



Using Examples and Non-Examples

This resource from DFI's [Learning by Scientific Design Network](#) provides practicing teacher-educators with an overview of a learning science-informed teacher action. To access additional materials, visit deansforimpact.org/resources

Teachers prompt students to connect (and distinguish) varied examples and contrasting non-examples

Look for

There are varied examples that will draw student attention to the deep structure of a concept



Why it's important provide varied examples:

Varied examples help define the most important parts of a concept so they aren't fooled by distracting factors that might cause them to under-generalize about key ideas. For students who may not encounter informal opportunities to learn about the concepts outside of school, chances to refine schema are especially important because new learning builds on prior knowledge and schema.

SUGGESTED NEXT STEP: Support the teacher in identifying varied examples that illustrate the deep structure of a concept.

Look for

There are contrasting non-examples that draw student attention to the boundaries of a concept



Why it's important to provide contrasting non-examples:

Non-examples help students attend to the boundaries of a concept and avoid overgeneralizing about key ideas. Because new learning builds on prior knowledge and schema, learning gaps are exacerbated if we don't support students in developing nuanced schema about ideas, especially for students who may not informally learn about the concepts outside of school.

SUGGESTED NEXT STEP: Support the teacher in identifying contrasting non-examples, and specifically ones that help attend to common misconceptions about the concept.

Look for

Students are prompted to elaborate about the connections and differences among examples and non-examples



Why it's important to prompt students to elaborate on connections:

Prompting students to articulate the connections and differences among examples helps them build accurate schema. By thinking deeply about the connections, students are more likely to store the ideas in durable ways they can draw on more easily in the future.

SUGGESTED NEXT STEP: Support the teacher to include in their lesson prompts that require students to process the connections and distinctions among examples and non-examples.

Common pitfalls novice teachers fall into



Missing Pieces: Students do not have the components they need to build schema because a teacher has failed to provide examples, non-examples, or opportunities to make connections between the two.



Unplanned Examples: Teacher does not intentionally select examples and non-examples ahead of time and so comes up with something in the moment that may be confusing or misleading for students.



Familiarity Bias: Teacher selects only examples students are familiar with, so they don't have opportunities to broaden schema.



Treating All Examples as Equal: Teacher does not intervene to correct student-generated examples or non-examples that do not fit or are not relevant. Students miss out on feedback to help them correct developing schema.

Strategies to identify deep structure of concepts

- **Do the work of students:** Completing the same instructional tasks asked of students helps novices to anticipate potential misconceptions, solidify their own understanding of the concept they're teaching, and plan relevant examples and non-examples.
- **Consult a colleague:** Ask colleagues who have taught the concept previously about definitions, surface features or misconceptions that distract students, and examples or non-examples that helped clear up confusion for students.
- **Compare curricula:** Compare how different curricula teach about the concept, looking at definitions, examples and non-examples, and prompts used in each.
- **Google it:** Google is a great place to start! No teacher knows every concept they teach deeply at first, so even if novices feel confident, encourage them to take the time to do internet research from credible sites.