

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

**Lesson Title:** Balloon Rocket      **Lesson #** 1      **Date:** March 13, 2026  
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**Rationale:**

This lesson is important because it introduces students to the concept of movement and force through a simple engineering challenge. Students will explore how air can create motion as they design and test a balloon rocket that travels along a string. Through experimentation, students begin to understand that designs can be tested and improved upon.

**Core Competencies:**

Communication	Thinking	Personal & Social
<p><b>Collaborating</b> <i>Working Collectively:</i></p> <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 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.</li> </ul>		<p><b>Social Awareness &amp; Responsibility</b> <i>Resolving Problems:</i></p> <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 space for others to use their voices. They generate, use, and evaluate strategies to resolve problems.</li> </ul>

**Big Ideas (Understand)**

Designs grow out of natural curiosity.

**Learning Standards**

(DO)	(KNOW)
Learning Standards - Curricular Competencies	Learning Standards - Content
<p><b>Applied Design</b> <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>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.</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></p> <ul style="list-style-type: none"> <li>• Develop their skills and add new ones through play and collaborative work</li> </ul>	
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### Instructional Objectives & Assessment

Instructional Objectives (students will be able to...)	Assessment
Students will: <ul style="list-style-type: none"> <li>• Explore how air can create movement</li> <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 will focus primarily on <b>observation and participation</b> rather than the final product.  <b>Formative Assessment</b> Teacher observations of: <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> <b>Student Reflection</b> Students will reflect through questions such as: <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>

### Prerequisite Concepts and Skills:

<ul style="list-style-type: none"> <li>• Ability to follow simple instructions</li> <li>• Basic listening skills during group discussions</li> <li>• Basic fine motor skills (using tape, holding materials)</li> <li>• Ability to handle classroom materials safely &amp; respectfully</li> <li>• Beginning ability to share materials with peers</li> <li>• Willingness to try new ideas and participate in hands-on activities</li> <li>• Ability to observe and describe what happens during an experiment</li> <li>• Ability to draw a simple idea or explain an idea verbally</li> </ul>
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## Indigenous 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 in small groups of 3-5 students

### 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).

## Differentiate Instruction (DI):

For students that may need extra support:

- Utilize smaller groups or pairs so students can receive more guidance.
- Separate students that do not work well together (i.e. Silas & Baldev/Nico)
- 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 without giving away design ideas so that students must design on their own without just copying.

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 if possible.
- Encourage creative flair in design: Colour, decorations, or unique shapes.
- Provide real-world connections (Show some videos of rockets taking off in the real world)
- Use simple vocabulary with visuals on the worksheet (balloon, straw, string, tape)

## Materials and Resources

### Materials:

- Balloons
- Straws
- Long string
- Tape
- Chairs or desks to tie the string between
- Laptop
- Projector
- Internet
- "My Design Plan" worksheet for each student (19) & add a picture of a balloon, straw, & string

### Resources:

- [https://www.youtube.com/watch?v=kgv4jcVpwzs&list=RDkgv4jcVpwzs&start\\_radio=1](https://www.youtube.com/watch?v=kgv4jcVpwzs&list=RDkgv4jcVpwzs&start_radio=1)
- [https://www.youtube.com/watch?v=Vfn\\_u768UoQ](https://www.youtube.com/watch?v=Vfn_u768UoQ)

## Lesson Activities:

Teacher Activities	Student Activities	Time
<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> <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>	<ul style="list-style-type: none"> <li>• Students will listen to the teacher</li> <li>• Students wishing to ask a question, will raise their hand &amp; wait to be called on</li> </ul>	10 min.
<p>Body:</p> <p><b>Planning</b></p> <p>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 balloon rocket</li> <li>• Discuss with their group how they think it will move</li> </ul> <p><b>Building</b></p> <p>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> </ol>	<ul style="list-style-type: none"> <li>• Students will listen to the teacher</li> <li>• Students will raise their hand if they want to ask or answer a question</li> <li>• Students will work on drawing a picture &amp; then have a discussion with their group</li> </ul> <ul style="list-style-type: none"> <li>• Students will listen to the teacher</li> </ul>	<p>5 min.</p> <p>15 min.</p>

<p>2. Tape the balloon to the straw. 3. Hold the balloon closed until ready.</p> <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</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>	<ul style="list-style-type: none"> <li>• In their groups, students will test their balloon on the string</li> <li>• Students will note the direction of their balloon &amp; think about where the air will go once it is released</li> <li>• Students will test their balloon rockets on a long string</li> <li>• Students will try to note how fast &amp; how far the straw travelled</li> </ul>	<p>10 min.</p>
<p><b>Closure:</b> <b>Reflection and Discussion (10 min.)</b></p> <p>The teacher will ask students:</p> <ul style="list-style-type: none"> <li>• <i>"What made your rocket move?"</i></li> <li>• <i>"Did some rockets go faster than others?"</i></li> <li>• <i>"What could make it go even farther?"</i></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>	<ul style="list-style-type: none"> <li>• Students will listen to the teacher</li> <li>• Students that want to answer a question, will raise their hand</li> <li>• Students will clean up the classroom &amp; put away supplies</li> </ul>	<p>10 min.</p>

**Organizational Strategies:**

<ul style="list-style-type: none"> <li>• Prepare materials in advance and organize them into bins for easy distribution.</li> <li>• Pre-cut and measure lengths of string to save time during the lesson.</li> <li>• Set up a designated rocket launch area in the classroom where the string can be safely attached between two chairs or desks.</li> <li>• Demonstrate the building process before handing out materials so students understand the task.</li> <li>• Distribute materials after instructions are given to help maintain student focus.</li> <li>• Have extra balloons and tape available in case materials break or need replacing.</li> <li>• Establish a clear testing order so students take turns launching their rockets safely.</li> <li>• Allow time at the end of the lesson for cleanup and proper storage of materials.</li> </ul>
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**Proactive, Positive Classroom Learning Environment Strategies:**

<ul style="list-style-type: none"> <li>• Establish clear expectations for safe use of materials before beginning the activity.</li> <li>• Encourage students to try their ideas even if they are unsure whether they will work.</li> <li>• Emphasize that mistakes are part of the design process and help us learn.</li> <li>• Praise effort, creativity, and teamwork rather than focusing only on successful outcomes.</li> <li>• Encourage respectful communication when sharing materials or discussing ideas.</li> <li>• Use positive reinforcement to acknowledge students who demonstrate cooperation and perseverance.</li> </ul>
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- Provide opportunities for students to share their designs and celebrate each other's work.
- Maintain a supportive atmosphere where all students feel comfortable participating and asking questions.
- Reward good behaviour!

**Extensions:**

- Students can redesign their rocket and test it again to see if they can make it travel faster or farther.
- Students can experiment with different balloon sizes to observe how it affects movement.
- Students can decorate their rockets with paper to make them look like real rockets or space vehicles.
- Students can test whether adding weight (small paper pieces) changes how the rocket moves.
- Students can compare rockets and discuss which design travelled the farthest and why.
- Students can measure the distance the rocket travels and compare results with classmates.
- Students can draw a picture or write a short sentence about what they learned from the activity.

**Reflections (if necessary, continue on separate sheet):**