

General Instruction Guidance for Design Thinking Units

Timeline

- Class periods are 50 minutes and meet daily.
- Most units, including air quality, take approximately two to three weeks.

Materials [for air quality]

- Cardboard
- Scissors
- Tape—duct tape, masking tape
- Gauze, cloth, T-shirt material, or other fabric
- Water bottles
- Rubber bands

Constraints

- Students must use the materials provided.
- Students are instructed to think about materials children in the landfill could find and realize that their materials are new and much cleaner than what could be found in a landfill.

Mini-lessons [see air quality lesson in Supplemental Materials]

Lesson	Title	Time
1	Introduction and Empathy	1 day
2	Defining the Problem	1 day
3	Ideate	2 days
4	Prototype and Building	3 days
5	Testing	1 day
6	Presenting and Reflecting	2.5 days

Management

- Grouping—we used various means of student grouping including student choice, heterogeneous grouping, interest grouping, and random grouping.
- Safety—for the air quality lessons, safety considerations including care when using scissors and wearing safety goggles during filter testing. Make sure the box is tightly sealed and test under a hood.

Critical thinking

- Students are tasked with using critical thinking throughout the design process with activities associated with each day's lesson [see air quality lesson in Supplemental Materials].

Differentiation

- Some would argue that design thinking pedagogy has built-in components of differentiation based on its project-based learning structure [Juliani 2018]. Often this is accomplished by differentiating the content, the process, or the product. Because this course was experiential, most of the differentiation occurred as teams worked to establish jobs.