

STEM Bites

TODAY'S CHALLENGE: LEGO Disaster Island

Overview:

Students will be given a tray of randomly, assorted LEGO bricks and will have 20-25 minutes to build their very own LEGO island!

After that time has elapsed, students will be given a card that describes a "disaster." They will then be given another tray of assorted LEGO bricks and will attempt to find a solution to avert the "disaster" affecting their island.



Next Generation Science Standards (NGSS):

3-5-ETS1 Engineering Design

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

MS-ETS1 Engineering Design

- MS-ETS1-1. 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-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 Engineering Design

- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
- HS-ETS1-2. 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-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Materials:

- Required:
 - LEGO bricks (You'll need quite a few and a nice variety if possible)
 - Amazon often has really good deals on LEGO creative bulk brick sets
 - Costco at times will also carry bulk brick sets at a really good price
- Optional:
 - Individual trays for all students to gather their LEGO bricks in

Investigation:

- The instructions for this activity are very simple and open-ended: Pick a tray and LEGO bricks and you have 20-25 minutes to build an island.
- Set a timer and give time updates throughout the activity so students are aware of how much time they have left to build their island.
- While students are working on their islands, set up more trays of LEGO bricks for students. Place a "Disaster Card" with each tray.
- After the first 20-25 minutes have elapsed, ask students to go up and grab another tray and to read their card (see Resources
- Students will then have another 20-25 minutes to problem solve and create a solution to their impending disaster.

Product or Artifact Possibility:

- Students will share their creations and explain their design and how they designed a solution to their impending disaster.
- Take a photo or video of your finished challenge and share it with the **Mid-Valley STEM-CTE Hub!**

Guiding Questions:

1. What is more challenging (Coming up with an island creation or designing a solution to the disaster?)
2. Share one positive design or idea that you wish you thought of?
3. Do you have an idea that could make someone else's design even better?

What are we discovering?:

- Students will demonstrate their creativity, connecting build ideas to the theme, managing the time well, and presenting the build to the group.
- Students will practice presentation skills as they share their designs and ideas with their classmates.

Resources:

1. Download the [Disaster Cards \(PDF\)](#).
2. One variation is to create teams of students for this activity so it incorporates aspects of teamwork and cooperation into the island design and problem-solving.

Acknowledgements:

STEM Bites are a project of the Oregon STEM Hub network. This lesson was developed by Chris Singer and the Mid-Valley STEM-CTE Hub as part of their Educator Lending Library program.