

Into the wild blue yonder.

Scott Miller's dad was a career Marine. He grew up on bases where there were always cool airplanes and helicopters. It was also the early days of the U.S. space program with the Mercury, Gemini and Apollo spaceflights.

"All these things struck a note with me. One thing led to another, and here I am today," he says.

Today Miller is a professor of aerospace engineering at Wichita State University in Wichita. He works with aeronautics and astronautics. "If you can design an airplane, you have the basic foundation to do a spacecraft also," he says.

Aerospace engineering deals with four areas: aerodynamics, structures, propulsion and flight mechanics. Aerodynamics relates the shape of an object to the effect of airflow on it. When you hold your hand out the window of a moving car, the air lifting your hand is aerodynamics. Structures has to do with making something incredibly light, but also very strong. Propulsion deals with how to create very big forces, using fuel and engines, to move a plane or rocket into the atmosphere or space. Miller says scientists today are working on combination rocket and jet engines. Flight mechanics means controlling the movement of the aircraft or spacecraft.

One of the hottest topics these days is figuring out a new way to go into space. Instead of going straight up into the air like a rocket, it may be possible to design an airplane that literally flies into space, according to Miller.

A scientist who wants to design such a plane will sit down with pad and paper and, using math and science, come up with his idea of a better way to do things, a theory. Next he will use computer simulation to visualize how his plane will work. Then he'll make a scale model and do testing using wind tunnels, vacuum chambers and special furnaces to simulate various stresses a plane might have to deal with in flight. A wind tunnel is a giant hollow closed loop with a fan which can blow winds up to Mach 3 (2,000 m.p.h.) The scientist will draw a conclusion as to what improvements are needed. Changes are made. Then it's more testing.

Even Wilbur and Orville Wright used the same basics (except for computers) in designing their plane one hundred years ago as scientists do today, according to Miller.

Like the Wright brothers, kids should dream big. "If students have any kind of interest in space or science, they have the opportunity to get in on the ground floor of the next generation of aviation and space. Things are going to get really interesting in the next 20 to 50 years. The moon was pretty impressive. Think about the next big thing—going to Mars!" And you're going to see new and wild stuff, such as space tourism," says Miller.

Students should also think positively. "I sometimes wonder if young kids think they can't do it. If they have trouble with math or something, they think 'I'll never be able to do it.' That's wrong. Don't ever cut yourself off. If you're really interested in something, that's half the battle—then it's just hard work," Professor Miller says.



Credit: WSU aerospace engineering website

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