



Paper Plane Challenge

Stage 1- Prep/Kindy – Year 2

Summary and Guiding Questions

Children will build and test paper planes according to a set design. Use the Get Onboard exclusive template that can be found in the Poster and Templates download or follow the instructions here: <https://www.foldnfly.com/1.html>

Children will investigate the properties of flight and aerodynamics through observation and investigation. Discussion should cover **thrust**, **lift**, **gravity** and **drag** but may not necessarily use these terms.

- How far can your paper plane travel?
- Whose paper plane can travel the furthest?
- How/why does your paper plane fly?
- I wonder if you could make it fly further. Can you improve this plane?

Objectives

That the children will:

- follow instructions
- construct a paper plane
- investigate and discuss how the paper plane flies
- test and measure the performance of a paper plane
- discuss the forces involved in flight

Australian Curriculum Links

Strand: Science understanding

Physical Sciences

Foundation: The way objects move depends on a variety of factors, including their size and shape (ACSSU005)

Year 2: A push or a pull affects how an object moves or changes shape (ACSSU033)

Strand: Science as a human endeavour

Nature and development of science

Foundation: Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE013)

Years 1-2: Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE021) & (ACSHE034)

Use and influence of science

Years 1-2: People use science in their daily lives, including when caring for their environment and living things (ACSHE022) & (ACSHE035)

Strand: Science inquiry skills

Questioning and predicting:

Foundation: Pose and respond to questions about familiar objects and events (AC SIS014)

Years 1-2: Pose and respond to questions, and make predictions about familiar objects and events (AC SIS024) & (AC SIS037)

Planning and conducting:

Foundation: Participate in guided investigations and make observations using the senses (AC SIS011)

Years 1-2: Participate in guided investigations to explore and answer questions (AC SIS025) & (AC SIS038)

Use informal measurements to collect and record observations, using digital technologies as appropriate (AC SIS026) & (AC SIS039)

Processing and analysing data and information:

Foundation: Engage in discussions about observations and represent ideas (AC SIS233)

Years 1-2: Use a range of methods to sort information, including drawings and provided tables through discussion, compare observations with predictions (AC SIS027) & (AC SIS040)

Communicating:

Foundation: Share observations and ideas (AC SIS012)

Years 1-2: Represent and communicate observations and ideas in a variety of ways (AC SIS029) & (AC SIS042)

Evaluating:

Years 1-2: Compare observations with those of others (AC SIS213) & (AC SIS041)

Prior Knowledge

It is expected that children in this age range will have some experience of flight. They may have been on an aeroplane and they may already have constructed paper aeroplanes. There may be children within this age range that are already aware of forces and how the forces of thrust, lift, gravity and drag impact flight. They may not be able to articulate their understanding using the correct scientific vocabulary but can still show understanding. Children in this age range will have some understanding of measurement and standardised units of measurement. Children in this age range will have experience of cutting and folding but some children will need some support in this area and will be at various stages of development. Class groupings and adult support available should reflect this.

Materials/Resources

- red paper/Get Onboard Paper Plane templates
- scissors (if children will be modifying designs in a follow up activity)
- access to a school hall or large open space (preferably indoors)
- measuring tape (such as the kind used in athletics) or a trundle wheel to mark out metres on the ground.
- tape or markers to indicate where a plane has landed
- hoops/targets
- large chart to record distances of throws (if this is being recorded)
- camera
- NASA website for teacher's research <https://www.grc.nasa.gov/www/k-12/UEET/StudentSite/dynamicsofflight.html#forces>
- <https://paperplanemafia.com/>

Procedure/Instructions

1. Whole class discussion about aeroplanes and flight. Who has been in a plane? Who has made a paper aeroplane? Who thinks they know how a plane flies? Explain that they are going to learn about flight by making and testing paper planes.
2. Teacher demonstrates how to make a standard paper plane Use Get Onboard template or <https://www.foldnfly.com/1.html>
3. In small groups children fold their own paper plane following instructions. Depending on the age and ability of each group, children may need adult support. Mixed ability groupings is best to allow children to support each other.
4. Children play with their plane. Encourage the children to observe how their plane is flying. How can they make it fly further or faster? What do they see happening as they watch their plane? Allow the children to play with their planes both indoors and outdoors so they can see the effect of the wind on their plane. Does how they throw their plane make a difference to its performance?
5. Whole class discussion about what they have learned about their paper planes and how they fly. Ask what they have learned about how their throw affects the plane (thrust), what the air around their plane is doing (lift and drag) and what makes their plane come back down (gravity/drag). *NB. The activity could end here if the group is young or time is limited. The second half of this activity could take place on a different day or after a break.*
6. **Paper Plane Challenge:** in pairs the children will now design their **own** paper plane using only one sheet of red paper the same size and weight as their original plane. They can fold their plane however they like and they can cut or tear the paper but they must add no weight or tape to the plane. Employ a time limit by which time each team should have a plan and have practised flying it.
7. Before testing it is important to discuss 'fair tests' and why they are important. They will be controlling the place where each plane is launched, which part of the plane to measure from, where the test is taking place, and who measures and records the flight. Each team will get 3 throws and their highest score will win. Although some direction can be given, children are encouraged to make and justify their own decisions.

8. **Testing the planes:** children take turns to fly their planes. Teachers and helpers measure and record data. This data can be used to construct large graphs/pictograms later to illustrate how to publish data.
9. **Discussion:** What did we learn? About flight? About the scientific method? About working with a partner?

Sample chart for recording data. This can be recorded on a white board or smart board so it can be seen by the whole class.

Design Team (Child's name or Plane Name)	Distance Throw 1	Distance Throw 2	Distance Throw 3

Assessment

Assessment will be mostly through questioning and discussion. Children can draw pictures of the process to indicate their understanding. Photographs and videos of the activities will support record keeping.

These lesson plans have been devised by Code Read Dyslexia Network with reference to and inspiration from the following:

https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero_p046/aerodynamics-hydrodynamics/how-far-will-paper-planes-fly

<https://explorable.com/paper-airplane-experiment>

<http://www.greatpaperairplane.org/>

https://www.nationalmuseum.af.mil/Portals/7/documents/education/paper_dart_airplane_lesson_plan.pdf