Year 8 Independent Learning Project (ILP)

Subject: Design and Technology

Date for the completion of this project:
The next D&T lesson you have after the hand in date.

ILP Title: Flight

In this project you will learn: About safety both in school and out. How to spot Health and safety issues. To understand the importance of safety and how to stay safe.	Time you should spend on this project: 4 weeks
At the end of this project you should: have developed a good understanding of basic health and safety in the workshop, the kitchen and out in the 'real world'. You should be able to identify safety issues and advise on how to prevent accidents.	
You should break down your time in the following way: 30 minutes per exercise should be enough	
Weblinks you should use to help you with this task: www.technologystudent.com	
Other resources and ideas which may help you could be: Newspapers, internet news sites	
Your work will be assessed by: Your technology teacher.	
The key words to learn in this project are: Included in the Glossary.	
Your parents may be able to help you by: Reading the guide and advising you on any tasks or situations you might not be familiar with. Checking you spellings and literacy.	

Instructions for Completing this Project

This project has been designed to be completed over a 4 week period so you will need to pace yourself and think about how long each section will take you to complete.

The deadline for this project to be handed in is 2nd January 2017. Make sure it is handed in to your DT teacher and make sure you have filled in the front page correctly.

Some of the questions in his project are research based. This means you will have to go out and find out the information from other sources such as books, television or the internet.

There are also a lot of people who can help you with this project such as your teachers and most importantly your parents so don't be scared to ask for help if you need it.

If you don't have a computer at home or access to the internet and feel you need it, you are welcome to come and use the Design and Technology computers most nights of the week, but make sure you ask a teacher if it's ok before you use it.

In the back of the booklet there is a list of key words and there meanings called a glossary. This glossary should help you with some of the questions in this booklet. This project has been designed to be as entertaining and as fun as possible, while still providing you with skills and knowledge

Any problems you have with this project feel free to come and see Mr Smith, Mrs Humpage or Mrs Dyer during lessons or breaks.

Steps Guidelines

You will be given a Step level for this project when it is completed. By the end of year 7 you should be around a Step 4 or 5 but it is possible if you really try hard to get a Step 6 which will place you in the top 5 % of the year!

Below is what you will need to do to achieve each level in this booklet. Tick them off when you complete them.

Step 4

- I can label my work to show important features.
- I can produce labelled work with minimal help.
- I can evaluate my work.
- I understand evaluation is an important task that leads to improvements.
- I can explain how to use tools safely.
- I can write descriptively.
- I can collect research from one or two sources.

Step 5

- I can gather research from 3 or more sources.
- I can descriptively label work.
- I can evaluate my work and use it to suggest improvements.
- I can write detailed and descriptive comments.
- I can identity tools and processes that would be used in a workshop.
- I can label my own work.

Step 6

- I can gather research from a range of different sources.
- I can clearly communicate my ideas.
- I can clearly evaluate my work and identify key improvements that need to be made.
- I can include as much detail as possible.
- I can produce labelled work with clear explanations on my own.

Parent /Guardians Guidelines

As part of the Independent Learning Project (ILP) in year 7, pupils will be independently working on this Safety project for Design & Technology. This project is to work alongside general homework and has been developed to encourage pupils improve their skills in independent study as well as their Design and Technology subjects

This project will cover a range of areas including:
Independent Research
Hazard Identification
Independent Writing
Hazard and Product Investigation
Analysis of Information
ICT
Extended Writing

At school pupils will be supported by their Design & Technology teachers. There are ICT facilities available at school to help pupils complete this project so it is not essential for you to have computer access at home. We only ask that you support your Son/Daughter by helping them with the work if possible and monitoring to ensure they are completing this project on a regular basis. We have included a glossary of words on the back of this project should you need any help with some of the vocabulary in this booklet.

How you can help your child further.

- Make yourself aware of the project by spending a few minutes going through it yourself.
- Read through the booklet with your Son/Daughter and discuss the tasks with them.
- Provide a quiet, distraction free place for them to work.
- Make sure your Son/Daughter is spending a minimum of 30 minutes a session completing the booklet.
- Assist them with any tasks they find difficult but try not to answer questions for them.
- Look at the work they have done and if necessary suggest how they can improve further.
- Take an interest in the work they have done to help encourage them.
- Make sure they hand in the project by the deadline date.

If you have any queries or problems please feel free to contact me or your Son/Daughters DT teacher at school.

Thank you for your support it is much appreciated,

Mr K Smith – Design and Technology

Introduction to flight

Flight has become a massive part of our lives and is used in many areas for many different jobs. Most commonly you will think of flight as what is used to get you away on your holidays, but it is also how some products are moved around, how mail can be sent so quickly to countries far away and one of the key parts of the armed forces protecting the country. In this booklet you will complete a number of tasks which show you how flight is affected by Design and Technology.

Flight Safety

Safety is an important part of flight and travelling using it. Answer the questions below about different types of flight safety.

Name 3 things that are used for flight security in airports.

_____
_____
_____

What are the 2 safety lights that are displayed during take off in an airplane?

_____
_____

What must you wear during take off and turbulence on an aircraft at all times?

_____

Explain 2 ways that safety information is given to you on board an aircraft.

_____
_____

How would you exit a plane in the event of an emergency and how would you get down to the ground?

_____
_____
_____
_____

What is located under each seat in an airplane?

_____

List 3 three reasons that someone may be refused to fly on an aircraft.

_____
_____
_____

The History of Flight

Flight has a long and fruitful history. Complete the time line below by linking up the dates to the correct comments.

1485	Otto Lilienthal studied aerodynamics and worked to design a glider that would fly. He was the first person to design a glider that could fly a person and was able to fly long distances.
1783	The first round-the-world flight is completed in Seattle, Washington by three, two-seat Douglas World Cruisers of the US Army Air Service.
1891	The Concorde makes its first transatlantic crossing.
1903	Leonardo Da Vinci made the first real studies of flight. He had over 100 drawings that illustrated his theories on flight.
1924	The Boeing 707 became the first successful jet airliner to enter passenger service.
1935	A U.S.A.A.F. B-29 bomber, the "Enola Gay," piloted by Col. Paul W. Tibbets, Jr., drops the first atomic bomb on Hiroshima, Japan.
1939	The brothers, Joseph Michel and Jacques Etienne Montgolfier, were inventors of the first hot air balloon. They used the smoke from a fire to blow hot air into a silk bag.
1945	The DC-3, the first successful passenger airliner, takes off for the first time from Santa Monica, California
1957	Orville and Wilbur Wright were the first people to fly the first heavier-than-air flight and travelled one hundred twenty feet in twelve seconds.
1971	The VS-300 becomes the first practical helicopter to ever take off. Igor Sikorsky himself piloted the vehicle and on his first flight, Sikorsky was able to lift off 3 ft for about 10 seconds

Materials

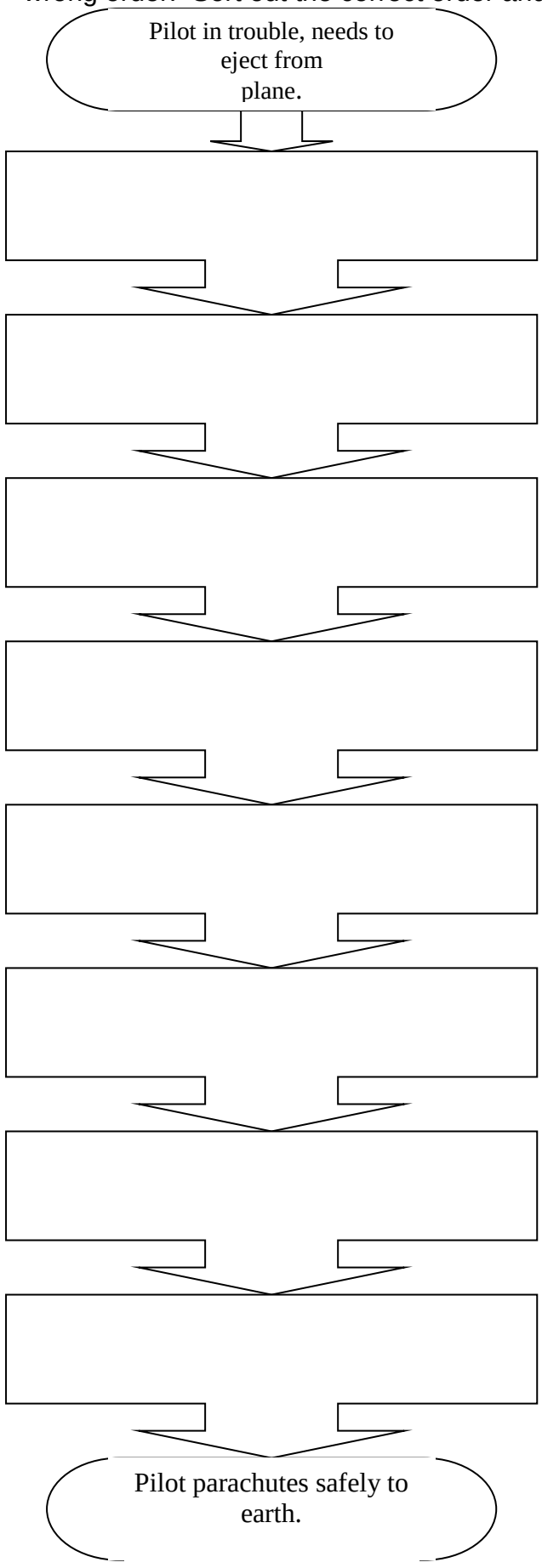
There are many materials used in flight and the manufacture of aircraft. These materials are used for specific reasons and have been carefully chosen for their properties.

Below is a list of different materials. For each write a description of its properties and where you think it would be used on an aircraft and why?

Material	Properties	Where would it be used?
Duralium		
Ply wood		
Fibreglass		
Rubber		
Aluminium		

The Ejector Seat

An ejector seat is a device that is used to safely escape from a fighter jet if a problem occurs with the aircraft. Listed below are the stages in the use of an ejector seat, but they are in the wrong order. Sort out the correct order and put them into the flow chart below.



Steps in the wrong order:

- Seat rises up rails ready for exit.
- Main chute opens.
- Pull handle.
- Rocket pack fires seat out.
- Seat stabilises ready for pilot release.
- Drogue chute opens for seat stabilising.
- Canopy release from cockpit.
- Pilot released from seat.

Draw or stick a picture of an ejector seat below (make sure you fill the whole space).

Logos and Graphic Designs

Each different commercial airline has its own logo and graphic design for its aircraft. What flight companies use the logos below?

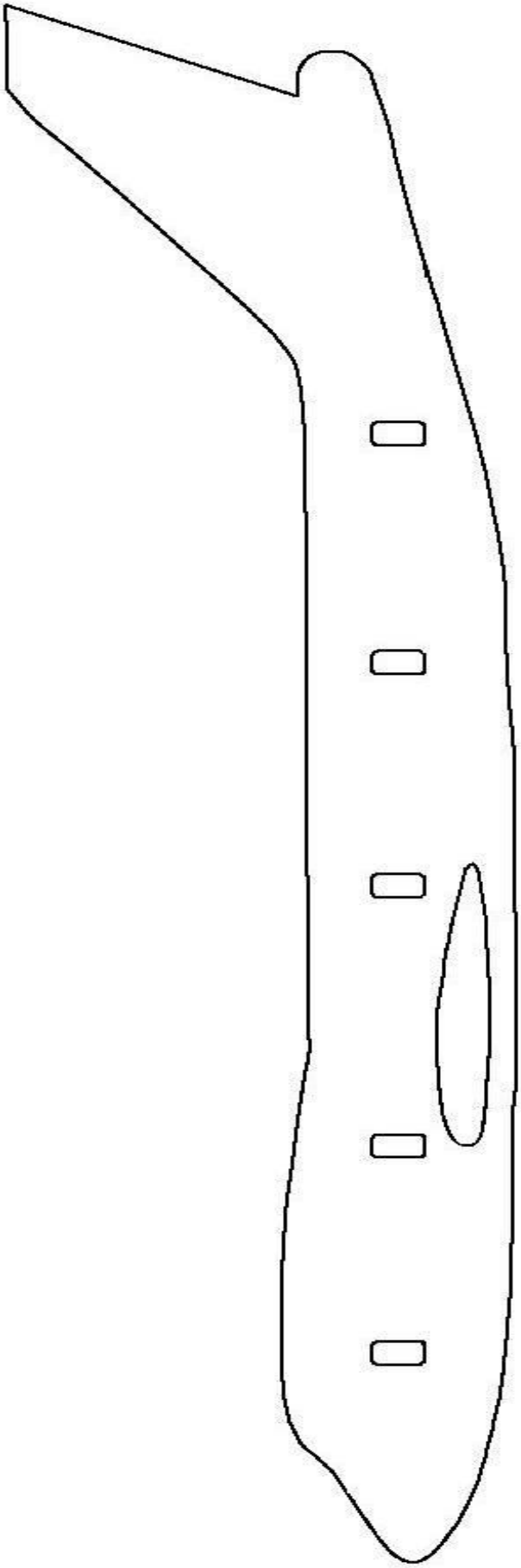
_____ _____ _____

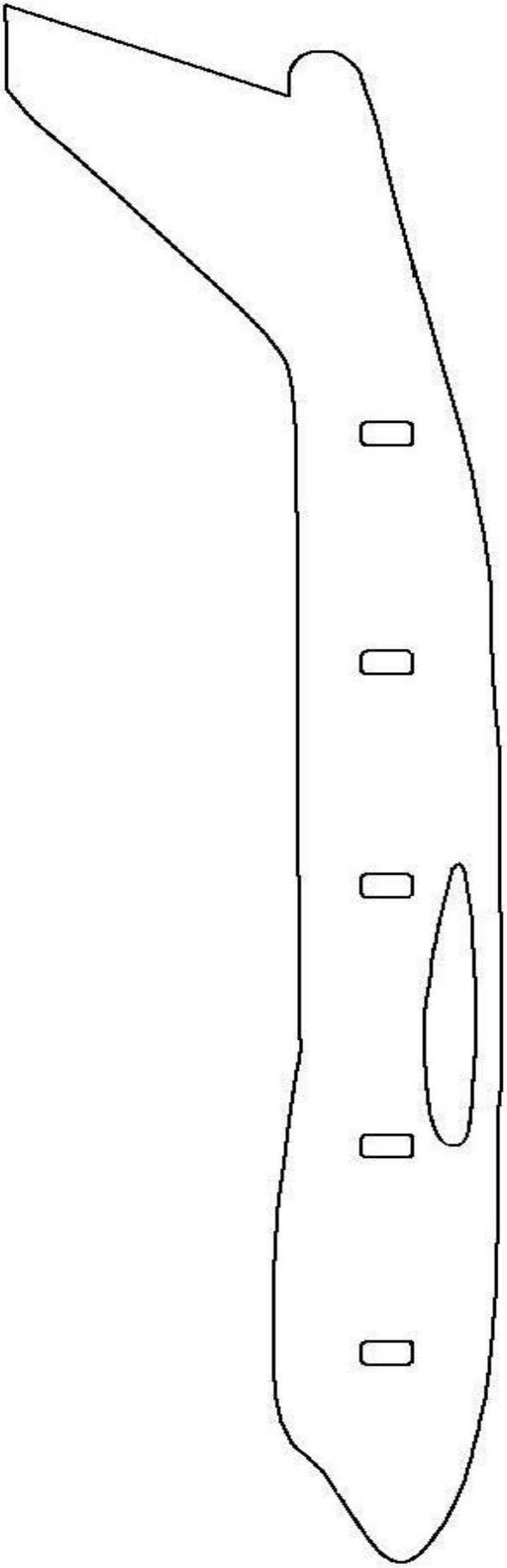
_____ _____ _____

Now you've seen some different logos design two of your own in the spaces below for a National airline (pick your country). Remember to use a pencil and ruler where you need to and you must add colour. When you've completed them write underneath what you think about them and why?

Logo Design 1	Logo Design 2
What do you think about this one and why?	What do you think about this one and why?

Aircraft are all painted so you can identify which company the plane comes from. Using the templates below design 2 different ways that an aircraft from your company could look. Remember to include your logo on the plane somewhere. (Add colour and use a pencil and ruler for straight lines)





Food in Flight

As part of most long flights you will get an onboard meal during the flight. The meals are usually small but provide you with energy for the flight and are usually healthy.

Below find and stick in pictures of 4 meals that could be used on board an airline as an in flight meal. Below each one explain why the meal would be suitable.

Meal 1	Meal 2
Why Chosen?	Why Chosen?
Meal 3	Meal 4
Why Chosen?	Why Chosen?

What does the term perishable mean?

_____

_____

Airline Interior

On the blank templates below design 2 different interiors for your aircraft company. You need to use colour and try to incorporate your logo into it somewhere to.

Name 2 materials that are used for the interiors of an aircraft:

_____

_____

Why do you think they use these materials for the interiors of planes?

_____
_____
_____
_____
_____

Why do you think it's important to use non-flammable materials in the design and use of airplanes?

_____
_____
_____
_____
_____

Flight Word search

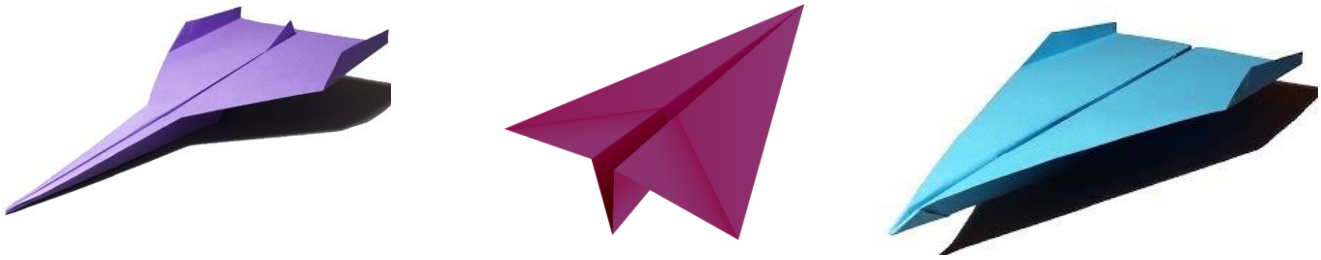
Below is a word search containing 30 words related to flight and air travel, can you find them all?

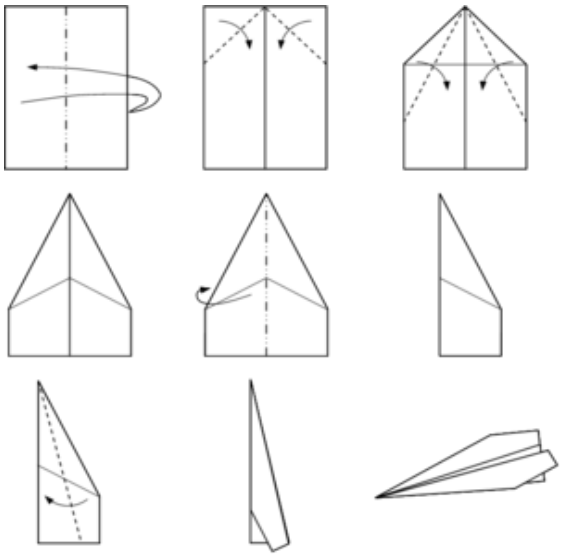
D I B M C W D E M K J K W H P W P E Q B Q W A Y A
Q Y P F X M U I N A T I T X O I R G H N T K U I O
T B B D H C A M U I E H B T L K Q B P P B A B N V
L Y Q H T U I F H A G R R O Y G A E K A Y W D Q A
G R J Y I S X A M M I N T U E I H G R Q K Y N Q H
X E D H S T E R W A R D E S S W T D Z T G K F J R
M H J I O O D R V E H N R T T T G J Z L O P E M Z
W C L E U M Y I I R N E U H E E G S D L V B E K E
W E L P C S A V L U H D S G R J J M N X J N B K P
W A T H Z T P A M T T O S I V I X S B G N X N X O
D C O T I L O L O R B G E L T C Z L Q U A H N H K
S D A O O L I R O A A F R G L N Z V C K F U K J X
F B N Z T X B P S P G I P N L M G M O Q N U W P J
G P D U A T X R A E G G N I D N A L I C P U S C G
F N M Z H E P O V D A H I D N B H N P X O B K I U
C O P G Y T F P U G G T B N L N Z O W A R C S O I
V R I M L V X E I O E C A A F Q O W L X B M H U V
M R V R N M U L C T N T C L L L J W H F A L G I X
W I B U B L M L R K P K N T O C I O V T U Q V R N
C S L F J C U O X H B O E I N G I G I Y Z Q H T R
T W S Z G C A R G O G F X T Y J O N H B E L E W R
T E D F B N T A X I R F S U D O U L U T C S G S R
J M V D T G W G E C F L T D X M Z N X W M Y N G B
B I M J G U P Z R U B Q C E Q E H I O W J E A D L
Y Q N U L T P S K O G T P Q I S G A K G U I A A X
M L G Y S D F C E E F X L O W Y W A L L Q V U L K
D S D K K I G C N D P N G K S W P M P Z X S Q B N
U Y R H O J H W W S R R U A U R D F V Z C A R Y E
E G J N Q Q B F L W Q B M K L N O T W A Y E X E Z
W V S V F G H V K K T S H S P H I I Q L C M A D U
L J V Z F E F U H R X F O R X P Q P Q M W S F Z U
C A B G T X Y E L U S Y E S Y I B G W F R Z N Z D
I K Y B S A W E W D D S I W X P H I N E W H D B B
F W K S Q V C B N R N Z B G N H U O H D U Z B E E
S L I W M R G R N J Y M S F M V B L E O K W X B K

ALTITUDE
AVIATION
BLACKBOX
CABIN PRESSURE
CUSTOMS
DOGFIGHT
EXPORT
JET ENGINE
LANDING GEAR
LOGO
MISSILE
POLYESTER
RAF
TAXI
TITANIUM
ARRIVAL
BAGGAGE
BOEING
CARGO
DEPARTURE
EJECTOR SEAT
IN FLIGHT MEAL
JETSTREAM
LANDING LIGHTS
MACH
PILOT
PROPELLOR
STERWARDESS
THRUST
WRIGHT BROTHERS

Paper Planes

Lots of people make paper planes, but I'm sure you have never made one as part of your schoolwork. You will have two tasks in this exercise.





This is a set of instructions for making a simple paper plane. See if you can follow them and try making your own. Your task is to design your own paper plane and to draw a set of instructions (like this one) to help other people make your paper plane. Test out your instructions on your parents, let them see if they can make your plane. Use another piece of paper if you need to.

Add your instructions for your paper plane here.

Lets see how well your plane actually flies. You are going to do a few test flights and work out the average distance your plane covered.

Pick a spot that you will launch your plane from, measure the distance your plane flies and complete the table below. Use a tape measure to measure the distance. If you haven't got one you can pace out the distance and measure it in yards instead of meters or cm.

Flight Number	Distance covered
1	
2	
3	
4	
5	

How many failures did you have before you managed to get five good flights?

What percentage of you flights were good? (5 ÷ total number of throws)x 100

What the longest distance you covered?

What was the shortest distance?

What is the range? (distance between the shortest and the longest):

What is the average distance (mean)?(add all your distances and divide by 5):

How well did your plane fly? Was it straight, curved, did it fly to the side? Describe the flight path.

Do you think you could improve the design? If so how?

Glossary

Here is a list of all the important words and their meanings you will find in this booklet. They may help you answer some of the questions.

Influence – How something affects you.

Awareness – Having knowledge/information about something.

Safety risk – Something that can be dangerous to you or others.

WSSC – Willenhall School Sports College

Encounter – Come into contact with.

Research – Finding out information about something.

Variety – More than one.

Sources – Places where you can find information from e.g. the internet, books, T.V., other people, magazines and newspapers.

Turbulence – when an aircraft travels through a change in air pressure which causes aircraft to shake and move around (can feel like an earthquake on a plane).

Located – found.

Refused – not allowed.

Glider – an airplane without an engine that just travels on the wind.

International – all around the world long distances.

Commercial flight – a regular passenger flight.

Cargo flight – a flight which transports goods such as mail and packages.

Properties – the main characteristics of something like it's heavy or it's strong.

Canopy – the big glass window that covers the pilot on a fighter jet.

Drogue chute – a tiny parachute that guides the direction of a person, stabilises them and helps to open the main chute.

Main chute – the big fabric bit of a parachute.

Logo – small pictures or words that symbolise a company.

Interior – inside of.

Incorporate – include.

Non-flammable – will not set on fire.

Disposed – got rid of.

Aerofoil – special shape of wing that helps planes to fly.

Black box – records all conversations and in flight data and can be used to reconstruct the last moments of a flight in the event of a crash.

Landing gear – the wheels on a plane.

Baggage – luggage.

Mach – measure of speed that sound is measured in.