

This document provides a summary of Recommendation 3 from the WWC practice guide *Organizing Instruction and Study to Improve Student Learning*. Full reference is on the last page.

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CONTENT **General**

GRADE LEVEL(S) **K-12**

LEVEL OF EVIDENCE **Moderate**

## Recommendation

# Combine graphics and descriptions.

Combining graphical presentations (e.g., graphs, figures) that illustrate key processes and concepts with verbal descriptions of those processes and concepts facilitates student learning. Adding relevant graphical presentations to text descriptions can lead to better learning than text alone. Studies emphasize that it is important that text descriptions appear near the relevant elements in visual representations to best enhance learning. Students learn more when the description is presented verbally rather than in written text, probably because a learner cannot read text and scrutinize an accompanying graphic at the same time. Also, verbal descriptions allow students to use visual and auditory processing capacities of the brain separately rather than potentially overloading the visual processing capacity by viewing both the visualization and the written text.

## How to carry out the recommendation

1. Combine verbal descriptions with graphical representations to illustrate the key steps of processes and procedures.

### South Carolina standards alignment

**TEACHERS:** INST.PIC.1, INST.PIC.2

**ACADEMIC STANDARDS:** ELA.K-12.I.3, ELA.K-12.I.4, M.K-12.MPS.RC.1, SCI.K-12.S.1.2

Visual representations of the key steps of a process should be integrated with verbal descriptions. The verbal description should help students focus on where to look and on what is being illustrated. It is important to make regular connections between steps in the procedures and how they are represented in visual representations. Verbally

describe the objects and processes while simultaneously indicating the relevant parts of the visual representation.

## 2. Use labels and text to describe visual representations.

### South Carolina standards alignment

**TEACHERS:** INST.PIC.1, INST.PIC.2

**ACADEMIC STANDARDS:** ELA.K-12.I.3, ELA.K-12.I.4, M.K-12.MPS.RC.1, SCI.K-12.S.1.2

When visual representations are used in text materials or written handouts, they should include brief text that labels unfamiliar objects and describes steps in the process being illustrated. These descriptions should be positioned as close as possible to the parts of the visualization being described and help students identify what specifically they should be looking at.

## 3. Use relevant graphics to illustrate the main points of the process or concepts.

### South Carolina standards alignment

**TEACHERS:** INST.PS.1, INST.PIC.2

**ACADEMIC STANDARDS:** ELA.K-12.I.3, ELA.K-12.I.4, M.K-12.MPS.RC.1, SCI.K-12.S.1.2

Teachers should choose pictures, graphs, or other visual representations that are relevant to the processes or concepts that are being taught. These visual representations do not need to be realistic; realism can distract from the main point that is being illustrated. A well-chosen sequence of pictures may enhance learning more than a moving animation.

## 4. Use multiple graphical representations of the same abstract concept.

### South Carolina standards alignment

**TEACHERS:** INST.PS.1, INST.PIC.2

**ACADEMIC STANDARDS:** ELA.K-12.I.3, ELA.K-12.I.4, M.K-12.MPS.RC.1, SCI.K-12.S.1.2

Use multiple graphical representations (e.g., symbols, graphs, pictures, or real objects) of the same abstract concept to demonstrate how the concept can be depicted in many

different ways. Authentic situations can be portrayed through stories, real world problem scenarios, or movie clips and used to convey abstract concepts. When using multiple visual representations of an abstract concept, draw students' attention to the components of the visualization that are relevant to the abstract concept so that students understand that the same core idea is being expressed in multiple ways.

## Potential roadblocks and how to address them

<b>Roadblock</b>	<b>Suggested Approach</b>
<i>Instructional materials may present verbal descriptions of a graphic or figure on a different page of the text, or alternatively not include a verbal description that aligns with the graphic or figure.</i>	Teachers should preview the instructional materials that their students will be learning from and make sure to draw the students' attention to the verbal description that maps onto the graph or figure. In addition, when preparing instructional materials or homework assignments, teachers should attend to the physical alignment of the graphs or figures and their matching verbal description.

For more information on the research evidence and references to support this recommendation, please refer to sources cited here:

Pashler, H., Bain, P., Bottge, B., Graesser, A., Koedinger, K., McDaniel, M., and Metcalfe, J. (2007) *Organizing Instruction and Study to Improve Student Learning* (NCER 2007-2004). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ncer.ed.gov>.