

Teacher's Guide

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Includes Discussion Questions, Classroom Activities, and Links to Resources



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Latex is tapped from
the trunk of a rubber tree.

BEFORE

YOU

READ



Engage your imagination and
consider the history of sneakers.

Morning glory

- ★ Have you ever wondered where your shoes or sneakers come from?
- ★ How do you imagine shoes or sneakers looked 100 years ago?
- ★ What might they look like 100 years from now?

VOCABULARY

sap

latex

sagebrush

rubber barons

robber barons

natural rubber

synthetic rubber

competition

collaboration

entrepreneur

publicity

inventors

customization

limited edition

aerobic exercise



AFTER YOU READ

Consider sneakers' influence on popular culture.

- ★ Think about the early entrepreneurs who developed the shoes we wear. Do you think they anticipated the role of sneakers in today's culture? Why or why not? How did baseball and gum help support women's sports? (Baseball and softball.)
- ★ Have you ever worn a shoe because a celebrity or athlete wore or endorsed it? What influenced your decision?
- ★ Which celebrities have the greatest influence on sneaker culture? Which sports figures? Entertainers? Fashion designers? Social media influencers? Support your position with current examples.

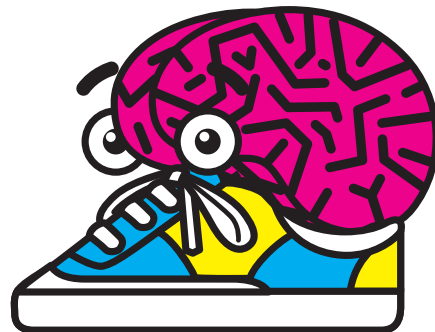


A statue of the Greek goddess Nike

AS YOU READ

Marvel at the history of sneakers. Did you know there was so much to learn about sneakers?

- ★ How did the changing availability of materials affect sneaker innovation and production?
- ★ What makes a successful sneaker entrepreneur? Think about the characteristics that help them succeed.
- ★ How have sports and sneakers played a part in social justice and/or activism?



LANGUAGE ARTS and SOCIAL STUDIES

GAMES and RECREATION

How have games been used in society?

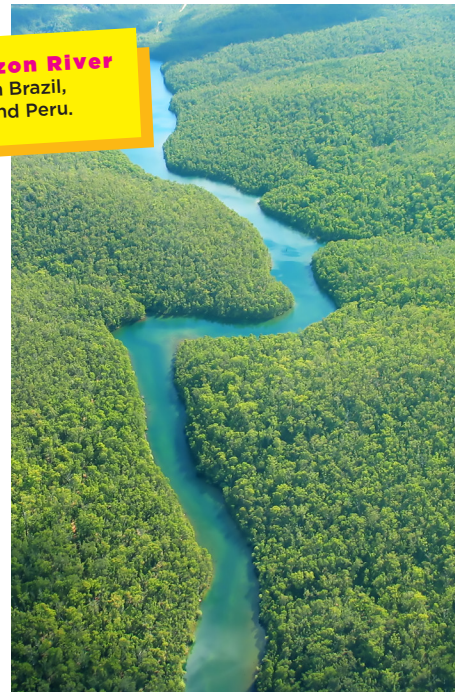
Think about the ancient Mayan ball game Pitz.

- ★ How did the Mayans view this game?
- ★ Was it a form of exercise?
- ★ A friendly competition against a neighboring team?
- ★ What other function did Pitz serve for the Mayans?

Organized games, sports, and teams are a part of modern society, too. You may play or watch sports at school or in your neighborhood or you may attend games in your city. National and international games are held live and broadcast for viewing.

- ★ How do games bring people together? If you've ever played a sport, how does it feel to train and perform with teammates? What is it like to have spectators and supporters cheering you on from the stands?
- ★ As a spectator, how does it feel to root for your team? How do you recognize the people cheering for your team? How do you know who's rooting for the other team?
- ★ What is the feeling when you win or your team wins? How do you celebrate? How does the team celebrate winning?

The Amazon River
runs through Brazil,
Colombia, and Peru.



INDUSTRIALIZATION

Rubber Barons is a play on words for the term *robber barons*. Robber barons are generically described as industrialists who enriched themselves and created demand for their products by exploiting natural resources as well as the workers. In this example, rubber barons used private armies to seize land from Indigenous people and force them to work on rubber plantations to meet the growing demand for rubber products.

Think about current sensibilities and expectations of responsible corporate citizenship; a good corporate citizen is a company that shows respect for the environment, workers, and the community where a product is made.

- ★ Research your favorite product or brand. Would you describe the company behind it as a responsible corporate citizen or a modern-day robber baron?
- ★ What could you (or other consumers) do to express your pleasure or displeasure with the company's practices? Do you think your efforts would affect the company or their business practices? Why or why not? Find an example of consumer influence on a company to support your response.



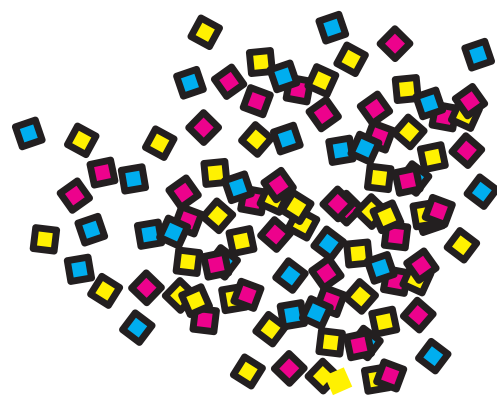
PROFILES IN COURAGE...

Ancient Greeks like Koroibos were not the only athletes who competed barefoot.

Several runners in modern history have successfully competed in their bare feet. Explore the career of marathoner Abebe Bikila, who won back-to-back Olympic gold medals in Rome (1960) and Tokyo (1964) representing Ethiopia. He ran barefoot to victory in 1960. In the 1964 Olympics, he competed in shoes. There is much speculation as to which shoe company sponsored him ... Adidas or Puma!

In September 2020, a young runner from the Philippines named Rhea Bullos raced wearing “shoes” she’d made with tape and decorated with hand-drawn Nike symbols. That day, there were only two pairs of shoes to share among 12 girls on the team. Her creativity and persistence paid off: Rhea won three gold medals in the 400-meter, 800-meter, and 1,500-meter races.

★ Think about an athlete you admire. Do they compete in a unique way compared to others in their sport? Do they wear “lucky” items or have rituals as they prepare for a game? Are these ways to help them win? Or do they have little or no effect? Share and compare your thoughts.



CONSERVATION AND MODERN USES

SCIENCE

Although sagebrush sandals were discovered in 1938, and were created more than 9,000 years ago, sagebrush is still an important plant and contributor to the environment. It is used in conservation and reconstruction of burned and deforested areas, especially in the western and Pacific northwestern United States.

Maybe you’d like to know how plants like sagebrush are used to provide food, protection, and shelter for animals and wildlife. Sagebrush is also helpful for soil conservation and water retention. It even has uses among humans: it can be used to make medicinal teas, and the stringy bark can be used for making rope and baskets.

Plant of the Week

https://www.fs.usda.gov/wildflowers/plant-of-the-week/artemisia_tridentata.shtml

Sagebrush Fact Sheet

https://plants.usda.gov/DocumentLibrary/factsheet/pdf/fs_artr2.pdf

PRESERVATION AND STEWARDSHIP

Take a look at the U.S. Forest Service website and the Opportunities for Young People listed there. You might want to use your curiosity to help preserve nature and discover new ways that plants, animals, and humans can respectfully coexist.

<https://www.fs.usda.gov/working-with-us/opportunities-for-young-people>

See the profile of Alberto Ortega, who was introduced to U.S. Forest Service firefighters when he was a child. He thought it would be his dream job, and he started working seasonally, or as a temporary worker, when he was a young person. Later, he became a permanent employee with the Forest Service, and it has been his career for many years. If you are interested in nature and conservation, view his story and think about your future occupation.

<https://youtu.be/Qyg6GBsSHpo>

INVENTORS and INSPIRATION

We read about Bill Bowerman and the waffle iron that inspired him to create gripping soles for Nike running shoes. Did you know that the octopus salad that inspired Asics's Kihachiro Onitsuka is a special type of scientific design? It's called biomimicry.

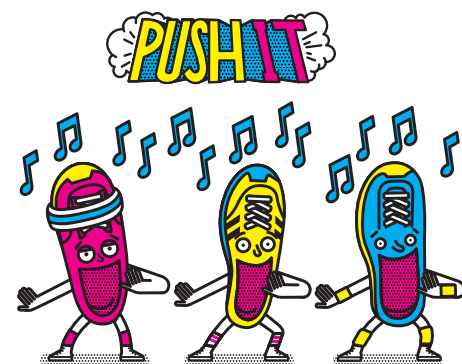
Biomimicry is problem solving inspired by nature. It can be copying a shape, function, or system that occurs in nature. The suckers on the octopus's tentacles gave Onitsuka the idea for suction cup-type grippers on basketball shoes.

In 1941, Swiss engineer George de Mestral was removing burrs from his dog and his own pants after a walk. He noticed how firmly the burrs stuck to the dog's fur and his pantlegs. When he examined a burr under a microscope, he was surprised to see little hooks protruding from the burr and clinging to the dog hair. With this in mind, he created a two-part fastener with a similar hook-and-loop structure. Combining two French words, *velours* for "velvet" + *crochet* for "hook," he called it Velcro!

The Freestyle aerobics shoe by Reebok featured Velcro ankle-strap closures. Now, there are many shoes, clothing items, and bags that use Velcro. Velcro, too, is biomimicry; it takes its design inspiration from a burr of the burdock plant.

Watch this quick bio of George de Mestral and the invention of the hook-and-loop closure.

<https://youtu.be/7un9wIEvNe0>



VISUAL ART

SHOES

Now that you know about biomimicry, can you identify other examples?

But first, learn about Fort Rock Sandals by visiting the Oregon Encyclopedia's link for more information on the discovery of the sagebrush sandals.

https://www.oregonencyclopedia.org/articles/fort_rock_sandals/#.ZC2wIOzMLOW

Examine the construction of the sandals. Imagine making your own sandals using raw materials such as sagebrush. How do you think they would feel on your feet? Or on your hands while weaving?

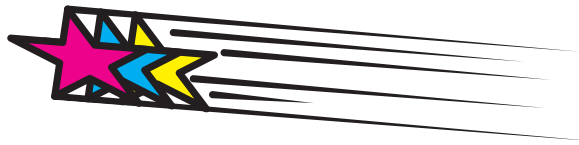
Try weaving in the style of the sagebrush sandals. For a simple project like a bracelet or bookmark, use three straws threaded with floss or yarn. You even might try raffia for a rustic look.

Straw Weaving Tutorial: https://youtu.be/LFtDxFN_Hpl

For a larger project similar to the Fort Rock Sandals, consider using heavier materials such as jute or sisal. Thread enough straws to cover the width of the bottom of your foot. The threaded straws will create the warp, or vertical strands, for weaving. (Follow the directions for threading, tying, and taping as shown in the straw-weaving tutorial above.) Next, tie in the jute or sisal that you will weave over and under the straws: these form the **weft**, or horizontal strands, of your weaving.

When your weaving measures enough to cover the bottom of your foot, consider how to weave the top portion to cover your toes. Reread the description of the Fort Rock Sandal toe cap. Are you able to re-create this? If not, consider creating simple straps to be knotted and worn between your toes and over the top of your feet. (Maybe you are weaving sagebrush flip-flops!)

Present your creation. Be sure to talk about the materials you used. Compare and contrast your modern sandal with the Fort Rock Sandal. What type of foot protection does each sandal offer? Are any areas of the foot exposed? What advantages (and disadvantages) might the modern sandal and the Fort Rock Sandal pose?



STANDARDS

ENGLISH LANGUAGE ARTS

Common Core State Standards Connections

ELA/Literacy

RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)

RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)

RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)

W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS4-1), (3-LS4-3), (3-LS4-4)

W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-1), (3-LS4-2), (3-LS4-3), (3-LS4-4)

W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-LS4-1)

SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS4-2), (3-LS4-3), (3-LS4-4)

SOCIAL STUDIES

K–5 History/Social Science standards are integrated into the K–5 Reading Standards. Reading and responding to biographies of historically significant . See Reading Informational Text. (RI.3.1, RI.3.3)

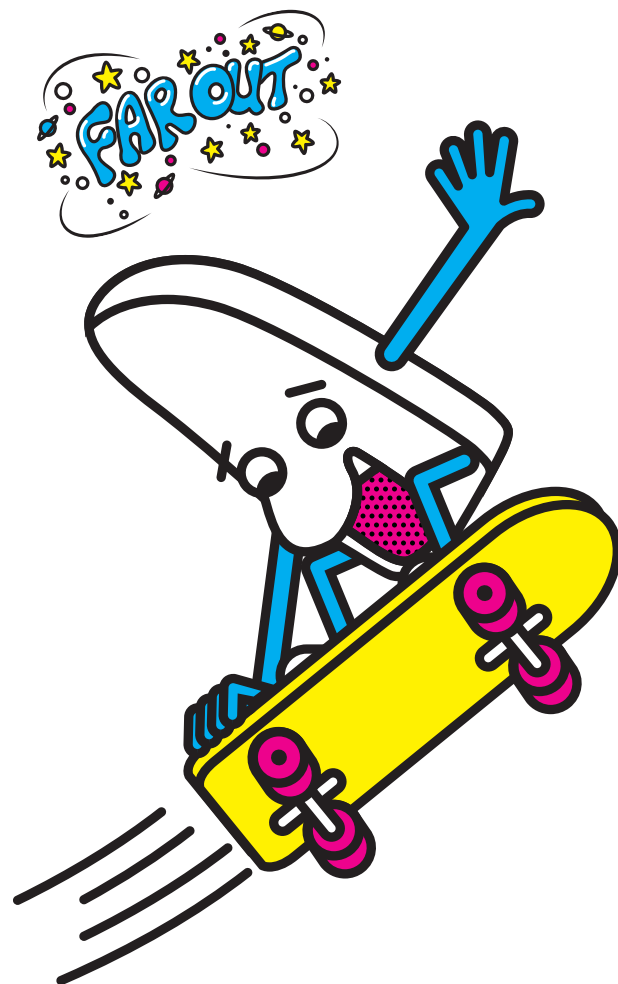
SCIENCE – Biological Evolution: Unity & Diversity

3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

[Clarification Statement: Examples of cause-and-effect relationships could be plants that have larger thorns than other plants, and may be less likely to be eaten by predators, and animals that have better camouflage coloration than other animals, and may be more likely to survive and therefore more likely to leave offspring.]

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

[Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on one another.]



VISUAL ARTS

See National Core Arts Standards, which include Artistic Processes and Anchor Standards:

- Creating
- Presenting
- Responding
- Connecting



LINKS

Biomimicry: The Burr and the Invention of Velcro

<https://www.microphotonics.com/biomimicry-burr-invention-velcro/#:~:text=Velcro%20was%20invented%20by%20George,burr%20to%20adhere%20exceedingly%20well.>

An Idea That Stuck: How George de Mestral Invented the Velcro Brand Fastener

<https://invention.si.edu/george-de-mestral-velcro-inventor#:~:text=gif,they%20attached%20themselves%20so%20tenaciously.>

Forest Service – U.S. Department of Agriculture

<https://www.fs.usda.gov/learn/conservation-education>



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