



High Flyers Alphabet Activity Book



Math and Language
Literacy for K-2

FLIGHT LOG
ENDORSEMENT
CODE:
HFLYENG

Acknowledgments

Thanks to the High Flyers Alphabet Activity Book team for their invaluable suggestions and fortitude to see this book come to fruition. Thanks also to the teachers who provided our team with ideas and feedback and, most important, the NASA Headquarters Aeronautics Research Mission Directorate for funding this outreach activity.

Team Members

Brontie DeFreitas-Fox, Communications Support Services Center

Carol Galica, Office of Educational Programs

Kelly Ison, Subsonic Systems Office

Shanessa Jackson, Office of Educational Programs

Susan Johnson, Subsonic Systems Office

Jenay Sharp Leach, Aeronautics Research Mission Directorate Education

Marge Lehky, Office of Educational Programs

Kelly Shankland, Logistics and Technical Information Division

Linda Skrada, Subsonic Systems Office

Tony Springer, Aeronautics Research Mission Directorate Education

Renee Yoder, Office of Educational Programs

Introduction

The National Aeronautics and Space Administration (NASA) conducts research for both aeronautics and space. This High Flyers Alphabet Activity book has been created to introduce several basic aeronautics terms for children in kindergarten through second grade. We want them to realize that many aeronautics terms and concepts surround them every day. These activities show how an alphabet letter can be related to both an aeronautics concept and basic aeronautics terms. In addition, children are invited to look at each letter, trace the letter, and print the letter in the space provided. Answers to the activities can be found on the last few pages of this book.

About NASA

We've made decades of contributions to aviation; every U.S. aircraft and U.S. air traffic control tower has NASA-developed technology on board!

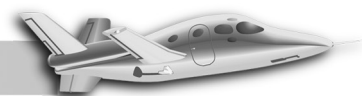
We develop advanced technologies for future aircraft that consume only half as much fuel, generate only one quarter of current emissions and one third less noise, and for improving the safety and efficiency of our national air transportation system.

What's exciting right now is that we've started to design, build and fly a series of new experimental aircraft – X-planes – that will prove the dramatic benefits of advanced technologies in piloted flight. Follow our X-plane stories and more using the links and social media handles below.

And remember, NASA's with you when you fly!

NASA Aeronautics

<http://www.nasa.gov/aeronautics>

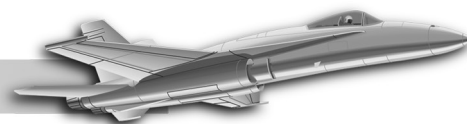


NASA Aeronautics Resources, Publications and More

<https://www.nasa.gov/aeroresearch/resources>

Aeronautics @ Home

<https://www.nasa.gov/aero-at-home>



Twitter: @NASAaero

Facebook: <https://www.facebook.com/NASAaero/>

Instagram: @NASAaero

Common Core Math and NGSS Science Standards

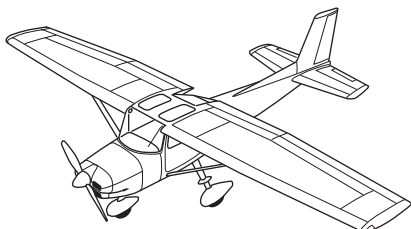
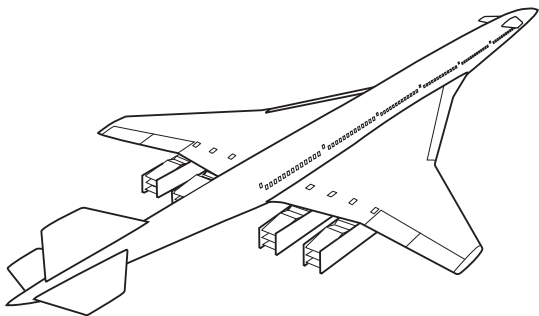
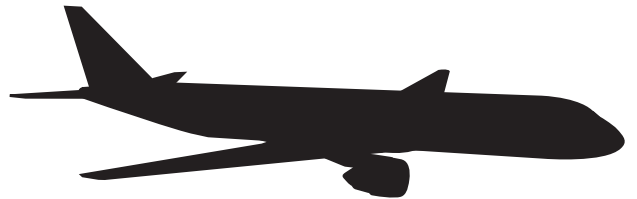
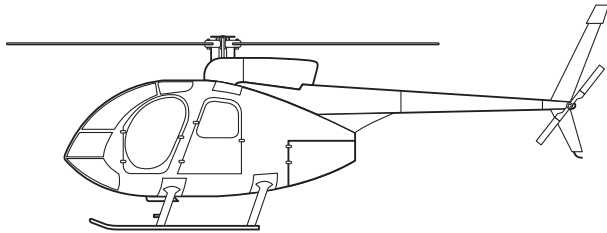
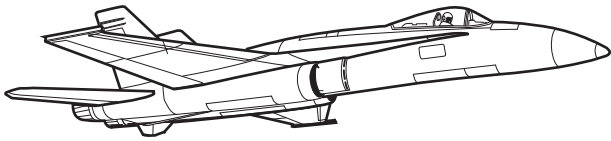
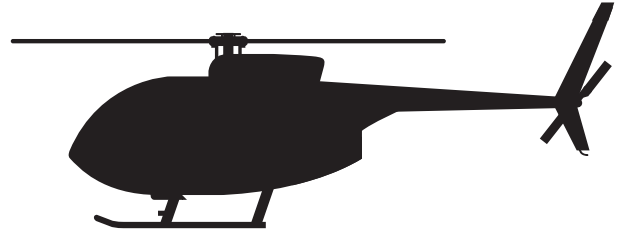
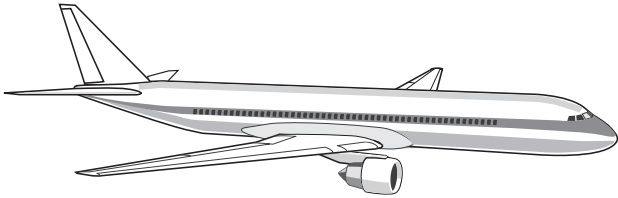
Educators: The High Flyers Activity Book covers many K-2 content standards including Math, ELA, and Science. This chart lists the Common Core and NGSS standards addressed in the use of this book. We hope you and your students enjoy the content.

Common Core Math	Common Core ELA	NGSS
Kindergarten		
CCSS.MATH.CONTENT.K.CC.A.3	CCSS.ELA-LITERACY.RI.K.4	K-2-ETS1-2
CCSS.MATH.CONTENT.K.CC.B.5	CCSS.ELA-LITERACY.RI.K.7	K-2-ETS1-3
CCSS.MATH.CONTENT.K.CC.C.6-7	CCSS.ELA-LITERACY.RF.K.1.D	
CCSS.MATH.CONTENT.K.OA.A.1	CCSS.ELA-LITERACY.SL.K.5	
CCSS.MATH.CONTENT.K.MD.A.1-2	CCSS.ELA-LITERACY.L.K.1.A	
	CCSS.ELA-LITERACY.L.K.5.C	
	CCSS.ELA-LITERACY.L.K.6	
Grade 1		
CCSS.MATH.CONTENT.1.OA.C.5	CCSS.ELA-LITERACY.RL.1.7	K-2-ETS1-2
	CCSS.ELA-LITERACY.RI.1.1	K-2-ETS1-3
	CCSS.ELA-LITERACY.RI.1.4	
	CCSS.ELA-LITERACY.RI.1.7	
	CCSS.ELA-LITERACY.RI.1.10	
	CCSS.ELA-LITERACY.RF.1.3.G	
	CCSS.ELA-LITERACY.RF.1.4.A	
	CCSS.ELA-LITERACY.RF.1.5	
	CCSS.ELA-LITERACY.L.1.1.A	
	CCSS.ELA-LITERACY.L.1.5.C	
Grade 2		
CCSS.MATH.CONTENT.2.MD.D.10	CCSS.ELA-LITERACY.RI.2.4	K-2-ETS1-2
	CCSS.ELA-LITERACY.RI.2.7	K-2-ETS1-3
	CCSS.ELA-LITERACY.L.2.5A	

Aa Aa

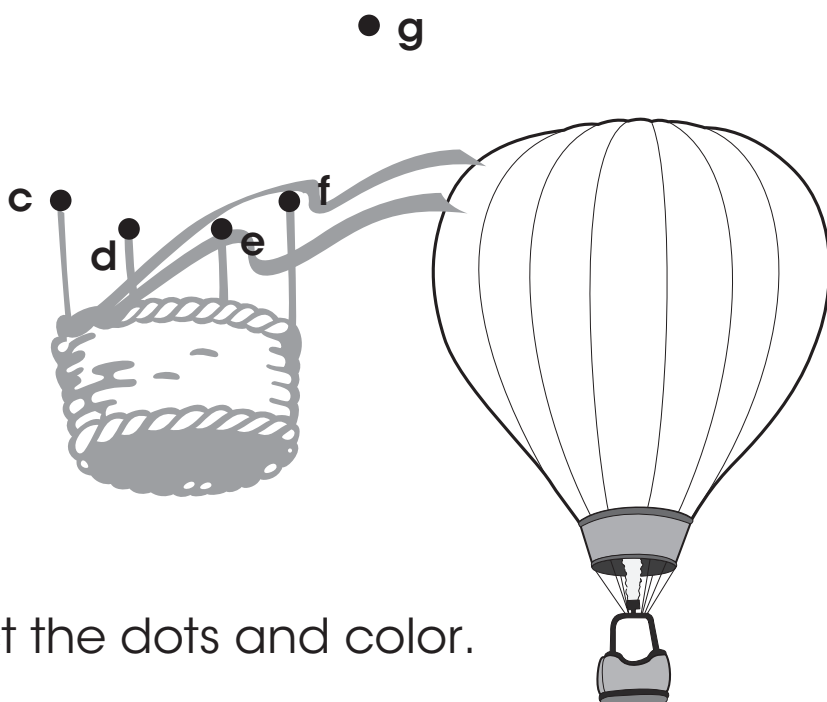
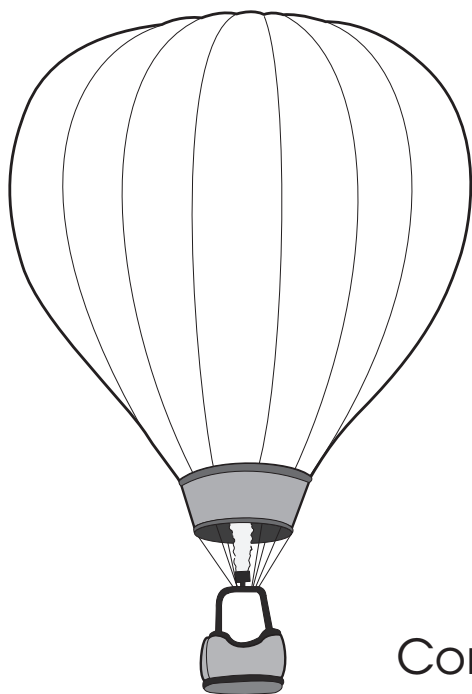
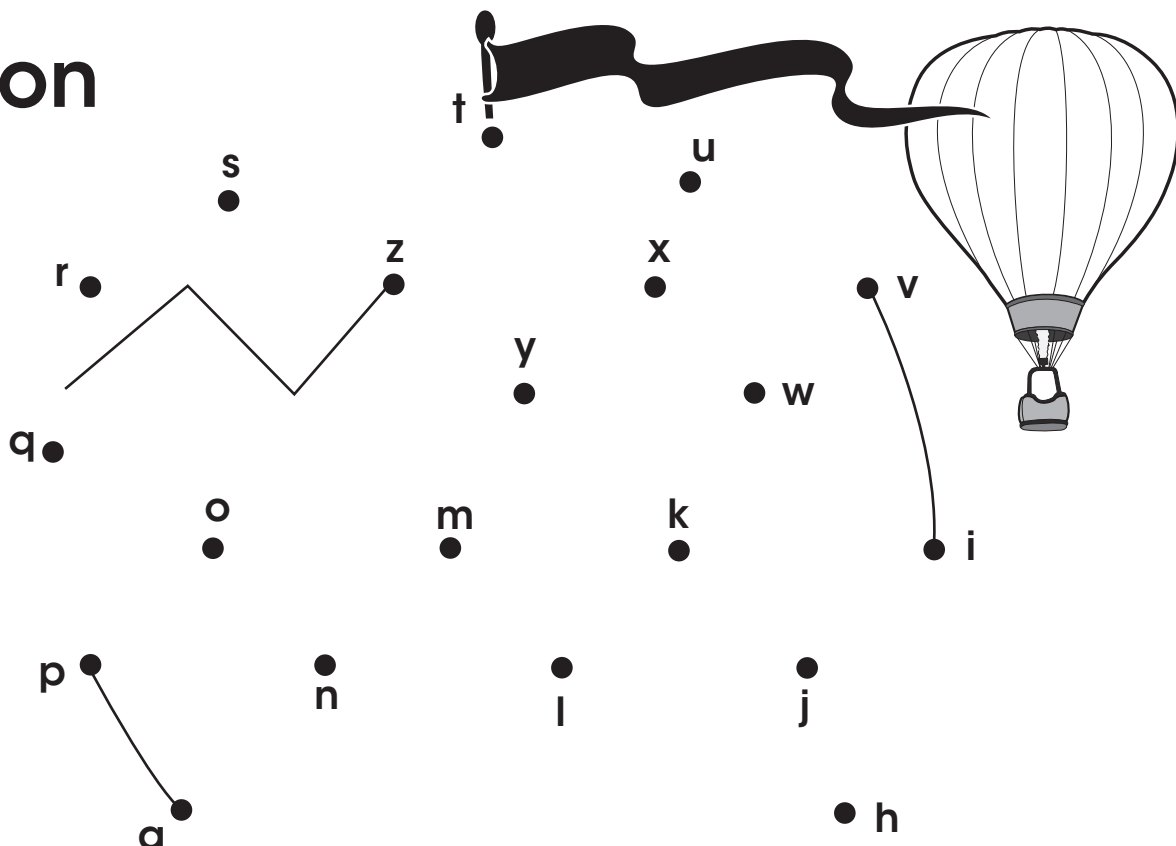
aircraft

Draw a line to match each **aircraft** to its shadow.



Bb Bb

balloon

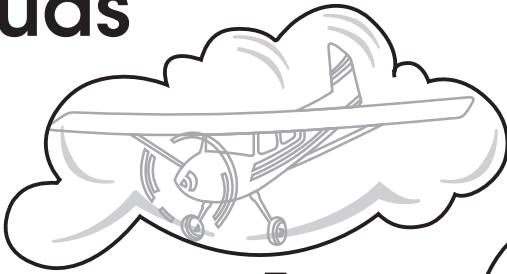


Connect the dots and color.

Cc Cc

clouds

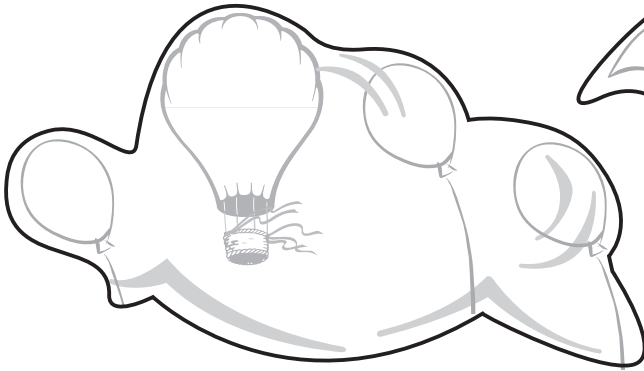
Count the pictures you see hidden in the **clouds**.



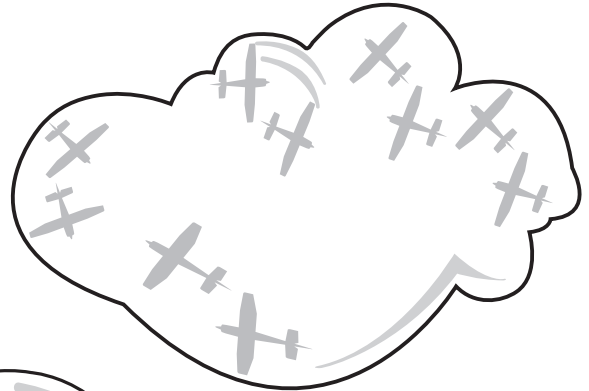
1



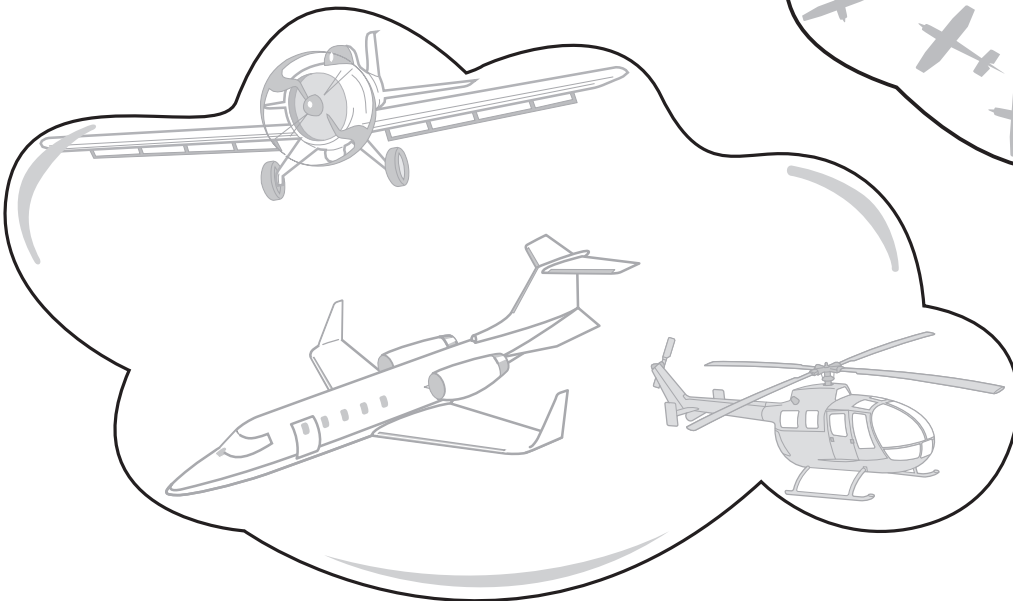
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Dd Dd


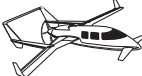

down

Follow the line and help the skydiver guide the parachute **down** to the target.

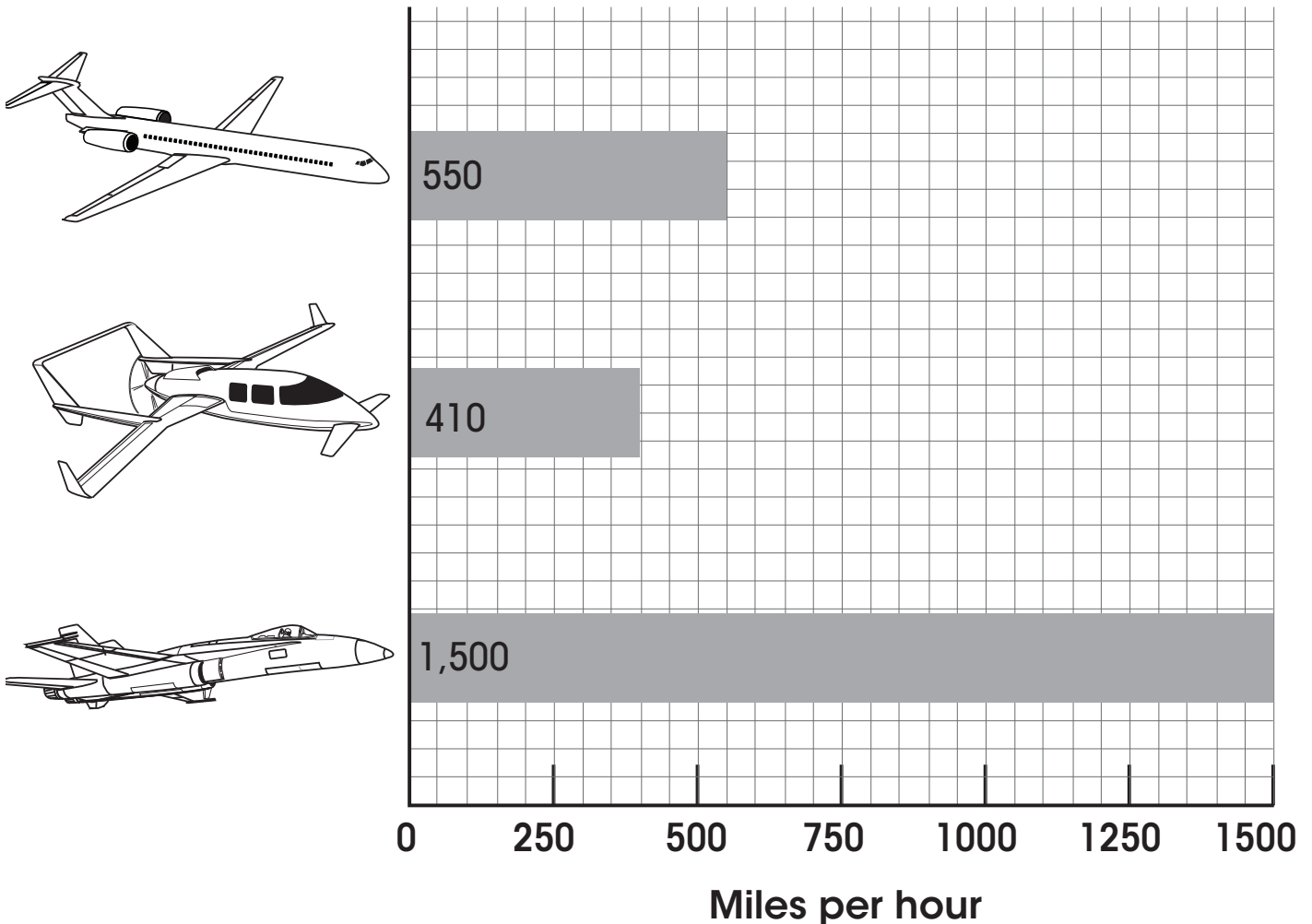


E e E e

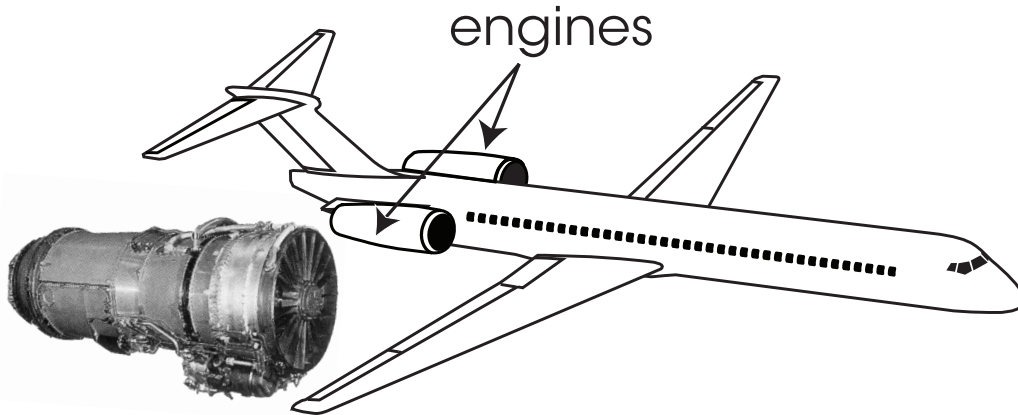
engine

Each aircraft has a different type of engine. The engines move aircraft through the air at different speeds. A passenger jet  flies through the air at about 550 miles per hour. A smaller private  aircraft flies through the air at 410 miles per hour. A  fighter jet flies through the air at 1,500 miles per hour.

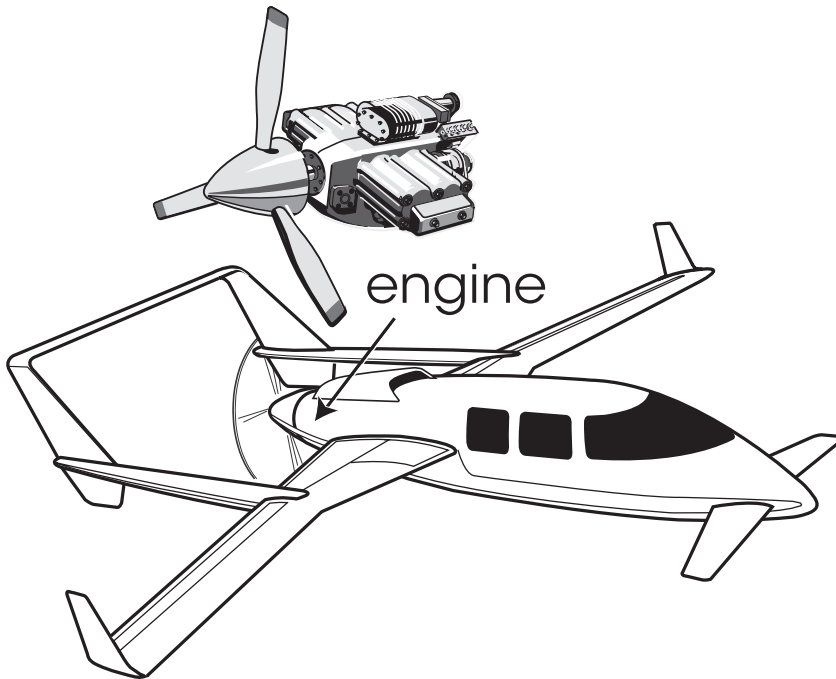
The chart below shows how fast each aircraft flies. Use the chart to complete the activity on the next page.



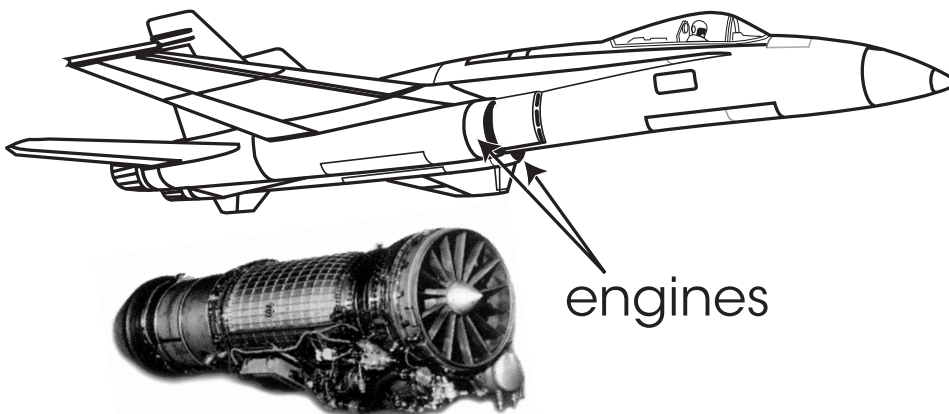
There was an airplane race. Look at the chart that tells you how fast these aircraft fly. Draw a line from the trophy to the aircraft in the order it finished.



1,500 mph



550 mph

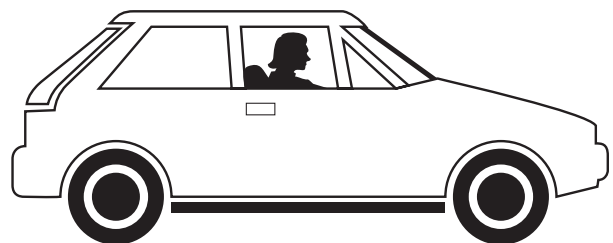
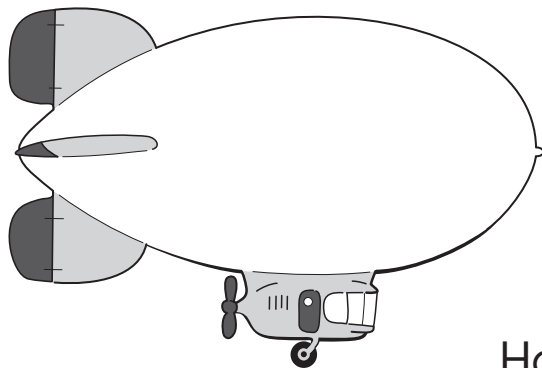
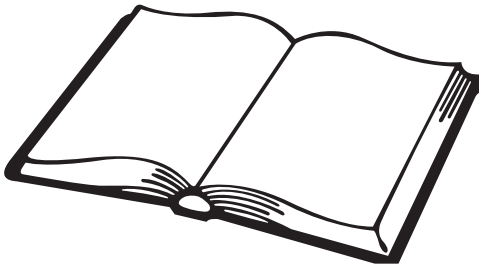
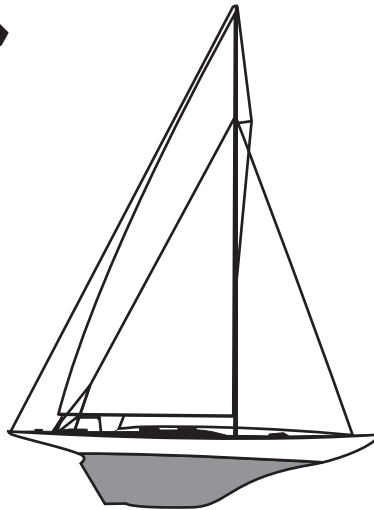
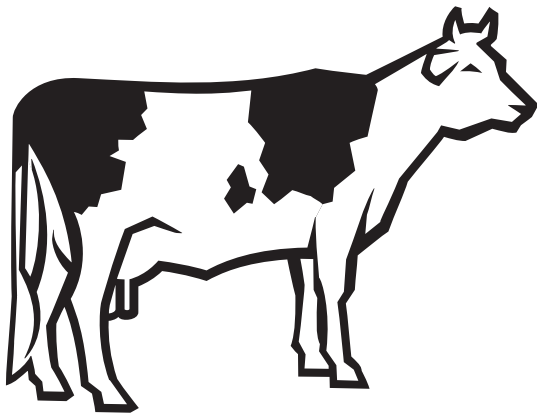
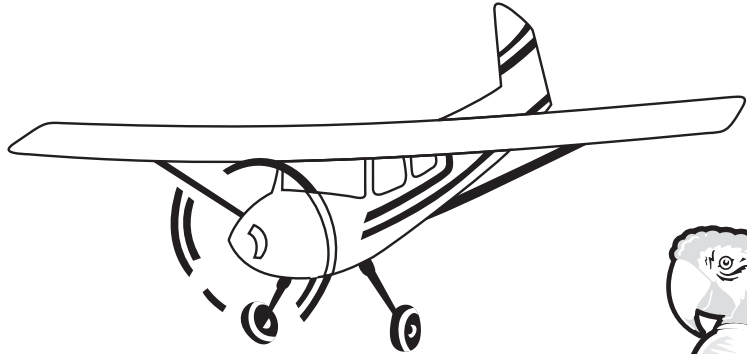


410 mph

Ff Ff

fly

Circle the pictures of the things that **fly**.



How many did you circle? _____

Gg Gg

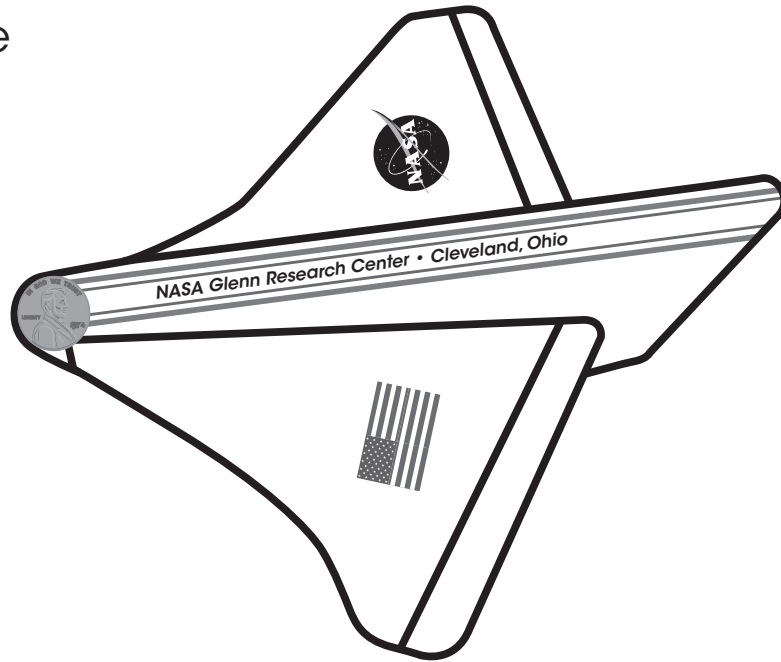
glider

Materials Needed

Scissors

Cellophane tape

One penny



Instructions

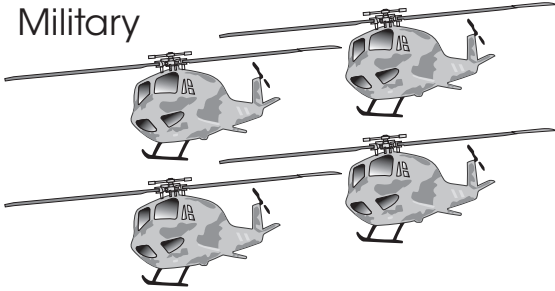
1. Cut out the wing and fuselage patterns that can be found on the back cover of this book.
2. Carefully cut the wing slot line located on the fuselage. Ask an adult to help you if you need help.
3. Slide the wing into the slot. Make sure the wing's center line lines up with the fuselage.
4. Tape the wing to the fuselage.
5. Tape the penny to the nose of the fuselage for balance.
6. Bend both flaps upward.
7. Gently launch the **glider** like you would with a paper airplane.

Hh

helicopters

Add the **helicopters** in each group.

Military

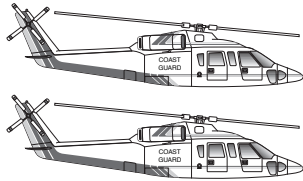


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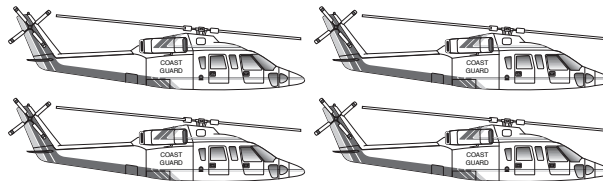


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Coast Guard

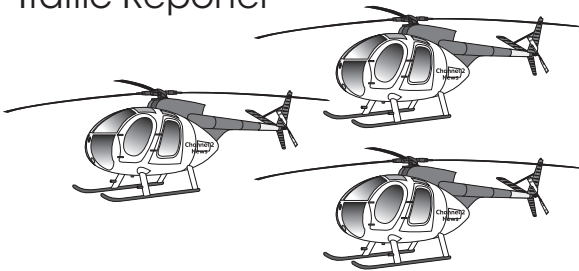


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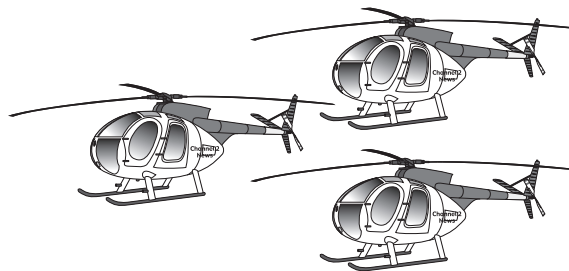


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Traffic Reporter

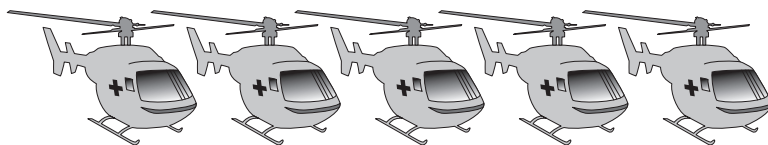


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Emergency Rescue



+

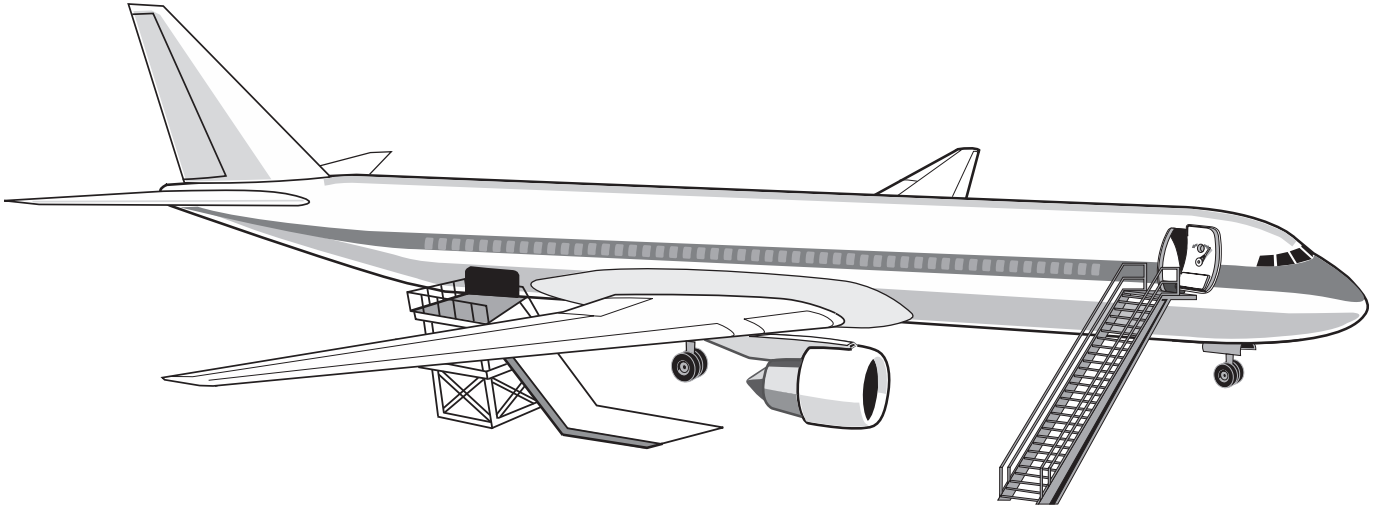


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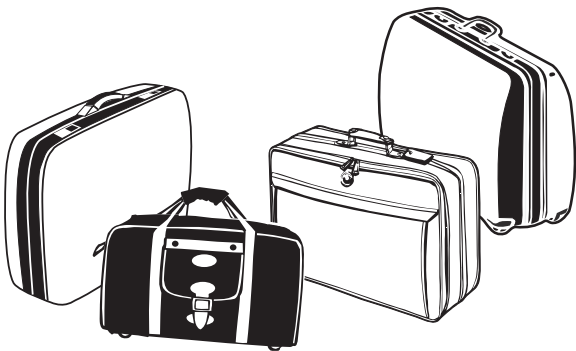
Ii

in

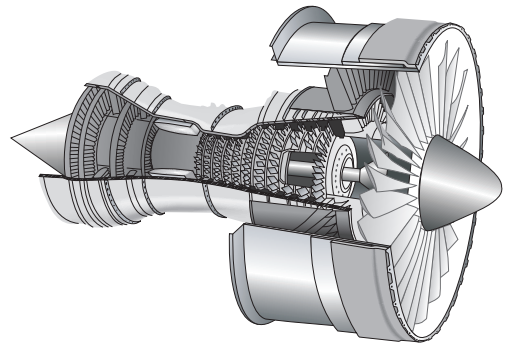
Draw a line to where the passengers, luggage, and engine go **into** the airplane.



passengers



luggage

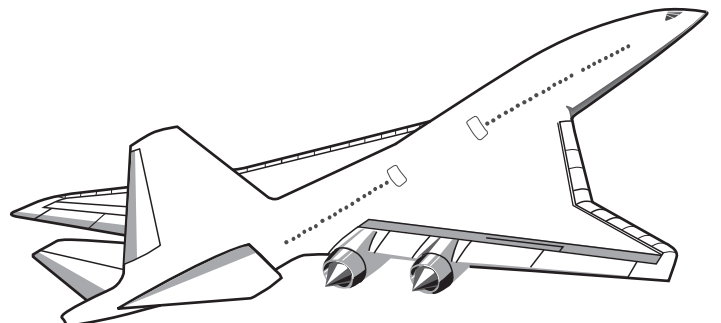
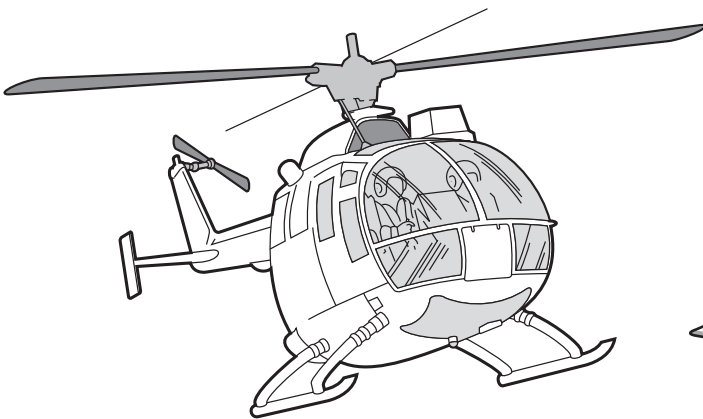
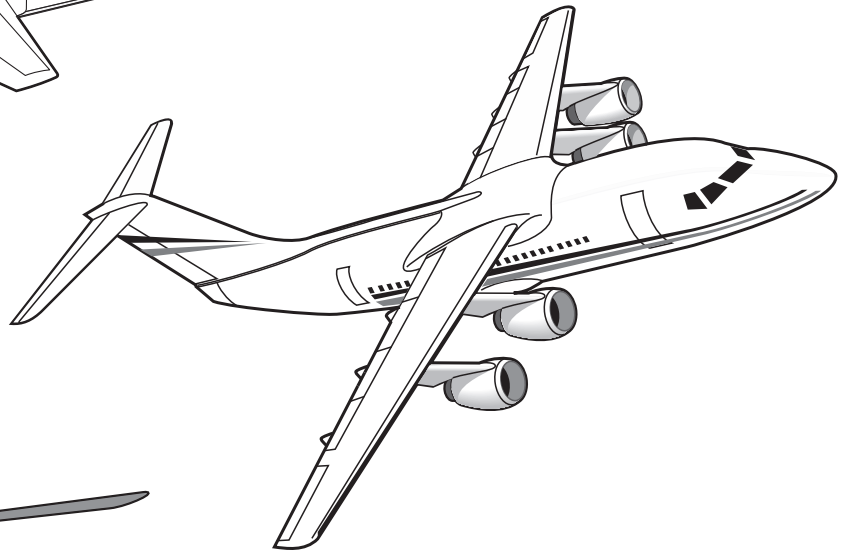
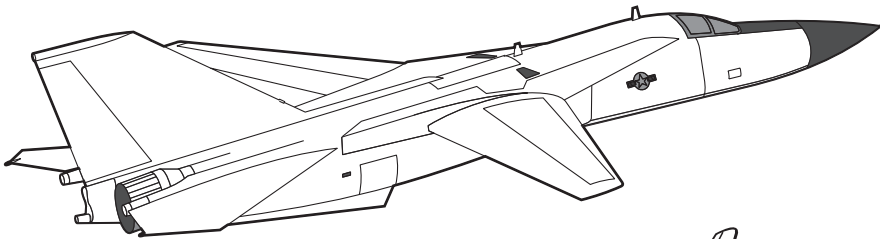
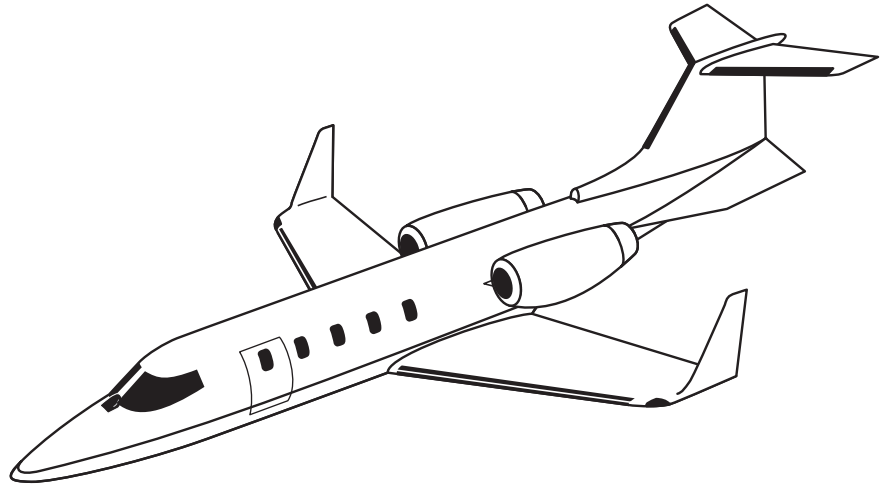


engine

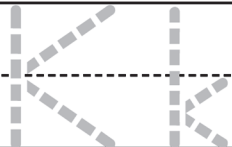
Jj Jj

jet

Circle the aircraft
that is *not* a **jet**.

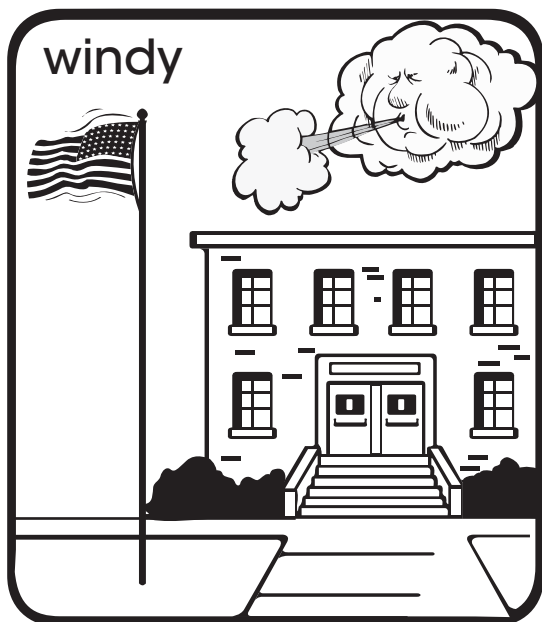
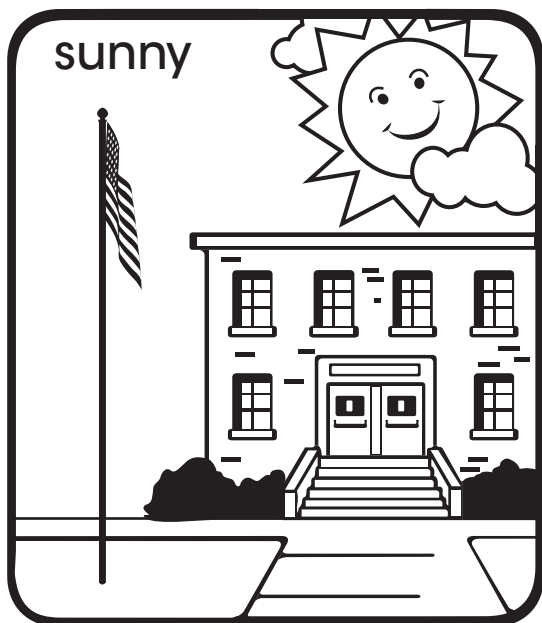
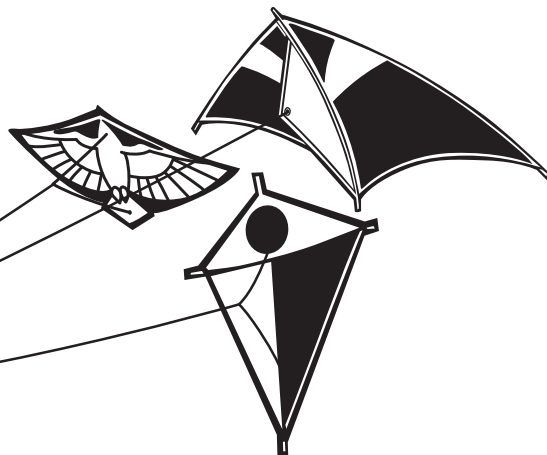


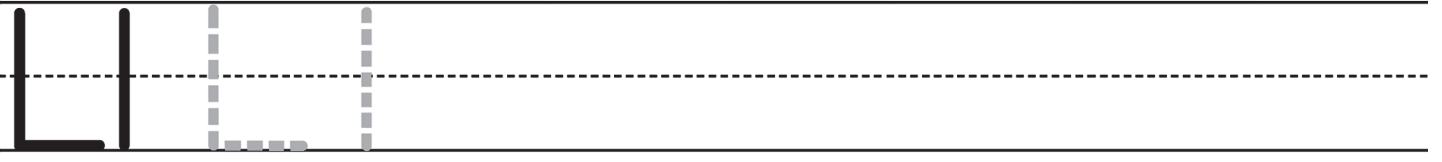
Kk



kite

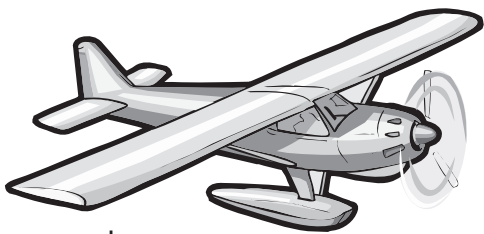
Color which type of day would be best for flying a **kite**.



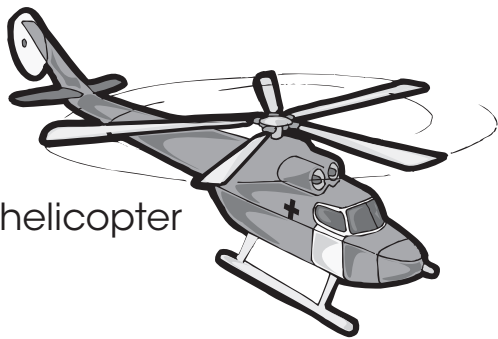
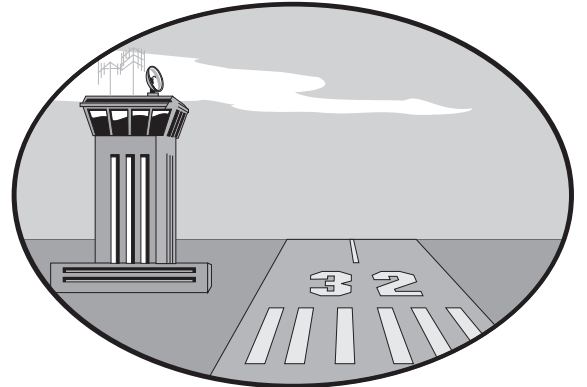


landing

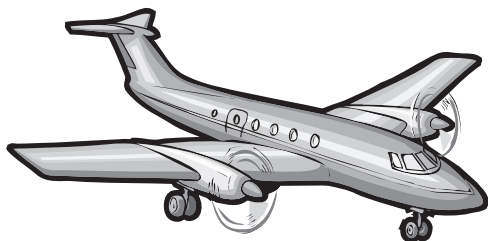
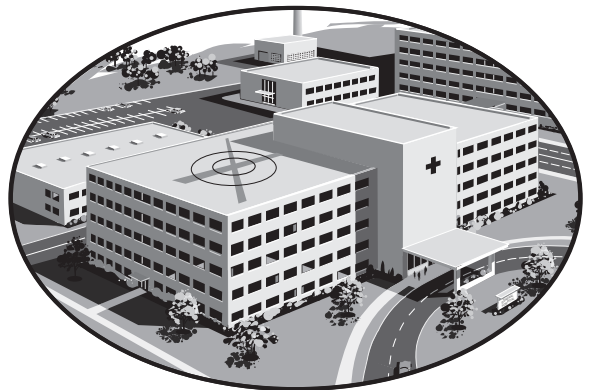
The aircraft below are **landing**. Draw a line to show where each aircraft would land.



seaplane



helicopter



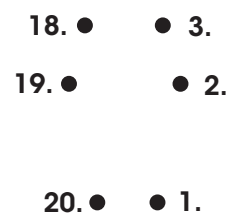
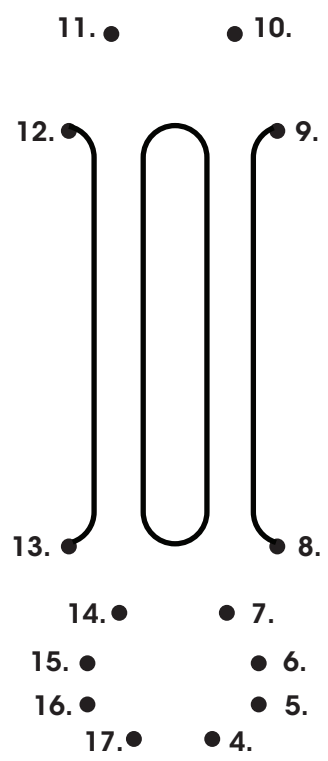
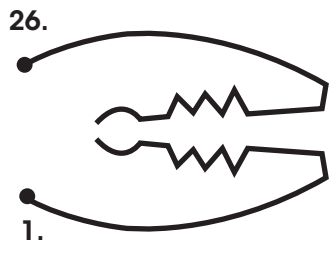
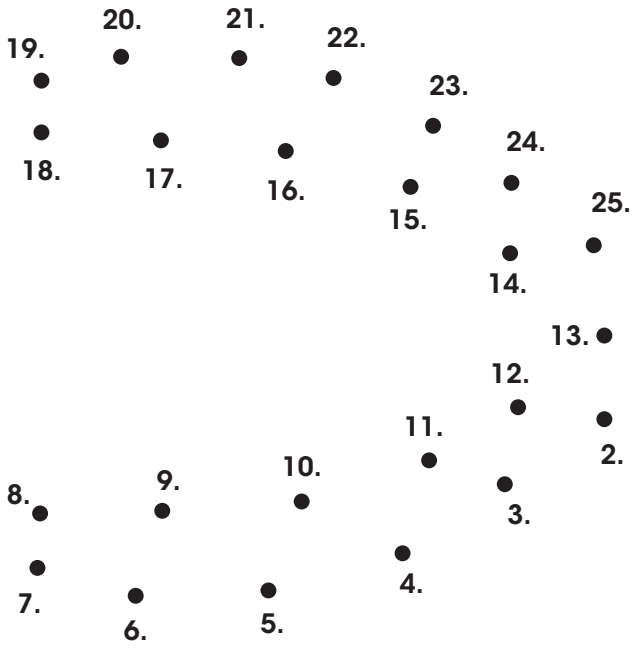
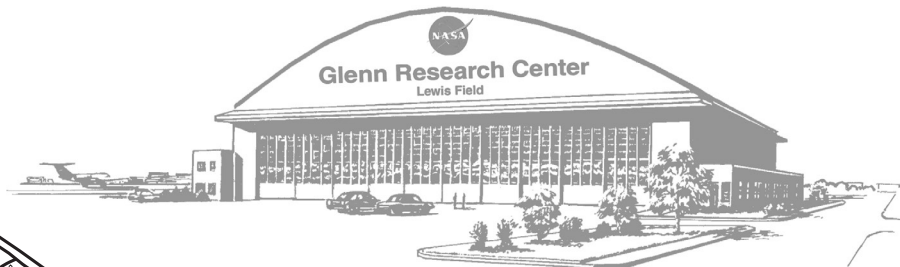
passenger plane



Mm Mm

mechanic

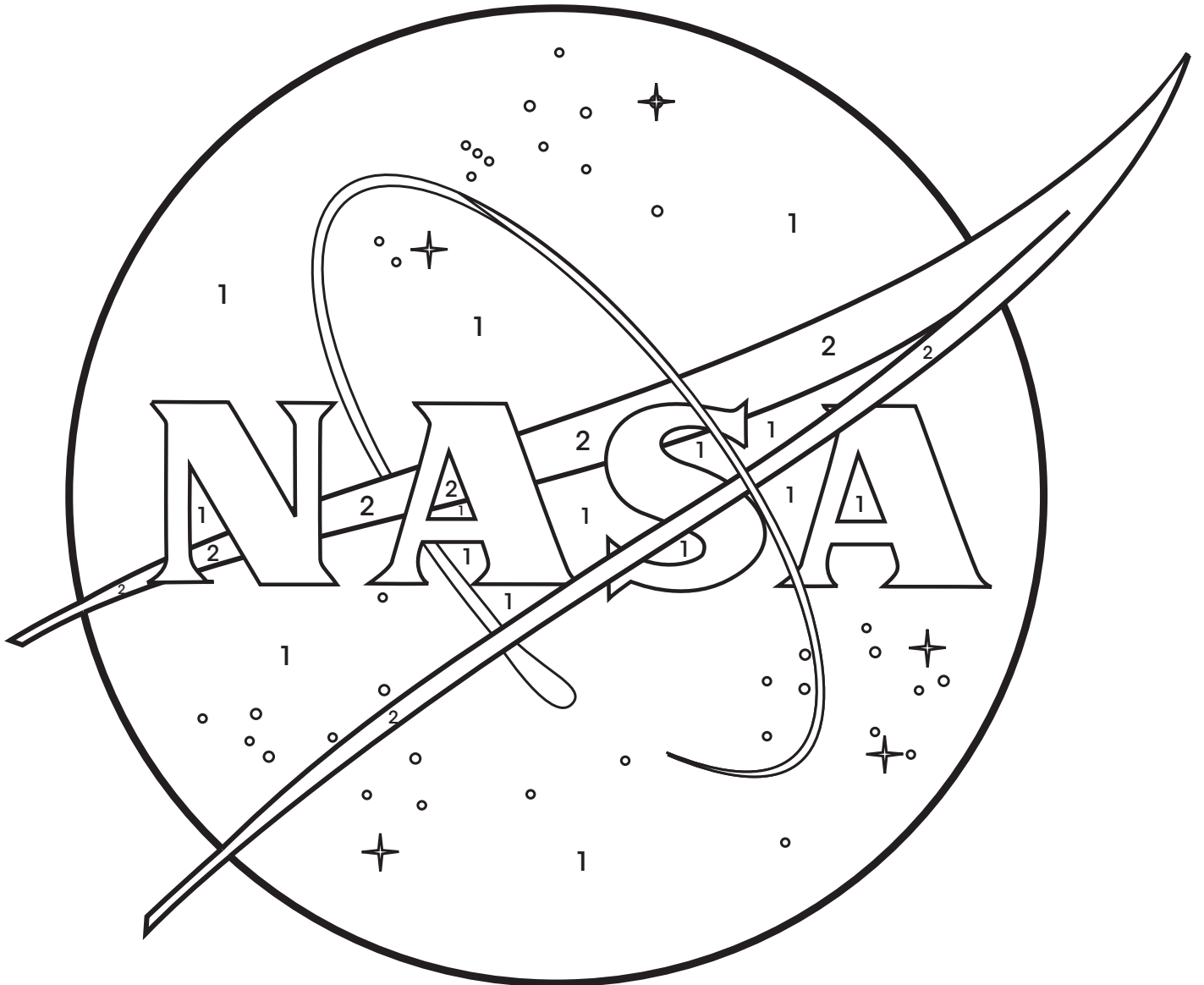
Connect the dots to see what type of tools a **mechanic** uses.



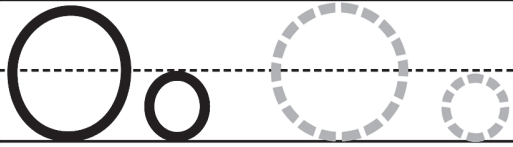
Nn Nn

NASA

National Aeronautics and Space Administration (**NASA**) logo. Color parts of the NASA logo numbered 1 blue and 2 red.



The NASA Insignia (more commonly referred to as the "meatball") reflects the history and tradition of the Agency. The sphere represents a planet, the stars represent space, the vector represents aeronautics, and the orbit represents space travel. John Medarelli of NASA Glenn Research Center created the insignia.

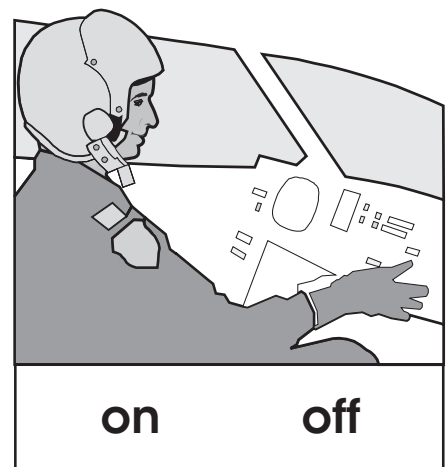
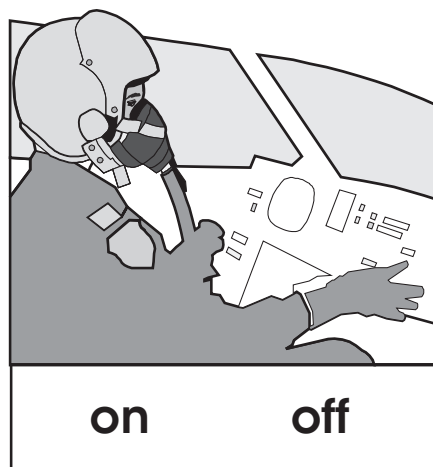
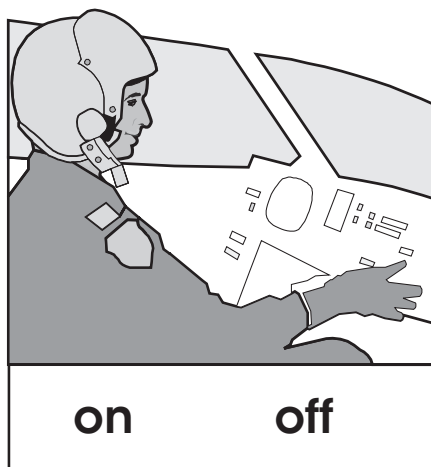
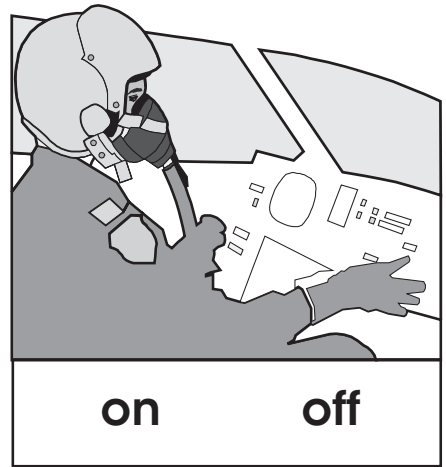
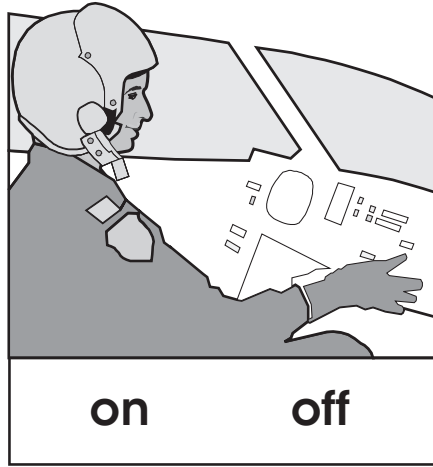
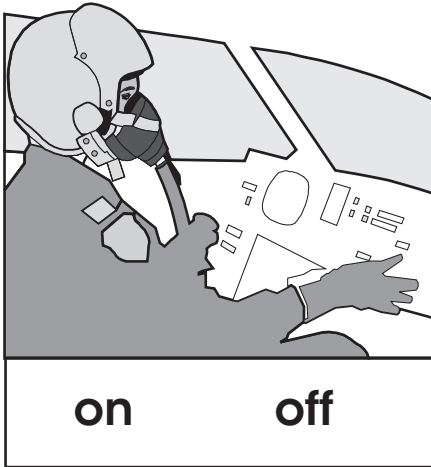


oxygen mask

Does the pilot have his **oxygen mask** on or off? Under each picture, circle the word **on** or **off**.

How many pilots have their oxygen masks on? ____

How many pilots have their oxygen masks off? ____



Pp Pp

pilot

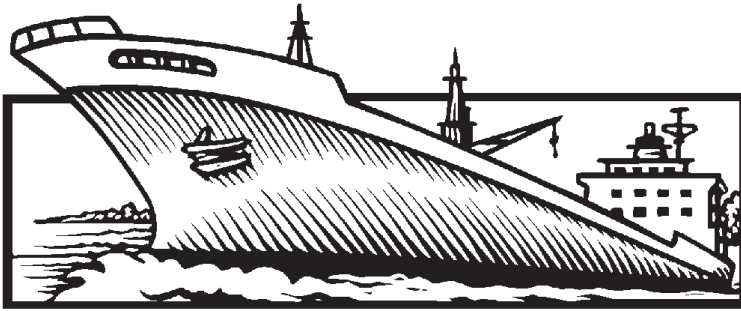
A **pilot** uses instruments in the cockpit to fly. Color the circles green, the squares red, the triangles yellow, and the rectangles blue.



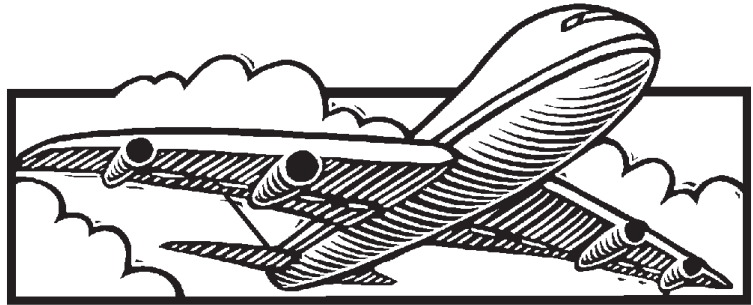
Qq Qq

quick

Your family is going on a trip far away. Under each picture is the time it will take each vehicle to get there. Circle the vehicle that will get you there the **quickest**.



2 weeks



2 hours

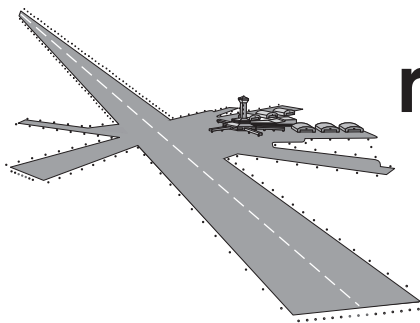


1 day



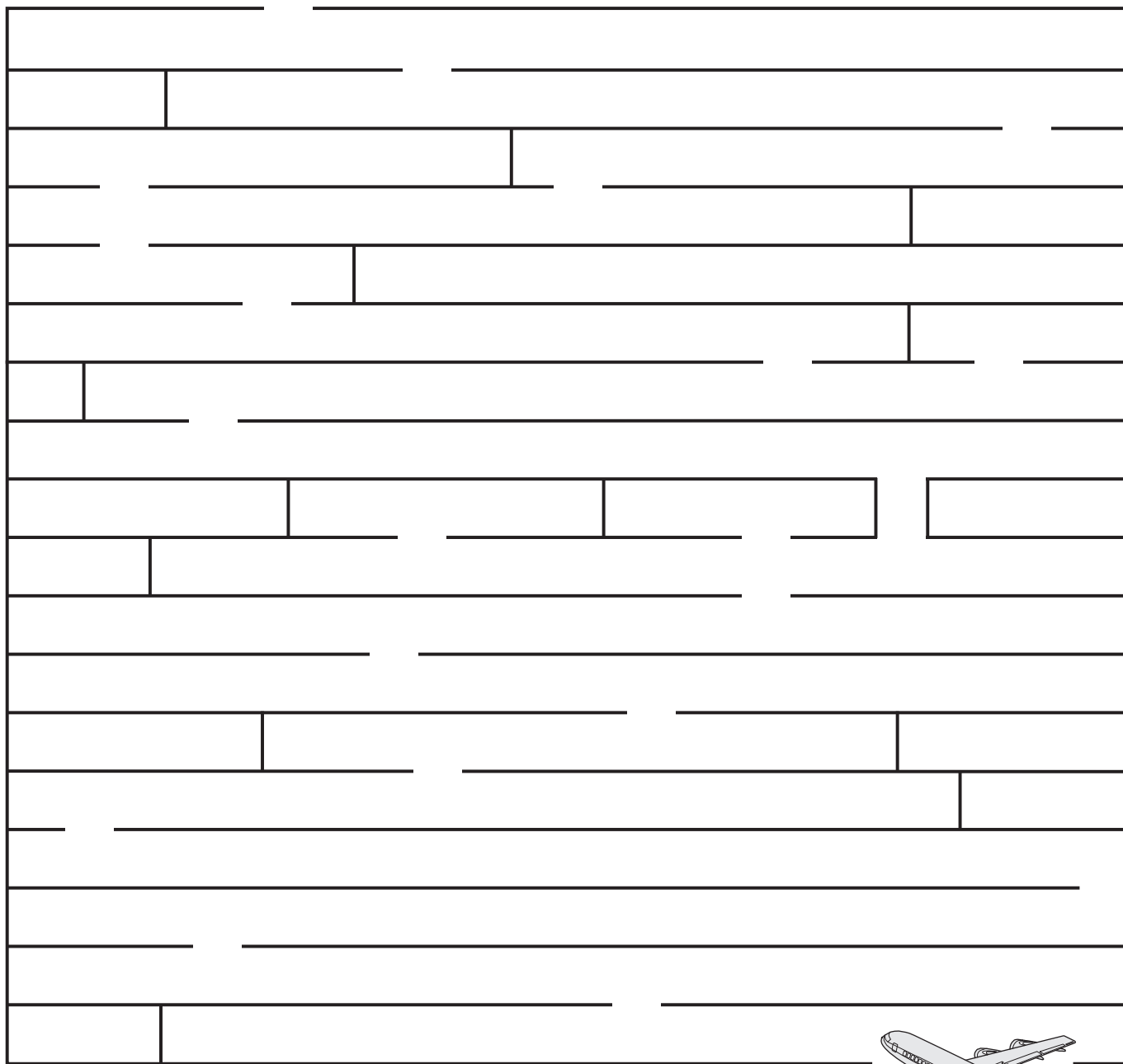
3 days

Rr Rr

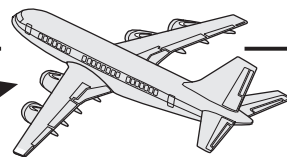


runway

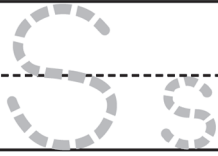
Help the airplane find the **runway** through the maze.



Start here

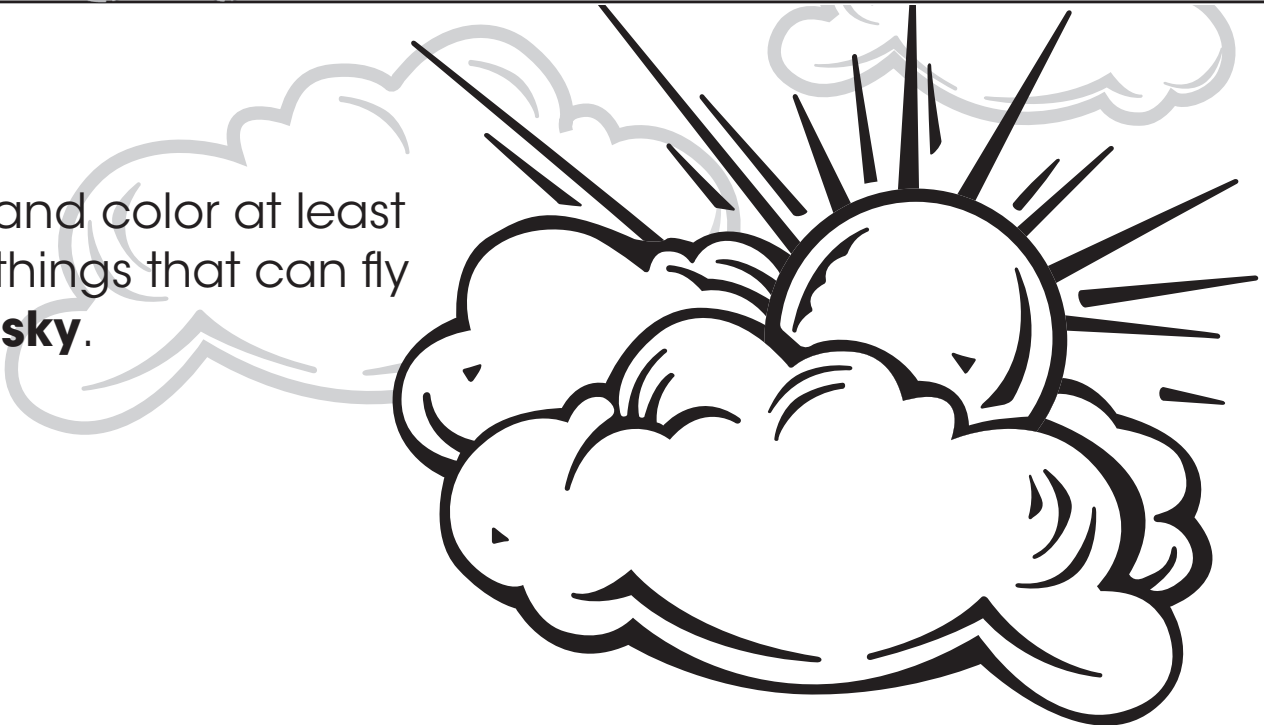


Ss



sky

Draw and color at least three things that can fly in the **sky**.

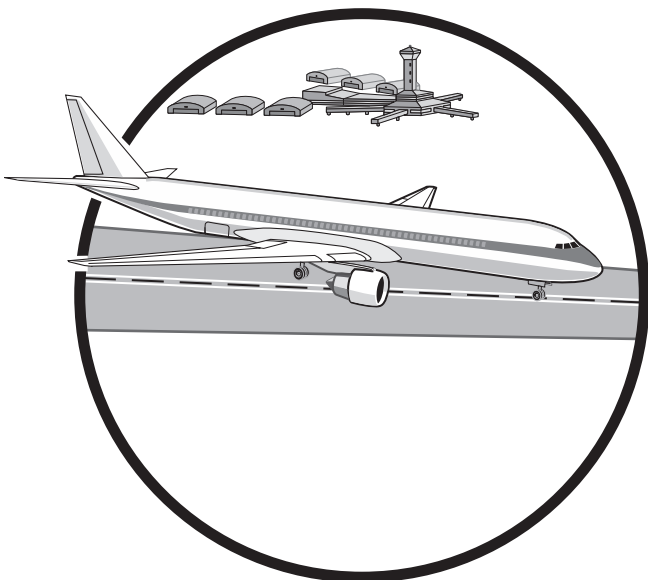
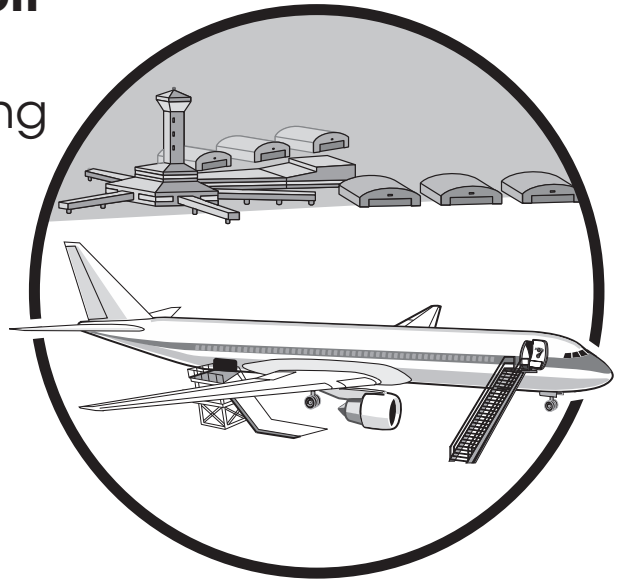
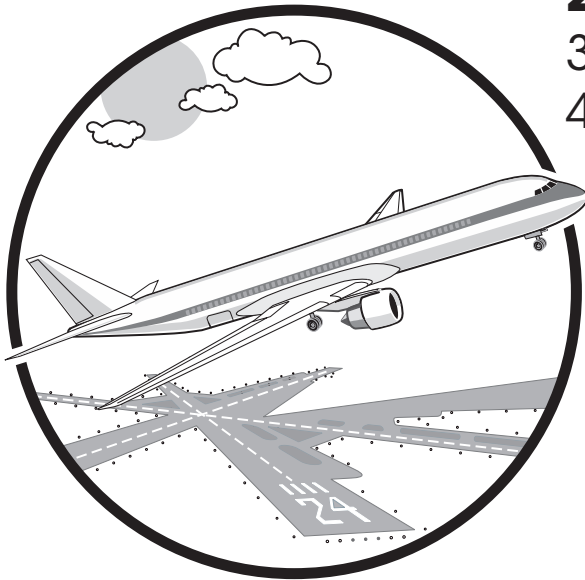


T t

takeoff

Write the number under the matching picture.

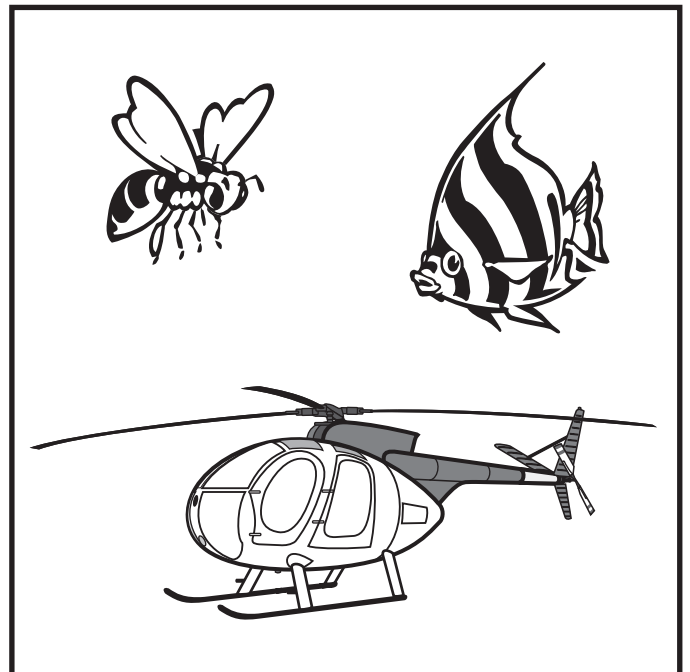
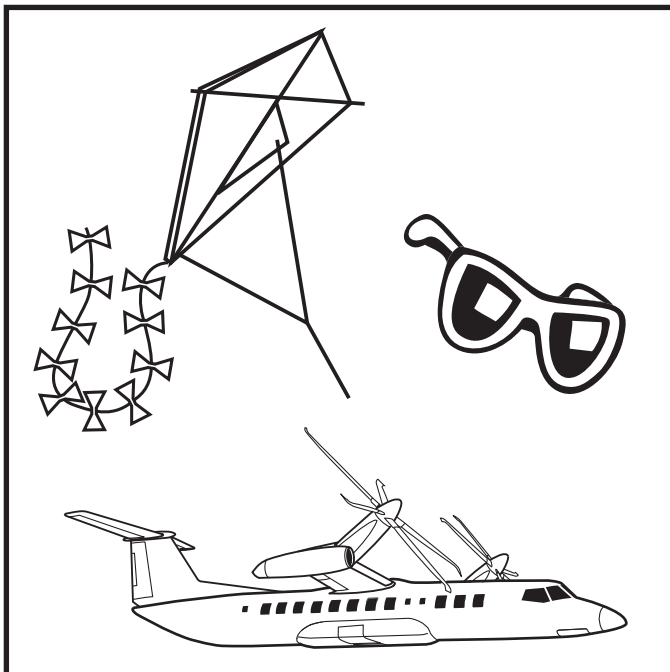
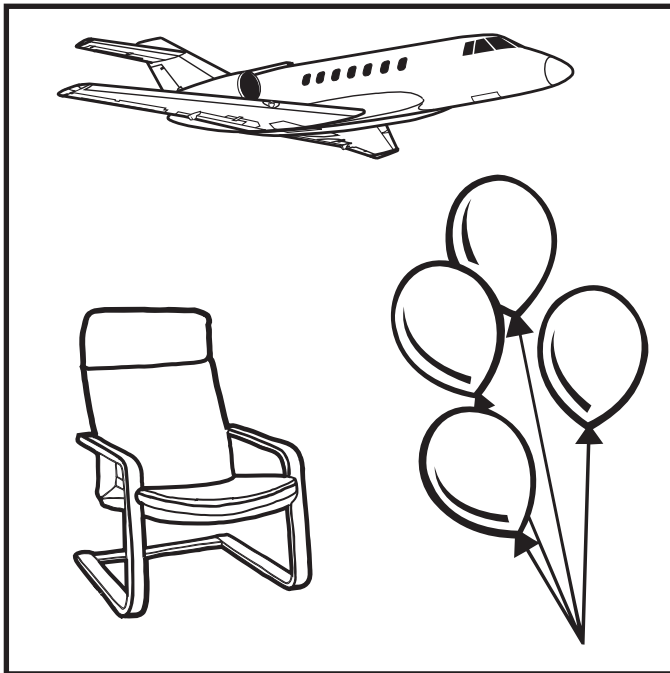
1. Loading
- 2. Takeoff**
3. Flying
4. Landing



Uu Uu

up

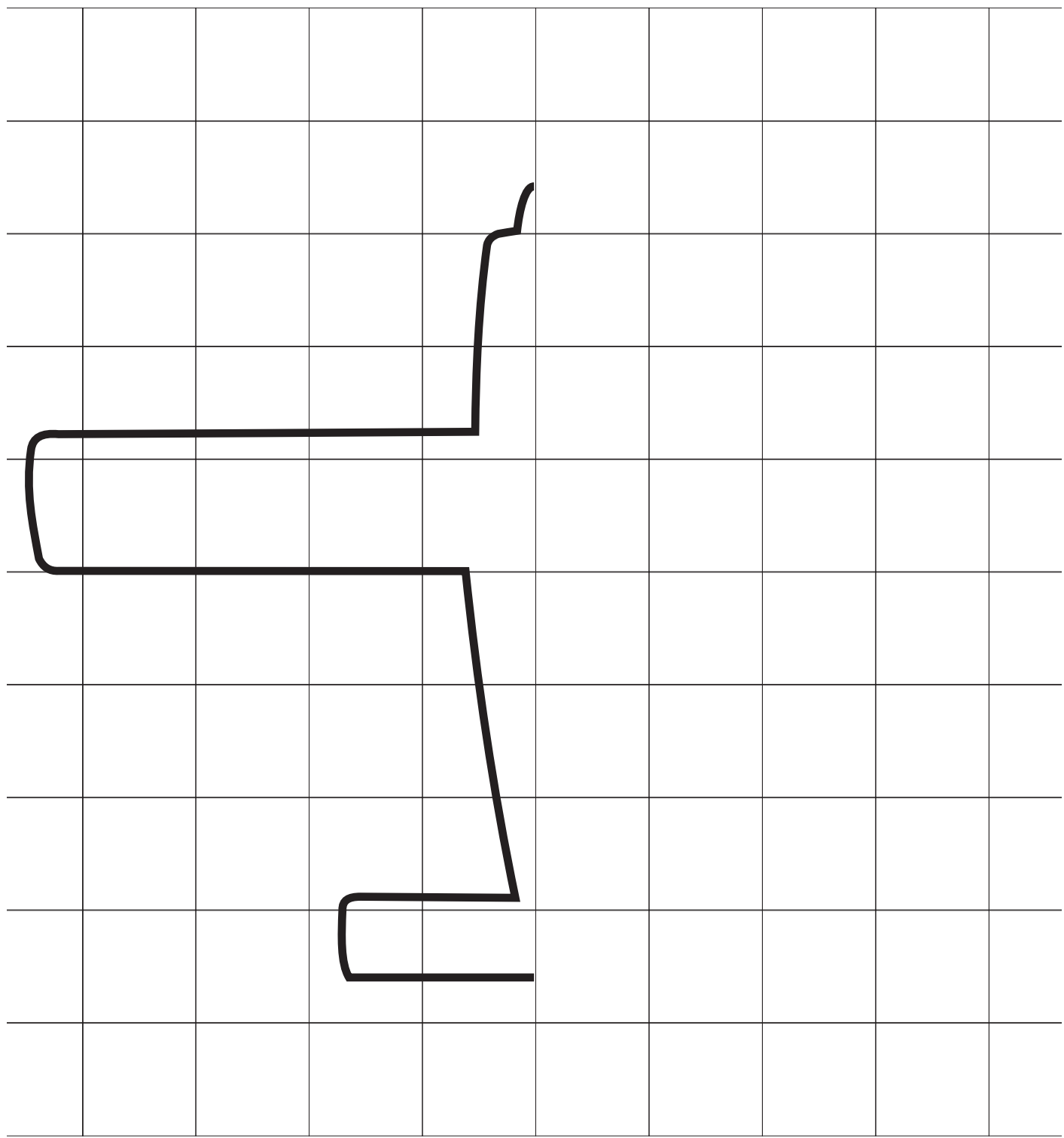
Circle the object in each group that does *not* go **up** in the air.



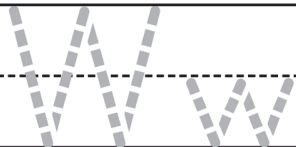
Vv Vv

view

To complete the entire **view** of the airplane, draw the other half.



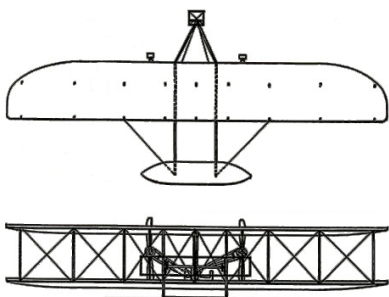
W w



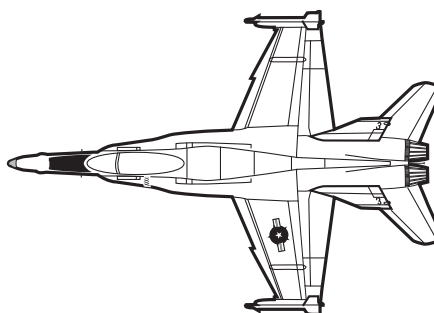
wing

Trace the different **wing** shapes.

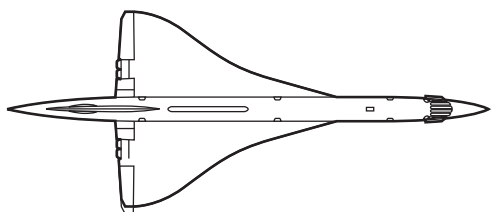
Wright Brothers



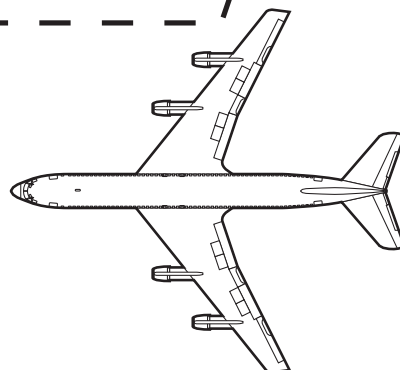
F-18
(Blue Angels)



Concorde



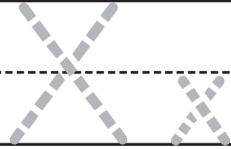
Boeing 747



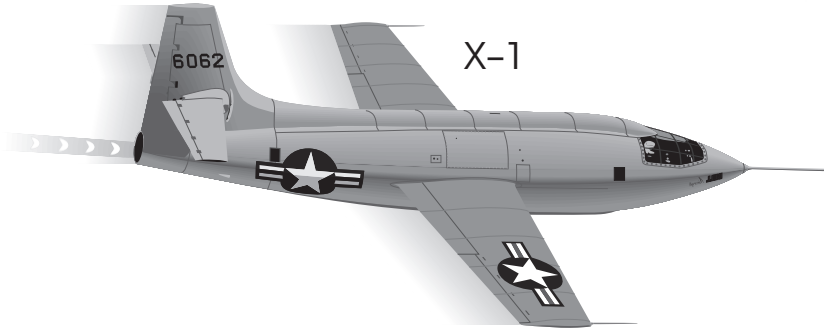
Paper airplane



Xx



X-plane



NASA uses test aircraft and space vehicles called **X-planes**. X-plane means experimental (X)-plane. Be an engineer and design your own X-plane in the space below. Give it an X-number and write it under your plane.

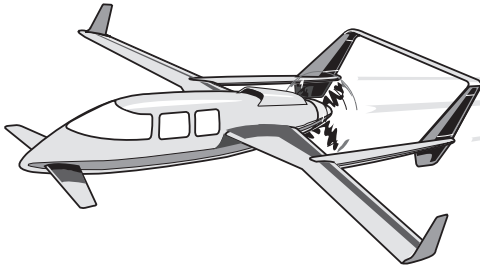
X- _____

Yy

Yy

you

Would **you** like to take an airplane ride? Who would you take with you? Draw their faces in the windows. Don't forget your face, too!

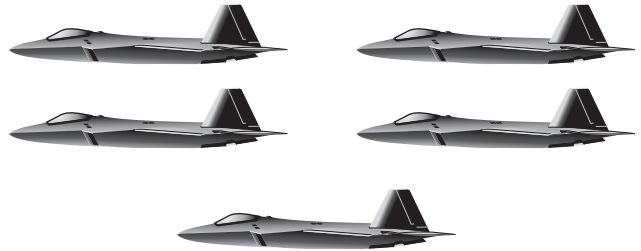
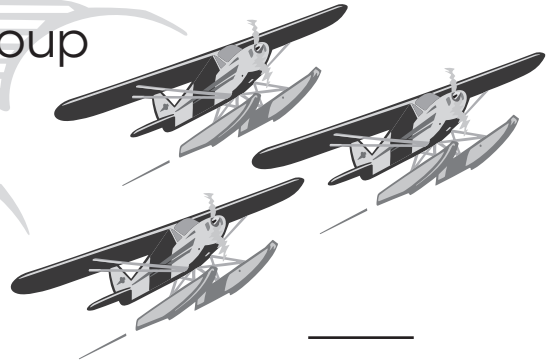
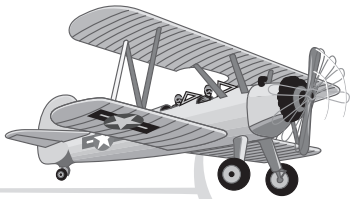
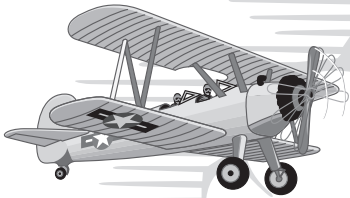


Where would **you** go on your airplane ride?

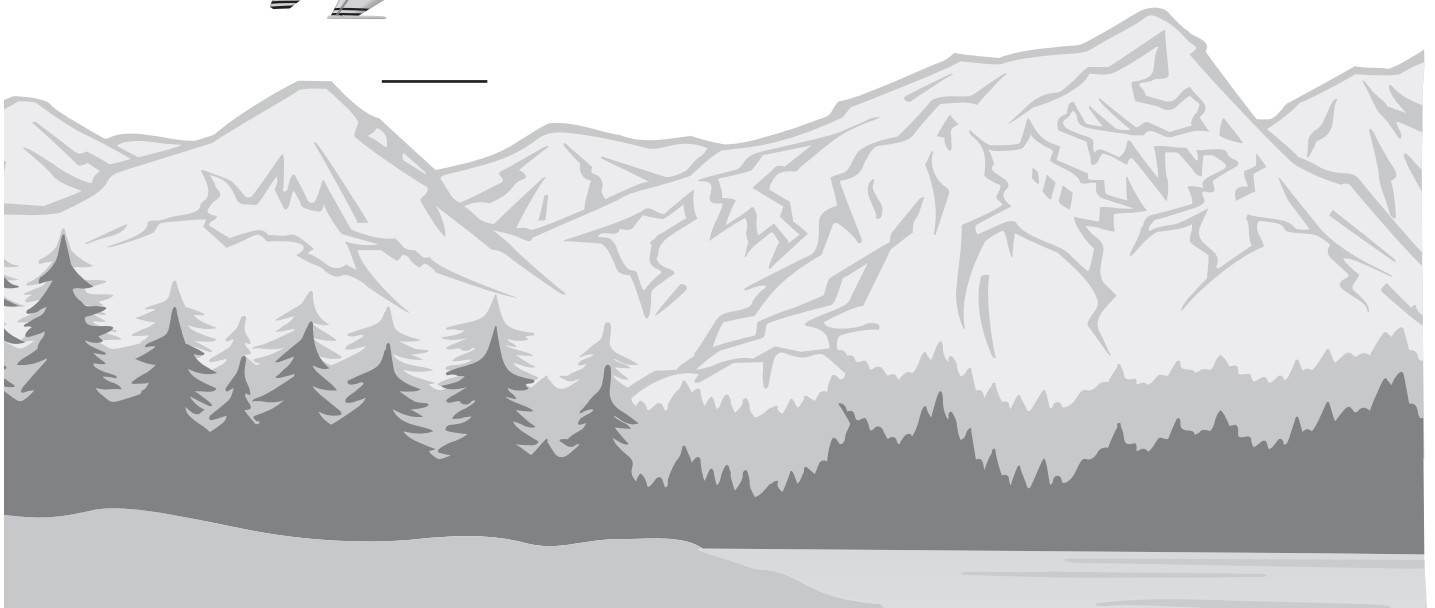
Zz Zz

zoom

Count the number of airplanes in each group as they **zoom** by.



How many airplanes did you count in all?



Aa aircraft

Aa aircraft

Bb balloon

Bb balloon

Cc clouds

Cc clouds

Dd down

Dd down

Ee engine

Ee engine

Ff fly

Ff fly

Gg glider

Gg glider

Hh helicopters

Hh helicopters

Ii in

Ii in

Jj jet

Jj jet

Kk kite

Kk kite

Ll landing

Ll landing

Mm mechanic

Mm mechanic

Nn NASA

Nn NASA

Oo oxygen

Oo oxygen

Pp pilot

Pp pilot

Qq quick

Qq quick

Rr runway

Rr runway

Ss sky

Ss sky

Tt takeoff

Tt takeoff

Uu up

Uu up

Vv view

Vv view

Ww wing

Ww wing

Xx X-plane

Xx X-plane

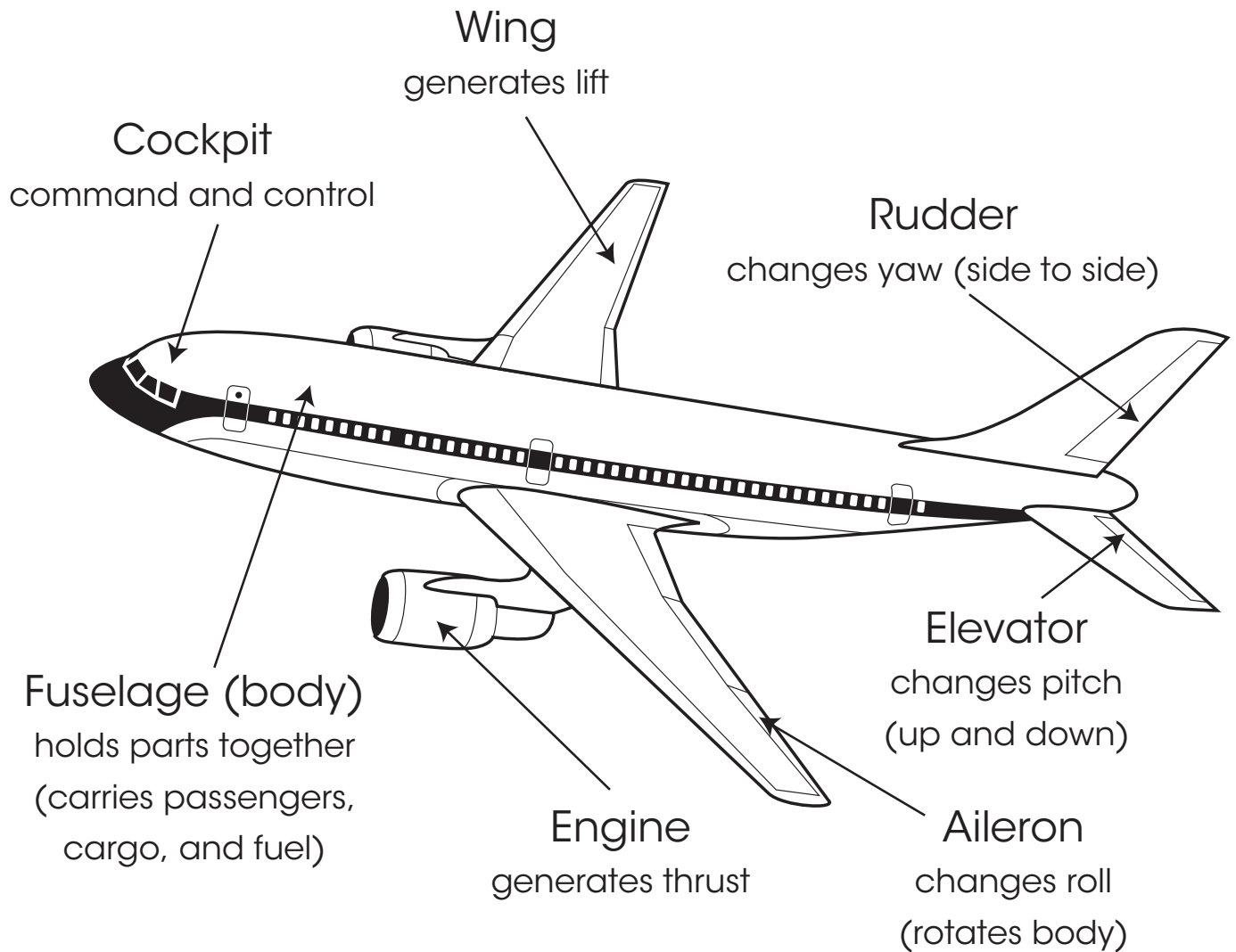
Yy you

Yy you

Zz zoom

Zz zoom

Airplane parts definitions



GLOSSARY



Aeronautics

The science of making and flying aircraft.

Aileron

A hinged flap on the back edge of the wing of an airplane; the flap is moved up or down to keep the airplane steady or make a turn in the air (refer to picture on page 39).

Aircraft

1. An item that you can fly or float through the air.
2. Any machine for flying.

Airplane

An aircraft that is kept up by the force of air upon its wings and driven forward by a jet engine or propeller.

Balloon

A large bag or rubber sack that is filled with air or other gases causing it to rise and float in the air.

Clouds

White or gray objects that float in the air and contain tiny water drops.

Cockpit

A place where the pilot or crew sits to control the aircraft (refer to picture on page 39).

Elevator

A part of the tail of an airplane that can be moved to make the airplane go up or down (refer to picture on page 39).

Elevon

A control surface on an airplane that combines the functions of an elevator and an aileron.

Engine

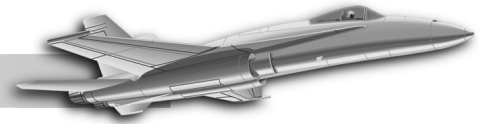
A machine, such as an aircraft engine, that uses energy of some kind to create motion and do work (refer to picture on page 39).

Engineer

A person trained and skilled in the design, construction, and use of engines, machines, or other devices of industry and everyday life.

Experimental

Having to do with a test or series of tests to find out if something is correct.

**Fuselage**

The main structural body of an aircraft to which the wings and tail are attached (refer to picture on page 39).

Glider

An aircraft that has no engine and is carried along by air currents.

Helicopter

A kind of aircraft that has a large propeller fixed on top and no wings; it can be flown backward, forward, straight up, and down.

Instrument

A mechanical or electronic measuring device that gives pilots information they need to fly their airplanes safely.

Jet

An airplane that moves very quickly and is jet propelled.

Kite

A tethered glider that is lifted by the wind.

Landing

The act of coming down after flying.

Loading

Putting something to be carried into or upon an aircraft.

Luggage

The suitcases, trunks, baggage, and belongings of a passenger.

Mechanic

1. A worker skilled in making, using, or repairing machines, vehicles, and tools.
2. A person who repairs and maintains aircraft.

Oxygen mask

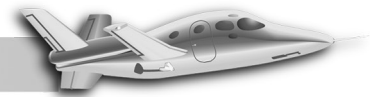
A mask placed over the mouth and nose and through which oxygen is supplied from an attached storage tank.

Parachute

A large cloth device that opens up like an umbrella and is used for slowing down a person or thing dropping from an airplane.

Passenger

A person traveling in an airplane but not helping to operate it.

**Pilot**

A person who operates an airplane, balloon, or other aircraft.

Propeller

A set of blades driven by an engine that pull or push an airplane through the air.

Runway

A surface on the ground specifically used for aircraft takeoffs and landings.

Rudder

A hinged, vertical flap at the rear of an aircraft; used for steering (refer to picture on page 39).

Seaplane

Any airplane designed to land on or take off from water.

Takeoff

The act of rising from the ground, especially in an aircraft.

Vehicle

An object that moves people, such as an automobile, bicycle, or aircraft.

View

A way of seeing or looking at something.

Wing

The part of an airplane that produces lift (refer to picture on page 39).

X-plane

A special vehicle designed for experimental flight tests.

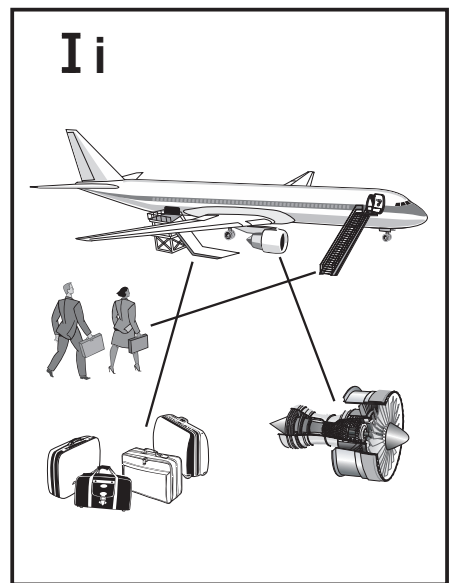
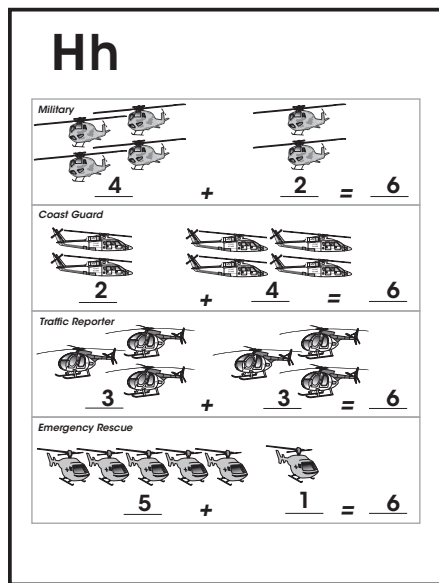
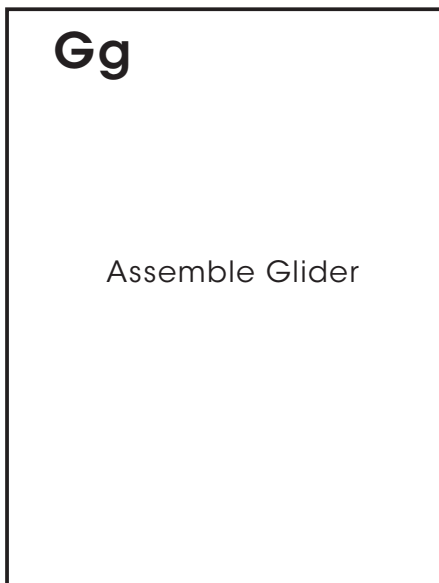
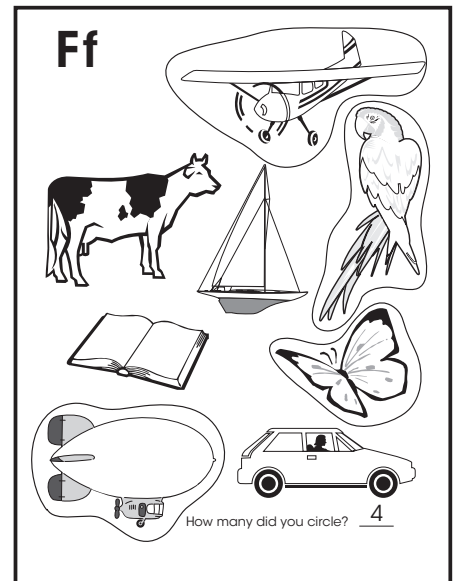
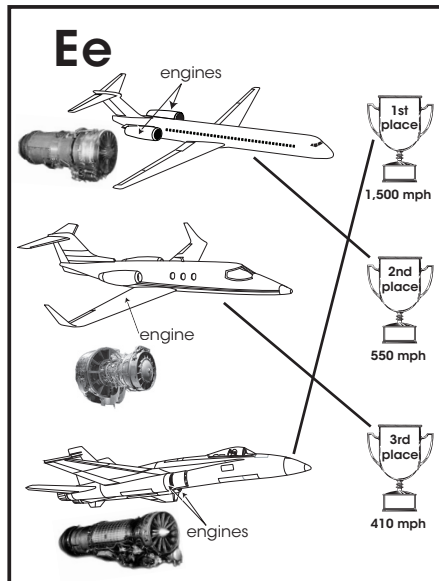
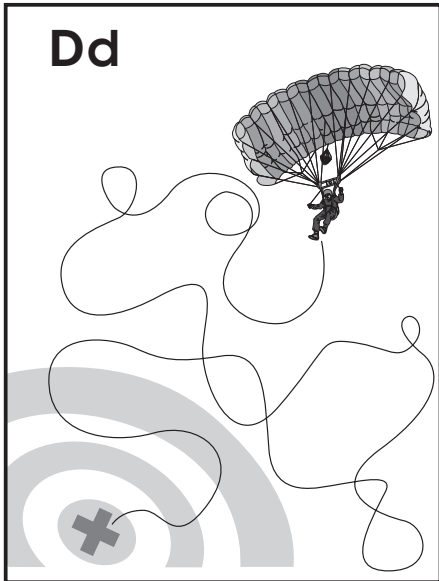
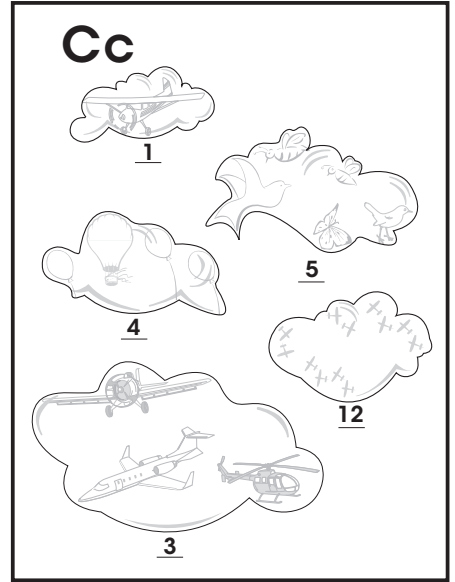
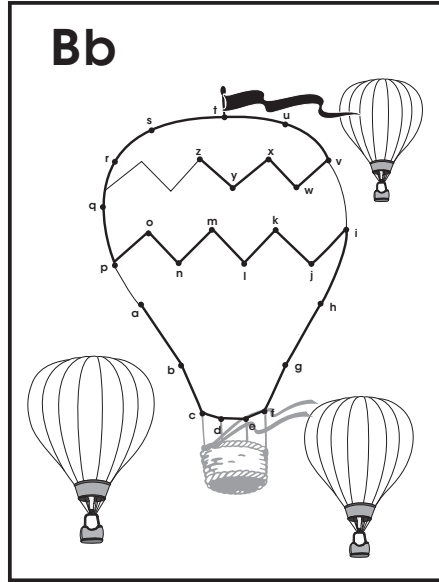
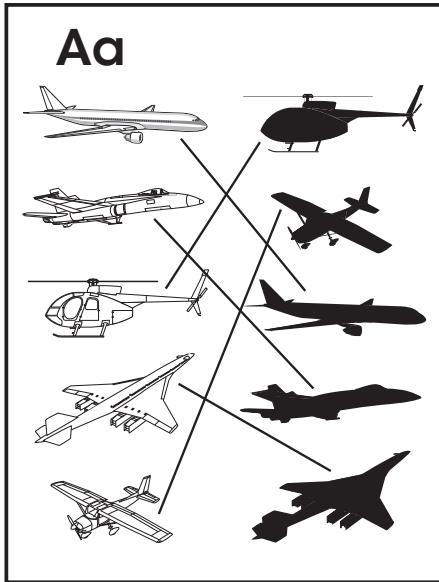
Source definitions:

"Webster's Student Dictionary," SMITHMARK Publishers, New York, NY, 1999.
<http://www.dictionary.com>

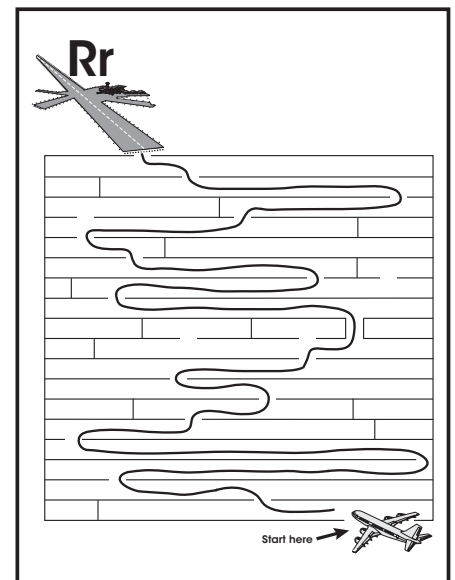
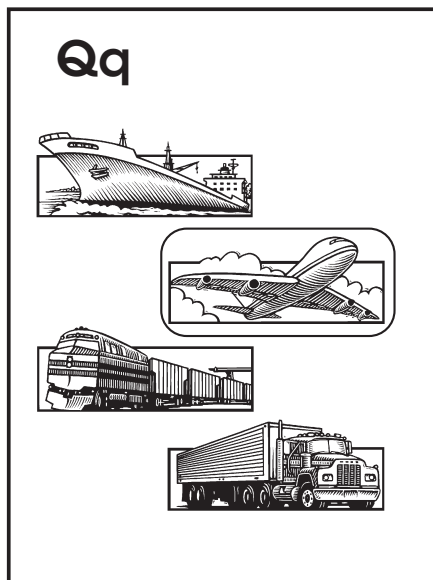
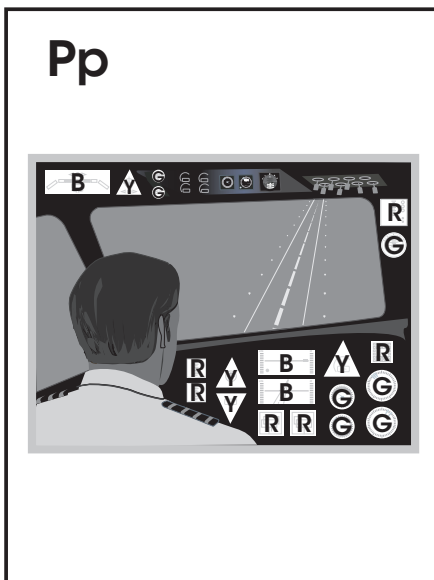
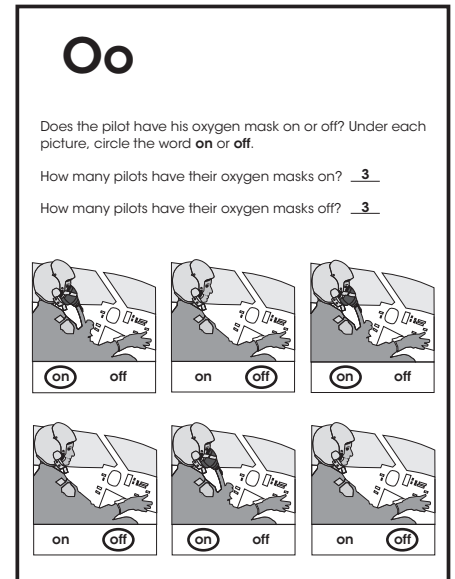
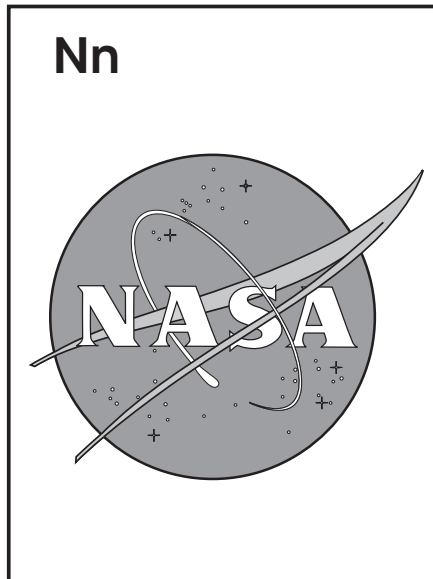
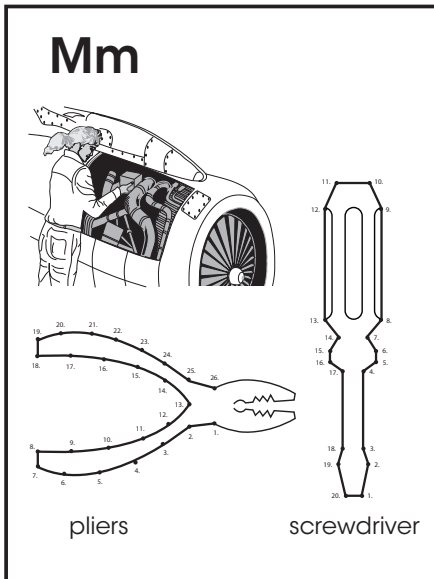
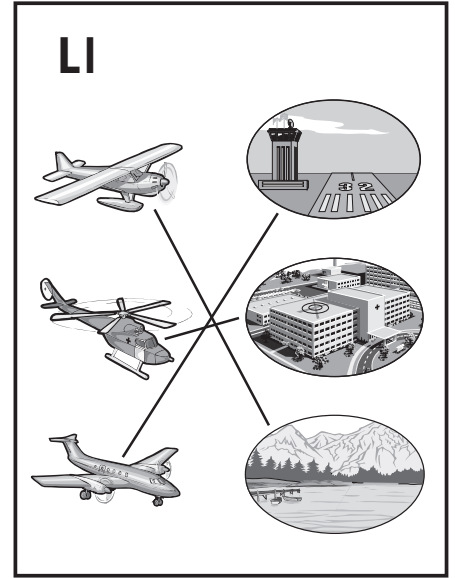
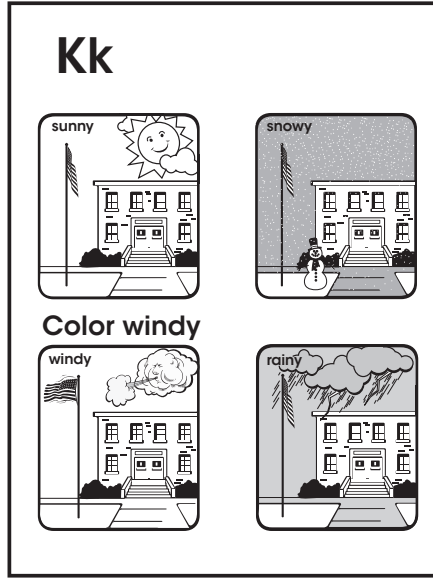
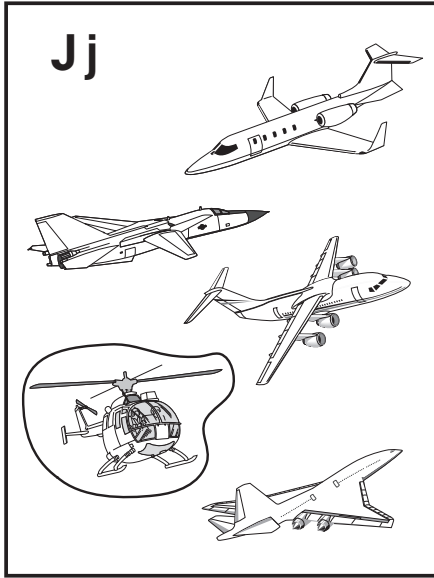
"Flight," The Nature Company Discoveries Library, Time-Life Books, 1995.

Little Explorers Picture Dictionary from EnchantedLearning.com
<http://www.littleexplorers.com/Dictionary.html>

Answer page

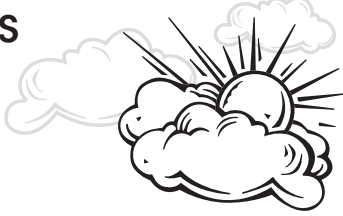


Answer page



Answer page

Ss

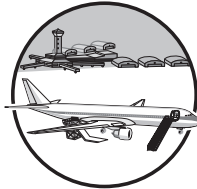


Your own drawings here.

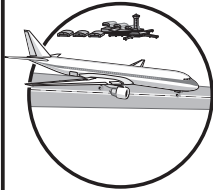
Tt



2



1

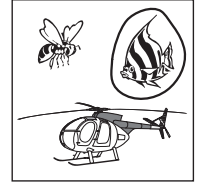
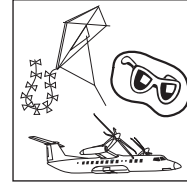
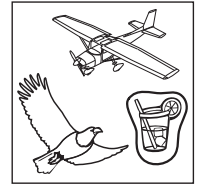
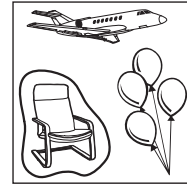


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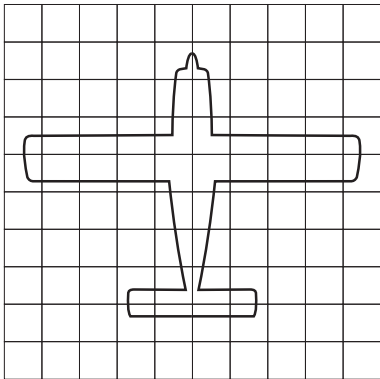


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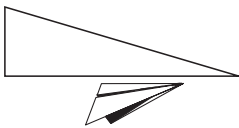
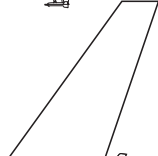
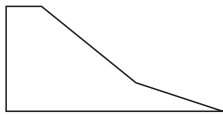
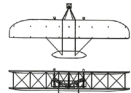
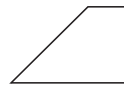
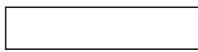
Uu



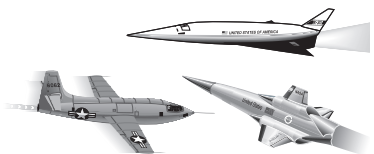
Vv



Ww

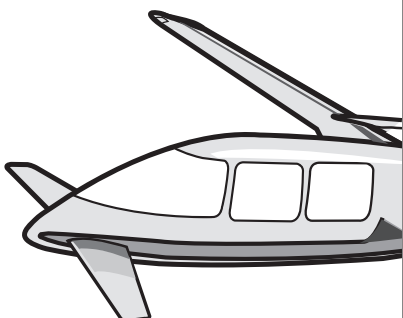


Xx



Your own drawing here.

Yy



Your own drawings here.

Zz



2



3

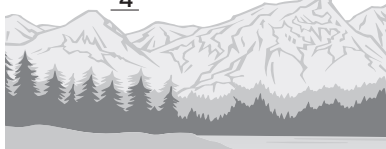


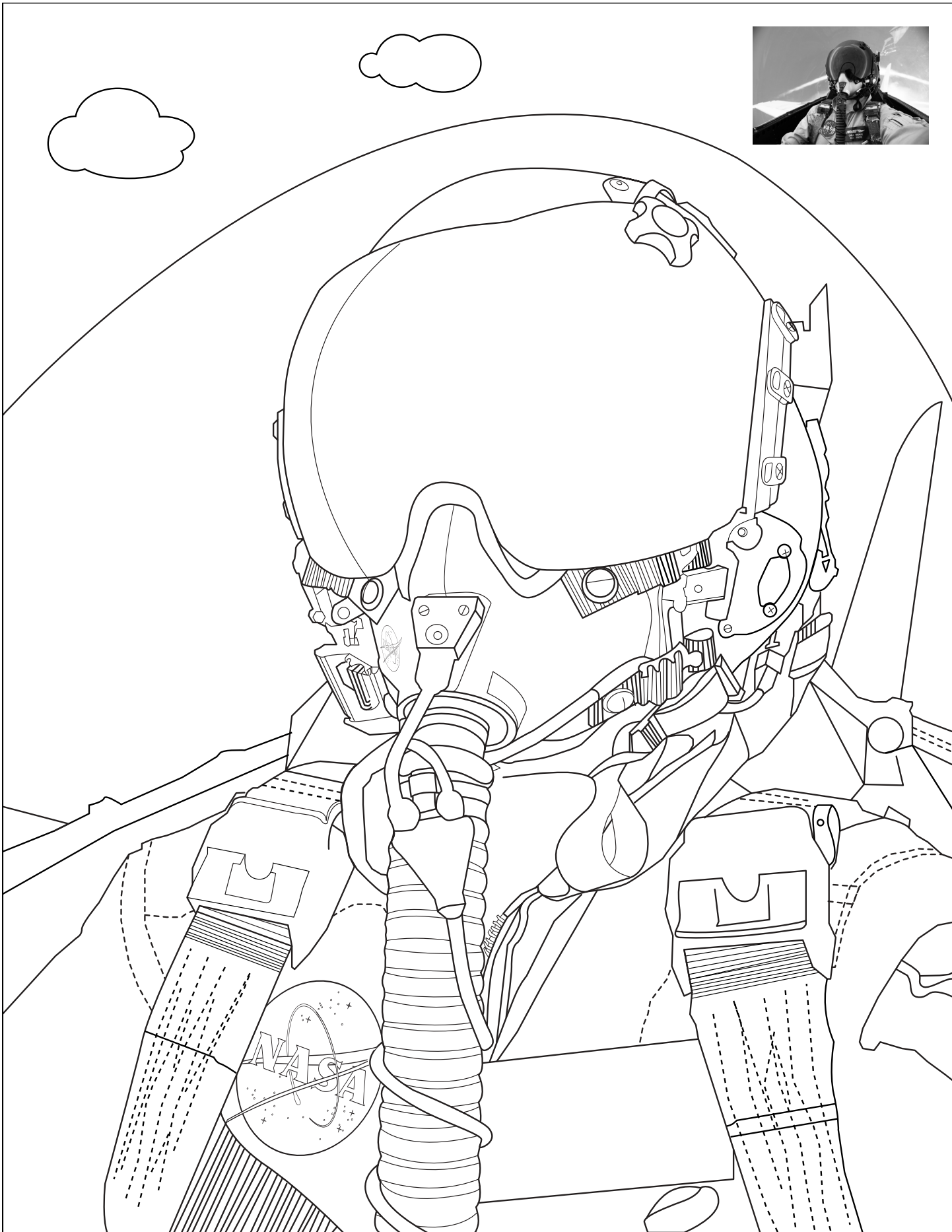
5



4

How many airplanes did you count? **14**





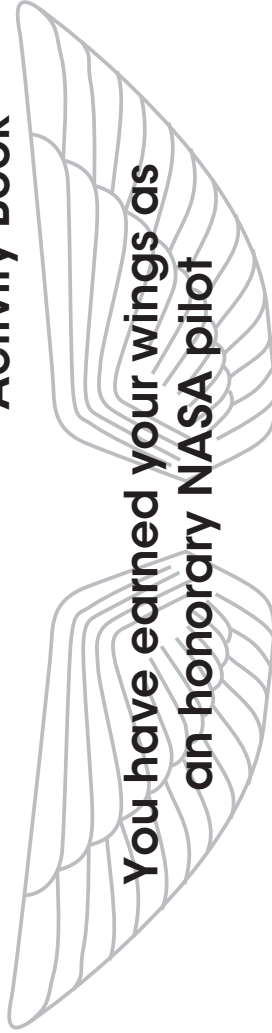
Congratulations

on completing the

Innovating Tomorrow's Engines



You have earned your wings as
an honorary NASA pilot

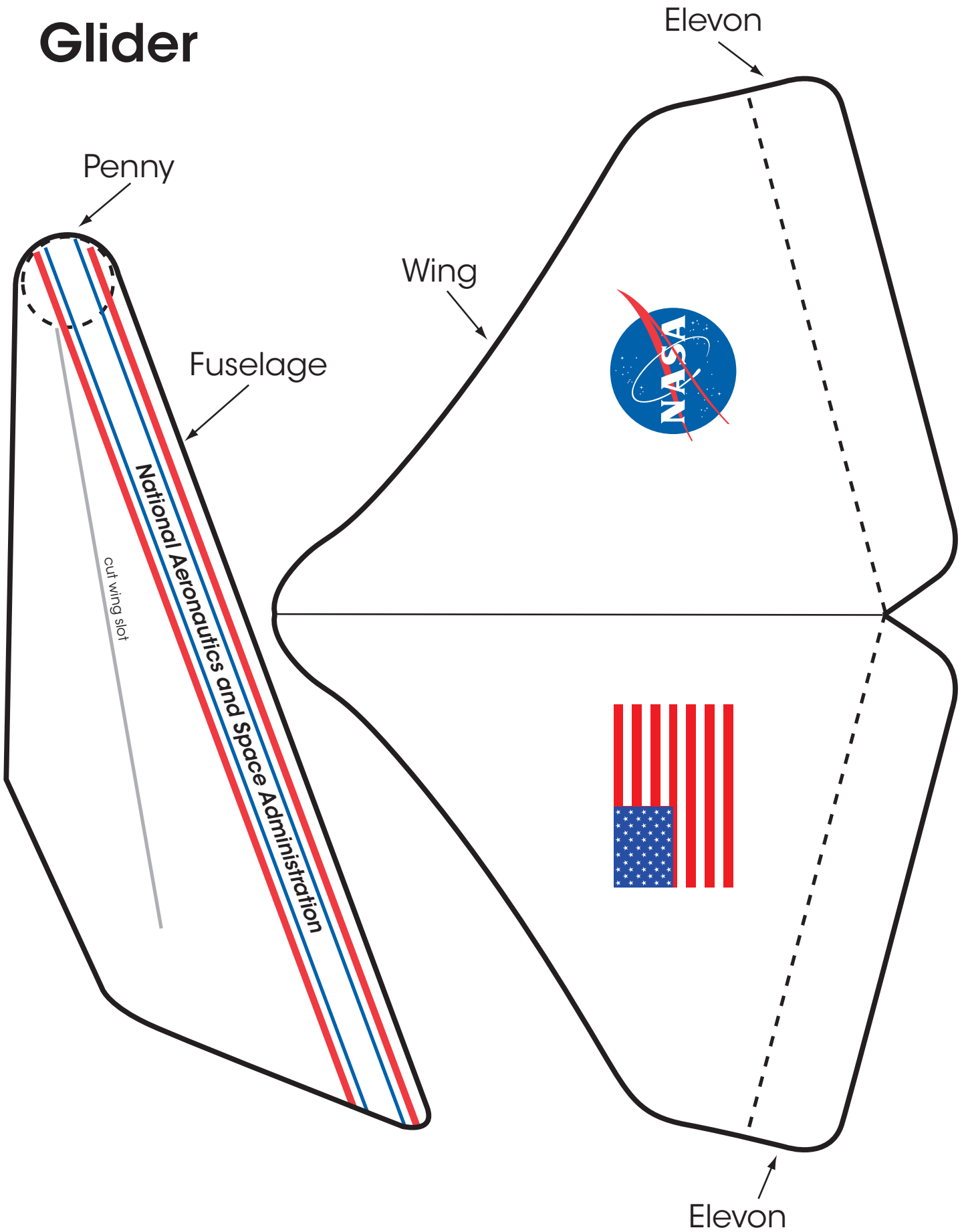


Four sets of horizontal lines for writing a name. Each set consists of a solid top line, a dashed middle line, and a solid bottom line.

Print your name on the lines above



Glider



National Aeronautics and Space Administration

Aeronautics Research Mission Directorate

Washington, DC 20546-0001

<https://www.nasa.gov/aeroresearch/resources>

<https://www.nasa.gov/aeroresearch>

www.nasa.gov

NP-2019-05-2720-HQ