



Station 1 WINGING IT!

CHALLENGE:

See how your “flapping rate” compares with different birds.

Count the number of times you can flap your arms in 10 seconds. Have someone with a stop watch, or watch with a second hand, tell you when to start and stop as you count your flaps. Record the number of flaps.

How do you compare?

BIRD	WING BEATS/10 SECONDS
Crow	20
Pigeon	30
Peregrine Falcon	43
Carolina Chickadee	270
Rufous Hummingbird.....	700

The master flapper award goes to the Rufous Hummingbird which is able to flap its wings 700 times in 10 seconds—that’s 70 times per second!

SUPER CHALLENGE:

How long can you flap your “wings” before you start to become tired?

A Blackpoll Warbler travels 2,000 miles, from New England to Venezuela, in three days! This degree of exertion is equivalent to a person running 4-minute miles for 80 consecutive hours.

20-YARD DASH CONVERSION CHART

Use this chart to check calculations for human running speeds for 20 yards.

FINISH TIME (SECONDS)	MILES/HOUR	FINISH TIME (SECONDS)	MILES/HOUR
3.0.....	13.6	6.0.....	6.8
3.1.....	13.2	6.1.....	6.7
3.2.....	12.8	6.2.....	6.6
3.3.....	12.4	6.3.....	6.5
3.4.....	12.0	6.4.....	6.4
3.5.....	11.7	6.5.....	6.3
3.6.....	11.4	6.6.....	6.2
3.7.....	11.1	6.7.....	6.1
3.8.....	10.8	6.8.....	6.0
3.9.....	10.5	6.9.....	5.9
4.0.....	10.2	7.0.....	5.8
4.1.....	10.0	7.1.....	5.8
4.2.....	9.7	7.2.....	5.7
4.3.....	9.5	7.3.....	5.6
4.4.....	9.3	7.4.....	5.5
4.5.....	9.1	7.5.....	5.5
4.6.....	8.9	7.6.....	5.4
4.7.....	8.7	7.7.....	5.3
4.8.....	8.5	7.8.....	5.2
4.9.....	8.3	7.9.....	5.2
5.0.....	8.2	8.0.....	5.1
5.1.....	8.0	8.1.....	5.1
5.2.....	7.9	8.2.....	5.0
5.3.....	7.7	8.3.....	4.9
5.4.....	7.6	8.4.....	4.9
5.5.....	7.4	8.5.....	4.8
5.6.....	7.3	8.6.....	4.8
5.7.....	7.2	8.7.....	4.7
5.8.....	7.1	8.8.....	4.6
5.9.....	6.9	8.9.....	4.6



Station 2

TRACK AND FIELD... AND AIR!

CHALLENGE:

How fast can you run?

Begin at the starting line and see how long it takes you to reach the finish line. Have someone with a stop watch tell you when to start, and measure how many seconds it takes you to complete the run. The marked-off distance is 20 yards. Using the following formula, calculate how fast you ran in miles per hour:

$$\frac{20 \text{ yards}}{\text{finish time in seconds}} \times \frac{1 \text{ mile}}{1,760 \text{ yards}} \times \frac{3,600 \text{ seconds}}{1 \text{ hour}} = \text{ x miles per hour}$$

For Example: If you ran the 20 yards in 5.9 seconds –

$$\frac{20 \text{ yards}}{5.9 \text{ in seconds}} \times \frac{1 \text{ mile}}{1,760 \text{ yards}} \times \frac{3,600 \text{ seconds}}{1 \text{ hour}} = 6.9 \text{ miles per hour}$$

If you want to check your answer, one of the station leaders can use the 20-Yard Dash Conversion Chart to check if your answer is correct. Compare your results with how fast some birds fly.

How do you compare?

<i>BIRD</i>	<i>FLIGHT SPEED IN MILES PER HOUR</i>
House Sparrow	20 mph
Crow	30-45 mph
Mallard	45-60 mph

SUPER CHALLENGE:

How long do you think it would take you to run a distance of 600 miles?
(Washington, D.C., to Atlanta, Georgia, is about 600 miles.)

It takes most students about 10 minutes to run a mile. At this speed and without stopping to rest, it would take you about 4 days! A Ruby-throated Hummingbird can complete a 600-mile nonstop flight across the Gulf of Mexico in as little as 18 hours!

FUN FACT: The fastest bird is the Peregrine Falcon, which can dive at speeds of up to 175-200 miles per hour when chasing its prey.



Station 3 WHAT'S YOUR WINGSPAN?

CHALLENGE:

Hold your arms out straight to either side and see how your "armspan" compares to the wingspan of different birds.

After a leader measures your "armspan" using a measuring tape, record the length.

How do you compare?

- Ruby-throated Hummingbird 4 inches
- American Robin..... 15 inches
- Crow 40 inches
- Bald Eagle 7 feet
- Andean Condor and Marabou Stork 10 feet
- Wandering Albatross 12 feet

FUN FACT: The largest bird in the world is the Ostrich, which can stand over 8 feet tall and weigh more than 300 pounds. The smallest bird is the Bee Hummingbird, which is only 2 inches long, including its bill and tail. (It weighs only as much as a ping pong ball!)

Station 5 THE NOSE KNOWS

CHALLENGE:

How well do you smell?

See how close you have to get in order to smell the mystery scent in the canister.

How do you compare?

If you were a Turkey Vulture, you could have easily smelled this down-wind from 200 feet away. Take a look around and try to locate something 200 feet away from you. Do you think you could smell something from that far away?

FUN FACT: Turkey Vultures can "sniff out" their food from up to 200 yards away (that's about the length of two football fields). The Turkey Vulture's sense of smell is so acute that engineers have used them to find leaks in a pipeline 42 miles long. They do this by pumping a chemical that smells like rotting meat (the smell Turkey Vultures use to locate their food) through the pipe and then seeing where the Turkey Vultures gather.

Scientists believe that both Turkey Vultures and Kiwis have an excellent sense of smell that helps them locate food, and that Storm Petrels use smell to locate their nests in dense breeding colonies. Although there is some controversy, most scientists believe that the majority of birds do not have a good sense of smell and rely more on their keen senses of sight and hearing to find food.

SUPER CHALLENGE:

Can you think of a bird in your area that uses its sense of sight or hearing to locate food?



Station 4 EATING LIKE A BIRD

CHALLENGE:

How many hamburgers do you think you could eat in a day?

Some birds increase their body weight by 5% in a single day before migrating. Look at the chart below to see how many hamburgers you'd have to eat in a day if you were a bird getting ready to migrate.

How do you compare?

You'd have to eat this many burgers every day for 10 days in a row to gain as much weight as many birds do before they migrate.

IF YOU NOW WEIGH:	IN A DAY, YOU'D HAVE TO EAT THIS MANY BURGERS:
60 pounds.....	42
100 pounds.....	70
150 pounds.....	105

FUN FACT: Each spring, hundreds of thousands of shorebirds, including Red Knots, Sanderlings, and Ruddy Turn-stones, visit the Delaware Bay shore of New Jersey and Delaware to gorge themselves on freshly spawned horseshoe crab eggs. During their stay of about 10 days, Red Knots gain 50% of their body weight in fat—the equivalent of a 100-pound person gaining 5 pounds of fat every day for 10 days. This increase in body fat enables the Red Knots to fly nonstop from the Delaware Bay to their arctic breeding sites. (What do you think will happen if horseshoe crabs are overharvested in the Delaware Bay?)

Station 4 EATING LIKE A BIRD CALCULATIONS

ASSUMPTIONS:

1. Each hamburger contains 250 calories.
2. Every 3,500 calories consumed results in a 1-pound weight gain.
3. This is a simplistic calculation that does not take into account the calories burned through digestion and through other activities. It also does not take into account different metabolic rates between individuals.

Formula used to calculate the number of hamburgers required to gain a given amount of weight:

$$\frac{(\text{Desired weight gain} \times 3,500 \text{ calories})}{\text{divided by } 250 \text{ calories}} = \# \text{ of hamburgers}$$

For example:

To increase body weight by 5%, a 60-pound person would need to gain 3 pounds

$$60 \text{ pounds} \times 5\% = 3 \text{ pounds}$$

$$3 \text{ pounds} \times 3,500 \text{ calories} = 10,500$$

$$10,500 \text{ divided by } 250 \text{ calories} = 42$$

This person would need to eat 42 hamburgers.