

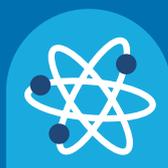
Suitable for  
3-7 years

- ✓ Solo
- ✓ Pairs
- ✓ Groups

Sarah's activity

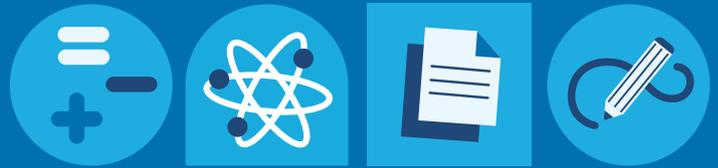
# Aeroplane model making

How to guide



# Sarah's activity

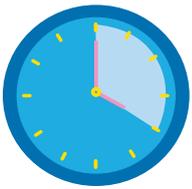
## Aeroplane model making



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### Aim

The aim of this activity is to work through the engineering design process of a plane build – from initial identification of essential parts to final decoration of the crafted plane. The activity is motivated by the history of Amy Johnson, the first woman to fly to Australia.



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### Time required

~20 minutes plus additional time if including the linked songs activity



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### Story to guide activity

**Wonderful Amy** by Sarah. The comic can be found [here](#).



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### Materials

- Worksheet (printable from our website)
- A range of materials for plane building. For this you could use items from the below list. Note – this is not an exhaustive list so you could add more to your collection as you find things. Neither do you need to provide everything but a good mix of different materials is useful.
- **For building**  
Craft sticks, cardboard tubes, recycling items like toilet roll cardboard centres, plastic containers and milk bottles, drinking straws, cardboard, pipe cleaners, lids, paper cups and plates, scraps of wood, chopsticks, corks, ...

→ **For connecting**

String, thread, glue, Sellotape, staples and stapler, clothes pegs, rubber bands...

→ **For decorating**

Pom poms, googly eyes, feathers, glitter, beads and buttons...and/or pens, crayons or paint



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## Safety

Supervise use of small parts



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## Instructions

1. Introduce the activity by reading the comic about Amy Johnson
2. Give out the worksheets for the children to go through the stages of the engineering design cycle. We also have printable posters of the engineering design cycle if you would like to put these up in the classroom during this activity.
3. Invite the children to explore using different materials to create their plane inspired by the pictures in the workbook or any other images of planes they can find in story books or on existing resources/toys in the setting

**Note:** the plane build is a model and does not need to fly



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## Prompt questions

**What essential parts does a plane need to have?  
Does your plane have them all?**

**What does each part of the plane do?**

**The wings:** Generate lift, hold plane in air, for turning, floating, landing

**The propeller/engine:** Power to make the plane move fast in order to take off, move plane forwards with force

**The Body:** Keeps everyone inside and safe, protects pilot and passengers from the elements

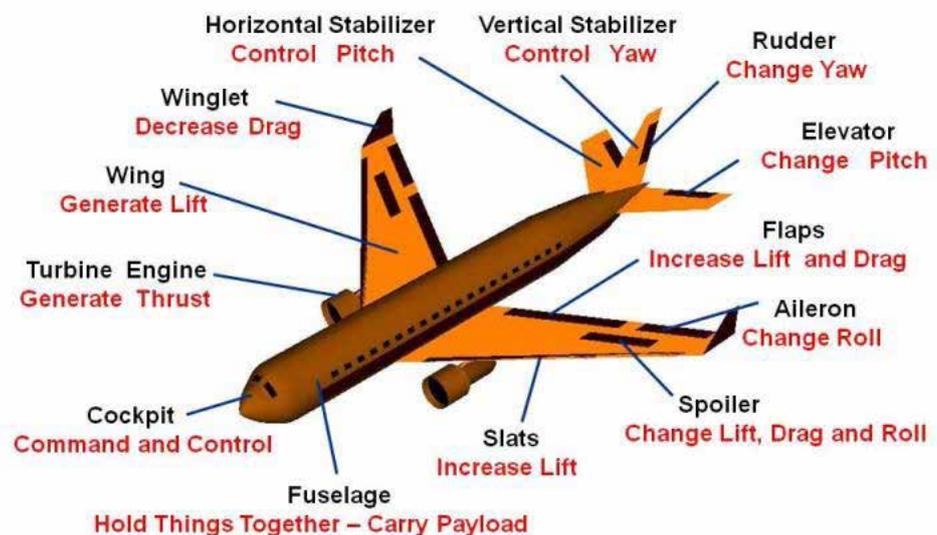
**The Tail:** Provides stability for the plane – if a gust of wind takes it off course, the tail returns the plane to it's original position

**The wheel:** Allows the plane to travel on the ground, used for taking off and landing

National Aeronautics and Space Administration



## Airplane Parts and Function



### What are all the stages of design development?

#### Why are these important?

- Idea, Design, Build, Test (and Refine). Ideas is important because you need to know WHAT and WHY you are building something. Design is important because this is where you figure out HOW it all works, and make sure it is ready to be in the real world. Build is important because this is where you MAKE the thing you have designed. Test is important because this is where you CHECK that everything you wanted at the start is there, and you check whether your design works properly. The refine stage would be where you take lessons learnt and any improvement and try again, making an even better build the next time (older students only)

### How have planes changed over the last 100 years?

- Engines instead of propellers
- Multi-jets
- People carriers/Commercial Flights
- Retractable Landing Gear
- All of these are Engineering improvements and have been designed by Engineers!

### Can you think of a way you would make a plane better if you could do anything?



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## Extensions

Repeat the activity with different materials; try out our activity where Sarah has written songs about Amy Johnson – see if you can learn and sing these; continue to explore flight by building different designs of paper aeroplane or trying some of our other activities, e.g. why not launch a rocket with Adah or find out how Antonio is trying to make drones quieter; or if you are interested in electronics try our stencilling circuitry activity by Christiaan



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## Career links

Sarah who developed this activity is an electrical or hardware engineer. She works in a team to design parts for different aeroplanes today – modern aircraft are more complex than those used by Amy Johnson and contain a lot of electrical parts to control them and in safety monitoring systems to keep the plane safe.