

GRADE 4 ADST: Duct Tape Design Challenge

Summary of Learning Opportunity

Students were presented with a real-world STEM (Science, Technology, Engineering, Math)/ADST challenge: design a useful product made entirely out of duct tape. The design process was scaffolded to help students develop and communicate their product idea and process. We also made connections between generating, evaluating and refining ideas and the Applied Design steps. Focusing and scaffolding on the literacy aspects helped students slow down and more meaningfully reflect on their design process.

ADST
Grade 4

Curricular Competencies

- Defining: identify the main objective for the design and any constraints
- Ideating: generate potential ideas; choose an idea to pursue
- Prototyping: outline a general plan, identifying tools and materials; construct a first version of the product, making changes to tools, materials and procedures as needed; record iterations of prototyping
- Testing: gather peer feedback and inspiration
- Sharing: demonstrate their product and describe their process; reflect on their design thinking and processes

Literacy Connections	Instruction and Assessment	Competencies Developed, Practiced, and/or Assessed
LITERACY: Develops Ideas— Generates ideas	1. Students were presented with a real-world challenge: design a useful product made entirely out of duct tape. The design process was scaffolded with worksheets to help students develop and communicate their product idea and process.	Defining, Ideating, Prototyping
LITERACY: Develops Ideas— Evaluates ideas, Refines ideas	2. We reviewed the Applied Design steps so that students could understand the iterative process approach.	Prototyping, Testing
LITERACY: Communicates— Expresses ideas and information	3. Students explained the design thinking and prototype building approach to a peer. They reflected on what they learned about the design process.	Testing, Sharing

Teacher's Reflection

Focusing this activity on the Literacy aspects of Developing and Communicating Ideas encouraged my students to actively engage in discussions. They shared their perspectives without fear of judgement, because everyone was engaged in the hands-on building challenge and wanted to help their peers. Students practiced their critical thinking skills by listening to others' ideas and perspectives and incorporating this information. The process of documenting and reflecting on their process helped students build further communication skills.

Demonstration of Student Learning, Teacher Assessment and Reflection

DESIGN PAGE:

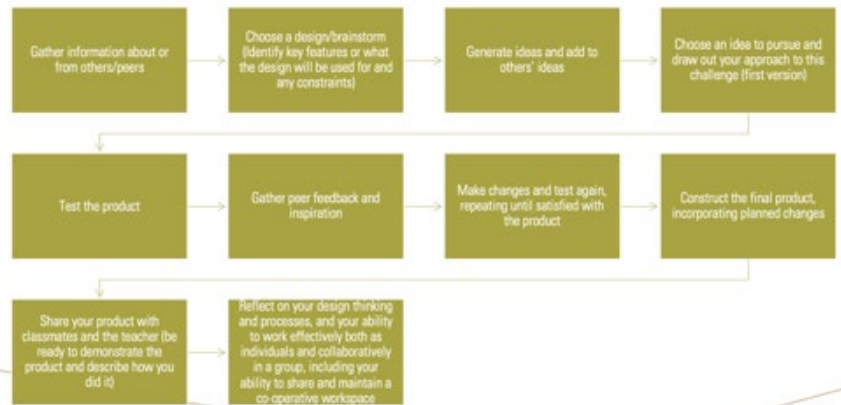
Explain your approach to this challenge and draw a diagram:

Excerpts from planning worksheets and discussion of the Applied Design steps.

How might the skills to complete this challenge carry over into real-world applications?

REFLECT:

APPLIED DESIGN



Student A (left) created a multi-use supply holder and described their design and decision to include support beams.

Student B (above) created a pencil case. They reflected after the project that some skills they used to complete this challenge would carry over into the real-world. They stated, "we took our time."

Teacher's Observations and Assessment

Student A: Proficient. They understood the context of the challenge and generated the idea of creating support beams. They expressed their design idea by explaining their approach to a peer using a diagram and showing the beams in their prototype.

Student B: Proficient. I observed this student actively seeking input from peers and from me. They used this feedback to refine their design (adding pockets and decorations). This student summarized their design process and reflected on the larger lessons taken from the design process.