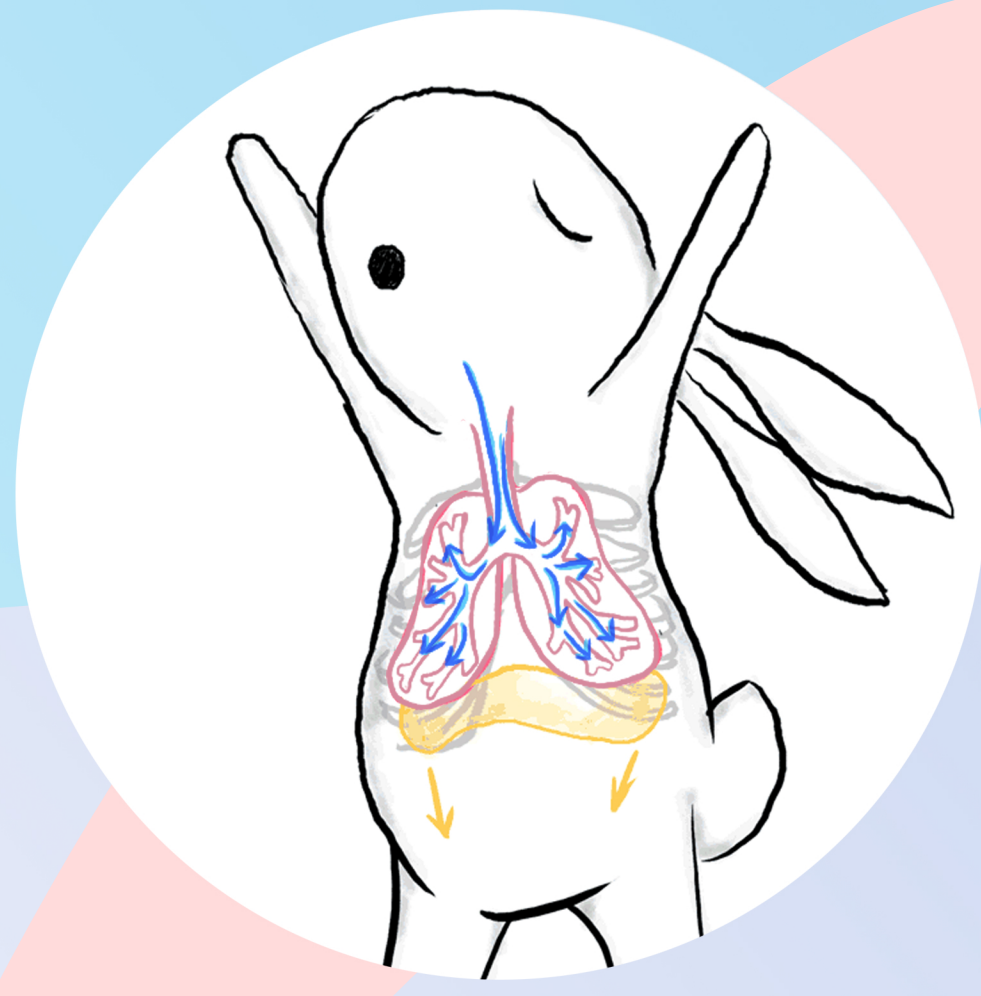
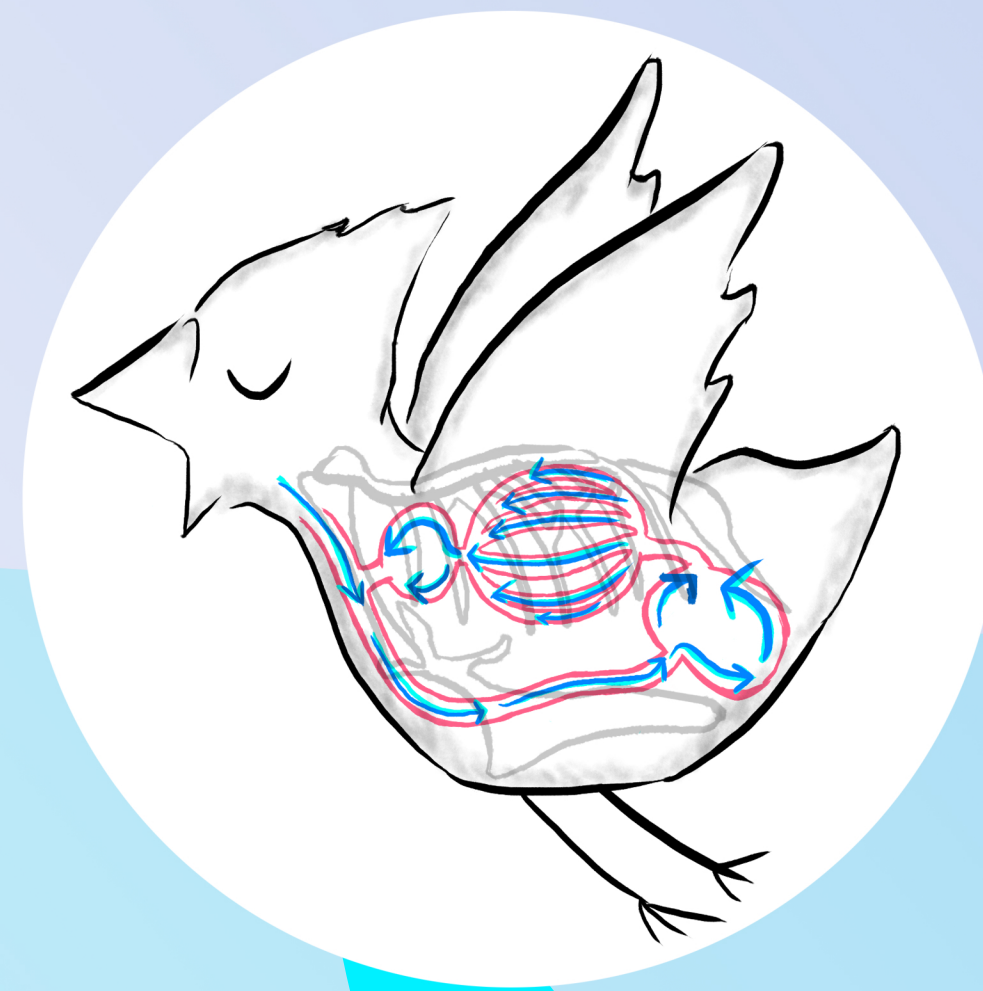


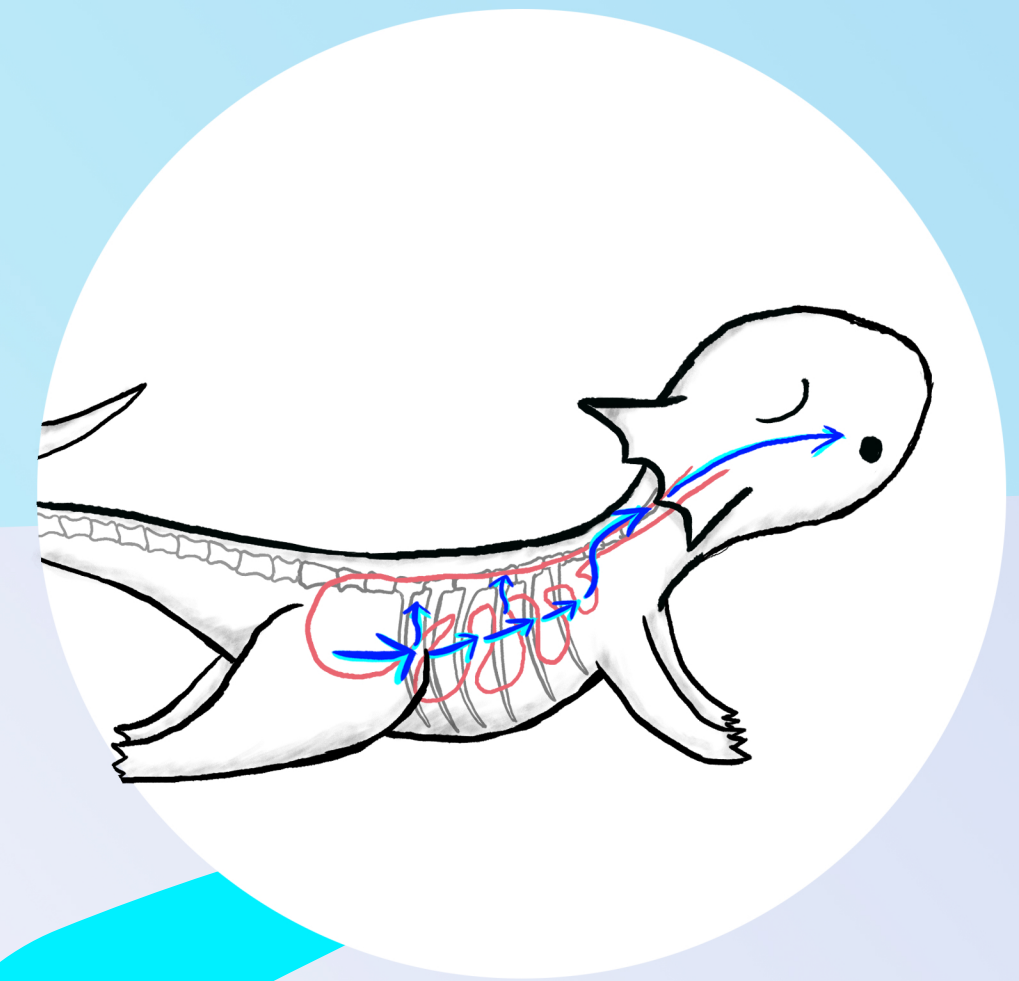
We All Breathe!



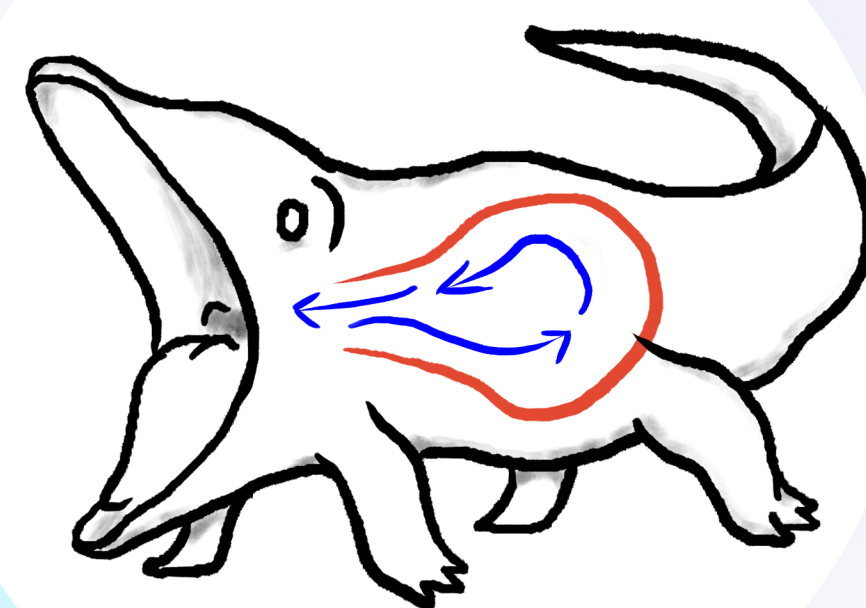
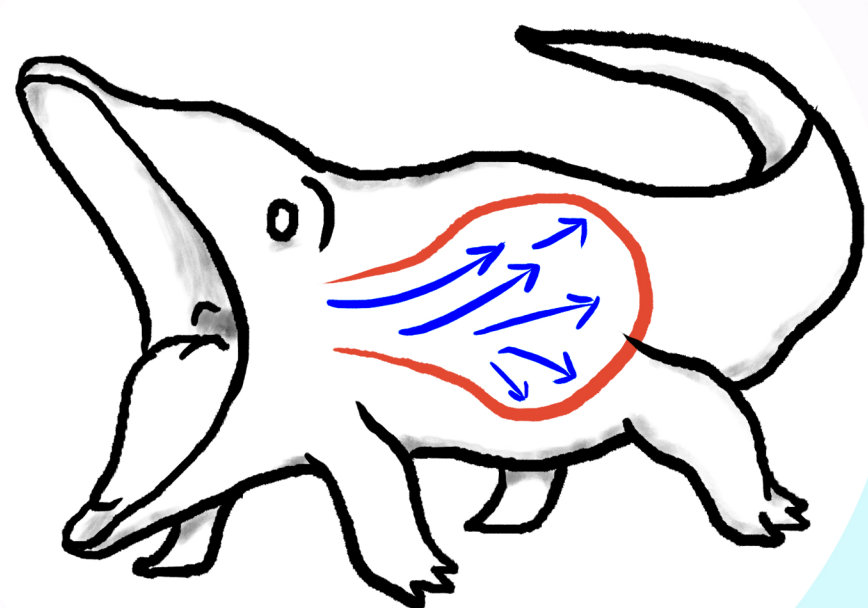
MAMMALS, LIKE HUMANS AND BUNNIES, BREATHE BY EXPANDING THEIR RIB CAGE, AND BY PULLING THE LUNG DOWN WITH THE DIAPHRAGM, A SPECIAL MUSCLE THAT CONNECTS THE BOTTOM OF THE LUNGS TOWARDS THE BODY WALL. THEIR LUNGS ARE SHAPED LIKE A HOLLOW TREE, WHERE THE AIR FLOWS THROUGH THE TRUNK OUT TO EACH LEAF (ALVEOLI) TO MEET WITH THE BLOOD STREAM, AND BACK OUT THE SAME 'BRANCH' TO THE TRUNK.



BIRDS BREATHE BY MOVING THEIR STERNUM AND RIBS, EXPANDING AND CONTRACTING A SET OF BALOON-LIKE CAVITIES IN THEIR BODIES CALLED AIR SACS THAT FORCE AIR THROUGH THE LUNG. THEY HAVE LUNGS THAT ARE SHAPED LIKE A BUNCH OF DRINKING STRAWS CONNECTED TO A LARGER SYSTEM OF TUBES AND SACS. THE AIR FLOWS UNIDIRECTIONALLY TOWARDS THE HEAD WHILE THE BIRD IS BREATHING IN AND OUT.



MOST LIZARDS DON'T HAVE A DIAPHRAGM, AND BREATHE ONLY BY EXPANDING AND CONTRACTING THEIR RIBS. BECAUSE THEY USE THEIR RIBS TO MOVE WHEN THEY BEND SIDE TO SIDE, THEY HAVE TROUBLE BEATHING AND RUNNING AT THE SAME TIME. THERE ARE MANY DIFFERENT KINDS OF LIZARD LUNGS! THEY ALL EXPAND AND CONTRACT LIKE MAMMAL LUNGS, BUT SOME PARTS ARE MORE LIKE THE AIR SAC OF BIRDS THAN MAMMAL LUNGS. WE ARE IN THE PROCESS OF DISCOVERING HOW AIR MOVES IN THESE LUNGS, BUT SOME OF THEM HAVE UNIDIRECTIONAL PARTS LIKE BIRDS AND IN-AND-OUT PARTS LIKE MAMMALS.



EARLY AMPHIBIANS PROBABLY HAD SIMPLE LUNGS LIKE MODERN AMPHIBIANS. THEY PROBABLY BREATHED OUT BY SQUEEZING THEIR TRUNK MUSCLES TO COLLAPSE THE LUNG AND BREATHED IN BY USING THEIR THROAT TO PUMP AIR INTO AND OUT OF THEIR CHEST LIKE FROGS, BUT MAY HAVE USED THEIR RIBS AS WELL, LIKE MODERN REPTILES.

