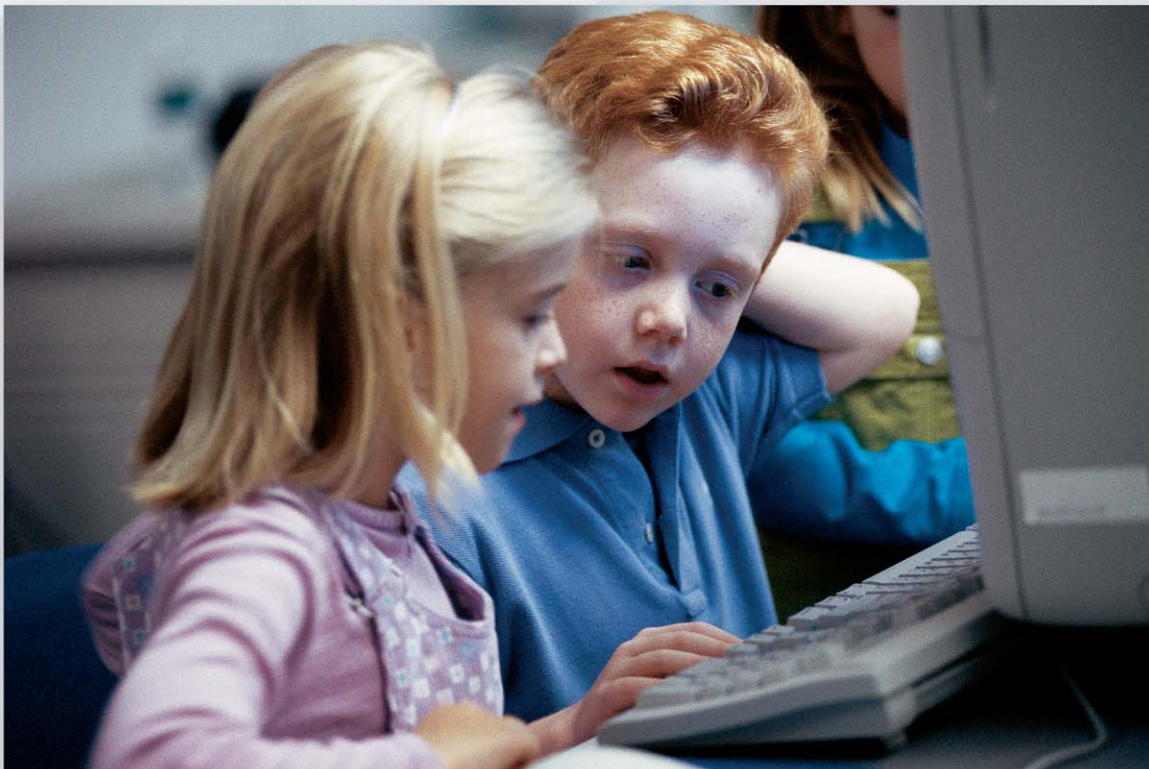


*A Participant's Manual for*

# TECHNOLOGY

## and Learning Styles



McREL Technology Solutions

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## Activity 3: Using Technology for Nonlinguistic Representation

*Notes:*

One of the most powerful features of technology in the classroom is the range of nonlinguistic representation that reaches a variety of learners. Nonlinguistic representation is one of the nine categories of effective instructional strategies identified by Marzano, Pickering, and Pollock in *Classroom Instruction that Works*. Research shows that the majority of traditional instruction is delivered in linguistic form, either as a lecture or as written material, leaving the learner to create his or her own nonlinguistic representation. Many psychologists believe that knowledge is stored in two forms, linguistic and in images. Helping students to create nonlinguistic images helps them to better understand and retain new knowledge (Marzano, Pickering, Pollock, 2001).

Many types of learners rely heavily on nonlinguistic representation for the acquisition of knowledge. Technology helps to provide access to ready-made nonlinguistic images as well as tools for students to create their own nonlinguistic representation.

Activities that produce nonlinguistic images include

- Using graphic organizers,
- Creating physical models,
- Generating mental pictures,
- Using pictographs, and
- Engaging in kinesthetic activities.

In this activity, you will explore these multimedia examples that help provide nonlinguistic representation of concepts:

- Applets
- Simulations
- Movies
- Pictographs
- Data Collection Tools

Of course, there are thousands of Web sites and software applications that we could have included. The resources that we selected for this activity will give you an idea of what to look for in future unit planning.

## Notes:

### Applets

An applet is a “small application” that is interactive and allows the user to manipulate one or more variables. We will first explore an applet designed to teach about the forces that affect a pendulum. You will then have time to explore applets that relate to your content area and appeal to your students. The appropriate grade levels are listed after each description.

- 🍎 Open your Web browser and go to Michigan State University’s LearningOnline Network Applet Collection at <http://lectureonline.cl.msu.edu/~mmp/applist/applets.htm>. Scroll down to the **Oscillations** section and click on **Pendulum**. Follow the instructions on the page. To keep all graphs visible as you change the variables, click on the pendulum to stop its motion, change a variable, and then click on the pendulum again to restart or drag it to begin a new swing. (Middle, High)
- 🍎 Another example of a science applet is a catapult simulation from the University of Minnesota, located at <http://www.lcse.umn.edu>. Click on **Specs > Labs > Catapult Lab**. Read over the information to activate your background knowledge of catapults and the variables that can affect its efficiency then scroll down to “**follow this link to practice.**” This has several variables to manipulate. (Middle, High)
- 🍎 A number of mathematics applets are available on the Internet. Go to Utah State University’s National Library of Virtual Manipulatives for Interactive Mathematics at <http://nlvm.usu.edu>. Click on **Virtual Library** from the home page and choose a content area and grade group of your choice. Explore the manipulatives for a few minutes. (K–12)
- 🍎 Another site that has both mathematics and language applets is the Skillswise Web site operated by the BBC. Go to <http://www.bbc.co.uk/skillswise> and click on **Games**. Explore a content area of your choice. For very young students, you may wish to visit the BBC’s Little Animals Activity Centre at <http://www.bbc.co.uk/schools/laac>. (Elementary, Middle)

Students can learn about global warming and what they can do by visiting [www.epa.gov/globalwarming/kids](http://www.epa.gov/globalwarming/kids).

- 🍎 Montessori classrooms are especially renowned for their variety of manipulatives and use of nonlinguistic representation throughout their curriculum. Go to <http://www.our-montessori.com> to see virtual examples of mathematics materials. (Elementary)
- 🍎 The National Council of Teachers of Mathematics (NCTM) has created the Illuminations Web site with lesson plans and applets for students. Go to <http://illuminations.nctm.org/> and click on **Web Resources**. Click on a content area and grade level of your choice. Explore one of these applets. (K–12)
- 🍎 A final applet that you may wish to visit helps young students in the early reading process. Go to <http://www.starfall.com> and click on the first activity, **ABC's**. Choose a letter and go through the applet. There will be sparkles around the letter or the arrow which you are supposed to click. As you move through this applet, think about how this is providing both linguistic and nonlinguistic representation for young students. Still in Starfall™, go back to the **main index** and click on the second activity, **Learn to Read**. Students can read the books and get help with sounding out the words. There is also an applet or two which corresponds to the letter being taught in each book. Click on one of the games under the **Play** menu and explore one of your choice. (Early Elementary)

*Notes:*