National Aeronautics and Space Administration

High Flyers Alphabet Activity Book

Math and Language Literacy for K-2

www.nasa.gov

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.

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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

Beginners Guide to Aeronautics
https://www.grc.nasa.gov/WWW/K-12/airplane/index.html

Twitter: @NASAaero

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Common Core Math and NGSS Science Standards

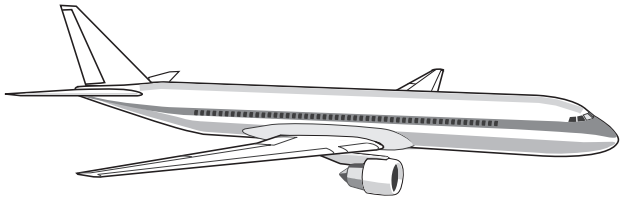
Educators: The High Flyers Activity Book covers many K-2 content standards including Math, ELA, and Science. This chart lists the Common Core and NGSS standards addressed in the use of this book. We hope you and your students enjoy the content.

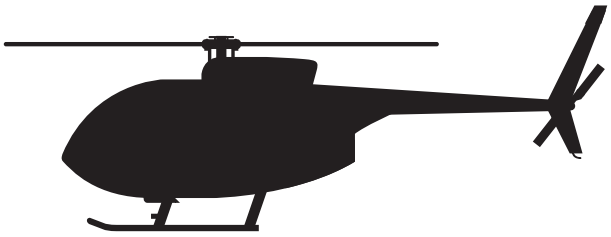
Common Core Math	Common Core ELA	NGSS
Kindergarten		
CCSS.MATH.CONTENT.K.CC.A.3	CCSS.ELA-LITERACY.RI.K.4	K-2-ETS1-2
CCSS.MATH.CONTENT.K.CC.B.5	CCSS.ELA-LITERACY.RI.K.7	K-2-ETS1-3
CCSS.MATH.CONTENT.K.CC.C.6-7	CCSS.ELA-LITERACY.RF.K.1.D	
CCSS.MATH.CONTENT.KOA.A.1	CCSS.ELA-LITERACY.SL.K.5	
CCSS.MATH.CONTENT.K.MD.A.1-2	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	

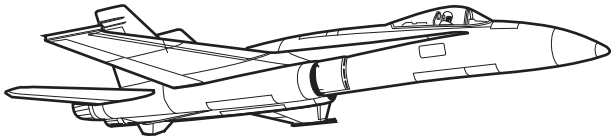
Aa Aa

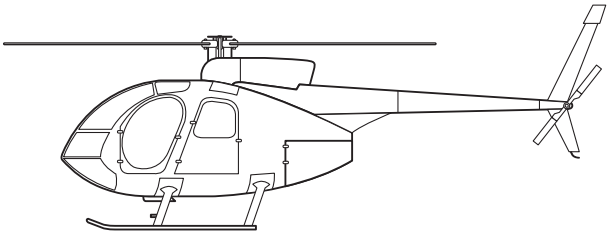
aircraft

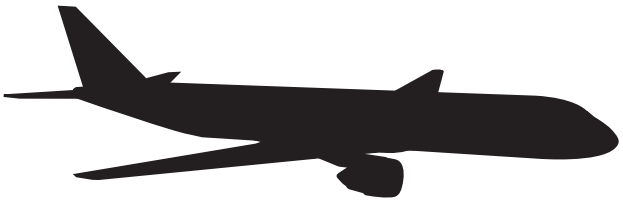
Draw a line to match each **aircraft** to its shadow.

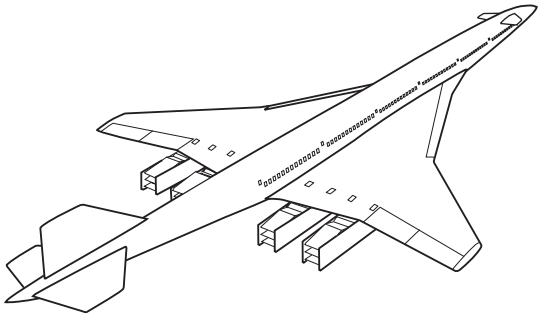


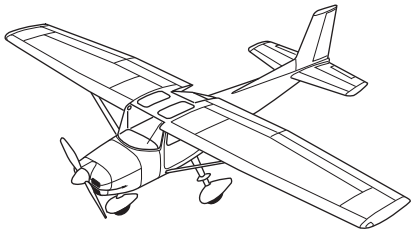


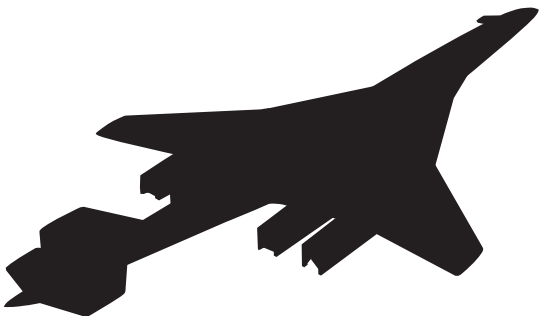






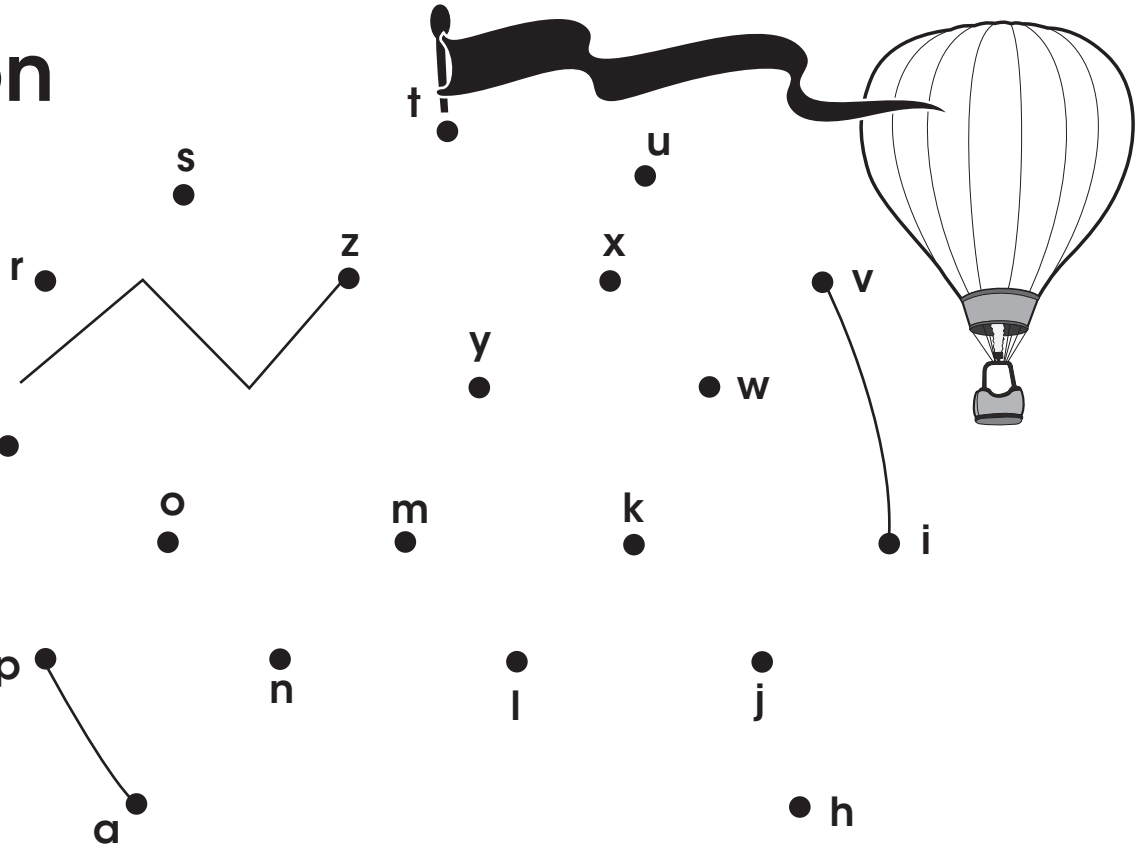


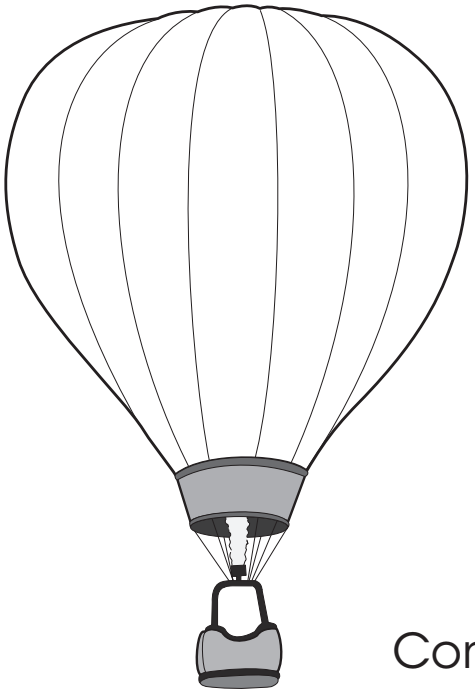


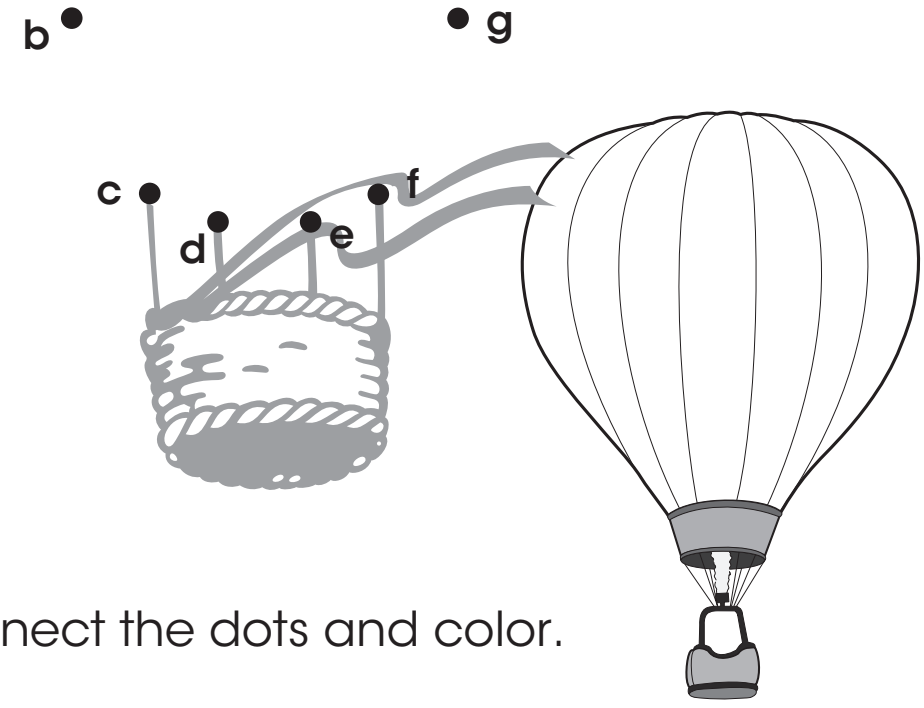


Bb Bb

balloon





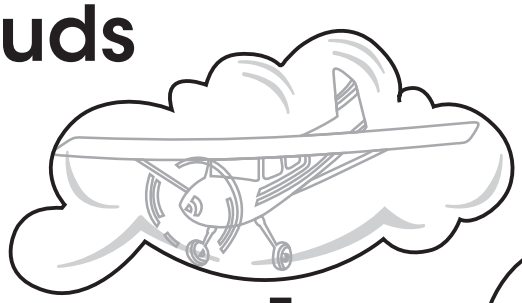


Connect the dots and color.

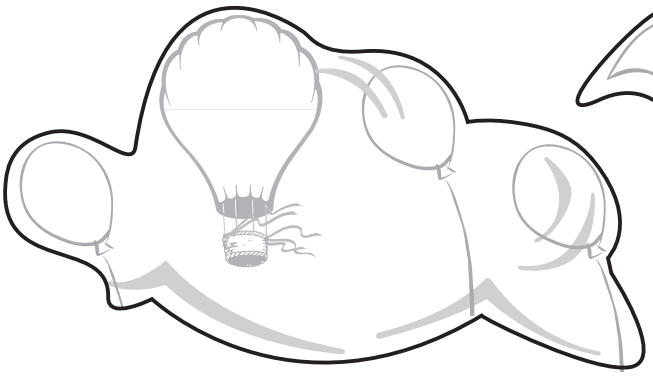
Cc C c

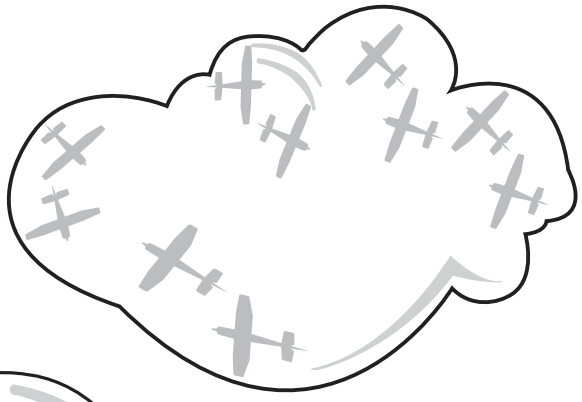
clouds

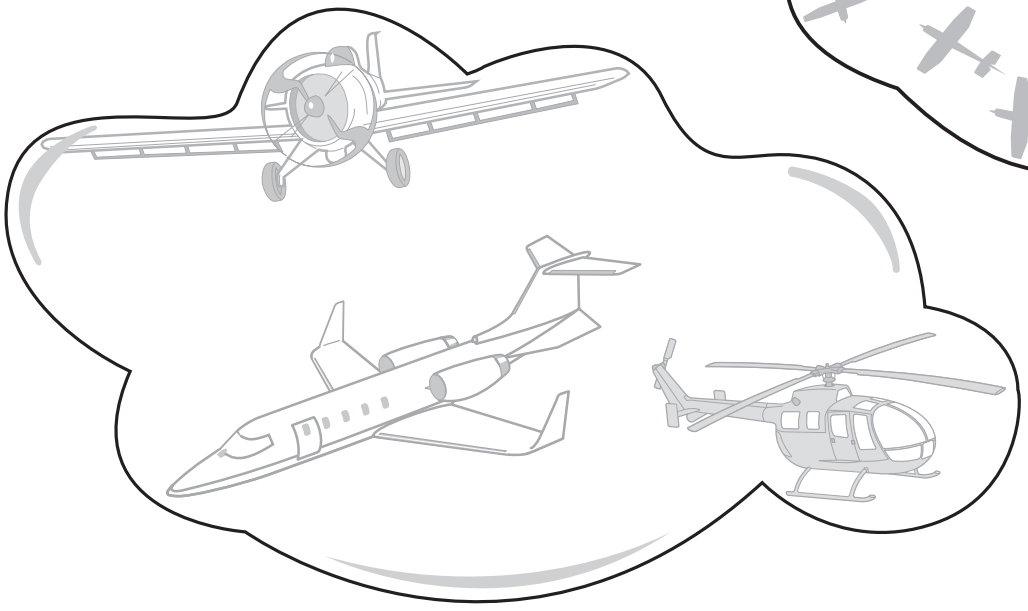
Count the pictures you see hidden in the **clouds.**



1







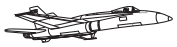
Dd Dd

down

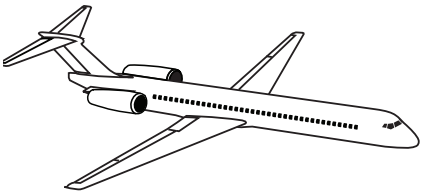
Follow the line and help the skydiver guide the parachute **down** to the target.

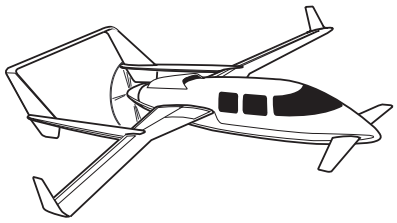
Ee

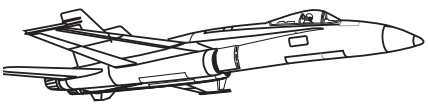
engine

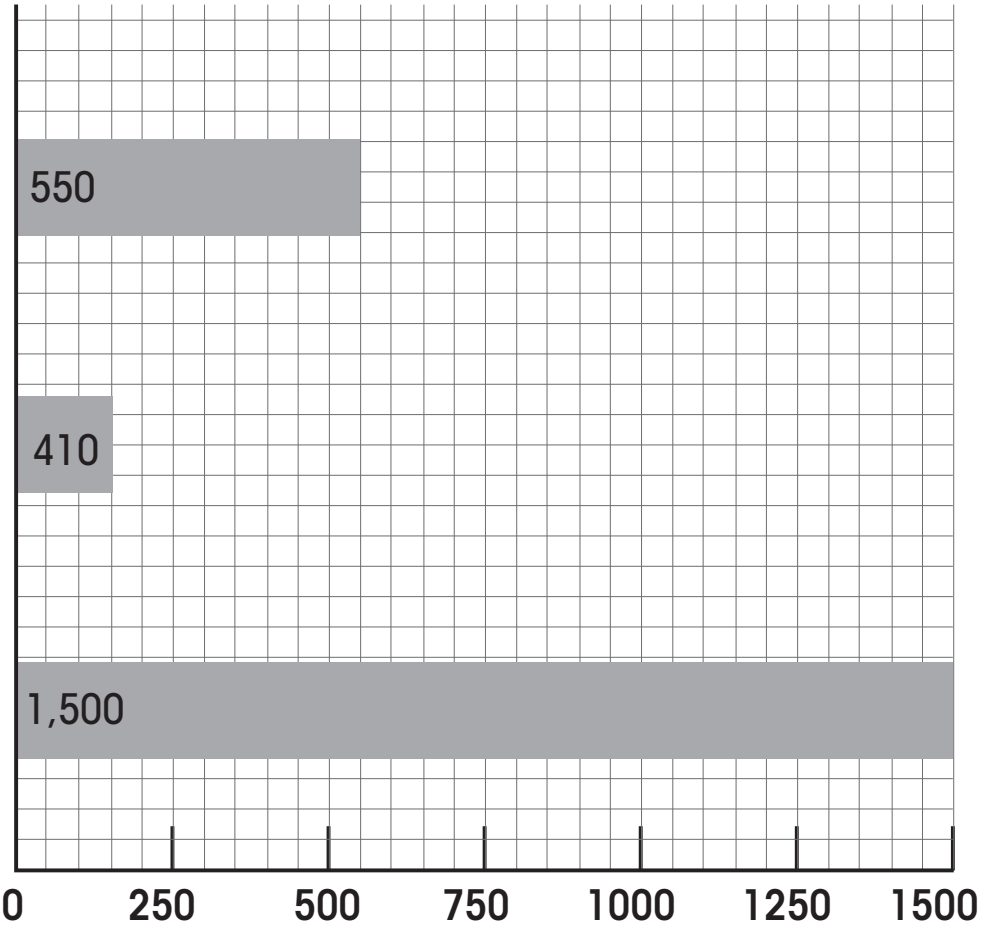
Each aircraft has a different type of engine. The engines move aircraft through the air at different speeds. A passenger jet  flies through the air at about 550 miles per hour. A smaller private  aircraft flies through the air at 410 miles per hour. A  fighter jet flies through the air at 1,500 miles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

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

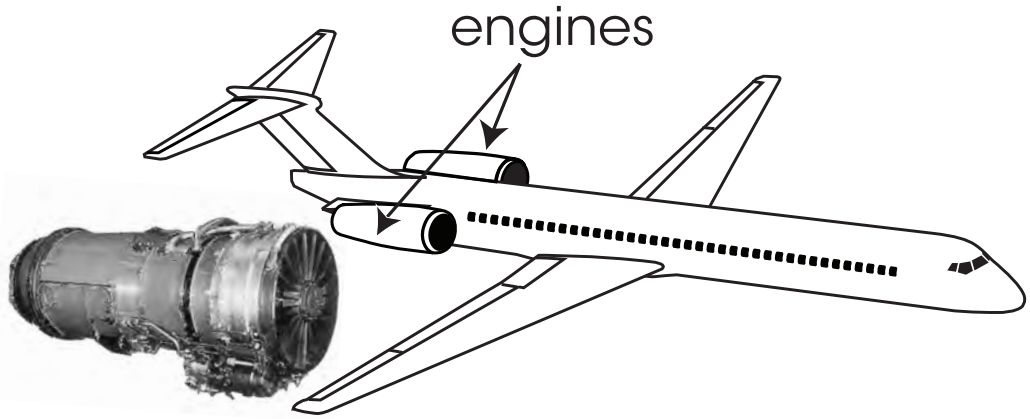




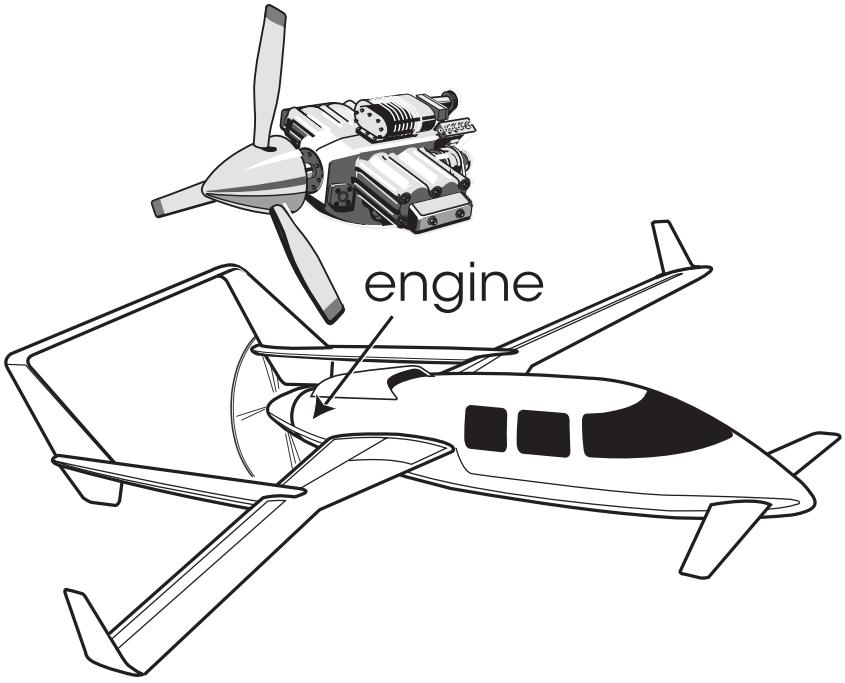




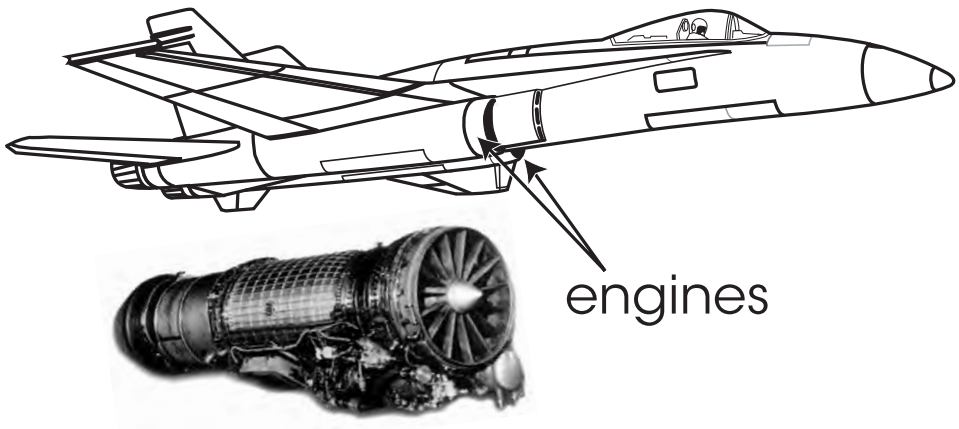
There was an airplane race. Look at the chart that tells you how fast these aircraft fly. Draw a line from the trophy to the aircraft in the order it finished.



1,500 mph



550 mph

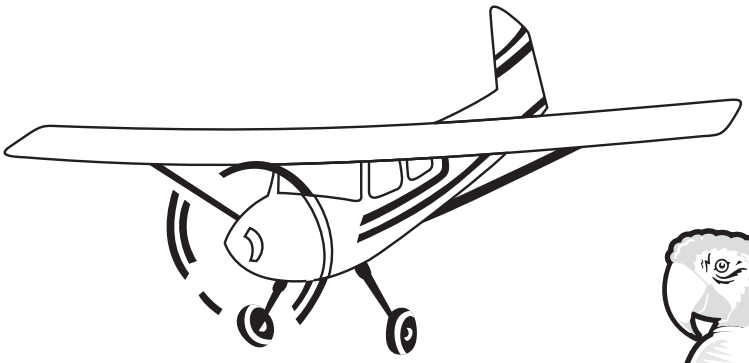


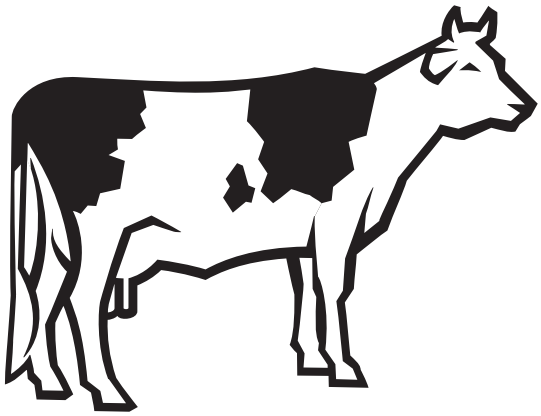
410 mph

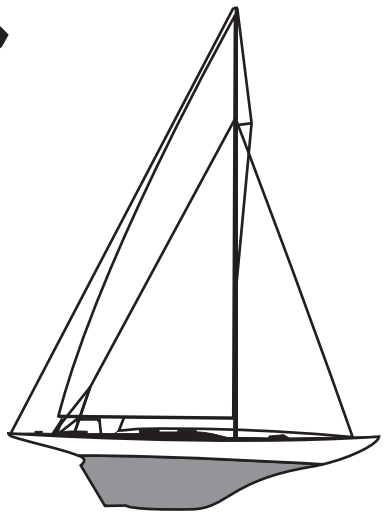
Ff

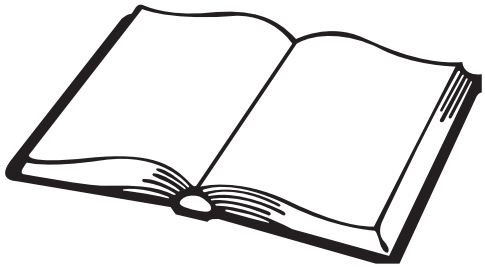
fly

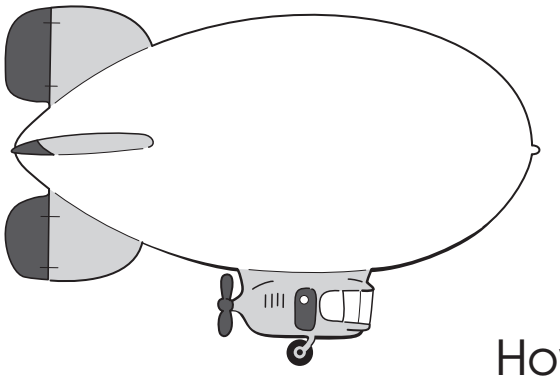
Circle the pictures of the things that **fly**.

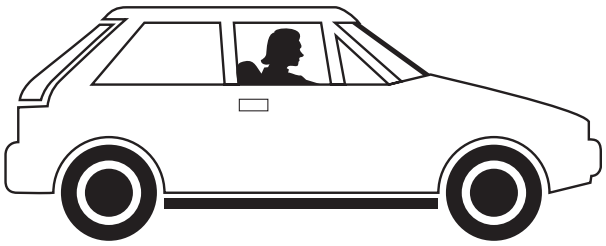












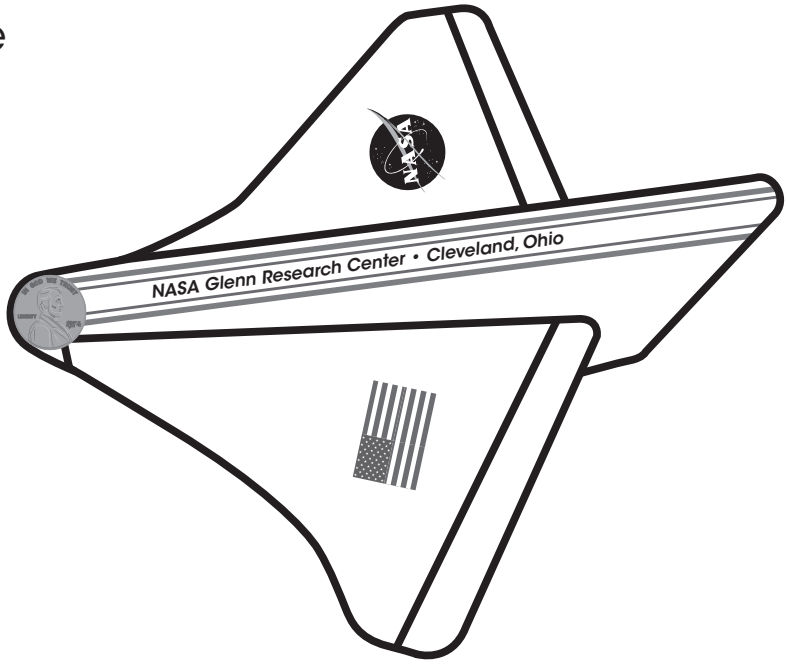
How many did you circle? _____

Gg

glider

Materials Needed

Scissors
Cellophane tape
One penny



Instructions

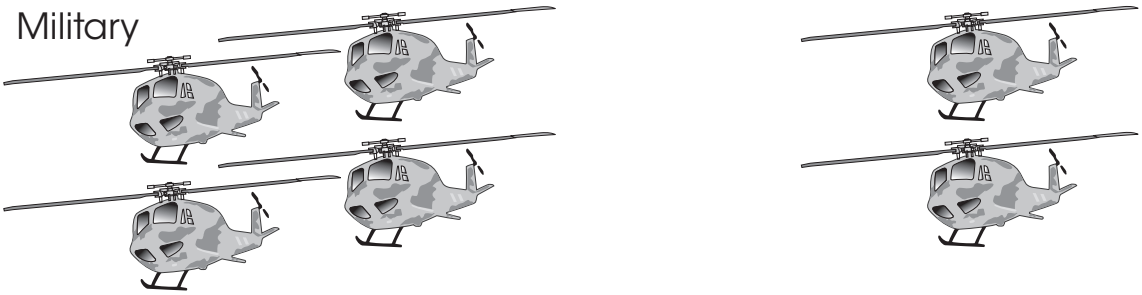
1. Cut out the wing and fuselage patterns that can be found on the back cover of this book.
2. Carefully cut the wing slot line located on the fuselage. Ask an adult to help you if you need help.
3. Slide the wing into the slot. Make sure the wing's center line lines up with the fuselage.
4. Tape the 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

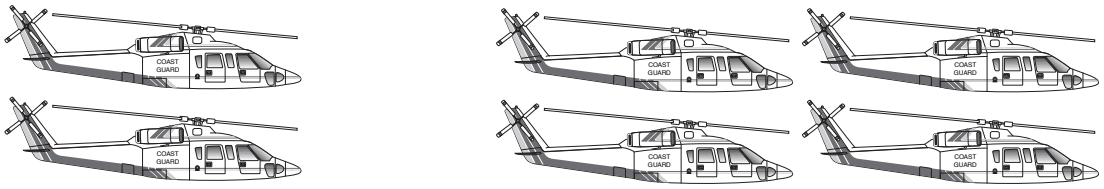
Add the **helicopters** in each group.

Military



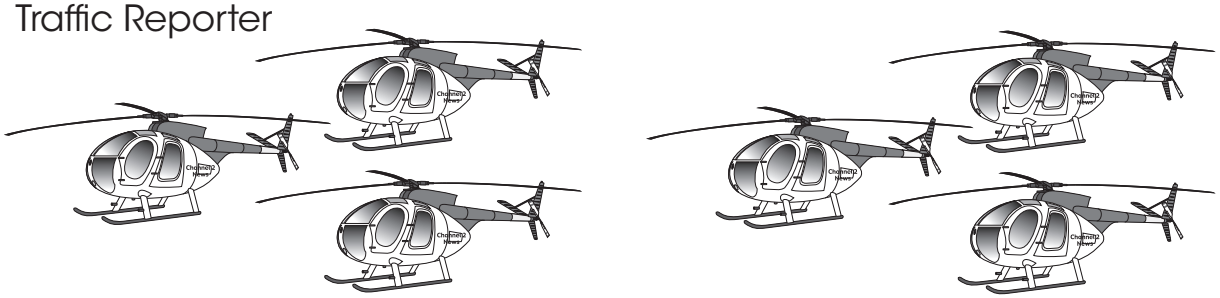
_____ + _____ = _____

Coast Guard



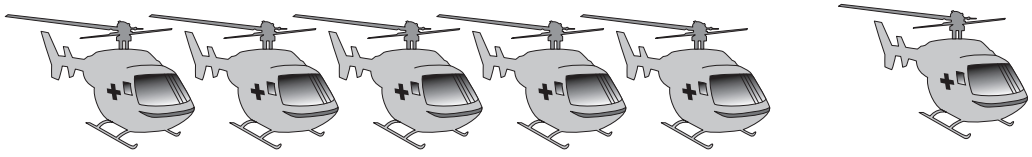
_____ + _____ = _____

Traffic Reporter



_____ + _____ = _____

Emergency Rescue

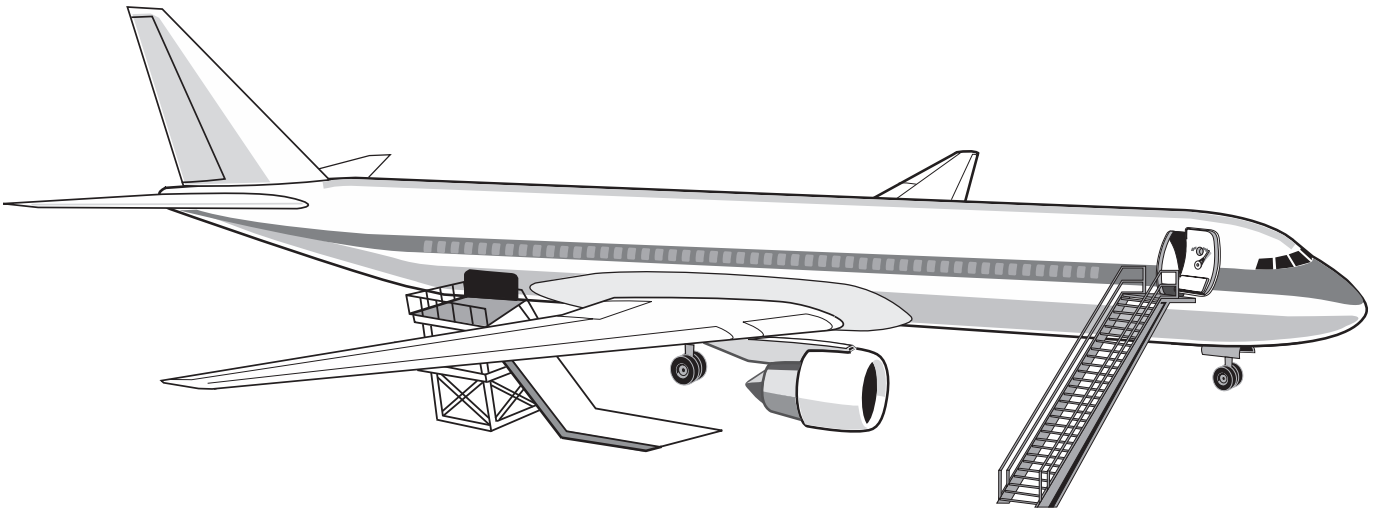


_____ + _____ = _____

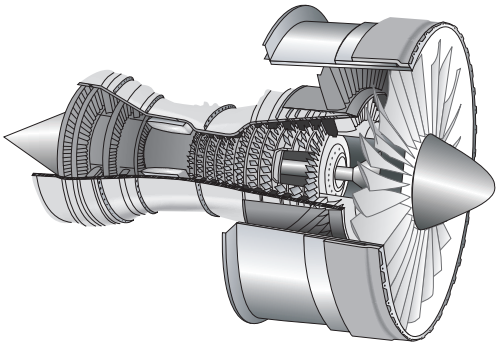
Ii

in

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



passengers



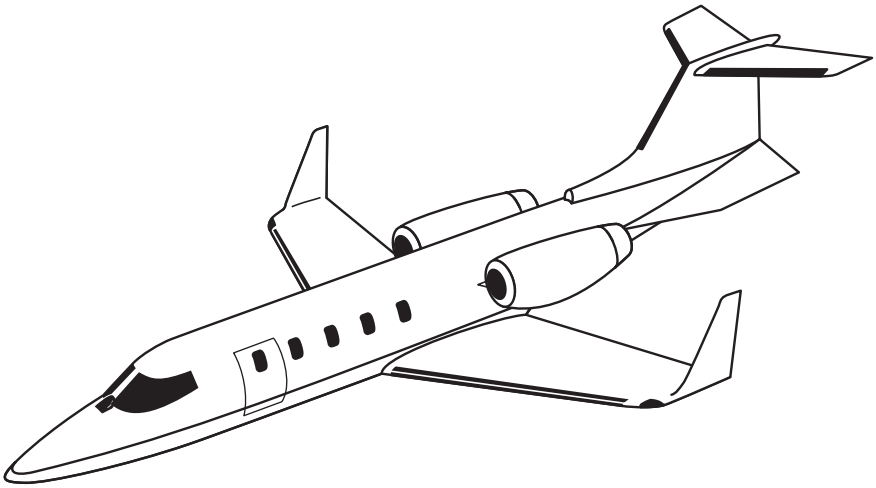
engine

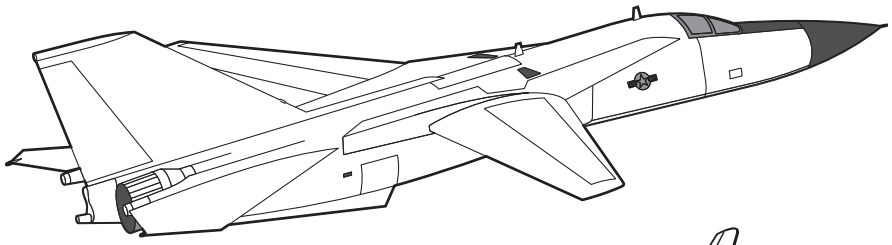
luggage

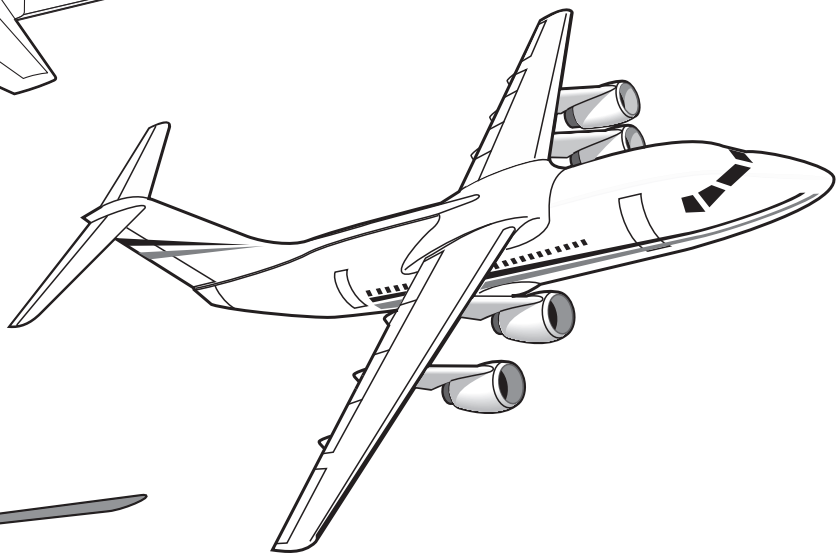
Jj

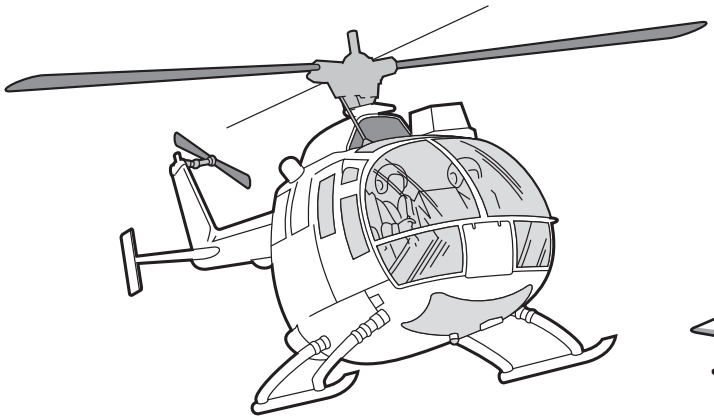
jet

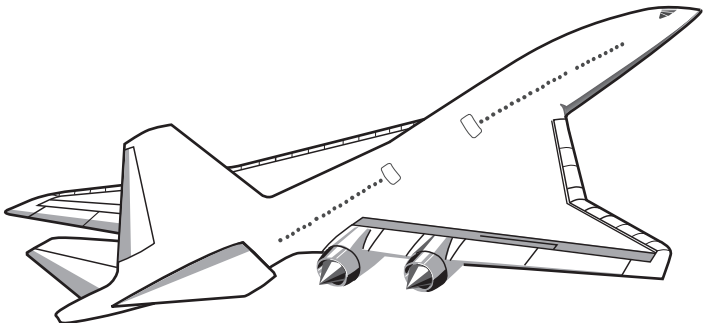
Circle the aircraft that is *not* a **jet**.





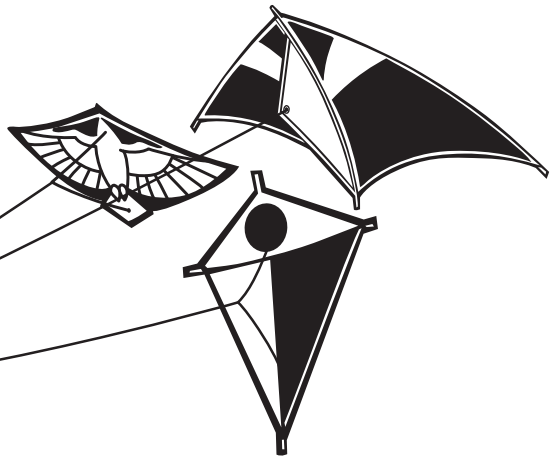




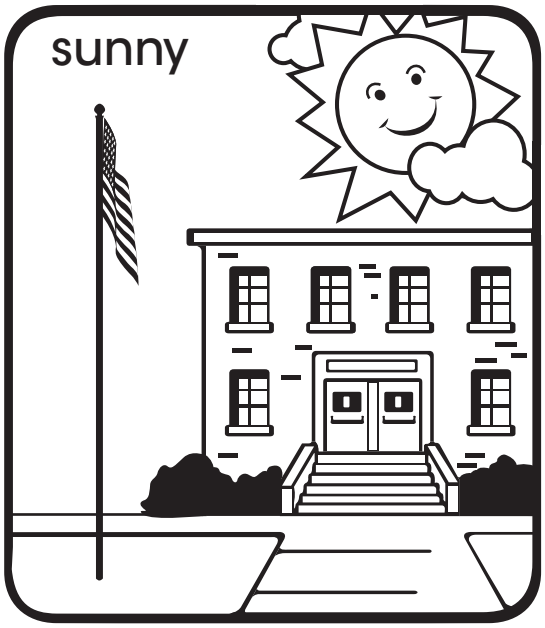


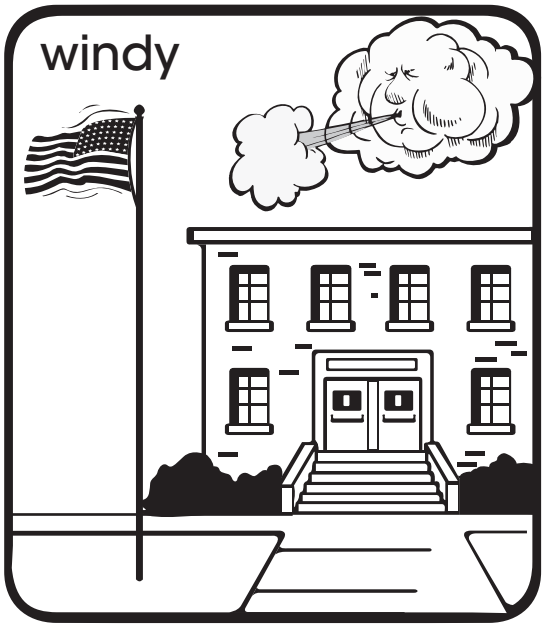
Kk

kite



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

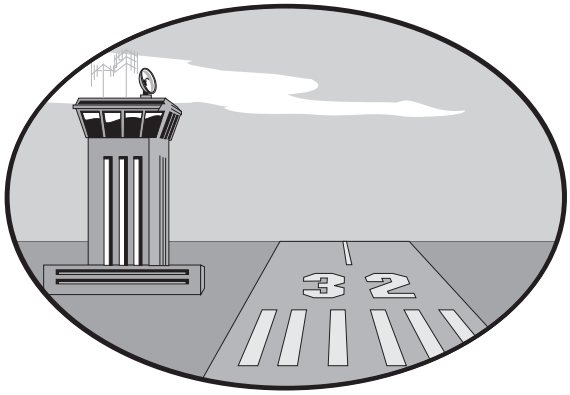


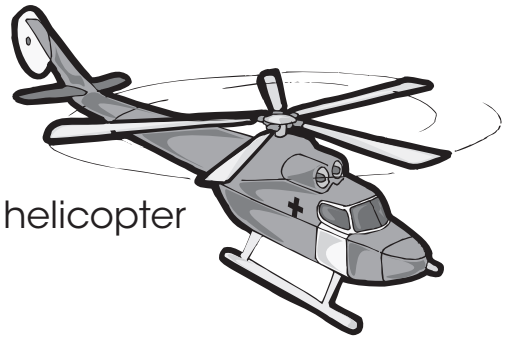


landing

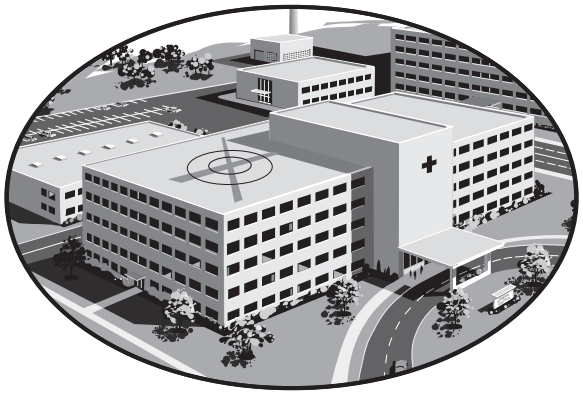
The aircraft below are **landing**. Draw a line to show where each aircraft would land.

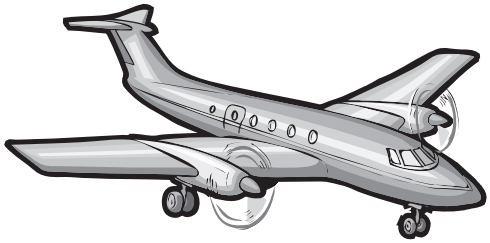
seaplane





helicopter



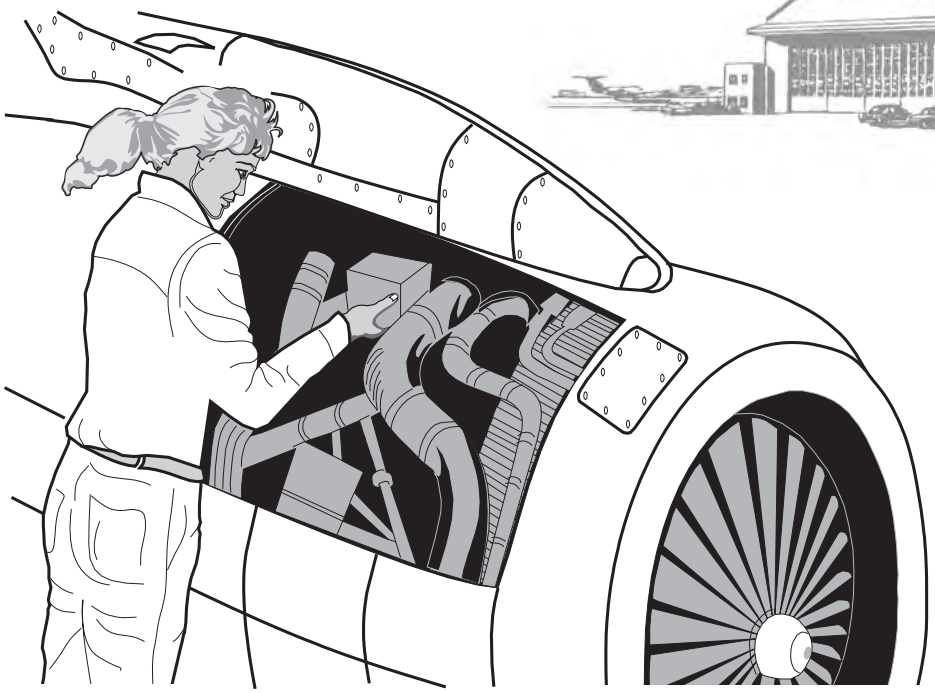


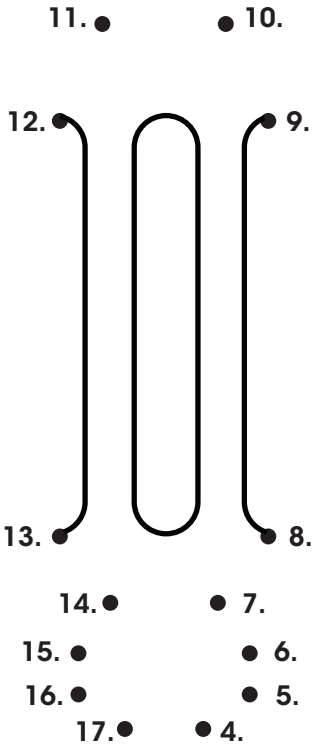
passenger plane

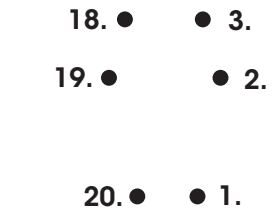
Mm Mm

mechanic

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



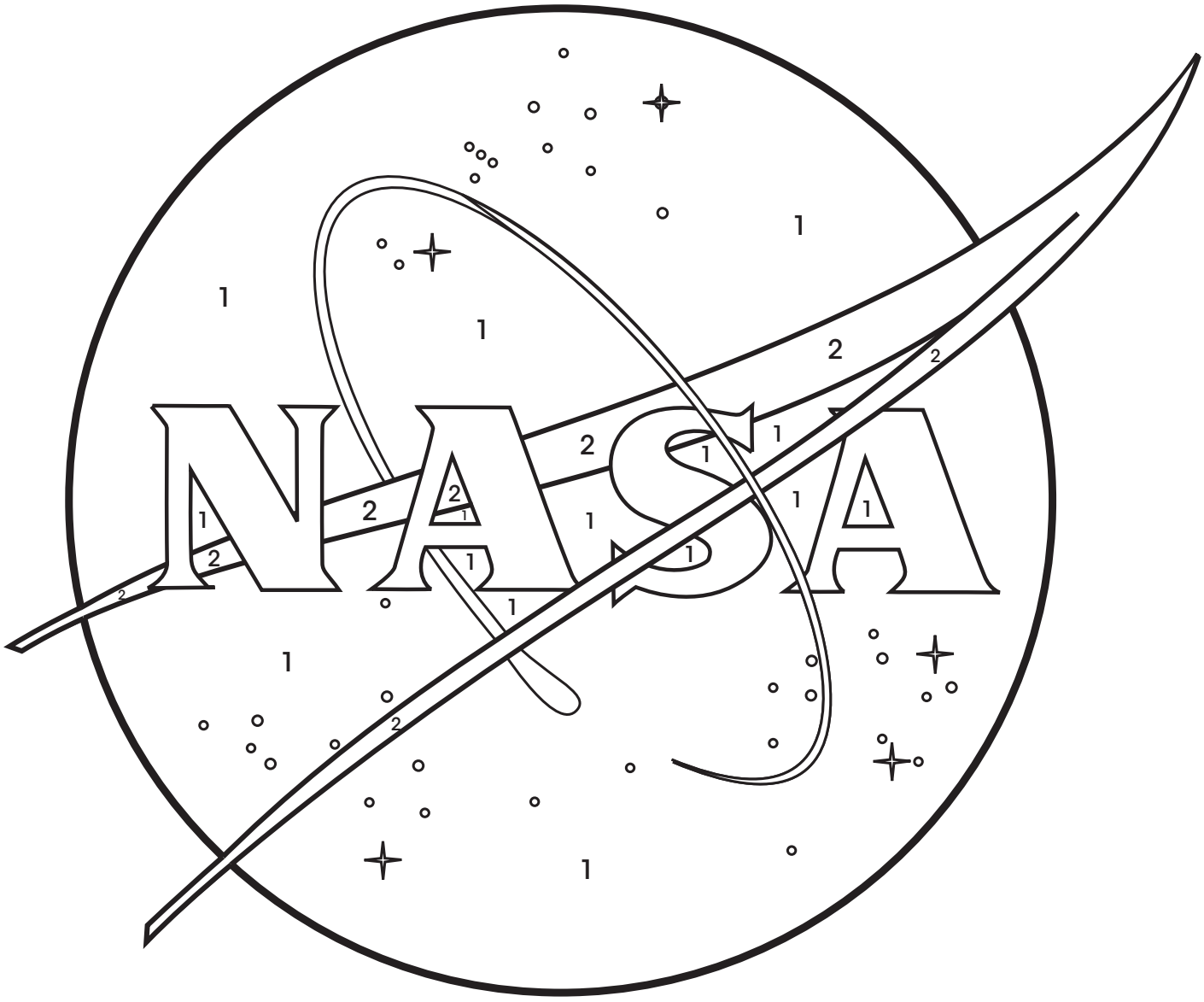




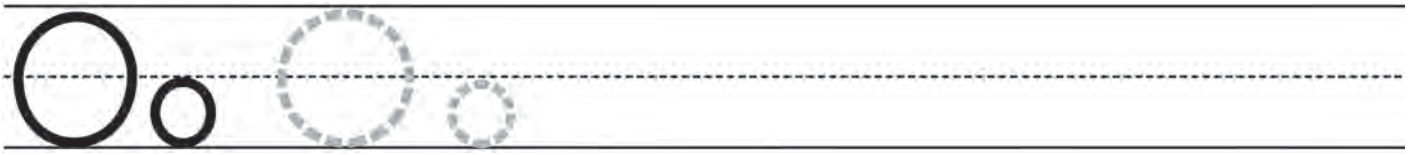
Nn

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.

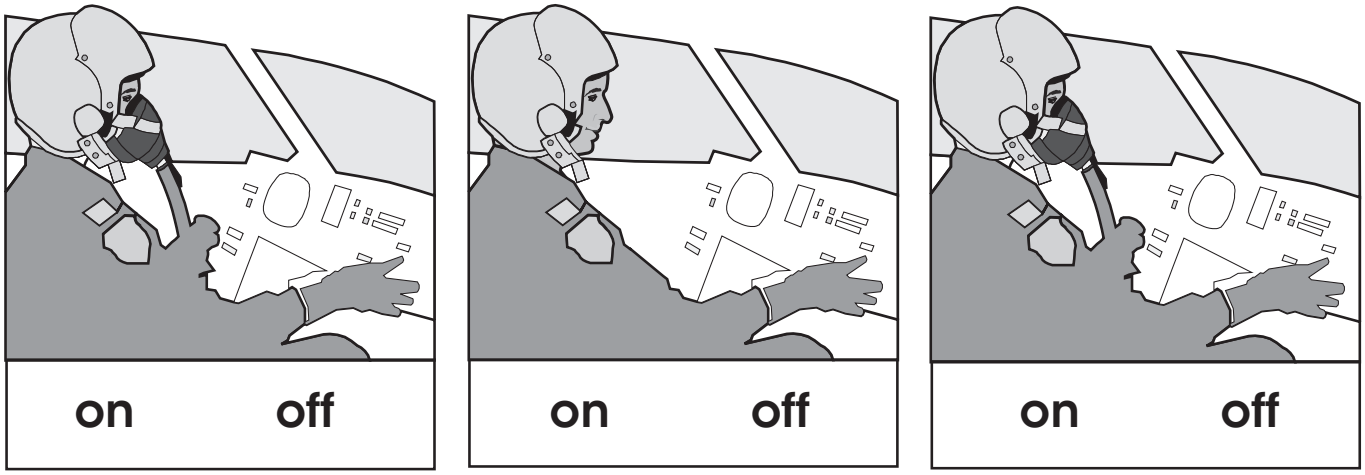


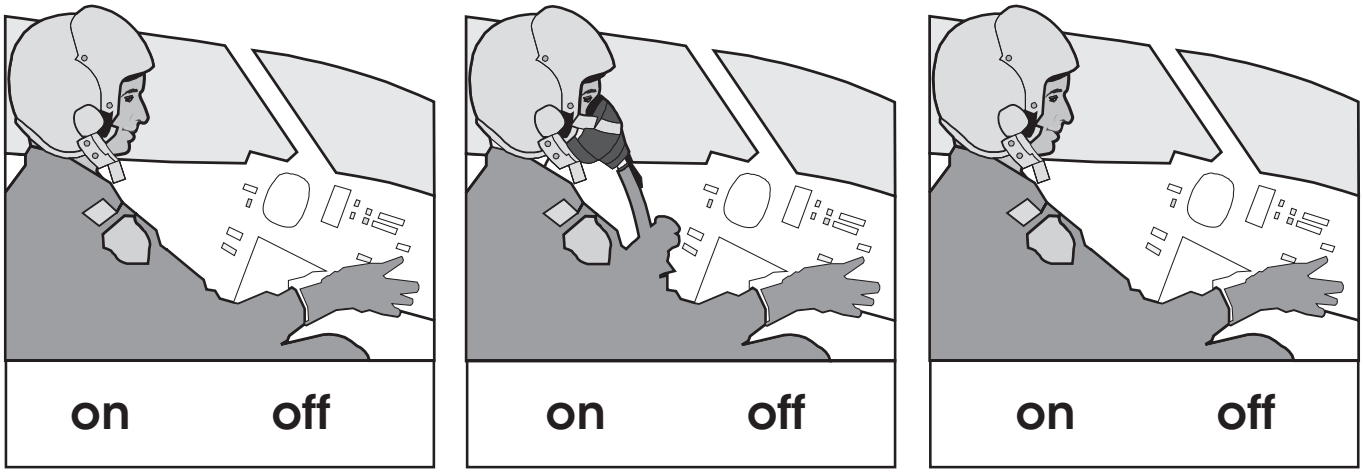
oxygen mask

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

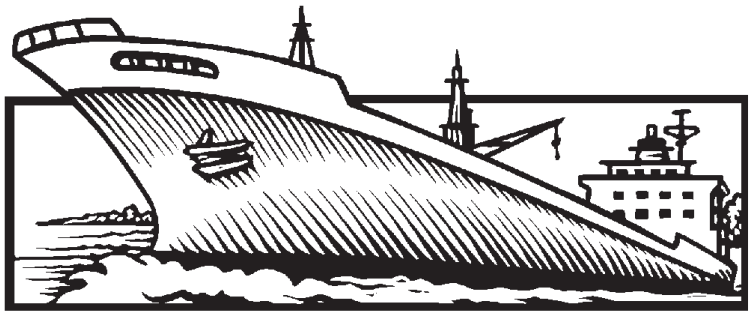
pilot

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

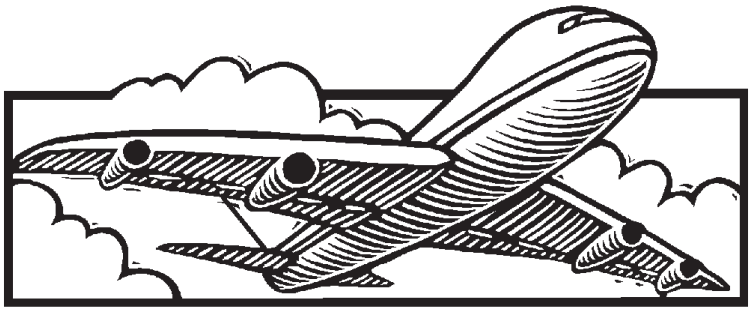
Qq

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

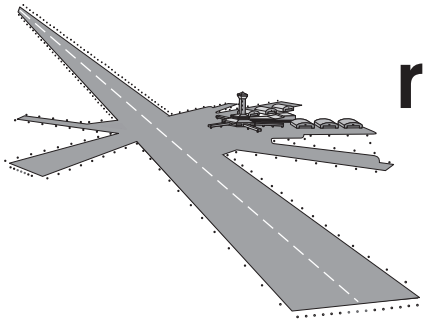


2 hours

1 day

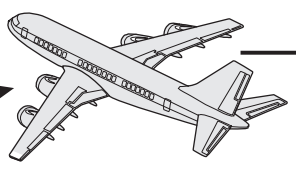
3 days

Rr



runway

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

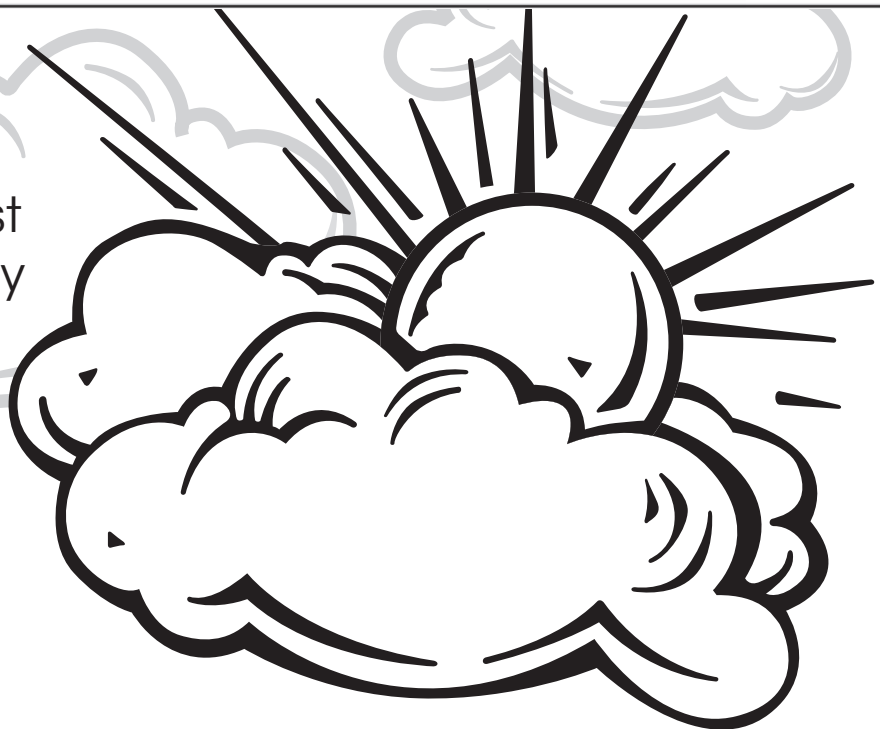


Start here

Ss S s

sky

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

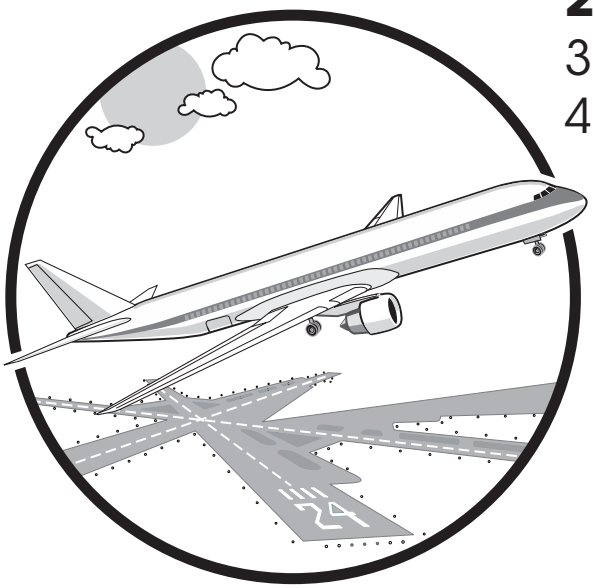


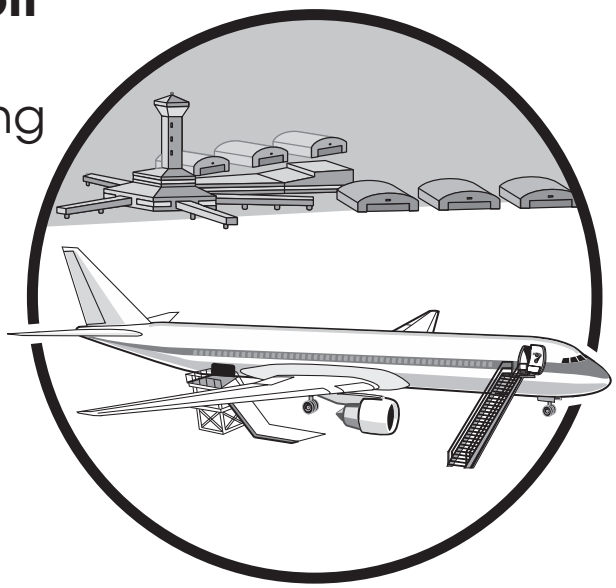
Tt

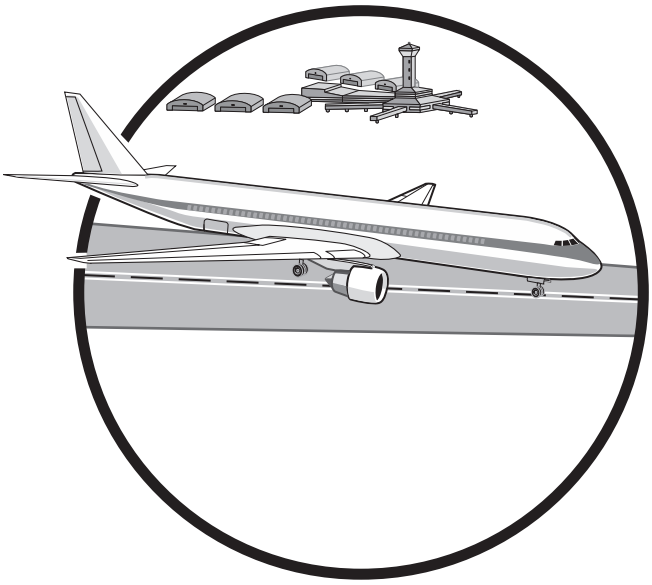
takeoff

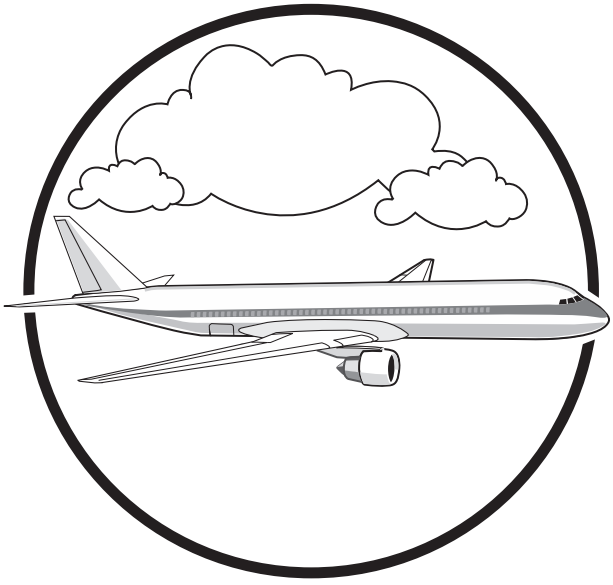
Write the number under the matching picture.

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





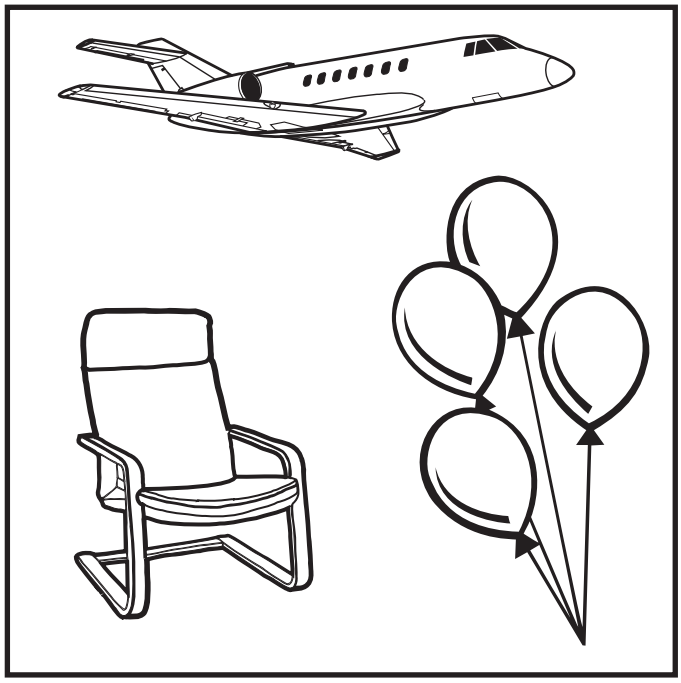


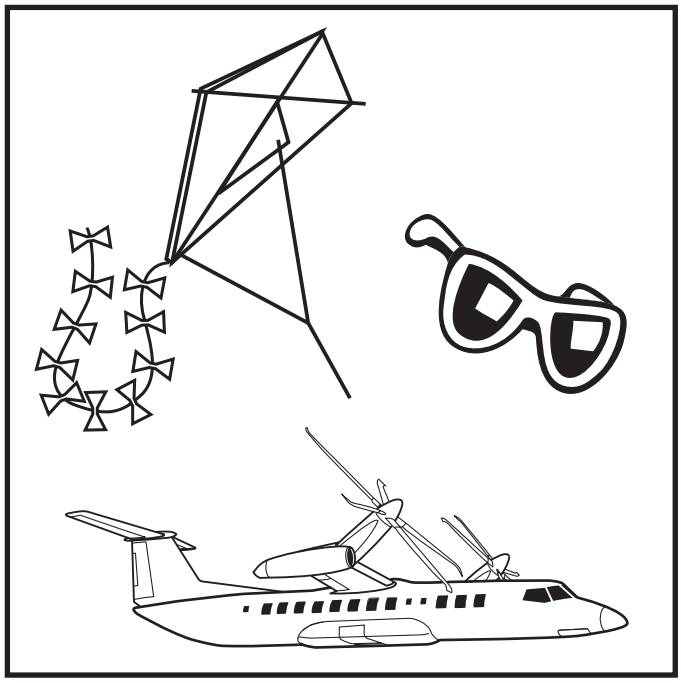


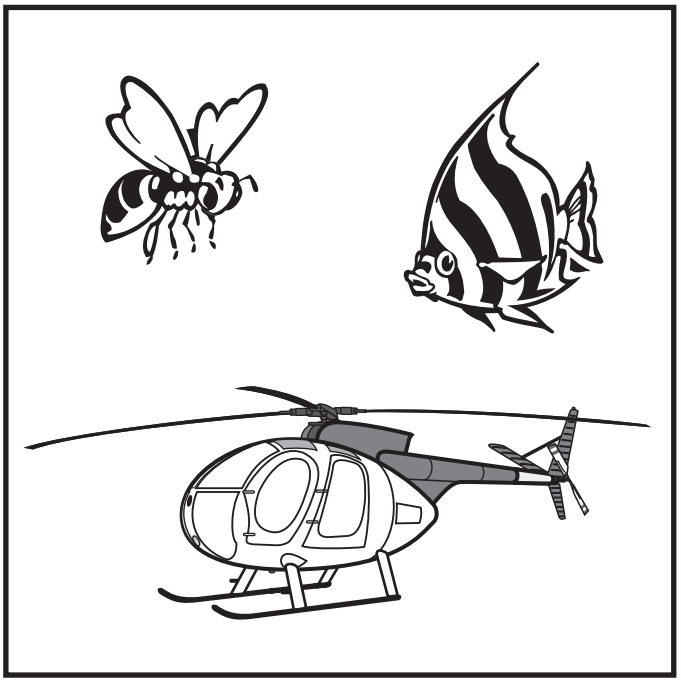
Uu

up

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

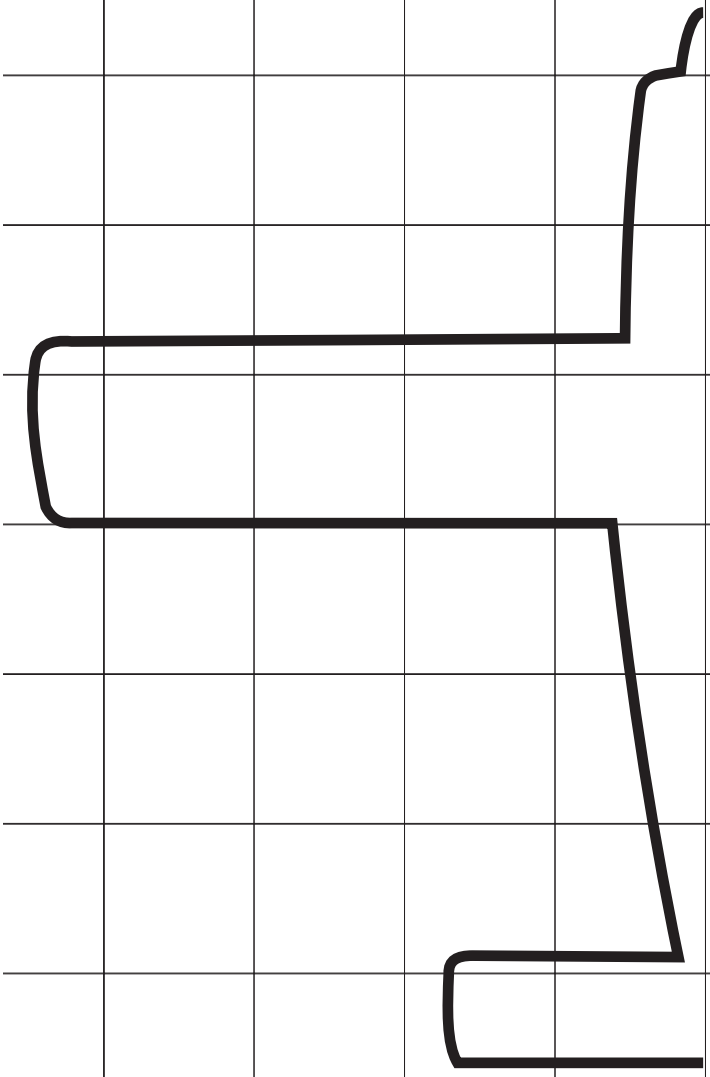






Vv

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

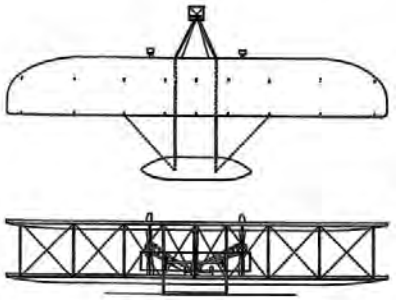


Ww

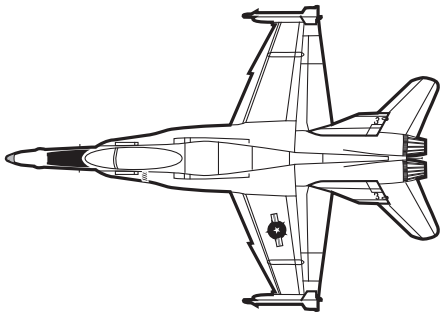
wing

Trace the different **wing** shapes.

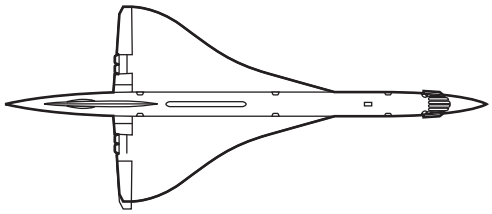
Wright Brothers



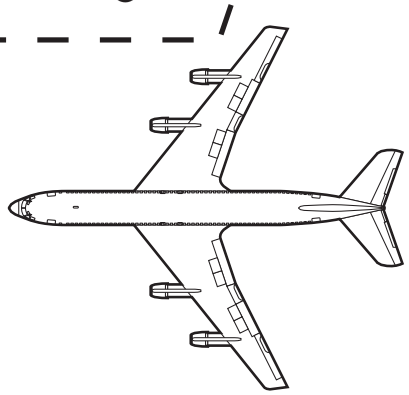
F–18
(Blue Angels)



Concorde



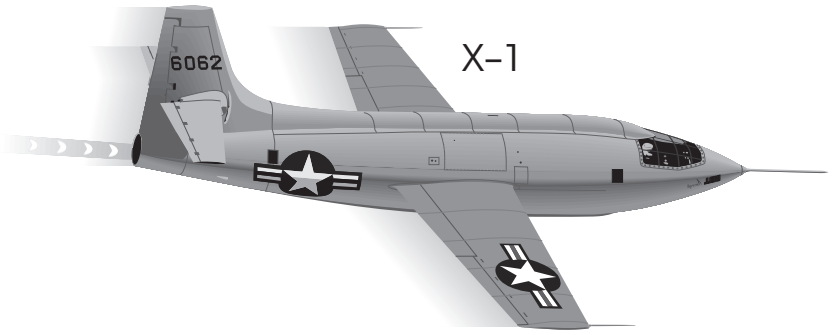
Boeing 747



Paper airplane

X-plane

X–15



X–1

X-48

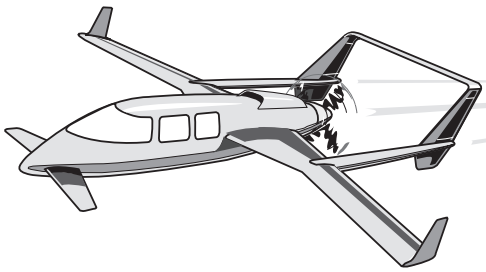
NASA uses test aircraft and space vehicles called **X-planes**. X-plane means experimental (X)-plane. Be an engineer and design your own X-plane in the space below. Give it an X-number and write it under your plane.

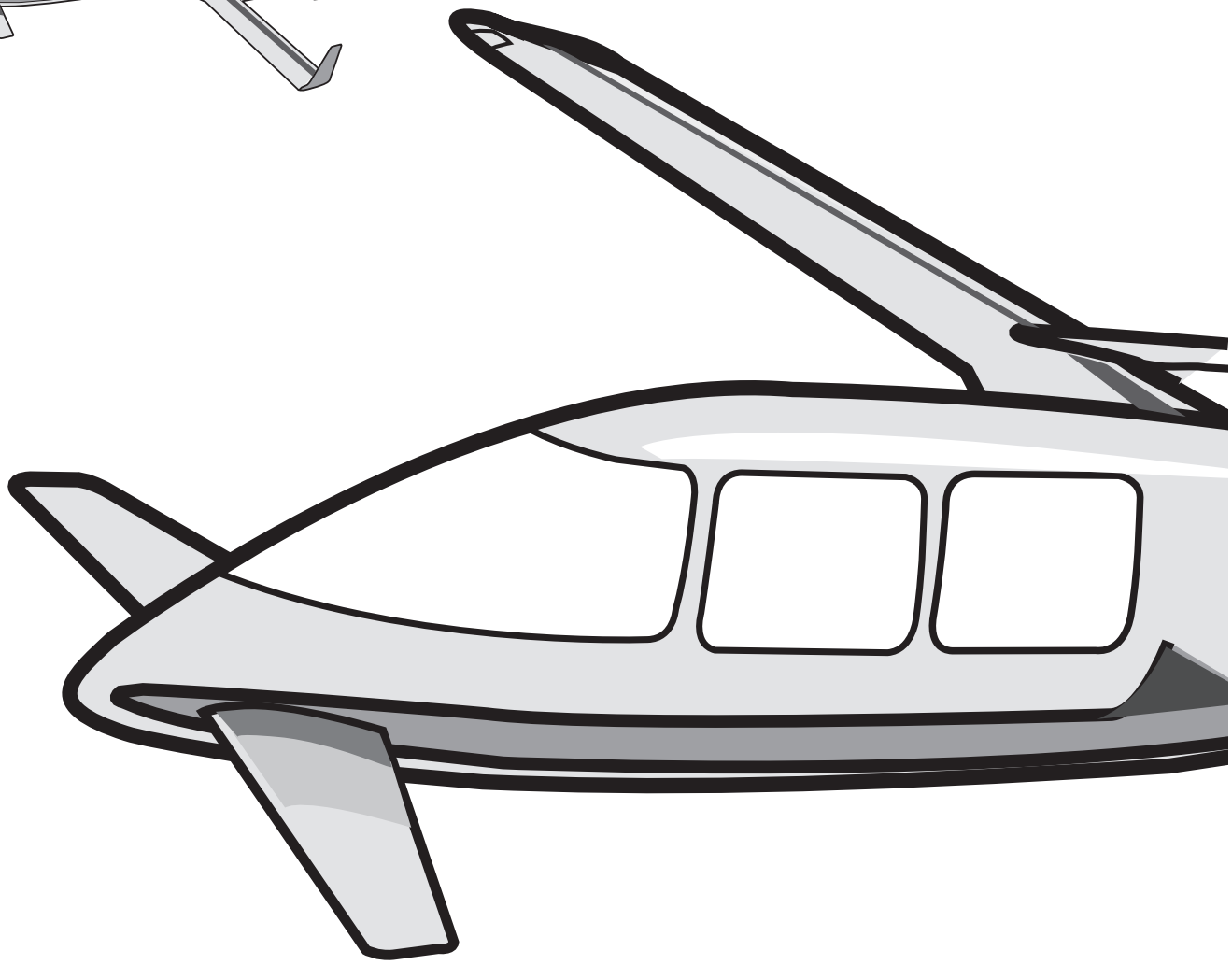
X- _____

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!



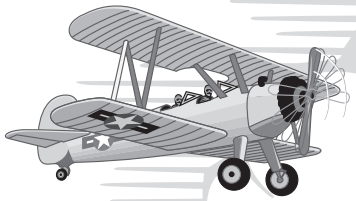


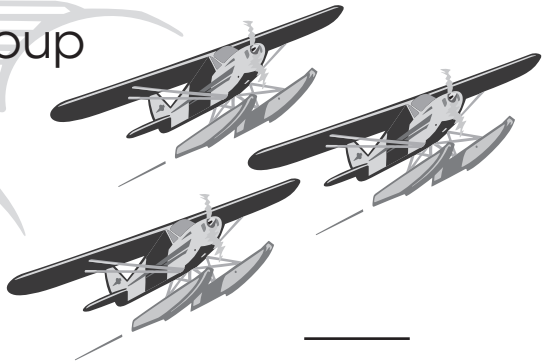
Where would **you** go on your airplane ride?

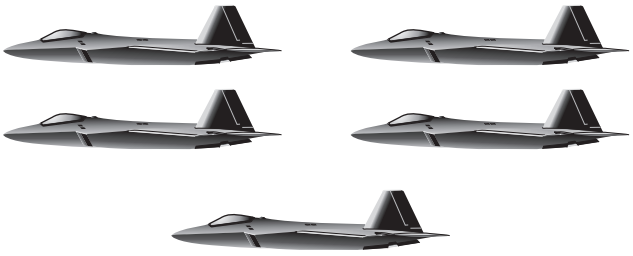
Zz

zoom

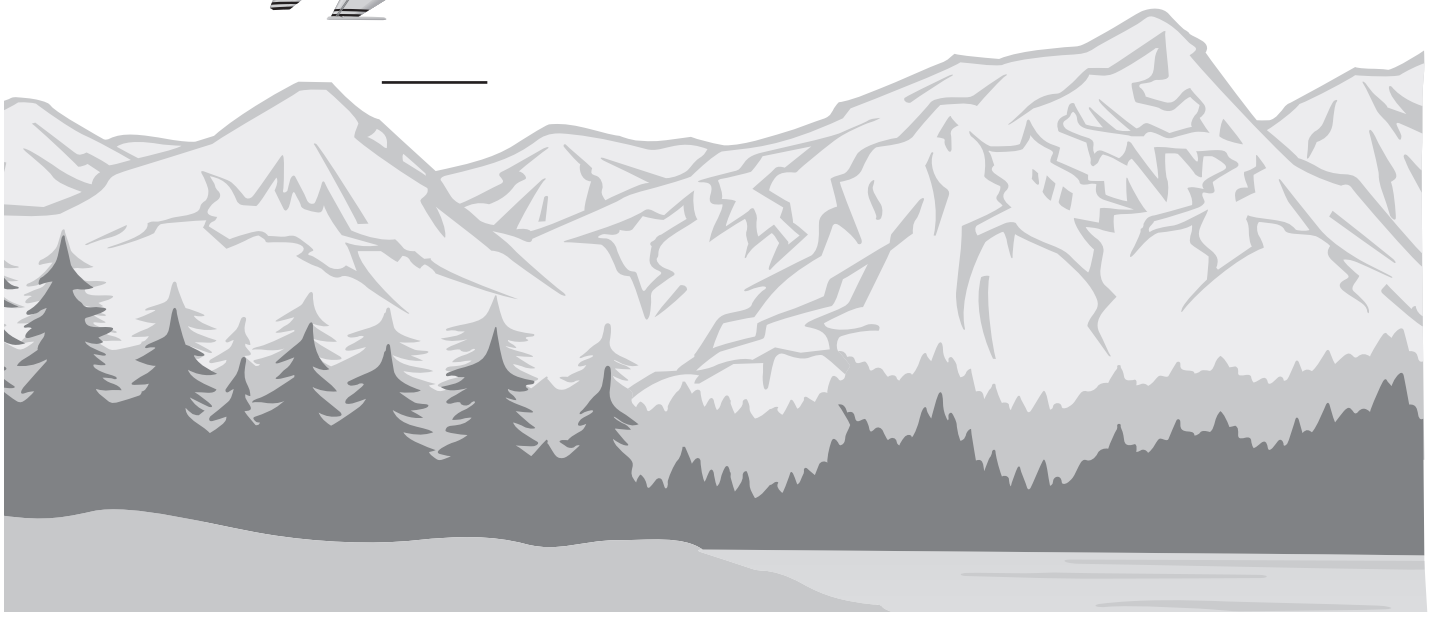
Count the number of airplanes in each group as they **zoom** by.







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

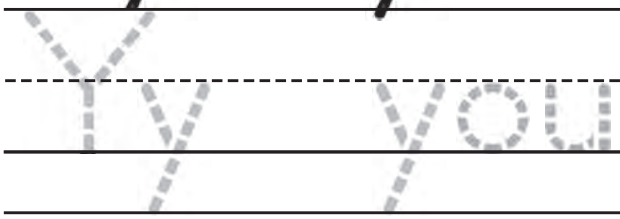
Ww wing

Ww wing

Xx X-plane

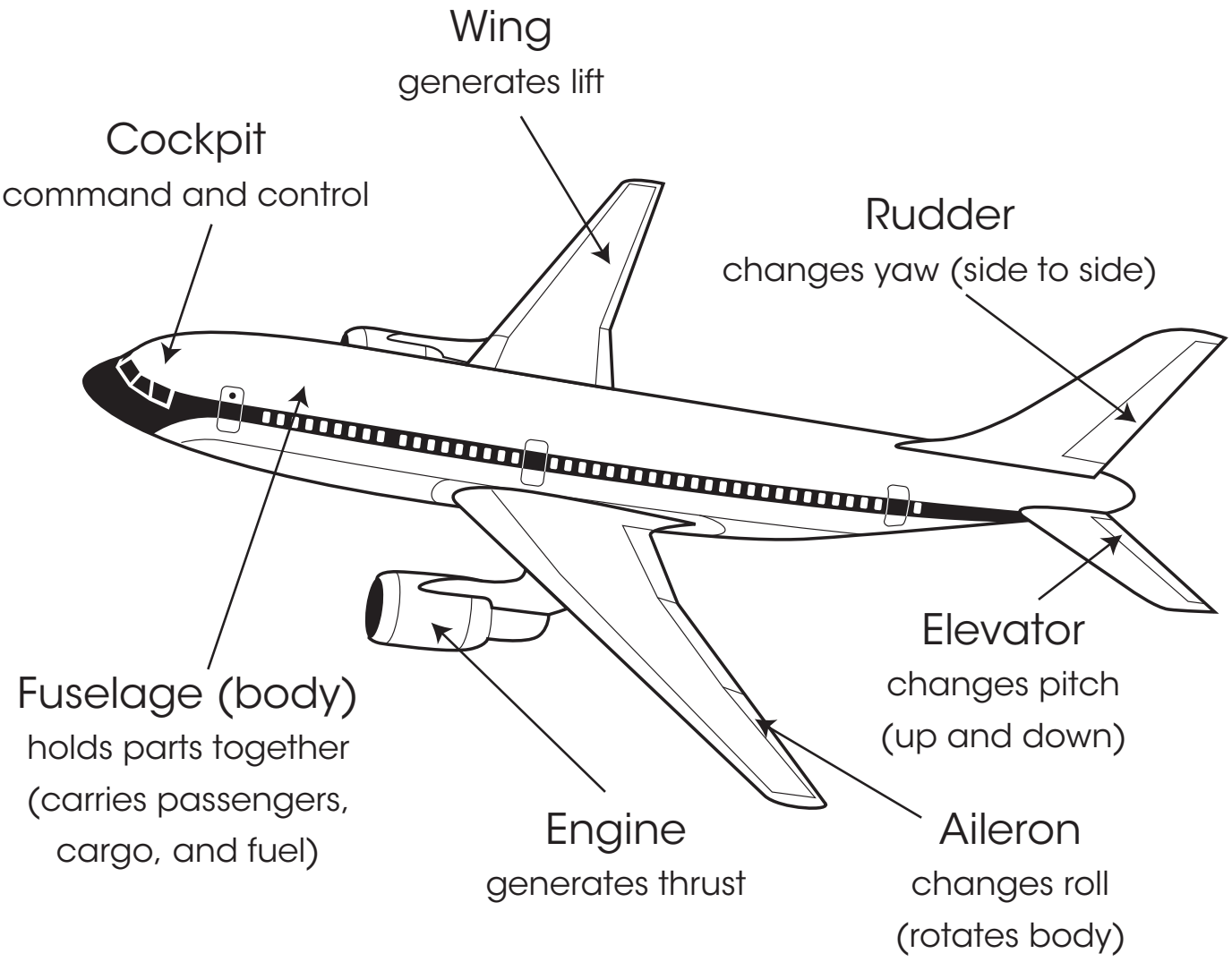
Xx X-plane

Yy you



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 41).

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 41).

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 41).

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 41).

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 41).

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 41).

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 41).

X-plane
A special vehicle designed for experimental flight tests.

Source definitions:

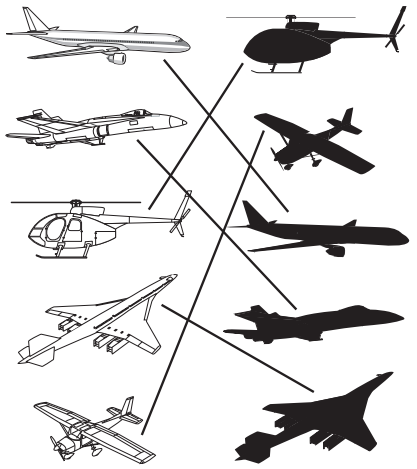
"Webster's Student Dictionary," SMITHMARK Publishers, New York, NY, 1999.
http://www.dictionary.com

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

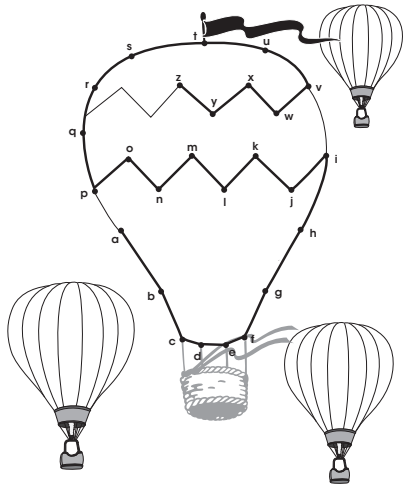
Little Explorers Picture Dictionary from EnchantedLearning.com
http://www.littleexplorers.com/Dictionary.html

Answer page

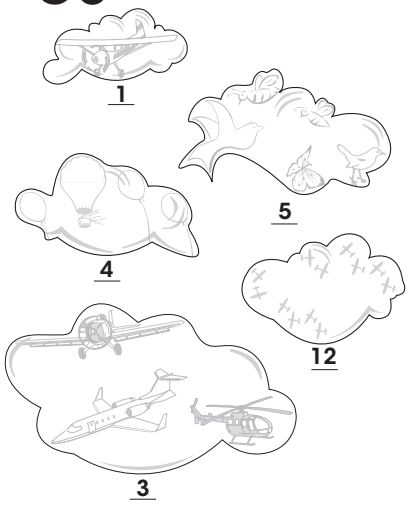
Aa



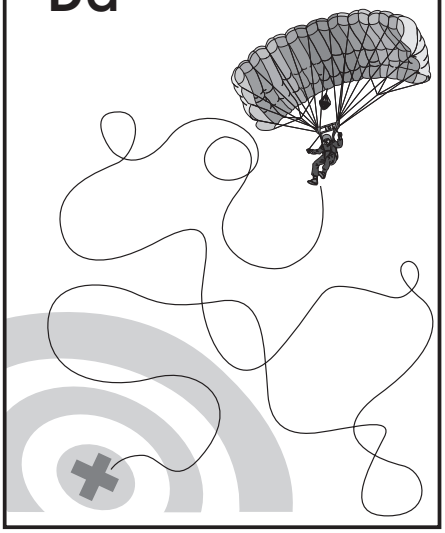
Bb



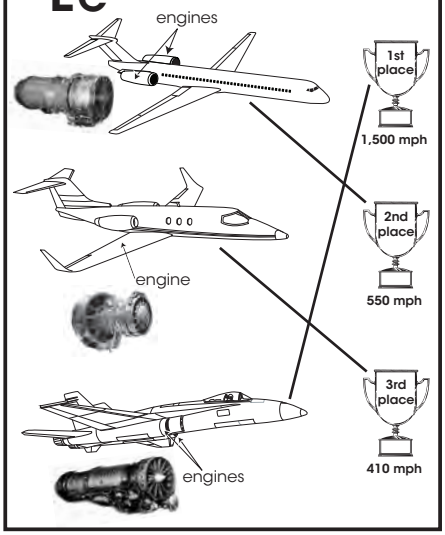
Cc



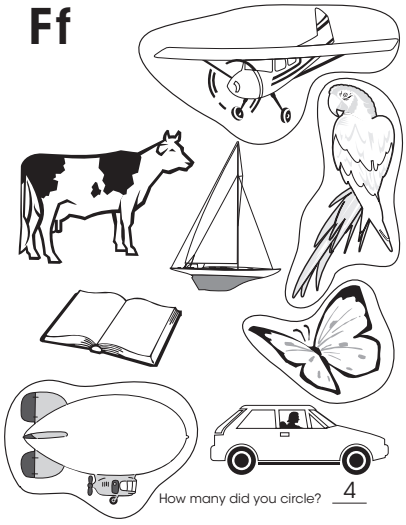
Dd



Ee



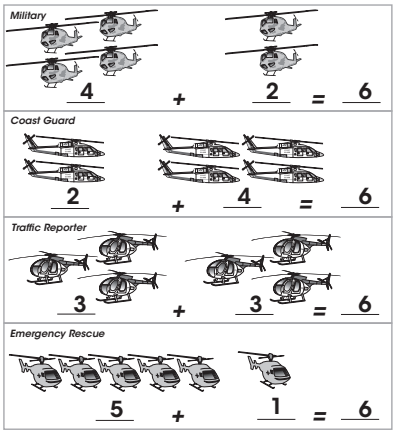
Ff



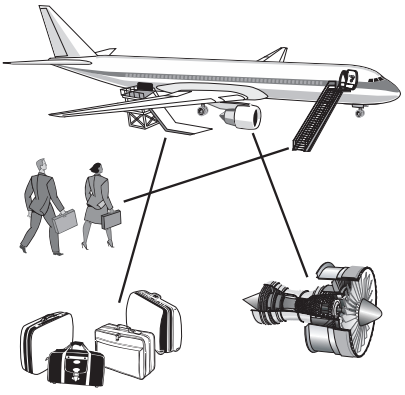
Gg

Assemble Glider

Hh

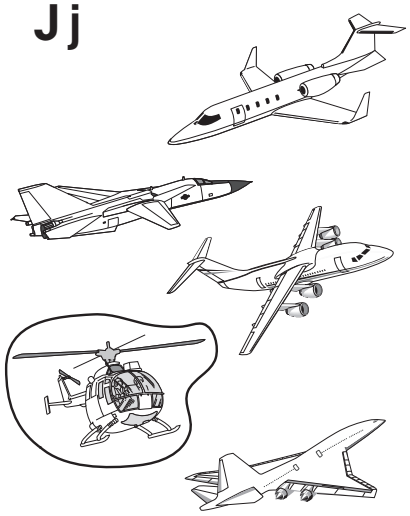


Ii

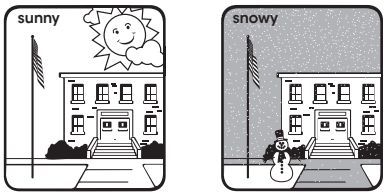


Answer page

J j

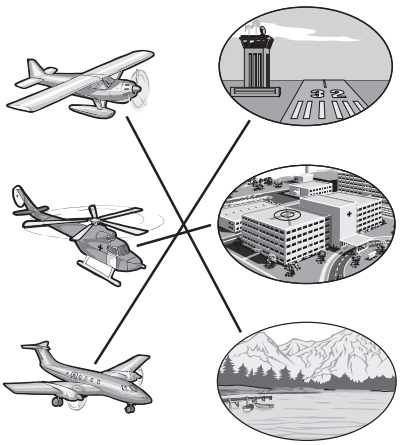


K k

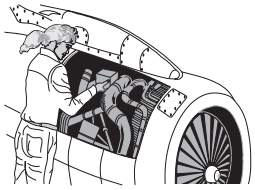


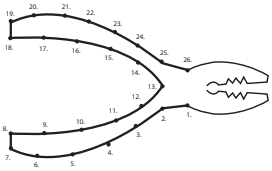
Color windy

L l

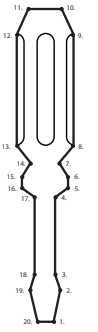


M m



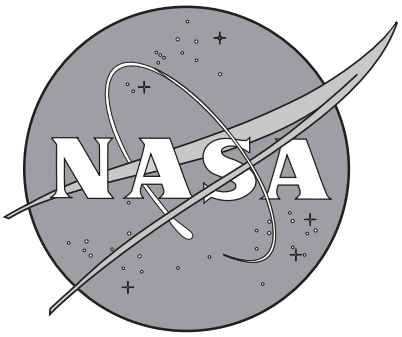


pliers



screwdriver

N n

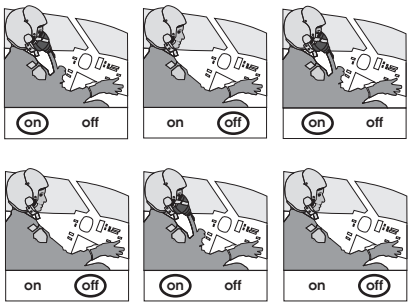


O o

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? 3

How many pilots have their oxygen masks off? 3



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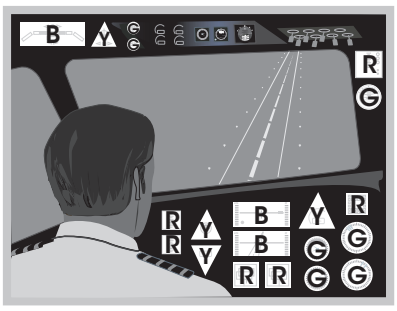
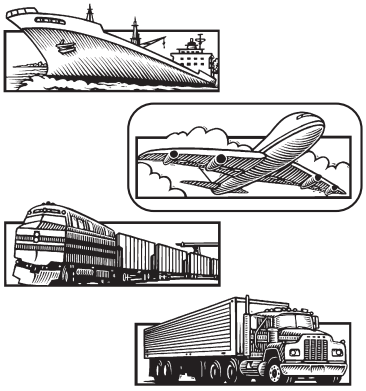
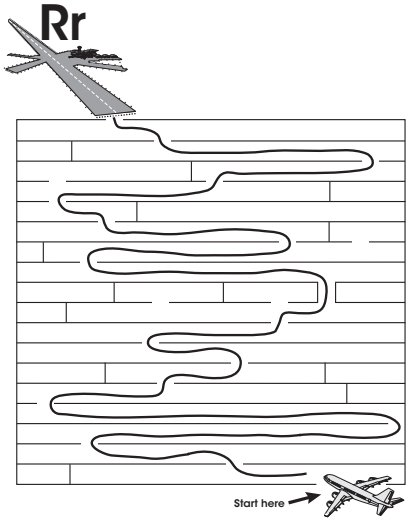


Q q

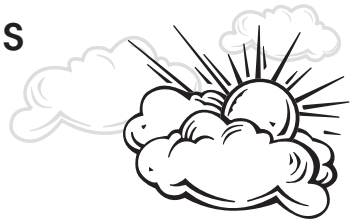


R r



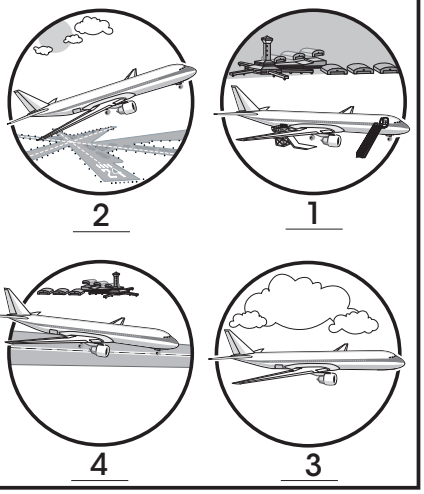
Answer page

Ss



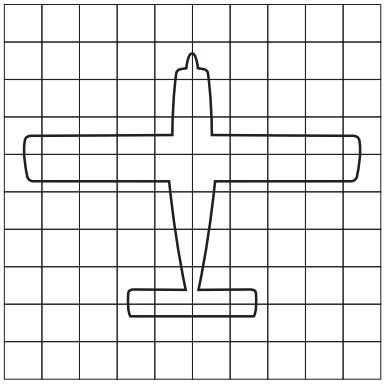
Your own drawings here.

Tt



Uu

Vv



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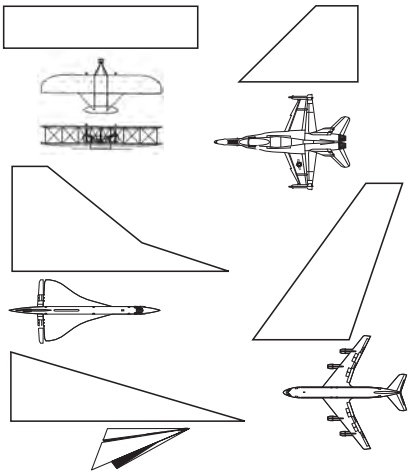

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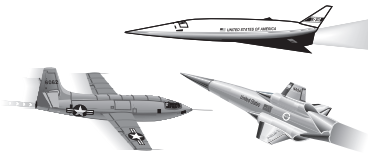
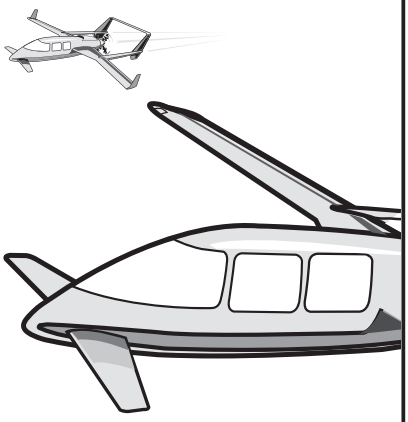


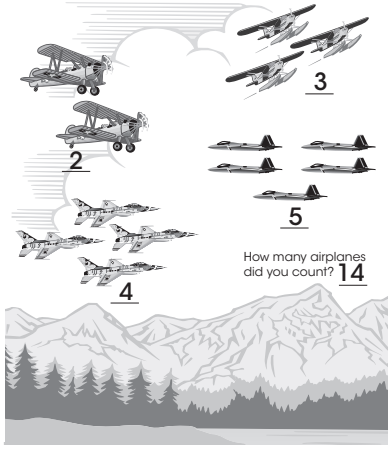
Your own drawing here.

Yy



Your own drawings here.

Zz

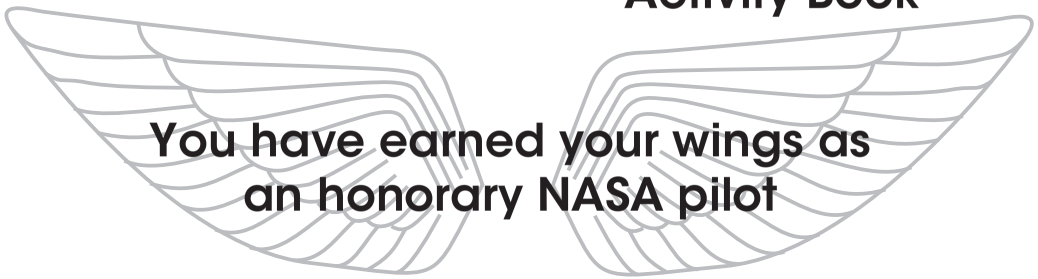


Congratulations

on completing the

Innovating Tomorrow's Engines

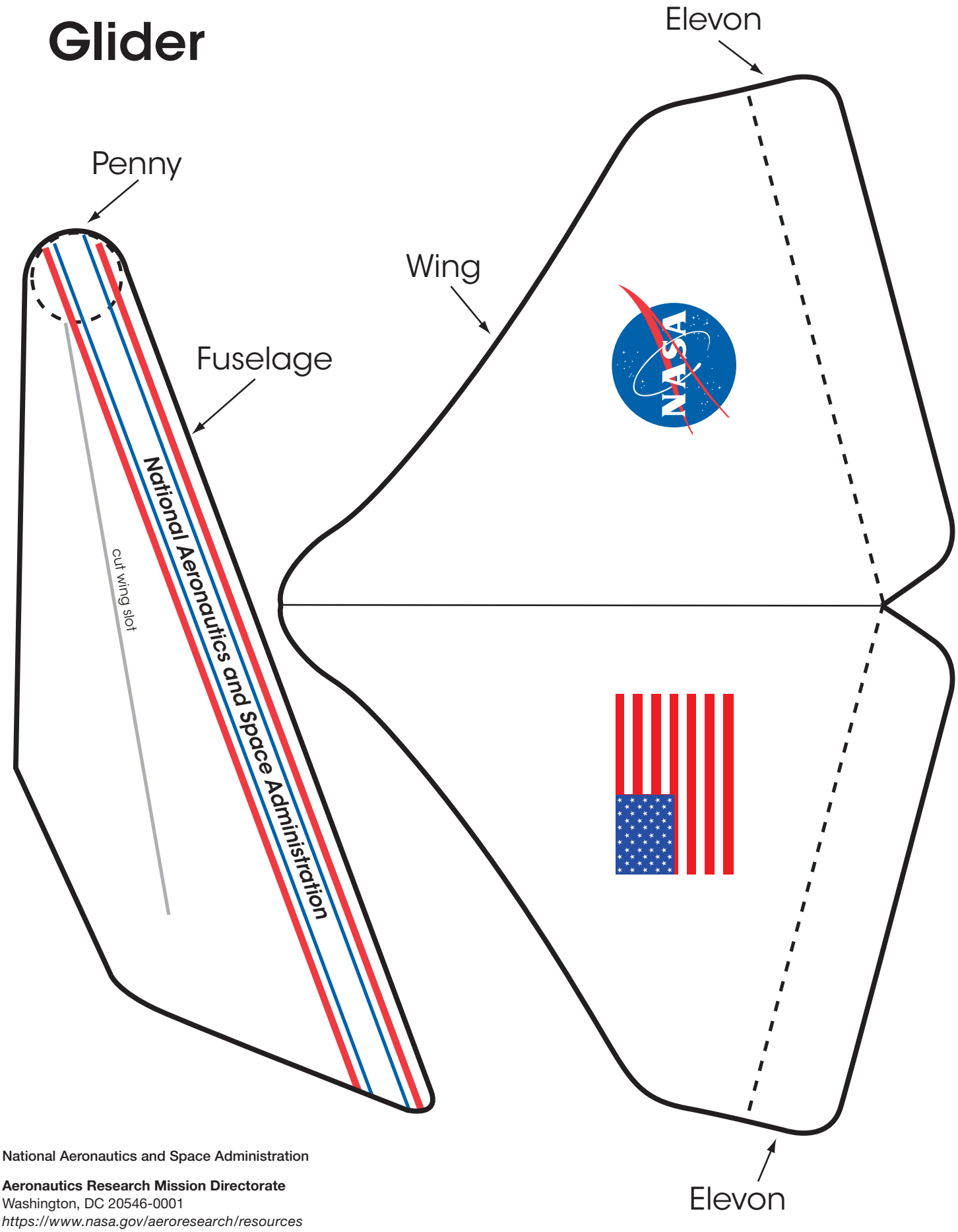
HIGH FLYERS Alphabet Activity Book



You have earned your wings as an honorary NASA pilot

Print your name on the lines above

Glider



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