



TRUCKEE MEADOWS PARKS FOUNDATION

AWARENESS • APPRECIATION • STEWARDSHIP

The Flight of Birds

Have you ever watched a bird flying in the sky or taking off from a branch and wondered how they do that? The following activities are something you can easily do at home, with a parent or guardian's help, and allow you to explore the topic of birds' flight.

Birds have been around for a very long time and are direct ancestors of dinosaurs! They have developed many special features which allow them to be aerodynamic.



What is Aerodynamics?

How can something be aerodynamic?

Experiment: Aerodynamics

Grab 2 sheets of copy paper. Leave one flat and turn the other into a paper airplane. You can follow this QR code for a video on how to make your own paper airplane!



Now, find a spot in your house that has clear space, like a hallway. While staying in one spot, gently toss each piece of paper, trying to use the same amount of strength for each one (That means don't hurl the plane while only setting the flat paper down!).

Which piece of paper went farther down the hallway? Circle one.

Flat Paper

Paper Airplane

Why do you think that is?

Most likely, your paper airplane went farther down the hallway than the flat sheet of paper. That is because the airplane's shape is more *aerodynamic*.

Aerodynamic

having a shape which makes moving through the air easier by reducing *drag*

Connecting the Dots between Planes and Birds

What do birds and paper airplanes have in common? Let's think about the shape of a bird.



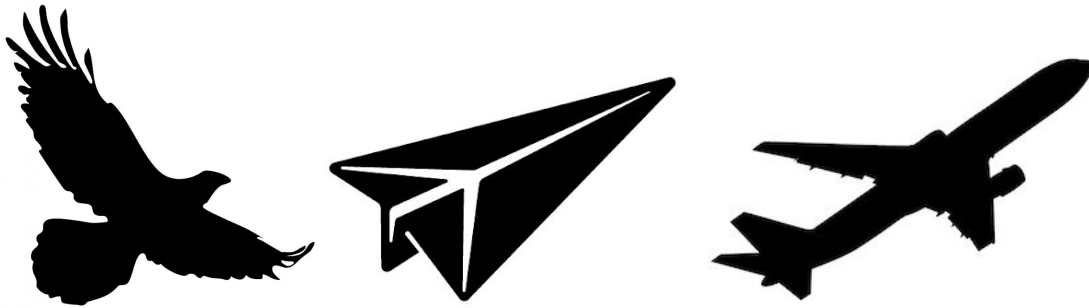
Does the shape of a bird look somewhat similar to the shape of your paper airplane?



What about the shape of a real airplane? Circle something that is similar between all three



All three of these shapes share a very similar design. This shape helps them be *aerodynamic* and move through the air. The pointy front, smooth body, and strong wings all work together to reduce *drag*.



What is Drag?

Experiment: Drag

You will need a clean and neat bed for this experiment! You will want to clear any pillows off the bed and make extra sure that the bed sheets are neat, tidy, and well placed.

Once the bed is ready, gather a couple of big books (no more than you can carry by yourself) and several sheets, blankets, towels, etc. as long as they feel different. Get one that is smooth, one that is rough, one that is bumpy, and one that is fuzzy. You will test each material one at a time. For this example, we will use a towel.

Place the towel flat on the bed so that one end is hanging over the edge. Place the books on top of the towel, opposite of the hanging edge. Stand on the edge of the bed with the hanging edge of the towel and slowly start dragging the towel off the bed. Pull until the books are at the edge of the bed.



What did you expect would happen?

Was it easier or harder to pull the books than you thought it would be?

Which material was easiest to pull across the bed? Circle one.

Smooth

Rough

Bumpy

Fuzzy

Why do you think there was a difference between each material?

One of the ways we can describe this difference is by using the word *drag*.

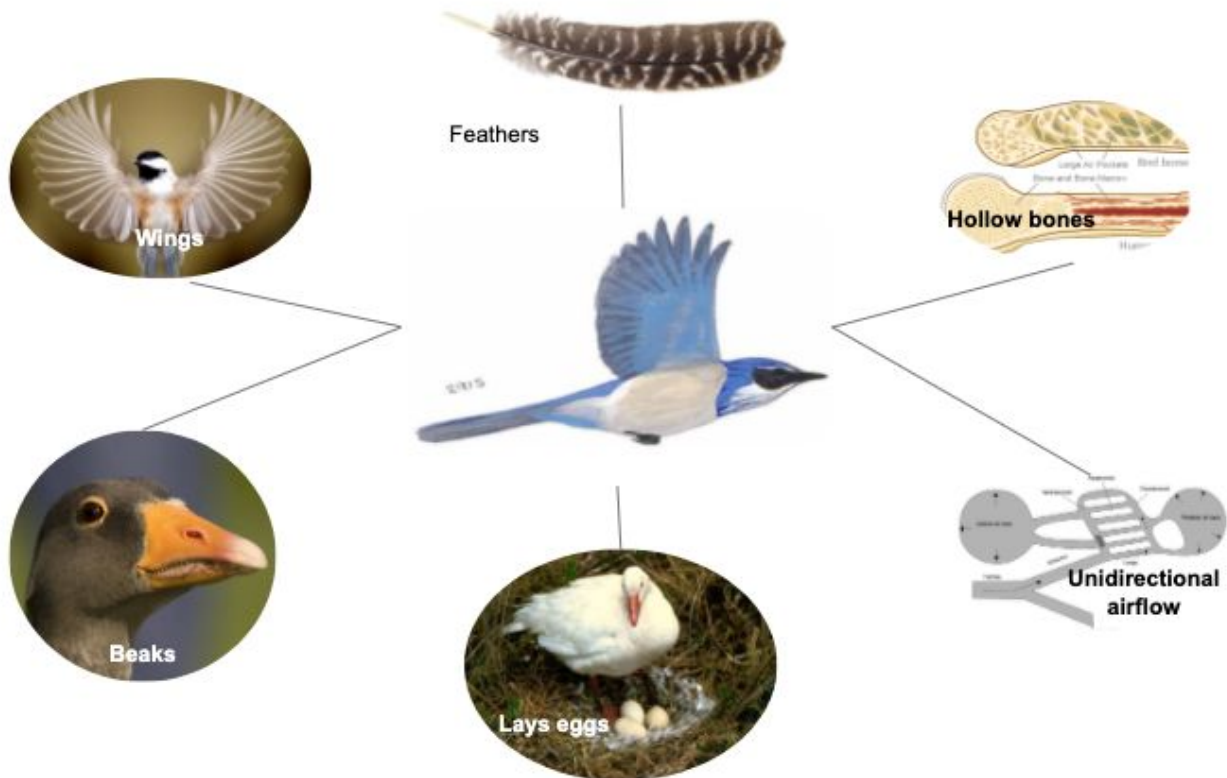
Drag

a force acting in the opposite direction of a moving object

We experience drag everytime we move our bodies, when we move different objects, and when things in the natural world are moving through the air--such as a bird! If something is moving forward, there is always *drag* that tends to slow the movement and push back in the opposite direction.

Connecting the Dots between Blankets and Birds

The diagram below shows different features that make it possible for birds to fly.



Do you think any of these features could be good for birds? Why or why not?

Do you think any of these features could be bad for birds? Why or why not?

Experiment: Drag Affecting Flight

Gather 5 paper clips and continue using the paper airplane from the first experiment.. Stand in the same clear space from before and add one paperclip at a time. The paperclips represent features that could increase drag and keep a bird from flying. Think about where you should put each paperclip on your paper airplane bird to represent each feature. Toss your plane as before and see how far it goes each time. Does it change?

How far did your plane fly?

Paperclip 1: Hair _____

Paperclip 2: Heavy bones _____

Paperclip 3: Baby growing inside _____

Paperclip 4: Teeth _____

Paperclip 5: Arms _____

Did your paper airplane go farther down the hall when you added paperclips? Why or why not?

Most likely, the plane flew a shorter distance each time you added a paper clip. This is due to the extra weight creating a stronger *drag*, which slows down the airplane. Too much *drag* would make it impossible to ever get off the ground, the same way that trying to pull a blanket with too many books is too hard to do!

We hope you enjoyed learning about bird flight and had fun trying out the experiments! If you are able to, go outside and try to observe some birds. Can you see how aerodynamics plays a role in helping them fly? If you liked our experiments, stay tuned for next week's distance learning activity.



For more information about the different characteristics of birds, follow this QR code to our YouTube video about birds!