

Air: Design a Parachute for a Lego Person

Grades: K-2 Timeframe: 1 Week



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The Purpose of This Resource:

This STEM challenge can be used during an air unit. Students work together in groups to create a parachute for a lego person. Students are able to find ways to best maximize air resistance. The students need to find the best way to increase the time that the lego person stays in the air when dropped from the second floor to the first floor.

Stage 1 - Desired Results

Big Idea(s)

We can create a parachute to maximize the air resistance so the skydiver has a safer landing.

PA Core Standards / Next Generation Science Standards

[T & E Education](#)

[Science Education](#)

[Mathematics
Education](#)

[Computer
Science](#)

[CEW](#)

3.2.4.D. Inquiry and Design: Recognize and use the technological design process to solve problems. • Recognize and explain basic problems. • Identify possible solutions and their course of action. • Try a solution. Describe the solution, identify its impacts and modify if necessary. • Show the steps taken and the results.	3.2.4.C. Inquiry and Design: Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information.	CC.2.4.2.A.1 Measurement, Data, and Probability Measure and estimate lengths in standard units using appropriate tools.	CSTA.1B06 Collaboration, Visualization, and Computation. Organize and present collected data visually to highlight relationships and support a claim.	13.1.3. Career Awareness and Preparation E. Describe the work done by school personnel and other individuals in the community.
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<u>Essential Questions</u>
<ul style="list-style-type: none"> • How can I maximize the air resistance of a parachute?

<u>Students Will Know</u>	<u>Students Will Be Doing</u>
<ul style="list-style-type: none"> • Content specific vocab <ul style="list-style-type: none"> ○ Air Resistance ○ Parachute ○ Gravity • Steps of Design Process 	<ul style="list-style-type: none"> • Students will explore the importance of a parachute. • Students plan and design a parachute for a Lego Person. • Students test out their designs. • Students redesign their parachute.

Stage 2 - Evidence of Understanding

Assessments (Formative and Summative):	Performance Task(s)
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<ul style="list-style-type: none"> ● If the teacher is using an Air Unit then the students should complete the end of unit of assessment. 	<ul style="list-style-type: none"> ● The teacher can check over the worksheet documenting the Engineering by Design process. ● The teacher can use observations throughout the lesson.
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Stage 3 - Lesson Learning Targets

Learning Activities:

I Can Statement:

I can find ways to maximize the air resistance of a parachute.

Lesson 1: Introduction to Need or Problem

Lesson Focus: Students will understand the importance of a parachute.

Materials:

- Projector
- Vocabulary Video Link- <https://www.youtube.com/watch?v=vZYwsAvHgVw>
- VR Video Link- <https://www.youtube.com/watch?v=xOdtoFDWJs4>
- Supply Sets Per Group: Lego Person, Tissue Paper, 2 Feet of String, Rubber Bands, Coffee Filters, Pipe Cleaners, Plastic Grocery Bag
- Worksheet

Procedure:

- Capture the students attention with VR Skydiving Video Link: <https://www.youtube.com/watch?v=xOdtoFDWJs4>
- Tell the students that they are going to be responsible for the safety of a Lego Person Skydiver
- Introduce the challenge to the students. Tell the students that they need to maximize the air resistance so the Lego Person can have a safe landing from the second to the first floor. A Lego Person lands safely as long the Lego Person was in the air for at least 3 seconds.
- Introduce the vocabulary and key concepts to the students through a video: <https://www.youtube.com/watch?v=vZYwsAvHgVw>
- Show the students the different provided materials.
- Students need to sketch their initial ideas or designs.

Lesson 2: Create a Prototype

Lesson Focus: Students will design a prototype.

Materials:

- Supply Sets Per Group: Lego Person, Tissue Paper, 2 Feet of String, Rubber Bands, Coffee Filters, Pipe Cleaners, Plastic Grocery Bag

Procedure:

- The students will work in teams. The students need to design a prototype using the provided materials.

Lesson 3: Test the Prototype

Lesson Focus: Students test the prototype.

Materials:

- Supply Sets Per Group: Lego Person, Tissue Paper, 2 Feet of String, Rubber Bands, Coffee Filters, Pipe Cleaners, Plastic Grocery Bag
- Stopwatch

Procedure:

- The students will work in teams. The students will test their prototype's landing.

Lesson 4: Re-Design

Lesson Focus: Students re-design the prototype.

Materials:

- Supply Sets Per Group: Lego Person, Tissue Paper, 2 Feet of String, Rubber Bands, Coffee Filters, Pipe Cleaners, Plastic Grocery Bag
- Worksheet

Procedure:

- The students will talk in their groups about what went well, and they will talk about how they can make adjustments to their parachute.
- The students will re-design their parachutes.

Lesson 5: Re-Test

Lesson Focus: Students re-test the prototype.

Materials:

- Materials Per Group: Lego Person, Tissue Paper, 2 Feet of String, Rubber Bands, Coffee Filters, Pipe Cleaners, Plastic Grocery Bag
- Stopwatch
- Worksheet (One Per Student)

Procedure:

- The students will talk in their groups about what went well, and they will talk about how they can make adjustments to their parachute.
- The students will re-test their parachutes.

STEM Challenge: Design a Parachute for a Lego Person

Sketch an Idea

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Reflections

What Went Well?	What Do You Want to Change?

Re-Design Sketch

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