Contents

For questions contact: Dr. Swati Shome at drswatishome@gmail.com

Air engines-1

Uncontrolled Propulsion

Materials

- Balloons

Procedure:

Blow up a balloon and release it.

Questions:

1. Blow into the air and blow into the balloon. Which one is more difficult? And why?

2. Which has higher pressure: air inside the balloon or air outside the balloon?

3. What happened when you released the inflated balloon?

4. When you release the balloon in which direction is the air moving – into the balloon or out of the balloon?

5. Is the balloon moving in the same direction as the air coming out of the balloon?

6. Draw the balloon with arrows showing which direction the air was moving and another arrow to show the direction in which the balloon was moving.

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Air Engines -2

Controlled propulsion

Make your balloon travel like a rocket!

Materials
- Balloons of different sizes
- Plastic drinking straws
- 50 feet of nylon fishing string
- Rough string
- Cello tape
- Clips

Rockets travel in a straight line. This is because the escaping gasses are very carefully controlled and the rocket is well balanced. How can you make your balloon travel in a straight line?

Do you think the balloon would travel further if directed on a straight path? ____________

How could this be accomplished? Write or draw your ideas.

What is an engine?

The job of the engine is just to move the airplane forward, not to lift the airplane. The wings are doing the lifting, not the engines.

Procedure:

1. Measure off a distance of at least 24 feet.
2. Slide the drinking straw onto the string.
3. Tie one end of the string to a chair and hold the other end of the string taut.
4. Blow up a balloon. Twist and clip the end of the balloon so that no air escapes. Attach the balloon to the straw with two pieces of tape. The neck of the balloon should be parallel to the string.
5. Release the clip to let the air rush out.

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Worksheet:

1. Let's Draw a picture of what is happening
2. If a small and large balloon are both inflated to their maximum capacity, which travels further?

Write your prediction and then try it out and write your result

	Prediction	Result
Big balloon	Less/ More distance	Less/ more distance
Small balloon	Less/ More distance	Less/More distance

3. Which balloon has the most fuel – the small balloon or the large balloon?

____

4. If a small long balloon and a large balloon are both inflated with the same amount (volume) of air, which travels further?

____

5. What happens if you attach two balloons to the straw? Is it better than one balloon? __________________________________
6. What happens if you use rough string instead of the smooth nylon string?

____

7. What happens if you use yarn instead of the smooth nylon string?

____

8. Is friction helping your balloon move faster or slower?

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In 1686, Sir Isaac Newton said: For every action, there is an equal and opposite reaction. (Newton's 3rd Law of Motion)

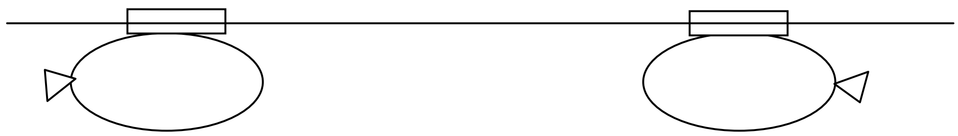
The equal and opposite reactions here are: 1) the air released from the balloon is traveling in one direction and, 2) the straw and balloon are traveling in the _______________ direction.

- A rocket engine works in the same way except that chemical or nuclear means are used to make an escaping gas much like the escaping air in your experiment.

Let's have a collision!

Blow up two balloons, clip the ends and tape them to two different straws. Place the 2 straws on the string such that their ends are on opposite sides of the string. Release the balloons and let them collide!

How far do the balloons go? This is an example of retrorocket!



What happens if you use one big balloon and one small balloon?

Did you know?

Propulsion means to push an object forward. A propulsion system is a machine that produces thrust to push an object forward.

Thrust is the force which moves an aircraft through the air. Thrust is generated by the **engines** of the aircraft through some kind of propulsion system.

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Crumpled Paper Balls

Materials
-2 sheets of paper

Procedure and worksheet

1. Crumple a sheet of paper into a small ball.
2. Predict what will happen if you hold a sheet of paper and the ball at the same height and drop them at the same time.

Do you think that the sheet of paper will fall faster than the crumpled ball of paper? Or will they fall at the same speed? Write your prediction.

	Predict (What do you think will happen?)
Crumpled ball	Slower / faster / same speed
Sheet of paper	Slower / faster / same speed

3. Then try it and write your result.

	Result	Other observations
Crumpled ball	Slower / faster /same speed	
Sheet of paper	Slower / faster /same speed	

4. Draw a picture of what happened.

5. Why do you think most things fall down when you drop them rather than floating up?

6. Try to explain your results.

7. Can you name some flying objects that use this principle to slow down the speed of falling? Think and write your answer.

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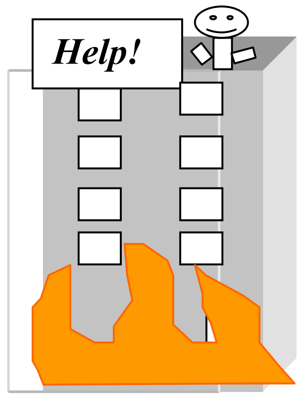
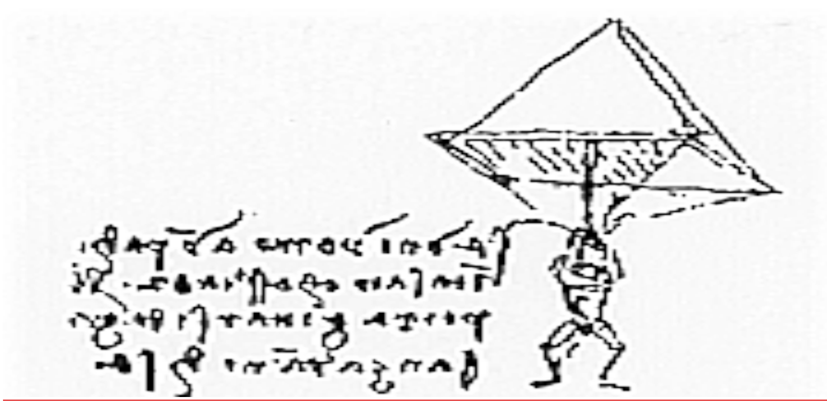
Look at that man stuck on the top of the burning apartment! He will surely die because there is no way for him to escape. Perhaps I can think of a device to save him.

Leonardo Da Vinci (in 1514 A.D.)



So he thought and thought and thought hard and drew the picture below. We now call this device a **<u>parachute</u>**.



Do you know of other uses of a parachute? Write them down.

____

____

____

____

Parachutes

Materials:
- 4 pieces of string (each 1 ½ feet long)
- 4 pieces of tape
- 4 jumbo paper clips
- 1 paper napkin or plastic sheet cut to same size

Question:
How do people survive when they Jump out of an airplane while using a parachute?

Procedure:
1. Attach the string to the corners of the plastic using the tape.
2. Tie the four pieces of string together.
3. Attach one paper clip as the "*passenger*"
4. Try releasing parachute.
5. Add four "*passenger paper clips*" and see how your results change

Worksheet:

1. Draw a picture of your parachute labeling all the parts.

2. Do you think the parachute will fall faster with 4 paper clips? Write your prediction. Then try it and write your result.

	Prediction	Result
1 paper clip	Slow / fast	Slow / fast
4 paper clip	Slow / fast	Slow / fast

3. Why is the parachute falling slowly instead of just free falling through the air?

____

____

4. Which falls slower? The parachute made from large size napkin or small size napkin?

	Prediction	Result
Small parachute	Slow / fast	Slow / Fast
Large parachute	Slow / fast	Slow / Fast

Passenger parachute

Make a parachute that can carry more cargo..

Materials:
- 4 pieces of string (each 1 ½ feet long)
- 4 pieces of tape
- 1 paper cup
- 1 plastic sheet cut to same size as paper napkin

Procedure:

1. Near the top of the cup, punch out four holes, on four sides of the cup.
2. Make a hole at each corner of the square plastic. Make sure that all of the holes are equal distances from their surrounding edges. Tie a string to each hole
3. Tie the other end of the string to a hole in the cup,
4. Repeat step3 until every corner is tied. Make sure that there are no twists or tangles in the strings. If there are, untie one string and take out the tangle.
5. Try it out! You can put a small toy, ball, or anything you want into the cup as passengers! You can make a troop of parachutes and have an invasion of soldiers! Enjoy!!!
6. Paint or decorate your parachute and bring it to class next week. We will show it to all other students in class. You could also make a different shape parachute.

Tips:

Cut a small hole in the top of the parachute, to let the air trapped in the parachute to escape. It may let your parachute wobble less.

Did you know?

A parachute slows down when it falls because of air resistance (or drag) acting on it. Air resistance (or drag) is a type of friction that occurs between an object and air.

Write about another two instances where you have felt air resistance or drag.

Experiment I. How do planes lift off the ground?-

Blow air **<u>above</u>**
a paper strip and
see what happens!

Materials:

- Paper
- Scissors

Method

1. Cut a strip of paper that is 1 inch wide and 6 inches long
2. Place one end of the paper just below your lower lip and blow hard over it
3. What happens?

4. Try doing the above with different lengths of paper,

A change in the speed at which air is flowing will cause a change in air pressure. Daniel Bernoulli, a Swiss scientist discovered what is now known as Bernoulli's principle: the pressure of a liquid or gas decreases as its speed increases.
The air pressure above the paper decreases when air moves fast over the top of it. This creates a low pressure above the paper. There is higher pressure under the paper. Hence the paper lifts upward.

Planes and helicopters use this principle to lift off the ground.

Experiment II. How do planes lift off the ground?

The shape of the wings is important for making a plane lift. In this experiment you will make a paper wing that lifts!

Materials

- 1 strip of paper 2 X 6 cm
- 1 strip of paper 2X 4 cm
- cellotape
- Wire or wooden skewer
- Scissors
- Tape

Method

1. Keep the short paper flat and tape the longer paper onto it such that an arch forms This is your airplane wing model.
2. Poke the skewer through the middle of both pieces of paper.
3. Move the skewer around slightly such that the hole becomes slightly bigger
4. Hold the skewer such that the paper is resting on your fingers.
5. Blow over the curved side of the paper.
6. What happens?

7. Blow over the flat side of the paper
8. What happens?

Why: You just produced Lift! The air traveling over the wing that you made has to travel farther and faster than air traveling under the wing. This makes the pressure over the wing less than the pressure on the bottom of your wing. Since things move from places of high pressure to low pressure the wing is lifted!

Experiment III. How do planes lift off the ground?

The shape of the wings is important for making a plane lift. In this experiment you will compare different shapes of wings to find out which shape produces the most lift.

Materials

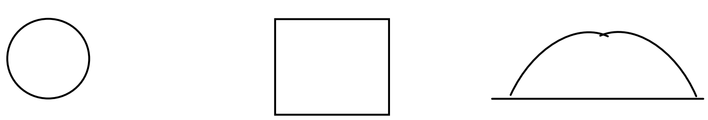
- 2 strip of paper 2 X 8 cm
- cellotape
- wire or wooden skewer
- scissors,
- tape,
- ruler

Method

Fold the one strip of paper to make a square. Tape it
Poke the skewer through the middle of square.
Move the skewer around slightly such that the hole becomes slightly bigger
Hold the skewer such that the paper is resting on your fingers.
Blow over the square..
What happens?

Now fold another strip of paper to make a circle. Tape it and repeat the same experiment above.

Which shape lifts the most?



Can you now figure out why the wing of an airplane is not rectangular in shape?

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Sled Kite

The forces on a kite are so similar to the forces on an airplane that the Wright brothers often flew their gliders as tethered kites to determine the best way to fly them.

Like an airplane, a kite is heavier than air and relies on the motion of the wind past the kite to generate the_____________↑ necessary to overcome the ______________↓ of the kite. The movement of the air past the kite also generates air resistance which is overcome with a control line.

The sled kite is a model of a parawing. Like any wing the parawing depends on the movement of air over its shape to generate a lifting force. Hang gliders use a parawing to glide from cliffs or mountain tops.

The sled kite in this activity has the shape of a sled when it catches the air.

Materials
- Sled kite template
- Paper
- Two straws
- Carbon paper

Procedure:

1. Make a copy of the sled kite template using the carbon paper.

2. Cut out the sled kite

3. Decorate the kite.

4. Cut the straws such that they will fit into area marked for the straws.

5. Tape the straws in place

6. Place two pieces of tape in the marked area covering the black circles.

7. Punch two holes marked by the black circles.

8. Cut two pieces of kite string to 45 cm each

9. Tie a string through each hole. Tie them such so that you do not tear the paper.

10. Tie the opposite end of both strings to a paper clip

11. Pick up the 1 m long piece of string. Tie one end of this string to the other end of the paper clip.

12. Make a small tail and a long tail for your kite,

13. Go outside. - Hold the 1 m length of string and run with the kite.

Worksheet

1. Do you think kites can lift objects?

____

2. Walk with your kite . How does the kite fly?

____

3. Run fast with your kite. How does the kite fly now?

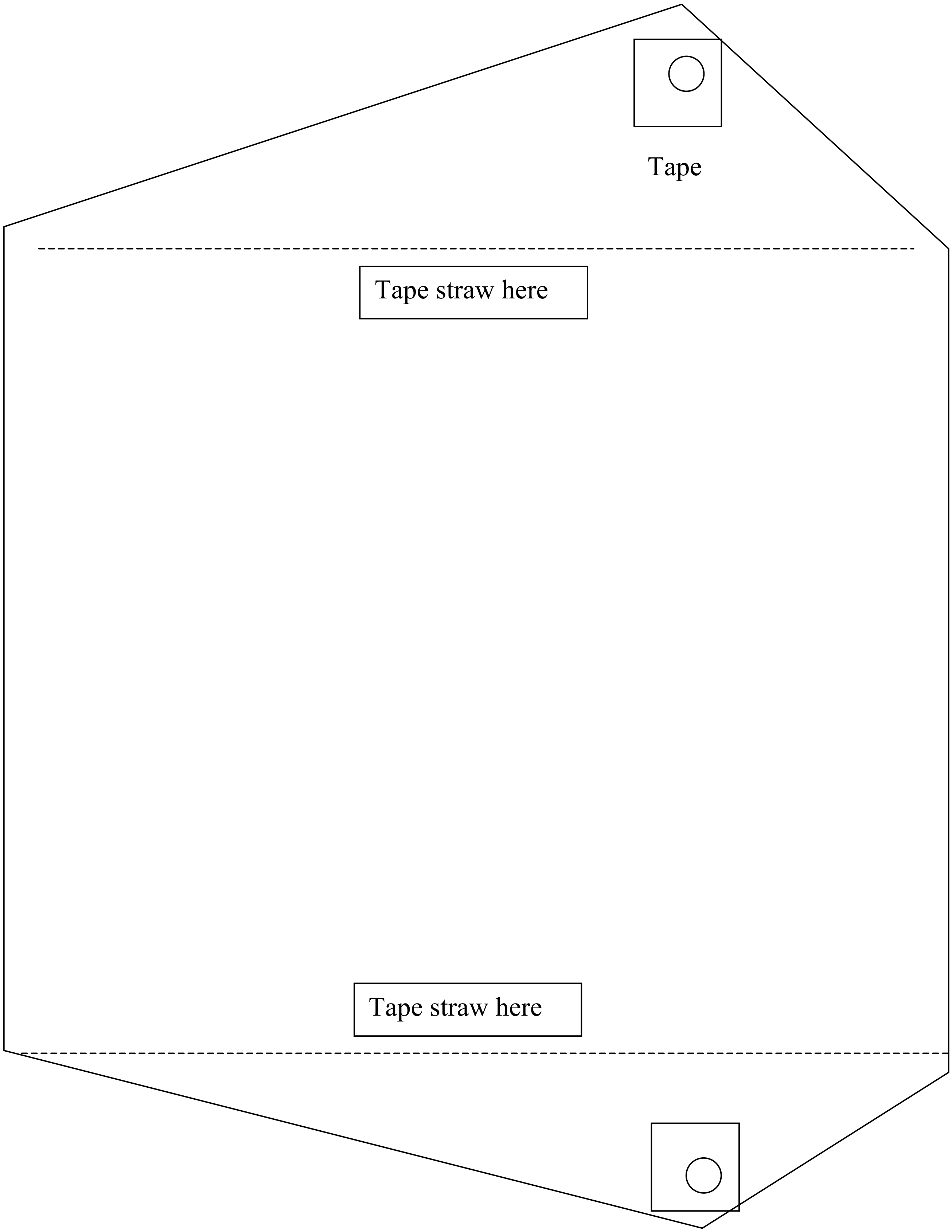
____

4. Try attaching your small tail to your kite. How does it fly now?

____

5. Try attaching your long tail to the kite. How does it fly now?

____



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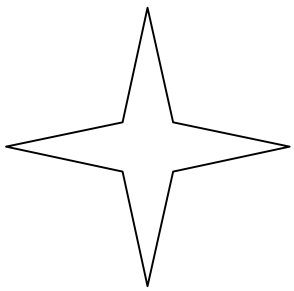
Make a compass

The compass has been used for centuries as a tool for navigation. It is an instrument that aligns a free pivoting magnet (called the needle) in Earth's magnetic field.

Since the invisible lines of the magnetic field are oriented in a North/South direction, the needle will orient itself in a North/South direction. The other cardinal points of the compass (east, west, and south are defined in relation to the north. Pilots use a compass to determine direction when flying airplanes. Boaters, hikers and hunters are examples of other people who rely on compasses.



Materials
- Paper pins
- Bowl of water
- Liquid soap
- Markers
- Styrofoam cup
- Scissors
- Strong magnet

Method

1. Cut the bottom out of the cup and float it on water

2. Place one drop of liquid soap in the water. This reduces surface tension and prevents the Styrofoam from getting stuck to the walls of the bowl.

3. Magnetize the compass needle by rubbing a pin in one direction on a strong magnet.

4. Check if the compass needle is magnetized by checking its strength with some fresh pins.

4. Place the magnetized compass needle on the floating Styrofoam disk. To minimize compass errors, place the compass away from metals, magnets, or electrical wiring.

In which direction does the needle point?

____

What happens to the needle if you turn the bowl around?

____

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What happens to the needle if you bring a paper clip close to it?
____

How can we figure out which is the North direction?
____

____

____

Write N, S ,W, and E on the four sides of the bowl to show which is North, South, East and West respectively.

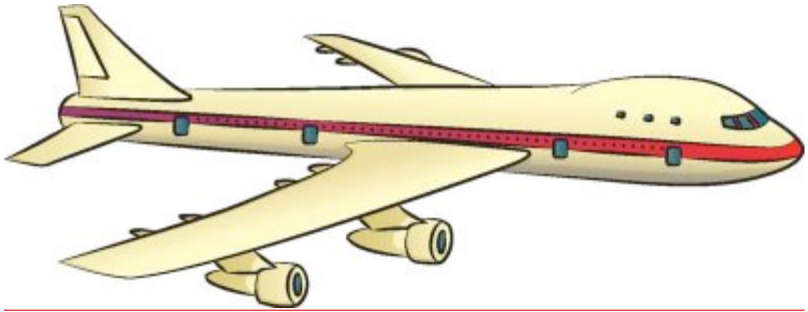
Find out the direction of the following:

Door of the classroom________________________________

Blackboard of the classroom ___________________________

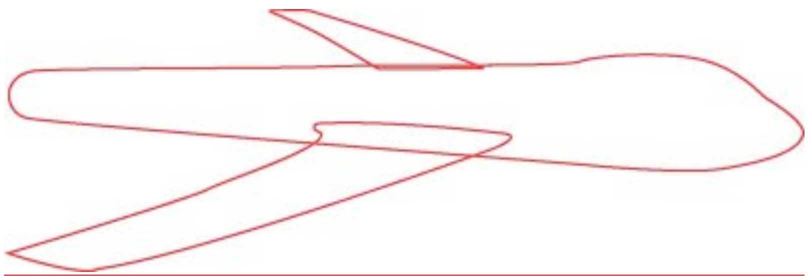
Back of the classroom_________________________________

How to draw a Passenger plane from Howstuffworks.com

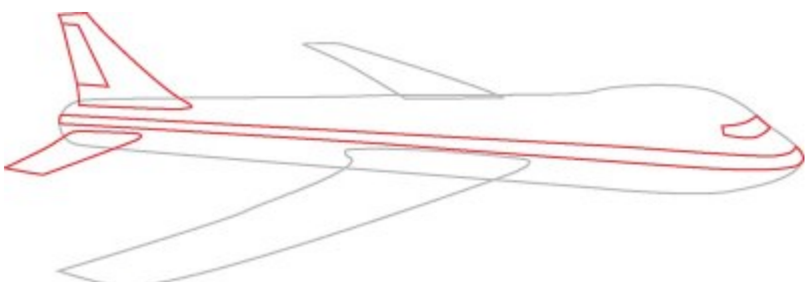


Follow the easy directions below to draw this passenger plane.

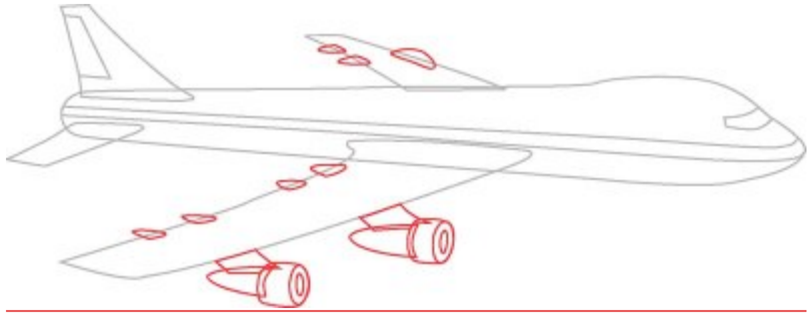
Follow the red lines in each picture to learn exactly what to draw in thet step. The lines drawn in previous steps are shown in grey.



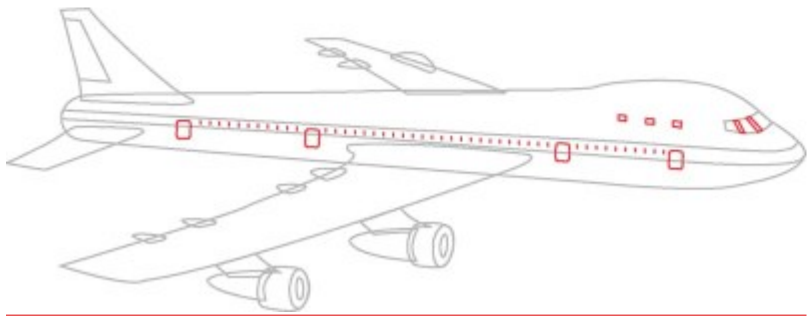
Step 1: For the main body or the' **fuselage**', draw a long cylindrical shape with a bump at the top of one end. Add two wings coming off the fuselage at an angle .



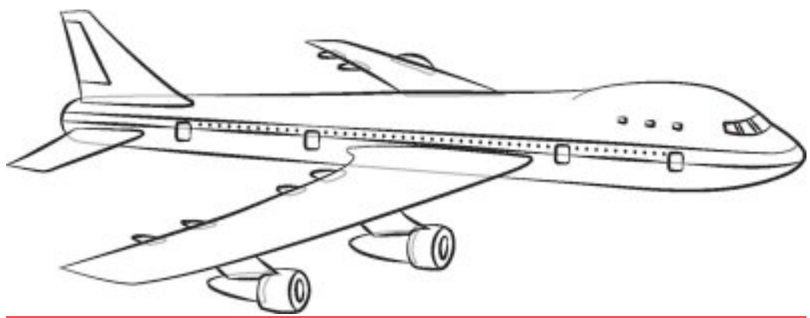
Step 2: Draw triangular shapes for the tail section. Add a wedge shape in the top tail. Draw two lines along the length of the body (curve the lines up a bit at the planes nose). Add the curved **cockpit** window.



Step 3: Draw two wedges below the nearest wing. Add bullet shapes and cylinders underneath the wedges. Draw small rounded cones on the back side of the wing. These are the 'jet engines'. Add two small cones and a halfcircle on the far wing to indicate the engines there.



Step 4: Draw four square-shaped doors along the side of the plane. Add cockpit windows and small windows along the planes side.



Step : Trace the pencil lines you want to keep with a pen. Erase any extra lines.

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Right flight

On December 17th 1903, two brothers Wilburt and Orville Wright became the first humans to fly a controllable, powered airplane. To unravel the mysteries of flight the Wright brothers built and experimented with model gliders. Gliders are airplanes without motors or and power source.

Problem solving for an airplane

1. Airplane dives into ground- check the weight distribution of the airplane. Perhaps the front (nose) of the airplane is too heavy
2. Airplane moves to the right or left- check the **rudder**
3. Airplane is rolling- Check the **ailerons**

Materials
- Styrofoam plate
- Template
- Plastic knife
- Toothpicks
- Sandpaper
- Binder clips
- Wooden dowel
- Paper clip
- Markers
- Goggles

Method and worksheet

1. Name a few materials that can be used to build a model glider

____

____

2. Try to 'fly' a Styrofoam plate. Can you describe how it *flew*?

____

____

3. Why do you think Styrofoam may be a good material to construct a model glider?

____

4. Trace the template onto a Styrofoam plate.

5. Cut out the wings, fuselages and elevator from the Styrofoam usng the plastic knife.

6. Use the sandpaper to sand the edges.

7. Assemble the glider by inserting the wings and the elevator into the fuselage slots.

8. Write your aircraft number, name, squadron logo , or emblem

9. Civilian aircraft have a letter or letters preceding the aircrafts identification number indicating in which country the aircraft is registered. Mexico uses the letter X. Canada uses the letters “CF”. You may “register” your model with your choce of country.

10. Try flying your plane. Describe how it flew

11.The gliders weight must be balanced properly before it will fly. Now add a paper clip to the nose of the glider. Try flying it and describe your flight.

12. Move the clips backwards or forwards on the fuselage to determine the best weight and balance for your glider.

Wind Socks

A wind sock is a type of kite that is used to detect the wind direction. It is a tapered tube of cloth that is held open at one end by a stiff ring. Wind is directed down the tube, causing the narrow end to point in the same direction the wind is blowing. Brightly colored wind socks are used at airports to help pilots determine the wind direction on the ground. Meteorologists use wind direction to help predict the weather.

There are a thousand uses for a windsock e.g.. shooting ranges, field burning, pesticide applications, oil fields, waste treatment plants.

The visibility is an important factor in the use of a wind sock. Landing craft can determine the speed and direction of the wind before approaching shore. Hot air balloonist, surfers, hang gliders, para sailers, and parachuters, all use the wind sock for instant visual recognition of the wind direction, speed, and gusts.

Materials
- Paper
- Tissue paper 28 cm x 28 cm
- Glue
- Tape
- Scissors
- Magnetic compass
- Wooden dowel
- Paper puncher
- 1 paper clip
- Ruler

1.2m kite string

Method

1. Fold the paper lengthwise to make the border strip of the wind sock

2. Form a loop from the strip and tape the ends of the paper together. This is your paper ring.

3. On the tissue paper use a marker to draw a line 4 cm from one edge and across the paper.

4. On the line drawn in part 3 above, measure and mark a point 3 cm from the edge. Continue marking the line with points that are 3 cm apart.

5. On the opposite end of the tissue paper also mark points that are 3cm apart.

6. Using the points, draw a series of lines on the tissue paper . With scissors, cut along these lines to make strips.

7. Glue the edge of your tissue paper to the edge of the paper ring. Let the glue dry.

8. Use a hole punch to punch three holes equal distance around the paper ring.

9. Cut 3 pieces of string 30cm long. Tie one end of each string to the wind sock at each of the 3 holes.

10. Tie the 3 loose ends of the string to a single paper clip. Add an additional 30 cm length of string to the paper clip.

11. Test the wind sock by holding the single string in front of a fan.

12. Tape the wind sock to a wooden dowel and place outside to monitor wind direction and speed. To help determine wind direction , use a compass to mark north , south, east and west below the wind sock (with the dowel in the center).

Worksheet

What does the wind sock do in the wind?

____

____

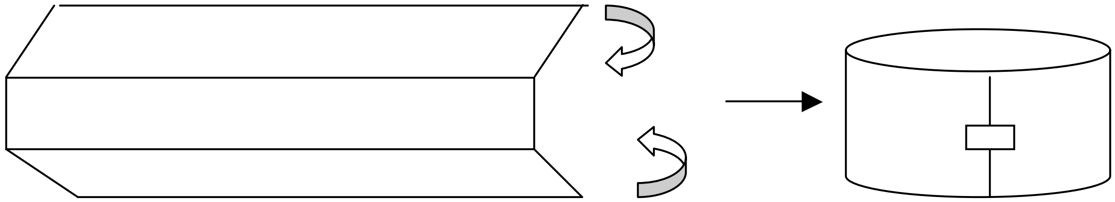
Where can wind socks be used?

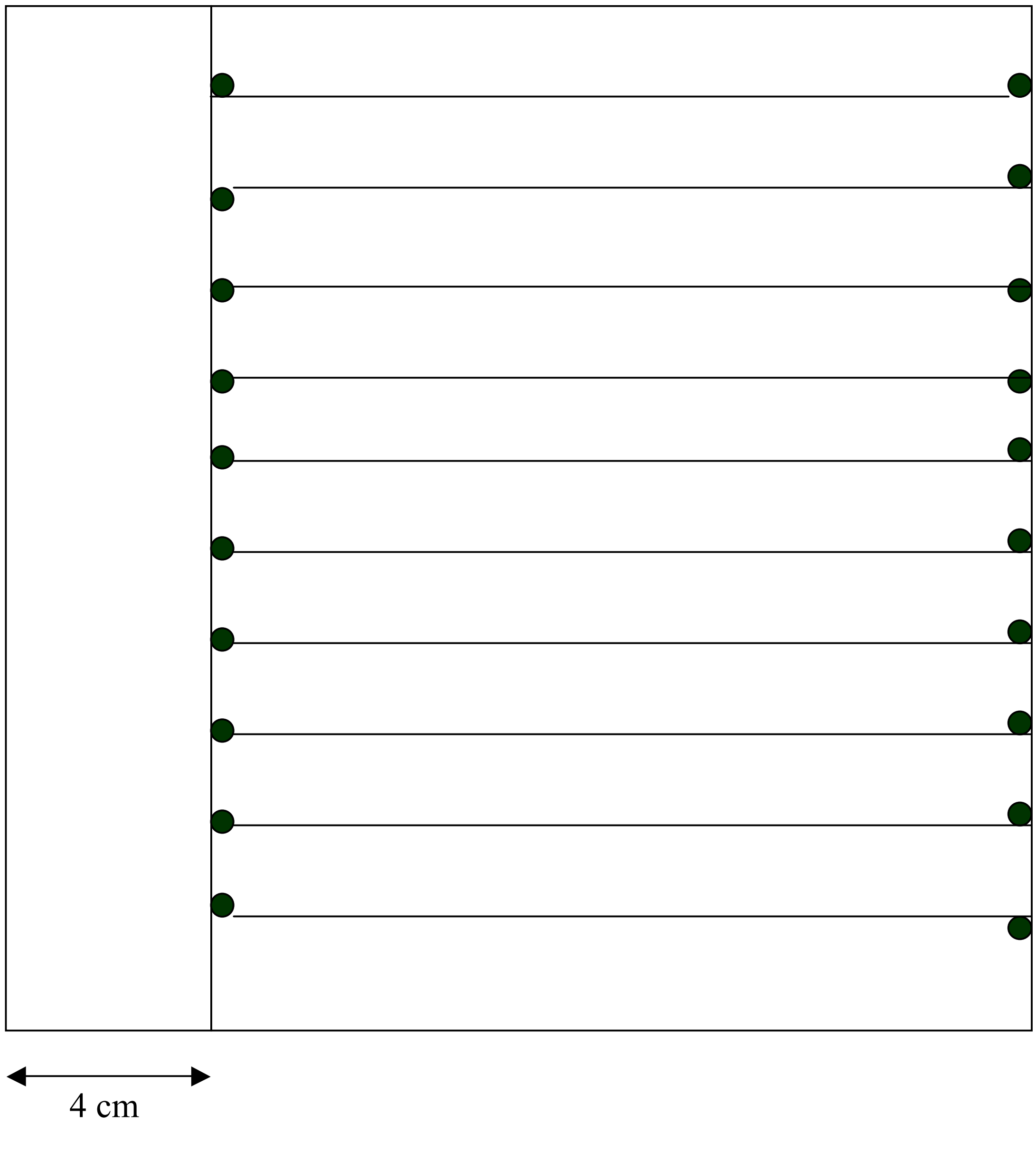
____

____

____

Draw a diagram of your wind socks flying in the air. Draw arrows to show the direction in which it will fly it will fly in no wind, slight breeze and strong gust. Label your diagram.




4 cm

Hoopsters

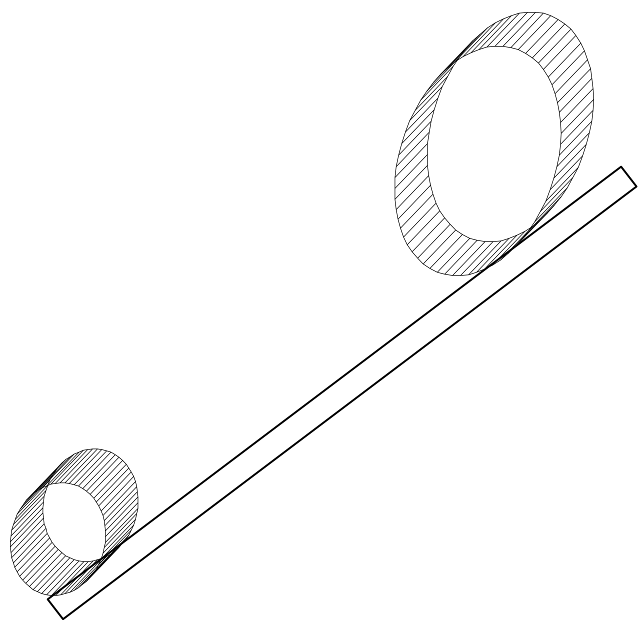
1. Cut the papaer into long strips. that are 1 inch wide and 5-10 inches long.

2. Put a piece of tape on the end of one strip. Curl the paper into a little hoop and tape the ends together.

3. Curl the long strip into a hoop and tape the ends together.

4. Tape the large hoop onto one end of the straw.

5. Tape the smaller hoop on the other end of the straw such that it lines up with the big hoop



7. Hold it in the middle of the straw, with the little hoop in front. Throw it like a spear. Does it fly?
8. Try throwing a straw. Which flies better-the straw or the hoopster?

Try to design a better hoopster.

Further things to try

- Put a paper clip at the bottom of the small hoop.
- Make a really long Hoopster with two straws. taped together
- Use wider or thinner strips of paper to make your loops.

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- Make a double Hoopster with two little hoops side by side on one end and two big hoops side by side on the other.

Draw the different Hoopsters that you made and write about which one worked best for you.

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Rotor Motor

Materials

- Paper
- Graph paper
- Template
- Scissors
- Measuring tape
- Pencil
- 3m length of light ribbon like a strip of audiotape

Observe some properties of air pressure and aerodynamics as you make and experiment with a rotor motor.

Procedure:

1. Cut along all solid lines of the template.

2. Fold along the dashed lines. Fold the long folds toward each other to form rigid body and to lower the center of gravity.." Fold the propeller blades in opposite directions such that one blade is toward you and the other blade away from you.

3. Attach a paper clip to the bottom of the handle, hold it high over your head, and drop it. Observe what happens as the rotor motor drops.
4. Draw your observation.

5. Which do you think will fall faster: 1. Ball of paper, 2. Rotor motor or 3. Sheet of paper? First write your prediction, then try it out and write your result.

	Prediction	Result
Ball of paper	Slow / Medium/Fast	Slow / /Medium/Fast
Rotor motor	Slow / Medium/Fast	Slow / Medium/Fast
Sheet of paper	Slow / Medium/Fast	Slow / Medium/Fast

6. Explain the results that you got above

____

____

____

7. To properly research our project we need to count the number of rotations made by the rotor motor as it falls. Any ideas how we may do that?

____

____

7. To determine the number of rotations 1. tape the ribbon to the rotor motor, 2.stand on the loose end of the ribbon, and 3. drop the rotor as usual. How does the ribbon make counting easier?

8. Draw a line graph that shows the relationship between the number of twists and the drop height of the rotor motor.

9. Now design a rotor motor that rotates faster, or flies longer.

10. Record your results

11. Results

When I add another paper clip to the rotor motor________________________________

____

When I make the propellar blades shorter ____________________________________

____

When I make the propellar blades longer _____________________________________

____

When I use a heavier paper to make the rotor motor _____________________________

____

When I use light wrapping paper to make the rotor motor________________________

____

Experiment with the rotor motor to see if you can make it spin in the opposite direction as it falls.

EXPLANATION

The blades of this motor turn as air pushes on the body of the motor, while the speed of their rotation is affected by the weight of the motor. Air rushes out from under each wing in all directions as the motor falls. The air hits against the body of the motor, causing it to rotate. Increasing the weight of the motor by adding paper clips causes it to fall faster, increasing the flow of air against the body of the motor, thus increasing the rotation speed. However, when too much weight is added, the motor is pulled down with such force that the wings are forced upward. Then the wings are no longer able to provide lift or rotation due to lack
otor quickly falls to the floor.

Plan to Fly there

The pilot of an airplane uses a flight plan to ensure a successful flight. The plan may contain the following information:

1. Aircraft identification number
2. Departure time (when the flight will leave)
3. Departure point (where plane will take off from
4. How it will get there (route of flight)
5. Where will it land (destination)
6. How long it will take to fly there(estimated time en route)
7. When the flight will land (estimated time of arrival
8. Colour of the airplane
9. The pilot's name

Abbreviations and codes are used on flight plans to save space and reduce the number of words.

The pilot plans the route of flight by connecting a series of points on an aeronautical chart. These points are abbreviated, and are listed on the flight plan to describe the route of flight.

Pilots use a radio or telephone to communicate or 'file" flight plan information with a Flight Service Station.

Once the airplane is airborne, Air Traffic Control (ATC) controllers use the flight plans to track airplanes and to maintain a safe distance between airplanes.

Talking on a radio or telephone can sometimes change the sound of words and letters. For example the letter B sounds like the letter P and the letter T sounds like the letter D. Most of the information on the flight plan is abbreviated or coded using numbers and letters. To help eliminate mistakes caused by a change in the sound of a letter, pilots use the International Phonetic Alphabet.

The International Phonetic alphabet assigns word sounds to every letter in the alphabet. Instead of saying the letter A, Pilots say Alpha.

International Phonetic Alphabets

A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whiskey
I	India	X	X-ray
K	Kilo	Y	Yankee
L	Lima	Z	Zulu
M	Mike		

Here are the Airport codes of a few cities of India.

Airport name	Airport code
Ahmedabad	AMD
Bangalore International Airport	BLR
Bhubaneshwar	BBI
Chandigarh	IXC
Chhatrapati Shivaji International	BOM
Darjeeling	DAI
Dehra Dun	DED
Hyderbad Airport	HYD
Indira Gandhi International	DEL
Kanpur	KNU
Lohegaon	PNQ
Nadras International (Meenambakkam)	MAA
Mysore	MYQ
Netaji Subhas Chandra	CCU
Simla	SLV
Tirupati	TIR
Varanasi	VNS
zero	ZER

An **aircraft identification** is a unique set of alphabets and numbers that identifies an aircraft, in similar fashion to a liscence plate on an automobile. All aircraft must be registered with a national authority. Most countries require the aircraft registration to be imprinted on the fuselage

India’s aircraft identification numbers start with the prefix VT. 3 numbers that identify the aircraft follow the prefix. All aircraft registered in the United States. have a registration number starting with N followed by 4 characters.

Time - AM/PM vs 24 Hour Clock

Normally the time is shown as **Hours:Minutes**. There are 24 Hours in a Day and 60 Minutes in each Hour.

Showing the Time

There are two major ways to show the time: "AM/PM" or "24 Hour Clock".

- With the **24 Hour Clock** the time is shown as how many hours and minutes since midnight.
- With **AM/PM** (or "12 Hour Clock") the day is split into the 12 Hours running from Midnight to Noon (the AM hours) and the other 12 Hours running from Noon to Midnight (the PM hours).

Converting AM/PM to 24 Hour Clock

For the first hour of the day (12 Midnight to 12:59 AM), subtract 12 Hours.

Examples: 12 Midnight=0:00,   12:35AM=0:35

From 1:00 AM to 12:59 PM, no change

Example : 11:20=11:20,   12:30PM=2:30

From 1:00 PM to 11:59 PM, add 12 Hours

Example 4:40PM = 16:40   11:25PM=23:25

For questions contact: Dr. Swati Shome at drswatishome@gmail.com

Worksheet to help with flight plan

Aircraft Identification	What is my airplanes number?	____________________
Departure Time	What time will we leave?	____________________
Departure Airport	Which airport will we leave from?	____________________
Route of Flight	How will we get there?	____________________
Destination of Trip	Where will we land?	____________________
Estimated Time En Route	How many hours wil it take to get there?	____________________
Arrival Time	What time will we land?	____________________
Aircraft Colour	What colour is my airplane?	____________________
Name of Pilot		____________________

Pilot's Flight Plan

Aircraft Number___________Departure Time________

Departure point________________________________

Route of Flight_________________________________

Destination____________________________________

Estimated time En route_______ Arrival time__________

Colour of Aircraft_______________________________

Name and Address of Pilot ________________________

____

____

Pilot's Flight Plan

Aircraft Number ___________Departure Time________

Departure point________________________________

Route of Flight_________________________________

Destination____________________________________

Estimated time En route_______ Arrival time__________

Colour of Aircraft_______________________________

Name and Address of Pilot ________________________

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