Using Pitsco products in your summer STEM camps or after-school camps offers children a hands-on experience like no other!

And we’ve made it easy for you to plan your camp.

With a teacher’s guide and Pitsco products, follow this sample outline to be on your way to STEM fun!

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**Four-Day STEM Camp for Grades 3-5**

**Sample Camp: The Power of Air**

<table>
<thead>
<tr>
<th>DAY 1</th>
<th>DAY 2</th>
<th>DAY 3</th>
<th>DAY 4</th>
</tr>
</thead>
</table>

Cost: $912.80

Students served: 30 (60 if working in pairs)

Cost per student: $15-$30

30+ hours of instruction | Unlimited fun!

---

**Camp Topics**

- Rocketry
- Solar Cars
- Structures
- Racing
- Air
- Siege Machines
- Maker/Engineering
# ROCKETRY CAMP

## STRAW ROCKETS

### GRADES 3-5

- Straw Rocket Elementary STEM Activity Guide
  - 1 Straw Rocket Construction
  - 1 Straw Rocket Testing
  - 1 Lesson 1: Straw Rockets and Newton’s Laws
  - 1 Lesson 2: How Gravity and Mass Affect Performance
  - 3 Challenge: The Great Rocket Fin Caper

### GRADES 6-8

- Straw Rockets Teacher’s Guide
  - 1 Varying Rocket Length
  - 1 Investigating Average Velocity
  - 2 Varying Rocket Length II
  - 2 Calculating Average Velocity
  - 2 Engineering Challenge I
  - 2 Varying Rocket Length II
  - 2 Mass vs Range
  - 2 Varying Launch Angles II
  - 4 Engineering Challenge II

## SOLID-FUEL ROCKETS

### GRADES 6-8

- Solid-Fuel Rockets Teacher’s Guide
  - 2 Solid-Fuel Rocket Construction
  - 1 Investigating Average Velocity
  - 2 Investigating Energy I
  - 1 Calculating Apogee – Similar Triangles
  - 2 Designing Fins
  - 2 Engineering Challenge I
  - 1 Investigating Maximum Velocity
  - 2 Investigating Energy II
  - 1 Calculating Apogee – Trigonometry
  - 2 Determining Optimum Ballast
  - 2 Engineering Challenge II

Suggested course of activities
GRADERS 6-8

**WATER ROCKETS**

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<td>1 Fuel Pressure Testing I</td>
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<tr>
<td>1 Fuel Pressure Analysis I</td>
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<tr>
<td>1 Fuel Volume Testing I</td>
</tr>
<tr>
<td>1 Fuel Volume Analysis I</td>
</tr>
<tr>
<td>1 Computing Apogee I</td>
</tr>
<tr>
<td>3 Fin Design I</td>
</tr>
<tr>
<td>1 Fuel Pressure Testing II</td>
</tr>
<tr>
<td>1 Fuel Pressure Analysis II</td>
</tr>
<tr>
<td>1 Fuel Volume Testing II</td>
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<tr>
<td>1 Fuel Volume Analysis II</td>
</tr>
<tr>
<td>1 Computing Apogee II</td>
</tr>
<tr>
<td>3 Fin Design II</td>
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</table>

**STRAW, SOLID-FUEL, AND WATER ROCKETS**

<table>
<thead>
<tr>
<th>Straw, Solid-Fuel, and Water Rockets User Guide (construction and testing only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Water Rocket Construction</td>
</tr>
<tr>
<td>2 Water Rocket Testing</td>
</tr>
<tr>
<td>2 Straw Rocket Construction</td>
</tr>
<tr>
<td>2 Straw Rocket Testing</td>
</tr>
<tr>
<td>2 Solid-Fuel Rocket Construction</td>
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<tr>
<td>2 Solid-Fuel Rocket Testing</td>
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</tbody>
</table>

Suggested course of activities

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## SOLAR CARS CAMP

### SUNEZOOM SOLAR CAR

**GRADES 6-8**

- SunEzoom Car Teacher’s Guide

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<tr>
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<th>Suggested course of activities</th>
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</thead>
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<td>1</td>
<td>Solar Car Construction</td>
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<td>1</td>
<td>Investigating Gears</td>
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<td>1</td>
<td>Measuring Speed</td>
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<tr>
<td>2</td>
<td>Graphing Distance vs Time</td>
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<tr>
<td>2</td>
<td>Changing Gears</td>
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<td>2</td>
<td>Engineering Challenge I</td>
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<tr>
<td>1</td>
<td>Investigating Gears II</td>
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<tr>
<td>1</td>
<td>Calculating Acceleration</td>
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<tr>
<td>2</td>
<td>Graphing Speed vs Time</td>
</tr>
<tr>
<td>2</td>
<td>Fast Gears</td>
</tr>
<tr>
<td>2</td>
<td>Engineering Challenge II</td>
</tr>
</tbody>
</table>

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LARGE STRUCTURES

GRADES K-2

1 Large Structures Building Basics
1 Vol. 1, Lesson 1: Relating Plane Shapes to Solid Shapes
1 Vol. 1, Lesson 2: Creating Shapes Using Defining Attributes
1 Vol. 1, Challenge: Making Connections
2 Vol. 2, Lesson 1: Engineering the ABCs
2 Vol. 2, Lesson 2: Building Geometric Solid Sense
1 Vol. 2, Challenge: Building Geometric Bridge Challenge

HOURS

Suggested course of activities

EXPLORING STRUCTURES IN LITERATURE

GRADES K-2

1 Linking Literature to Structures – Teacher Book

2 Introduction to Structures in Literature
2 Sailing for Souvenirs
   We’re Sailing Down the Nile by Laurie Krebs and Anne Wilson
2 Direct That Golf Ball
   Curious George Plays Mini Golf adapted by Marcy Goldberg Sacks
2 Mudge’s Terrific Tree House
   Henry and Mudge and the Tall Tree House by Cynthia Rylant
2 Pigeon Perch
   Curious George Builds a Home adapted by Monica Perez
2 Swift Swine Sled Design
   The Three Little Pigs’ Sledding Adventure by Stephen Krensky
1 Unit Wrap-Up

HOURS

Suggested course of activities

GRADES 3-5

1 Straw Structures Elementary STEM Activity Guide

1 Straw Structure Construction
1 Lesson 1: Simple Shapes, Strong Structures
1 Lesson 2: Skyscrapers and Forces
2 Challenge: Skyscraper Challenge

HOURS

Suggested course of activities

STRAW STRUCTURES

GRADES 3-5

1 Straw Structures Elementary STEM Activity Guide

1 Straw Structure Construction
1 Lesson 1: Simple Shapes, Strong Structures
1 Lesson 2: Skyscrapers and Forces
2 Challenge: Skyscraper Challenge

HOURS

Suggested course of activities

GRADES 3-5

1 Linking Literature to Structures – Teacher Book

2 Introduction to Structures Engineering Challenges
2 Everlasting Egyptians
   Mummies Made in Egypt by Aliki
2 Lunch Lifter
   Mama Provi and the Pot of Rice by Sylvia Rosa-Casanova
2 Personal Palace
   If I Built a House by Chris Van Dusen
2 Trust the Trusses
   Twenty-One Elephants and Still Standing by April Jones Prince
2 Simple Siege
   Castle Under Siege! by Andrew Solway
1 Unit Wrap-Up

HOURS

Suggested course of activities
## TOOTHPICK BRIDGES

**GRADES 3-5**
- **Lesson 1:** Bridges: What Are They Good For?
- **Lesson 2:** Bridges and Newton’s Third Law
- **Lesson 3:** Building a Bridge (need to allot time for drying)

**HOURS**
- 2
- 1
- 3

**GRADES 6-8**
- **Investigating Shapes and Strength**
- **Bridge Construction**
- **Calculating Efficiency**
- **Maximizing Load Capacity**

**HOURS**
- 3
- 3
- 1
- 3

**Engineering Challenge I**
- 4

**Engineering Challenge II**
- 3

**Suggested course of activities**

## BALSA BRIDGES

**GRADES 6-8**
- **Investigating Beam Strength**
- **Testing Joint Strength**
- **Designing a Bridge** (need to allot time for drying)

**HOURS**
- 1
- 2
- 3

**Investigating Lamination**
- 2

**Testing Joint Strength II**
- 2

**Designing for Efficiency**
- 2

**Engineering Challenge I**
- 4

**Engineering Challenge II**
- 8

**Suggested course of activities**
# TOOTHPICK AND BALSA BRIDGES

## GRADES 6-8

User Guide (construction and testing only)

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<thead>
<tr>
<th>HOURS</th>
<th></th>
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</thead>
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<td>Toothpick Bridge Construction</td>
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<tr>
<td>4</td>
<td>Balsa Bridge Construction</td>
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<tr>
<td>2</td>
<td>Finish Bridge Construction</td>
</tr>
<tr>
<td>2</td>
<td>Toothpick Bridge Testing</td>
</tr>
<tr>
<td>2</td>
<td>Balsa Bridge Testing</td>
</tr>
</tbody>
</table>

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<td>Balloon Car Construction</td>
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<td>1</td>
<td>Balloon Car Testing</td>
</tr>
<tr>
<td>2</td>
<td>Lesson 1: Go the Distance</td>
</tr>
<tr>
<td>2</td>
<td>Lesson 2: Fold-Up Speed Racer</td>
</tr>
<tr>
<td>2</td>
<td>Challenge: Transformation</td>
</tr>
</tbody>
</table>

**Suggested course of activities**

<table>
<thead>
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<th>GRADES 3-8</th>
<th>AP BOTTLE RACERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User Guide (construction and testing only)</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>AP Bottle Racer Construction</td>
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<td>1</td>
<td>AP Bottle Racer Testing I</td>
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<td>2</td>
<td>AP Bottle Racer Construction – Improvements</td>
</tr>
<tr>
<td>1</td>
<td>AP Bottle Racer Testing II</td>
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</tbody>
</table>

**Suggested course of activities**

<table>
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<td><strong>Fold-N-Roll Vehicles Teacher’s Guide</strong></td>
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</tr>
<tr>
<td>1</td>
<td>Fold-N-Roll Construction</td>
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<td>Determining Momentum</td>
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<td>2</td>
<td>Calculating Average Velocity</td>
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<td>4</td>
<td>Designing a Fold-N-Roll Pattern</td>
</tr>
<tr>
<td>5</td>
<td>Engineering Challenge I</td>
</tr>
<tr>
<td>2</td>
<td>Determining Effects of Height on PE</td>
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<td>3</td>
<td>Calculating Material Costs</td>
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<td>5</td>
<td>Designing a Vehicle</td>
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<tr>
<td>6</td>
<td>Engineering Challenge II</td>
</tr>
</tbody>
</table>

**Suggested course of activities**

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## KAIZON KITES

**GRADES 3-5**

- **KaZoon Kites Elementary STEM Activity Guide**
  - 2 KaZoon Kite Construction
  - 1 Lesson 1: Geometry in Action
  - 1 Lesson 2: High-Flying Fun
  - 2 Challenge: Kite Challenge

**GRADES 6-8**

- **KaZoon Kites Teacher’s Guide**
  - 2 KaZoon Kite Construction
  - 1 Comparing Size and Lift
  - 1 Calculating Area and Volume
  - 2 Designing a Tetrahedral Kite
  - 1 Engineering Challenge I
  - 2 Determining How Size Affects Flight
  - 1 Calculating Density
  - 2 Designing Polyhedral Kites
  - 2 Engineering Challenge II

## SPACESHIPONE

**GRADES 3-5**

- **SpaceShipOne Elementary STEM Activity Guide**
  - 1 SpaceShipOne Construction
  - 1 SpaceShipOne Testing
  - 1 Lesson 1: Airfoils and Lift
  - 2 Lesson 2: Forces of Flight
  - 2 Lesson 3: Glider Design

## PARACHUTES

**GRADES 3-5**

- **Parachutes Elementary STEM Activity Guide**
  - 2 Parachute Construction
  - 2 Lesson 1: Testing Shroud Length
  - 2 Lesson 2: Parachute Targeting
  - 2 Lesson 3: Parachute Size

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Visit [Pitsco.com/Camps](http://Pitsco.com/Camps) to explore a list of recommended products and corresponding teacher guides.
## EZ Catapults
### Grades 3-5
- **EZ Catapult Elementary STEM Activity Guide**
  - **Hours**
    - 2 EZ Catapult Construction
    - 2 Lesson 1: Which One Would You Choose? Part 1
    - 2 Lesson 2: Which One Would You Choose? Part 2
    - 2 Challenge: Building Walls Challenge

## EZ Trebuchets
### Grades 3-5
- **EZ Trebuchet Elementary STEM Activity Guide**
  - **Hours**
    - 2 EZ Trebuchet Construction
    - 2 Lesson 1: Testing String Length
    - 1 Lesson 2: Testing Mass
    - 1 Challenge: Target Challenge

## EZ Catapults and EZ Trebuchets
### Grades 3-5
- **User Guide (construction and testing only)**
  - **Hours**
    - 2 EZ Catapult Construction
    - 1 EZ Catapult Testing
    - 2 EZ Trebuchet Construction
    - 1 EZ Trebuchet Testing

## Catapults
### Grades 6-8
- **Catapults Teacher’s Guide**
  - **Hours**
    - 2 Catapult Construction
    - 1 Relating Speed and Mass
    - 1 Transportation Design
    - 2 Measuring Elasticity
    - 4 Engineering Challenge I
    - 1 Calculating Altitude
    - 2 Relating Force and Range
    - 3 Modifying the Catapult
    - 7 Engineering Challenge II
### GRADES 6-8

**Trebuchets Teacher’s Guide**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Trebuchet Construction</td>
</tr>
<tr>
<td>1</td>
<td>Investigating Effects of Ammunition Mass</td>
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<tr>
<td>1</td>
<td>Calculating Potential Energy</td>
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<tr>
<td>2</td>
<td>Modifying the Trebuchet I</td>
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<tr>
<td>4</td>
<td>Engineering Challenge I</td>
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<tr>
<td>2</td>
<td>Finding Initial Velocity</td>
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<tr>
<td>2</td>
<td>Relating Mass and Range</td>
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<tr>
<td>2</td>
<td>Modifying the Trebuchet II</td>
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<tr>
<td>2</td>
<td>Engineering Challenge II</td>
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</table>

**Suggested course of activities**

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**SAIL CAR**

**GRADES 3-5**

- Sail Car Elementary STEM Activity Guide

<table>
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<th>HOURS</th>
<th>Description</th>
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<td>Sail Car Construction</td>
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<tr>
<td>2</td>
<td>Lesson 1: Sailing Away</td>
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<td>2</td>
<td>Lesson 2: Sail Off into the Distance</td>
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<tr>
<td>2</td>
<td>Lesson 3: Need for Speed</td>
</tr>
<tr>
<td>2</td>
<td>Challenge: Obstacle Course</td>
</tr>
</tbody>
</table>

**Suggested course of activities**

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**INVENTION**

**EXPLORE-A-PAK**

**GRADES 3-8**

User Guide (construction and testing only)

<table>
<thead>
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<th>HOURS</th>
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<td>Prompt 1: General Problem with Many Solutions</td>
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<td>Prompt 2: Specific Problem with Guidelines</td>
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<td>1</td>
<td>Prompt 3: The Word Problem</td>
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<td>2</td>
<td>Prompt 4: The Memo</td>
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</tbody>
</table>

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