



Natural Resources

Kite Day

5E Lesson Plan

Source Material: [NASA Aeronautics Kites Lesson](#)
Mission Focused Area: [Aeronautics and Flight](#)

Lesson Overview

In this lesson, students listen to a story about the creation of a kite in “The Kite Festival,” a story that includes a simplified engineering process including design, material selection, testing, and optimization (improving the design). Afterward, students create their own kite for flying.

NASA Connection

Building on a legacy of aeronautical research that can trace its origins to the earliest days of powered, heavier-than-air flight, NASA's Aeronautics Research Mission Directorate remains committed to transforming aviation by dramatically reducing its environmental impact, improving efficiency while maintaining safety in more crowded skies, and paving the way to revolutionary aircraft shapes and propulsion that opens new possibilities for commercial air travel including supersonic flight over land.

Objectives

- Students discuss the importance of conserving natural resources through reuse and recycling
- Students identify wind as a natural resource that provides lift
- Students classify materials based on observable properties
- Students participate in the engineering design process by building a kite

Guiding Questions

- What materials are needed to make a good kite?
- What impact does material selection have on product design and performance?
- What is lift?
- Which materials provide the most lift and stability?

National STEM Standards

NGSS

- **2-PS1-2** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
- **2-PS1-1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- **K-2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

5E Instructional Model



Materials

Engage

- Popsicle sticks
- Ball of string/yarn
- Fold-up paper map
- Band-Aids
- Fabric belt
- Napkins

Explore

- Bird feather

Explain

- Recyclable materials from home
- Printer paper
- Cardstock
- Construction paper
- Cardboard
- Tissue paper
- Materials from Explain activity
- Tape
- Straws
- String

Suggested Scaffolding

This lesson was written for second grade students. It may be adjusted for kindergarten and first grade students by providing the kite template in the Elaborate section to build their kites instead of using recyclable materials. Students would decorate their kite as suggested in the source material. Kindergarten and first grade students would use the kite sun catcher activity in the source material as the Elaborate activity. Students would complete the printable worksheet identifying the best weather for kite flying as the Evaluate activity.

Teacher Action



Engage - "The Kite Festival" by Leyla Torres

- Read "The Kite Festival" by Leyla Torres
- Hand each child one object in order to role-play throughout the story. To ensure that all children can participate, prepare duplicates of as many items as possible.
- As the story is read, choose one student to be the main character

Scripted CFU questions

- Where did the materials come from to build the kite?
- What kinds of things does your family reuse and recycle?
- Why didn't the kite fly the first time?
- How did they fix it?



Explore - Light and Strong

- Provide each student with a bird feather (synthetic is fine, but a real bird feather is best)
- Allow students to investigate the effects of wind on the feather by going outside or by blowing on the feather

Scripted CFU questions

- Why do birds fly so well?
- What part of the feather is light?
- What part of the feather is strong?
- What happens when wind blows the feather?



Explain - Selecting Materials

- Ask students to bring in recyclable materials from home
- Provide additional materials for students who forget (preferably materials from the recycling bin)

Scripted CFU questions

- Which natural resource(s) do the materials come from?
- Which materials were made by people?
- Which material is the lightest?
- Which material is the strongest?
- Which material would you choose to make a kite? Why?



Elaborate - Building a Kite

- Challenge students to design and build a kite
- Provide additional material for students to construct kites
- Provide students with the [kite template](#) if needed. (Follow procedure on pages 59-61.)
- Allow students to test and redesign if necessary

Scripted CFU questions

- How is your kite similar to the bird feather?
- Does the shape of your kite matter?
- Which materials provide the strength?
- What happens when the wind blows your kite?
- How can you improve your kite?



Evaluate - Kite Day

- Hold a kite festival
- Allow students to describe their design process and demonstrate the final product

Scripted CFU questions

- What is the best day to fly a kite?
- Why did you choose your materials?
- Why did you choose that shape?
- How does your design help your kite fly?
- What challenges did you have while building your kite?

Student Action



Engage - "The Kite Festival" by Leyla Torres

- Collect the appropriate items from the "audience" members as the child in the story receives different materials
- Display a kite for the other children to see once the kite is created



Explore - Light and Strong

- Toss the feathers into the air to feel them and to "weigh" them
- Sketch the feather and label the parts that are light and strong



Explain - Selecting Materials

- Hold equal sizes of material in each hand and compare them by weight
- Take designated test strips of each material and attempt to break them by pulling
- Select materials to build a kite from based on weight and strength



Elaborate - Building a Kite

- Draw and label a sketch of the kite using the selected materials
- Build the kite
- Test the kite
- Redesign, build, and test if necessary



Evaluate - Kite Day

- Justify material selection and explain the design process for the kite

Additional Literature Connections

- "[Dora and the Rainbow Kite Festival](#)" by Christine Ricci
- "[Kite Day](#)" by Will Hillenbrand
- "[Kite Flying](#)" by Grace Lin

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