

DESIGN AKTIVE



STEMPILOT[®]

Engaging Students in STEM with Flight Simulation

DESIGN A KITE

Hey there, engineering maestros! Ready to reach new heights? Fasten your seatbelts and join us for a thrilling journey where you'll unleash your inner engineer. From drafting innovative blueprints to constructing the ultimate kite, get set to design and build your very own flying machine. Let's spark our imaginations and take flight together as we explore the fascinating world of aviation!

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THE HISTORY OF KITES

BEFORE WE EMBARK ON THIS EXCITING ENGINEERING ADVENTURE, LET'S DIVE INTO THE HISTORY OF KITES.

DID YOU KNOW THAT OVER 3,000 YEARS AGO, KITES WERE FIRST INVENTED AND POPULARIZED IN ASIA?

THESE ANCIENT MARVELS WERE CRAFTED FROM SILK-LIKE MATERIALS AND BAMBOO, USING HIGH-TENSILE-STRENGTH SILK FOR FLYING.

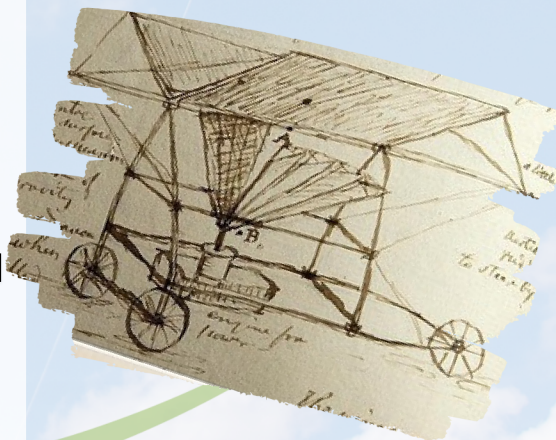


DECORATED TO RESEMBLE MYTHOLOGICAL CREATURES OR LEGENDARY FIGURES, THESE KITES OFTEN LACKED TAILS AND BOWS. KITES LATER FLEW INTO EUROPE DURING THE ROMAN EMPIRE, USED AS PENNON-TYPE KITES IN WARTIME. IN



THE 18TH CENTURY, ALEXANDER WILSON USED KITE TRAINS (MULTIPLE KITES ON A SINGLE LINE) AS METEOROLOGICAL DEVICES TO MEASURE TEMPERATURES AT VARIOUS ALTITUDES.

IN THE 19TH CENTURY, SIR GEORGE CAYLEY, THE FATHER OF AERONAUTICS, MODIFIED KITES TO CREATE THE FIRST MANNED GLIDER. HIS DETERMINATION AND INGENUITY PAVED THE WAY FOR AVIATORS LIKE THE WRIGHT BROTHERS TO DEVELOP AIRPLANES. TODAY, WE HAVE MODERN KITES AVAILABLE IN STORES, ONLINE, OR READY TO BE CREATED BY IMAGINATIVE MINDS LIKE YOURS!



TYPES OF KITES

BEFORE WE DIVE INTO BUILDING OUR KITES, LET'S EXPLORE THE DIFFERENT TYPES OF KITES:

1. **SINGLE-LINE KITES:** PERFECT FOR BEGINNERS AND KIDS, THESE KITES ARE GREAT FOR RELAXING, COMPETITIVE KITE FIGHTING, OR CREATING COLORFUL SKY DISPLAYS.
2. **MULTI-LINE SPORT KITES:** WITH MORE THAN ONE LINE, THESE KITES CAN PERFORM FLIPS, STALLS, AND OTHER COOL MANEUVERS. THEY'RE PERFECT FOR SYNCHRONIZED FORMATIONS OR CHOREOGRAPHED PERFORMANCES.
3. **POWER KITES:** DESIGNED TO GENERATE A LOT OF LIFT AND PULL, THESE KITES ARE IDEAL FOR KITEBOARDING, KITESURFING, AND PULLING PEOPLE ON SKIS, BOARDS, OR BUGGIES.
4. **BOW KITES:** FEATURING A FLAT DOME AND A WIDE WIND RANGE, THESE KITES ARE SAFE AND VERSATILE FOR VARIOUS ACTIVITIES.
5. **HYBRID KITES:** COMBINING THE BENEFITS OF BOW KITES AND C-KITE HANDLING, THESE KITES ARE GREAT FOR CONFIDENT KITEBOARDERS WHO WANT TO FREERIDE, FREESTYLE, OR RIDE WAVES.
6. **DELTA KITES:** STEADY AND EASY TO RESTART, THESE KITES ARE EXCELLENT FOR FREERIDING OR PRACTICING FREESTYLE TRICKS.
7. **PARAFOIL KITES:** SOFT AND FRAMELESS, THESE KITES GET THEIR SHAPE FROM THE AIR AND CAN BE PACKED INTO A SMALL BAG FOR CONVENIENCE.
8. **ROKKAKU KITES:** TRADITIONALLY MADE FROM BAMBOO AND WASHI PAPER, THESE HEXAGONAL KITES ARE FLOWN IN JAPANESE FESTIVALS.

ACTIVITY

DESIGN YOUR KITE

CALLING ALL YOUNG ENGINEERS! YOUR SUMMER PROGRAM IS GEARING UP FOR ITS FIRST-EVER SUMMER FEST, THEMED "THE PAST, THE PRESENT, AND THE FUTURE." THE CAMP DIRECTOR WANTS THE CAMPERS TO SHOWCASE THEIR CREATIVITY BY DESIGNING AND BUILDING THEIR OWN KITES TO FLY DURING THE FESTIVAL.

TO CREATE YOUR KITES, EACH CAMPER IS REQUIRED TO:

1. CHOOSE A TYPE OF KITE THEY WISH TO CREATE.
2. CREATE A BLUEPRINT INDICATING WHAT MATERIALS THEY WILL BE USING.
3. MAKE IT COLORFUL AND UNIQUE.
4. ENSURE IT IS ABLE TO FLY.

MATERIALS

TO DO THIS ACTIVITY, MAKE SURE THAT YOU HAVE:

- A VARIETY OF PAPER OF DIFFERENT SIZES
 - COMPUTER PAPER
 - CARDSTOCK
 - CONSTRUCTION PAPER
 - POSTER PAPER
 - NEWSPAPER
 - TISSUE PAPER
- TISSUE RIBBON OF VARIOUS COLORS & SIZES
- KITE STRING
- SCISSORS AND HOLE PUNCHERS
- RULERS
- TAPE
- GLUE
- GLITTER
- WOODEN SKEWERS
- YARN
- PLASTIC BAGS
- LIGHTWEIGHT FABRIC
- CRAYONS
- MARKERS
- COLORED PENCILS

*ENSURE ALL NECESSARY MATERIALS ARE PREPARED IN ADVANCE AND THAT RELEVANT SOFTWARE IS INSTALLED PRIOR TO THE START OF THE LESSON.

LESSON PLAN

DESIGN YOUR KITE

- **PREPARATION:** ENSURE ALL MATERIALS ARE PREPARED AND READY IN ADVANCE.
- **VIDEO INTRODUCTION:** HAVE YOUR CAMPERS/STUDENTS SIT DOWN AND WATCH THE SHORT VIDEO "WHO INVENTED THE KITE? THE STORY BEHIND INTERNATIONAL KITE DAY FOR KIDS | KIDZONEER."
- **DISCUSSION:** OPEN THE FLOOR FOR DISCUSSION. SOME POSSIBLE DISCUSSION QUESTIONS ARE:
 - WE LEARNED A LITTLE BIT ABOUT SOME OF THE USES KITES HAD IN ANCIENT CHINA AND INDIA, BUT WHAT ELSE DO YOU THINK WE CAN USE KITES FOR?
 - WHY DO YOU THINK KITES WERE MADE OUT OF LIGHTWEIGHT MATERIAL?
- **EXPLANATION:** EXPLAIN TO YOUR CAMPERS/STUDENTS THAT THEY WILL BE CREATING THEIR OWN KITE USING THE MATERIALS PROVIDED.
 - FOR YOUNGER CAMPERS/STUDENTS, HAVE THEM USE THE PROVIDED KITE TEMPLATE.
 - FOR OLDER CAMPERS/STUDENTS, HAVE THEM CREATE A KITE BASED ON THE TYPES OF KITES FOUND IN THE "KITES OF TODAY" HANDOUT.
- **DESIGNING:** HAVE YOUR CAMPERS/STUDENTS BEGIN PLANNING OUT THEIR KITE DESIGN.
- **BUILDING:** AFTER THEY HAVE DESIGNED THEIR KITES, HAVE THEM CHOOSE THEIR MATERIALS AND BEGIN BUILDING THEIR KITES. ENCOURAGE CREATIVITY!
- **TEST FLYING:** AFTER THEY HAVE FINISHED CREATING THEIR KITES, HAVE YOUR CAMPERS/STUDENTS TAKE THEIR KITES AND TEST FLY THEM.
- **Post-Flight Discussion:** OPEN THE FLOOR FOR DISCUSSION. SOME POSSIBLE DISCUSSION QUESTIONS ARE:
 - WHAT DID YOU NOTICE WHEN FLYING YOUR KITES?
 - WHY DO YOU THINK SOME KITES FLEW BETTER THAN OTHERS? EXPLAIN.

WANT MORE?

EXTENSION ACTIVITIES

WANT TO EXPLORE THE WORLD OF KITES MORE? CHECK OUT THESE EXTENSION ACTIVITIES YOUR CAMPERS/STUDENTS WILL LOVE:

- **FLYING CONTEST:** ORGANIZE A CONTEST TO SEE WHICH KITES CAN REACH THE HIGHEST ALTITUDE, HAVE THE MOST STABLE FLIGHT, AND PERFORM THE BEST MANEUVERS.
- **WIND EXPERIMENTS:** USE YOUR KITES TO PERFORM WIND EXPERIMENTS, WEATHER TRACKING, AND STUDY THE PRINCIPLES OF LIFT, DRAG, AND THRUST.
- **CULTURAL SIGNIFICANCE:** EXPLORE THE SIGNIFICANCE KITES HAVE IN DIFFERENT CULTURES AROUND THE WORLD.

LET'S GET CREATIVE AND TAKE FLIGHT TOGETHER!



KITES OF TODAY



Single-line kites

PERFECT FOR BEGINNERS AND KIDS, THESE KITES ARE GREAT FOR RELAXING, COMPETITIVE KITE FIGHTING, OR CREATING COLORFUL SKY DISPLAYS.



Multi-line Sport kites

WITH MORE THAN ONE LINE, THESE KITES CAN PERFORM FLIPS, STALLS, AND OTHER COOL MANEUVERS. THEY'RE PERFECT FOR SYNCHRONIZED FORMATIONS OR CHOREOGRAPHED PERFORMANCES.



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