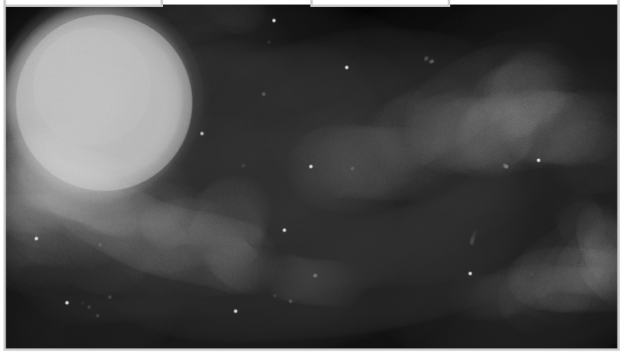
Title: | Page:

Scene No. | Shot No.



Open on a black screen, the faint sounds of night (bugs chirping, etc) in the background.

Scene No. | Shot No.



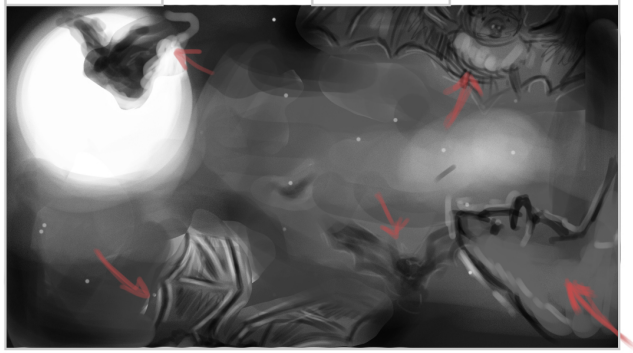
A bright full moon in a stary night sky fades in, the background noises growing a bit louder, with the addition of bat noises.

Scene No. | Shot No.



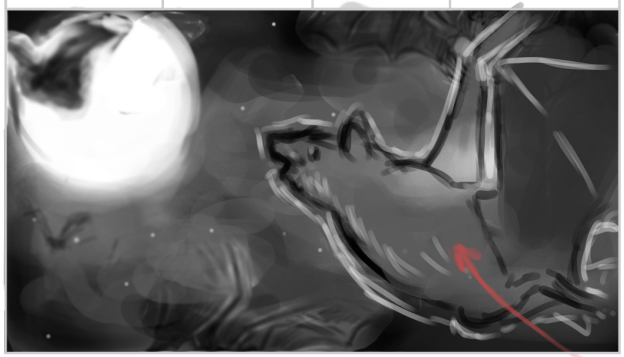
As the scene brightens, dark bat shapes fly quickly around the screen. “BATS! You may have heard some scary things about them before...are they something to fear?”

Scene No. | Shot No.



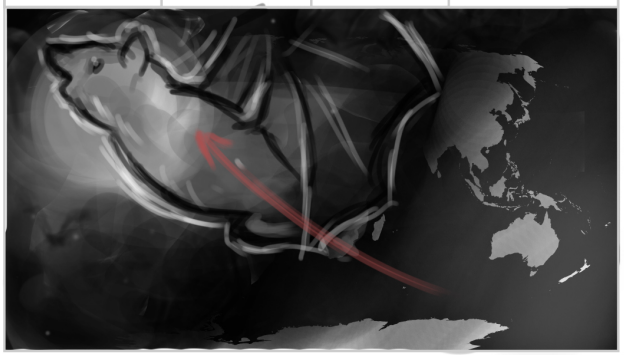
As bats in the background flit about, a more detailed bat moves fast into the foreground of the scene.

Scene No. | Shot No.



As the bat moves into the middle of the scene, it slows down (bullet time).
“No! Bats are helpful to us...”

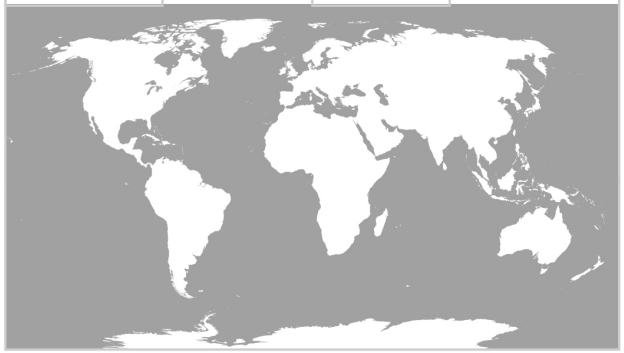
Scene No. | Shot No.



The bat continues to bullet time until it reaches the upper left corner of the scene, where it resumes normal speed. It drags behind it a screen with the world map just appearing.
“...and are vital parts of many ecosystems!”

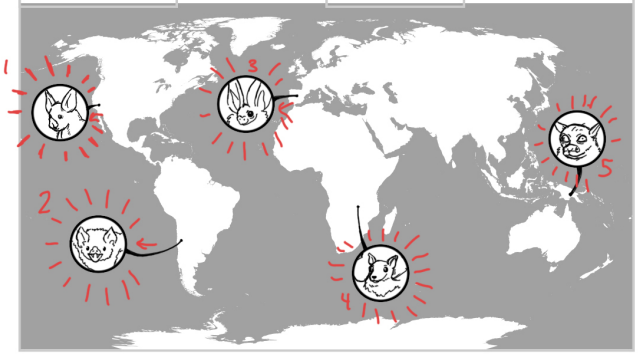
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Scene No. | Shot No.

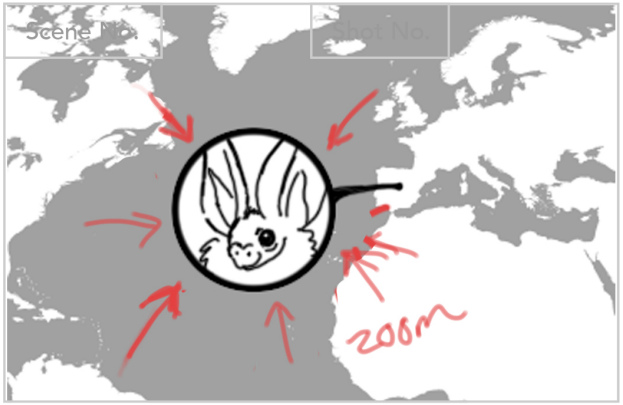


Scene of world map pops in.
“These wonderful, unique creatures are found all over the world...”

Scene No. | Shot No.



Circles displaying different bats pop out from their respective areas.
“...on every continent but Antarctica!”



We zoom in on one of the bats.
“We are lucky to have bats...”

Scene No. | Shot No.



The zoom in becomes a moving scene of a grey big-eared bat chasing a moth.
“They eat insects and other pests,”

Scene No. | Shot No.



Jump cut to a lesser longed nose bat drinking nectar.
“pollinate our plants,”

Scene No. | Shot No.



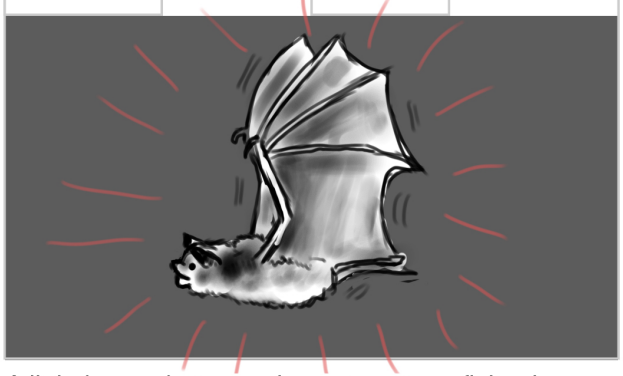
Jump cut to a straw colored fruit bat eating a fruit.
“and disperse seeds. Having robust bat populations can be an indicator of the overall health of the environment.”

Title:	Page:

Scene No.	Shot No.

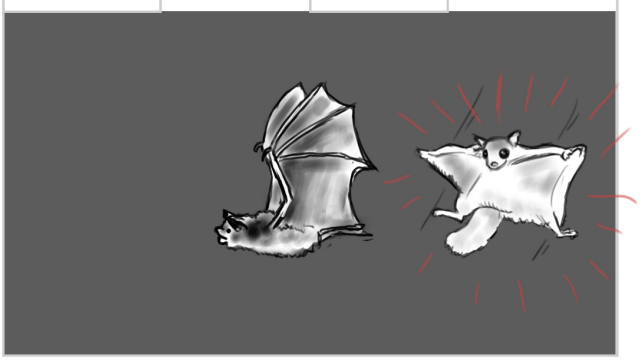
Fade to dark screen.
“So, how do these amazing animals get around to do all these things?”

Scene No.	Shot No.



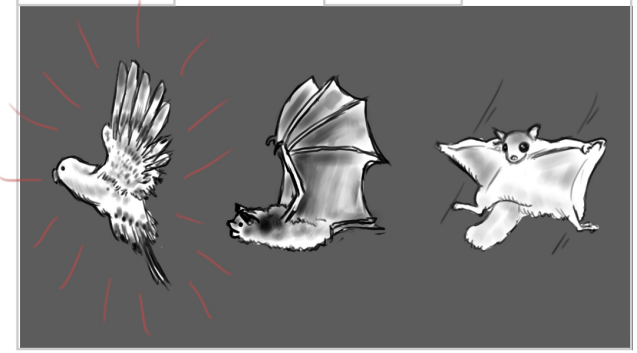
A little brown bat pops in center stage flying in place.
“They are the only true flying mammal with a suite of unique adaptations that allow them to stay aloft.”

Scene No.	Shot No.



The flying bat shrinks while a falling-in-place flying squirrel pops into the scene on the right.
“Flying squirrels, you may ask? They are merely falling gracefully!”

Scene No.	Shot No.

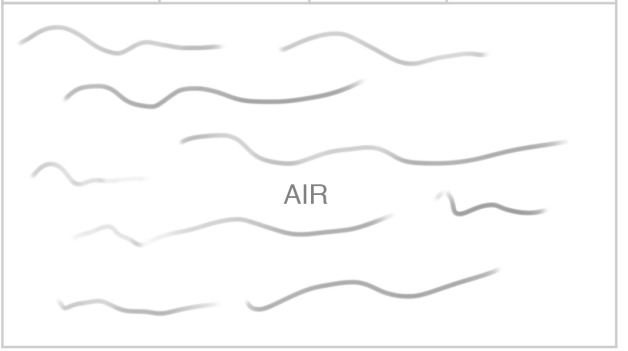


Lastly, a budgie pops into the left side of the scene, flying in place as well.
“Bat flight is also distinctly different from bird flight ”

Scene No.	Shot No.

The scene fades to white.
“Let’s start our journey into bat flight by briefly talking about the basics of flight.”

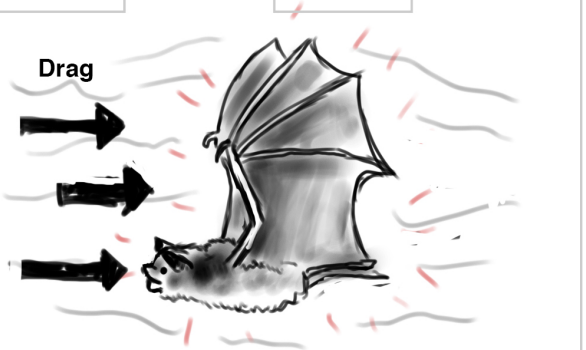
Scene No.	Shot No.



We see “wavy” lines displaying the fluid concept of air.
“Air is a fluid.”

Title: | Page:

Scene No. | Shot No.



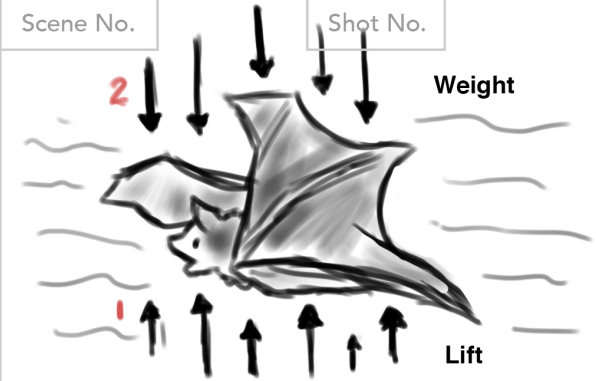
A still image of a little brown bat in flight pops into the air scene with the wavy lines. Motion graphic arrows go againt the bat with text indicating this is drag.
"As an object moves through the air, a force called drag gets exerted on it. Drag creates a force that acts against motion."

Scene No. | Shot No.



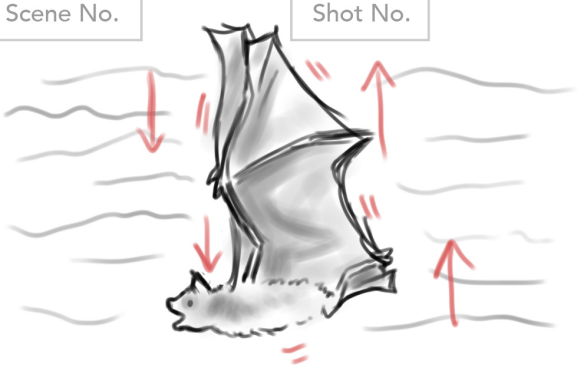
The still bat comes to life, struggling against a strong wind.
"Imagine walking against a strong wind."

Scene No. | Shot No.



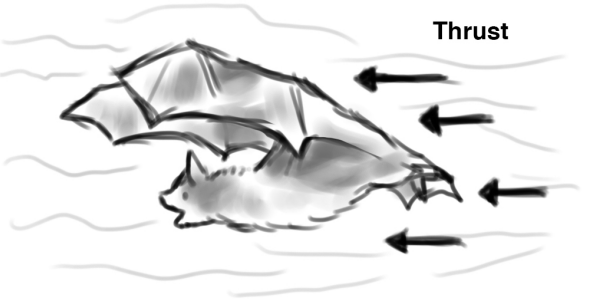
The bat flies back to center screen and freezes in place. Motion arrows first go up to indicate lift. Then arrows go down to indicate weight.
"Lift is another force acting on an object moving through the air. Lift is directed upwards, and it counteracts the weight of the object."

Scene No. | Shot No.



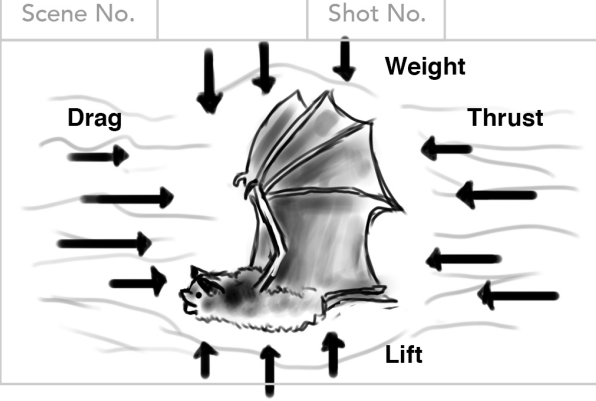
The bat comes back into motion and moves up and down.
"Flying animals usually rely on wing area and the speed of the flyer to generate lift. Imagine how wind blows leaves up in the air but twigs and branches stay on the ground."

Scene No. | Shot No.



The bat freezes in place once again. Motion graphic arrows going forward in the direction of the bat and label indicate thrust.
"Lastly, thrust is a directional force produced through power, such as wing flapping. Thrust provides a force that can accelerate the object forward."

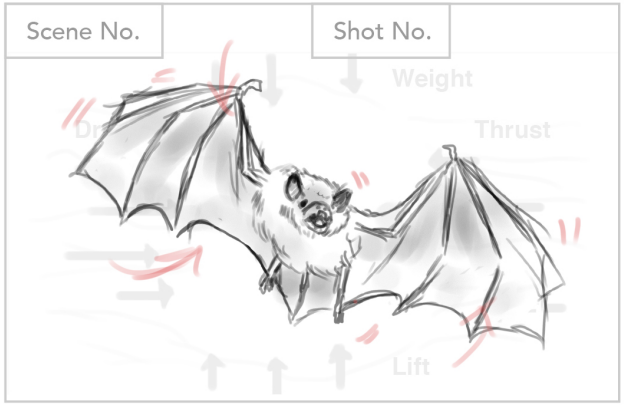
Scene No. | Shot No.



Labels and arrows for drag, weight, lift, and thrust all appear together around the bat.
"As a flyer you want to generate lift to keep airborne, reduce drag to move fast or produce drag to slow down, and..."

Title: | Page:

Scene No. | Shot No.



The bat comes to life once again, flying around dynamically, as the labels fade away.
"produce thrust to aid lift in keeping yourself up and moving."

Scene No. | Shot No.



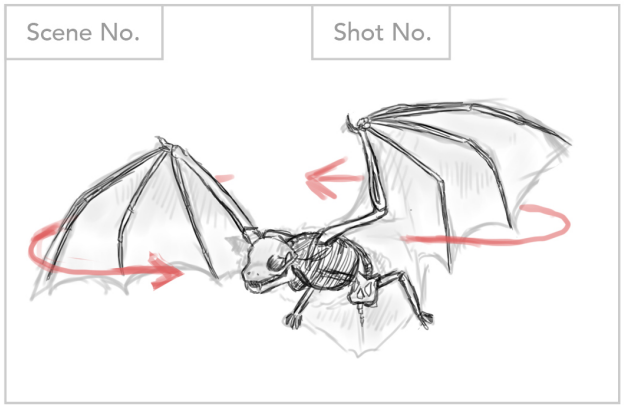
The bat continues to to fly around the scene, but then begins to slow down...
"Let's take a closer look at how our bats use their wings to fly! Though different species often have their own specialized wing shape and structure (or, morphology)..."

Scene No. | Shot No.



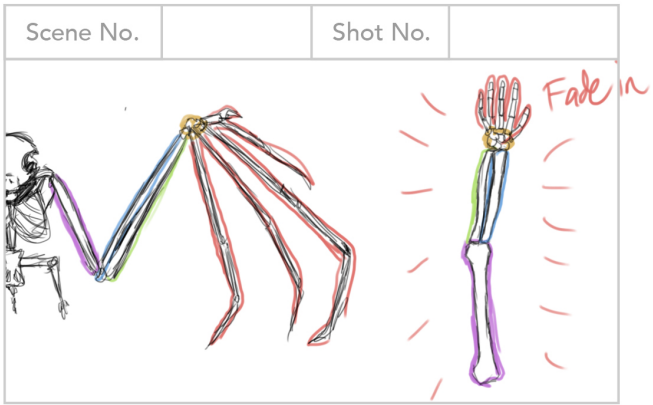
*The bat comes to a stop at the center of the scene and through ~*movie*~ magic transforms into a 3D rendered bat.*
"a few anatomical aspects apply to all bats."

Scene No. | Shot No.



The bat begins to turn transparent as the camera rotates around it. This happens slowly until we see just the skeleton of the bat, facing us.

Scene No. | Shot No.



The arm and hand bones are highlighted and labeled, with a pop up of a graphic representation of the human arm/hand bones to show comparison. Color highlights these bones.
"First, the bones in bat wings are very similar to the bones of our own arms and hands! The finger bones are really elongated and increase the surface area of the wing."

Scene No. | Shot No.



The bat rotates back and the outer mass fades back in until it is opaque.

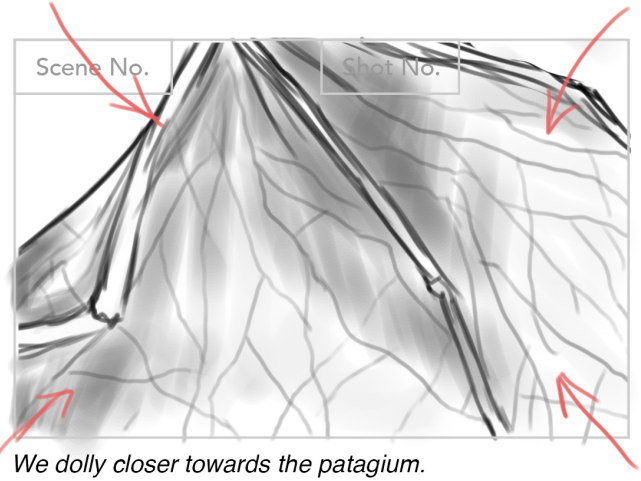
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Scene No. | Shot No.



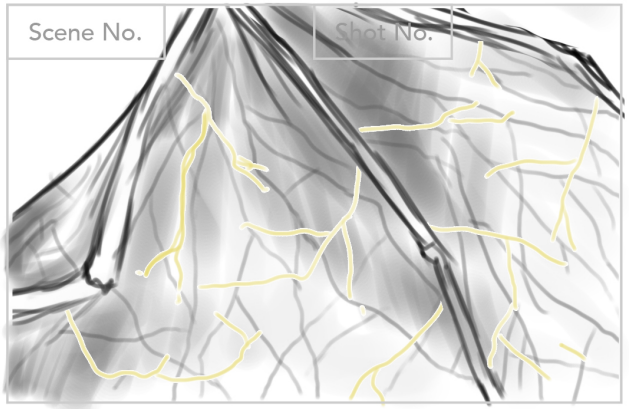
Color is used to highlight the wing membranes with motion graphic leader line/label.
"The skin that envelopes these bones and forms the wings is called the patagium."

Scene No. | Shot No.



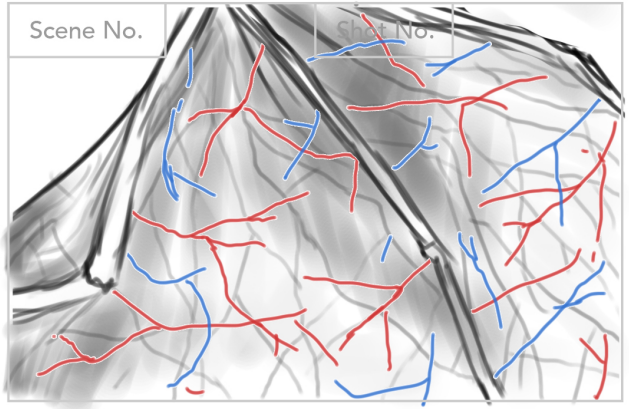
We dolly closer towards the patagium.
"This membrane, made up of two layers of skin, is paper thin and elastic."

Scene No. | Shot No.



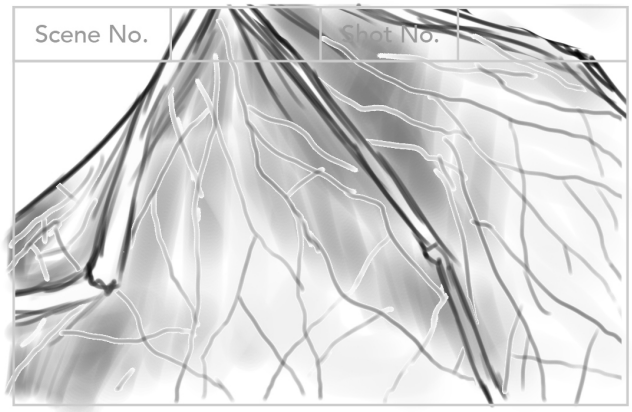
Nerves are highlighted.
"It is laced with nerves..."

Scene No. | Shot No.



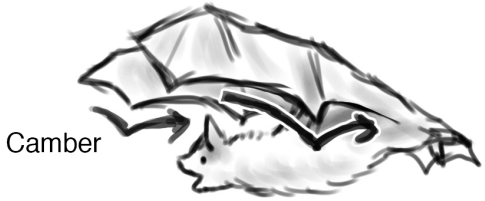
Blood vessels are highlighted.
"blood vessels..."

Scene No. | Shot No.



The muscles are highlighted.
"and muscles. Some of these muscles are not connected to any bones, and can change stiffness of the wing."

Scene No. | Shot No.



We fade from the wing muscles to a still bat in flight. Motion graphic arrows and label indicate camber.
"Other muscles in combination with the finger bones change to shape or camber of the wing. Camber is the curvature of the wing profile, which can be changed to increase lift."

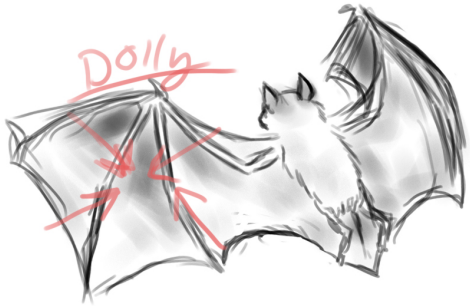
Title: | Page:

Scene No. | Shot No.



The bat begins to fly in place.
"Our bat's wings can morph and change shape easily and quickly, making them dynamic, highly maneurverable flyers."

Scene No. | Shot No.



The bat freezes agin. We begin to dolly in towards the membrane again.
"Lastly, covering these wings are fine, tiny hairs."

Scene No. | Shot No.



We now see a landscape of hairs.
"These hairs sense wind speed and direction..."

Scene No. | Shot No.



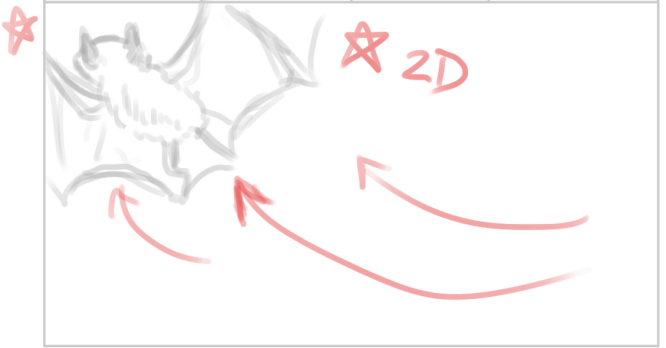
We dolly dramatically back out, motion graphics indicating wind hitting the wing. Signals become "lit up" going to bat's brain.
"allowing the bat to feel the airflow near the wing."

Scene No. | Shot No.



The bat goes into motion.
"When these all come together, and we look at how the bones and membrane move as the bat flies, we can see that bats essentially swim through the air. We can also start to understand how effective bats are as fliers, and how unique they are in the animal kingdom."

Scene No. | Shot No.



The bat transforms back into 2D, flying around and away.
"The flight mechanics and wing anatomy of bats are only two aspects out of many that make bats so special...."

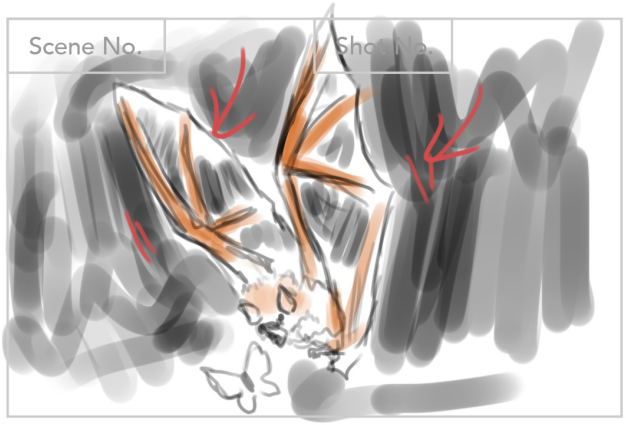
Title: | Page:

Scene No. | Shot No.



We jump cut to honduran white bats cuddled together.
"And even then there is so much diversity amongst them!"

Scene No. | Shot No.



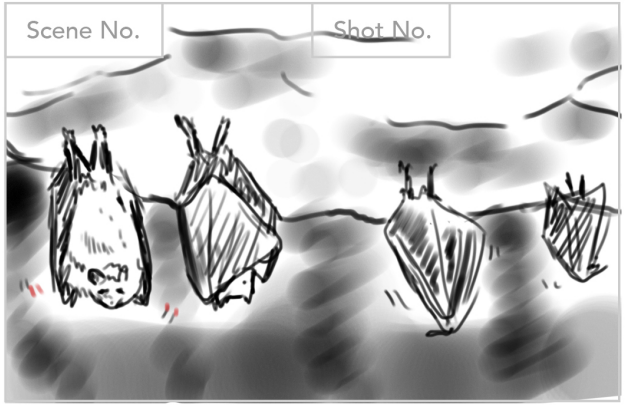
Jump cut to a painted bat chasing a moth.

Scene No. | Shot No.



Jumpcut to a lying fox swims in some water.

Scene No. | Shot No.



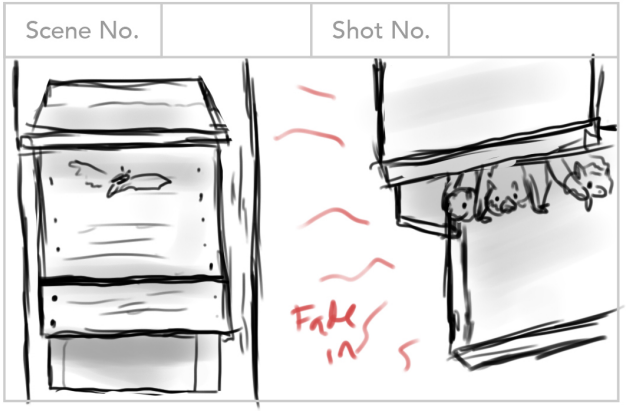
Jumpcut to a sleeping bats upside down.
"We need to take care of our bats to aid in keeping these distinct flyers in our lives to keep our environment healthy and happy."

Scene No. | Shot No.



Jump cut to a scene of outside the Bat Cave of the ROM
"Consider taking time to learn more about bats, look into bat conservation..."

Scene No. | Shot No.



We finish on a scene of a bat house on a tree...fade in to the right a look into it showing bats.
"or even build your own bat house."