

USING THE POWER OF



IN SCIENCE AND LITERATURE

By Valerie Bang-Jensen and Mark Lubkowitz

Every parent knows that the upside of driving carpool is the conversations with your captive audience. Mark pulls up at 3:00. Rozella and Lucas climb into the back seat, arguing over animal “superpowers.” Rozella champions echolocation; Lucas advocates for flying. Mark asks, “Do you know what superpower every human has? We are champion pattern spotters.” “That’s not a superpower!” proclaims Rozella. Mark responds slyly, “I just discovered a new animal. It has feathers, a beak, and talons. What is it?” Lucas rolls his eyes, “A bird.” “Nailed it,” Mark affirms, “But how did you know?” Rozella sees where this is heading, “Because it fits the bird pattern.”

The most innovative contribution of the Next Generation Science Standards is the seven crosscutting concepts that create a framework for thinking like a scientist, and pattern is the first concept to understand because it is the foundation for the other

six. People are hardwired to see pattern. In the block corner, we might see Eleanor and Zane building a wall, relying on pattern recognition to find similar block sizes and shapes. Children in the after-school Lego club are pros at sorting through the bin to find that one piece that finishes their pattern. All of us use pattern to navigate our lives; it allows us to be healthy (think exercise, food choices, and playground safety) and to avoid danger (lightning, fire, and traffic).

Pattern spotting is what scientists do and by teaching students to name phenomena as patterns, they begin to think like scientists. Patterns help scientists identify new diseases, predict weather patterns, and formulate new questions. Recognizing patterns is as integral to science as salt is to cooking. We once heard a chef say that salt is the superhero of cooking, and we are convinced that pattern is the superhero of science—we find it in everything.

QUICK START QUESTIONS FOR ACTIVATING PATTERN’S SUPERPOWERS

After identifying a pattern, help students activate the superpowers with these questions:

CLASSIFYING: How do I know one when I see one and what do I already know about it?

If we only said, “It’s a mammal,” you would know that it has hair, lactates, and gives live birth. Classifying allows you to tap into and apply prior knowledge.

PREDICTING: What can I predict?

Pattern allows you to make hypotheses based on the evidence provided by the pattern.

QUESTIONING: What causes this pattern?

Children's literature and science: a surprisingly powerful friendship

Science is a tangible, germane, and integral part of life. That's why picture books are an authentic and powerful tool for helping students explore scientific patterns and ideas. By examining the rich illustrations and descriptive narrative through the lens of the Next Gen crosscutting concepts, your students will begin to read like scientists and see science everywhere. When we notice the bird land on a branch in *Owl Moon*, we know that Pa has successfully called it an owl because the talons, wings, and hoot fit the owl pattern.

Whenever we read words like *typical*, *routine*, *fashionable*, *again*, or *normal*, we know the author is describing a pattern. Developing a lens for seeing these concepts everywhere empowers students to integrate literature and science.

Patterns are frameworks for creating literature

Just like pattern helps us understand science, it also helps us understand literature. Salt is found in almost every recipe and pattern appears in every book. In picture books, we see patterns of genre, layout, language, topics, and illustrations, which offer opportunities to explore pattern. Stories themselves contain patterns: characters appear throughout the story, plots twist and turn, and we expect a resolution. In folktales and fairy tales, readers expect that the number three will play a starring role in the form of pigs, wishes, and bowls of porridge. Poetry may be shaped by patterns, such as a number of syllables, parts of speech, rhyme, and rhythm. Nonfiction presents captions, labels, and diagrams. Seeing patterns in various genres enables us to anticipate what will be in a book before we even open it; in fact, it is by leaning on pattern that we become effective readers.

Pattern has us on the edge of our seats

Young readers love the flipped ending of *Brown Bear, Brown Bear, What Do You See?* because it unexpectedly changes the pattern. Breaking a pattern is an effective literary strategy for creating resolution or tension. How many times have we all said, "I loved the surprising ending"? In *The Hunger Games*, Katniss and Peeta throw their society into chaos when they break the pattern of one ultimate winner. And in *Charlotte's Web*, we know that the daily pattern on the farm is about to blow up when Fern asks, "Where's Papa going with that ax?"

In science and in literature, pattern is a superhero—with superpowers. When we recognize a pattern, we are able to classify (we know science fiction when we see it), predict (Henry will lose a tooth this year), and question (Rozella asks how echolocation works). Pattern is the gateway to the other crosscutting concepts as we describe in our book *Sharing Books, Talking Science*. Helping your students become adept pattern spotters will empower them as readers and help them develop the conceptual framework for thinking and reading like scientists.



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