

Rocket STEM Module

Standards:

5P.1.1.1.1 Ask investigatable questions and predict reasonable outcomes about the changes in energy, related to speed, that occur when objects interact.

5P.3.2.2 1 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.*

Essential Question:

How are different kinds of rockets fueled?

How do I design a rocket that will go far?

Content Objectives:

Student will be able to build 2 types of rockets (Straw rocket and one from scratch)

Students will know the components a rocket needs.

Language Objectives:

Listening: The student will be able to other's ideas about their rocket

Speaking: The student will explain their idea about their rocket

Reading: The student will interpret the questions on the log sheet

Writing: The student will input their data on their log sheet and answer questions.

Academic Language:

Nose cone-tip of the rocket

Fins- side of the rocket on the bottom

Body tube- The straw that the nose cone and fins are on

Fuel- how the rocket is powered

Resistance- friction and wind causing things to slow down

Assessments: (Pre, formative, and summative)

Pre- questioning in the beginning of the lesson day 1

Formative- day 1 log sheet questions, fist to 5

Summative- questions on log sheet, reflection question on demonstration day, 2 stars and a wish

Accommodations

More support when building the rocket

Have model rocket available for student to look at

Day 1 Straw Rockets

Greeting:

Focused Instruction

- a. Intro straw rockets by demonstrating one for them.
 - i. What will be fueling this rocket? Answer: wind/air/breath
 - ii. What fuels other rockets?
 - iii. Vocab:
 1. Nose cone-tip of the rocket
 2. Fins- side of the rocket on the bottom
 3. Body tube- The straw that the nose cone and fins are on
 - iv. “We will be making these straw rockets and testing how far they travel.”
- b. “First we need to talk about safety.” (Set norms) (anchor chart paper)

Guided instruction

- c. Building straw rocket
 - i. Students need
 1. Construction paper
 2. Tape
 3. Big straw
 4. Clear straw
 5. Scissors
 - ii. Make nose cone and tape to top of straw
 - iii. Tape fins on the bottom
 - iv. Insert clear straw

Collaborative Learning

- d. Testing and logging distance of rocket
 - i. Pair students up
 - ii. Lay out tape measure
 - iii. Hand out log guide
 - iv. Test 3 times per pair (One logs, one test, switch)

Independent

- e. Analyze/reflect
 - i. Make line graph
 - ii. Did it go farther each time?
 - iii. What factors could have impacted your distance
 - iv. What ways could you improve your rocket?
 - v. What would you keep the same?

Day 2

Greeting (beach ball get to know)

Focused Instruction

- a. Based on your experiment yesterday, rebuild/redesign your straw rocket.
- b. Things to think about (nose cone size, shape, fins)
- c. Revisit norms

Collaborative Learning

- f. Testing and logging distance of rocket
 - i. Pair students up
 - ii. Lay out tape measure
 - iii. Hand out log guide
 - iv. Test 3 times per pair (One logs, one test, switch)

Independent

- g. Analyze/reflect
 - i. Make line graph
 - ii. What changes did you make to your rocket
 - iii. Compared to yesterday, did your rocket improve?

Guided Instruction

- h. Intro finger rockets. Talk about how these are powered.

Day 3

Greeting (fun fact)

Guided Instruction

- a. Reintroduce finger rocket. Talk about differences in fuels/how they work. Talk about the fins
- b. Revisit norms

Collaborative Learning

- i. Testing and logging distance of rocket
 - i. Pair students up
 - ii. Lay out tape measure
 - iii. Hand out log guide
 - iv. Test 3 times per pair (One logs, one test, switch)

Collaborative Learning/Independent Learning

- a. While sitting with an assistant, begin to plan your rocket. (Show model)
- b. Spend the rest of the time building rocket and clean up

Focused Instruction

- a. Talk about the plan for tomorrow

Day 4

Greeting (2 Stars and a Wish)

- a. 2 things you liked about the module and one thing you wish would have been different.

Collaborative learning/Independent Learning

- b. Work on your rocket to demo. Ask your table mate if you need help

Focused instruction

- a. Demo teacher rocket. Show how it works and what to do/not to. Fist to 5 on understanding

Guided instruction

- a. Demo your rocket.
- b. The teacher will help you set up and hold the rocket.

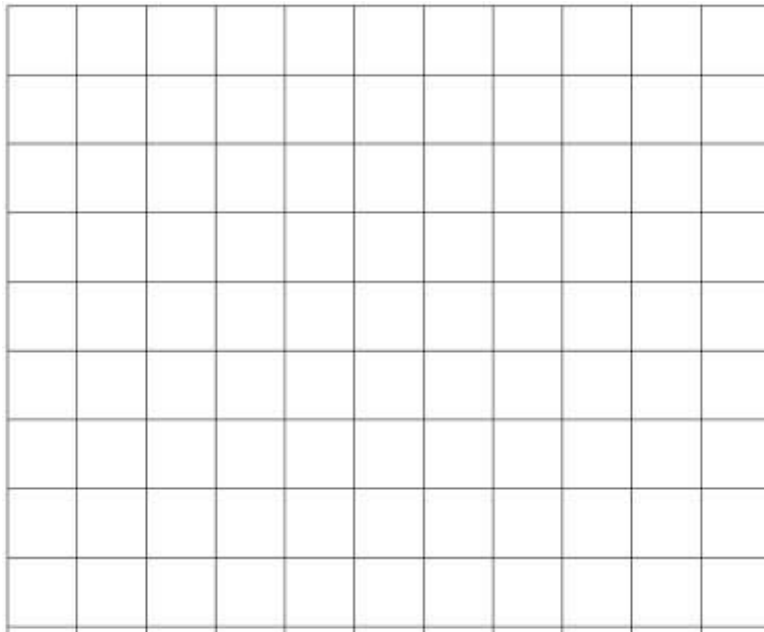
Independent

- a. Reflection sheet (on scratch paper)
 - i. What went well? What would you change?



Rocket Launch Log

Distance Traveled (Feet/inches)		
Trial 1	Trial 2	Trial 3



Make line graph

Did it go farther each time?

What factors could have impacted your distance

What ways could you improve your rocket?

What would you keep the same?

Distance Traveled (Feet/inches)		
Trial 1	Trial 2	Trial 3

Add plot points to the line graph

What changes did you make to your rocket

Compared to yesterday, did your rocket improve?

Day 2- Finger Rockets

Distance Traveled (Feet/inches)		
Trial 1	Trial 2	Trial 3

Day 2- Finger Rockets

Distance Traveled (Feet/inches)		
Trial 1	Trial 2	Trial 3

Day 2- Finger Rockets

Distance Traveled (Feet/inches)		
Trial 1	Trial 2	Trial 3