

Strategy #5: 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 non-examples:

- 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:
 - **Science** students are studying physical and chemical changes in matter. In order to understand what is meant by "physical change" the teacher shows slides with several examples. The first might be an ice cube melting on the counter, then perhaps a lake freezing over in the winter. Students begin to form hypotheses: *physical changes have to do with temperature*, or, *physical changes happen when a substance moves between the liquid and solid states*. Then the teacher shows more examples: someone slicing a carrot, mixing a cake batter, shattering a window, crumpling up a piece of foil. Students revise their answer in light of the new examples, since none of these has to do with temperature or changes in state. Perhaps they notice that all the changes are visible to the naked eye. The teacher then shows **non-examples** to help students refine their definitions. Sometimes it helps to show examples and non-examples in pairs. For instance, the teacher may juxtapose the example of chopping wood with the non-example of burning wood, or the example of mixing cake batter with the non-example of baking a cake. The class continues this way with progressively more nuanced examples and non-examples until students have formed specific criteria to help them accurately judge examples from non-examples on their own.
 - High school **history** students are studying "absolutism." They start by reading four short descriptions of absolute monarchs — King Philip II of Spain, France's Louis XIV, Russia's Peter the Great, Frederick III of Norway. Knowing that these are all *examples*, they look for common traits. They may notice that the first two monarchs are Catholic but, upon reading about Peter the Great, will reject this as a characteristic of "absolutism" because Peter was Russian Orthodox. But they might be savvy enough to notice that all of these monarchs claimed a divine right to rule.

What we *love* about this step is that usually history students would be reading about Philip II and Louis the XIV with the intention of highlighting and memorizing the dates of their reign and terms like "Edict of Nantes" or "Spanish Armada." 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 non-examples:** After students have working definitions (usually lists of criteria) for the target concept, they practice applying these definitions to more examples and non-examples.

- The science teacher gives groups of students several photographs of physical changes mixed-up with photographs of chemical changes (or other non-physical changes). Using their definitions, students sort the photos into two piles: physical changes and non-physical changes. 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 leaders to determine whether or not they fit the concept of absolutism: Benito Mussolini of Italy, the emperors of the Ming dynasty in China, William and Mary of England, King Salman of Saudi Arabia, for instance. Pairs share their findings with the class, using evidence to defend their claim that the leader they researched was or was not an example of absolutism.
- 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 non-examples 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.