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Please enjoy this complimentary excerpt from *Tools for Teaching Conceptual Understanding, Elementary*, by Julie Stern, Nathalie Lauriault, and Krista Ferraro. Use the strategy of *concept attainment* with your students, which mimics the brain's natural concept-formation process by drawing out patterns from examples and nonexamples.

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Strategy #6: Concept attainment.

Concept attainment lessons are super easy to plan, and kids love them because it feels like they're putting together the clues in a mystery. The steps below mimic the brain's natural concept-formation process by drawing out patterns from examples and nonexamples:

1. **Examples:** The goal of a concept attainment lesson is for students to develop their own "definition" of a concept by investigating many examples. This works particularly well for discipline-specific concepts to which students won't have had a lot of previous exposure, or for which their prior understanding is likely naive or incomplete. For instance,
 - Young science students are asked what it means for something to be living. After writing down their initial guess, the teacher shows several slides of living things. The first might be a human, then several animals. Kids may guess that living things run, eat, and breathe. Then the teacher may show pictures of trees, flowers, and mosses, and kids may need to revise their answer in light of the new examples, since these plants cannot run. Perhaps they notice that all of these things grow, so they add that to the list. The class continues this way with progressively more nuanced examples. Students are challenged to alter their definitions when the teacher shows pictures of pinecones and roadkill (since, in science, "living" refers to anything that is or has been alive).
 - **History** students are studying leadership. They start by reading four short descriptions of American leaders—George Washington, Abraham Lincoln, Frederick Douglass, and Eleanor Roosevelt. Knowing that these are all examples of leaders, they look for common traits. They may notice that the first two were presidents but, upon reading about Douglass, will reject this as a characteristic of leadership because Douglass and Roosevelt were not elected leaders. But they might be savvy enough to notice that all of these people had influence on the nation.

What we *love* about this step is that usually history students would be reading about George Washington and Eleanor Roosevelt with the intention of highlighting and memorizing the dates and details about their lives. But they are so much more engaged when we explain to them that their goal is *not* to find and memorize these terms, which are *facts*, but rather to use these facts to investigate the larger *concept*.

2. **Distinguishing examples from nonexamples:** After students have working definitions (usually lists of criteria) for the target concept, they practice applying these definitions to more examples and nonexamples.
 - The science teacher gives groups of students a bunch of photographs of living and nonliving things. Using their definitions, students sort the photos into two piles: living and nonliving. Then they compare with a neighboring group to see if the result was the same.
 - The history teacher asks student pairs to research one from a list of other people to determine whether or not they fit the concept of leadership: for example, Christopher Columbus, Charles Darwin, and King George III. Pairs share their findings with the class, using evidence to defend their claim that the person they researched was or was not an example of leadership.
3. **Confirm Critical Attributes:** Finally, the teacher guides students through the critical attributes of the concept. That's right, the more formal "definition" of the concept comes at the *end* of the lesson. By this time, students have a fairly solid understanding of the concept, so they actually *understand* what they're writing down and won't go home to try to *memorize* the definition like it's a fact.
4. **Reflection:** It's also nice to spend a little time reflecting at the end of the lesson. When was it that you "got" the concept? Which examples or nonexamples were most challenging for you? How did your partner/group help you develop your understanding of the concept? What makes a concept different from a fact? How is it different to learn about a concept (as opposed to a fact)?
5. **Concept Wall and Concept Maps:** It's a good idea to designate one space of the room as your concept wall—a space to put all the concepts as you study them. Students can use them to frequently draw concept maps and connections between and among different concepts at different points throughout the school year, as most concepts in every discipline are related to each other in some way.