

Workshop 3

Learning to Share

Perspectives

DESCRIPTION

Often teachers complain that they do not have ample opportunity to talk with colleagues about their students' mathematical reasoning. In this workshop you will learn about professional development focused on the discussion of cases in mathematics teaching. Carne Barnett describes this case approach. A long-term teacher group is shown at work. The development of cases for children in elementary and middle school mathematics classes is highlighted as an evolving approach to furthering the development of their mathematical thinking.

DR. CARNE BARNETT

Carne Barnett is a senior research associate at WestEd in Oakland, California, where she directs the Mathematics Case Methods Project. Teachers in this professional development project discuss cases about mathematics teaching dilemmas. Dr. Barnett's own teaching experiences led to her interest in this pioneering work, which is patterned after methods used in other professions such as business and health. She has written numerous books for teachers and students and has been published in research journals. She was formerly a teacher educator at the University of California, Berkeley, and has conducted professional development across the United States and in Malaysia, Australia, and Saipan.

Workshop 3 Timeline

Getting Ready

30 minutes

Teaching Patterns

Last week your homework was to observe your own teaching, focusing especially on elements of discourse. Using some of the self-observation information from your reflective journal, share some of the patterns you saw in your own teaching of mathematics or science. With the group, make a master list of the kinds of patterns you all recorded. Are there common themes across the group?

Take what you've learned one step further and begin to incorporate some of the principles into your own teaching. With your Web Buddy, share some of the ideas you have for incorporating a case approach to your own mathematics or science classes. Support each other's beginning ideas and try to take some steps. Report to your Web Buddy about your successes!

Take One-Third

Materials Needed

- 16 beans or other discrete objects (thumbtacks, erasers, small blocks)

Preview the Problem

Please work on the following problem by yourself so that you can examine your own ideas. As you work, think about what might be hard or confusing to a child (or to you).

On your own, draw a picture in which you take $\frac{1}{3}$ of $1\frac{1}{3}$. Hint: Start with a picture of $1\frac{1}{3}$.

Read the Case

Silently, read the case "Take One-Third,"* which follows. You will refer to this case in your site discussion during the video.

* From *Fractions, Decimals, Ratios, & Percents: Hard to Teach and Hard to Learn? Mathematics Teaching Cases*. © 1994 Heinemann. Reproduced with permission.

Workshop 3 Timeline

Watch the Workshop Video

60 minutes

Going Further

30 minutes

State Issues in Question Format

With your group, discuss the issues that the videotape raises. Follow the case discussion procedure.

In pairs, first list three or four issues in question format. Some stems you might find useful are:

- Why might a student...
- What might happen if...
- What does _____ mean?
- What if the problem/manipulative were...

Share those issues with the rest of the group. (Usually it works best if you go around the group, with each pair contributing one issue at a time.) One member of the group might record comments on a large piece of chart paper or on the chalkboard.

Pick one of the questions and talk about it as a group.

For Next Time

Ongoing Activity

Reflective Journal

In your journal, answer the following:

- How do you attempt to find out about children's ideas when you teach a science topic?
- How do you structure lessons to help children examine their ideas?
- What frustrations do you feel around helping students develop concepts?

Homework

Children and adults have formed a variety of interpretations of their world throughout their lifetime. Many of these interpretations do not fit with the way science explains the world.

For instance, you may have heard children say some of the following:

- Solids are things that are hard.
- Because air is invisible, it doesn't take up any space.
- We don't need light to see because our eyes will adapt.
- Plants get their food from the soil.
- The phases of the moon are caused by clouds.
- The summer is hot because the Earth is closer to the Sun.

In your journal, answer the following:

- How do you attempt to find out about children's ideas when you teach a science topic?
- How do you structure lessons to help children examine their ideas?
- What frustrations do you feel around helping students to develop concepts?

Reminder: Sign up for a Web Buddy (see Workshop Components, p. 11).

Reading Assignment

To prepare for Workshop 4, please read the article by Peter Hewson, "Conceptual Change in Science Teaching and Teacher Education," which can be found in the Appendix.

