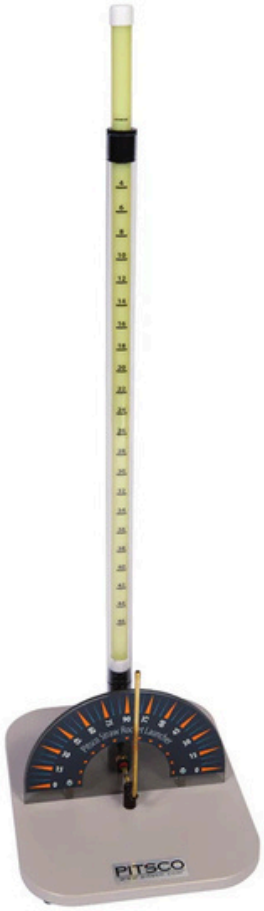
Pitsco Full-Size Straw Rocket Launchers



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Pitsco Full-Size Straw Rocket Launchers

The Pitsco Full-Size Straw Rocket Launchers STEAM Kit offers students an exciting and interactive way to explore the physics of flight, force, and motion. Using full-size straw rockets, students experiment with different launch angles, force levels, and rocket designs to understand how aerodynamics, thrust, and gravity work together to influence flight paths. This hands-on kit encourages experimentation, critical thinking, and teamwork, making it ideal for exploring fundamental engineering and physics concepts in a fun and engaging way.

Grade Level

4th - 12th

Group Size

2 - 4

Time Duration

30 - 60 minutes

Content of Kits

Components

- Straw rocket launcher

Consumables

- Plastic straws
- Play-doh
- Index cards
- Graph paper

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Usage

Getting Started

1. **Introduce Rocketry Principles -** Begin by discussing the basic principles of rocketry, including thrust, lift, drag, and gravity. Explain how these forces affect a rocket's flight path and performance.

2. **Demonstrate the Launcher -** Show students how to assemble and use the full-size straw rocket launcher properly. Demonstrate how to load a rocket, aim, and launch it, explaining the importance of adjusting the launch angle and force for different flight results.

3. **Safety Briefing -** Emphasize the importance of safe rocket launching practices. Please remind students to aim the rockets away from people and faces, and make sure that the launch area is clear of obstacles.

Storage

- Use resealable bags for any additional parts (e.g., extra straws, fins) to prevent misplacement.
- Keep the kit in a dry area to prevent wear and tear, especially if the rockets are made of paper or lightweight materials.

Troubleshooting

- **Rocket not launching properly -** Check that the straw is seated securely in the launcher and that the air hole is unobstructed. Ensure the launcher is aimed at the correct angle.
- **Rocket flies erratically or doesn't travel far -** Encourage students to experiment with varying the launch force and angle. Adjusting the position of the straw rocket or modifying the rocket design can help improve its flight path.
- **Rocket falling apart or losing stability -** Make sure that all parts of the rocket, including any added fins or nose cones, are securely attached. Offer additional tape or glue if necessary.

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Activity Guide

Beginner

Launch and Measure!
Students will launch their straw rockets and measure how far they travel. Discuss the factors that might affect flight distance, such as the launch angle and force. Students can adjust the angle and force to see how it impacts the rocket's distance.

Intermediate

Angle and Force Experiment
Students will experiment by launching their straw rockets at different angles and with varying amounts of force. They will measure and record the distance traveled at each angle and force level, analyzing the data to determine the optimal conditions for the farthest flight.

Advanced

Rocket Design Challenge
Students will modify their straw rockets by adding fins, adjusting the length, or creating different nose cone shapes. They will then test how these changes affect the rocket's flight. Encourage students to document their design changes and experiment with different combinations to achieve the best performance.

Extension Activities:

Design Your Own Rocket System
Students will design a complete rocket system, from the rocket body to the fins and nose cone, and even the launch platform. They will present their design to the class, explaining the reasoning behind their choices, and then launch their creations to evaluate their performance.

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Learning Extensions

STEAM Connections: Engineering - Math - Science

Learning Objectives:

- Understand the basic principles of rocketry, including thrust, lift, drag, and gravity.
- Explore the relationship between force, angle, and flight distance.
- Experiment with design modifications to optimize rocket performance.
- Collect and analyze data to understand how different factors affect flight.
- Develop teamwork and problem-solving skills through collaborative experiments.

Career Connections:

- **Aerospace Engineer -** Designs and tests rockets and spacecraft, considering principles of aerodynamics and propulsion.
- **Mechanical Engineer -** Develops mechanical systems, such as launch mechanisms, to optimize performance.
- **Physicist -** Studies the forces and mechanics involved in rocketry, including the effects of gravity and thrust.
- **Data Analyst -** Collects and analyzes data from experiments to improve designs and performance.

Essential Employability Skills:

- Critical Thinking
- Collaboration
- Problem-Solving
- Creativity
- Communication

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Resources and Accessibility

Safety Guidelines

- Always aim the rocket away from people and faces.
- Ensure that the launch area is clear of obstacles and bystanders.
- Supervise the use of the straw rockets to prevent misuse and accidents.
- Ensure that rockets are launched in a safe, open space to avoid damage to property or injury.

Accessibility

- Provide tactile markers or larger components for students with visual impairments to help them handle and launch rockets.
- Allow students with motor challenges to collaborate with a partner or use adaptive tools for better control during the launch.
- Offer extended time for students who may need more time to experiment and record data.

Library Catalog

Library Resources

Feedback

QR to feedback survey