



The Mini Page

Betty Debnam, Founding Editor and Editor at Large

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Launching Pad to the Space Age

Happy Birthday, NACA!

The National Advisory Committee for Aeronautics, or NACA, opened up the skies for today's airplanes and helped lead America into space.



photo courtesy NACA

Less than 12 years after the Wright Brothers flew their first successful airplane, the U.S.

Congress founded NACA on March 3, 1915. Only 43 years later, NACA morphed into NASA, the National Aeronautics and Space Administration.

To celebrate the 100th birthday of this pioneer of the air and outer space, The Mini Page talked with an expert from the NASA history office.

The sky's the limit

Part of NACA's mission was "to separate the real from the imagined" about flight. NACA workers went even further than that. They turned what they imagined into reality.

Much of what we take for granted about air flight today is based on research from NACA labs. Experts say NACA was the main force behind the changes that turned slow, wood-and-cloth American biplanes into modern jets.

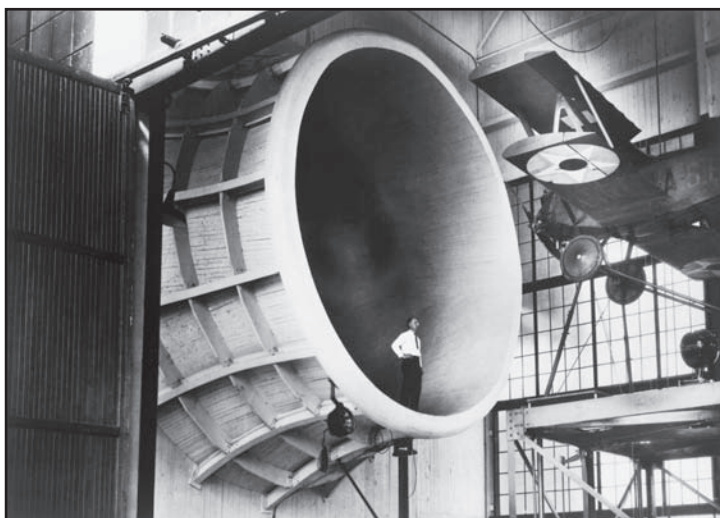


photo courtesy NASA

A NACA researcher stands in a wind tunnel in 1927 as he studies a Sperry M-1 Messenger. This plane was the first full-size airplane to be tested in a special wind tunnel designed to study propellers.

The shape of things to come

The shapes of the wings and **fuselage** (FYOO-suh-lahzh), or main body of an aircraft, in today's planes are based on NACA research. Its tests showed what worked best in different conditions.

After World War II, NACA began working on how to bring things back from space. This work led to the space capsules for the Apollo moon missions.



photo courtesy NASA

A NACA engineer tests ways to cool an engine.

Age of wonder

At the beginning of the 20th century, people's imaginations were on fire. Wonders were springing up all over. In 1915, Alexander Graham Bell made the first transcontinental phone call, Henry Ford produced his millionth car, and motion pictures were starting to tell exciting stories.

To Americans, phones, cars and movies seemed more wonderful and practical than airplanes. But in Europe, people were building on the Wright Brothers' invention. America fell behind in aviation.

After World War I began in 1914, the U.S. Congress, realizing the United States needed to catch up, founded NACA.

Getting Off the Ground

Starting small

In its first years, 12 unpaid aviation experts made up the entire NACA staff. It had no research facilities. Its yearly budget was only \$5,000, which was small even for 1915.

Scientists soon realized they needed laboratories to test their theories. It wasn't enough to figure things out on paper. They began construction on the first NACA facility, Langley Memorial Aeronautical Laboratory, in 1917 in Virginia. Langley was the first U.S. civilian laboratory for studying flight.

Langley allowed researchers to experiment with almost anything they wanted. This freedom encouraged creativity and led to important breakthroughs.

In addition, NACA shared its discoveries with the world. This encouraged even more invention. NASA still follows this policy of freely sharing its knowledge.

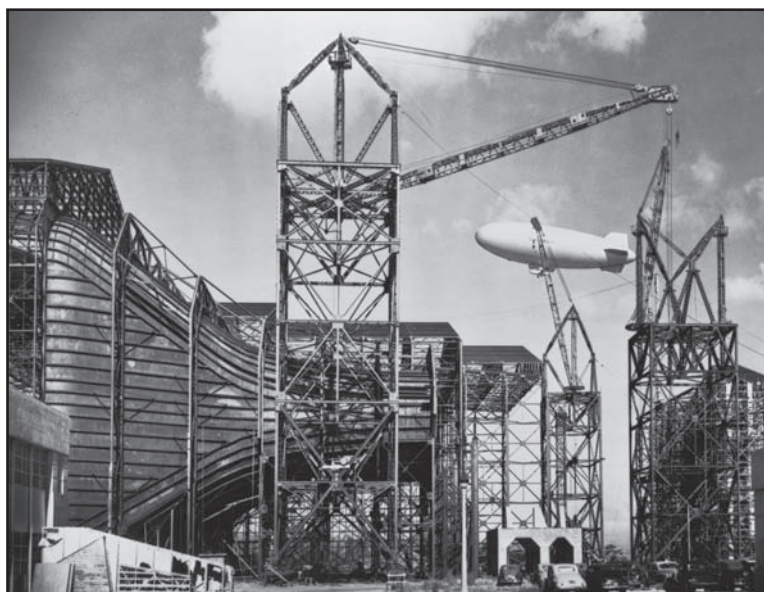


photo courtesy NASA

NACA builds a wind tunnel at the Ames Aeronautical Laboratory in Moffett Field, California, in 1943. It was big enough to test full-size models of planes. A blimp is in the background on the right.

Ames Laboratory, now Ames Research Center, was named after Joseph Sweetman Ames, one of the original 12 members of NACA. Langley was named after Samuel Langley, a plane designer and head of the Smithsonian Institution.

Wind tunnels

A **wind tunnel** is used to learn how wind flows around an airplane. Experts can test how airflow changes with different wing designs or body shapes. Airflow can affect speed, control, how much fuel is needed and **turbulence**, or violent motion.

NACA built the first civilian wind tunnel in the United States by copying a British design.

Tools to test planes

Soon, NACA was improving on the British design and building some of the most advanced wind tunnels in the world. Almost all U.S. military aircraft used in World War II were tested in NACA wind tunnels.

NACA tested small-scale models as well as full-size models of aircraft in its wind tunnels. Today, NASA uses wind tunnels, test flights and computers.

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Ready Resources



The Mini Page provides ideas for websites, books or other resources that will help you learn more about this week's topics.

On the Web:

- www.nasa.gov/history
- [facebook.com/NASAHistoryOffice](https://www.facebook.com/NASAHistoryOffice)
- 1.usa.gov/1KUq2fC

At the library:

- "Research Airplanes: Testing the Boundaries of Flight" by Don Berliner
- "Book of Flight: The Smithsonian National Air and Space Museum" by Judith Rinard

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Try
'n
Find

NACA

F	W	S	S	C	I	T	U	A	N	O	R	E	A	A
A	U	I	P	L	M	R	E	E	N	I	G	N	E	I
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N	E	T	D	T	E	J	E	G	A	L	E	S	U	F

Words that remind us of NACA are hidden in the block above. Some words are hidden backward or diagonally. See if you can find: AERONAUTICS, AIRPLANE, AVIATION, BIPLANE, ENGINEER, FLIGHT, FUEL, FUSELAGE, JET, LABORATORY, LUNAR, MACH, PILOT, ROCKET, SOUND, SPACE, SUPERSONIC, TEST, TUNNEL, WIND, WINGS.

and Rookie Cookie are about to take a
n find:

- | | | | |
|------------------------------------|------------------------------------|--|---------------------------------|
| ☐ ladder | ☐ word MINI | ☐ number 7 | ☐ heart |
| ☐ flowerpot | ☐ needle | ☐ feather | ☐ pencil |
| ☐ frog | ☐ number 3 | ☐ goose | |
| ☐ canoe | ☐ basket | ☐ question mark | |



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Rookie Cookie's Recipe

Pineapple-Orange Salad

- 1 (8-ounce) container light sour cream
- 1 (4-ounce) package orange-flavored gelatin
- 1 small can mandarin oranges, drained
- 1 (15-ounce) can crushed pineapple, drained
- 1 (8-ounce) container non-dairy whipped topping, thawed
- 1 small jar maraschino cherries

1. In a large bowl, combine all ingredients except cherries.
2. Divide mixture into small bowls; cover and place in refrigerator for an hour.
3. When ready to serve, top each serving with a maraschino cherry.

Makes 6 to 8 servings.

You will need an adult's help with this recipe.

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Meet Lily James

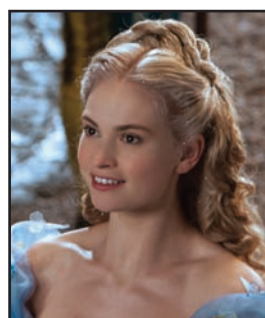


photo by Jonathan Olley, © 2014 Disney Enterprises Inc. All rights reserved.

Lily James stars as Cinderella in the Disney live-action movie “Cinderella.” She has acted in several plays, movies and TV shows, including “Downton Abbey.”

Lily, 25, was born in Esher, Surrey, England, and named Lily Thomson. Her grandmother was an actor, and her father was an actor and singer. She has a younger and an older brother.

She studied musical theater in school in London. When she first auditioned for “Cinderella,” she was trying to get a role as one of the stepsisters.

Lily supports causes such as animal protection groups.



**Gus
Goodsport's
Supersport**



Height: 5-10
Age: 68
Hometown:
Chicago, Illinois

from The Mini Page © 2015 Universal

Mike Krzyzewski

Mike Krzyzewski (shuh-SHEFF-skee), nicknamed “Coach K,” became the head coach of Duke University’s men’s basketball team in 1980 after coaching for five seasons at the United States Military Academy at West Point. His record at Army, where he was also a cadet and a 1969 graduate, was 73-59. He’s done much better for the Blue Devils.

Coach K's Duke teams have won 12 Atlantic Coast Conference regular-season titles and 13 ACC Tournament Championships, while making 29 NCAA Tournament appearances and 11 trips to the Final Four and claiming four national championships. A total of 26 of his players have been named All-Americans.

On Jan. 25, Coach K moved into a class all by himself with a 77-68 victory over St. John's in New York City's Madison Square Garden. With that triumph, he became the first Division I men's coach to achieve 1,000 career wins, pushing his career record to 1,000-308.

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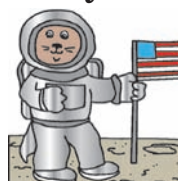
 **TM Mighty
Funny's**
TM Mighty Funny's

Mini Jokes

All the following jokes have something in common. Can you guess the common theme or category?

Nathan: How do NASA scientists heat their homes?

Nancy: With space heaters!



Nelson: Where do NASA scientists send otters?

Nora: To otter space!

Noreen: How does NASA prepare for a flight?

Ned: They plan-et carefully!



Flying Into the Future

The sound barrier

In the 1930s and 1940s, pilots discovered that as planes flew faster, difficulties increased. Airflow at higher speeds created more turbulence, and pilots had trouble keeping control of the plane.

When planes fly faster than the speed of sound, air waves form a barrier that keeps the plane from moving forward. The speed of sound is about 760 miles per hour.

In order for a plane to fly faster than the speed of sound, it has to be able to burst through the barrier.

Breaking the sound barrier

NACA helped create planes that flew faster than any aircraft had flown before. These planes, the X-1 class, became the first planes to fly faster than the speed of sound.

The fuselage was made in the same shape as a machine gun bullet because experts knew those bullets stayed stable at supersonic speeds.



photo by Lt. Robert A. Hoover,
courtesy NASA

U.S. Air Force test pilot Chuck Yeager was the first person to break the sound barrier, in a Bell X-1 rocket plane.

Look through your newspaper for stories about aircraft and spacecraft.

Next week, The Mini Page is about the Vietnam War.

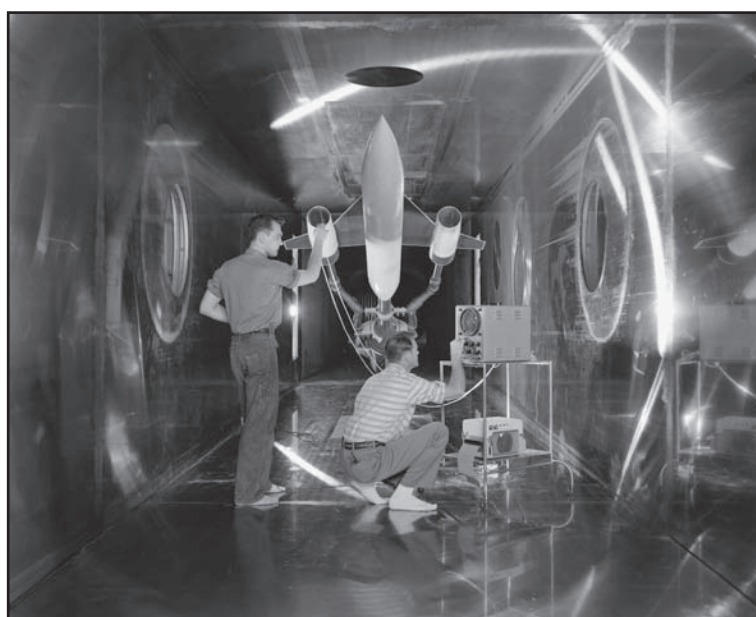


photo courtesy NASA

NACA engineers check a model of a supersonic aircraft before a test run in the Supersonic Wind Tunnel in 1957.

The speed of sound is called Mach 1. A plane flying faster than the speed of sound is moving at supersonic speed.

The Mini Page thanks Yvette Smith, NASA history office, for help with this issue.

Soaring dreams

NACA experts began imagining journeys into outer space years before the Soviets launched the first satellite. Before NASA was formed, NACA engineers had already come up with the plan for the first American human spaceflight program, Project Mercury.

They figured out how spacecraft could re-enter the Earth's atmosphere. This included a plan for heat shields and a worldwide network to track spacecraft re-entry.

NACA scientists made the first plans for what became the successful moon landings. These plans included a lunar lander to carry astronauts to the surface of the moon and a command module that would stay in lunar orbit.

When NACA merged into NASA, NACA staff and labs became the core of NASA.

Test pilots

Results from wind tunnel tests didn't always match what happened in real life. NACA realized they needed specially trained pilots to figure out how different types of planes worked in actual flight.

Test pilots had to be smart, quick-thinking and brave. They risked their lives each time they tested a new plane.



photo courtesy NASA Dryden Flight Research Center

NACA test pilot A. Scott Crossfield flew more than 100 rocket aircraft flights. He was the first pilot to reach Mach 2, or twice the speed of sound.

The Mini Page Staff

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