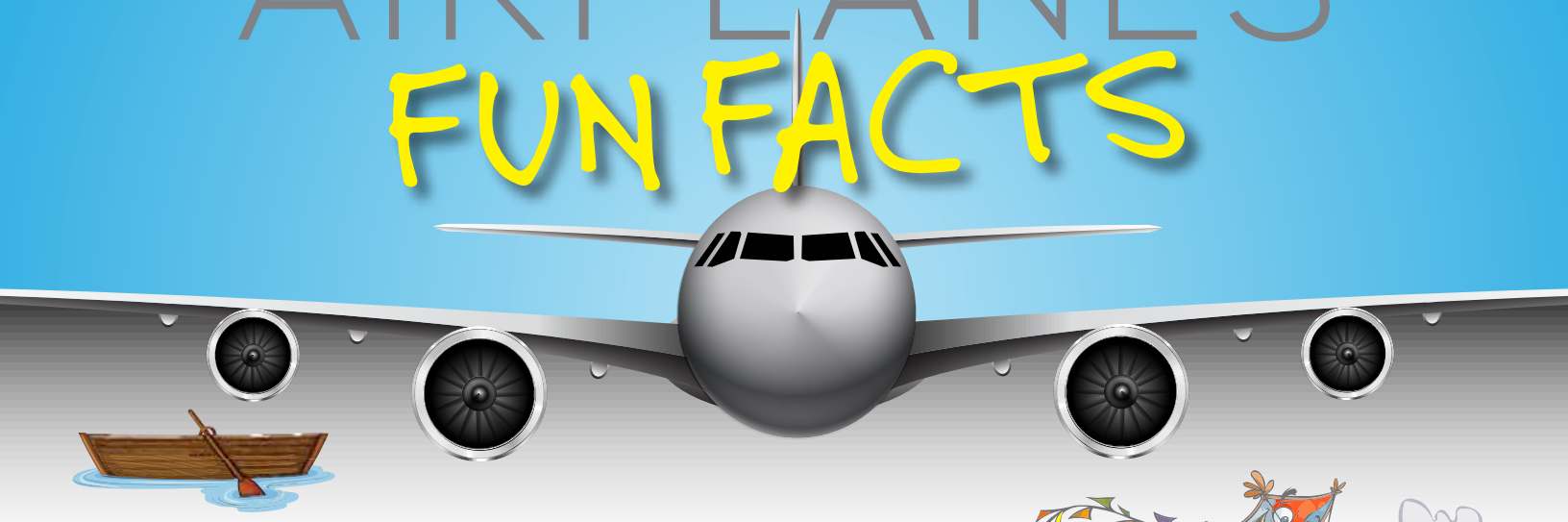
NATIONAL GEOGRAPHIC

LIVING IN THE AGE OF AIRPLANES

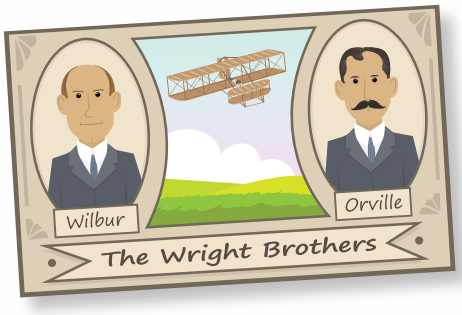
FUN FACTS



Not Far From Home

It's hard to imagine a world without air travel. It seems as if airplanes and airports have always been here. After all, our first flight was little more than 100 years ago. Until about 5,000 years ago, walking was just about the only way to get around. And if you wanted to carry heavy things, you dragged around a sledge—a board with smooth runners. This might explain why most ancient peoples never traveled more than 20 miles from where they were born.

Of course the wheel—and the boat—changed our transportation options greatly. Humans could walk, roll, and row to visit new lands. From chariots to bicycles to trains to automobiles, wheels and how they moved helped us go faster and faster over thousands of years. The skies, though, were still for the birds. Now if only these wheels could fly!



Learning to Fly

Flight did not just begin when the Wright brothers had their first engine-powered, sustained flight in 1903. Mankind has kept a steady eye on the sky since the beginning. (In fact, it was one of the first things we mapped because that was all we could see.) The kite is thought to have been invented in China about 3,000 years ago. And the hot air balloon was invented more than 100 years before the Wrights' first flight. So the brothers weren't just "flying by the seat of their pants": They had a lot of research to help get airborne. But what would these early pilots have to know in order get a vehicle with wings and an engine, heavier than air, to stay up in the sky? They learned to balance the four forces.

Four Forces

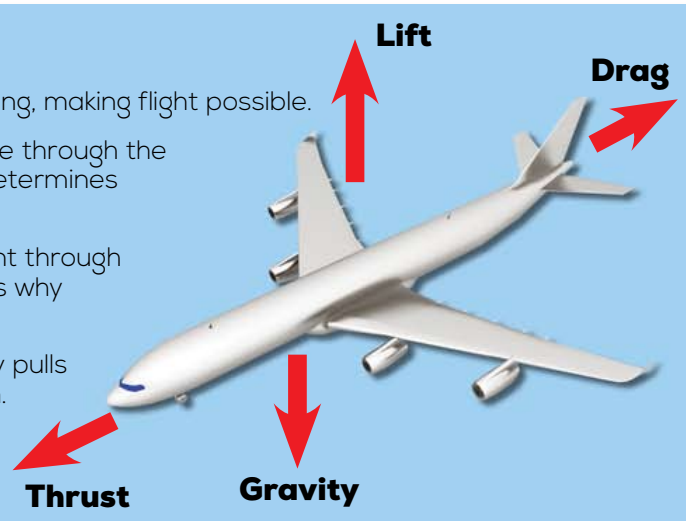
These forces, in balance, keep an airplane in the air and moving, making flight possible.

Thrust is all about forward motion. Thrust propels an airplane through the air. The propulsion system, like an engine, jet, or propellers, determines the amount of thrust, or how fast the plane moves.

Drag wants motion to stop. It resists the airplane's movement through air. Every part of the outside of the plane causes drag. This is why the exterior design of the plane is so important.

Weight is where the force of gravity comes in to play. Gravity pulls the plane's weight downward, toward the center of the earth.

Lift is the force caused by the motion of the aircraft in the air, directly opposing the weight of the airplane. So the plane stays up.



Going the Distance

The next time you complain about how long it takes to fly somewhere, think about how else you might make the journey. See how long it takes to walk, bike, drive, or fly from City Hall in New York City to the following cities' downtown areas. Then answer the questions below. You might gain a greater appreciation for flying!

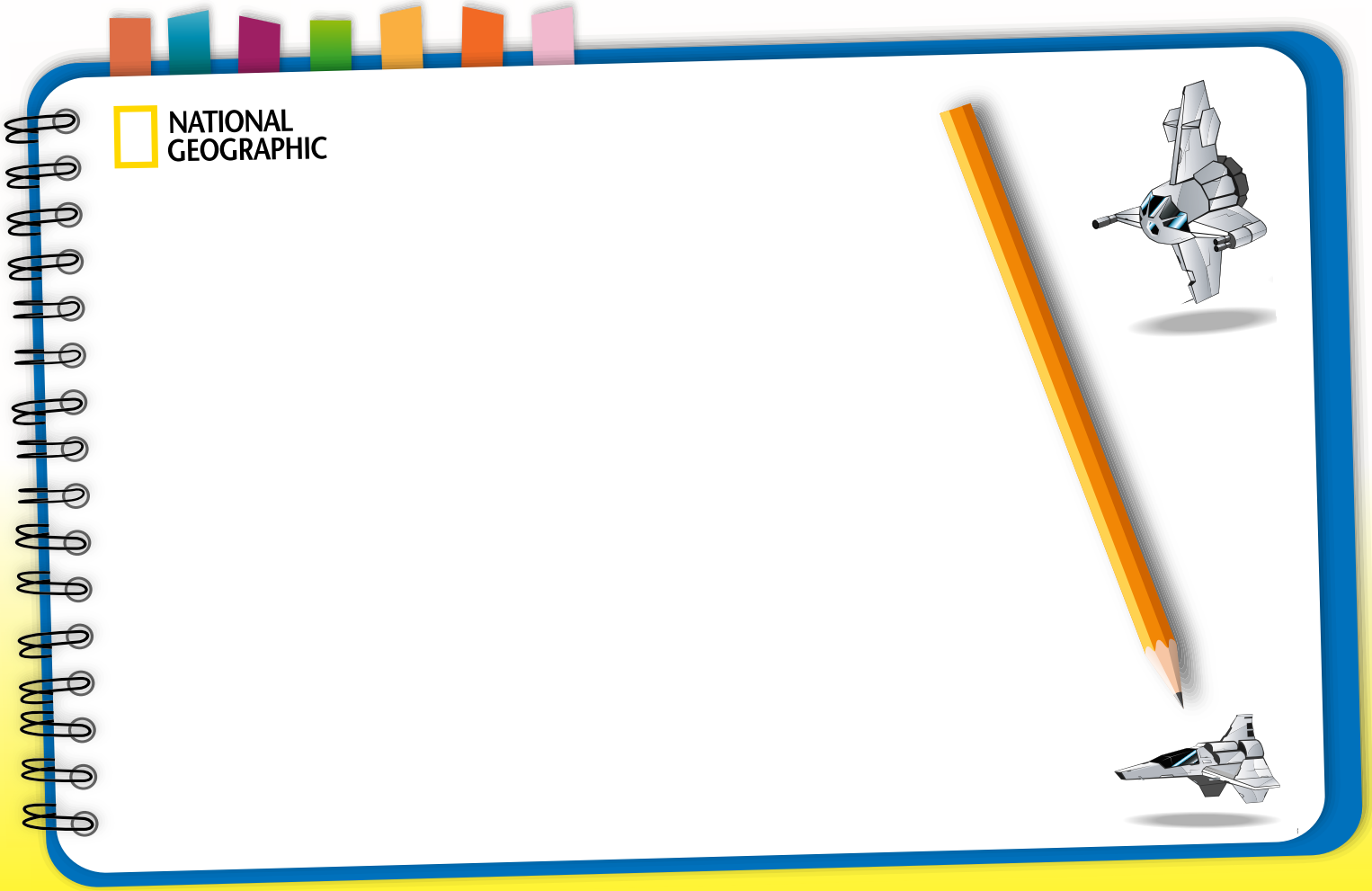
Destination	Distance from NYC (approx.)	Walk	Bicycle	Drive	Fly
Vancouver, BC	2,428 miles (3,908 km)	39 days, 14 hours	11 days, 15 hours	1 day, 20 hours	6 hours, 02 mins
Oklahoma City, OK	1,325 miles (2,132 km)	20 days, 7 hours	6 days, 7 hours	21 hours, 37 minutes	4 hours, 56 mins
Chicago, IL	712 miles (1,146 km)	10 days, 21 hours	3 days, 14 hours	12 hours	2 hour, 30 mins
Washington, DC	204 miles (328 km)	3 days, 3 hours	1 day	3 hours, 45 mins	1 hour, 30 mins

1. If you were walking from New York City to Washington, DC, and needed to be in Washington for two days, how long would you need for the entire round trip? How long if you rode a bike? How long if you flew?
2. How often do you think people who lived in New York City 100 years ago would visit friends or family in Oklahoma City? How would they get there?
3. Flying instead of walking to Vancouver, BC from New York City saves you how much time?

Answers: 1. Eight days, 6 hours; four days; two days, 3 hours. 2.) Not often, if at all. They would have had to walk, take a horse drawn wagon, take a train, or possibly drive, though highway infrastructure did not exist yet. 3.) 39 days, 7 hours, 58 minutes.)

Planes of the Future

The last 100 years has seen transportation take to the skies. Amazing technology has been developed to take us higher, faster, and further than we ever imagined. How do you envision airplanes in another 100 years, both how they will look and how they will fly? Draw and explain your plane of the future below.



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