How Birds Fly

Text by Emily K. Pifer
Illustrations by Ruby McCormick

Have you ever wondered how a bird **FLIES**, or how it is able to stay up in the air?

GRAVITY is a force that pulls objects to Earth. Birds must be able to overcome gravity and can do so by controlling the flow of air past their wings. Gravity is what causes you to fall to the ground after tripping over something.

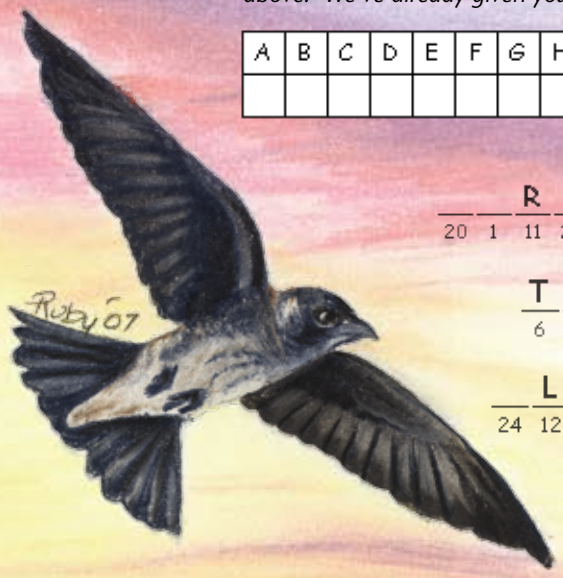
LIFT is a force that works against gravity and is provided by a bird's wing. The shape of a bird's **WING** separates air into two airstreams, one on top of the wing and one underneath the wing. The pressure above the wing is lower than the pressure below the wing, creating an **UPWARD FORCE**, known as lift. A bird can change the amount of lift by changing the angle of its wings. For a bird to stay airborne, air must move past the wings at a certain rate; if not, the bird will fall.

DRAG is the force that slows a bird down to the point where there is not enough lift to overcome gravity. Drag is **FRICTION** between the air and the bird. Purple Martins use drag when slowing down to land on their houses.

THRUST is the force that helps a bird **FLY** through the air, and is created when a bird flaps its wings to fly. Birds pull their wings down and forward and then backward and upward (rather than simply down and up) in order to fly. The **DOWNWARD AND FORWARD** movements that make up the downstroke produce thrust. Thrust must equal drag for birds to fly at a **STEADY SPEED**. If thrust is greater than drag, the bird will fly faster, and visa versa. So, when Purple Martins flap their wings, it generates thrust and lift, which help them fly through the air.

We've added a puzzle below, see if you can figure out the Purple Martin sentence after reading the paragraphs above. We've already given you a head start with a few letters, and a key.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
											12						11		6						



			R		L					R	T								L			T	.		
20	1	11	20	12	13		18	19	11	6	17	2	5		1	5	13		12	17	24	6			
	T		R			T									R			T							
	6	15	11	1	5	6			19	2	25			25	11	19	10		6	21					
		L			T		R						T					R							
	24	12	7		6	15	11	21	1	10	15		6	15	13			19	17	11					

generated by DiscoverySchool.com