

Ahmed's Delivery

2nd Grade

Unit 3 – Building Bridges with Unlikely Friends

Text Connection: *Ahmed's Secret* by Florence Parry Heide & Judith Heide Gilliland

Design Challenge Summary

Challenge: What will the students be required to do?

Ahmed spends a lot of time walking his goods up stairs to his customers. Design an object or tool to help Ahmed deliver his goods without going up the stairs. The object or tool has to deliver the item (domino) at least 10 snap cubes off the ground at least 3 times.

Standards: What standards are addressed?

Science:

- NS.1.2.1 Communicate observations orally, in writing and in graphic organizers
- NS.1.2.2 Develop questions that guide scientific inquiry
- NS.1.2.3 Conduct scientific investigations as individually and in teams
- NS.1.2.4 Estimate and measure length...
- NS.1.2.5 Collect measurable empirical evidence in teams and as individuals
- NS.1.2.6 Make predictions in teams and as individuals based upon empirical evidence
- NS.1.2.7 Use age-appropriate equipment and tools in scientific investigations
- PS.6.2.1 Investigate the relationship between force and motion

2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as need to solve a given problem.

Math:

Mathematical Practice Standards

- 2.MD.1 Measure the length of an object by selecting the appropriate tools

Other:

- W.2.2 Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points and provide a concluding statement or section
- W.2.3 Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts and feelings, use temporal words to signal event order, and provide a sense of closure
- W.2.7 Participate in shared research and writing projects
- SL.2.1 Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups
- SL.2.3 Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information or deepen understanding of a topic or issue
- SL.2.4 Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences
- SL.2.6 Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification

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Result: What will students know, value, and be able to do as a result of the lesson? What's the big idea?

Know and apply the engineering design loop process.
Demonstrate ability to modify designs based on observations and predictions.
Work collaboratively on solving a problem.

Assessment: What evidence will be used to determine student learning?

Did they successfully deliver the items?
Did they follow the design loop process?
Did they work collaboratively?

Prior Knowledge/Experiences: What prior content knowledge and skills will the students need?

Experience with the Engineering Design Loop process
Connections to the Mathematical Practices
Investigations/inquiry in Science
Experiences with measurement
Experiences with simple machines and tools

Summary/Connections: How will this design challenge connect with new/future learning, other content areas, real world experiences, etc.?

This lesson will help students develop problem solving skills and collaboration skills that are essential in succeeding in the 21st century. It will allow student the opportunity to transfer and apply skills from various content areas within one task.

As a summary activity, you could engage students in:

W.2.2 Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points and provide a concluding statement or section

W.2.3 Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts and feelings, use temporal words to signal event order, and provide a sense of closure

Extensions:

Change the height required
Research simple tools and alter your design

Materials/Equipment/Preparation: What materials and equipment will students need to successfully complete this design challenge?

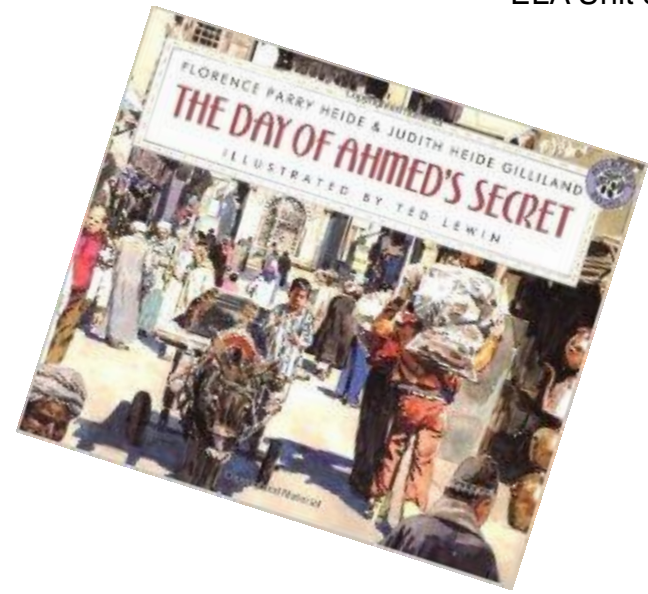
Materials: Spoon, ruler, tape, paper, string, paper clips, button, straw, popsicle stick, rubber bands (etc.)
Snap cubes, Domino (items)

ADDITIONAL INFORMATION

This is very open-ended to see the variety of designs that students come up with. After looking at designs, you can choose components to highlight and show to class. This STEM activity is heavily based on the Engineering, Technology, and Applications of Science component of the Next Generation Science Standards.



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Group Supplies:

Spoon, ruler, tape, paper, string, paper clips, button, straw, popsicle stick, rubber bands (etc.)

Snap cubes

Domino (items)