Title: Raising the Flag
Grade Level: 1st – 3rd Grade
STEM Content Standards:

- **Science:**
  - Next Generation Science Standards
    - ESS2.B – Plate tectonics and large-scale system interactions: Maps show where things are located. One can map the shapes and kinds of land and water in any area.
    - PS1.A – Structure of matter: Matter exists as different substances that have observable different properties. Different properties are suited to different purposes. Objects can be built up from smaller parts
    - PS2.A – Forces and motion: The effect of unbalanced forces on an object results in a change of motion. Patterns of motion can be used to predict future motion. Some forces act through contact, some forces act even when the objects are not in contact.
- **Technology and Engineering:**
  - Standard 1: Students will develop an understanding of the characteristics and scope of technology
    - Benchmark B: All people use tools and techniques to help them do things
  - Standard 2: Students will develop an understanding of the core concepts of technology
    - Benchmark D: Different materials are used in making things
    - Benchmark E: People plan in order to get things done
  - Standard 8: Students will develop an understanding of the attributes of design
    - Benchmark A: Everyone can design solutions to a problem
    - Benchmark B: Design is a creative process
  - Standard 9: Students will develop an understanding of engineering design
    - Benchmark A: The engineering design process includes identifying a problem, looking for ideas, developing solutions, and sharing solutions with others
    - Benchmark B: Expressing ideas to others verbally and through sketches and models is an important part of the design process
- **Math:**
  - Common Core Mathematics Standards
    - CCSS.Math.Content.1.NBT.A.1: Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral
    - CCSS.Math.Content.1.MD.1: Order three objects by length; compare the lengths of two objects indirectly by using a third object
    - CCSS.Math.Content.1.MD.2: Express the length of an object as a whole number of length units, but laying multiple copies of shorter objects (the length of the unit) end to end
    - CCSS.Math.Content.1.G.2: Compose two-dimensional shapes or three-dimensional shapes to create a composite shape and compose new shapes from the composite shape

Big Ideas:

- Flags represent cultures, places, and beliefs
- Symbols can be used to represent things that are important
- The engineering design loop process can be used to create different flags

Content Information:

- Science
  - Flags are made of materials that will withstand environmental conditions.
    - Some materials can withstand environmental conditions and some cannot.
  - A pulley is used to hoist a flag up the flagpole. A pulley is a simple machine designed to make tasks easier.
  - Animals are unique in their physical and behavioral characteristics. There are many flags that incorporate animals to represent different virtues or to send messages.
  - Weather data can be taken by observing flags blowing to 1) estimate wind speed (The Beaufort Wind Scale) and 2) determine wind direction.
- Technology/engineering:
  - As new products have been developed, flags have been made of human-made materials that last longer than natural materials (cotton vs. polyester vs. nylon).
  - Special materials are used for flags that must be used in special places (Moon landing flag, sports team flags on car windows).
  - Flags can be used to notify people (surveyor boundary markers), warn people (roadway flaggers), or warn of approaching danger (flag on dunebuggy).
  - Symbols are used to communicate (more from symbols book).
- Mathematics:
  - Different shapes have different purposes.
  - Symmetry: There is a good story about this in the history of the Arkansas flag: http://www.netstate.com/states/symb/flags/ar_flag.htm.
  - Scale: Different sized flags are used for different purposes.
  - Count the number of stars on various flags and describe why that number is important.
  - Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
  - Order objects by length; compare the lengths of two objects indirectly by using a third object.
  - Express the length of an object as a whole number of length units, but laying multiple copies of a shorter object (the length of the unit) end to end.
  - Distinguish between defining attributes versus non-defining attributes; build and draw shapes to possess defining attributes.
  - Compose two-dimensional shapes or three-dimensional shapes to create a composite shape and compose new shapes from the composite shape.
  - Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, quarter of. Describe the whole as two of, or four of the shares.
- Social Studies:
  - Flags represent the beliefs of people in a region or area.
  - First flags were used by the military so send signals on the battlefield.

    - Ships, airplanes, and space vehicles use flags to identify the home country.
    - Symbols are used to represent things that are important to people, cultures, a nation/state/region.
        - The United States flag includes a 5-sided star for each State.
            - Started with only 13 stars, now has 50.
        - Blue on the flag represents freedom, red represents hardiness, courage, and valor, white stands for purity and innocence.
        - The Olympic flag is represents the five inhabited continents of the world, united by the Olympics, while the six colors are those that appear on all the national flags of the world at the present time.
- Art:
    - Colors are used to symbolize different things (i.e., blue=boys, pink=girls)
- English Language Arts:
    - Flags can be used to send signals or messages.
        - Nautical flags: Ships use a different flag for every letter of the alphabet.

Mini Lessons/Activities:

Listed below are 5 suggested mini lessons/activities that would be beneficial to complete prior to the flag challenge. These activities will help introduce the content information to students. As the teacher, it is important to remember that your role is to be the facilitator. You should help the students find the answer, instead of directly telling the students what the solution is.

1. Discuss weather conditions with students. You can talk about a range of things: wind speed, wind direction, materials that flags are made from, etc.
2. Ask the students to name different kinds of flags that they have encountered. Talk about what flags are used for (to notify people, warn people, communicate, mark boundaries, etc.). Also, you could discuss the different materials that flags are made out of and why.
3. Have students measure different flags around the classroom. You can discuss the different sizes and measurements of flags. This could involve a measurement worksheet.
4. Show the students a flag with symmetry and a flag without symmetry. Ask them to guess what they think 'symmetry' means. Show the students the difference and have them each draw a flag with symmetry.
5. Show the students a flag with many different shapes. Have the students draw all the shapes that they see in the flag. As a class, draw each individual shape on the board and talk about their differences.
6. Read a book on the history of the United States flag or your state flag. Discuss the use and meaning of the symbols on the flag(s). Have students think of a symbol that would represent something that they like. You could also discuss the use of color and the meaning behind different colors.

Scenario:

- Family Flag: Your neighborhood is competing in a capture the flag competition! Each family needs a flag to put in their front yard that represents them. You need to design and create a flag that represents YOUR family.
- School Flag: Our school is participating in a town parade. Each class needs to design and create a flag that represents OUR school. The flag that best represents the school will be used at the town parade.

Essential Question:
How are symbols, shapes, codes, and patterns used on flags to represent culture, places, beliefs, and history?

Challenge:
Students will work individually to design a flag the represents their family. Following this activity, the students will be placed into groups and asked to design a flag that represents the school. After completing each flag, the students and/or teams must present the flag and describe how the flag represents their family or the school.

Parameters or Constraints:

- The flag must:
  - Be designed using the materials supplied by the teacher.
  - Measure exactly 12" by 24".
  - Include symbols, shapes, and colors that represent their family, the class or the school.
  - Include holes that will allow the flag to be mounted to a "flagpole."
  - The class flag must represent every student in the class.

Tools, Materials, and Resources:

Tools		
Scissors Pens/pencils Markers	Paint Colored pencils Crayons	Glue
Materials		
Paper Cloth Cardstock	Dowel rods (for flagpoles)	*You can use any other materials that you see fit for the project.

Deliverables:

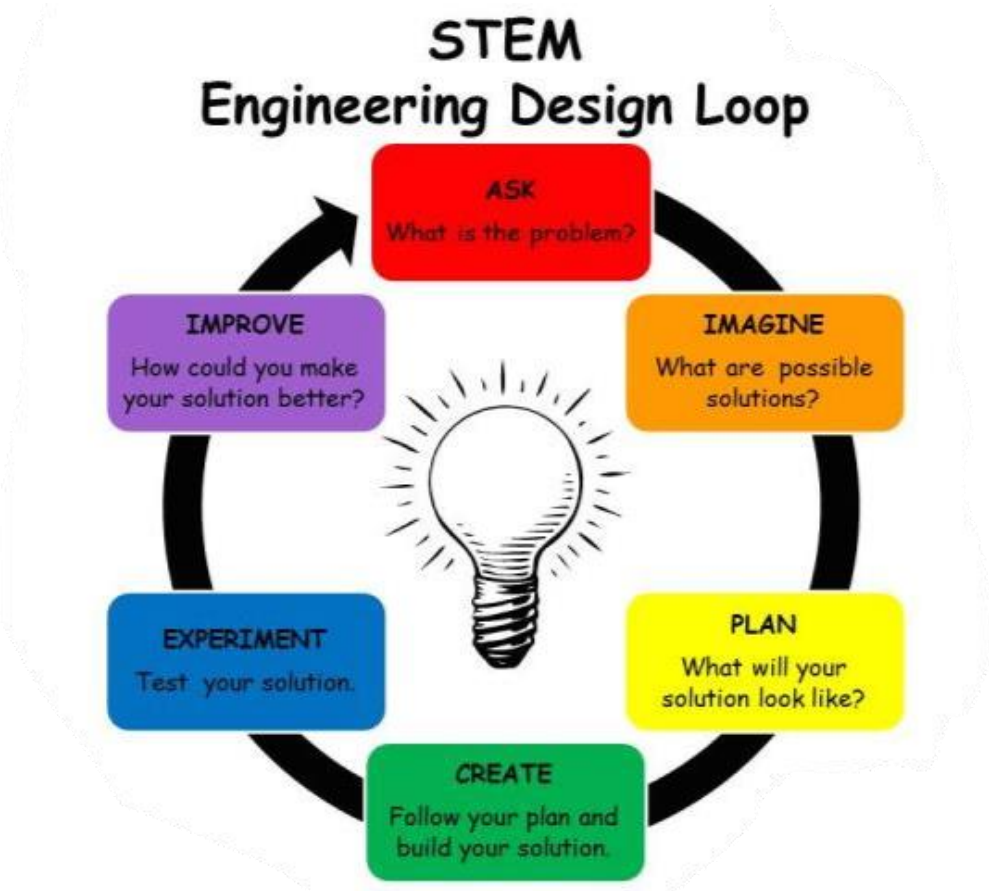
- Student workbook

Evaluation:

- Student workbook (evaluation of the design loop and reflection)
- Teacher rubric
- Optional: partner or team evaluations

Raising the Flag!

How are symbols, shapes, codes, and patterns used on flags to represent culture, places, beliefs, and history?



Family Flag:

Your neighborhood is competing in a capture the flag competition! Each family needs a flag to put in their front yard that represents them. You need to design and create a flag that represents YOUR family.

- The flag must:

- Be designed using the materials supplied by your teacher.
- Measure exactly 12" by 24".
- Include symbols, shapes, and colors that represent your family or the school.
- Include holes that will allow the flag to be mounted to a "flagpole."
- The class flag must represent every student in the class.

Design your family flag!

Ask: What is the problem?	
Imagine: How can the problem be solved?	

Plan: Draw three different solutions to the problem.		
Idea #1	Idea #2	Idea #3
Create: Draw a final copy of your flag & attach it to a flagpole!		

Test: Does your flag represent your family?	
Share: What symbols are you going to share with your classmates and what do they represent?	
Improve: What changes would you make to your flag?	

School Flag:

Our school is participating in a town parade. Each class needs to design and create a flag that represents OUR school. The flag that best represents the school will be used at the town parade.

- The flag must:
  - Be designed using the materials supplied by your teacher.
  - Measure exactly 12" by 24".
  - Include symbols, shapes, and colors that represent your family or the school.
  - Include holes that will allow the flag to be mounted to a "flagpole."
  - The class flag must represent every student in the class.

Design our school flag!

Ask: What is the problem?	
Imagine: How can the problem be solved?	

Plan: Draw three different solutions to the problem.		
Idea #1	Idea #2	Idea #3
Create: Draw a final copy of your flag & attach it to a flagpole!		

Test: Does your flag represent your family?	
Share: What symbols are you going to share with your classmates and what do they represent?	

Improve: What changes would you make to your flag?	_____ _____ _____ _____

Partner/Team Evaluation:

Your Name: _____
Partner's Name: _____
Date: ____/____/_____

Self and Team Evaluation

	Me	Partner or Team
Worked together as a team.		
Good listeners.		
Accepting to new ides.		
Used materials and tools correctly.		
Followed project rules.		
Comments:		

Teacher Rubric

Student Name:_____

- The student participated and followed directions.
  - Least Developed 1 2 3 4 5 Most Developed
  - Comments:_____
    _____
- The student used symbols effectively on their family and school flag.
  - Least Developed 1 2 3 4 5 Most Developed
  - Comments:_____
    _____
- The student's design loop worksheet was completed and ideas were developed.
  - Least Developed 1 2 3 4 5 Most Developed
  - Comments:_____
    _____
- The student successfully completed the family flag and school flag.
  - Least Developed 1 2 3 4 5 Most Developed
  - Comments:_____
    _____
- Student shows understanding of the overall concepts.
  - Least Developed 1 2 3 4 5 Most Developed
  - Comments:_____
    _____
- Student worked collaboratively with partner or team.
  - Least Developed 1 2 3 4 5 Most Developed
  - Comments:_____
    _____

Total Score: ____/30 points

Comments: _____
_____