

Skateboard Science

Science Article

What's the Connection?

When Betsy Byars test rode “The First Skateboard in the History of the World,” she had two simple goals: stay on the board and don’t get hurt. Today, skateboarders perform acrobatic leaps, dizzying mid-air spins, and other tricks that look nearly impossible. In this lesson, you will read a **science article** that explains one of these moves.

Skill Focus: Follow Multi-Tasked Instructions

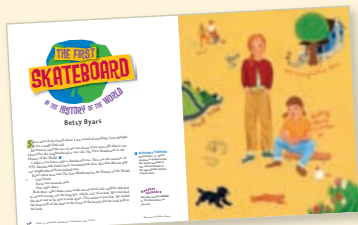
The skateboarding trick described on the next few pages is usually completed in one fluid motion. The writers divide it into steps to give a scientific explanation of how the skateboarder is able to complete the trick. Use these strategies to follow the instructions:

- **Preview** the instructions to get an idea of what they are about. Look at titles, subheadings, and graphics such as photos or illustrations.
- Read the steps in **numerical order**. Don’t skip around.
- Notice **transitional words and phrases** such as *during*, *as*, and *meanwhile*. These words connect ideas between and within each step.
- Focus on the vivid verbs, adverbs, and adjectives that **describe** what happens in each step.
- Pay attention to **illustrations**. Illustrations enhance your understanding of instructions. Be sure you understand the factual information they present.

Finally, to make certain you truly understand these steps, restate each one in your own words in a chart like the one shown.

Review: Take Notes

	<i>My Own Words</i>
<i>Before the Ollie</i>	<i>Three forces are acting on the rider and his board. Weight and gravity pull the board and rider down. The ground pushes them up. These forces cancel each other out, so nothing speeds up the skateboard or stops it from rolling.</i>
<i>Step 1</i>	
<i>Step 2</i>	



Use with “The First Skateboard in the History of the World,” page 510.



READING 2E Use a glossary to determine the meanings of words. **9** Compare and contrast the stated or implied purposes of different authors writing on the same topic. **12A** Follow multi-tasked instructions to complete a task, solve a problem, or perform procedures. **12B** Interpret factual, quantitative, or technical information presented in illustrations.

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Skateboard Science by Pearl Tesler and Paul Doherty

In the Beginning, Skateboarding Was Simple. . . . **A**

With nothing more than a two-by-four on roller-skate wheels, the sidewalk surfers of the 30s, 40s, and 50s had a straightforward mission: Start at the top of a hill and ride down. The primary goal was just to stay on and avoid collisions; given the humble equipment and rough road conditions, it was no small challenge. Now, thanks in part to improvements in design and materials, skateboarders have a higher calling.

In a blur of flying acrobatics, skaters leap and skid over and onto obstacles, executing flips and turns of ever increasing complexity—all at top speeds. For onlookers and beginners, it can be hard to follow the action, let alone answer the question that springs naturally to mind: How on earth do they do that? While it may seem that modern skateboarders are defying the laws of physics, the truth is that they're just using them to their advantage. Let's take a closer look at a fundamental skateboarding move and the physics principles behind it.

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FOCUS ON FORM
 A science article is an informational text on a scientific subject. The author's purpose for writing a science article is usually to inform or explain. Science articles often use illustrations to convey factual information and clarify ideas.

TAKE NOTES
 Preview the article's title and subheadings. Use the subheadings as topics for notes, leaving space beneath them. Then, as you read, record key information about the topics in the appropriate spaces.

B TAKE NOTES

Reread lines 18–20.
What are two pieces of background information about the ollie that you can add to your notes?

C SCIENCE ARTICLE

How does the illustration clarify the information in lines 30–36?

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Jumping: The Ollie

Invented in the late 1970s by Alan “Ollie” Gelfand, the ollie has become a skateboarding fundamental, the basis for many other

20 more complicated tricks. **B**


In its simplest form, the ollie is a jumping technique that allows skaters to hop over obstacles and onto curbs. What’s so amazing about the ollie is the way the skateboard seems to stick to the skater’s feet in midair. Seeing pictures of skaters performing soaring four-foot ollies, many people assume that the board is somehow attached to a skater’s feet. It’s not. What’s even more amazing about the ollie is that to get the skateboards to jump up, the skaters push down on the board! . . . Let’s take a closer look.

Forces in the Ollie

30 Imagine a skater rolling along a flat surface. As he does so, there are three forces acting on the skateboard. One of these forces is the weight of the rider. Another is the force of gravity on the board itself. The third is the force of the ground pushing up on the skateboard. Since these three forces balance out to zero, the skateboard doesn’t speed up or slow down. It rolls along at a constant speed. **C**

As the skater gets ready to perform an ollie, he crouches down. This will help him jump

40 high when the time comes. (Don’t believe it? Stand perfectly straight and try jumping without crouching . . . you didn’t get very high, did you?) Now let’s follow the changing forces that go into making an ollie.



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TEKS 9

D AUTHOR'S PURPOSE

Authors writing on the same topic may write for very different purposes. In her memoir, Betsy Byars tells about the first time she rode a skateboard. In her description, she includes her thoughts and feelings about what happens. This science article also discusses riding a skateboard. However, the writer includes mostly factual information about how to ride a skateboard. Why does the memoir include thoughts and feelings while the science article focuses on facts? What is the difference in the implied purpose of each work?

E FOLLOW INSTRUCTIONS

Why does the illustrator include arrows in these illustrations? What factual information do they convey?

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1 The skater pushes himself upward by explosively straightening his legs and raising his arms. During the jump, his rear foot exerts a much greater force on the tail of the board than his front foot does on the nose. This causes the board to pivot counterclockwise about the rear wheel, which means the tail of the board touches the ground. **D**

2 As the tail strikes the ground, the ground pushes back. The result of this upward force is that the board bounces up and begins to pivot clockwise, this time around its center of mass, which is the center of the board.

3 With the board now completely in the air, the skater slides his front foot forward, using the friction between his foot and the rough surface of the board to drag the board upward even higher.

4 The skater then begins to push his front foot down, raising the rear wheels and leveling out the board. Meanwhile, he lifts his rear leg to get it out of the way of the rising tail of the board. If he times this motion perfectly, his rear foot and the rear of the board rise in perfect unison, seemingly “stuck” together. **E**

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F FOLLOW INSTRUCTIONS

Notice how many steps there are in an ollie according to this article. Be sure to restate the same number of steps in your chart.



TEKS 2E

G SCIENCE ARTICLE

When you read a science article, you may come across familiar words that have unfamiliar meanings. For example, the writer of this article frequently refers to the “nose” of a skateboard. In this context, the word *nose* does not mean “the part of the face above the mouth.” The writer has included a **glossary** of skateboarding terms to help you determine the meanings of unusual or difficult words. You can use the glossary to find out that, in this context, *nose* means “the front end of a skateboard.” Why is a glossary like this one especially helpful when you read a science article?

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5 The board is now level at its maximum height. With both feet touching the board, the skater and board begin to fall together under the influence of gravity.

6 Gravity eventually wins out and the skater bends his legs to absorb the impact of the landing. **F**

Skateboarding

GLOSSARY

clockwise in the same direction as the turning hands of a clock

counterclockwise in the opposite direction as the turning hands of a clock

nose the front end of the skateboard

pivot to turn or revolve from a central point

tail the back end of the skateboard **G**

Comprehension

1. **Recall** How did the ollie get its name?
2. **Clarify** What are some of the ways skateboarding has changed since the 1930s, 1940s, and 1950s?

Critical Analysis

3. **Follow Multi-Tasked Instructions** How do the transitional words and phrases in the article help a reader perform a procedure correctly? Support your response with an example from the instructions.
4. **Evaluate a Science Article** How did the factual information presented in the illustrations help you understand the instructions? Provide a specific example from the text in your response.



READING 9 Compare and contrast the stated and implied purposes of different authors writing on the same topic. **12A** Follow multi-tasked instructions to complete a task, solve a problem, or perform procedures. **12B** Interpret factual, quantitative, or technical information presented in illustrations.

Read for Information: Compare and Contrast Author's Purpose

WRITING PROMPT

Betsy Byars's memoir and the science article you just read are about skateboarding. While both texts are on the same topic, the authors probably wrote them for very different purposes. Write a paragraph in which you **compare** and **contrast** each author's purpose for writing a text on skateboarding. Keep in mind that an author's purpose is usually implied, so you must infer it using details in the text. Remember too that authors often have more than one purpose for writing.

To answer this prompt, you will need to do the following:

1. Review the chart you completed as you read "The First Skateboard in the History of the World."
2. Create a similar chart for "Skateboard Science." Record details from the text that reveal the purpose of the text.

<i>Inform</i>	<i>Share Thoughts or Feelings</i>	<i>Entertain</i>

3. In a paragraph, contrast each author's purpose for writing a text on the topic of skateboarding. First, state how each author's purpose is different. Then, support your statement with details from the text.