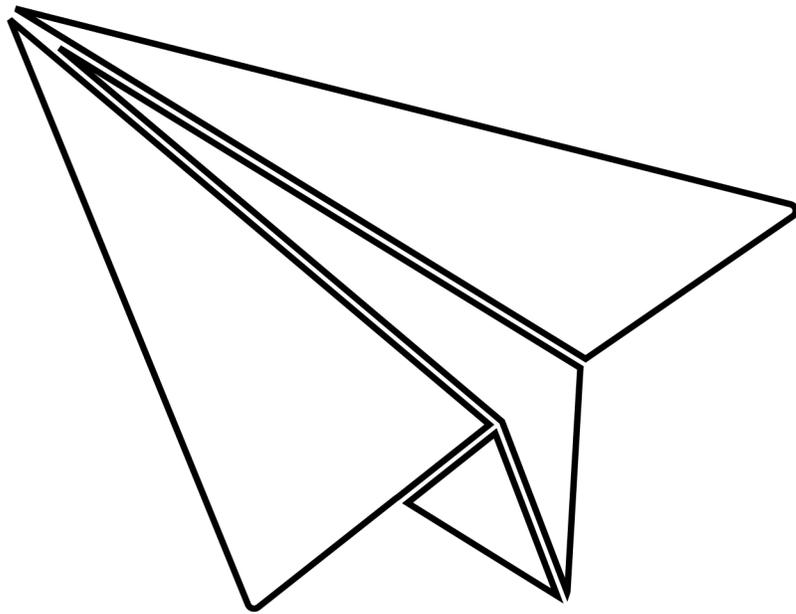


# PAPER PHYSICS CAMP



WITH SCIENCE MOM + MATH DAD

# SUPPLY LIST

## Required Items

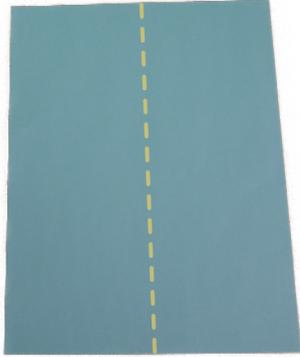
- Letter Paper (A4 paper will probably work for most things)
- Origami paper (6 inch recommended. **DIY substitution:** paper cut into squares)
- Scissors
- Paper clips (at least a couple)
- Rubber bands (three or four)
- Pencil or pen
- Tape (scotch tape or masking tape)

## Optional Items

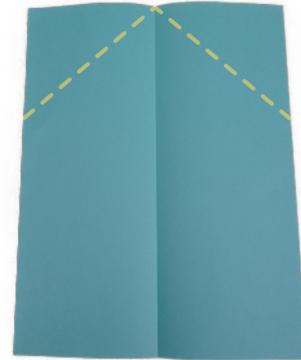
- Markers
- Crayons
- Glue sticks

# The Classic Dart

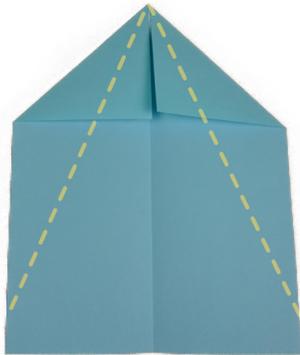
- ①. Fold the paper in half hotdog-style. Then open it back up.



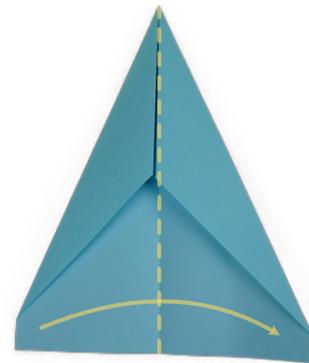
- ②. Fold the top two corners into the center line.



- ③. Fold the obtuse corners to the center line.



- ④. Fold the two wings together.



- ⑤. Fold each wing down so that the edges meet.



- ⑥. Reopen the wings by lifting them up a bit more than 90°.

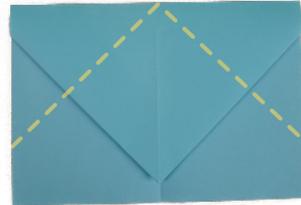


# The Harrier

- ①. Follow the first two steps for The Dart. Then drag the tip to about 2 cm from the bottom and crease the fold.



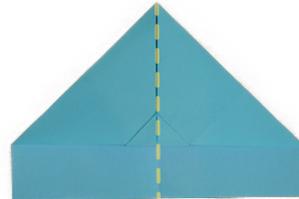
- ②. Fold the top two corners into the center line.



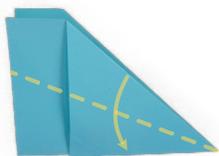
- ③. Fold the triangular flap up.



- ④. Fold the two wings up together.



- ⑤. Fold each wing down so that the edges meet.

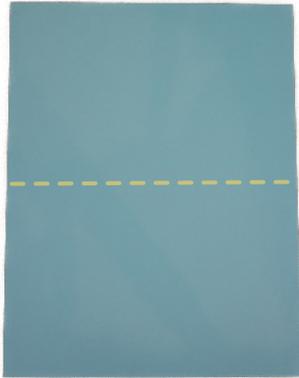


- ⑥. Reopen the wings by lifting them up a bit more than 90°.

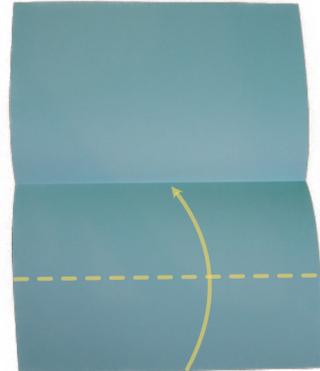


# The Front Four

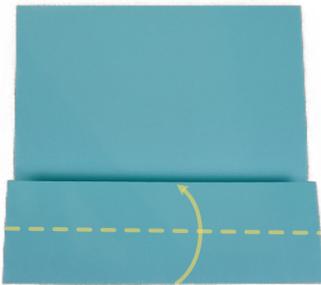
- ①. Fold the paper in half hamburger-style. Then open it back up.



- ②. Fold the bottom edge up to the center.



- ③. Again fold the bottom edge up to the original center crease.



- ④. Then fold the layered part over the original center crease.



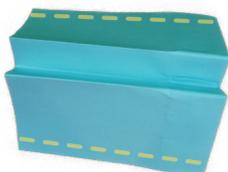
- ⑤. Fold the paper in half to make a "V" shape.



- ⑥. About 2 cm from the base, fold the "V" into two wings.



- ⑦. Give the wings tips about 1 cm from the edge



- ⑧. Reopen the wings and tips to about 90°.

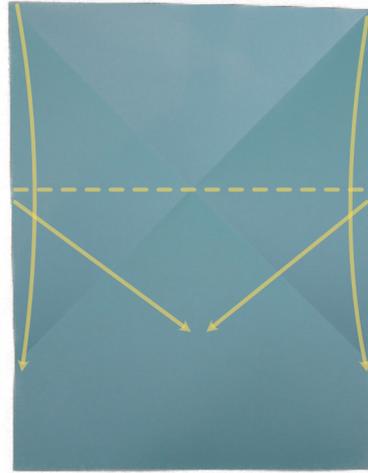


# The Stealth Glider

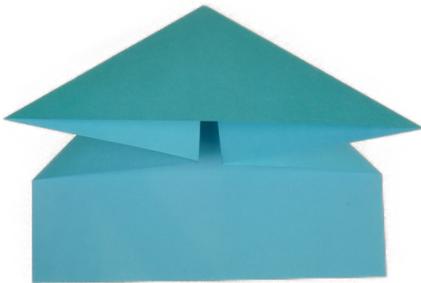
- ①. Fold the top edge to the left edge. Then fold it back up. Repeat on the other side.



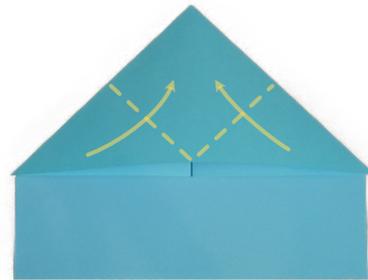
- ②. Fold the top two corners into the center line.



- ③. Firmly crease the new fold in place.



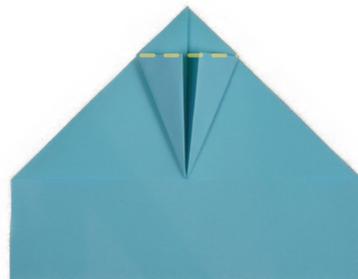
- ④. Fold the lower corners of the top layer of the triangle up to the top corner



- ⑤. Fold the lower edges of the square to the center diagonal of the square.



- ⑥. Fold the top layer of the triangle in the kite shape down.



⑦. Tuck the two dangling triangles behind the bottom of the kite.



⑧. Fold down the top triangle to make a flat top.



⑨. Tuck the bottom triangles into the slots of the top triangle.



⑩. Flip the plane over.



⑪. About 1 cm from the wing tip, fold the edge down. In 1 additional cm, fold the tip up. Adjust these folds to be 90°.

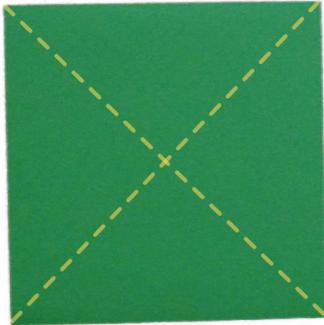


⑫. Fold the top layer of the triangle in the kite shape down.

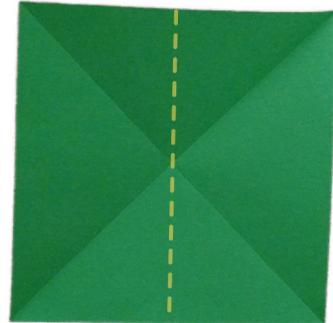


# Disc Star

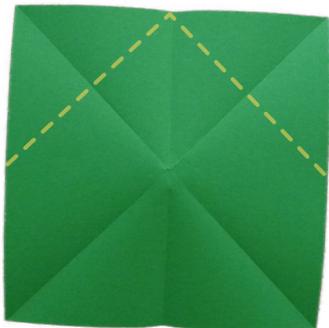
- ①. Fold opposite corners together. Then crease and reopen the square.



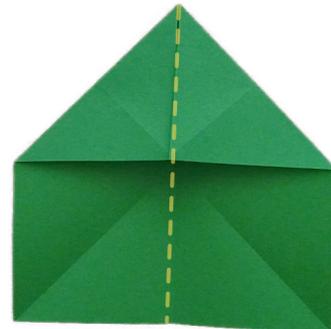
- ②. Fold in half. Crease and then reopen.



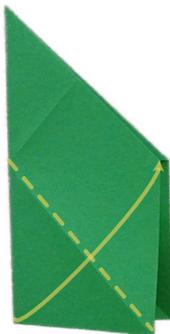
- ③. Fold the top two corners down to the center and crease.



- ④. Fold the entire structure in half.



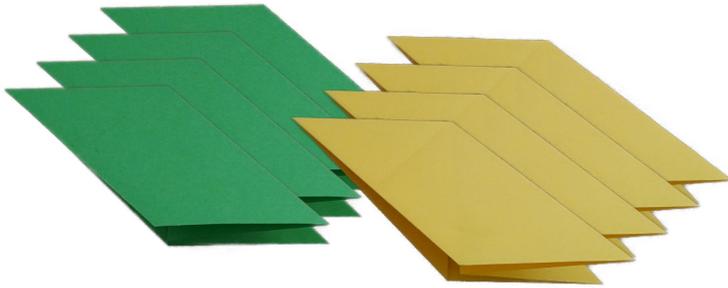
- ⑤. Tuck the bottom corner inside to make a parallelogram.



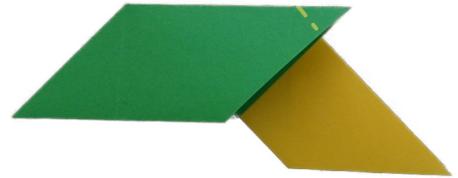
- ⑥. Repeat this process with 7 other squares to get 8 identically folded parallelograms.



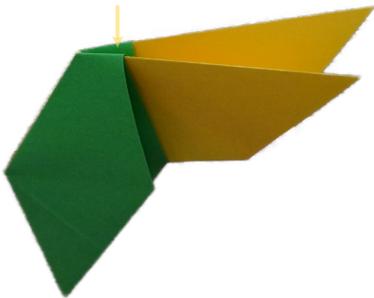
⑦. Note that you can use any color you want, but alternating the colors is nice.



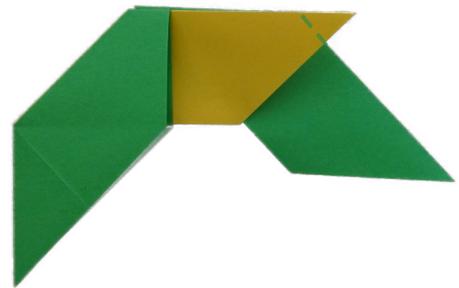
⑧. Fit one parallelogram inside the wings of another so their tops align. Make a crease for two triangles that spill over the edge.



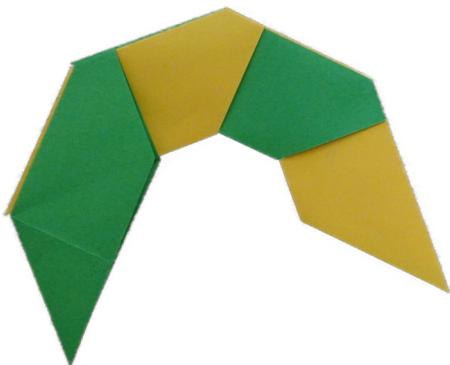
⑨. Tuck the triangle fold inside the wings, tying the two papers together.



⑩. Repeat steps ⑧ and ⑨ for all the remaining pieces.



⑪. Only the 8<sup>th</sup> piece will require you to carefully position the pieces, but the procedure stays the same.

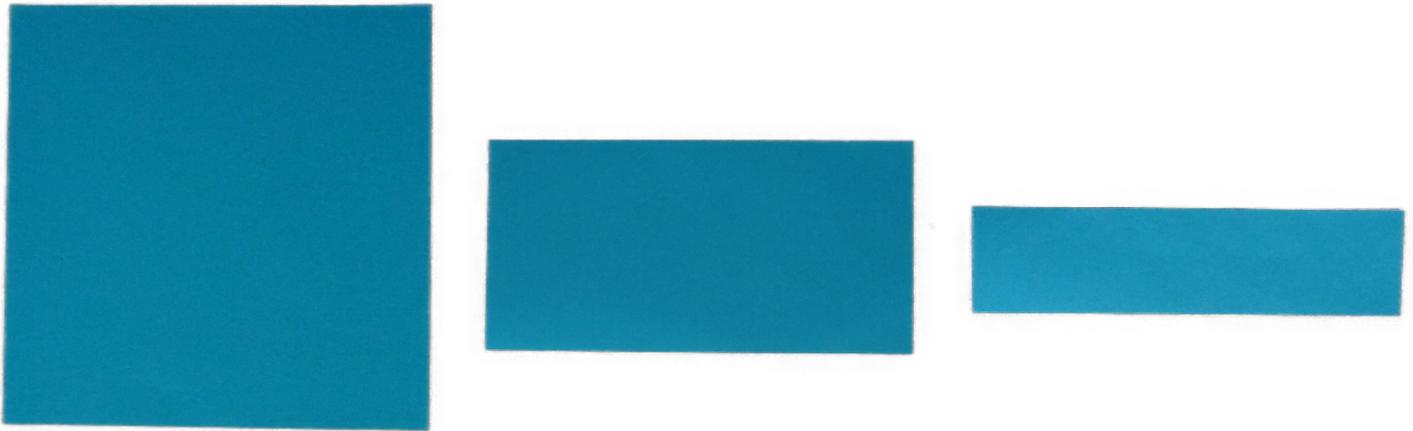


⑫. Once the ring is finished, the pieces will slide back and forth, so it can morph into a star.

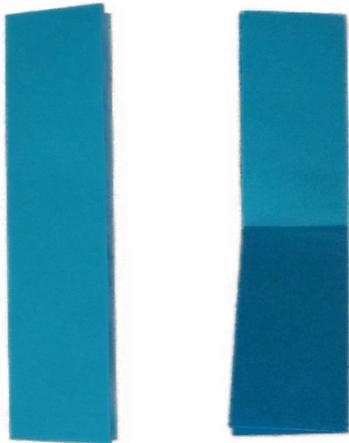


# Ninja Star

①. Fold a square in half. Then fold it in half again to get a long narrow strip.



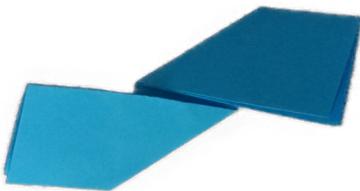
②. Fold the strip in half and undo the fold. Fold across, using the center line as a guide.



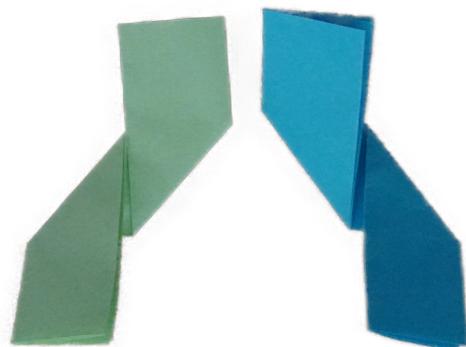
③. Duplicate the previous fold in the other direction.



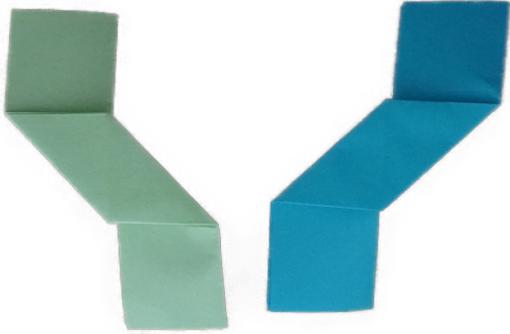
④. Repeat steps ①-③ with another square, except that the two pieces should be mirror images



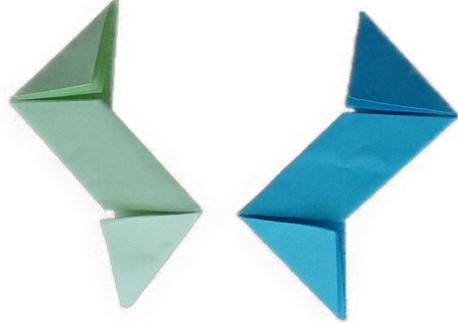
⑤. Once you have verified that the two pieces are mirror images, flip them over.



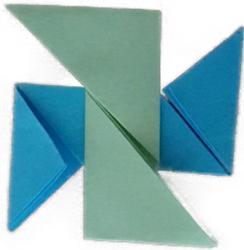
- ⑥. Fold the squares on each end into a triangle so that the whole shape becomes a "Z" shape.



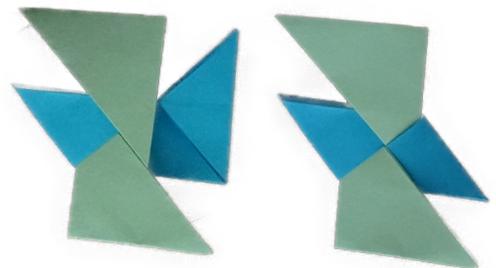
- ⑦. Flip over one piece and place one on top of the other perpendicularly.



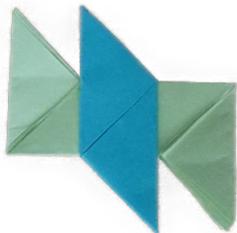
- ⑧. Fold a triangular wing of the bottom piece over the top piece. Then tuck it into the top piece.



- ⑨. Repeat with the other triangular wing piece.



- ⑩. Flip the construction over and duplicate steps ⑧ and ⑨.

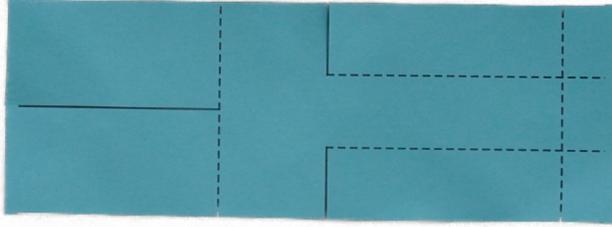


- ⑪. Don't throw your cool new ninja star at other people. :)

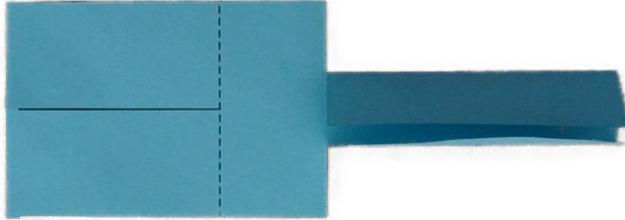


# Helicopter

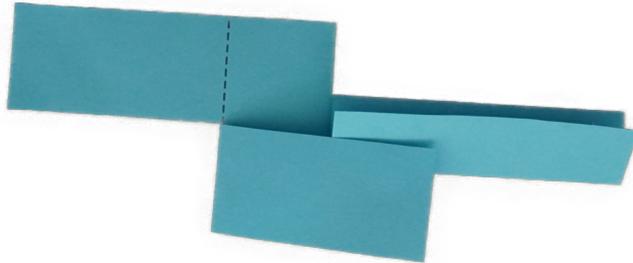
①. Cut along all solid lines. The dashed lines are for folds.



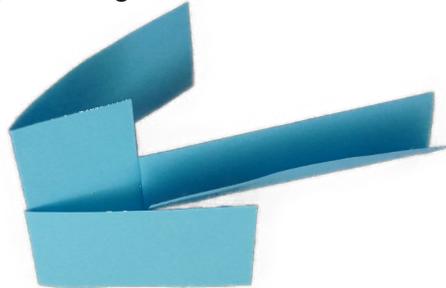
②. Fold section C and D along the dotted line.



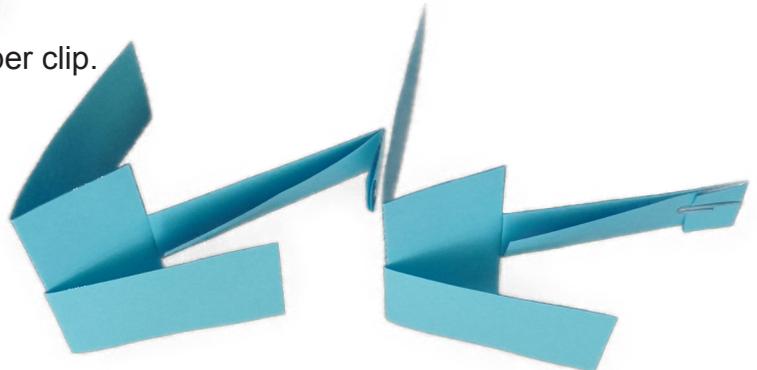
③. Fold section B towards you along the dotted line.



④. Fold section A away from you along the dotted line.

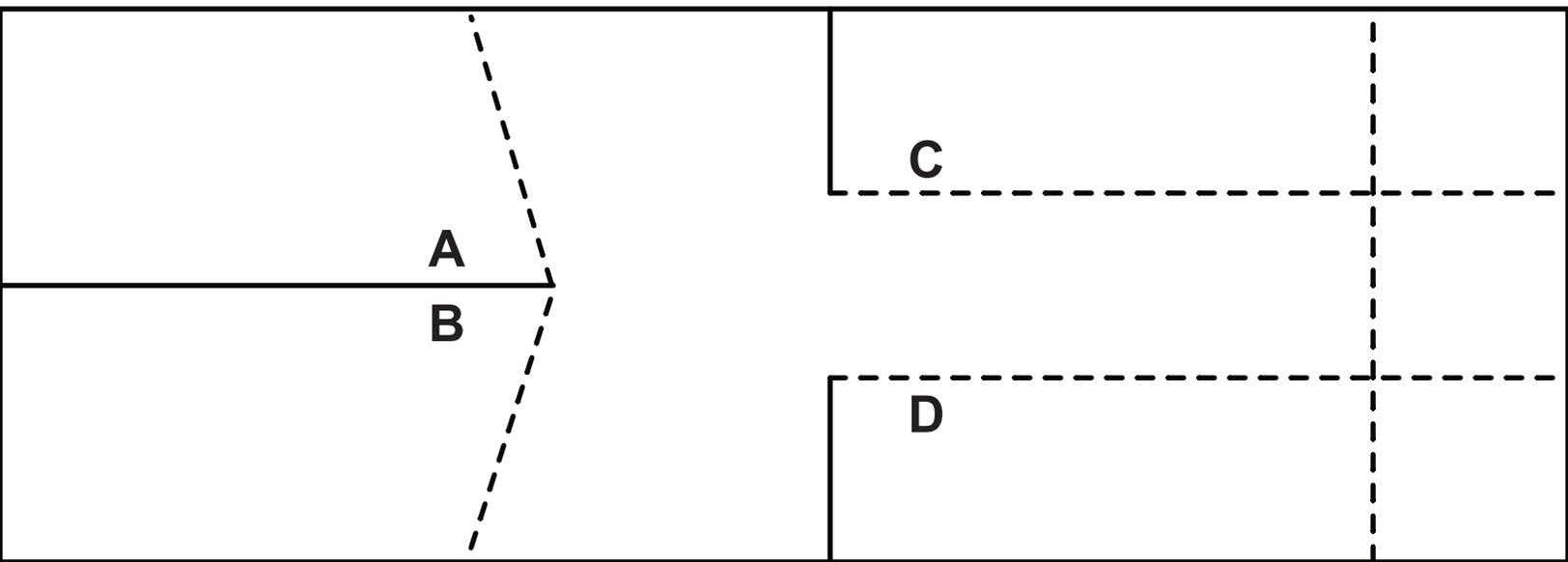
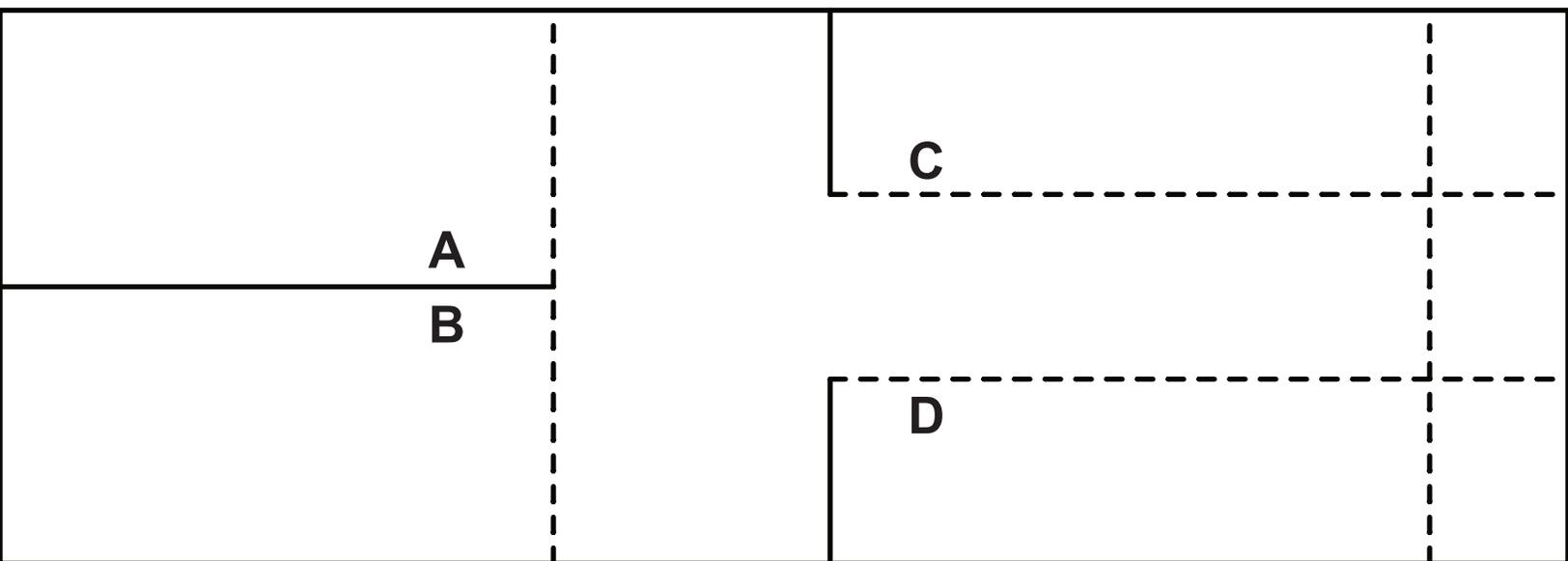
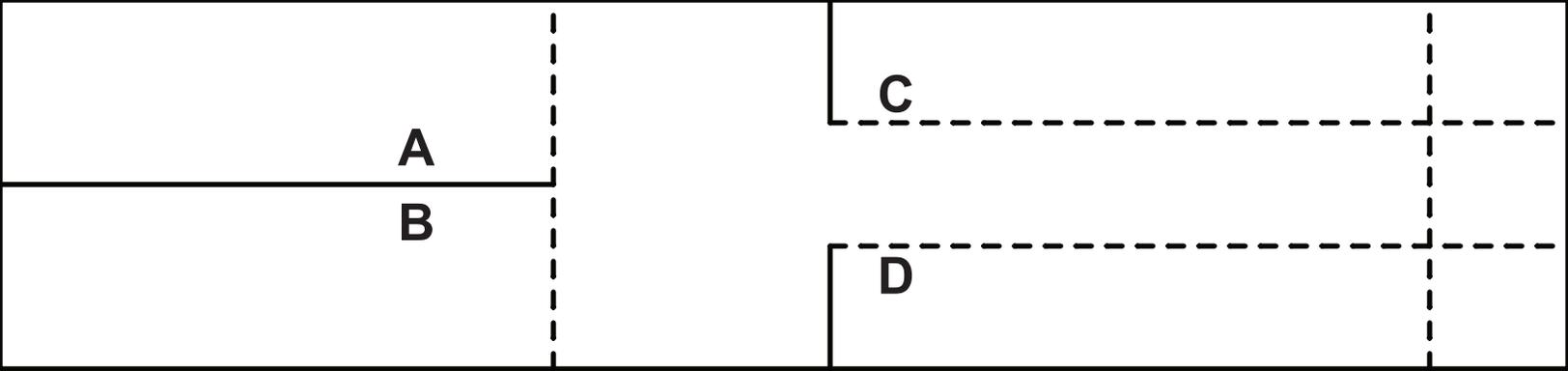


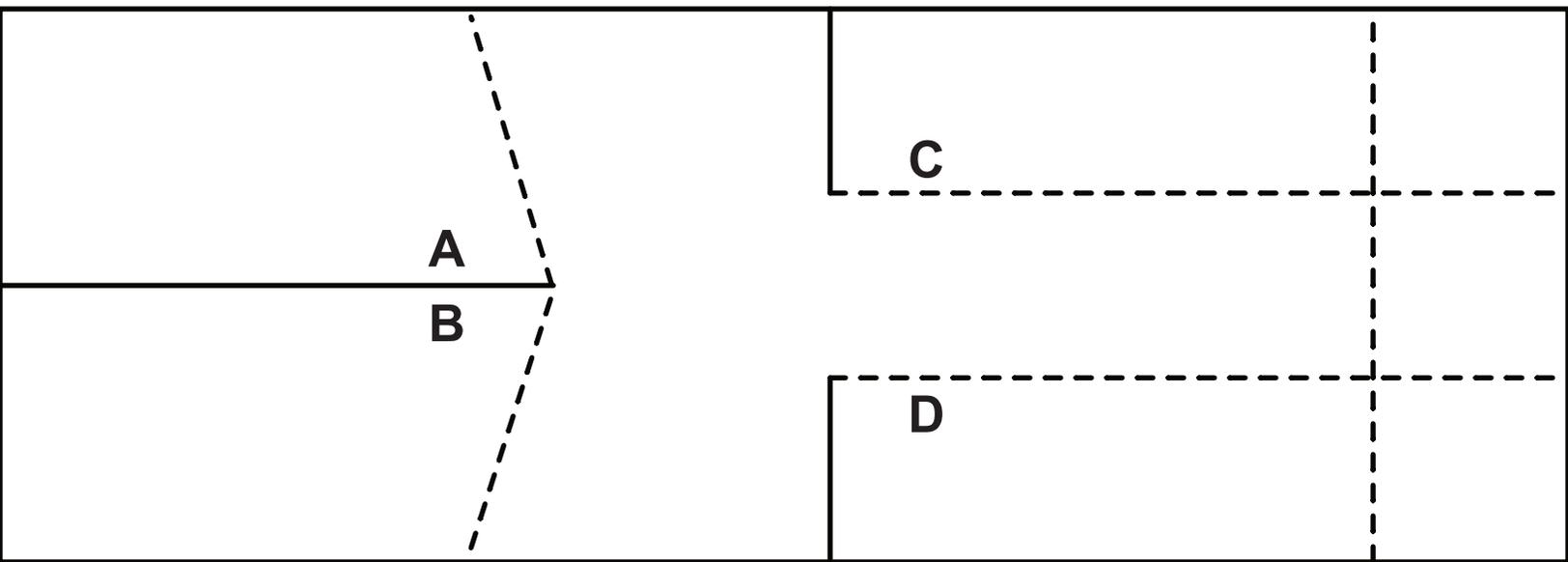
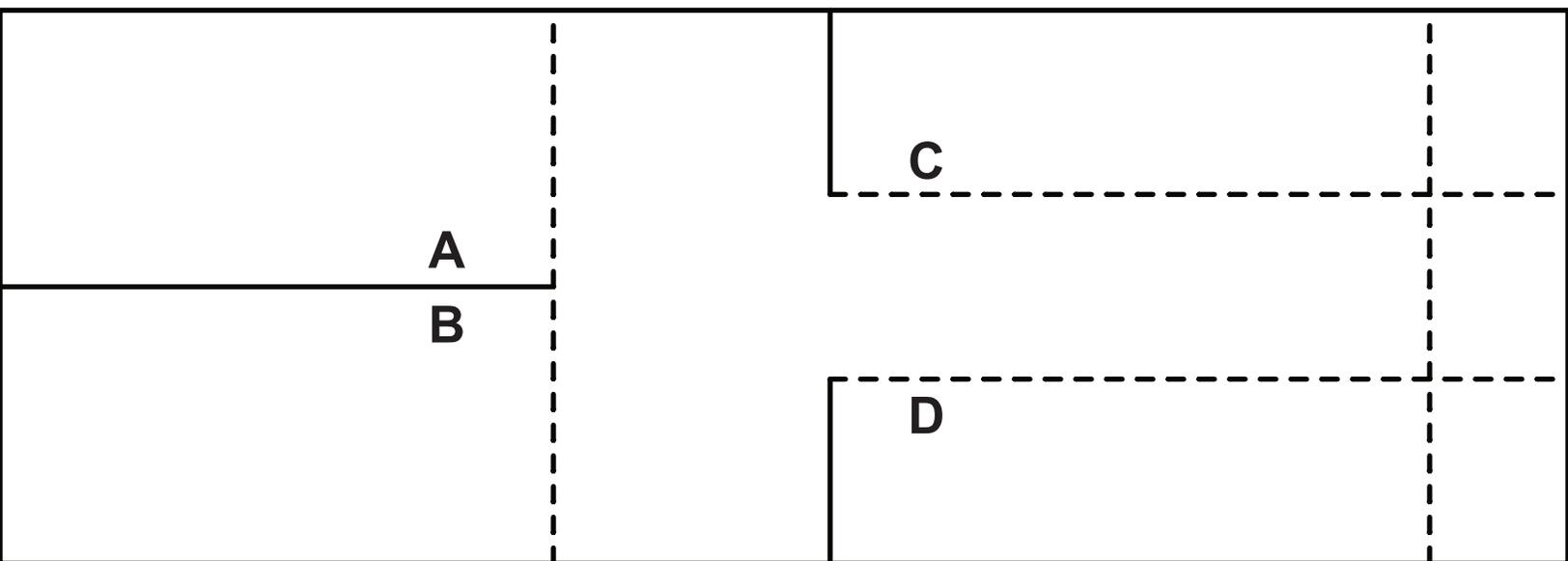
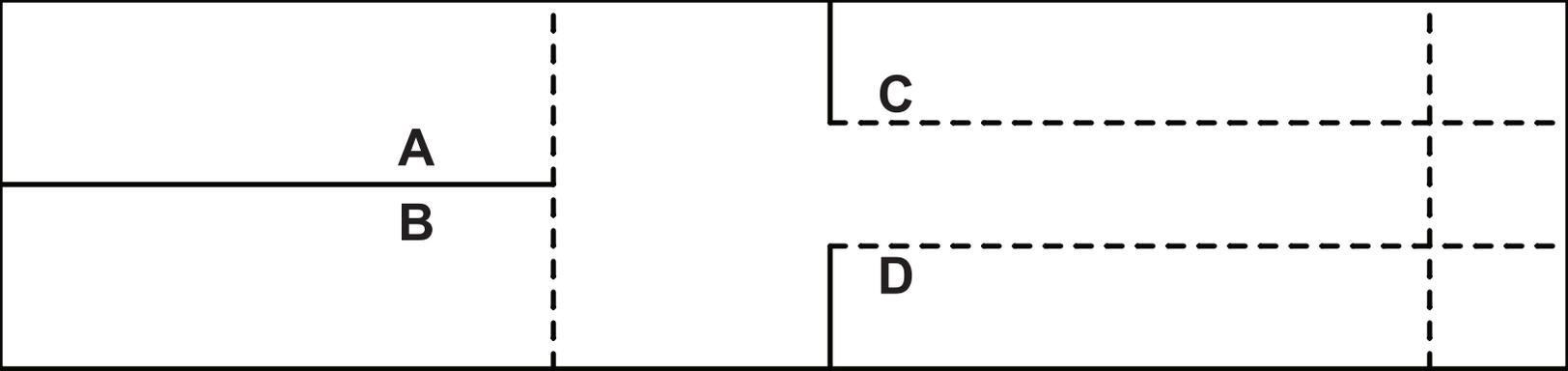
⑤. Fold the tip up and hold it in place with a paper clip.



⑥. Toss the final helicopter into the air or drop it from the ceiling.







# Paper Airplane

Serge Ballif

Melody

Pa-per air - plane fly - ing through the sky. Pa - per air - plane

Echo

Pa-per air - plane fly - ing through the sky. Pa-per air - plane

Detailed description: This block contains the first three measures of the song. The Melody part is written on a treble clef staff with a key signature of one sharp (F#) and a 4/4 time signature. It features a simple melody with quarter and eighth notes. The Echo part is written on a second treble clef staff, mirroring the melody but with a more rhythmic, eighth-note pattern. Lyrics are placed below the notes.

4

Guit.

gli-dingoh so high. Fold and tuck the edge - s in, Got-ta make the crease just right. Pa - per

Guit.

gli-dingoh so high. Fold and tuck the edge - s in, Got-ta make the crease just right.

Detailed description: This block contains measures 4 through 6. The top staff is labeled 'Guit.' and shows a guitar accompaniment with a mix of quarter and eighth notes. The bottom staff is also labeled 'Guit.' and shows a similar accompaniment. Lyrics are placed below the notes.

7

Guit.

air - plane read - y for the flight.

Guit.

Pa - per air - plane read - y for the flight.

Detailed description: This block contains the final three measures of the song, measures 7 through 9. The top staff is labeled 'Guit.' and shows a guitar accompaniment. The bottom staff is also labeled 'Guit.' and shows a similar accompaniment. Lyrics are placed below the notes.