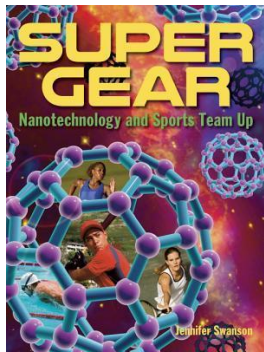


Text Scaffolding Treasure Hunt

When teachers utilize instructional scaffolding, they give students support in gradually learning a new skill or concept. In the same way, a nonfiction writer can provide support to help readers understand a complex idea.

Because young readers have limited prior knowledge and may have trouble thinking abstractly, nonfiction books often include clusters of sentences that slowly build an explanation. This text scaffolding acts like building blocks to guide students in gradually developing an understanding of the concept.




To help students understand how text scaffolding works, use a document camera to display page 7 of the expository literature title *Super Gear: Nanotechnology and Sports Team Up* by Jennifer on your classroom interactive whiteboard and show students the steps Jennifer Swanson uses to help readers build an understanding of why nanomaterials have a large surface area.

1. Swanson begins by clearly defining the term *surface area*, in case it's new to her readers.
2. Next, she uses an everyday example (a potato being cut into french fries) to show how surface area increases as an item (the potato) is cut into smaller and smaller pieces.
3. She then forges a connection between this example and nanoparticles, which are like billions and billions of itty-bitty potato pieces.
4. Finally, she describes how these billions of pieces give the nanomaterial a much greater surface area than that of a regular substance.

Because Swanson's precisely worded sentences build one upon another, step by step, readers feel supported as they move from one idea to the next, and ultimately, gain a clear and accurate understanding of the complex information.

play with surface area, the space that covers the outside of an object. Surface area can be increased by dividing something into smaller parts. Let's look at a potato, for instance. The entire outside of the potato is the surface area. But inside the potato are atoms that are not exposed to the surface. They don't count toward the total surface area.

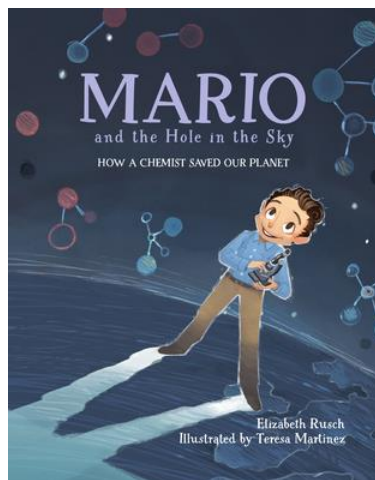
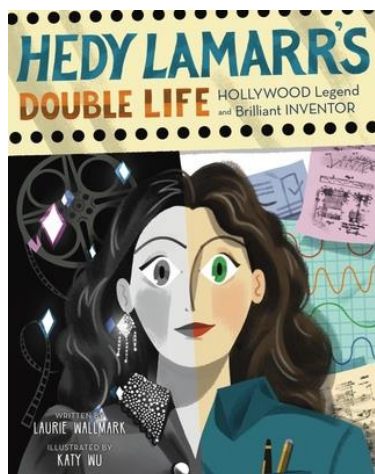
Cut the potato in half. The surface area increases. Now cut the halves into french fries. The surface area of the potato increases more than tenfold. The same thing happens in nanotechnology.



A whole potato has less surface area than the same potato cut into slices or french fries, because more of it is underneath the surface.

A nanomaterial can be made up of billions and billions of nanoparticles. The outside of each nanoparticle counts toward the total surface area. This gives the nanomaterial a much greater surface area than that of a normal substance. The larger surface area allows for more interaction between particles. Now instead of just two larger particles interacting with each other, you may have ten nanoparticles sticking together. The extra interactions can speed up a reaction or improve the strength and durability of a product.

Tiny Bits of Science 7



Next, divide the class into small groups and pass out copies of the narrative nonfiction titles *Hedy Lamar's Double Life: Hollywood Legend and Brilliant Inventor* by Laurie Wallmark and *Mario and the Hole in the Sky: How a Chemist Saved Our Planet* by Elizabeth Rusch. Encourage each team to spend time reading and examining their book carefully. Let the students know that they may need to read passages multiple times before they're able to identify instances of text scaffolding. As they spot examples, they should mark them with a sticky note and make a few notes about the concept the being explained.

When all the groups have completed this task, invite student volunteers to share one of the scaffolding examples their team found and the concept it clarifies.

Finally, invite students to look back at nonfiction they wrote earlier in the year. Can they find any places where they used text scaffolding? If so, encourage them to look for ways to improve the text based on what they've learned in this lesson. If not, they should hunt for places where adding scaffolding could help to clarify an idea they were trying to explain.

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