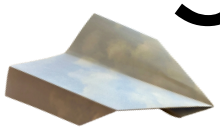
AIR & SPACE
STEM Outreach

STEM Activity



Paper Airplanes

Grades: 2-8

Time: 35 minutes

Objective:

Students will build and test paper airplanes at various difficulty levels to explore how shape and structure affect flight. They will observe how the four forces of flight—lift, thrust, drag, and weight—impact their planes.

Materials:

- Paper (recycled is encouraged)
- Rubberbands
- Asynchronous lesson with step-by-step videos and pictures
- Stop watch, measuring tape, pencils, paperclips (optional extension)

Follow & tag us to showcase your work!

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Literacy Connections:

- *Classified: The Secret Career of Mary Golda Ross, Cherokee Aerospace Engineer* by Traci Sorell
- *Wood, Wire, Wings: Emma Lilian Todd Invents an Airplane* by Kirsten W. Larson

NGSS Stanard:

- MS-PS2-2: Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

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Name: _____

Date: _____

Paper Airplane Data Sheet

Trial Number	Flight Distance (in feet)	Hang Time (seconds)	Flight Notes (Patterns/Observations/Additional Weight (paperclips))
Beginner Trial 1			
Beginner Trial 2			
Beginner Trial 3			
Intermediate Trail 1			
Intermediate Trail 2			
Intermediate Trail 3			
Advanced Trial 1			
Advanced Trial 2			
Advanced Trial 3			

Reflection Questions:

1. Which airplane design flew the farthest? Why do you think that happened?

2. Did the hang time change between designs? If it did, explain the change.

3. What did you notice about how each airplane flew? Were there any patterns?

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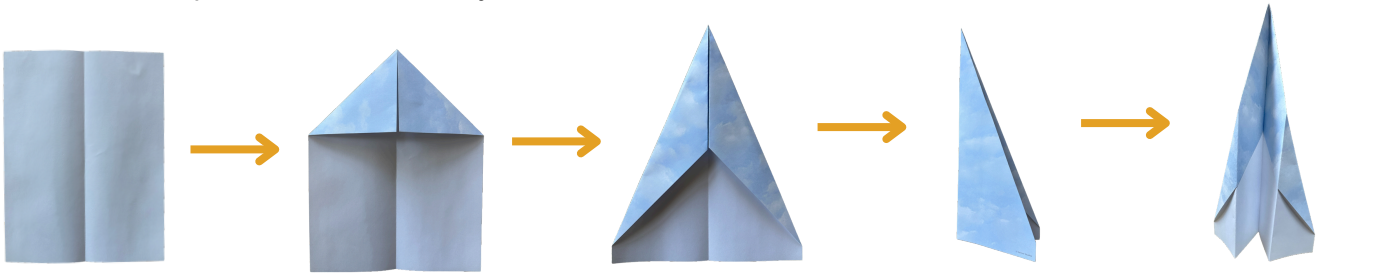
Beginner Level Paper Airplanes

Step-by-Step Instructions

F-16 Fighting Falcon

A highly maneuverable, single-engine fighter jet known for its speed and versatility.



Fold paper in half and open it back up.

Fold the top corners to the center line.

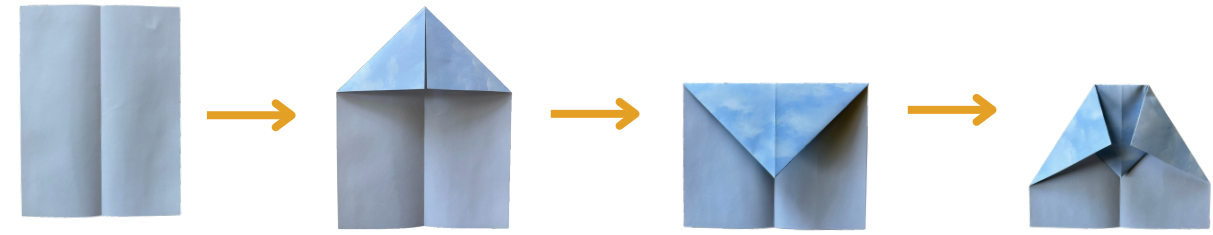
Fold the new the top corners to the center line.

Fold the paper airplane in half.

Fold the wings down to the bottom edge.

C-17 Globemaster III

A reliable transport aircraft used for long flights, cargo missions, and humanitarian aid.

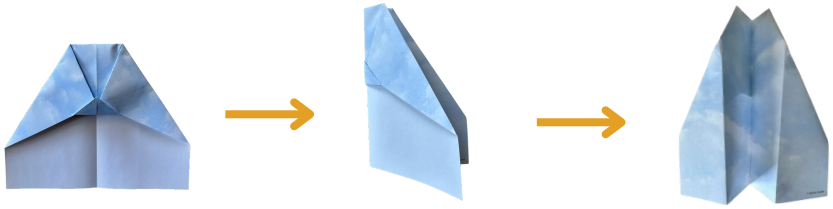


Fold paper in half and open it back up.

Fold the top corners to the center line.

Fold the top point down.

Fold the top corners to the center line.



Fold the small center triangle up to secure the flaps.

Fold the paper airplane in half.

Fold the wings down to the bottom edge.

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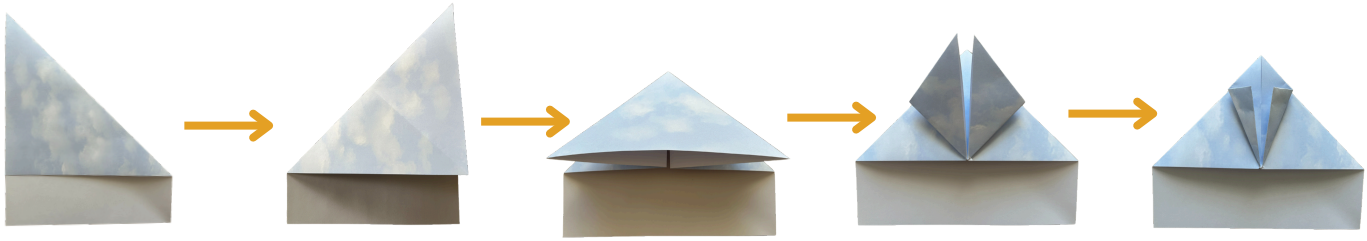
Intermediate Level Paper Airplanes

Step-by-Step Instructions

B-2 Spirit

Known for its sleek, flying-wing design, the B-2 is built for efficiency and can glide smoothly for long distances.



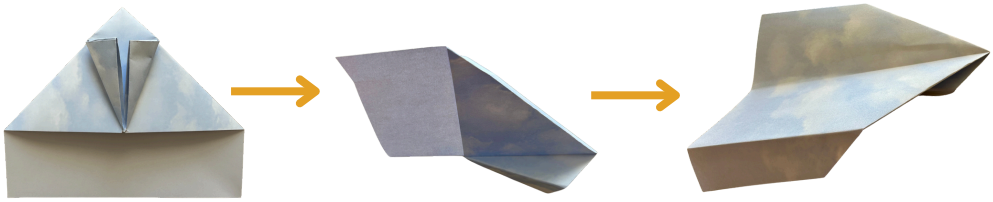
Fold top right corner to left side and open it back up.

Fold the top left corner to the right side and open it back up.

Accordion fold in both sides in so it makes a triangle.

Fold the right and left sides of the triangle up to the top point.

Fold outsides of right and left triangle into the center.



Fold down top left and right points and tuck into top pockets.

From the bottom, gently fold the paper airplane in half.

Fold down the wings.

F/A-18 Hornet

A carrier-capable fighter jet that can take off with the help of a catapult. It's fast, versatile, and can be launched at steep angles.

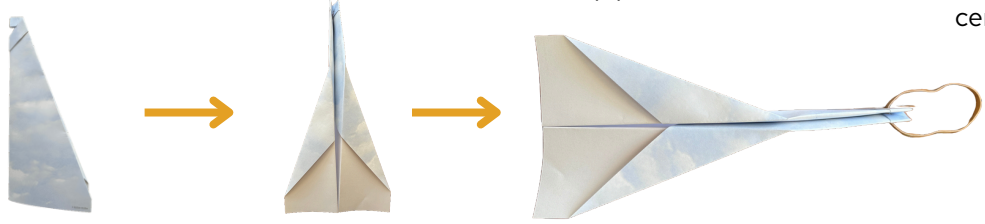
Fold paper in half and open it back up.

Fold the top corners to the center line.

Flip it over, fold the top point down.

Flip it over, fold the top edges to the center.

Fold the paper airplane in half.



Using scissors, cut out triangle slit on the bottom tip.

Fold the wings back to the bottom edge.

Place a rubber band in the cut out slit and use it to launch the paper airplane.

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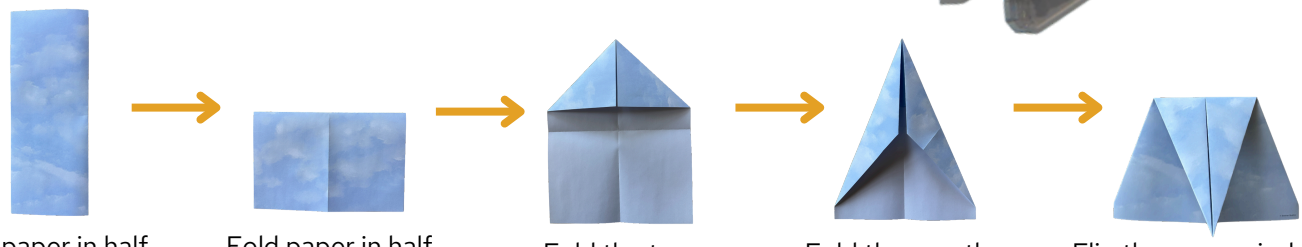
Advanced Level Paper Airplanes

Step-by-Step Instructions

F-22 Raptor

A stealthy, high-speed fighter jet designed for air superiority. It's known for its ability to reach supersonic speeds.



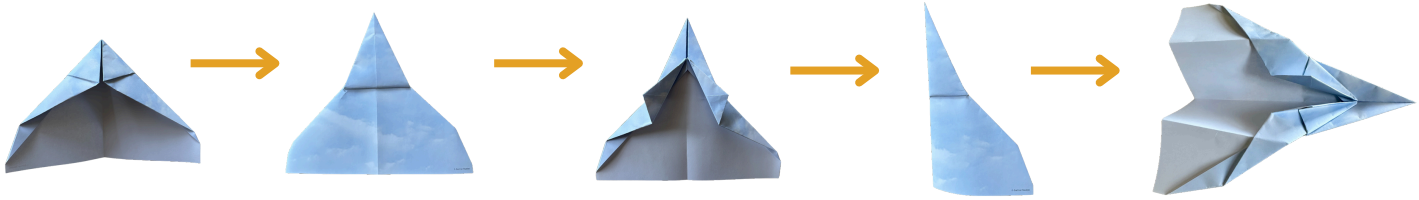
Fold paper in half length-wise and open it back up.

Fold paper in half width-wise and open it back up.

Fold the top corners to the center line.

Fold the new the top corners to the center line.

Flip the paper airplane over fold the tip to meet the bottom.



Flip it and fold both corners to the center.

Flip it and fold the point back up.

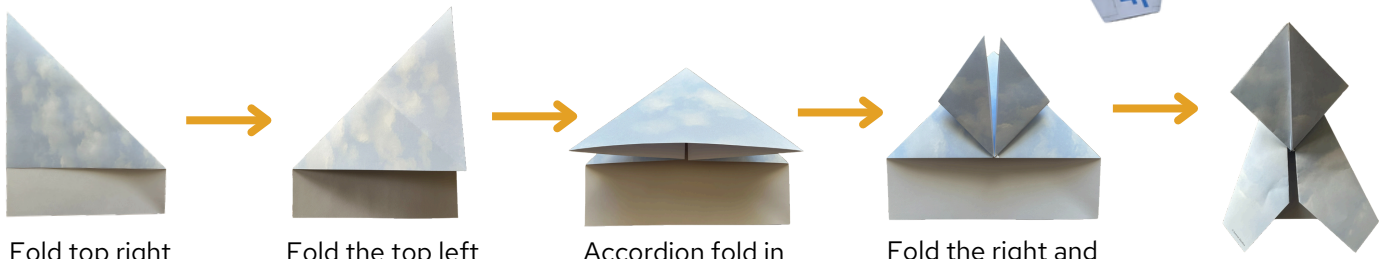
Flip it and fold the small center flaps to the outside edge.

Fold the paper airplane in half.

Fold the wings to the bottom edge.

F-104 Starfighter

Known for its thin fuselage, small wings, and high-speed capability. Its sleek design focused on speed and distance.



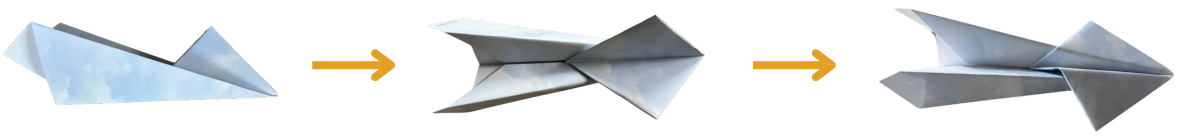
Fold top right corner to left side and open it back up.

Fold the top left corner to the right side and open it back up.

Accordion fold in both sides in so it makes a triangle.

Fold the right and left sides of the triangle up to the top point.

Fold the outer edges to the center.



Fold the paper airplane in half.

Fold the outer wing in half from the top point to the back.

Fold the inner wings down.