

Whiteboarding your way to great student discussions

Using large whiteboards to facilitate group learning helps students communicate their ideas

David Henry, Buffalo State College
Julie Henry, Canisius College
Stephanie Riddoch, William Street School, Lancaster, NY

Group learning has been embraced by many elementary school teachers as a critical component of teaching and learning about science. Teachers have developed many techniques to facilitate group learning, but sometimes wish for a better method to keep students on task, allow the teacher to track the progress of individual groups, and promote high-level thinking and discussion. We have found that large dry erase boards, that some call whiteboards, are a powerful tool for facilitating discussion among groups of students. When each group receives a large whiteboard and specific instructions about how to use the board in recording their thinking, the classroom comes alive with high-level discussion. We have found that students' discussions were more animated, stayed on topic, and demonstrated higher-level thinking when using the boards.

Examples for Use of Whiteboards

We use whiteboards whenever we want the students to share their thinking and come to a group consensus about an idea. At the beginning of a unit this is effective in eliciting students' prior knowledge. After an experiment, whiteboards help student draw conclusions from data. As an assessment tool, whiteboards give the teacher an opportunity to hear students explain their thinking. Most importantly, the whiteboards

create an atmosphere in the classroom where ideas are student-generated, leading to students constructing their own evidenced-based knowledge.



Give plenty of space for the students to work. A carpeted floor works great!

The photos accompanying this article demonstrate one use for whiteboards. At the conclusion of a unit on batteries and bulbs, we engaged our student in an open-ended activity using whiteboards. Through earlier experiences, the students had developed deep understanding of how a normal light bulb is constructed. On this day, a three-way light bulb was demonstrated for the students, showing the four different levels: off, low, medium, high. The guiding question given to the students was "How is a three way light

bulb constructed?” They were instructed to draw a diagram of the inside of a three-way bulb and label the different parts. The students worked in groups of three or four and were given freedom to work at their desks or on the floor. They were given 20 minutes to complete their whiteboard. During this time the teacher circulated throughout the room giving encouragement, clarification, and guidance to the groups.



Circulating and asking guiding questions keeps the students on task.

Benefits of Whiteboards

When students see their thoughts or another student’s thoughts in writing, the idea becomes more concrete, and they are more likely to develop an opinion about the idea, to agree or disagree. The benefit of a large whiteboard is that the students can easily see what is being written and drawn, and also know that it is easily modified (as contrasted with a marker and a piece of chart paper). The ease of modification means that students may be willing to write or draw something that they are not quite sure of and expose it to group discussion and possible revision. Ideas are more easily exposed, discussed, accepted, discarded, and modified with the flexibility of a whiteboard.

When students share ideas in groups, they are practicing one of the key elements of science - communicating about scientific ideas. The National Science Education Standards have identified inquiry as a focus for effective science lessons. Using whiteboards can help teachers achieve Teaching Standard A: Teachers of science plan an inquiry-based science program for their students. Teaching Standards B reminds us that teachers should “focus and support inquiries while interacting with students,” and “orchestrate discourse among students about scientific ideas.” This is the central purpose of whiteboarding.

What are whiteboards

The large whiteboards we use are 24”x 32” and are cut from a 4’x8’ sheet white economy tile board. Our local home center sells sheets for about \$10 and will make the cuts for you. We also cut handles and rounded the corners of each board. Use the boards like you would use any dry erase surface. All dry erase markers and cleaners will work on these boards. White socks work great as erasers and also can store the markers. We try to give each group at least two different colors. Many students use different colors to emphasize different ideas or different parts of their diagrams.

Many teachers currently use smaller whiteboards, usually about one foot square. While these boards have many uses, we have found that they are not adequate to facilitate group discussion. The large size has many advantages. The students tend to write larger on the large boards, making it easier for the teacher to quickly see and understand the group’s thinking. A large board gives enough room for the students to divide the board into sections. This is valuable if you have multiple focus questions or if you want the students to have both a diagram and a written explanation.

Making Whiteboards Work for You

As with any new teaching technique, the students must be introduced to this method of group work. When we introduce whiteboards to a class, we first model the group dynamic for the entire class. We invite a few volunteers to the center of the room and have them engage in a discussion using the whiteboard. At different junctures, we ask the models to “freeze” and point out to the class how the group is working together to determine what goes on the board. This modeling is needed periodically as a reminder of how groups should work together. An emphasis should be put on listening skills, critically thinking about another student’s idea, and patience in explaining one’s own ideas.

You may need to rearrange the classroom space to accommodate the whiteboards so that students can share the responsibility for writing. Children are often happy to work on the floor or in the hallway if needed. It is often helpful to divide the whiteboard into reasonable sections.

Initially, children may want to divide the board so that each group member gets a square. In such instances, we spend a little time with the group to help them appreciate the importance of discussing one another’s ideas and come to a consensus if possible. This is a great opportunity to help students with their communication skills. Redirecting the students and suggesting better divisions, such as tables or diagrams and different explanations may also help the students focus on group, instead of individual, ideas as a developing community of scientists.

When the students are working, scaffolding is needed to get the students to improve their ability to focus, discuss, and share ideas on the board. One benefit of whiteboards is that the teacher can easily see what all the groups are doing. When the

groups are working on their whiteboards, the teacher’s role is that of facilitator. Ask clarifying questions, ask for more detail if it is needed, encourage creative, novel ideas, and be sure to not get stuck on helping one group. Students respond well to specific guiding questions. As you circulate and observe the students’ responses, feel free to stop the class and provide more guidance or structure as needed.



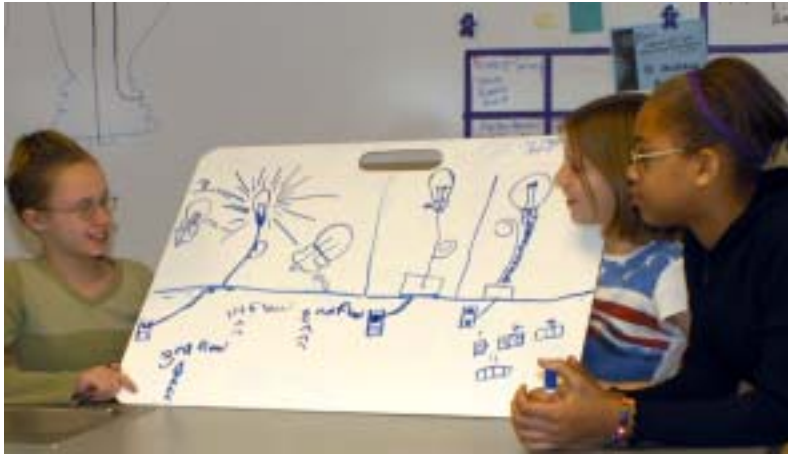
Ideas on Whiteboards are more open to discussion and modification.

Sharing Whiteboards

After groups have completed their boards, the boards should be shared with the rest of the class, facilitating whole-class discussion, meaning-making and closure. This can take place in many ways.

Museum walk: The students silently walk from board to board to get a chance to see everyone’s work. Then the teacher leads a discussion about what they noticed.

The circle: Students form a circle where all groups hold their boards for the others to see. This allows all the students to see all the boards at once. This technique creates an atmosphere that encourages discussion



Presenting their ideas gives students practice in communicating their ideas



between groups. The teacher should avoid being the center of attention, and stand on the outside of the circle.

Presentations: Groups take turns presenting their board to the rest of the class. As shown in pictures 4 and 5, each group displays their board, briefly explains their thinking and answers questions from the rest of the class.

Here are some guidelines for using large whiteboards in your classroom:

- ❑ Model the expected group behavior
- ❑ Give clear, specific guiding questions
- ❑ Demonstrate how you want the whiteboard divided, but avoid dividing by person
- ❑ Give plenty of space to the groups as they work.
- ❑ Give two or more colors to each group
- ❑ Circulate and assist
- ❑ Allow time for group sharing and closure

Resources

MacIsaac, Daniel. Whiteboarding In The Classroom
http://physicsed.buffalostate.edu/AZTEC/BP_WB/index.html

Playscapes (800)248-7529 sells large whiteboards

