Strategies for Promoting Active and Collaborative Learning in Learning Community Classes, Including Math  
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**JIGSAW T-PARTY:**  
A collaborative exercise to share group work strategies and an analysis of how these strategies support learning

**Overview of the task**

1. **Individually first:** take 7 minutes to read and make sense of the particular group work protocol you have in such a way that you could explain it to another person

2. **With folks who read the same protocol** (10 minutes)  
   (i) Check your understanding of the protocol.  
   (ii) Analyze how the principles of learning are invited into this protocol  
   PROCESS to support group analysis – engage a round robin: Each person shares one insight/idea for the chart shown below. Wait to share another until everyone in the group has had a chance to speak. You don’t have to all address every box, just make sure everyone’s voice and mind has had equal access to completing the chart overall.  
   (iii) Take notes. You all need to be able to talk about the task and your understanding of how it invites learning to someone who hasn’t read about the task.

3. **T party** - get together in groups of 3 to learn about two other protocols (15 minutes). Each person will have 5 minutes to present overview of protocol and how it invites learning.

4. **Reflection** (5 minutes)

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<th>Learning principles &amp; practices – questions to help you analyze group tasks:</th>
<th>Notes on the protocol you are presenting</th>
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<tbody>
<tr>
<td>• In what ways does the student have an opportunity to use and connect with their <strong>prior knowledge</strong>?</td>
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<td>• Who’s doing the thinking? In what ways is the student involved in <strong>organizing and making sense of the material</strong>?</td>
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<td>• In what ways does the student have an <strong>opportunity to apply/experiment</strong> with the new skill/knowledge?</td>
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<td>• In what ways can the student encounter a “bump” to their thinking – an opportunity to check in with and challenge those ideas?</td>
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<td>• <strong>In what way is reflection built in</strong> – for example, an opportunity to see ideas have changed, or to notice new questions?</td>
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**SUPPORTING GROUP WORK – FOOD FOR THOUGHT**

**Develop group-worthy tasks** -- Lotan, (2003) – “Many educators believe that group work and collaborative learning are effective in academically and linguistically heterogeneous classrooms, and the evidence for the academic and social benefits of these instructional strategies is substantial (Sharan, 1990; Slavin, 1983). Too few educators, however, understand the crucial design elements needed for successful group tasks. Some students who easily complete tasks designed for individuals may refuse to devote time and energy to building group cohesiveness or group consensus; others may openly resist making their grades dependent on the efforts (or lack thereof) of other members of their group. The teacher, therefore, must deliberately and carefully craft learning tasks that are "group-worthy. Such tasks have the following five design features: (1) They are open-ended and require complex problem solving. (2) They provide students with multiple entry points to the task and multiple opportunities to show intellectual competence. (3) They deal with discipline-based, intellectually important content. (4) They require positive interdependence as well as individual accountability. (5) They include clear criteria for the evaluation of the group's product.”

**Help students reflect on the group roles they play and to develop better strategies for collaboration.**

(www2.tech.purdue.edu/Ols/courses/.../task_maintenance_roles.doc) This link provides a list to the kinds of roles that people play to get a task done and other roles that people play to help maintain positive/productive relationships while working on a project. While I don’t know the background or source of this set of roles, it has been a provocative and useful tool for self-assessment, reflection and discussion. I’ve used it quite a bit though in group work throughout a course of study. Students do things like: (i) self-assess themselves; (ii) practice roles they need to develop; (iii) debrief group work and make visible ways in which people *effectively* played some of the roles; and (iv) analyze group work when the storm hits – notice which roles the group has in place and which might be missing and worth getting someone to fill in. My goal is to help people see roles in action, become flexible in playing a range of roles, and identify what roles look like when they are played effectively, analyze group work, problem solve and articulate needs for roles. I avoid practices that invite blame or exclusion. I work under the paradigm that we are all in the process of learning these skills. We’re better at some than others, and the big goal for our work together is to become more skilful with at least one role that is less familiar/comfortable to play.

**Help students develop a “learning culture” that is interdependent and where the group is only as successful as the individuals who learn as a result of the group’s collaboration** – I learned about this broken circles exercise from Elisabeth Cohen’s (1994) work in which she addresses status in group work. It’s a wonderful task in which students bump into all kinds of issues that can plague group work, such as: their desires to do the work for others, or their desire to have others do the work for them, or their internal dialogue about what they are good at and not good at, and what it means to “help” another student on a task in such a way as to not rob the opportunity for learning. This little activity, combined with group worthy tasks and opportunities to reflect on process, have been invaluable to me in my teaching. Students regularly refer to “this is a broken circles activity” as a way of setting the ground rules.

(www.stanford.edu/class/ed284/csb/Broken/BC&Stext.doc)

**Assessing group work.** One of the more attractive by-products of group work is the unique window it provides into student thinking. As one wanders around the classroom listening to student conversations, there are abundant opportunities to gather data about levels of student understandings and competencies. Many faculty worry however, about the pitfalls of assigning group grades and about sorting out individual vs. collective performances. Although less than ideal, one solution is to use group work for learning/developing understanding/reviewing but stick to individual "testing" and accountability for grading. Often a blend of group and individual accountability works well. In math for example, one can use on-line courseware to measure competent skill development, but use group activities, often with formative rather than summative assessments, for exploration and concept development. Many faculty use variations of Read/Confer/Write testing – where students are given questions to consider, have some class time to discuss them cooperatively, and then write responses individually. For those worried about free-loaders, those who come expecting their group members to carry them, consider some form of (possibly graded) "entrance ticket" to class that shows evidence of reading done, problems attempted, or research undertaken. Making peer and self-assessment part of the mix helps as well. The point is that assessment doesn't need to be the sticking point, for faculty or for students. The resources below reveal many strategies for combining individual accountability with the advantages of group engagement.
RESOURCES

To read more about the nature of learning, check out:
Bransford, J.D., Brown, A.L. & Cocking, R.R. (1999) How People Learn: Brain, Mind, Experience, and School. Washington D.C. National Academy Press (note: this series also has additional volumes on how people learn history and science that I’ve found very provocative and useful; see separate reference for math below)


To read more about strategies for developing group worthy tasks & supporting group work, check out:

Cohen, E. (1994) Designing Group Work: Strategies for the Heterogeneous Classroom. Stylus Press. Note: this book focuses on group work in K-8 classrooms. That being said, her work on “Complex Group Instruction” is actively being used in professional development at the high school math level (e.g. Lisa Jilk, Research Associate in the College of Education, University of Washington and an Instructional Coach with Seattle Public Schools). Personally, the issues and exercises she describes have been very useful to Sonja in supporting group work at a college, even graduate, level


To read more about inviting dialogue and group work into Mathematical contexts:


Dubinsky, E. et.al. (1997) Readings in Cooperative Learning for Undergraduate Mathematics, Mathematical Association of America, Notes Series #44.

To learn more about assessment tools applicable to group work (and other contexts):
**Task:**
Eight adults and two children need to cross a river, and they have one small boat available to help them. The boat can hold either one adult and a child, or two children (but not two adults). Everyone in the group is able to row the boat. How many one-way trips does it take for the eight adults and two children to cross the river?

**Final Product:**
On a separate sheet of paper, show how you get all eight adults and two children across the river. Using this method or another method, find how many trips it would take to get the following groups across the river:

- 6 adults and 2 children
- 15 adults and 2 children
- 3 adults and 2 children
- 100 adults and 2 children

Generalize these results in order to write a rule for finding the number of trips needed to get any number of adults (A) and two children across the river.

**Keep an organized record of the group’s thinking.** Each member of your group should be prepared to present the ideas of your group to the class.

**Extension:**
What happens to your rule for finding the number of trips if there are different numbers of children? For example, 8 adults and 3 children. How many trips does it take for any number of adults and 11 children?

One group of adults and children took 27 trips across the river. How many adults and children were in the group? Is there more than one solution to this question? If so, what rule fits each solution?

This is an adaptation of the Crossing the River activity that originally appeared in *Mathscape: Seeing and Thinking Mathematically, Patterns in Numbers and Shapes, Lesson 3*. 1998. Mountain View, CA: Creative Publications. Adapted for the *Fostering Algebraic Thinking Toolkit* (Heinemann, Portsmouth, NH) for the Monroe School District by Sunshine Campbell, University of Washington, Mathematics Education Project, September 2008.