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.