Demonstration of Teaching a Lab Session (by the Mentor TAs)
Acceleration & Circular Motion

Today, a mentor TA will demonstrate how to teach a problem-solving laboratory session at the University of Minnesota. The goals of this activity are for you to learn:
- the structure of the problem-solving labs you will be teaching;
- the rationale for each teaching action in the lab sessions.
- how to use the video analysis of motion software (VideoTOOL & VideoRECORDER)
- how to properly install a Firewire camera
- how to use the Ultr@VNC computer screen projection application

Be sure to ask the mentor TA questions as you go through the lab.

INDIVIDUAL AND GROUP TASKS:

1. Participate in the laboratory demonstration as undergraduates might.

2. Periodically, we will stop the demonstration. Discuss the reasons for *each part* of the lesson plan with your group. Then *individually* write the reasons under "Rationale" on the attached lesson plan. These reasons will then be shared and expanded upon by the class and instructors.

3. Work on the assigned laboratory problem and be prepared to discuss your results.

COOPERATIVE GROUP ROLES:

Skeptic: Ask what other possibilities there are, keep the group from superficial analysis by not allowing the group to agree too quickly; ask questions that lead to a deeper analysis; agree when satisfied that the group has explored all possibilities.

Manager: Suggest a plan for discussing the reasons for each part of the lesson plan; make sure everyone participates and stays on task; watch the time.

Checker/Recorder: Ask others to explain their reasoning process so it is clear to all that their suggestions can be discussed; paraphrase, your group's rationale.

Time	Opening Moves	Comments / Rationale

	0 Get there early and lock door.
	  - Collect one piece of equipment needed for lab problems
	  - Write new groups/roles on board (when appropriate)
	  - Write which warm-up questions groups should write on board
	  - Open Door	

10 min.	**1.** Prepare students for group work by showing group/role assignments.	
	2. Prepare students for lab.	
~1 min.	**a)** <u>Focus on what students should learn</u>. Tell students which Warm-up Question(s) they should discuss and put on the board.	
5 min	**b)** <u>Diagnose student difficulties</u>. While groups discuss *Warm-up Questions*, circulate around the class, ***observe/listen to*** each group, and diagnose difficulties.	
2 min	**c)** <u>Post Group Answers</u>. Select (randomly) one person from each group to write/draw on board answers to the *Warm-up Questions*.	
5-10 min	**d)** <u>Lead a class discussion</u>. Give students a few minutes to read all the answers on the board. Ask the representatives of each group to give their reasons for each of their answers.	
1 min	**e)** <u>How much time</u>. Tell class time they need to stop (usually about 30 – 40 minutes) and remind Managers to keep track of the time.	

NOTES:

Time	Middle Game	Comments / Rationale

5 min	**3.** Coach groups in problem solving (making decisions) by:
	a) <u>Diagnose initial difficulties with the problem or group functioning</u>**.**
	  - Return equipment to groups
	  - Watch class from front of room:
	      Don't answer questions.
	      Is class able to proceed?
	    Stop class and discuss difficulty if everyone is off task.	

~5 min.	**b)** <u>Monitor groups and intervene to coach when necessary</u>**.**
	    Monitor and diagnose :
	Establish a circulation pattern around room. Listen to each group (without them knowing) at least one before answering questions.
	      Diagnose difficulties with physics;
	      Diagnose difficulties with group functioning.
	      Prioritize who needs the most help.
	      Is entire class confused on the same thing? If so, stop the class and discuss the difficulty.	

variable	Coach Groups with the Most Need.
	  - coach first with the group that needs the **most** help, and so on
	  - Always join a group at eye level.
	  - If you spend a long time with group, circulate around class again, listening briefly to each group and diagnose difficulties, before intervening again.
	  - Be sure groups are completing all parts of the problem
	  - If a group finishes early, have them start the next problem.	

Time	Middle Game (continued)	Comments / Rationale
10 min	**4. Start grading lab procedures (journals).** Check to make sure that each student is recording essential observations and measurements. **5.** Prepare Students for class discussion by **a)** <u>Ten-Minute Warning</u>. Ten minutes before you want the groups to stop, tell them to find a good stopping place and clean up their area. (Make sure you are done grading journals). (If groups are new, you may want to pass out the group functioning forms.)	
5 min	b) <u>Posting Corrected Warm-up Questions and/or Results</u>. Tell one person in each group, who is *not* the Recorder/Checker, to write their corrected answers (if necessary) to the warm-up questions on the board (and/or their results).	

NOTES:

Time	End Game	Comments / Rationale
~10 min	6. Lead a class discussion. Usually, focus the discussion on the qualitative analysis of problem.	
5 -10 minutes	7. Optional: Discuss group functioning. Call on one group for "good" response, another group for a "problem," and a third group for a "specific action." Repeat until every group has spoken twice.	
5 min	8. Start next problem. If there is time, have students start the next assigned lab problem. Repeat Steps 1 through 7.	
	9. End of Lab Session. a) Tell students what lab problem(s) to do Warm-up Questions for next week. b) Assign students problems to write up (if last session of lab). In each group, randomly assign each student in the group a different problem for a lab report. c) Leaving the Lab. Leave a neat lab room for the next class.	

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