Lesson Title: Take a Flight with a Kite

Standards Addressed: Science and Technology And Engineering Education
3.4.3.C2, 3.4.4.C2 , 3.4.6.D1

Real-World Problem: How is a kite created, designed, tested and redesigned?

What skills will students use or learn? Design thinking and process, building a kite, applying science and technology to flight.

Objective(s): The student will design, construct, and fly a kite. (See content extensions for additional objectives.)

Materials or Resources Needed:

Light-weight material (trash bag, shopping bag, paper bags, plastic table cloth, tissue paper, really thin cardboard, paper plates, newspaper, ribbon)

Frame materials (straws/dowels/sticks)

Kite tether (yarn, rope, string, fishing line, twine)

Fastening materials (yarn, rope, string, fishing line, twine, tape, glue)

Measurement device (ruler, tape measure, yardstick)

Scissors

Marking device (marker, pencil, pen, crayon)

Hole punch (may carefully use scissors if don't have a hole punch)

Art supplies (markers, paint, colored pencils)

Instructional Procedures/Learning Tasks (grades K-5):	**List Questions for Higher-Order Thinking (Webb's DOK) that students could process throughout:**

• Have students create a small kite such as a paper plate kite	1. What do you think would happen if you made your kite a different size? 2. What do you think would happen if your kite was a different shape?
Instructional Procedures/Learning Tasks (grades 6-8): • Set max or min dimensions for kite if desired	**List Questions for Higher-Order Thinking (Webb's DOK) that students could process throughout:** 1. Could a kite be too big or too small? 2. What factors, beyond this size of a kite, are needed for a kite to fly?
Instructional Procedures/Learning Tasks (grades 9-12): • Design a kite that does not use the traditional geometric kite design.	**List Questions for Higher-Order Thinking (Webb's DOK) that students could process throughout:** 1. After designing, building, and flying two different sized kites, compare and contrast the flight time and height. 2. What factors, beyond this size of a kite, are needed for a kite to fly?

Content Extensions

Mathematics: ❑ Design a blueprint (scale model) of a kite. Include on your blueprint the dimensions of the various parts of the kite along with any angles. ❑ Determine a scale factor to use to take your blueprint to building the actual kite. (Materials needed: Graph paper, ruler, protractor, calculator) ❑ Calculate the area and perimeter of your design. ❑ What geometric figures can be used in the design of a kite? ❑ How can you estimate how high a kite will fly?
Science: ❑ How can the kite be modified to fly higher?

- ❑ Explain the role of kites in the study of flight.
- ❑ How were kites used in the study of energy?

Social Studies:

- ❑ Create a story telling the history of kites
- ❑ Using a map, locate where different kite festivals are held (this could be extended to creating a tour with Google Maps)

English:

- ❑ Write a poem about your kite
- ❑ Read a book about kites

Other:

- ❑ **Art:** decorate in a unique way using a specific art style or theme.
- ❑ **Business:** Create a promotional item to sell your kite.
  Create a business plan to mass produce your kite.
- ❑ **College & Career Ready:** Collaborate (virtually) with a friend and design kites. Compare and contrast the flight time and the height. Determine the factors which caused the differences.

Student Reflection: Keep a journal to document the process and reflect on the end result of your project.