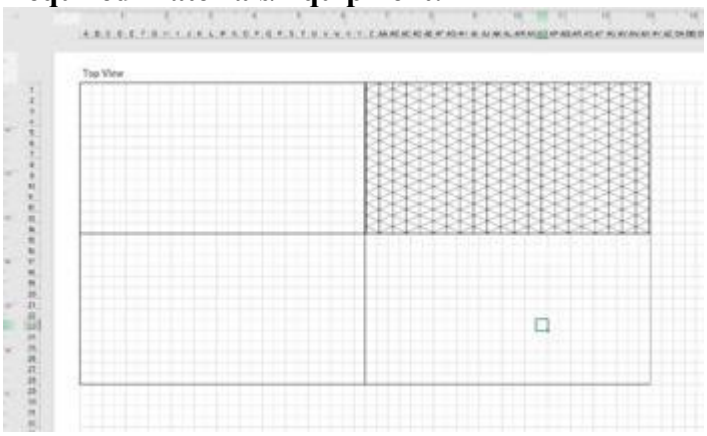
- Students will define inclusivity.

- **Students will sketch the inclusive space.** We all heard the notion of practice makes perfect, but what about planning? In the last lesson students got acquainted with the engineering design process and their group definition of inclusive space. Groups are to sketch out their plans for their inclusive space. Introduce the idea of Multiview sketch to students. Ask students why is it important to plan and sketch their design? What is the role of planning and sketching when designing.
- Students will 3D model their inclusive space.
- Students will prototype their building. Must build a miniature model.
- Students will present their work - Google slides or science fair poster event.

Closure (How will the lesson be wrapped up?):

- **Submission**: The lesson will be wrapped up by asking students to submit Multiview sketches of their inclusive space.
- **Discussion**: Have a quick discussion with students about the current space they are in. Does it feel welcoming or are there things that can be fixed? This can mean the classroom or even the school.

Required Materials/Equipment:



Multiview paper
Calipers
Rulers
Erasers
pencils

Adan Escobedo
EDUC 612

Title of Lesson: Building an inclusive space, Part 3

Date of Creation: 11/20/2022	**Creator of the Lesson:** Adan Escobedo	
Grade Level: 7-8	**Subject:** Design and Modeling	**Time Duration:** 50 Minutes

Summary of Lesson:
Students are introduced to 3D modeling by using TinkerCAD website and will be asked to design a space that is inclusive to all students. Students will be put into teams to define what inclusive means and figure out what inclusive spaces look like. This lesson is part of a weeklong project in which students will define, sketch, 3D models, and prototype a space. Students will present a group presentation in which they present all aspects of the lessons and connect them with the Engineering Design Process. Guided inquiry should lead students to consider inclusivity outside of just ADA requirements. This step is having students make 3D models of their inclusive spaces.

NGSS:
MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
HS-ETS1-2: Engineering Design- Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-PS4-2: Evaluate questions about the advantages of using digital transmission and storage of information.

NCAS:
VA:Cr1.1.4a: Brainstorm multiple approaches to a creative art or design problem.
VA:Pr5.1.4a: Analyze the various considerations for presenting and protecting art in various locations, indoor or outdoor settings, in temporary or permanent forms, and in physical or digital formats.

DSE Alignment:
promote social justice, equitable and inclusive educational opportunities, and full and meaningful access to all aspects of society for people labeled with disability/disabled people.
assume competence and reject deficit models of disability by having students see how devices can pivot from calling on superheroes to supporting students with disabilities.

Lesson Objectives and Assessments:

Objective 1: Groups will work to 3D model inclusive spaces in TinkerCAD.
Assessment 1: 3D models should be submitted in STL Files.

Teacher Guide: Remind students to use measurements from sketches into their 3D models.

TinkerCAD - Tutorial for Beginners in 9 MINUTES! [2021 - COMPLETE]

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EDUC 612

Anticipatory Set (Prior to beginning of the Lesson):
Students will answer three essential questions:
How does 3D Modeling support the engineering design process?
What can 3D modeling do to support inclusivity?

Lesson Progression (Will the lesson unfold/develop?):

- Students will define inclusivity.
- Students will sketch the inclusive space.
- **Students will 3D model their inclusive space.**
- Students will prototype their building. Must build a miniature model.
- Students will present their work - Google slides or science fair poster events.

Closure (How will the lesson be wrapped up?):

- **Submission**: The lesson will be wrapped up by asking students to submit Multiview sketches of their inclusive space.
- **Connecting it all together**: Have students write a reflection about a time they didn't understand something, like instructions or a lesson, until they saw it. Can 3D models make things easier to understand? Would visuals or models offer opportunities to serve people with disabilities?

Required Materials/Equipment:

TinkerCAD.com

Adan Escobedo
EDUC 612

Title of Lesson: Building an inclusive space, Part 4		
Date of Creation: 11/20/2022	**Creator of the Lesson:** Adan Escobedo	
Grade Level: 7-8	**Subject:** Design and Modeling	**Time Duration:** 50 Minutes (but can be extended)

Summary of Lesson:
Students are introduced to 3D modeling by using TinkerCAD website and will be asked to design a space that is inclusive to all students. Students will be put into teams to define what inclusive means and figure out what inclusive spaces look like. This lesson is part of a weeklong project in which students will define, sketch, 3D models, and prototype a space. Students will present a group presentation in which they present all aspects of the lessons and connect them with the Engineering Design Process. Guided inquiry should lead students to consider inclusivity outside of just ADA requirements. This step is having students build miniature models of their inclusive spaces and prepare for poster board/presentation event.

NGSS:
MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
HS-ETS1-2: Engineering Design- Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-PS4-2: Evaluate questions about the advantages of using digital transmission and storage of information.

NCAS:
VA:Cr1.1.4a: Brainstorm multiple approaches to a creative art or design problem.
VA:Pr5.1.4a: Analyze the various considerations for presenting and protecting art in various locations, indoor or outdoor settings, in temporary or permanent forms, and in physical or digital formats.

DSE Alignment:
promote social justice, equitable and inclusive educational opportunities, and full and meaningful access to all aspects of society for people labeled with disability/disabled people.
assume competence and reject deficit models of disability by having students see how devices can pivot from calling on superheroes to supporting students with disabilities.

Lesson Objectives and Assessments:

Objective 1: Students will work on prototype models and prepare for demonstration event.
Assessment 1: Students will submit a completed model that resembles sketches and 3D designs.

Teacher Guide:
This day of the class is a lab day, where students are encouraged to take all aspects of lessons, compile the ideas, and begin to build a model. Your role is to provide students with resources and equipment needed. Ask questions that encourage thinking, as even with planning, new ideas can

arise. This is not a competition, so students are encouraged to see what others are doing; The idea is to grow, sharing ideas leads to more accessibility.

Adan Escobedo
EDUC 612

Anticipatory Set (Prior to beginning of the Lesson):
Students will answer two essential questions:
How does planning impact creating?
How does including voices of those you are service impact creation after you planned?

Lesson Progression (Will the lesson unfold/develop?):

- Students will define inclusivity.
- Students will sketch the inclusive space.
- Students will 3D model their inclusive space.
- **Students will prototype their building. Must build a miniature model.**
- Students will present their work - Google slides or science fair poster events.

Closure :
This part of the project can be done in one class period but if students need more time, feel free to make an assessment about where everyone is at in their construction. It is not our job to inhibit or rush our students, so if they need more time, add another day.

Required Materials/Equipment:

Students can use CTE materials and can include recyclables
Duct tape
Velcro tape
Felt sheets
Craft foam
Nylon straps
Corrugated cardboard
Jumbo craft sticks
Dowel rods
Safety pins
Scissors
Rulers
Masking tape
Bandage rolls
String
Rubber bands
Heavy cardstock
Paper fasteners
Bubble wrap
Craft wire
Utility/X-Acto knives
Wire cutter
Tacky glue
Recycle/reuse materials

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Title of Lesson: Building an inclusive space, Part 5		
Date of Creation: 11/20/2022	**Creator of the Lesson:** Adan Escobedo	
Grade Level: 7-8	**Subject:** Design and Modeling	**Time Duration:** 50 Minutes

Summary of Lesson:
Students are introduced to 3D modeling by using TinkerCAD website and will be asked to design a space that is inclusive to all students. Students will be put into teams to define what inclusive means and figure out what inclusive spaces look like. This lesson is part of a weeklong project in which students will define, sketch, 3D models, and prototype a space. Students will present a group presentation in which they present all aspects of the lessons and connect them with the Engineering Design Process. Guided inquiry should lead students to consider inclusivity outside of just ADA requirements. This is the final step of the project; students will share work with the class.

NGSS:
MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
HS-ETS1-2: Engineering Design- Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-PS4-2: Evaluate questions about the advantages of using digital transmission and storage of information.

NCAS:
VA:Cr1.1.4a: Brainstorm multiple approaches to a creative art or design problem.
VA:Pr5.1.4a: Analyze the various considerations for presenting and protecting art in various locations, indoor or outdoor settings, in temporary or permanent forms, and in physical or digital formats.

DSE Alignment:
promote social justice, equitable and inclusive educational opportunities, and full and meaningful access to all aspects of society for people labeled with disability/disabled people.
assume competence and reject deficit models of disability by having students see how devices can pivot from calling on superheroes to supporting students with disabilities.

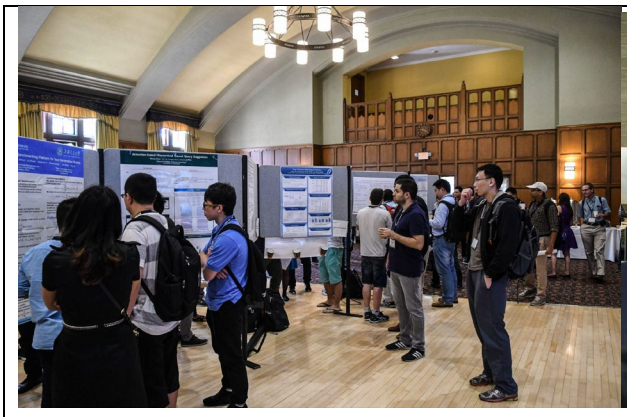
Lesson Objectives and Assessments:

Objective 1: Groups will work to 3D model inclusive spaces in TinkerCAD.
Assessment 1: 3D models should be submitted in STL Files.

Teacher Guide:
Demonstration day

If you decide to have presentations, please allow students who are uncomfortable to do alternatives; if you decide to have poster walk through, allow students who are interested.

Adan Escobedo
EDUC 612



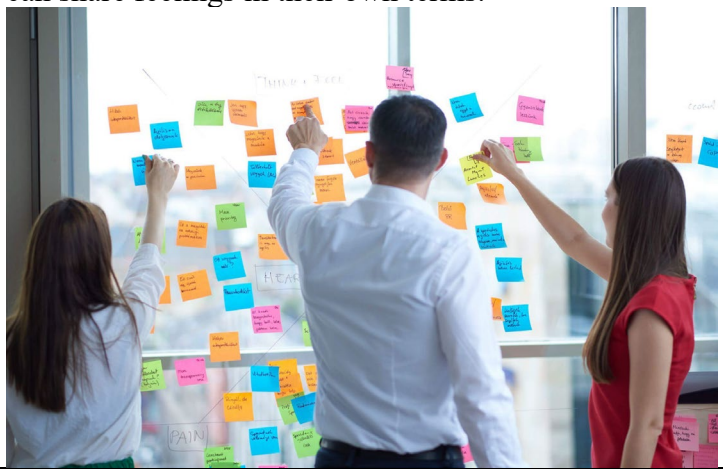
Anticipatory Set (Prior to beginning of the Lesson):
Students will answer two essential questions:
How do you make a space inclusive and accessible for everyone?
How can a space be accessible and inclusive for you?

Lesson Progression (Will the lesson unfold/develop?):

- Students will define inclusivity.
- Students will sketch the inclusive space.
- Students will 3D model their inclusive space.
- Students will prototype their building. Must build a miniature model.
- **Students will present their work - Google slides or science fair poster events.**

Closure (How will the lesson be wrapped up?):

- **Submission**: Presentation or demonstration poster boards.
- **Connecting it all together**: After presentation/poster board walk through, have students put post it notes with their definition of accessibility and inclusive space on the wall. Students can share feelings in their own terms.



Conclusion

This lesson can be expanded or connected with history classes. After learning about accessibility, let's think of moments where there was historic segregation. For example, students in San Diego would benefit from learning about the Lemon Grove Incident.

Lemon Grove Incident

Engineering should not be separating the human aspect of creation to serve peoples' needs. The push for STEAM as an educational and career pathway should always remember that its greatest asset is the diversity of humanity, which aims to promote and serve.

Disability Studies and Disability Justice can advance education towards equity. These frameworks center on assets and consider intersectionality. The expansions in this lesson are an emancipation from ableism and shifts the dynamic in context of those who experience oppression by using Ware's (2020) disability as a cultural lens. Lessons should move away from simple solutions of accessibility, a notion found in the ADA movement. Ferguson and Nusbaum (2012) argue that "disability studies might initially portray itself as the interdisciplinary study and representation of the concepts, cultures, and personal experiences of disability in all its variation" but that we must acknowledge that complexity of variance that comes within race, gender, and identity (p. 70). Disability justice calls on anti-capitalist politics and liberation (Bernie et al., 2018); Disability studies in education should be liberatory to everyone.

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