What Are Group Leaders?

Group leaders have been chosen to pioneer a new approach to encouraging learning in BIOS 201. On seven Wednesdays (during class time), the BIOS 201 students will meet in fifteen separate groups to formulate the best explanations they can for critical concepts and processes. Group leaders manage this process, using their knowledge of course material and their understanding of discussion dynamics.

The group leaders are a new kind of coach. They organize the day’s session and spend approximately three to five minutes at the end of each discussion (2 or 3 topics per period) going over:

- The group’s discussion process
- The accuracy and completeness of the group’s explanation

This approach means that group leaders do not conduct the “teacher tactic” of initiating a question, asking for a response from a student, and then evaluating the student’s answer. Group leaders let their teams get as far as they can, and then they encourage better group-directed learning in the future and place the team’s explanation in context, adding, correcting, and connecting it to other concepts and course work.
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WHAT ARE DISCUSSION GROUPS?

The BIOS 201 professional discussion groups prepare students to take part in the daily conversations that will be part of their future life, first as a student in advanced Rice courses and, later, as a physician, researcher, lawyer, manager, citizen, or any of the myriad careers that beckon to students in BIOS 201. As professionals, these students will be expected to participate in meetings and discussions, contributing insights and conclusions born of their own, personal knowledge and grounded on scientific foundations they learned here. When they attend advanced classes, they will engage in discussions of the material presented both in class and in peer study groups and project teams. When they propose solutions to problems, they will be expected to explain processes and scientific facts for non-specialists as well as other scientists. And in many interdisciplinary situations, they will need to reconcile different perspectives and definitions in order to reach a consensus about how to approach a complex problem.

To perform these tasks successfully, not only must students have a wide knowledge of biological terms and concepts, but they must also be able to present them coherently, concisely, and persuasively. The discussion sections will help students practice these skills by leading through a series of steps to prepare for a discussion meeting, participate in a group discussion in a positive way, lead and manage the discussion toward a productive conclusion, and reach a consensus about the topic.

Students taking Bios 201 will lead and carry out the professional discussion sections. The group leader will try to refrain from participating in the discussion, and instead will observe the discussion, evaluating the accuracy and effectiveness of the presentation, the quality of the discussion, and the process of discussion. A person the group leader designates will also keep track of the number of positive contributions each student makes. A student’s grade for the day will reflect the number and quality of contributions made and the thoroughness with which the Preparation Form was completed before class.

How students learn: Mental maps

We all learn by acquiring information from our environment (through visual and auditory systems). We map the information in the brain in a unique and personal way that reflects how we relate to it. We use these mental maps to structure and code knowledge, store it, decode and recall it. As a student learns about a topic from the textbook, his/her mind creatively constructs a unique map that places the new information in the context of the existing map. Students in BIOS 201 will have a myriad of unique experiences, learning styles, perceptions of their needs, and even perceptions of shared experiences. Although two students may read the same passage from the Biology textbook on an assigned topic, they will come to the discussion with different mental maps of the information. For example, a student who grew up near a beach may relate a biological process to the movement of water in the tides. Another student who worked in a laboratory last summer may relate a process to a similar process in his/her research area. In the discussion session, each student will bring his/her own mental map to the group. By sharing their understanding of the material and questions about it, the entire group will come to a consensus on the topic—a group mental map—that will be richer than the mental maps of any individual. The multiple connections will enable participants to solve problems and apply the
concepts in multiple ways, increasing their mastery of their knowledge. Students will apply their knowledge on exam questions based on the discussion topics.

Logistics of discussion groups

Each discussion group consists of 12-14 students and one group leader. The discussion groups will meet on seven pre-determined Wednesday mornings during the semester during normal class time. The meetings will occur in various locations on campus that foster face-to-face communication.

During each discussion session, students will discuss two or three pre-assigned topics. After the topics are assigned (in class and by email or posting on the course website), students will have one week to research the topics and complete a Preparation Form for each topic. The completed Preparation Forms will be brought to each session and handed in to the group leader at the end of the session.

Roles

At the beginning of the session, the group leader will assign roles:

- The presenter will give a short (five to seven minute) presentation on his/her topic, using the Preparation Form as a source of notes. A legal pad will be available if the presenter wishes to draw a visual aid for the rest of the group.
- The discussion leader will moderate the discussion. He/she will keep the discussion going, turn to the group for questions or comments, notice who wishes to speak and help ensure that everyone’s voice is heard, etc. If the group seems confused, the discussion leader will ask the group leader for clarification.
- A writer will take notes during the presentation. After the presentation, the writer will prepare a short (1/2 to 1 page) written summary of the topic. The summary is due in class on the Monday following the discussion session.
- The summarizer/synthesizer will pull together the most important points made during the discussion and conclude the discussion.
- The log keeper will keep track of each student’s participation by marking a check next to each student’s name when he/she contributes a meaningful comment or question.
- The timekeeper will help keep track of time.

Time management

When two topics are assigned per session, each topic is discussed for approximately 20 minutes: 5-7 minutes for presentation, 8-10 minutes for discussion, and the remaining time (3-7 minutes) for summary/synthesis. The group leader will comment on the group’s discussion for 3-5 minutes per topic.

When three topics are assigned per session, each topic is discussed for approximately 15 minutes: 5-7 minutes for presentation, 5-6 minutes for discussion, and the remaining time (2-4 minutes) for summary/synthesis. The group leader will comment on the group’s discussion at the end of the session for 5 minutes.
EFFECTIVE DISCUSSION SESSIONS

Establishing the tone

It is important to establish a tone in the session that encourages students to feel comfortable sharing their ideas with one another. Many of the students in your group will be freshmen and insecure about what they know. Few, if any, students will have participated in small group discussions in a large lecture class like Biology. As the group leader, you must establish a tone in which students know that everyone has a right to speak and, in fact, is expected to do so.

Whenever possible, have group members sit in a circle or facing one another. Try to relax the students. During the first meeting, introduce yourself. What year are you? From what college? What is your major? Why did you take BIOS 201? Now, ask students to introduce themselves.

Establish ground rules for the discussion. The primary presenter should not be interrupted during his/her presentation. During the discussion, only one person should speak at a time—no talking over others! Students should listen respectfully, with no attacking or making fun of another’s ideas or interpretations. If a student disagrees, he/she must disagree with the idea, not with the person.

Providing feedback to your group

When the discussion ends, you will remark on what the group accomplished. Did they reach a consensus about the topic? Were there any points of confusion to clarify? What were the highlights of the discussion? What questions about the topics remain? How might the group work better next time?

Compliment group members who made exceptionally insightful or helpful comments. Encourage shy students to participate in the future by communications (email or verbal) outside of the group discussion time.

Giving Feedback to Disruptive Participants

Psychologists have urged instructors, managers, and parents to place the pressure for positive participation on disruptive individuals through DESCRIBING the behavior’s effect on the group or on another individual instead of LABELING the behavior.

DO SAY: The group got off to a slow start because Harold spent the first full minute after Jean presented complaining about the traffic. The best time to refine the explanation is right after the presenter finishes.

DON’T SAY: Harold was a butt-head, taking up the first part of the time with his whining.
Once you’ve described the effect of the disruption, the responsibility to the group shifts to the person who caused the problem. The ball is then in his or her court. Obviously, the list of disruptions we might mention could be long, but four types are probably the most problematic.

- **Addition of wrong information** ("most cells have two complete sets of organelles")
- **Disparagement of other members or their knowledge** ("only a complete dork would think that…")
- **Off-topic remarks that eat up the available time** ("What about those Astros?")
- **Criticisms of the group’s purpose or the discussion project, inviting an “us versus them” attitude toward the experience** ("this is so totally Mickey Mouse—I can get this out of the book by reading")

Unless the entire session appears to be headed toward disaster, it’s best to let group members try to deal with the offensive folks themselves. The best response during the feedback session is to point to the good outcomes or benefits of NOT doing the disruptive behaviors:

- “You need to come prepared. When you supply wrong information, it slows the team down. Now there are corrections that you need to understand, and no one countered when Arden said ___“
- “You know from every sport you’ve played that the team suffers when players spend time dissing one another. If you disagree with a contribution, focus on the subject; don’t attack the person.”
- “You didn’t have time in the discussion to deal with possible applications of the concept, and that’s where the bonus points are. The Astro’s win won’t help you on the test."
- “Although memorizing something from the book might have helped most of us in the past, the kind of mastery the discussion sessions are supposed to foster will be crucial to working in research groups and project teams in other courses. That’s why we take foundation courses—so we can use the stuff later. If you just memorize something, you don’t necessarily have mental access to it in the same way you need it during problem solving.”

**HOW TO ASSESS STUDENTS**

As a group leader, you will be responsible for evaluating student performance in the discussion groups. Each time you evaluate a presentation or written summary, you will use a rubric (assessment sheet) containing clearly defined criteria. You will also have an opportunity to write in specific feedback. You will also award points for completed Preparation Forms, for participation in the discussion, and for adequate summarizing/synthesizing.
Preparation forms

Students can earn from 0-2 points for their preparation forms:
- 0 points for no preparation
- 1 point for incomplete preparation (some areas completed)
- 2 points for complete preparation (all areas completed)

Summarizer

Students can earn from 0 to 2 points for their role as summarizer/synthesizer. They are given points for adequately summarizing and synthesizing, for example:
- reiterating presenter’s main points
- incorporating the discussion comments into the presenter’s material
- synthesizing the multiple areas of the discussion into a coherent summary.

Discussions

Students can earn from 0-2 points for participation in the discussion:
- 0 points for no contribution
- 1 point for marginal contribution
- 2 points for positive contribution (e.g., new information; helpful analogy or other learning tool; novel explanation or insight; significant point of confusion)

Examples of marginal comments:
“What? I don’t understand.”
“I really liked the way you compared the process to a river. That helped me get it.”

Examples of positive comments:
“I recall reading that there is another type of protein that participates in the process. It’s called.…”
“I think it’s helpful to think of this (concept) as a 3D jigsaw puzzle, with…”
“You explained that X requires Y, but doesn’t X act independently of Y when…”

For each discussion session, you will have a list of all the students in your group. Next to each student’s name, make a mark for a marginal contribution (e.g., a check ✓). For positive contributions, make a different mark (e.g., a plus +). At the end of the session, you will be able to determine whether students have earned 0 points (no marks), 1 point (only checks), or 2 points (at least one plus) for their discussion.

Presentations

You will evaluate student presentations using the rubric on page 12 of this handbook.
**Written summaries**

You will evaluate the written summaries using the rubric below. Criteria are the same as those described above for presentations, except as noted for Style/Organization.

<table>
<thead>
<tr>
<th>WRITTEN SUMMARY RUBRIC</th>
<th>Needs improvement</th>
<th>Acceptable</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Clarity/Audience-appropriateness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Depth</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Style/Organization</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

*See criteria for organization above. Style: writing was free from significant errors in grammar.*

**TOTAL**

/ 12

**Contribution to student’s grade in class**

The maximum points earned from discussion session assignments is 100 points. The 100 points will be contributed by the following:

- 25% Preparation forms
- 25% Discussion
- 20% Presentation(s)
- 20% Write-up(s)
- 10% Summarizing/synthesizing

In the course, there are four one-hour exams (100 points each) during the semester plus a final cumulative exam (200 points). The lowest exam grade of the four exams taken during the semester will not be counted in the final tally. Thus, a student can earn 600 points in the course, of which 100 points are discussion session points.

For each topic, the *best five* written summaries will be posted on the course website for students to use in preparation for exams. *OPTIONAL: When a team’s summary is chosen to be posted, each member of the team will be given one extra-credit point. Thus, a student can earn as many as 14-21 extra credit points (depending on the number of assigned topics) in the course, based on team effort in the group discussion as reflected in the write-up.*

**MANAGING DISCUSSION SESSIONS**

The following is a summary of an *ideal* discussion session and what to do if any problems arise:

1. All students arrive on time to the session.
a. Variation: a student is more than 5 minutes late.

b. Consequence: you have the option of naming that student to be the second presenter for the day (But if student never shows up to class and the absence is unexcused, another student will be named the second speaker and the absent student will get a ZERO for that presentation).

2. You assign all of the roles: two presenters, two discussion leaders, two writers, two summarizers, two log keepers, and two timekeepers (i.e., 12 assignments for 12-14 members of the group).

   Variation: If you have fewer than 12 students at the session, a student can be timekeeper or logkeeper for both topics.

3. You ask the first assigned presenter if he/she is prepared to speak.

   a. If the reply is no, the presenter will be allowed to defer to the next discussion session. The penalty is 3 points off the total score for the presentation next time. Reassign the logkeeper or timekeeper to be the presenter.

   b. If the reply is yes, the presenter begins a short presentation (5-7 min) of the topic. Students are not allowed to interrupt the presenter at this time.

4. During the presentation, you take notes to provide feedback to the presenter.

5. The timekeeper must notify the presenter when 6 minutes have elapsed. At 7.5 minutes, the timekeeper must tell the presenter to wrap up.

6. Open discussion follows the presentation. Students should make comments or ask questions they prepared ahead of time on their Preparation Forms. They should chime in with their interpretations of how the topic relates to other knowledge or experience. Students should discuss potential applications or meaningful questions that they have formed.

7. The logkeeper will have a list of names of all members of the group. He/she will make marks when each student makes a positive contribution. (Group members will wear name tags.)

8. When 13-17 minutes have elapsed and there is a natural break in the discussion, the timekeeper will indicate this to the discussion leader, who will ask the summarizer/synthesizer to wrap-up/conclude/summarize main points.

9. As group leader, you will now comment on what was discussed:

   a. Point out inaccuracies that were not corrected in the discussion;

   b. Suggest alternative ways of thinking about the topic;

   c. Highlight the strength’s of the group’s discussion and what they achieved (e.g., were they complete? Concise? Accurate?). Suggest how they might do better next time.

10. Complete your rubric for the presenter.

11. Repeat above steps for Topic 2.

**The First Discussion Session**

The first session will be handled a little differently from the rest: you will begin slightly later and allow introductions.

We expect some students to be late because they can’t find the location for the session or forgot to show up there. If your group is not complete, do not begin until 10:10 am (on this first day
only). Begin the first session by introducing yourself first and then allowing the students to introduce themselves.

**NOTIFICATION SYSTEM**

Classroom locations and student lists for each discussion group will be posted by email or on the course website. Topics for each session will be similarly posted. For the first session, the two discussion questions/topics are as follows:

How are cytoplasmic proteins normally folded in cells and what are the processes that ensure elimination of abnormally folded proteins?

How are ion gradients created across the plasma membrane of cells and, in general, what are the functions of these gradients?

**THE PREPARATION FORM**

A copy of the Preparation Form students will complete before each discussion session is attached at the end of this manual. The Cain Project and the course instructors welcome any feedback that might help improve this Preparation Form.

**INSTRUCTOR CONTACT INFO**

If you have any questions or concerns during your service as a group leader, you may contact the course instructors or the Cain Project:

Dr. Mike Gustin  
BCB  
x5158  
gustin@rice.edu

Dr. Dan Wagner  
BCB  
x5933  
dswagner@rice.edu

Dr. Mary Purugganan  
Cain Project  
x6128  
maryp@rice.edu
PREPARATION FORM BIOS 201

Group: _____ Date: _______ Topic: ___________________ Name:__________________

IN A NUTSHELL:

<table>
<thead>
<tr>
<th>PARTS of Topic</th>
<th>COMMENT AND QUESTION (how / why)</th>
</tr>
</thead>
</table>

RELATIONSHIP TO OTHER TOPICS, COURSES, PROCESSES, EXPERIENCES

POSSIBILITIES FOR APPLICATIONS, MEANINGFUL QUESTIONS, PROJECTS

My estimation of this topic’s future usefulness to me

1 2 3 4 5
Not useful moderately useful very useful
Group # __________  Group leader initials __________  Date __________

Topic ___________________________________  Presenter __________________________________

**PRESENTATION RUBRIC**

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<thead>
<tr>
<th></th>
<th>Needs improvement</th>
<th>Acceptable</th>
<th>Good</th>
<th>Excellent</th>
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<tbody>
<tr>
<td><strong>Accuracy</strong>. Facts were correct. Presenter seemed to know what he/she was talking about; was not confused about the material.</td>
<td>0 1 2 3</td>
<td>1 2 3</td>
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<tr>
<td><strong>Clarity/audience-appropriateness</strong>  Presenter targeted his/her explanation to peers in class. Avoid jargon and acronyms. Included definitions. Reworded confusing explanations.</td>
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<td>1 2 3</td>
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<tr>
<td><strong>Depth</strong>  Presenter covered the material sufficiently to educate the group. Speaker was prepared to lead a discussion on the topic; presentation was not superficial. Topic was covered, not “skirted.”</td>
<td>0 1 2 3</td>
<td>1 2 3</td>
<td></td>
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<tr>
<td><strong>Organization.</strong>  Presentation was logically ordered. Presenter moved from general (familiar) to specific (new). Ideas were presented in coherent “chunks”; presenter did not ramble between several ideas simultaneously.</td>
<td>0 1 2 3</td>
<td>1 2 3</td>
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<td><strong>TOTAL</strong></td>
<td></td>
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Strengths of presentation:

Areas for improvement:
Log of participation in discussion

Group # ________  Date ______________
Topics ______________________________________
Logkeeper’s name ______________________

<table>
<thead>
<tr>
<th>Student name</th>
<th>Participation</th>
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Schedule of Discussion Sessions

8/31  Wed  Practice session
9/7   Wed  Session 1
9/12  Mon  Written summaries 1 due
9/21  Wed  Session 2
9/26  Mon  Written summaries 2 due
9/28  Wed  Session 3
10/3  Mon  Written summaries 3 due
10/19 Wed  Session 4
10/24 Mon  Written summaries 4 due
10/26 Wed  Session 5
10/31 Mon  Written summaries 5 due
11/9  Wed  Session 6
11/14 Mon  Written summaries 6 due
11/16 Wed  Session 7
11/21 Mon  Written summaries 7 due

Procedure for students to submit papers:
Students must email their completed written summaries to their group leaders, copying to Dr. Gustin (gustin@rice.edu) and Dr. Wagner (dswagner@rice.edu) no later than Mondays at 10 a.m.

Grading and returning:
Group leaders must grade and return the completed rubric (and the written summaries, if notes were made on it) no later than the following Thursday at 11:59 p.m.