



# Welcome to our Maker Space!

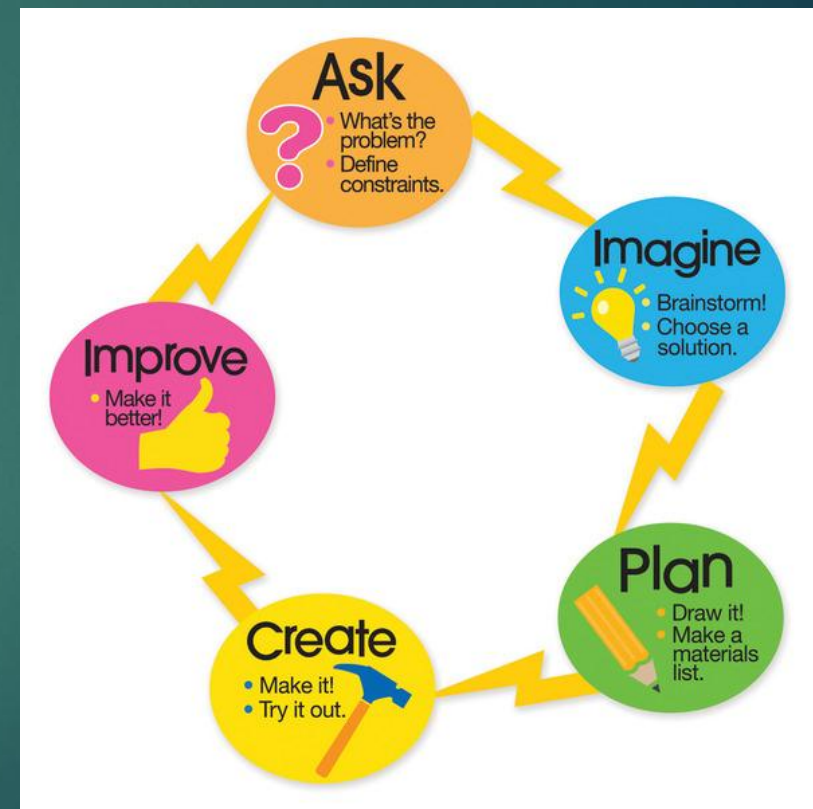
HAWTHORNE ELEMENTARY

# Maker Difference Space, to be specific.



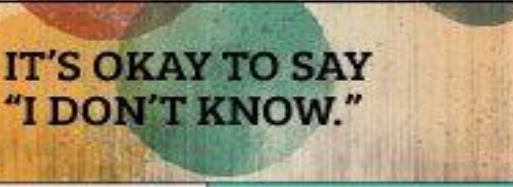




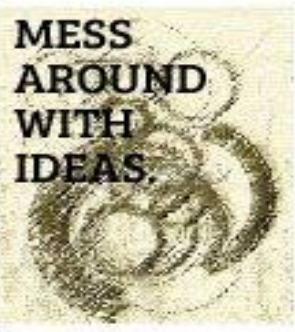
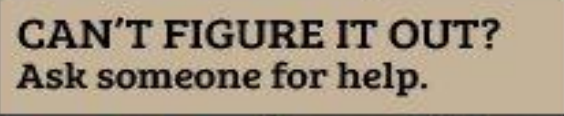



- ▶ We will use our abilities to build, create, innovate, adapt, and make.
- ▶ Each month will have a service project you can do at school, home, or in your spare time that will help someone else.
- ▶ You can choose to participate in it or not, and you can especially suggest ideas YOU think are needed in our community too.

# What is a Makerspace?

- ▶ It's kind of like recess for your brain!
- ▶ We are going to follow the design/engineering process for different projects.
- ▶ <https://www.youtube.com/watch?v=fxJWin195kU>
- ▶ 5 min video right click the link and choose 'open hyperlink'



# Rules for our space

 <p><b>NO IDEA IS DUMB.</b></p>	 <p><b>RESPECT OTHERS' WORK.</b> Don't poach their parts.</p>	 <p><b>IT'S OKAY TO SAY "I DON'T KNOW."</b></p>	
 <p><b>KEEP THE DECIBELS LOW.</b></p>		 <p><b>MAKE IT SMALLER. BIGGER. LIGHTER. FASTER. BRIGHTER.</b></p>	 <p><b>FAILURE IS AN OPTION!</b></p>
<h2>SHOP RULES</h2> 		<p>This is a place for purposeful, active thinking. Build, make, prototype, ideate, and create!</p>	
 <p><b>MESS AROUND WITH IDEAS.</b></p>	 <p><b>CAN'T FIGURE IT OUT?</b> Ask someone for help.</p>		 <p><b>HORSING AROUND IS FOR THE GYM.</b></p>
	 <p><b>FOOD.</b></p>	 <p><b>HANDS ON, MINDS ON.</b></p>	
<p><b>CLEAN UP AFTER YOURSELF.</b></p>			

# Our Makerspace will help us...

- ▶ Embrace failure as a means for heading toward success
- ▶ Allow students to collaborate and learn from one another
- ▶ Create experts who students will look to for guidance
- ▶ Foster creative thinking
- ▶ Create ways for students to ask real questions to drive their exploration
- ▶ Encourage students to pursue existing passions or seek out new passions
- ▶ Ignite excitement and a joy for learning
- ▶ Promote multiple ways to solve problems
- ▶ Allow students to practice perseverance in day to day learning
- ▶ Expose students to materials they may have never used before: 3D printers, robotic balls, textile materials, circuits, littleBits, programming, and so much more!
- ▶ Encourage student reflection on the process of making

# Here's a book that shows this in action

- ▶ [The Most Magnificent Thing](#) by Ashley Spires (Love This!)
- ▶ Click on the link to hear the story read aloud. (5 min) **OPTIONAL- right click and choose 'open hyperlink'**
- ▶ <https://www.youtube.com/watch?v=RCNOex5b7wA>



# Will we make mistakes? YES!!

- ▶ That is all part of the plan.
- ▶ Remember...
- ▶ **F...A...I...L** just means
- ▶ **F**irst
- ▶ **A**ttempt
- ▶ **I**n
- ▶ **L**earning

# Our first project

- ▶ Do you remember the 3 Little Pig story?
- ▶ Those little pigs tried to beat the wolf by building a house out of different things.
- ▶ One used straw, one used sticks, and one used bricks.
- ▶ You are going to work with others to come up with a plan for a house the wolf could not blow down.
- ▶ Fill out your design planning sheet and show it to your teacher when you are finished designing.
- ▶ Explain what materials will be needed (paper, cardboard, legos, K'nex, recyclables, etc.)



# Your sheet looks like this and follows all the steps in the engineering-design process

Name(s):	Period:
<b>Identify the Problem</b> (What do we need to fix?)	
<b>Brainstorm</b> (How can we fix it?)	
<b>Design &amp; Build</b> (What will our design look like? How will we build it?)	
<b>Test &amp; Evaluate</b> (Does it work? What needs fixing?)	
<b>Redesign</b> (How do we make it better?)	
<b>Share Solution</b> (What is our pitch? Why should people use our solution?)	
<b>Reflections</b> (What did we learn in this process?)	

There's a stack of these on the circulation desk for you to use.

# October Maker project

- ▶ This is the month for all things creepy and spooky! What's creepier than spiders?
- ▶ We are going to explore a little bit about spiders and their webs.
- ▶ Click this link <https://www.youtube.com/watch?v=Ty-tZ7-TzSM>
- ▶ Then, you each are going to design and make your own spider **or** spider's web you can take home with you.
- ▶ Your group is going to be your "spider family"
- ▶ Your challenge is to figure out how you can show that each person belongs to the same spider family without telling anyone. They will have to be able to figure it out from looking at your work.

You will have a  
planning page

## October Makerspace Day

What have I observed about spiders?

What is my plan for making a spider or a spider web?

What materials will I need?

|

Teacher approved? Then Build.

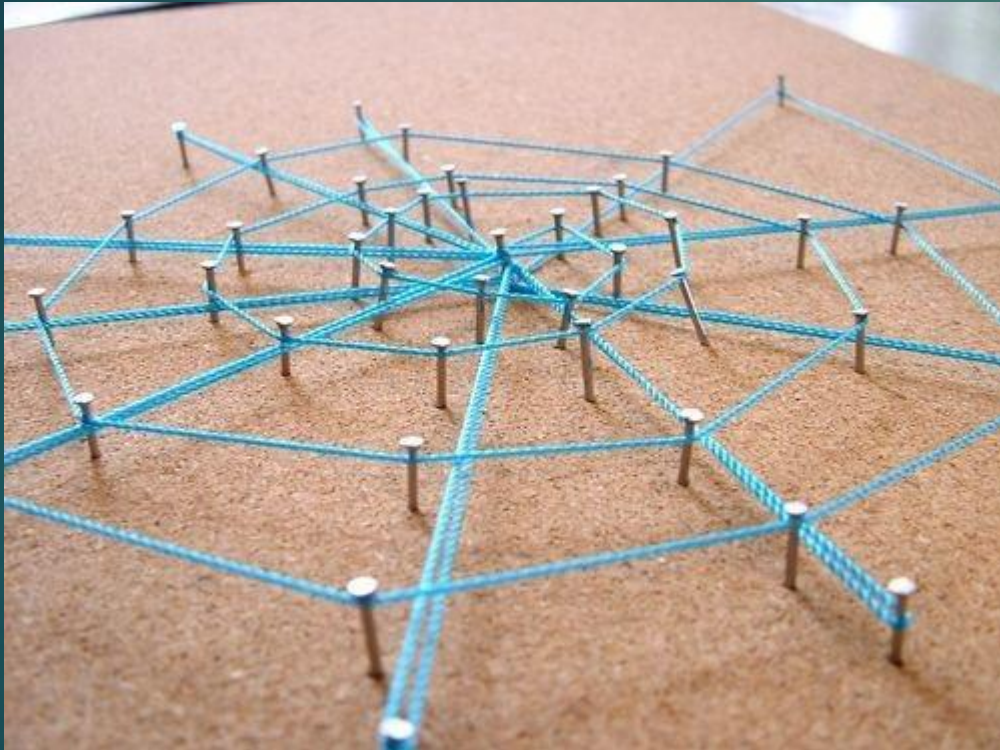
What could I change or improve? How could I take this to the next level?

# Lower grades

- ▶ You will use construction paper, scraps, straws, legos or other materials to make your own spider. (Legos cannot be taken home)
- ▶ You can also count the types of shapes , colors, and other spider parts when done



# Upper grades



- ▶ You are going to place small tacks or nails into cardboard to make really cool spider webs.
- ▶ Use materials correctly! If you don't, then you will have to draw your web instead.
- ▶ This is one example, but yours can be as different as you make it

# More to explore

- ▶ Here are some other ideas to learn more about spiders and animals
- ▶ **Biodiversity—Learning About the Creatures Around You**
- ▶ *What kind of spiders do you have where you live? Or other creatures? If you are curious to learn about your local biodiversity, explore these Science Buddies Project Ideas:*
- ▶ [Bug Vacuums: Sucking Up Biodiversity](#): Have you ever wondered what a [wildlife biologist](#) does? These scientists study and monitor the health of habitats and ecosystems, often by identifying and counting plants and animals. Take on the role of a wildlife biologist by examining the biodiversity of insects in your own backyard using a homemade bug vacuum!
- ▶ [Finding Phyla](#): Animals come in all shapes and sizes, each a small part of the amazing diversity of life. These differences can also help us to classify animals into different groups. Which group do you belong to? How many different types of animals can you find around your home? Do this experiment to investigate the diversity of animal life around your home.

# December/ January Maker Space Day



# Let's learn about snowflakes

- ▶ There are many fascinating things about winter. One of them is snow! Snow is amazing because it is made up of individual crystals and they all have six points, but the way they form can be grouped in to 6 different types depending on how it is formed.
- ▶ Here is a video (+- 6 Min) about the science of snowflakes
- ▶ <https://www.youtube.com/watch?v=fUot7XSX8uA>
- ▶ Here is another video (8 minutes) about Snowflake Bentley if you want more information  
<https://www.youtube.com/watch?v=ptLmA263hIk>



# You are going to engineer your own snowflake

- ▶ Based on what you learned, you are going to build a snowflake
- ▶ You can choose your materials with teacher permission
- ▶ Complete the planning sheet and show to a teacher for approval to start
- ▶ When you are done, tell the story of how your snowflake came to be, or a day in the life of your snowflake
- ▶ Or you can do the math of your snowflake: how many spikes, needles, sides, and holes, how many would fit on a spoon, a box, or in a room, etc... be creative!

## Makerspace Snowflake Planning Page

We are engineering snowflakes!

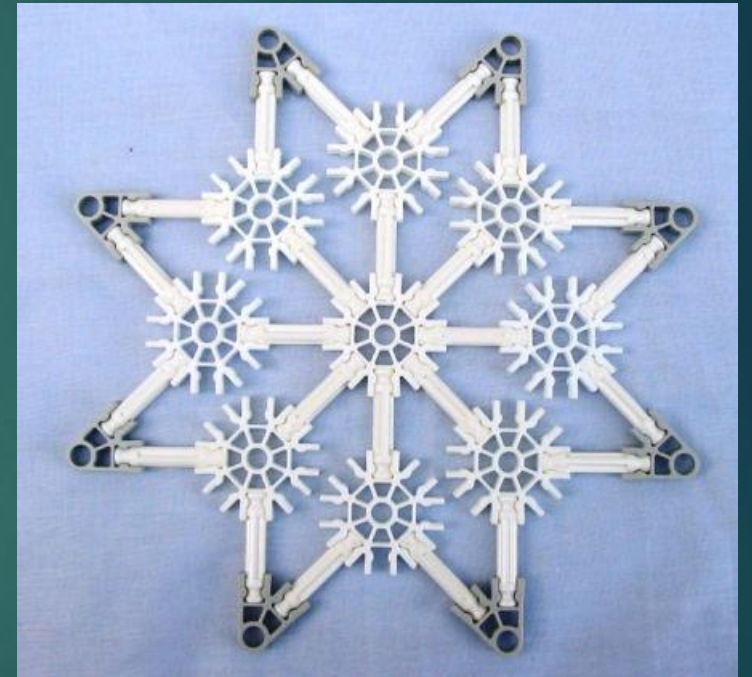
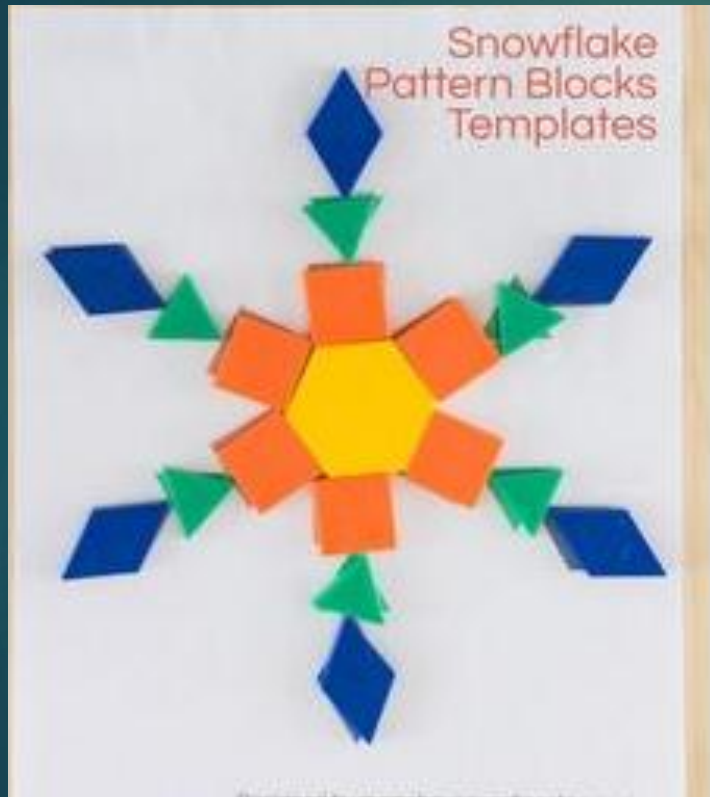
1. Design your snowflake below. (remember they all have six sides)
2. Choose the best materials for your snowflake.  
Straws and clay, straws and yarn, paper cutting, K'nex, or pipe cleaners.
3. Get teacher approval to start building.
4. Build your snowflake.
5. As an extension activity, the story of how your snowflake came to be, or a day in the life of your snowflake
  - ▶ Or you can do the math of your snowflake: how many spikes, needles, sides, and holes, how many would fit on a spoon, a box, or in a room, etc... be creative!



Some ideas with straws, pipe cleaners, and beads...

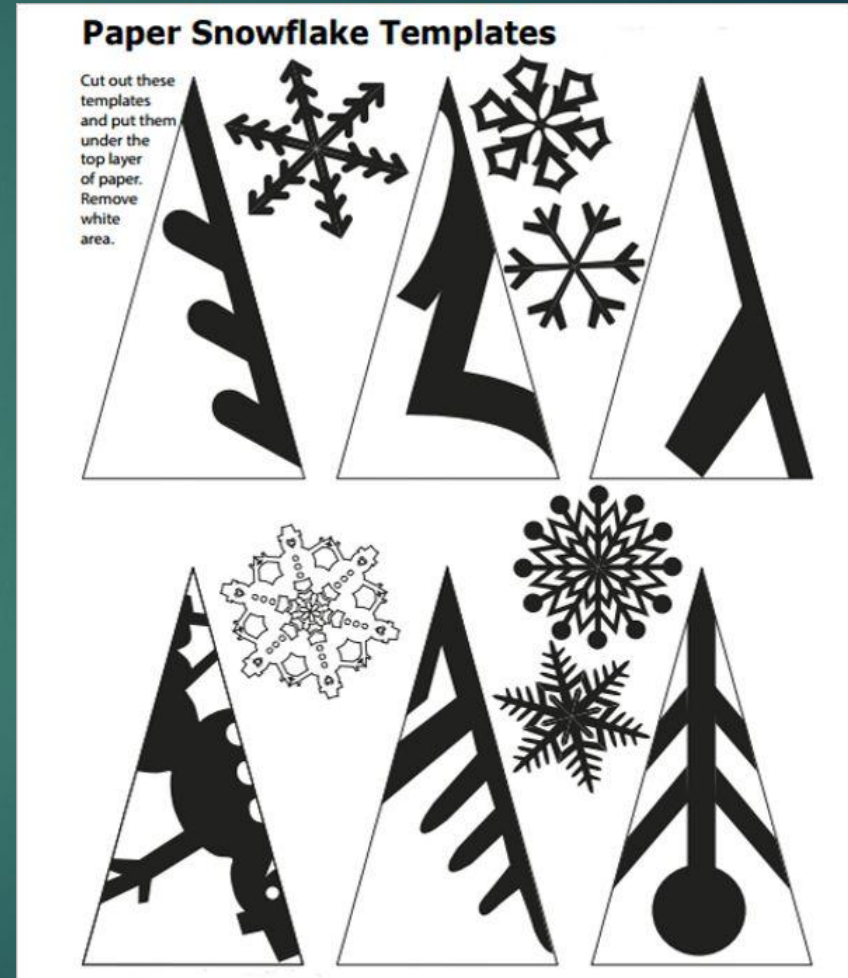


# Ideas for using K'nex or pattern blocks

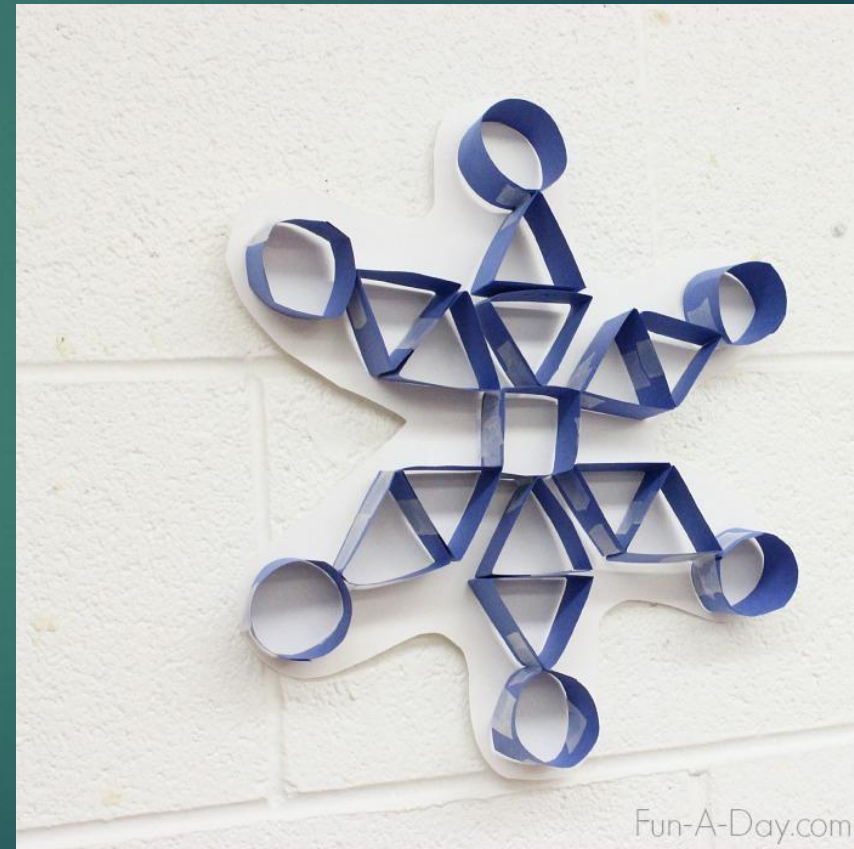
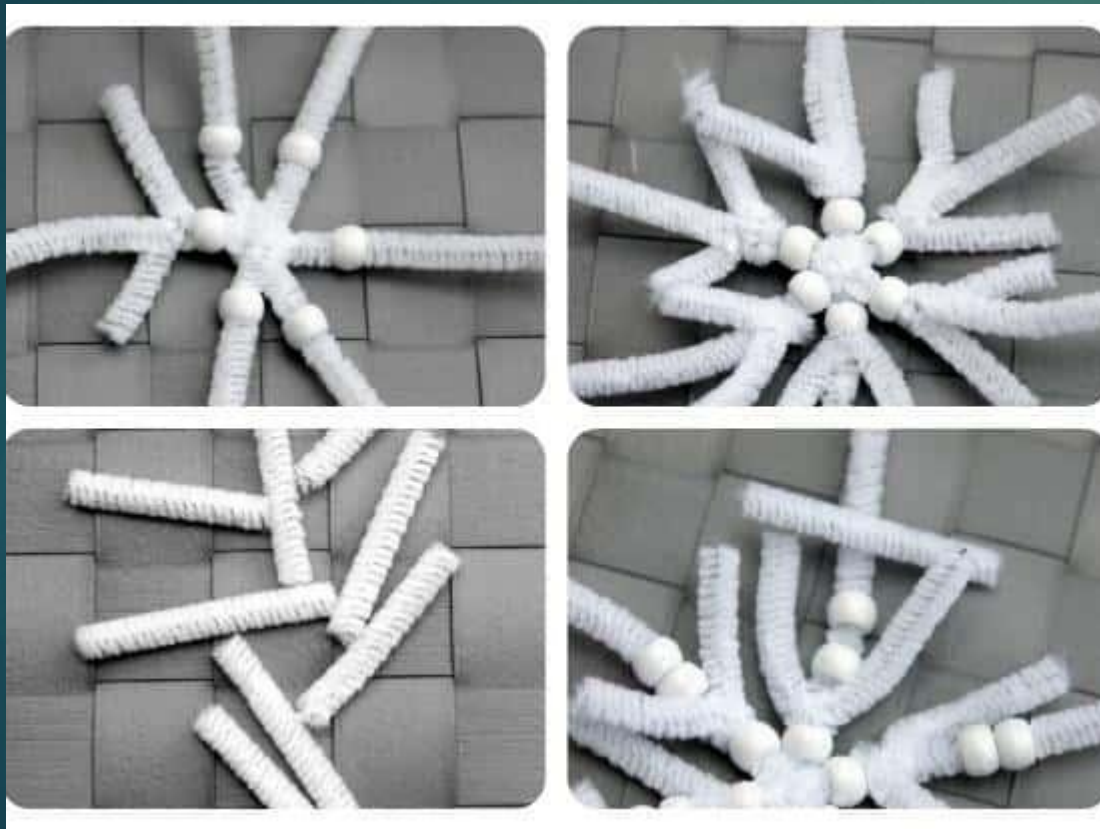


# You can make them out of paper

- ▶ Cut into a square
- ▶ Fold 3 times (so you will have a six sided shape)
- ▶ Cut in or out on the FOLDS over a trash can to keep the area tidy
- ▶ Unfold it
- ▶ Tell your story or make a math problem about the number of needles, spikes, holes, etc.



# Ideas using pipe cleaners or slips of paper loops and shapes



# February Makerspace Project

## Monumental People

- ▶ We have learned a lot about famous Americans in our classes like Rosa Parks, Sacajawea, Dr. Martin Luther King, Jr, Different presidents, and LOTS more people who have done amazing things.
- ▶ I think everyone who does something incredible should get an award.
- ▶ Sometimes people around the world have made monuments, statues, or buildings to honor great people.
- ▶ Here are some examples...

# William Tecumseh Sherman monument in New York City





Horatio  
Nelson's  
column in  
London  
(famous British  
Admiral who  
won a big  
battle)





the 38th (Welsh)  
Division  
Memorial in  
South Wales,  
Great Britain is  
for a division of  
soldiers





The Marine  
Corp War  
Memorial  
outside  
Arlington  
National  
Cemetery in  
Virginia

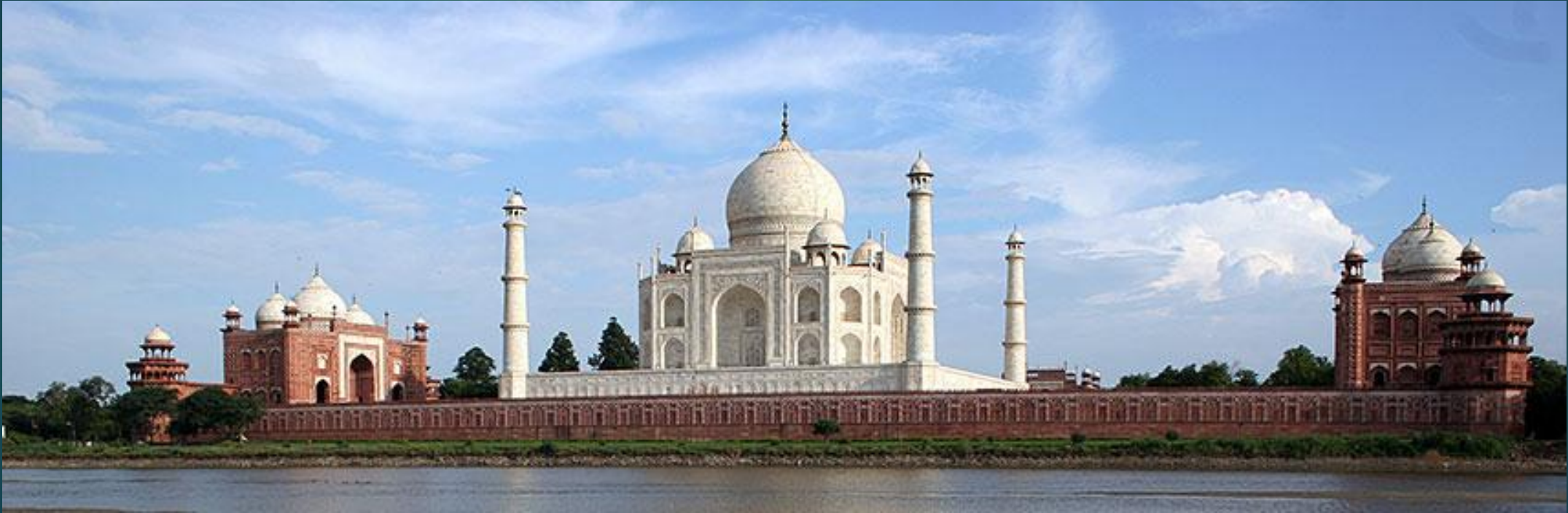
Joan of Arc,  
a woman  
who led the  
French army



# The Great Pyramids of Giza to honor pharoahs



# Taj Mahal made for the ruler of India's wife



# Your challenge...

- ▶ While these are really beautiful, sometimes it is hard to tell what the people were famous for.
- ▶ You can guess some soldiers but other times it can be tricky to figure out.
- ▶ Your job will be to choose any person you think has done something amazing and create a monument for them.
- ▶ You must make it clear what great thing they did by how you make, build, draw, or create your monument.
- ▶ You can make it out of any materials or supplies we have available, but use your planning page first.
- ▶ It does not have to be a model. You can write a song, draw a picture, use legos or Knex, pop up cards, anything you can think of!
- ▶ Be creative!

# For example... Rosa Parks

- ▶ Rosa Parks was famous for peacefully protesting segregation on buses. You could make a bus out of supplies and put a quote on each window or “Stand up for what’s right” on the side



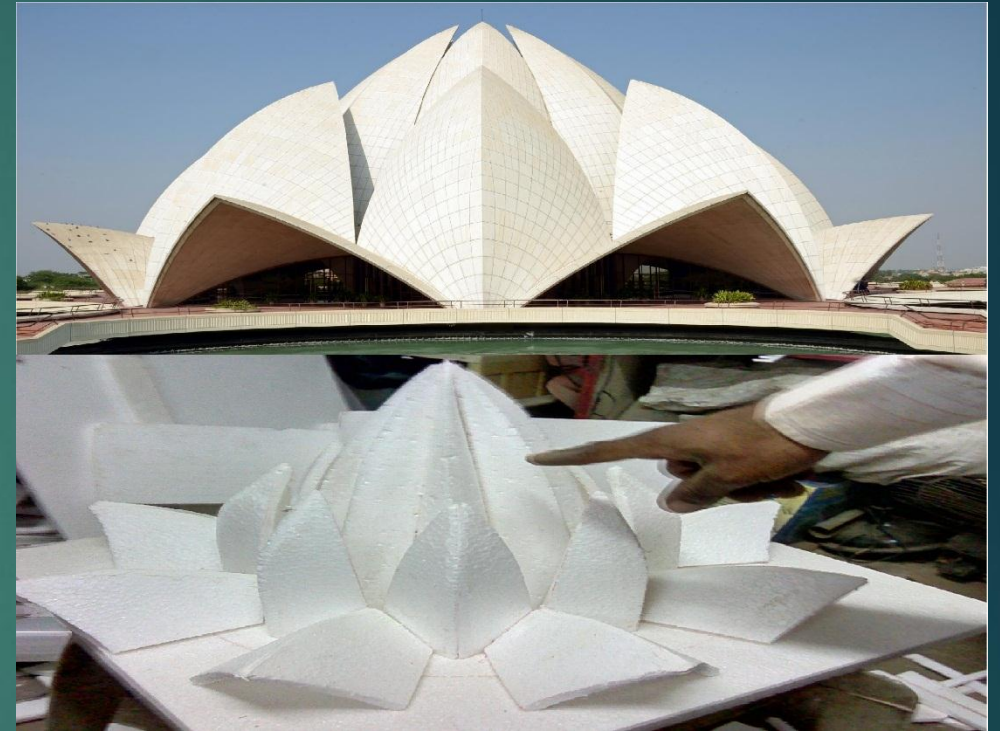
# Presidents who were good leaders



You could make finger puppets for them and write their great deeds like a scroll for them to hold.



# Cardboard monuments or statues



You can tell they were soldiers but this one might be good if they were famous for origami or special flowers or something

# Some ideas for where to start...

- ▶ Great People in math and science
- ▶ Famous FIRST people (African Americans in engineering, science, NASA, voting, etc.)
- ▶ People who work behind the scenes to make a difference (Kid President, Mother Theresa, fire fighters, cancer doctors, etc)
- ▶ Inventors
- ▶ Musicians
- ▶ Writers
- ▶ Artists
- ▶ <http://gardenofpraise.com/leaders.htm> (list of good leaders with links and pics)



# March Maker's Space

# Spring is in the Air!

- ▶ What's a popular children's toy
- ▶ Is used by teams of adults in competitions around the world?
- ▶ Is often featured in poetry, legends, and folk tales?
- ▶ Originated in China at least 3,000 years ago?
- ▶ Was outlawed during the 18th century because it distracted shopkeepers from their duties?
- ▶ Has been used to pull boats, carriages, sleds, and ice skaters?
- ▶ Is a traditional New Year's gift for Japanese children?
- ▶ Has led directly to major scientific discoveries?
- ▶ Helped make Benjamin Franklin, Alexander Graham Bell, Wilbur and Orville Wright, Leonardo da Vinci, Guglielmo Marconi, and Homan Walsh famous?

# Did you guess “a kite”?

- ▶ If so, you were exactly right!

Historians believe that the first kites were built in China about 3,000 years ago, using materials, such as bamboo and silk. *(Image at right courtesy of clappingsimon.)* Kites may have been brought from China to Japan and other Asian countries, historians say, as part of early religious festivals or ceremonies. In fact, the earliest significance of kites was primarily religious. They were widely considered to be useful for ensuring a good harvest or scaring away evil spirits. Throughout the years, as the popularity of kites spread from Asia to Europe and beyond, they became more widely known as children's toys and came to be used primarily as a leisure activity.



# Did you know...

- ▶ In the 15th century, Leonardo da Vinci discovered how to use a kite to span a river.
- ▶ Leonardo da Vinci's method was later used, by 10-year-old Homan Walsh, in the construction of one of the world's first suspension bridges at Niagara Falls, New York.
- ▶ In 1749, Scottish scientist Alexander Wilson used several kites, attached in a row, to measure and compare air temperature at different altitudes.
- ▶ Benjamin Franklin used kites to pull boats, carriages, and sleds in experiments with traction and to experiment with electrical energy in the atmosphere.
- ▶ In 1901, [Guglielmo Marconi](#) used a kite to help transmit the first trans-Atlantic wireless telegraph message.
- ▶ Kite technology also led to the invention of the airplane, the parachute, and the helicopter. It may even have contributed to the U.S. victory during World War II. Sailors aboard the aircraft carrier USS *Block* used kites built by Lieutenant Paul Garber to practice shooting at moving targets and to pass important papers from ships to flying aircraft.



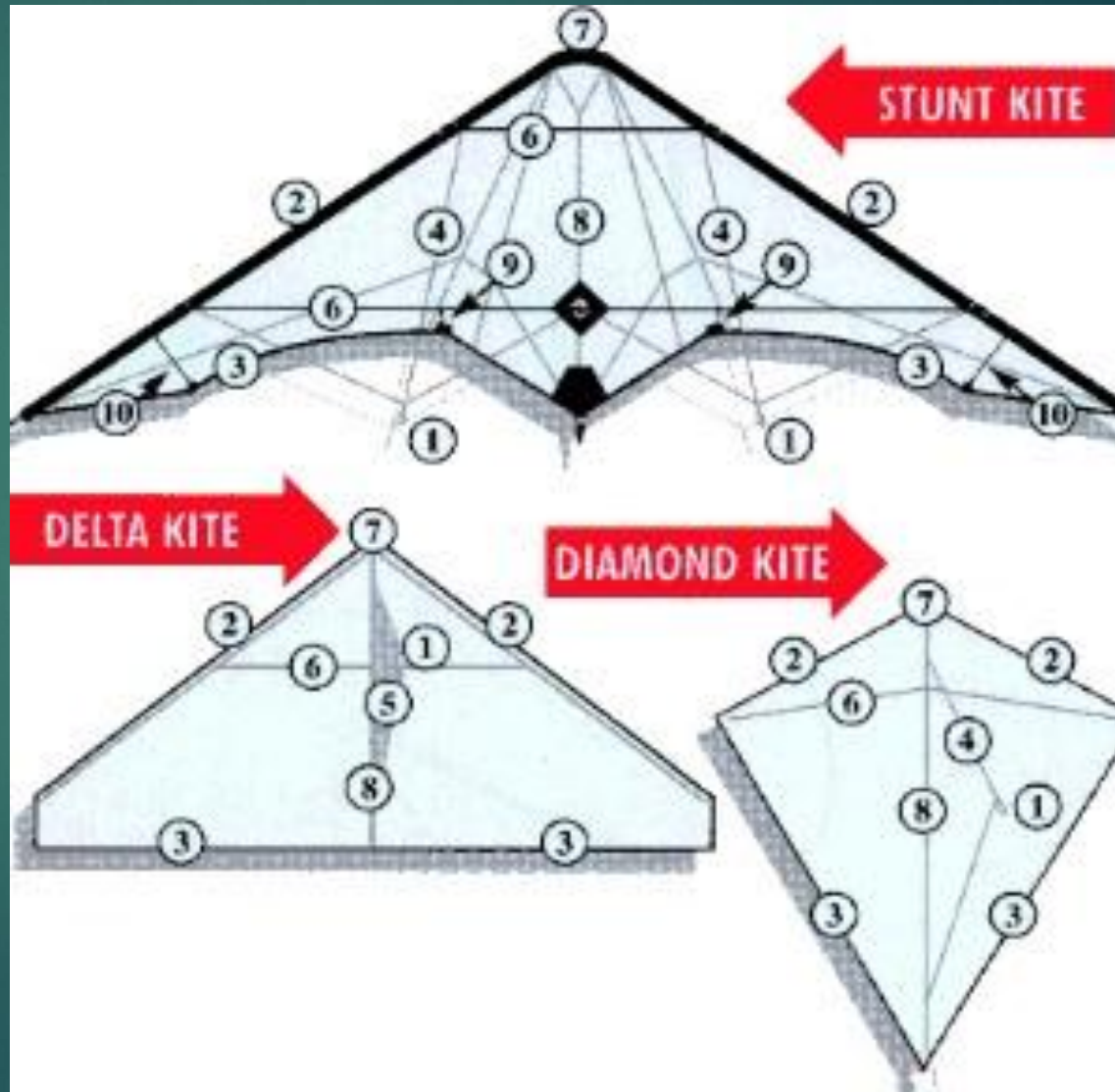
Kites are very much a part of math and science.



# Your task today is to design and build a kite.

## ► Parts of a kite...

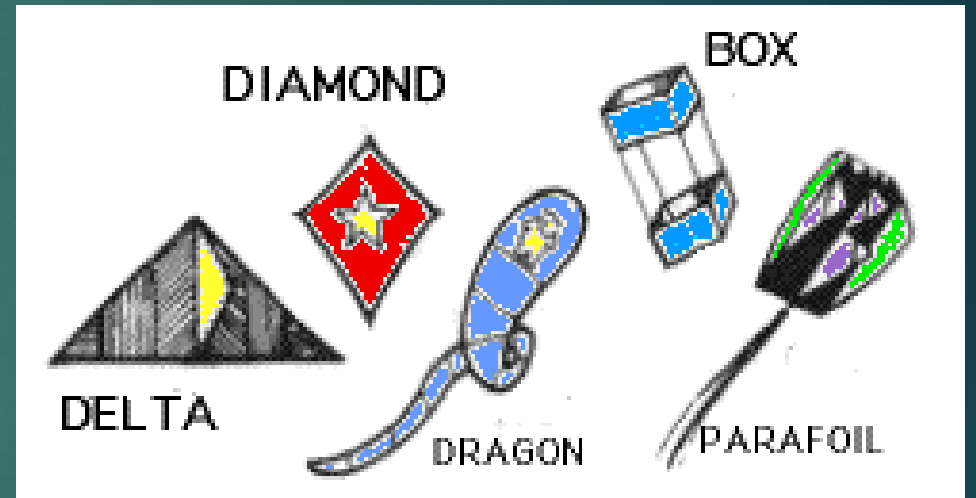
- 1.Tow Point
- 2.Leading Edge
- 3.Trailing Edge
- 4.Bridle Lines
- 5.Keel
- 6.Cross Stick or Spar
- 7.Nose
- 8.Center Stick or Spine
- 9.Stand Off
- 10.Baton



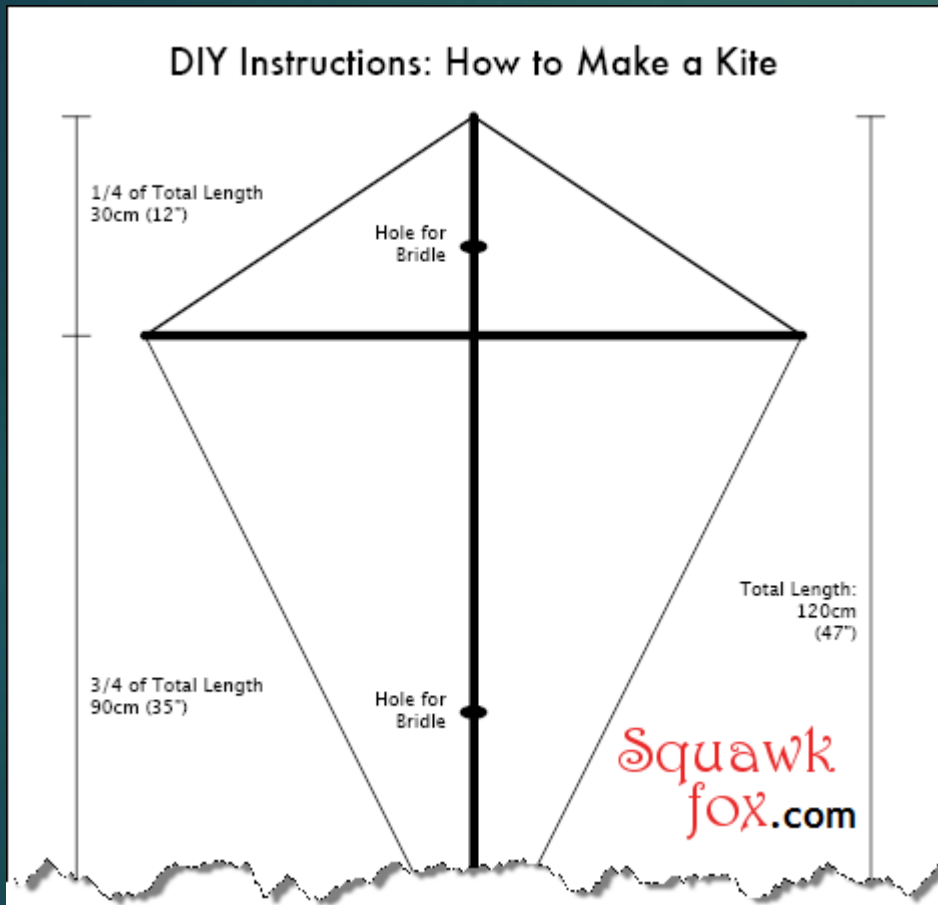


# You can use anything you want to build your kite, but here is a simple starter idea

- ▶ [https://www.youtube.com/watch?v=llzJa4poU\\_c](https://www.youtube.com/watch?v=llzJa4poU_c) grocery bags and straws or bamboo skewers... (4 ½ Min)
- ▶ <https://www.youtube.com/watch?v=hP0jFnmMAIA> paper and straws...
- ▶ <https://www.youtube.com/watch?v=ln9YvlhikAg>



# Essentials

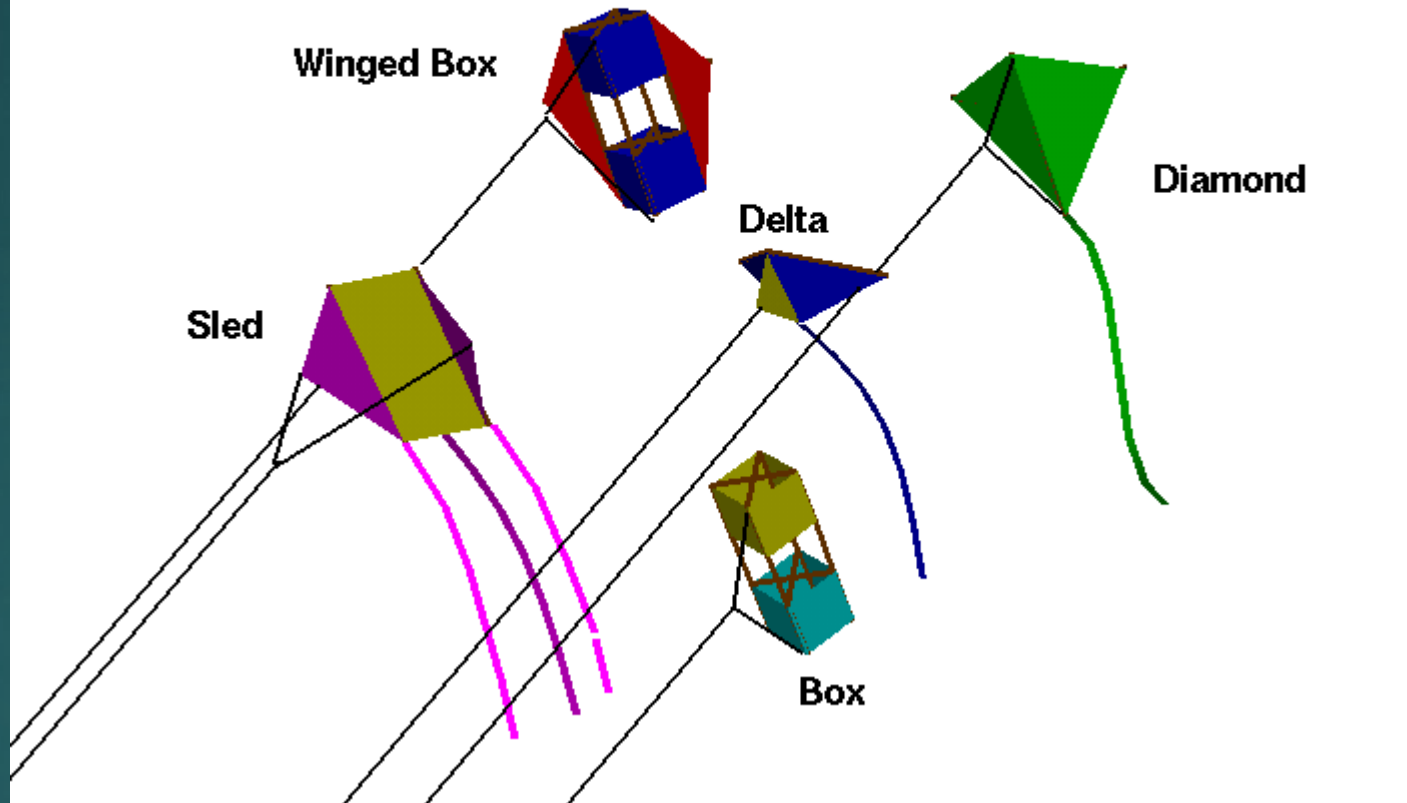


- ▶ You must have a kite base out of paper, plastic, grocery bag, etc
- ▶ What are you using for support? Straws, cardboard, skewers, bamboo, sticks?
- ▶ Make sure you have a tail so it will fly
- ▶ How are you going to attach the string?



# Kites

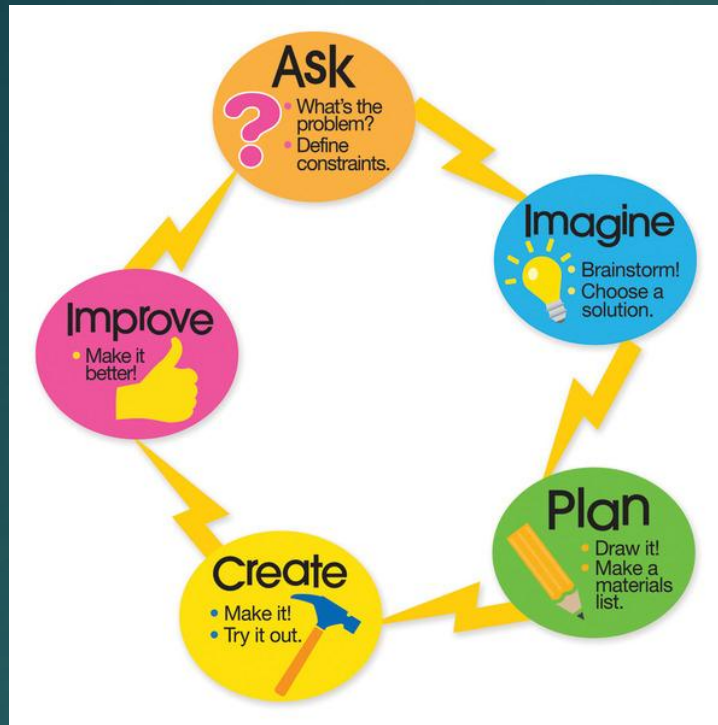
Glenn  
Research  
Center



THERE ARE MANY DIFFERENT KINDS OF KITES THAT EACH FLY DIFFERENTLY

# Here are some more kite resources

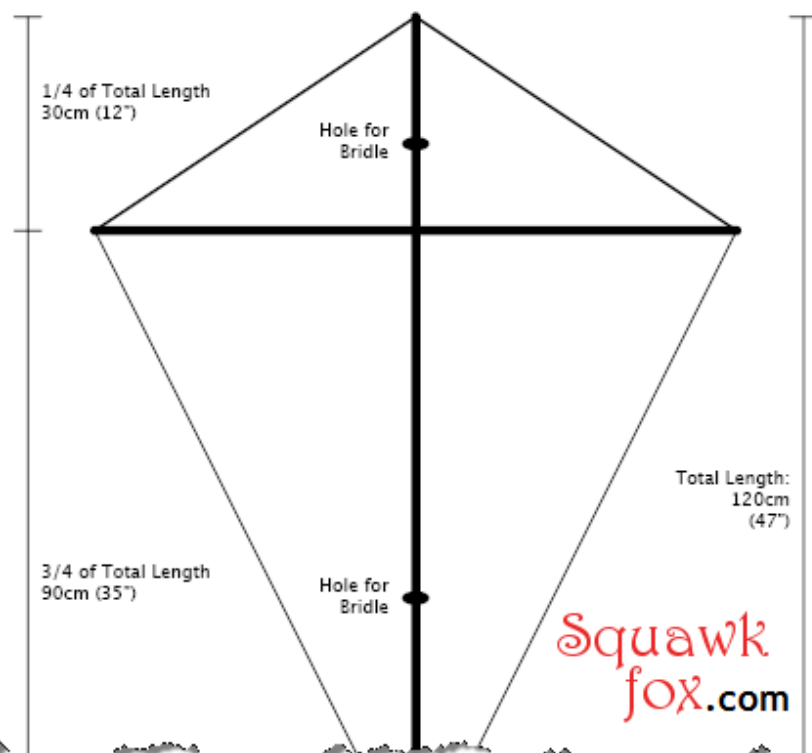
- ▶ [Professor Kite and the Secret of Kites](#)  
Contains pictures of different kinds of kites and tips on the best wind speed for flying each type. The site also gives general rules for picking good kite-flying days and comprehensive directions to help beginners get their kites off the ground. Basic safety tips are included as well.
- ▶ [The Virtual Kite Zoo](#)  
Provides construction tips on kitemaking, an overview of the ways in which kites have been used throughout history (some will surprise you!), and a teachers' page with suggestions for integrating kites into the curriculum. Links to lots of kite projects are also included.
- ▶ [Fly Me to the Moon](#)  
Contains 45 pages of clearly written information on the history and science of kite flying.
- ▶ [Anthony's Kite Workshop](#)  
Includes kite plans, construction tips, kite-related definitions, stories, cartoons, and much more. In addition, [Anthony's Kite Gallery](#) provides examples of many unusual, elaborate, and exotic kites. A good reference for students who would like to design their own kites or to spark a discussion of how each type of kite stays aloft.
- ▶ [Famous Historic Kite Flights](#)
- ▶ [20 Kids, 20 Kites, 20 Minutes](#)
- ▶ [Basic Sled Kite](#)
- ▶ [Kite Flight, Safety First](#)



# Now, it's your turn!

- ▶ Imagine what kind of kite you might like to make
- ▶ Plan it out on paper
- ▶ Design it with your materials
- ▶ Build it
- ▶ Test it out
- ▶ See what you could do to improve it, or take it to the next level

## DIY Instructions: How to Make a Kite



Squawk  
fox.com

# Extra ways to extend learning

- ▶ **Geography.** Provide each student with a map of the world and the list of foreign-language words for "kite" found at the ["Kite" Translation Table](#). Invite students to create and decorate a miniature construction paper kite for each country listed. Ask them to label the kite with that country's word for kite and attach it to the correct location on the map. Older students might decorate their kites with a representation of the country's flag. Younger students might each create one kite and attach it to a map on a classroom bulletin board.

# Arts and Crafts.

- ▶ First, check out the construction and knot tying tips at [The Virtual Kite Zoo](#). Then pick a sunny, breezy day. Arrange students into small groups, print the directions for building a kite found at one of the other **Kite Project Sites** listed at the end of this article. Provide each group of students with a copy of the directions and help them complete their kites. If possible, provide students with a safe time and place to fly their creations.



# Writing.

- ▶ Ask each student to research classroom, library, or online resources to find information about the life of one of the people mentioned in the quiz at the beginning of this article. Or ask them to find and research another person whose work with kites resulted in an important discovery. Then invite students to write a biography of that person. Encourage students to share the biographies with their classmates.

# Art/History and Classifying.

- ▶ Provide students with historical information from one of the sites referenced at the end of this article. Then provide each student with construction paper in the shape of a simple kite and appropriate art supplies. Ask each student to design a kite that reflects some aspect of the history of kites during the last 3000 years.
- ▶ Ask each student to look through magazines or Web sites to find and print out or cut out pictures of kites. Then create a chart listing the various types of kites, such as box kite, sled kite, stunt kite, and so on. Classify the kites in the collected pictures according to their type. Younger students might classify their pictures according to simpler criteria, such as color or size, instead.

# Science.

- ▶ Help students make a [wind scale](#) using the online directions provided by the Miami Museum of Science.
- ▶ **More Science.** Continue the activity above by using the wind scale to measure wind speed over a period of several days or weeks. Record your findings on a calendar or in a journal and then compare the wind speed readings with the information on [The Beaufort Wind Scale](#). Ask: Which days would have been best for flying a kite?

# Health/Art.

- ▶ Brainstorm with students a list of rules for safe kite flying. Then arrange students into pairs and ask each pair to create a poster illustrating one of the kite safety rules discussed.
- ▶ **Word Find.** Invite students to complete one of the following weather word searches:  
[Weather Wiz Kids Word Search](#)  
[Weather Word Search](#)

# Have fun!

- ▶ Look back at your design.
- ▶ What could you do **differently**?
- ▶ Share your ideas with others and get their feedback.

