

# Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM/BETT Unit Plan Template

**Unit Title:** Design Challenges      **Number of Lessons:** 5      **Time (in weeks):** 5  
**Name:** Tanya Blackall      **Subject(s):** ADST      **Grade(s):** 1

## Rationale

Applied Design, Skills, and Technologies (ADST) encourages students to explore creativity, problem solving, and innovation through hands-on experiences. In Grade 1, students begin developing foundational design thinking skills by identifying problems, generating ideas, creating simple designs, and reflecting on their work.

This unit introduces students to the design process through a series of engaging and developmentally appropriate design challenges. Each lesson presents a new problem for students to solve using everyday materials. Through these activities, students practice planning, building, testing, and improving their creations while developing collaboration and communication skills.

The activities are designed to encourage curiosity, experimentation, and perseverance. Students will explore concepts such as movement, stability, strength, and protection while building structures and devices. By sharing their designs and reflecting on their successes and challenges, students develop confidence in their ability to think creatively and solve problems.

## Overview:

This unit consists of five stand-alone design challenges that introduce students to different aspects of the design process. Each lesson provides an opportunity for students to think creatively and explore how materials can be used to solve practical problems.

Students will design and test a balloon rocket that travels along a string, construct a bridge strong enough to hold toy cars, build a chair that can support a stuffed animal, design a shelter for a toy animal, and work collaboratively to construct a tower using spaghetti and a marshmallow. Through these varied challenges, students will experiment with movement, structural stability, protection, and teamwork.

Each lesson follows a simplified version of the ADST design process appropriate for Grade 1 students: thinking about the problem, planning an idea, creating a design, testing the design, and sharing their results.

## CORE COMPETENCIES

Communication	Thinking	Personal & Social
<b>Collaborating</b> <i>Working Collectively:</i> <ul style="list-style-type: none"> <li>Students combine their efforts with those of others to effectively accomplish learning and tasks. As members of a group, they appreciate interdependence and</li> </ul>	<b>Creative Thinking</b> <i>Creating &amp; Innovating:</i> <ul style="list-style-type: none"> <li>Students get creative ideas that are novel and have value. An idea may be new to the student or their peers, and it may be novel for their age group or the larger community.</li> </ul>	<b>Social Awareness &amp; Responsibility</b> <i>Resolving Problems:</i> <ul style="list-style-type: none"> <li>Students identify and develop an appreciation for different perspectives on issues. They show empathy, disagree respectfully, and create</li> </ul>

<p>cooperation, commit to needed roles and responsibilities, and are conscientious about contributing. They also negotiate respectfully and follow through on plans, strategies, and actions as they share resources, time, and spaces for collaborative projects.</p> <p><b>Supporting Group Interactions:</b></p> <ul style="list-style-type: none"> <li>Students engage with others in ways that build and sustain trusting relationships and contribute to collective approaches. They value diverse perspectives and integrate the ideas of others with their own to tackle tasks, issues, and problems. Students seek to distribute leadership, listen actively, take turns in discussions, acknowledge contributions, and identify missing voices. They regulate the group's interactions together, mutually encouraging one another, creating space for marginalized voices, and applying constructive strategies to navigate through misunderstandings, struggles, and conflict.</li> </ul>	<p>It may be new to a particular context or absolutely new. The idea or product may have value in a variety of ways and contexts – it may be fun, provide a sense of accomplishment, solve a problem, be a form of self-expression, provoke reflection, or provide a new perspective that influences the way people think or act. It can have a positive impact on the individual, classmates, the community, or the world.</p>	<p>space for others to use their voices. They generate, use, and evaluate strategies to resolve problems.</p>
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**BIG IDEAS**

(multiple subject areas for integrated unit)

Subject Name: ADST 1	Subject Name: Science 1	Subject Name: PHE 1 (Social Emotional)
<ul style="list-style-type: none"> <li>Designs grow out of natural curiosity.</li> </ul>	<ul style="list-style-type: none"> <li>Matter is useful because of its properties.</li> </ul>	<ul style="list-style-type: none"> <li>Learning about ourselves and others helps us develop a positive attitude and caring behaviours, which helps us build healthy relationships.</li> </ul>

## LEARNING STANDARDS

Curricular Competencies	Content
<p><b>Applied Design</b></p> <p><b>Ideating</b></p> <ul style="list-style-type: none"> <li>• Generate ideas from their experiences and interests</li> <li>• Add to others' ideas</li> <li>• Choose an idea to pursue.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Choose tools and materials</li> <li>• Make a product using known procedures or through modelling of others</li> <li>• Use trial and error to make changes, solve problems, or incorporate new ideas from self or others</li> </ul> <p><b>Sharing</b></p> <ul style="list-style-type: none"> <li>• Demonstrate their product, tell the story of designing and making their product, and explain how their product contributes to the individual, family, community, and/or environment</li> <li>• Use personal preferences to evaluate the success of their design solutions</li> <li>• Reflect on their ability to work effectively both as individuals and collaboratively in a group</li> </ul> <p><b>Applied Skills</b> Develop their skills and add new ones through play and collaborative work</p>	<ul style="list-style-type: none"> <li>• <i>Students are expected to use the learning standards for Curricular Competencies from Applied Design, Skills, and Technologies K-3 in combination with grade-level content from other areas of learning in cross-curricular activities to develop foundational mindsets and skills in design thinking and making.</i></li> </ul>

### Prerequisite Concepts and Skills:

<p>Students may benefit from prior experience with:</p> <ul style="list-style-type: none"> <li>• Using scissors and tape safely</li> <li>• Working cooperatively with peers</li> <li>• Following simple instructions</li> <li>• Drawing basic pictures to represent ideas</li> <li>• Taking turns sharing materials</li> </ul>
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### Teacher Preparation Required:

Lesson #	Teacher Preparation Required (See Unit Plan Sample)
Lesson 1	<ul style="list-style-type: none"> <li>• Buy balloons</li> <li>• Buy straws</li> <li>• Collect long string to use</li> <li>• Collect tape to use</li> <li>• Set up the laptop &amp; prime videos</li> </ul> <p><a href="https://www.youtube.com/watch?v=kqv4jcVpwzs&amp;list=RDkqv4jcVpwzs&amp;start_radio=1">https://www.youtube.com/watch?v=kqv4jcVpwzs&amp;list=RDkqv4jcVpwzs&amp;start_radio=1</a></p>

	<p><a href="https://www.youtube.com/watch?v=Vfn_u768UoQ">https://www.youtube.com/watch?v=Vfn_u768UoQ</a></p> <ul style="list-style-type: none"> <li>• Turn on projector &amp; speakers</li> <li>• Make a demo model to show the students</li> <li>• Print "My Design Plan" worksheet for each student (19)</li> </ul>
Lesson 2	<ul style="list-style-type: none"> <li>• Collect cardboard pieces from recycling</li> <li>• Buy or find craft sticks (i.e. popsicle sticks or tongue depressors)</li> <li>• Collect paper</li> <li>• Collect tape</li> <li>• Collect toy Hot Wheels cars</li> <li>• Blocks to create a gap (already on a shelf in the classroom)</li> <li>• Set up laptop &amp; prime video</li> <li>• <a href="https://www.youtube.com/watch?v=SgAi5fPU8oU">https://www.youtube.com/watch?v=SgAi5fPU8oU</a></li> <li>• <a href="https://www.youtube.com/watch?v=C-c-1prGssM">https://www.youtube.com/watch?v=C-c-1prGssM</a></li> <li>• Turn on projector</li> <li>• Print "My Design Plan" worksheet for each student (19)</li> </ul>
Lesson 3	<ul style="list-style-type: none"> <li>• Collect cardboard from recycling</li> <li>• Buy paper cups</li> <li>• Buy craft sticks (i.e. popsicle sticks or tongue depressors)</li> <li>• Collect tape</li> <li>• Collect smaller stuffed animals (already in a bin in the classroom)</li> <li>• Set up laptop</li> <li>• Queue up Canva presentation with types of chairs in picture form</li> <li>• <a href="https://www.canva.com/design/DAHDTmB9ri0/tJDgDjmt0INyMVDqFx8K2w/view?utm_content=DAHDTmB9ri0&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=h2092aca912">https://www.canva.com/design/DAHDTmB9ri0/tJDgDjmt0INyMVDqFx8K2w/view?utm_content=DAHDTmB9ri0&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=h2092aca912</a></li> <li>• Turn on projector</li> <li>• Print "My Design Plan" worksheet for each student (19)</li> </ul>
Lesson 4	<ul style="list-style-type: none"> <li>• Collect cardboard from recycling</li> <li>• Collect paper</li> <li>• Collect tape</li> <li>• Pick out toy plastic animals roughly the same size &amp; weight for each group</li> <li>• Bring a spray bottle of water to simulate rain</li> <li>• Bring a fan to simulate wind</li> <li>• Turn on projector</li> <li>• Set up laptop</li> <li>• Print "My Design Plan" worksheet for each student (19)</li> <li>• Set up the Canva pictures of animals &amp; their shelters</li> <li>• <a href="https://www.canva.com/design/DAHDT4-TeM/gQMDuEAIrPRTYh-wXRWE3w/view?utm_content=DAHDT4-TeM&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=hd6a575f6ef">https://www.canva.com/design/DAHDT4-TeM/gQMDuEAIrPRTYh-wXRWE3w/view?utm_content=DAHDT4-TeM&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=hd6a575f6ef</a></li> </ul>
Lesson 5	<ul style="list-style-type: none"> <li>• Set up the laptop</li> <li>• Turn on the projector</li> <li>• Set up the Canva pictures of tall buildings around the world</li> <li>• <a href="https://www.canva.com/design/DAHDT2I7eTs/o_-YTxt-VVKgA7Sgbffa-g/view?utm_content=DAHDT2I7eTs&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=hf5d4659459">https://www.canva.com/design/DAHDT2I7eTs/o_-YTxt-VVKgA7Sgbffa-g/view?utm_content=DAHDT2I7eTs&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=hf5d4659459</a></li> <li>• Buy dry spaghetti</li> <li>• Collect tape</li> <li>• Collect one piece of paper for each group (4-5)</li> <li>• Buy average sized marshmallows</li> <li>• Print "My Design Plan" worksheet for each student (19)</li> </ul>

## Cross-Curricular Connections:

### Science

Students explore basic scientific concepts such as movement, force, stability, and protection while testing their designs. For example, the balloon rocket demonstrates how air can create motion, and the bridge and tower challenges explore structural strength and balance.

### Mathematics

Students engage with measurement, spatial reasoning, and comparison. During testing phases, students compare tower heights, observe which bridge holds more weight, and examine how shapes and structures affect stability.

### English Language Arts

Students practice oral communication skills by discussing their ideas, explaining their designs, and reflecting on what worked or what they would improve. Drawing design plans also allows students to represent ideas visually before building.

### Social-Emotional Learning (Physical Health Education)

Students practice cooperation, problem-solving, perseverance, and respectful communication while working with peers during collaborative design challenges.

## Aboriginal Connections/ First Peoples Principles of Learning:

**Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place):** When students explore designing things in this unit, they will directly be involved in learning organically as they work together to make a design that will work for the proposed purpose. By experimenting with different materials and testing their designs, they will ultimately be using reflection to improve their designs as they go along.

**Learning involves recognizing the consequences of one's actions:** As students experiment with their designs to see if they will work for their intended purpose, they will see that their actions have consequences and then they can adjust from there. Recognizing a problem and trying to fix it is essentially how we learn and grow as constant learners.

## Universal Design for Learning (UDL)

### Multiple Means of Representation

- Teacher modeling of design ideas
- Visual examples of structures and designs
- Step-by-step instructions with visuals

### Multiple Means of Engagement

- Hands-on learning experiences
- Choice in design solutions
- Collaborative building activities

### Multiple Means of Expression

- Students may communicate ideas through drawing, building, and/or verbal explanations.
- Peer discussion during reflection.

Differentiation may include providing additional scaffolding, pairing students strategically for collaboration (pair by ability so that everyone can succeed such as Jameson with Baldev and Liam with Amelia), or offering simplified materials for students who may need extra support & time (Silas & Bowen).

## Differentiated Instructions (DI)

For students that may need extra support:

- Utilize smaller groups or pairs so students can receive more guidance.
- Allow simplified materials (i.e. only 3 types of building materials instead of 6).
- Teacher modeling: Demonstrate a sample design step-by-step before students begin.

For students that may need a challenge:

- Challenge students to improve their design after the first test (e.g., make the tower taller, bridge stronger, and balloon rocket go farther).
- Add extra criteria such as stability underweight, longest distance, or most creative design.

Students with attention or focus challenges (Bowen, Silas, Emma P. Devina, & Baldev):

- Give short, step-by-step instructions.
- Use timers for each stage (plan, build, test, reflect).

General:

- Allow students to choose which materials they want to use from available options.
- Encourage creative flair in design: Colour, decorations, or unique shapes.
- Provide real-world connections (“Design a bridge like ones you see in your neighborhood” or “Build a shelter like animals in your backyard”).
- Use simple vocabulary with visuals (tape, paper, balloon, marshmallow).

## Overview of Lessons:

### Lesson 1: Balloon Rocket

<b>Name &amp; Time (Minutes Allotted):</b>	<b>Balloon Rocket – 50 minutes</b>
<b>Learning Standards: Curricular Competencies</b>	<p><b>Applied Design</b></p> <p><i>Ideating</i></p> <ul style="list-style-type: none"> <li>• Generate ideas from their experiences and interests</li> <li>• Add to others’ ideas</li> <li>• Choose an idea to pursue.</li> </ul> <p><i>Making</i></p> <ul style="list-style-type: none"> <li>• Choose tools and materials</li> <li>• Make a product using known procedures or through modelling of others</li> <li>• Use trial and error to make changes, solve problems, or incorporate new ideas from self or others</li> </ul> <p><i>Sharing</i></p> <ul style="list-style-type: none"> <li>• Demonstrate their product, tell the story of designing and making their product, and explain how their product contributes to the individual, family, community, and/or environment</li> <li>• Use personal preferences to evaluate the success of their design solutions</li> <li>• Reflect on their ability to work effectively both as individuals and collaboratively in a group</li> </ul> <p><b>Applied Skills</b></p> <ul style="list-style-type: none"> <li>• Develop their skills and add new ones through play and collaborative work</li> </ul>
<b>Learning Standards: Content</b>	<ul style="list-style-type: none"> <li>• <i>Students are expected to use the learning standards for Curricular Competencies from Applied Design, Skills, and Technologies K-3 in combination with grade-level content from other areas of learning in cross-curricular activities to develop foundational mindsets and skills in design thinking and making.</i></li> </ul>
<b>Instructional Objectives</b>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• Explore how air can create movement</li> </ul>

	<ul style="list-style-type: none"> <li>• Design and build a simple balloon rocket</li> <li>• Test and observe how their design moves</li> <li>• Reflect on what worked and what could be improved</li> </ul>
Assessment:	<p>Assessment in this unit will focus primarily on <b>observation and participation</b> rather than the final product.</p> <p><b>Formative Assessment</b> Teacher observations of:</p> <ul style="list-style-type: none"> <li>• Student engagement</li> <li>• Ability to generate ideas</li> <li>• Collaboration with peers</li> <li>• Problem-solving strategies</li> <li>• Willingness to test and revise designs</li> </ul> <p><b>Student Reflection</b> Students will reflect through questions such as:</p> <ul style="list-style-type: none"> <li>• What worked well in your design?</li> <li>• What was challenging?</li> <li>• What would you change next time?</li> </ul>
Teaching Strategies:	<ul style="list-style-type: none"> <li>• Materials for each lesson will be prepared in advance and placed in labeled bins or containers. Each group or table will receive the same set of materials to ensure fairness and reduce potential conflicts.</li> <li>• Students may work individually or in small groups depending on the activity. Clear instructions will be provided before distributing materials to ensure students understand the task and expectations.</li> <li>• The classroom will be arranged so that students have adequate space for building and testing their designs. Testing areas, such as spaces for launching rockets or testing bridges, will be clearly identified to maintain safety and organization.</li> </ul>
Materials:	<ul style="list-style-type: none"> <li>• Balloons</li> <li>• Straws</li> <li>• Long string</li> <li>• Tape</li> <li>• Chairs or desks to tie the string between</li> <li>• Laptop</li> <li>• Projector</li> <li>• Internet</li> <li>• "My Design Plan" worksheet for each student (19)</li> </ul>
<b>Lesson Activities:</b>	
Introduction/Hook: 10 min.	<p>The teacher will:</p> <p>Begin by asking students questions to activate prior knowledge:</p> <ul style="list-style-type: none"> <li>• "Have you ever seen a rocket launch?"</li> <li>• "What makes rockets move?"</li> <li>• Show some very short videos from YouTube showing a rocket launch</li> </ul> <p>Move onto:</p> <ul style="list-style-type: none"> <li>• Blow up a balloon and release it without tying it. Ask students to observe what happens.</li> </ul> <p>Discuss:</p> <ul style="list-style-type: none"> <li>• "What made the balloon move?"</li> </ul>

	<ul style="list-style-type: none"> <li>• “Where did the air go?”</li> </ul> <p>Explain that today students will <b>design a balloon rocket</b> that travels along a string.</p>
Body:	<p><b>Planning (5 min.)</b> The teacher will explain that designers often plan their ideas first.</p> <ul style="list-style-type: none"> <li>• Put students into small teams of 3</li> </ul> <p>Each student will:</p> <ul style="list-style-type: none"> <li>• Draw a quick picture of their rocket</li> <li>• Discuss with their group how they think it will move</li> </ul> <p><b>Building (15 min.)</b> The teacher will set up a string stretched across the classroom and thread a straw onto it.</p> <p>Students:</p> <ol style="list-style-type: none"> <li>1. Inflate a balloon (without tying it).</li> <li>2. Tape the balloon to the straw.</li> <li>3. Hold the balloon closed until ready.</li> </ol> <p>The teacher will encourage students to think about:</p> <ul style="list-style-type: none"> <li>• Direction of the balloon</li> <li>• Where the air will go</li> </ul> <p><b>Testing (10 min.)</b></p> <ul style="list-style-type: none"> <li>• Students release the balloon rockets and watch them travel along the string.</li> <li>• Students may test more than once if time allows.</li> </ul> <p>The teacher will encourage them to observe:</p> <ul style="list-style-type: none"> <li>• how fast it moved</li> <li>• how far it travelled</li> </ul>
Closure:	<p><b>Reflection and Discussion (10 min.)</b> The teacher will ask students:</p> <ul style="list-style-type: none"> <li>• “What made your rocket move?”</li> <li>• “Did some rockets go faster than others?”</li> <li>• “What could make it go even farther?”</li> <li>• Highlight that testing helps designers improve their ideas</li> </ul> <p><b>Clean-up Time</b></p> <ul style="list-style-type: none"> <li>• Students will clean up the classroom</li> </ul>

## Lesson 2: Build a Bridge for Toy Cars

Name & Time (Minutes Allotted):	<b>Build a Bridge for Toy Cars (Hot Wheels Cars) – 50 minutes</b>
Learning Standards: Curricular Competencies	<p><b>Applied Design</b></p> <p><i>Ideating</i></p> <ul style="list-style-type: none"> <li>• Generate ideas from their experiences and interests</li> <li>• Add to others’ ideas</li> <li>• Choose an idea to pursue.</li> </ul> <p><i>Making</i></p> <ul style="list-style-type: none"> <li>• Choose tools and materials</li> </ul>

	<ul style="list-style-type: none"> <li>• Make a product using known procedures or through modelling of others</li> <li>• Use trial and error to make changes, solve problems, or incorporate new ideas from self or others</li> </ul> <p><b>Sharing</b></p> <ul style="list-style-type: none"> <li>• Demonstrate their product, tell the story of designing and making their product, and explain how their product contributes to the individual, family, community, and/or environment</li> <li>• Use personal preferences to evaluate the success of their design solutions</li> <li>• Reflect on their ability to work effectively both as individuals and collaboratively in a group</li> </ul> <p><b>Applied Skills</b> Develop their skills and add new ones through play and collaborative work</p>
<b>Learning Standards: Content</b>	<ul style="list-style-type: none"> <li>• <i>Students are expected to use the learning standards for Curricular Competencies from Applied Design, Skills, and Technologies K-3 in combination with grade-level content from other areas of learning in cross-curricular activities to develop foundational mindsets and skills in design thinking and making.</i></li> </ul>
<b>Instructional Objectives</b>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• Design a bridge that spans a gap</li> <li>• Build a structure that supports weight</li> <li>• Test their design using toy cars</li> <li>• Reflect on how their bridge performed</li> </ul>
<b>Assessment:</b>	<p>Assessment in this unit will focus primarily on <b>observation and participation</b> rather than the final product.</p> <p><b>Formative Assessment</b> Teacher observations of:</p> <ul style="list-style-type: none"> <li>• student engagement</li> <li>• ability to generate ideas</li> <li>• collaboration with peers</li> <li>• problem-solving strategies</li> <li>• willingness to test and revise designs</li> </ul> <p><b>Student Reflection</b> Students will reflect verbally through questions such as:</p> <ul style="list-style-type: none"> <li>• What worked well in your design?</li> <li>• What was challenging?</li> <li>• What would you change next time?</li> </ul>
<b>Teaching Strategies:</b>	<p><b>Explicit Instruction</b> The lesson will begin with a short teacher-led discussion about bridges and their purpose. The teacher will explain that bridges help people and vehicles travel across spaces such as rivers or valleys. Visual examples or simple pictures of bridges may be shown to help students understand how bridges work. Clear instructions and expectations will be provided before students begin the design challenge.</p> <p><b>Modeling</b> The teacher will model the planning stage by drawing a simple bridge</p>

	<p>design on the board and explaining how designers think about strength and stability before building. Modeling will help students understand how to plan their ideas and consider how their bridge will support the weight of toy cars.</p> <p><b>Inquiry-Based Learning</b> Students will be encouraged to explore and experiment with materials to discover what makes a strong bridge. Rather than providing a single correct method. This encourages students to think critically and develop their own solutions.</p> <p><b>Hands-On Learning</b> Students will actively engage in constructing their bridges using the provided materials. Hands-on learning allows students to experiment with different building techniques while developing problem-solving and fine motor skills.</p> <p><b>Collaborative Learning</b> Students may work individually or in pairs to build their bridges. Working together encourages communication, idea sharing, and cooperative problem solving.</p> <p><b>Guided Questioning</b> Throughout the activity, the teacher will circulate and ask open-ended questions to support student thinking. Questions such as “What part of your bridge is holding the most weight?” or “How could you make your bridge stronger?” help guide students as they test and improve their designs.</p> <p><b>Reflection and Discussion</b> At the end of the lesson, students will participate in a short class discussion to share their bridges and describe what worked well. Reflecting on the design process helps students understand that testing and improving ideas is an important part of engineering and design.</p>
<b>Materials:</b>	<ul style="list-style-type: none"> <li>• Cardboard pieces</li> <li>• Craft sticks (i.e. popsicle sticks or tongue depressors)</li> <li>• Paper</li> <li>• Tape</li> <li>• Toy Hot Wheels cars</li> <li>• Blocks to create a gap</li> <li>• Laptop</li> <li>• Internet</li> <li>• Projector</li> <li>• “My Design Plan” worksheet for each student (19)</li> </ul>
<b>Lesson Activities:</b>	
<b>Introduction/Hook:</b> 10 min.	<p>The teacher will: Show pictures or discuss examples of bridges.</p> <p>Ask:</p> <ul style="list-style-type: none"> <li>• “Why do people build bridges?”</li> <li>• “What do bridges need to be able to do?”</li> <li>• Explain that bridges must be <b>strong enough to hold weight.</b></li> </ul>

	<ul style="list-style-type: none"> <li>Tell students they will build a bridge that <b>toy cars can safely cross</b>.</li> </ul>
Body:	<p><b>Planning (5 min.)</b> The teacher will:</p> <ul style="list-style-type: none"> <li>Explain to the students that they will each draw their own bridge design to support a Hot Wheels car.</li> <li>Explain that they will be put into small groups to share their ideas and formulate a new version that they will attempt to create in given materials</li> <li><i>"I will create the groups."</i></li> <li><i>"I want you to think about how long your bridge must be."</i></li> <li><i>I want to think about how it will stay strong enough for a Hot Wheels car to drive over it without collapsing. Ideally more than one car in your testing phase."</i></li> </ul> <p><b>Building (15 min.)</b> The teacher will show pictures or discuss examples of bridges &amp; ask:</p> <ul style="list-style-type: none"> <li><i>"Why do people build bridges?"</i></li> <li><i>"What do bridges need to be able to do?"</i></li> <li>Explain that bridges must be strong enough to hold weight depending on their intended purpose (i.e. cards, trains, etc.).</li> <li>Repeat to students that in their small groups, they will build a bridge that toy cars can safely cross.</li> <li><i>"You will place your bridge between two supports."</i></li> </ul> <p><b>Testing (10 min.)</b> Students will test their bridge by:</p> <ul style="list-style-type: none"> <li>Driving toy cars across.</li> <li>Adding more cars to test the bridge's strength.</li> </ul>
Closure:	<p><b>Reflection &amp; Sharing (10 min.)</b> The teacher will discuss:</p> <ul style="list-style-type: none"> <li>Which bridges were strongest?</li> <li>What shapes or materials helped?</li> <li>Highlight that <b>strong designs help structures carry weight</b>.</li> </ul> <p>Clean Up Time!</p>

### Lesson 3: Build a Chair for a Stuffed Animal

Name & Time (Minutes Allotted):	<b>Build a Chair for a Stuffed Animal – 50 minutes</b>
Learning Standards: Curricular Competencies	<p><b>Applied Design</b></p> <p><i>Ideating</i></p> <ul style="list-style-type: none"> <li>Generate ideas from their experiences and interests</li> <li>Add to others' ideas</li> <li>Choose an idea to pursue.</li> </ul> <p><i>Making</i></p> <ul style="list-style-type: none"> <li>Choose tools and materials</li> <li>Make a product using known procedures or through modelling of others</li> <li>Use trial and error to make changes, solve problems, or incorporate new ideas from self or others</li> </ul> <p><i>Sharing</i></p>

	<ul style="list-style-type: none"> <li>• Demonstrate their product, tell the story of designing and making their product, and explain how their product contributes to the individual, family, community, and/or environment</li> <li>• Use personal preferences to evaluate the success of their design solutions</li> <li>• Reflect on their ability to work effectively both as individuals and collaboratively in a group</li> </ul> <p><b>Applied Skills</b></p> <ul style="list-style-type: none"> <li>• Develop their skills and add new ones through play and collaborative work</li> </ul>
<p><b>Learning Standards: Content</b></p>	<ul style="list-style-type: none"> <li>• <i>Students are expected to use the learning standards for Curricular Competencies from Applied Design, Skills, and Technologies K-3 in combination with grade-level content from other areas of learning in cross-curricular activities to develop foundational mindsets and skills in design thinking and making.</i></li> </ul>
<p><b>Instructional Objectives</b></p>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• Design a chair for a stuffed animal</li> <li>• Build a stable structure</li> <li>• Test if their chair can support weight</li> <li>• Reflect on their design</li> </ul>
<p><b>Assessment:</b></p>	<p>Assessment in this unit will focus primarily on <b>observation and participation</b> rather than the final product.</p> <p><b>Formative Assessment</b> Teacher observations of:</p> <ul style="list-style-type: none"> <li>• Student engagement</li> <li>• Ability to generate ideas</li> <li>• Collaboration with peers</li> <li>• Problem-solving strategies</li> <li>• Willingness to test and revise designs</li> </ul> <p><b>Student Reflection</b> Students will reflect verbally through questions such as:</p> <ul style="list-style-type: none"> <li>• What worked well in your design?</li> <li>• What was challenging?</li> <li>• What would you change next time?</li> </ul>
<p><b>Teaching Strategies:</b></p>	<p><b>Explicit Instruction</b> The lesson will begin with a brief teacher-led discussion about chairs and their purpose. Students will be asked to observe chairs in the classroom and identify important features such as legs, a seat, and a backrest. The teacher will explain that chairs must be stable and strong enough to hold weight. Clear instructions will be provided before students begin designing their own chairs.</p> <p><b>Modeling</b> The teacher will model the planning stage by drawing a simple chair design on the board. During this process, the teacher will demonstrate how designers think about balance and support when planning a structure. Modeling helps students understand how to organize their ideas before beginning the building process.</p>

	<p><b>Hands-On Learning</b> Students will actively engage in constructing their chairs using a variety of materials. Hands-on learning allows students to explore how different materials can be used to create stable structures and encourages experimentation and creativity.</p> <p><b>Inquiry-Based Learning</b> Students will be encouraged to think critically about their designs by experimenting with different building strategies. Instead of providing a specific way to build the chair, the teacher will allow students to test ideas and discover what works best.</p> <p><b>Guided Questioning</b> While students are building, the teacher will circulate and ask questions that encourage deeper thinking. Questions such as “How will your chair stay standing?” or “What part of the chair will hold the stuffed animal?” help students reflect on their design decisions.</p> <p><b>Collaborative Learning</b> Students may work individually or in small groups, allowing them to share ideas and support one another during the building process. Collaboration helps students practice communication and teamwork skills.</p> <p><b>Reflection and Discussion</b> At the end of the lesson, students will share their chairs and test them with their stuffed animals. A short class discussion will allow students to talk about what worked well and what challenges they experienced. Reflecting on the activity reinforces the idea that designs can be improved through testing and revision.</p>
<b>Materials:</b>	<ul style="list-style-type: none"> <li>• Cardboard</li> <li>• Paper cups</li> <li>• Craft sticks (i.e. popsicle sticks or tongue depressors)</li> <li>• Tape</li> <li>• Smaller stuffed animals</li> <li>• Canva presentation to show chair pictures</li> <li>• Laptop</li> <li>• Projector</li> <li>• “My Design Plan” worksheet for each student (19)</li> </ul>
<b>Lesson Activities:</b>	
<b>Introduction/Hook:</b> 10 min.	<p>The teacher will:</p> <ul style="list-style-type: none"> <li>• Discuss different types of chairs &amp; show pictures (<b>Canva</b>)</li> </ul> <p>Ask students:</p> <ul style="list-style-type: none"> <li>• What makes a chair comfortable?</li> <li>• What makes a chair strong?</li> </ul> <p>Show a classroom chair and identify parts:</p> <ul style="list-style-type: none"> <li>• legs</li> <li>• seat</li> <li>• back</li> </ul> <ul style="list-style-type: none"> <li>• Explain that students will <b>design a chair for a stuffed animal.</b></li> </ul>
<b>Body:</b>	<b>Planning (5 min.)</b>

	<p>The teacher will:</p> <ul style="list-style-type: none"> <li>• Instruct students that they will each draw their own chair design. Encourage them to think about:</li> <li>• <i>"How many legs it needs."</i></li> <li>• <i>"How it will stay balanced."</i></li> </ul> <p><b>Building (15 min.)</b></p> <p>The teacher will:</p> <ul style="list-style-type: none"> <li>• Tell students that they will be working in small groups chosen by the teacher (groups of 3)</li> <li>• Students will combine their ideas &amp; come up with a plan of design together</li> <li>• Students will then construct their chairs using available materials.</li> </ul> <p>The teacher will support students by asking questions such as:</p> <ul style="list-style-type: none"> <li>• <i>"How will your chair stay upright?"</i></li> <li>• <i>"Where will the animal sit?"</i></li> </ul> <p><b>Testing (10 min.)</b></p> <ul style="list-style-type: none"> <li>• Students will test their chair by placing their stuffed animal on the chair.</li> <li>• If it collapses, students will try to improve their design <u>together</u> if there is time.</li> </ul>
Closure:	<p><b>Reflecting &amp; Sharing (10 min.)</b></p> <p>The teacher will discuss:</p> <ul style="list-style-type: none"> <li>• <i>"What helped your chair stay up?"</i></li> <li>• <i>"What was challenging?"</i></li> <li>• Emphasize that <b>designers often improve their designs after testing.</b></li> </ul> <p><b>Clean Up Time!</b></p>

#### Lesson 4: Build a Shelter for a Toy Animal

Name & Time (Minutes Allotted):	<b>Build a Shelter for a Toy Animal – 45 min.</b>
Learning Standards: Curricular Competencies	<p><b>Applied Design</b></p> <p><i>Ideating</i></p> <ul style="list-style-type: none"> <li>• Generate ideas from their experiences and interests</li> <li>• Add to others' ideas</li> <li>• Choose an idea to pursue.</li> </ul> <p><i>Making</i></p> <ul style="list-style-type: none"> <li>• Choose tools and materials</li> <li>• Make a product using known procedures or through modelling of others</li> <li>• Use trial and error to make changes, solve problems, or incorporate new ideas from self or others</li> </ul> <p><i>Sharing</i></p> <ul style="list-style-type: none"> <li>• Demonstrate their product, tell the story of designing and making their product, and explain how their product contributes to the individual, family, community, and/or environment</li> <li>• Use personal preferences to evaluate the success of their design solutions</li> </ul>

	<ul style="list-style-type: none"> <li>• Reflect on their ability to work effectively both as individuals and collaboratively in a group</li> </ul> <p><b>Applied Skills</b></p> <ul style="list-style-type: none"> <li>• Develop their skills and add new ones through play and collaborative work</li> </ul>
<b>Learning Standards: Content</b>	<ul style="list-style-type: none"> <li>• <i>Students are expected to use the learning standards for Curricular Competencies from Applied Design, Skills, and Technologies K-3 in combination with grade-level content from other areas of learning in cross-curricular activities to develop foundational mindsets and skills in design thinking and making.</i></li> </ul>
<b>Instructional Objectives</b>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• Design a shelter for a toy animal</li> <li>• Build a structure that provides protection</li> <li>• Test their shelter</li> <li>• Reflect on how their design worked</li> </ul>
<b>Assessment:</b>	<p>Assessment in this unit will focus primarily on <b>observation and participation</b> rather than the final product.</p> <p><b>Formative Assessment</b> Teacher observations of:</p> <ul style="list-style-type: none"> <li>• student engagement</li> <li>• ability to generate ideas</li> <li>• collaboration with peers</li> <li>• problem-solving strategies</li> <li>• willingness to test and revise designs</li> </ul> <p><b>Student Reflection</b> Students will reflect verbally through questions such as:</p> <ul style="list-style-type: none"> <li>• What worked well in your design?</li> <li>• What was challenging?</li> <li>• What would you change next time?</li> </ul>
<b>Teaching Strategies:</b>	<p><b>Explicit Instruction</b> The lesson will begin with a teacher-led discussion about shelters and why animals and people need them. Students will be asked to think about examples of shelters such as houses, nests, dens, or burrows. The teacher will explain that shelters help protect living things from weather and other dangers. Clear instructions will be provided before students begin the design challenge.</p> <p><b>Use of Visual Examples</b> Visual examples of different shelters may be shown to help students understand how structures can provide protection. These examples support students in visualizing their own designs and help build background knowledge.</p> <p><b>Modeling</b> The teacher will model how to plan a simple shelter design by drawing an example on the board. While modeling, the teacher will demonstrate how to think about important features such as walls, a roof, and an entrance. This helps students understand how designers plan before building.</p>

	<p><b>Inquiry-Based Learning</b> Students will be encouraged to explore different building ideas and materials to determine how best to protect their toy animal. The teacher will allow students to experiment and test their designs rather than giving specific instructions on how to build the shelter.</p> <p><b>Hands-On Learning</b> Students will actively construct their shelters using the available materials. This hands-on approach allows students to experiment with different structures and develop problem-solving and fine motor skills.</p> <p><b>Guided Questioning</b> During the building process, the teacher will circulate and ask questions that encourage students to think critically about their designs. Questions such as “How will your shelter protect the animal?” or “What could you add to make the shelter stronger?” help guide student thinking.</p> <p><b>Reflection and Discussion</b> At the end of the lesson, students will test their shelters and share their designs with the class. Students will discuss what worked well and what they might change if they redesigned their shelter. This reflection reinforces the idea that designs can be improved through testing and revision.</p>
<b>Materials:</b>	<ul style="list-style-type: none"> <li>• Cardboard</li> <li>• Paper</li> <li>• Tape</li> <li>• Toy plastic animals</li> <li>• Spray bottle of water to simulate rain</li> <li>• Fan to simulate wind</li> <li>• Laptop</li> <li>• Canva presentation with pictures of animal shelters</li> <li>• Projector</li> <li>• “My Design Plan” worksheet for each student (19)</li> </ul>
<b>Lesson Activities:</b>	
<b>Introduction/Hook:</b> 5 min.	<p>The teacher will:</p> <ul style="list-style-type: none"> <li>• Discuss how animals live in shelters such as nests, dens, or burrows.</li> <li>• Show pictures of various animals &amp; their shelters via Canva</li> </ul> <p>Ask:</p> <ul style="list-style-type: none"> <li>• <i>“Why do animals need shelters?”</i></li> <li>• <i>“What do shelters protect them from?”</i></li> </ul> <ul style="list-style-type: none"> <li>• Explain that students will build a <b>shelter for a toy animal.</b></li> </ul>
<b>Body:</b>	<p><b>Planning (5 min.)</b></p> <p>The teacher will:</p> <ul style="list-style-type: none"> <li>• Explain that students will each draw their shelter idea.</li> </ul> <p>Encourage them to think about:</p> <ul style="list-style-type: none"> <li>• Walls</li> <li>• Roofs</li> <li>• Entrances</li> </ul>

	<p><b>Building (15 min.)</b> The teacher will:</p> <ul style="list-style-type: none"> <li>• Make groups of 3</li> <li>• Instruct students to get together &amp; discuss their designs</li> <li>• Students will come together &amp; make a decision about a design</li> <li>• Students to start construct their shelters.</li> </ul> <p>The teacher will circulate and ask:</p> <ul style="list-style-type: none"> <li>• <i>"Where will the animal go?"</i></li> <li>• <i>"How will the shelter stay standing?"</i></li> <li>• <i>"Will the shelter withstand rain, wind, snow, and heat from the sun?"</i></li> </ul> <p><b>Testing (10 min.)</b> The teacher will for each model:</p> <ul style="list-style-type: none"> <li>• Simulate wind by blowing air or using a fan.</li> <li>• Lightly sprinkle water with a spray bottle.</li> <li>• Students will observe whether their shelter protects the animal &amp; holds up to some tests</li> </ul>
Closure:	<p><b>Reflection &amp; Sharing (10 min.)</b> The teacher will facilitate the students asking themselves:</p> <ul style="list-style-type: none"> <li>• "Did your shelter protect the animal?"</li> <li>• "What would make it stronger?"</li> <li>• Discuss how <b>designs help solve real-world problems.</b></li> </ul> <p>Clean Up Time!</p>

### Lesson 5: Spaghetti & Marshmallow Tower Challenge

Name & Time (Minutes Allotted):	<b>Spaghetti &amp; Marshmallow Tower Challenge – 50 minutes</b>
Learning Standards: Curricular Competencies	<p><b>Applied Design</b></p> <p><i>Ideating</i></p> <ul style="list-style-type: none"> <li>• Generate ideas from their experiences and interests</li> <li>• Add to others' ideas</li> <li>• Choose an idea to pursue.</li> </ul> <p><i>Making</i></p> <ul style="list-style-type: none"> <li>• Choose tools and materials</li> <li>• Make a product using known procedures or through modelling of others</li> <li>• Use trial and error to make changes, solve problems, or incorporate new ideas from self or others</li> </ul> <p><i>Sharing</i></p> <ul style="list-style-type: none"> <li>• Demonstrate their product, tell the story of designing and making their product, and explain how their product contributes to the individual, family, community, and/or environment</li> <li>• Use personal preferences to evaluate the success of their design solutions</li> <li>• Reflect on their ability to work effectively both as individuals and collaboratively in a group</li> </ul>

	<p><b>Applied Skills</b></p> <ul style="list-style-type: none"> <li>• Develop their skills and add new ones through play and collaborative work</li> </ul>
Learning Standards: Content	<ul style="list-style-type: none"> <li>• <i>Students are expected to use the learning standards for Curricular Competencies from Applied Design, Skills, and Technologies K-3 in combination with grade-level content from other areas of learning in cross-curricular activities to develop foundational mindsets and skills in design thinking and making.</i></li> </ul>
Instructional Objectives	<p>Students will:</p> <ul style="list-style-type: none"> <li>• Collaborate with peers to design a tower</li> <li>• Build a structure using limited materials</li> <li>• Test the stability of their design</li> <li>• Reflect on teamwork and problem solving</li> </ul>
Assessment:	<p>Assessment in this unit will focus primarily on <b>observation and participation</b> rather than the final product.</p> <p><b>Formative Assessment</b> Teacher observations of:</p> <ul style="list-style-type: none"> <li>• student engagement</li> <li>• ability to generate ideas</li> <li>• collaboration with peers</li> <li>• problem-solving strategies</li> <li>• willingness to test and revise designs</li> </ul> <p><b>Student Reflection</b> Students will reflect verbally through questions such as:</p> <ul style="list-style-type: none"> <li>• What worked well in your design?</li> <li>• What was challenging?</li> <li>• What would you change next time?</li> </ul>
Teaching Strategies:	<p><b>Explicit Instruction</b> The lesson will begin with a brief teacher-led discussion about towers and tall structures. Students will be asked to think about examples such as buildings, towers, or monuments and consider why these structures need to be strong and stable. The teacher will explain the design challenge and clearly outline the rules and expectations for building the tower.</p> <p><b>Modeling</b> Before students begin building, the teacher will model the planning process by drawing a simple tower design on the board. The teacher will explain how designers think about creating a strong base and balancing materials when building tall structures. This modeling supports students in understanding how to approach the design challenge.</p> <p><b>Collaborative Learning</b> Students will work in small teams to build their towers. Collaborative learning encourages students to share ideas, communicate effectively, and work together to solve problems. Working in teams also allows students to learn from each other's strategies and perspectives.</p>

	<p><b>Inquiry-Based Learning</b> Students will explore different ways to construct their towers using spaghetti and tape. Rather than providing a specific building method, the teacher will encourage experimentation and creative thinking as students test different approaches to make their towers taller and more stable.</p> <p><b>Hands-On Learning</b> Students will actively engage in constructing and testing their towers. This hands-on experience allows students to develop spatial awareness, fine motor skills, and problem-solving abilities while exploring structural stability.</p> <p><b>Guided Questioning</b> Throughout the activity, the teacher will circulate and ask open-ended questions to guide student thinking. Questions such as “What could make your tower stronger?” or “How can you make the base more stable?” help students reflect on their design choices and consider improvements.</p> <p><b>Reflection and Discussion</b> At the end of the activity, students will test their towers by placing the marshmallow on top and measuring their height. A class discussion will allow students to share their experiences, describe their strategies, and reflect on what worked well or what they might change in the future. This reflection reinforces the importance of testing and improving designs in the engineering process.</p>
<b>Materials:</b>	<ul style="list-style-type: none"> <li>• Dry spaghetti</li> <li>• Tape</li> <li>• One piece of paper for each group</li> <li>• One average sized marshmallow for each group</li> <li>• Canva presentation with pictures of tall buildings around the world</li> <li>• Laptop</li> <li>• Projector</li> <li>• Internet</li> <li>• “My Design Plan” worksheet for each student (19)</li> </ul>
<b>Lesson Activities:</b>	
<b>Introduction/Hook:</b> 5 min.	<p>The teacher will: Discuss tall structures such as towers or skyscrapers &amp; ask students:</p> <ul style="list-style-type: none"> <li>• “What helps tall buildings stay standing?”</li> <li>• “Why do towers need to be strong?”</li> </ul> <ul style="list-style-type: none"> <li>• Show some pictures of tall buildings (Canva)</li> <li>• Explain the challenge: Build the <b>tallest tower possible</b> that can hold a marshmallow on top.</li> </ul>
<b>Body:</b>	<p><b>Planning (10 min.)</b> The teacher will:</p> <ul style="list-style-type: none"> <li>• Put students into three groups of 5-6.</li> <li>• Tell students that they will work in those teams to discuss ideas.</li> </ul> <p>Encourage them to think about:</p>

	<ul style="list-style-type: none"> <li>• A strong base</li> <li>• How to make the tower tall</li> <li>• Students will each sketch the idea</li> </ul> <p><b>Building (15 min.)</b> The teacher will:</p> <ul style="list-style-type: none"> <li>• Instruct the teams to construct their towers using the provided materials.</li> <li>• Circulate &amp; encourage teamwork and problem solving.</li> </ul> <p><b>Testing (10 min.)</b></p> <ul style="list-style-type: none"> <li>• The students will place their marshmallow on top of the tower while the teacher and fellow students watch.</li> <li>• The teacher will measure each tower by height &amp; celebrate designs.</li> </ul>
Closure:	<p><b>Reflection &amp; Sharing (10 min.)</b> The teacher will discuss:</p> <ul style="list-style-type: none"> <li>• <i>"What helped your tower stay standing?"</i></li> <li>• <i>"What did your team do well?"</i></li> <li>• Reinforce that <b>designing often involves testing and improving ideas.</b></li> </ul> <p>Clean Up time!</p>

**Resources:**

<p><b>Lesson 1:</b></p> <ul style="list-style-type: none"> <li>• <a href="https://www.youtube.com/watch?v=kgv4jcVpwzs&amp;list=RDkgv4jcVpwzs&amp;start_radio=1">https://www.youtube.com/watch?v=kgv4jcVpwzs&amp;list=RDkgv4jcVpwzs&amp;start_radio=1</a></li> <li>• <a href="https://www.youtube.com/watch?v=Vfn_u768UoQ">https://www.youtube.com/watch?v=Vfn_u768UoQ</a></li> </ul> <p><b>Lesson 2:</b></p> <ul style="list-style-type: none"> <li>• <a href="https://www.youtube.com/watch?v=SgAi5fPU8oU">https://www.youtube.com/watch?v=SgAi5fPU8oU</a></li> <li>• <a href="https://www.youtube.com/watch?v=C-c-1prGssM">https://www.youtube.com/watch?v=C-c-1prGssM</a></li> </ul> <p><b>Lesson 3:</b></p> <ul style="list-style-type: none"> <li>• <a href="https://www.canva.com/design/DAHDTmB9ri0/tJDgDjmt0INyMVDqFx8K2w/view?utm_content=DAHDTmB9ri0&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=h2092aca912">https://www.canva.com/design/DAHDTmB9ri0/tJDgDjmt0INyMVDqFx8K2w/view?utm_content=DAHDTmB9ri0&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=h2092aca912</a></li> </ul> <p><b>Lesson 4:</b></p> <ul style="list-style-type: none"> <li>• <a href="https://www.canva.com/design/DAHDT4-TeM/gQMDuEAIrpRTYh-wXRWE3w/view?utm_content=DAHDT4-TeM&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=hd6a575f6ef">https://www.canva.com/design/DAHDT4-TeM/gQMDuEAIrpRTYh-wXRWE3w/view?utm_content=DAHDT4-TeM&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=hd6a575f6ef</a></li> </ul> <p><b>Lesson 5:</b></p> <ul style="list-style-type: none"> <li>• <a href="https://www.canva.com/design/DAHDT2I7eTs/o_-YTxt-VVKgA7Sgbffa-g/view?utm_content=DAHDT2I7eTs&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=hf5d4659459">https://www.canva.com/design/DAHDT2I7eTs/o_-YTxt-VVKgA7Sgbffa-g/view?utm_content=DAHDT2I7eTs&amp;utm_campaign=designshare&amp;utm_medium=link2&amp;utm_source=uniquelinks&amp;utlId=hf5d4659459</a></li> </ul> <p>Worksheet for all lessons:</p>
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# My Design Plan

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Design Challenge: \_\_\_\_\_



## Draw Your Idea

## 2 Choose Your Materials

Circle or add what you will use:



Tape



Paper



Cardboard



Cups



Sticks

Other: \_\_\_\_\_

## 3 Build Your Design



## 4 Test Your Design



Yes



A little



Not yet

## 5 What Would You Change?

Draw or write your idea:

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## Extensions to Unit:

### **Balloon Rocket**

Students can experiment with changing the size of the balloon or adjusting the angle of the string to see how it affects movement. They may also design decorations or “rocket bodies” using paper.

### **Bridge for Toy Cars**

Students can attempt to improve their bridge to hold more weight. Additional challenges may include building a longer bridge or testing which shapes make the strongest supports.

### **Chair for a Stuffed Animal**

Students may redesign their chair to hold a heavier toy or add features such as armrests or a backrest.

### **Shelter for a Toy Animal**

Students can modify their shelters to better protect the animal from simulated wind or rain. They may also design shelters for different types of animals.

### **Spaghetti and Marshmallow Tower**

Students can attempt a second build to improve their tower after observing other designs. Teams may also discuss what strategies helped create the tallest or strongest structures.

## Reflections and Revisions