



TeachEngineering

STEM Curriculum for K-12

Dyeing to Design



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Vibrant, Colorful, Sustainable

A team of chemical engineers at a startup clothing company is taking advantage of this demand for sustainable clothing made with non-toxic materials and dyes. However, they need your help!

They have chosen several sustainable fabrics they would like to use in this new product line, but they need assistance from you in order to find dyes that are safe, but also display vibrant colors.

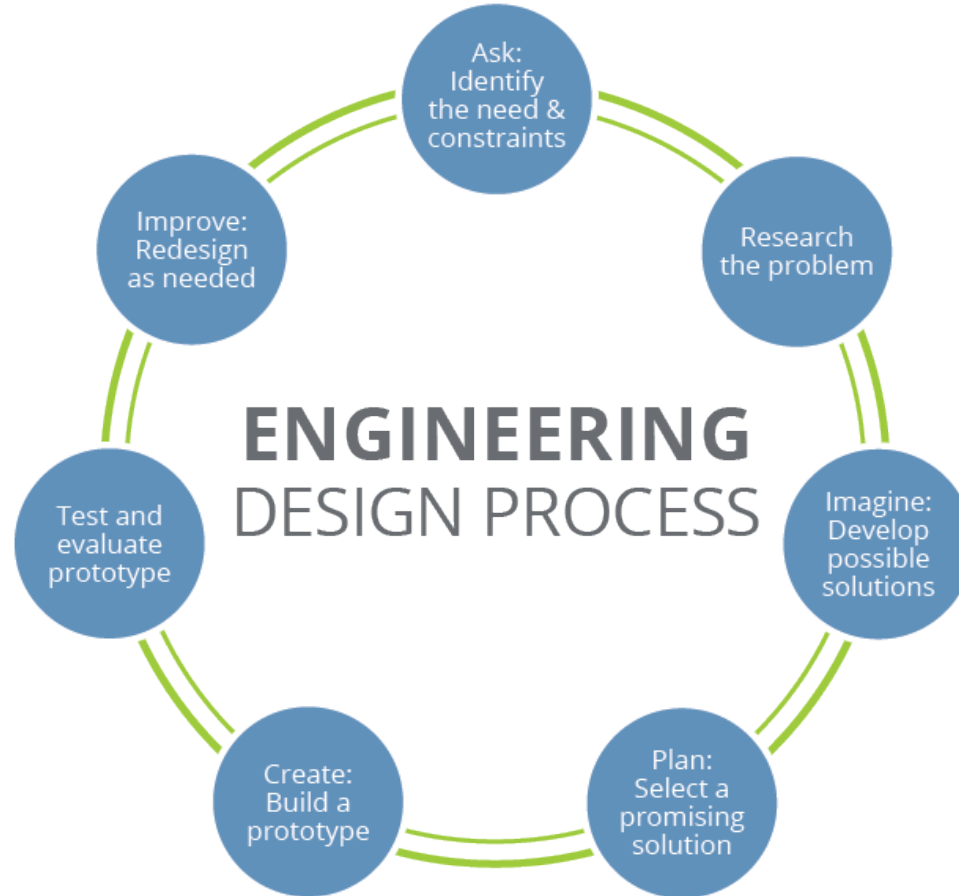
To help with reproduction of colors on a larger scale for the room, they are requesting to have the colorant (solute), solvent, concentration and absorbance levels, and other physical and chemical properties of the dyes used.



Group Roles

Role	Description
Chemical Engineer	This person is responsible for obtaining the chemicals used during the dye creation while in the classroom. They organize the creation of the different concentrations of the dye.
Analytical Chemist	This person is responsible for checking all calculations included in the group design pitch. They are to motivate and encourage the group as they complete the data collection and analysis of the dyes.
Technical Writer	This person is responsible for checking the written portion of the groups design pitch. They are to motivate and encourage the group as they complete the written portions of the dye technical data sheets.
Designer	This person is responsible for organizing the completion of the design pitch board. This person is responsible for maintaining the group materials.

Engineering Design Process



Solutions, Solvents, and Solute

- **Solution** – Any dissolved substance in a liquid
- **Solute** – Any substance being dissolved
- **Solvent** – Substance doing the dissolving

Example: The Solution of Cool-Aid

Solute – powder of flavor and sugar

Solvent - water

