

Outline for Teaching a Discussion Section

This outline, which is described in more detail in the following pages, could serve as your "lesson plan" for each discussion session you teach.

Preparation Checklist:

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| <ul style="list-style-type: none"> <input type="checkbox"/> assign new roles <input type="checkbox"/> assign new groups and roles (when appropriate) <input type="checkbox"/> solve the problem; decide what to have students put on board (diagram, plan, algebraic solution) | <ul style="list-style-type: none"> <input type="checkbox"/> photocopies of problem statement (one per person) <input type="checkbox"/> photocopies of answer sheet (one per group) <input type="checkbox"/> photocopies of problem solution (one per person) |
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	What the Students Do	What the TA Does
<p>Opening Moves: 2 min.</p>	<ul style="list-style-type: none"> • Sit in groups. • Read problem. • Checker/Recorder puts names on answer sheet. 	<ol style="list-style-type: none"> 0. Get to the classroom early. 1. Briefly introduce problem. 2. Pass out group problem and answer sheet. 3. Tell class the time they need to stop and remind managers to keep track of the time.
<p>Middle Game</p>	<ul style="list-style-type: none"> • Do the assigned problem: <ul style="list-style-type: none"> - participate in discussion, - work cooperatively, - check each other's work. 	<ol style="list-style-type: none"> 4. Take attendance. 5. Monitor groups and intervene when necessary. 6. A few minutes before you want them to stop, remind the students of the time and to finish working on their problem. Also pass out group functioning forms.
<p>End Game: 5-10 min.</p>	<ul style="list-style-type: none"> • Finish problem. • Check answer. • Participate in class discussion. 	<ol style="list-style-type: none"> 7. Select one person from each group to put their diagram/plan/algebraic solution on the board. 8. Lead a class discussion similarities and differences. 9. If necessary, lead a class discussion of group functioning. 10. Pass out the problem solution.

Detailed Advice for TAs about General Discussion Section Lesson Plan

0. Get to the classroom early.

When you get to the classroom, go in and lock the door, leaving your early students outside. The best time for informal talks with students is after the class.

Prepare the classroom by checking to see that there is no garbage around the room and that the chairs and desks are properly arranged. If you have changed groups, list the new groups and roles on the board at this time also. Let your students in when you are prepared to teach the discussion session.

1. Briefly introduce problem.

Spend a minute or two telling students about the problem - remind them what physical principles they have been discussing in class, and tell them why this particular problem has been chosen. **DO NOT LECTURE YOUR CLASS ON PHYSICS!**

Tell the students what you want them to put on the board when their time is up (diagram, solution plan, or algebraic solution).

2. Pass out group problem statement and answer sheet.

Give a copy of the problem to each student, but only one answer sheet to each group. This will help the students work in groups since they can only turn in one answer sheet for the group. The problem should have all the relevant equations given, **DO NOT ALLOW YOUR STUDENTS TO USE THEIR BOOKS OR NOTES!**

3. Tell class when (at what clock time) they need to stop and remind managers to keep track of time.

If you are planning on doing the group functioning worksheet, be sure to leave time at the end of class. Be sure to leave time for your end game!

4. Take attendance.

Take attendance as soon as the groups are working. Doing this early will cut down on tardiness.

5a. Diagnose initial difficulties with the problem or with group functioning.

Once the groups have settled into their task, spend about five minutes circulating and *observing* all groups. Try not to explain anything (except trivial clarification) until you have observed all groups at least once. This will allow you to determine if a whole-class intervention is necessary to clarify the task (e.g., I noticed that very few groups are drawing a careful force diagram. Be sure to draw and label a diagram. . . .).

5b. Monitor groups and intervene when necessary.

Establish a circulation pattern around the room. Stop and observe each group to see how easily they are solving the problem and how well they are working together. Don't spend a long time with any one group. Keep well back from students' line of sight so they don't focus on you. Make a mental note about which group needs the most help.

Intervene with the group that needs the most help. If you spend a long time with this group, then circulate around the room again, noting which group needs the most help. Keep repeating the cycle of (a) circulate and diagnose, (b) intervene with the group that needs the most help.

6. A few minutes before you want them to stop, remind the students of the time and to finish working on their problem.

Also pass out group functioning forms at this time (if necessary, about every 2 - 3 weeks). (Note: Another common teaching error is to provide too little time for students to process the quality of their cooperation. Students do not learn from experiences that they do not reflect on. If the groups are to function better next time, members must receive feedback, reflect on how their actions may be more effective, and plan how to be even more skillful during the next lab or discussion session.)

When you were an undergraduate, your instructors probably did not stop you to have a class discussion at the end of a recitation period. Doing this is one of the hardest things you will have to do as a TA. You may be tempted to let students keep working so that they can get as much done as possible, or to let them go home early so that they like you better. However, research has shown that students do not learn from their experiences unless they have the chance to process their information. One good way to do this is by comparing their results with the whole class.

Most students do not want to stop, and may try to keep working. If it is necessary, to make your students stop working you can warn them that you will not accept their paper if they keep working. You are in charge of the class, and if you make it clear that you want the students to stop, they will.

7. Select one person from each group to put their diagrams/solution plans/algebraic solution on the board.

In the beginning of the course, select students who are obviously interested, enthusiastic, and articulate. Later in the course, it is sometimes effective to occasionally select a student who has not participated in the discussion as much as you would like. This reinforces the fact that *all* group

members need to know and be able to explain what their group did. Typically, the Recorder/Checker in each group is NOT selected.

8. Lead a class discussion of these results.

A whole-class discussion is commonly used to help students consolidate their ideas and make sense out of what they have been doing. Discussions serve several purposes:

- to summarize what students have learned;
- to help students find out what other students learned from the same problem;
- to produce discrepancies, which stimulate further discussion, thinking, or investigations.

These discussions should always be based on the groups, with individuals only acting as representatives of a group. This avoids putting one student "on the spot." The trick is to conduct a discussion about the results without (a) **telling** the students the "right" answer or becoming the final "authority" for the right answers, and (b) without focusing on the "wrong" results of one group and making them feel stupid or resentful. To avoid these pitfalls, you could try starting with general, open-ended questions such as:

- How are these results the same?
- How are these results different?

Then you can become more specific:

- What could be some reasons for them to be different?
- Are the differences important?

Always encourage an individual to get help from other group members if he or she is "stuck."

Encourage groups to talk to each other by redirecting the discussion back to the groups. For example, when a group reports their answer, ask the rest of the class to comment: "What do the rest of you think about that?" This helps avoid the problem of you becoming the final "authority" for the right answer.

9. If necessary, lead a class discussion about the group functioning.

Discussing group functioning occasionally is essential. Students need to hear difficulties other groups are having, discuss different ways to solve these difficulties, and receive feedback from you.

- Randomly call on one member of from each group to report either
 - one way they interacted well together, or
 - one difficulty they encountered working together, or
 - one way they could interact better next time.
- Add your own feedback from observing your groups (e.g., "I noticed that many groups are coming to an agreement too quickly, without considering all the possibilities. What might you do in your groups to avoid this?")

10. Pass out the solution.

Passing out the solution is important to the students. They need to see good examples of solutions to improve their own problem solving skills. Again, it is important to pass them out as the last thing you do, or the students will ignore anything that you say after you have passed them out. You cannot possibly be more interesting than the solutions.