

Generating Big Ideas : A Quick Guide

Step 1a. *What's coming up next in your curriculum?*

Write two sentences, as if to a fellow teacher, about the topic you plan to teach.

Step 1b. *Expand what you know.* Use reputable web sites or written resources to broaden your understanding of the topic. Some teachers create concept maps to organize their thinking.

Remember—this is *not* a linear process; teachers typically go “back and forth” between these steps as they continually re-develop the big idea. It takes a few days to think through these steps.

Step 2. *Moving from topics toward big ideas.* Your topic might be expressed as a thing, a process, a concept, a theory, or a law. What makes this topic so important to study, that is, beyond knowing labels, definitions and examples?

Could this topic be taught within the context of a bigger idea? For example, density taught within the context of buoyancy? Simple machines within the context of forces and energy?

Is the topic made up of connections among smaller explanations (evolution for example). Is there a deeper underlying theory that encompasses this topic or explains how it works?

Step 3. *Creating the Big Idea: Coupling a rich phenomenon with its explanatory model.*

Using Step 2 as a starting point, what is an observable event (for example earthquakes, die-offs of species, different kinds of rusting) that exemplifies the big idea and that kids can come to a deep understanding of over a period of days?

What underlying events provide a “why explanation” for this phenomenon? Use unobservable events, processes, and things to create a causal storyline that has no gaps.

Do **NOT** skip this step! Draw for yourself a full explanatory diagram (your model) that combines representations of observable things and unobservable processes at work.

Step 4. *What does success for students look like?* Kids should be able to use the Big Idea to explain new phenomena that are different from the ones you've used in class—and/or use the Big Idea to predict “what if” scenarios or conduct thought experiments. What might these new phenomena or thought experiments be?

Kids should be able to use different kinds of evidence to support or refute parts of any explanatory model. What kinds of experiences might students draw evidence from to support their explanatory models?

NOW you are ready to plan!

Assumptions about your background understandings before using the quick guide:

1. You have read and understood the ideas in the Big Idea Primer—you know what is meant by a Big Idea, and what science goals do *not* count as a Big Ideas.
2. You understand why curriculum topics, as listed, rarely represent a Big Idea your kids should be working towards.
3. You know why a Big Idea cannot be expressed in a simple word or phrase if you want to use it to help you plan for instruction.
4. You know where to look on the Web for reputable information on science topics, in order to update your own understanding of science ideas.
5. You know what counts as an explanatory model, how they can be used in science, and how to draw pictorial representations of one.
6. You know how to make the Big Idea and classroom lessons relevant to kids' lives.

Directions:

1. Write a brief description of the puzzling phenomena in the top half of the diagram.
2. Below, draw the explanatory model, including observable *and* unobservable features. Represent a full causal story with no “gaps” in it.
3. In right hand box write activities that students will do that help them understand one or more components of the explanatory model.
4. Draw lines connecting each activity to the appropriate part of the explanatory model that they help students understand.

Name phenomena here:

Sketch explanatory model
below. You can draw
outside the lines!

Name major unit activities, then connect
with the part of the explanatory model
they will help kids understand.

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