

Lifeguard Chair Design Challenge

Adapted from stemedhub



Engineering Design Process: Identify the Problem

Engage:

Design Task:

Local authorities have recently decided to open a privately-owned swimming pool to the public. A grand-opening ceremony is currently being planned, and the Town Safety Inspector has ordered that lifeguard chairs be constructed, so the swimming pool meets public safety codes. These new lifeguard chairs must be completed before the pool can be opened to the public.

You have just been hired by the Safe Stands Company to design and construct lifeguard chair models in time for the grand-opening ceremony. The chairs must be sturdy enough for the lifeguards to sit on and must be tall enough for them to patrol everyone at the pool.

How can we design a safe, economical chair that meets the client's specifications?

Criteria:

- Chair must be at least 30 cm tall
- Cards can be folded but not torn
- No piece of tape can be longer than 5 cm
- Chair cannot be taped to the floor or any other object or surface
- Chair must be in one piece
- Chair must support "lifeguard" for 20 seconds in an upright position
- Financial implications must be taken into consideration

Constraints:

- Only use the materials provided
 - 40 index cards (20¢ per card)
 - 1 meter of tape (5¢ per cm)

Design Brief

Problem	
Goal	
Client (Who is paying?)	
End User (Who is using it?)	
Criteria (Features)	
Constraints (Limits)	
Materials (What will we use?)	

Explore:

Engineering Design Process: Design Sketch

Individual Sketch

Team Sketch

Engineering Design Process: Build/Create and Test

- Try to stick to your group design
- If you make any adjustments, record it on your design sketch
- Test your design and see if it meets the criteria
- Record results on data chart

Explain:

Engineering Design Process: Communicate Results

Data:

	Lifeguard Chair Testing				
Group	Number of Cards Used	Seat Height (cm)	Time (s)	Cost	Met Criteria?
1					
2					
3					
4					
5					
6					

Observations:

Data Interpretations and Inferences:

Design Strengths and Weaknesses:

Elaborate:

Engineering Design Process: Improve and Retest

Redesign:

Reflection: