



Smithsonian

The Art and Science of Skateboarding



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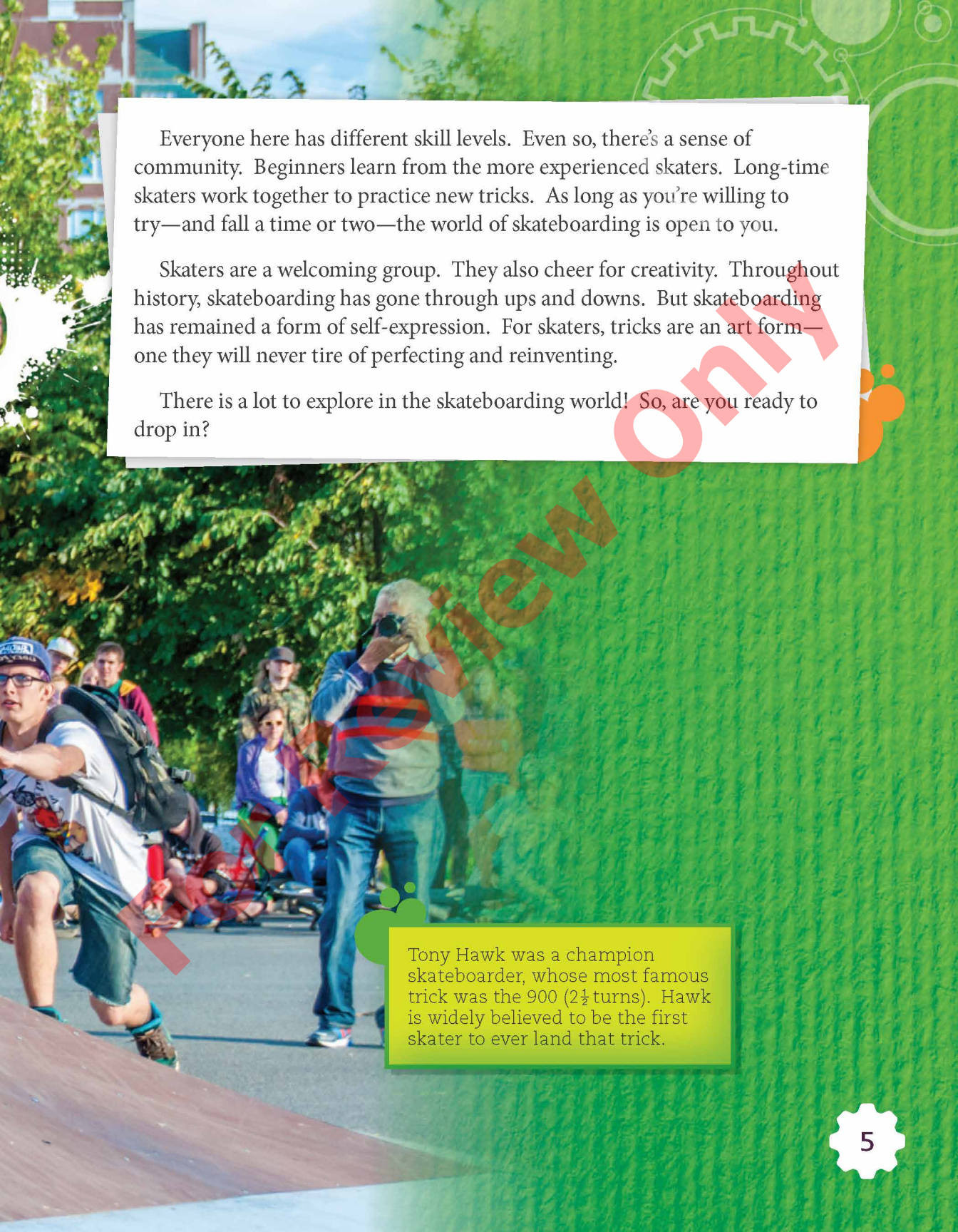
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Editor's Note: Readers should always wear protective gear when skateboarding, including helmets that fit correctly, wrist guards, kneepads, elbow pads, and practical shoes. Always use quality skateboards to prevent injuries.



The Skate Park

Welcome to a community skate park! This space has ramps, stairs, and rails, and it's packed full of skaters. Some skaters zip past, rolling down basins quickly. Others swing by, hopping onto ledges and skating along edges with focused balance. One skater rockets down the pavement in a straight line. She bends her knees and jumps—lifting toward the sky—while her skateboard stays “attached” to her feet!



Everyone here has different skill levels. Even so, there's a sense of community. Beginners learn from the more experienced skaters. Long-time skaters work together to practice new tricks. As long as you're willing to try—and fall a time or two—the world of skateboarding is open to you.

Skaters are a welcoming group. They also cheer for creativity. Throughout history, skateboarding has gone through ups and downs. But skateboarding has remained a form of self-expression. For skaters, tricks are an art form—one they will never tire of perfecting and reinventing.

There is a lot to explore in the skateboarding world! So, are you ready to drop in?



Tony Hawk was a champion skateboarder, whose most famous trick was the 900 ($2\frac{1}{2}$ turns). Hawk is widely believed to be the first skater to ever land that trick.



The Basics of the Board

At first glance, skateboards have a simple design. They're just wooden boards with wheels, right? Actually, skateboards are more than they first appear to be. Even simple boards have a lot of clever design elements. Each **aspect** has been finely tuned over the years through trial and error.



ARTS

The Art of Grip Tape

Grip tape has a grainy surface that feels like sandpaper. This tape does exactly as its name suggests: it helps skaters grip the board. Skaters use grip tape and paint to create their own unique designs. These designs range from simple to inventive and can help skaters express themselves artistically.



A builder glues together plies of wood.



A builder traces the shape of a board onto plies of wood.

The Deck

The **anatomy** of a skateboard breaks into three parts—the deck, the wheels, and the trucks. The wooden plank that skateboarders stand on is the deck.

Today, decks are made of sugar maple wood. For years, **engineers** experimented with different materials for a skateboard's base. In the past, decks were made of aluminum or plastic. But maple wood has become the first-choice material for decks. This is due to the wood's strength and **elasticity**. Maple wood bends easily. This lets skateboard builders mold the deck.

A deck is usually made of seven plies, or layers, of wood. The layers are pressed tightly together using glue. The glue then dries, and the deck is shaped into the curved form people are used to seeing.

Skateboard decks come in several styles. However, most styles fall into two categories. The first category is the shortboard. True to its name, this board is the shortest style on the market, and it is also the most popular, recognizable style. The shortboard is built for tricks and jumps since it is the lightest of all boards.

The deck of a shortboard has a unique, **concave** design, which tilts **up** at the edges of the deck, as well as at the nose and tail of the board. **This** shape serves two purposes. First, the shape makes the board **stronger**. Second, it makes the board easier to control. The shape is **also crucial** to completing many well-known skateboarding tricks.

In contrast, the longboard is designed for travel. The **longboard** is the second category. Nicknamed “cruisers,” these **boards** can glide down roads smoothly. The boards also turn **corners** with less effort. Longboards have longer decks, which can **accommodate** larger wheels.





These skaters ride shortboards at a park.



freeriding



cruising



long
distance



speedboard



boardwalking



surf style

longboards

STEAM CHALLENGE

Define the Problem

Engineers consider many things when designing safe and unique skate parks. They test the size, angle, surface material, and shape of ramps so that skaters can use them to practice and invent tricks. Your task is to design and build a model of a new skate park for your community.



Constraints: The design must be safe and useful for skaters. It must include at least three attractions where skaters can kick turn, ollie, and grind. There must be a safe area for both beginners and experts.



Criteria: Your model must clearly show different areas of the park where tricks can be practiced safely.





Research and Brainstorm

What types of tools do engineers use to design skate parks? What attractions are popular for beginners? What attractions are popular for experts?



Design and Build

Sketch your park design. What purpose will each part serve? What materials will work best? Build the model.



Test and Improve

Test your model. Use a piece of a craft stick and your fingers to show how tricks should be performed. Did they work? How can you improve the park? Modify your design and try again.



Reflect and Share

How would you modify your attractions if almost all the people who visit your park are beginners? What were the biggest challenges you faced when designing your skate park?

