

Design a Shoe

Description:

Students will be designing a shoe while considering materials, aesthetics, and unique needs of the wearer.

Objective(s):

Students will use research and prototyping to create a new shoe.

ISTE/NGSS Standards:

4a: Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

5c: Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

MS-ETS-1.1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS-1.2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Teq Lesson Plan Activity

Essential Question(s):

How are materials selected in shoe development?

Materials:

- Challenge cards
- Readings on shoe materials ([here](#) and [here](#))
- Pencils
- Colored Pencils or crayons
- EDP Graphic Organizer

<https://docs.google.com/document/d/1UYqqzT3aMgdNVb6-zog02Q4mY686WuM-2iHSEfsyLps/edit>

Do Now:

1. Have students generate a list of shoe types.
2. Have students' separate shoes down into categories (work, sports, hiking, leisure, etc.).

Lesson:

1. Class will review articles on the compositions of different shoes
 - If the teacher uses the second article, they should modify it to exclude information on duties and other expenses, as this could be an unnecessary distraction for middle schoolers.
2. Class will be given challenge cards, working individually or in a group, students will create a shoe to address the challenge. Examples of challenges include:
 - Athletic shoes for a 4-year-old
 - Walking shoes for a 75-year-old
 - Boots for a construction worker
 - Slippers for someone with balance issues
 - Running shoes for a person in an area with excessive rainfall
3. Students will design their shoes, considering the following: age of the wearer, materials that should be used, appealing aesthetics, and durability of the shoe.
4. If the teacher wants students to use a template, free coloring pages with various shoes are [here](#).
5. Students will present their shoes to the class for review from classmates.

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Closure:

Students will complete the reflection in the EDP graphic organizer.

Extension:

Students can attempt to create their own shoes using makerspace materials. A breakdown of how this can be done can be found [here](#).