

Hiller Aviation Museum Exhibit Safari

Young Aviators

Count Down To Takeoff

ANSWER KEY

1. The 1903 Wright Flyer had 0 wheels.

Wilbur and Orville built their earliest gliders and airplanes with skids for landing gear. To take off, the whole airplane was lifted onto a small trolley that followed a series of tracks laid into the wind. Once the airplane rose, the trolley fell off and remained behind. By 1910 the Wrights had added wheels to their aircraft to make it easier to take off and land from different locations.

2. The Santa Clara glider is being flown by what kind of person? (Circle the correct answer).

~~Firefighter~~

Acrobat

~~Construction Worker~~

Farmer

John Montgomery's Santa Clara glider did not have movable controls. The pilot guided it by moving his body around to change the glider's balance point. Montgomery found that acrobats had a natural knack for flying his glider by balance and he preferred to hire them as pilots. Modern aircraft have flight controls (ailerons, elevator, rudder) to make this hectic method of flight unnecessary.

3. What carnival ride does the Aerocycloid look like? (Circle the correct answer).

~~Merry-Go-Round~~

~~Roller Coaster~~

Ferris Wheel

~~Bumper Car~~

The Aerocycloid could not generate enough lift to leave the ground, although its moving patens probably provided a pleasant, cooling breeze for its pilot. Helicopter rotors ultimately provided a more efficient route to vertical flight.

4. How many propellers are stacked up on the left side of the Stanford Wind Tunnel? 17
5. How many blades are on the giant Wind Tunnel Fan to the right of the Wind Tunnel? 8

The Stanford Wind Tunnel was used to systematically test propellers of different sizes and shapes. The Wright Brothers were the first to realize that propellers behaved like rotating wings, and their success in powered flight was due in part to the care and attention than they gave to propeller design. The Stanford tests further advanced this process and led to even more efficient propellers.

6. Push the button to turn the Vin Fiz airplane's engine. How many propellers does this airplane have? 2

A single rotating propeller imparts an undesirable turning force to the airplane it is attached to. The Wrights solved this problem in many of their aircraft (including the Vin Fiz) by using a single engine to turn two

propellers in opposite directions. Modern airplanes use their controls to adjust for this turning force.

7. What is the Pepsi Plane's propeller made out of? (Circle the correct answer).

~~Wood~~

Metal

~~Stone~~

~~Plastic~~

The first propellers were made from beautiful laminated (layered and glued) wood, carved and polished to an ideal shape. Small airplanes today may still use wooden propellers, but in the 1930s it became possible to build metal propellers with a changeable pitch angle. The Pepsi Travel Air has a device in its propeller hub able to change the angle the aluminum alloy blades make with the air to provide better performance. The propeller on the floor in front of the Pepsi Travel Air has fixed pitch, like a wooden propeller.

8. Name an airplane able to land and take off from water. (Circle the correct answer).

Republic Seabee

~~Pepsi Plane~~

~~Honeymoon Airplane~~

~~Miss Los Angeles~~

The Seabee is one of many airplanes on display at the Museum able to operate from the water. The Seabee is actually an amphibian, able to operate from land or water; other aircraft such as the Boeing 314 were flying boats, unable to use runways. In the 1930s long, paved runways were rare. A flying boat or amphibian could visit any city in the world with an ocean harbor or nearby lake, and as a result they were quite popular for passenger travel in the 1930s and 1940s.

9. How many people could a Hiller Rotorcycle carry? 1

The Rotorcycle was developed as a portable helicopter able to be assembled and flown by a single pilot for rescue purposes. The helicopter could be dropped to a pilot whose aircraft had been forced down in rough terrain; the pilot could then assemble the helicopter and fly to safety. Advances to rescue helicopters eventually made it possible to winch a downed pilot into a large, hovering helicopter. This proved to be a safer and easier way to rescue a downed pilot, especially if the pilot is injured.

10. A Boeing 737 needed 2 crew members in the cockpit.

Early airliners needed three crew members: captain, first officer and flight engineer. The Boeing 737 allowed a crew of two to fly the plane and handle the engines without help from a flight engineer. The Museum's Boeing 737 includes a third jump seat for use by a pilot observer, sometimes called a "jump seater". All of today's modern jet airliners have two-person flight crews.