

Talk Science

Professional Development

Transcript for Grade 4 Classroom Case: The Role of Consolidation Discussions



1. Why Have a Consolidation Discussion?

A Consolidation Discussion centers on three questions: What did you do? Why did you do it? And what did you find out? A goal is to ensure that all students can answer these three questions.

In science classes where engaging challenges and first hand investigations are the norm, students also need time to organize their experiences and ideas so they can describe what they did, explain the reasons they did what they did, and make sense of their results. When this happens through talk, everyone benefits: the speaker, who discovers what understanding is clear and what is a little fuzzy; and classmates who share in the consolidation process, and teacher who gains insight into her student's understanding and reasoning.

In this Classroom Case, 4th grade students confront the problem of comparing liquid volumes when the liquids are in containers that are different sizes and shapes. In the process of comparing liquids, students are deepening their understanding of the concept of volume, what it means to take up space, and how you measure volume.

The **first clip** describes the content of the lesson or context for the consolidation discussion. Students are introduced to the investigation question, write a prediction in their notebooks, and, with a small group of classmates, come up with a method for comparing the liquid volumes. While the procedures for comparing volumes vary in detail, all groups of students recognize the need to use either three identical containers or a single container that can be marked or calibrated.

For the learning from this investigation to “stick,” students must not only complete the activity but have a chance to explain their understanding fully – they need to replicate their procedures in words, explain why they did what they did, and share their findings. In the **second clip** you'll hear two students verbalize their experience. In the course of the full discussion, the teacher, Candace, made sure that every student contributed in some way to this discussion.

In the **final clip**, you'll hear Candace reiterate the key questions that frame a consolidation discussion: What did we do? Why did we do it (what was the problem we set out to solve or the question we needed to answer?), and what did we find out.

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Consolidation Discussions are opportunities for students to

- Review their procedures and findings through talk
- Solidify understanding of key science concepts and processes that are the focus of the investigation.

2. Investigating Liquid Volumes

Teacher: Okay. So we have a question up here today and I put it up here, you want to turn around, take a look at that question. Everybody see it? How can we compare the volume of liquids? But before we go any further, I want to review what volume is.

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The class discusses volume and what it means to say an object or material takes up space.

We have these three containers and they're labeled A, B, and C and you're going to go back to your seat and with your group members you're going to predict which container has the greatest volume

[Which has the greatest volume, Liquid A, B, or C?]

and you're going to put them in order from least to greatest, sort of like a weight line but we're now not talking about weight, we're talking about ...?

Children: Volume.

Teacher: I'm going to write your predictions down on a class chart, from your groups, and talk for a minute about and we're going to let you figure out how to figure out exactly which one has the most volume. Okay? It's going to give you an opportunity to explore, But first you have to make a prediction.

[We see students writing predictions]

Text on screen

After they predict, students come up with a procedure to test their predictions.

[We see students discussing ways to test their predictions]

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Predicting and Testing Predictions

- Volume is a very difficult concept for students
- When they predict, students must confront the challenges of comparing liquid volumes in different sorts of containers
- Talking about their ideas in small groups is a rehearsal for full class discussion

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3. Describing Their methods

Teacher: There's our question: "How can we compare the volume of liquids?" Who can explain what they did?

Blerta: We use three cups for measuring and we find that they all take up the same space in all three water samples reached the second line in each cup.

Gabriel: We had an extra cup. With the extra cup we poured B, we poured B into ...

Teacher: What was your extra cup like?

Gabriel: It was like A and we poured B into the extra cup and then we found when we measured them together to see if they are the same, they were the same volume and then we poured water back into B and then we did it with C. And then C was the same too. So then we found out that they were all the same.
So and then we marked where they were all the same.

Teacher: By marked, can you say a little more about that?

Gabriel: Like we marked where they would stop at

Teacher: On your extra cup?

Gabriel: No, on A. We measured it on the spare cup and then we found out that – and we put the mark there so we wouldn't forget where they would all stop.

Teacher: All right. And what did you find out?

Gabriel: We found out that all the liquid was the same volume.

Teacher: Is there another group that hasn't shared what they did?

Text on final screen

Describing Their Methods

When students talk about their procedures and findings they

- Discover what is clear and what is not
- Have a chance to clear up confusion
- Further consolidate their learning

4. Consolidating Learning

Text on screen

Discussion Questions to Help Students Consolidate Learning

- What did we do?
- Why did we do it?
- What did we find out?

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- Teacher: Who can recap and say what did we do?
- Keylin: We first predicted what would be the least volume and the most volume.
- Teacher: Okay. So first we made a prediction. We put them in order from the least to the greatest. Is that what you just said?
Yes, all right. [Student nods, yes]
- Teacher: Why were the predictions so different?
Because we – have a look – CBA, CBA, BAC, BAC, CBA, CBA. They were different, Not everybody thought the same thing. Why? What was that about?
- Nathaniel: Because there was different containers and even though it was the same volume, it was spread out differently.
- Teacher: Yeah. They're different shapes. Kiani spoke about, if we could just take that container C and squish it together it could look more like B or A but you just can't squish water together can you? It just doesn't hold in your hands, so you had to come up with a plan for measuring.
- Teacher: What were we measuring about the water? Sarrah?
- Sarrah: We were measuring the volume of the water. To see how much space it took up.
- Teacher: Exactly. And what did we discover?
- Sarrah: Well, at my table we discovered that A, C, and B are all the same because we were having a problem with the regular ones so we used two more cups of the same as A and we poured some of C and B and since the outside of the table was tipping a little bit it still looked the same.
- Teacher: OK. We had to move it on the table instead of that seam in the middle so you could see if they were the same.
- Sarrah: Yes, and they are.
- [The Teacher summarizes the discussion.]
- Teacher: So what did we do to compare the volume of the liquids? What did we do?
- Nathaniel: We used extra cups to measure each of the A, B, and C to see if all the volumes were the same.
- Teacher: OK and why did we do that? Anamarie?

Anamarie: To measure the water.

Teacher: To measure the water. What were we measuring?

Anamarie: The volume.

Teacher: The volume. OK And what did we discover?

Text on final screen

Consolidating Learning

Three questions can frame a consolidation discussion

- What did we do?
- Why did we do it?
- What did we find out?

Everyone benefits when there's time for students to talk through their ideas

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