

SI Leader Training Manual

First in the World STEM - OSIP

Mission

The Department of Education (DOE) First in the World (FITW) Program funding has provided TAMUCC the opportunity to establish a new science, technology, engineering, and math (STEM) Online Supplemental Instruction Project (STEM-OSIP) that will provide online instruction to over 10,000 students over the course of four years. This project will focus on online Supplemental Instruction (SI) as the means to address global excellence through STEM graduates. STEM-OSIP is a research study. The major research question is: Can online SI be as effective as face-to-face SI? You or your instruction is not part of the research. Only the method of the service based on attendance is the research focus. No researchers will be looking at your session content for either method for research purposes.

Purpose of the Research Project

The purpose of this project is to test the relative effectiveness of two different types of delivery of Supplemental Instruction (SI)--face-to-face SI and online SI--for undergraduates taking historically difficult STEM courses (i.e., STEM courses where typically 30% or more of enrolled students earn a grade of D or F or withdraw prior to the end of the semester). Why investigate the relative effectiveness of these two SI formats? Face-to-face has been the standard method of delivery for SI since the 1970s, and much evidence has been collected regarding the impact of face-to-face SI on student learning. However, many campuses across the USA find themselves with an extreme shortage of one of the most important resources for implementing face-to-face SI: classroom space. Moreover, nontraditional students, who continue to increase in number and representation on university campuses, often do not have the scheduling flexibility necessary to attend SI delivered in the traditional, face-to-face format. Due to recent advances in distance-learning technology and the ubiquity of electronic devices that feature high-speed internet access, online SI might be a viable means for replacing or augmenting face-to-face SI and thus addressing these resource-constraint and accessibility issues. However, the extent to which online SI is equivalent to face-to-face SI in terms of impact still needs to be ascertained. All questions regarding the research being conducted should be referred to the Principle Investigator, Dr. Patricia Spaniol-Mathews.

Contact Information Regarding Research Study

If you have questions regarding this study, you may contact the Principal Investigator, Dr. Patricia Spaniol-Mathews, at (361) 825-3163 or Patricia.Spaniol-Mathews@tamucc.edu. You can also visit her office located in the Classroom West building in office #121A. In addition, you may visit the FITW STEM-OSIP website at <http://fitw.tamucc.edu/> to obtain more information about the research project.

This research study has been reviewed by the Research Compliance Office and/or the Institutional Review Board at Texas A&M University-Corpus Christi. For research-related problems or questions regarding your rights as a research participant, you can contact Caroline Lutz, Research Compliance Officer, at (361) 825-2497 or caroline.lutz@tamucc.edu.

Welcome to First in the World

Congratulations and welcome to the First in the World (FITW) Program. This manual will be utilized to train you and provide you with all of the information that you need to know for your position as a Supplemental Instruction (SI) Leader. The SI Program Manager is your designated trainer and will train you on all aspects of your new position. As a SI Leader, you are recognized as a very important part of our community, and we want to ensure that your work experience is a rewarding and positive one. Your work experiences at FITW will help prepare you for future career opportunities. You will learn skills in many areas such as time management, professionalism, and leadership. You will also develop strong work habits and job skills and have an excellent resource for future job references. The Supplemental Instruction experience enables you to explore career options, discover strengths and weaknesses, and apply your academic learning to the world of work. You are to treat college employment as a regular job and are expected to conduct yourself in a responsible and professional manner.

Student Employee Definition

A student employee is a part-time hourly employee who is enrolled at Texas A&M University-Corpus Christi with the primary goal of achieving a degree and therefore, must be degree seeking. Students may not perform any work or subsequently be paid for work performed before all steps in the hiring process have been performed. Student employees are limited in the number of hours they work based on the position in which they are employed. Student employees may hold more than one position on campus as long as the combination from all positions **does not exceed 29 hours per week**. In addition, student employees are not eligible for overtime, paid holidays, vacation, sick leave, jury duty, unemployment insurance, medical benefits, or permanent status, but they are eligible for workers' compensation.

Communication

If you have any questions about your employment with the FITW Program you must consult your supervisor, which is the SI Program Manager, for clarification. The relationship between you and your supervisor should be open and honest, and you should feel comfortable discussing any work-related issues that you may have. Student employees are also encouraged to

make suggestions that might enhance service to students. If there is a time when you and your supervisor do not agree, you are urged to discuss your work-related problem and/or complaint with them. Communication with your supervisor is an important job skill and most important in resolving differences. You are encouraged to adhere to FITW's organized chain of command and discuss matters with your direct supervisor first to find a solution to the problem at hand. However, if discussion with your supervisor has not resolved any issues, student employees are encouraged to meet with the FITW Director to assist in finding a solution.

Email

SI Leaders working for the FITW Program are required to check their email account daily. The supervisor will utilize email as the primary way to communicate with SI Leaders. It is the responsibility of the SI Leader to check their email and respond in a timely manner. In addition, it is also the responsibility of the SI Leader to practice proper and professional etiquette when emailing students and/or faculty and staff on behalf of the FITW Program as required for their job duties. All SI Leaders should utilize proper speech, grammar, and word usage as deemed appropriate for an academic setting. In addition, when emailing you should identify the person you are emailing using their appropriate name and title (i.e. Dr., Professor, etc.). Your supervisor will train you more extensively on email etiquette as it is utilized in your specific job duties. If SI Leaders continuously do not check their emails for messages from supervisors or use inappropriate email practice, they will receive disciplinary action.

Professionalism

The FITW Program is committed to providing a work environment that is respectful, professional, safe, accepting of cultural differences, and free from inappropriate and abusive workplace behavior. SI Leaders must always conduct themselves in a professional manner and remain sensitive to students, supervisors, and other student employees. You are expected to exhibit a high degree of professionalism while working for FITW. Your workspaces are within public view; therefore, your conduct should always reflect positively upon you, FITW, and the university. Unprofessional behavior such as playing computer games, wearing headphones, sleeping, visiting with friends while on the job, unnecessary noise or inappropriate conversations, cell phone use, tardiness, repeated absences, and any other behavior that is not conducive to an academic setting will not be tolerated. In the event that these acts of

unprofessionalism should occur, they must be corrected as soon as possible or they will result in disciplinary action.

Non-Discriminatory Conduct

The FITW Program strives to maintain a work environment free from discrimination. This commitment requires that no discrimination shall occur on the basis of race, color, religion, national origin, sex, sexual orientation, marital status, pregnancy, age, disability, veteran's status, or any other classification that precludes a person from consideration as an individual. This policy is in accord with Title VII of the Civil Rights Act of 1964, as amended, Title IX of the Educational Amendments of 1972, as amended, Sections 503 and 504 of the Rehabilitation Act of 1973, the American Disabilities Act of 1990, the Vietnam Era Veterans' Readjustment Act of 1974, and related administrative regulation and executive orders.

Confidentiality

The Family Educational Rights and Privacy Act (FERPA) set requirements designed to safeguard student privacy both of access to student records and to the release of such record. Confidentiality is a requirement of employment with the FITW Program. All SI Leaders must sign a Confidentiality Agreement stating that they will maintain confidentiality when it comes to the information they learn regarding the students they serve. You will not have access to any student records.

For more information, please see the following sites:

- FERPA: <http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html>
- University policy: <http://registrar.tamucc.edu/ferpa/index.html>

Dress Code

In order to create a positive and professional impression, SI Leaders are required to be neat and clean at all times. Appearances should not distract from student learning and your ability to lead.

Appropriate attire to wear while on the job includes:

Jeans, Slacks, Pants, and Suit Pants

- Nice-looking jeans (no rips, frays, etc.) are acceptable.

- Slacks that are similar to Dockers including cotton pants, wool pants, and nice-looking dress synthetic pants are acceptable.

Skirts, Dresses, and Skirted Suits

- Skirts, dresses, and skirted suits should be at or below the knee when standing. For split skirts, the split should also not extend above the knee when standing. Casual and dress skirts are acceptable.

Shirts, Tops, and Blouses

- Casual shirts, dress shirts, sweaters, blouses, and turtlenecks are acceptable.
- Collared polo shirts are appropriate, as are t-shirts with the university logo.
- If a unit adopts and provides a uniform shirt, student workers are required to wear it.

Shoes and Footwear

- Tennis shoes, loafers, clogs, boots, dress sandals, flats, dress heels, and leather deck-type shoes are acceptable for work.
- Shoes worn for medical reasons and approved by direct supervisor.

Jewelry, Makeup, Perfume, and Cologne

- These should be in good taste, with limited visible body piercings and tattoos.
- Remember, that some employees are allergic to the chemicals in perfumes and make-up, so wear these substances with restraint.

Head Coverings

- Head covers that are for religious purposes or to honor cultural traditions are allowed.

Attire that is not acceptable and must not be worn while on the job includes:

- Jeans with holes, sweatpants, exercise pants, leggings/jeggings, overalls, and any spandex or other form-fitting pants
- Shorts of any kind
- Short, tight skirts that ride halfway up the thigh
- Mini-skirts, sun dresses, beach dresses and spaghetti-strap dresses
- Tank-tops, any other shoulder-baring tops, midriff tops, halter-tops, t-shirts (unless on

Casual Fridays/special circumstances), sweatshirts, and shirts with potentially offensive words, terms, pictures, cartoons, or slogans

- Clothing that is ripped, frayed, dirty, offensive, or clothing that reveals too much cleavage, your back, your chest, your stomach or your underwear, is never appropriate under any circumstance
- Flip-flops
- Hats

If your dress is not appropriate for work, you will be asked to leave and change clothes, which will result in disciplinary action in the event that you are asked to dress more appropriately more than once. Student employees are encouraged to bring a change of clothes in the event that the clothes they are wearing might not be appropriate for work. If you have any questions regarding the dress code or wonder if you what you are wearing is acceptable, you should ask your supervisor immediately.

Work Areas

Regardless of the areas in which you are working such as the classroom or the Classroom West Building, all SI Leaders are required to keep the work area neat, organized, and presentable. At the end of your SI sessions please make sure to erase the boards that were used, put all tables and/or chairs back in their original arrangement, and throw away all trash. After office and planning hours are conducted, please make sure to erase all boards used, push in chairs that have been utilized, and throw away all trash. We are all responsible for maintaining a clean working environment and must make the effort to clean up our assigned areas of work on a daily basis.

Equipment and Office Supplies

Equipment and office supplies are designated for work ONLY related to FITW. This includes printer access, paper, office supplies, MacBooks, textbooks, and anything else that has been purchased with FITW funds. Abuse of these policies will result in disciplinary action. All materials loaned to the SI Leader must be returned the last shift of their employment. Failure to return the items such as the MacBooks, Boogie Boards, and text books will result in an invoice for the cost of the items not returned.

Phone Use

Personal phone calls on business phones and/or cell phones are not permitted unless in the case of an emergency. If you do need to take an emergency call on your cell phone, please step out of the work area so as to not disturb the others that are working. Excessive personal use of phones, especially cell phones, will result in disciplinary action.

Work Schedules

All work schedules will be created in a collaborative effort between the SI Leader and the SI Program Manager and/or the SI Graduate Assistant.

SI Course Meetings

SI Leaders are required to attend all SI course meetings in the rooms in which they are assigned as listed on the online class schedule.

SI Sessions

All scheduled SI sessions must vary in times throughout the week, which means that you are expected to schedule morning, afternoon, and evening sessions. This is done to provide students with a variety of session times to choose from that are beneficial to their schedule. You are responsible to bring to your supervisor's attention all requests for a change to your session schedule within the first week of school. Schedules are finalized after the second week of school and cannot be changed again unless a change to a face-to-face session is required due to a room conflict. The only exception is in regards to online sessions. If an online session time does not have attendance and students request a change in the session time or day, then the SI Leader can request a change.

SI Leaders will conduct three 50-minute, face-to-face sessions per week. Face-to-face sessions are to be conducted in the room in which you are assigned. In the event that you have an issue with your room and you have to leave, then put a note on the door to inform late students where you have moved to so they can find your session. If there is not a known empty room near your scheduled room, then you can bring your students to the Classroom West Building room #125 to conduct your session. Or, you can speak to the SI Program Manager or SI Graduate Assistant and see if there is an extra room available for your session.

SI Leaders will conduct three 50-minute online sessions per week. Online sessions are to be conducted in the best place possible according to your schedule. SI Leaders should keep in mind that space is limited on campus and online sessions need to be conducted in a quiet room with little background noise. Therefore, it is best to schedule online sessions during a time when you can conduct the session in your own home as your schedule permits.

Double Sessions (Test Reviews)

- SI Leaders may schedule a double session right before an exam.
- SI Leader must email the SI Graduate Assistant at least a week in advance in order for a room request to be made and approved with plenty of time to announce the session day, time, and location.
- Email must include the day and time of session and the size of room needed.
- Once the room is requested and approved, the SI Graduate Assistant will contact the SI Leader with the approved information.
- SI Leader will announce in class, sessions, and on the Blackboard sites the time, dates, and locations of the double session.
- Please note that if you schedule a double session for the students assigned to face-to-face sessions, then you have to schedule a double session for the students assigned to the online sessions.

Office and Planning Hours

Office and Planning Hours are set at times according to what works best with your schedule.

Face-to-face Office Hours and Planning Hours are conducted in the Classroom West Building in room #114. You must sign in and out of the Office Hour Binder located at the front desk.

Online Office Hours are conducted in the best place possible according to your schedule.

Mandatory Trainings

- All SI Leaders will be trained to understand the FITW STEM-OSIP research project and its importance. You are not a researcher and must refer all questions regarding the research to the Principle Investigator, Dr. Patricia Spaniol-Mathews.

- All training meetings are MANDATORY, and you will be paid for the hours that you attend a training. If you are unable to attend a training meeting, then it is your responsibility to contact your supervisor as soon as possible with your reason for not being able to attend. In addition, you need to schedule an individual meeting time with your supervisor to review the information covered in the training meeting. Failure to receive an excused absence to the training meetings will be documented and reviewed during the employee evaluation. Excessive absences to these events will result in disciplinary action.
- All new SI Leaders who have not worked on campus must complete the trainings assigned to them by the university. The trainings are located on TrainTraq through the Single Sign On website. Trainings must be completed within the first two weeks of being hired.
 - Single Sign On website - <https://sso.tamus.edu/Logon.aspx>
- Because of the nature of the research grant, all SI Leaders must complete the Collaborative Institutional Training Initiative (CITI) training. This training provides valuable information on ethical research. However, you are not a researcher so all student's questions about the STEM-OSIP research must be referred to the Principal Investigator, Dr. Patricia Spaniol-Mathews at 361 825-3163 or pspaniolmathews@tamucc.edu.
 - CITI Training website - <https://www.citiprogram.org/>

Punctuality

You are required to arrive at least five to seven minutes early to all SI course meetings and sessions so that you are able to prepare for the meeting and talk with the students who are attending. You are required to be punctual to all office and planning hours. Contact your supervisor as soon as possible if you anticipate being late to any sessions or office hours so that the supervisor and/or SI Graduate Assistant can inform the students of the tardiness. In addition, inform the professor if you are going to be late to any course meetings so they are informed of the tardiness. Finally, inform your supervisor and/or SI Graduate Assistant if you anticipate being late to any planning hours so they are informed of the tardiness. Frequent tardiness will result in disciplinary action.

Time Off Work

All requests for time off from your regular work schedule must be submitted to your supervisor via email as soon as you are aware of the needed request. The email must include the dates you are requesting off and the reason for the request. The supervisor will respond to the email with an answer to the request or with questions if more information is needed. Once the request is approved, then the SI Leader is responsible for informing the professor and the students of the approved absence. In addition, the SI Leader must reschedule all sessions missed because of the absence and must inform the students of the new times and locations before the absence takes place. In the event that a conflict arises such as an emergency, illness, car trouble, or a death in the family and you are unable to work, please contact your supervisor as soon as possible. All time off is unpaid. Three unexcused absences will automatically result in the student employee being placed on probation for the remainder of the semester. Once a student employee is placed on probation, a subsequent unexcused absence will result in termination of employment. Excessive absences can be deemed excused if paperwork is provided that warrants the absence.

Canceling/Rescheduling Sessions

Canceling Sessions

Cancelled sessions affect everyone involved with the SI course and must be prevented as much as possible. Please remember that no matter the reason for the cancellation, SI Leaders are always responsible for scheduling a make-up session and informing the students and professor accordingly.

Sessions cancelled without the approval of the SI Program Manager, or in violation of the following policies, may result in termination of employment.

- SI Sessions are automatically cancelled when they overlap with the TAMUCC holiday schedule or when all campus classes/events are canceled due to situations such as bad weather. In the event that this occurs, then the SI Program Manager will notify SI Leaders and initiate rescheduling.
- If a SI Leader's illness and/or emergency dictates cancellation of a session, then the SI Leader must contact the SI Program Manager via phone or email ASAP. Emergency is defined as a death in the family, documented accident or illness, or other extenuating circumstances, which will be evaluated on a case-by-case basis by the SI Program

Manager. Making up sessions will be determined by the SI Leader in conjunction with the SI Program Manager on a case-by-case basis.

- In all other cases such as vacation, attending a conference, organization meetings, make-up exams/test review sessions, field trips, or any other school-related function, the SI Leader must submit a **Session Cancellation Request Form** to the SI Program Manager via email at least a week prior to the start of the scheduled session. The SI Leader must also provide written documentation from the event they attended, which required cancelling a session.
- NO cancellation will be approved without a suggested date and time for rescheduling the session(s).
 - Please note that advanced notice is not for the SI Program Managers' convenience, but rather for the purposes of securing a room through the campus reservation system.
- SI Leaders must inform the students of the session cancellation as soon as possible.
 - Remind students of the cancelled session before class and session, and post it on your Blackboard site.
- Sign-In Sheets and Online Attendance Logs **MUST** be turned in for cancelled sessions.

Rescheduling Sessions

- SI Leaders will complete the Session Cancellation Request Form with dates and times to reschedule the cancelled session.
- The SI Graduate Assistant will check the room reservation site to see if any requested dates and times that the SI Leader requested are open.
- Once a room request is made and approved, then the SI Graduate Assistant will inform the SI Leader of the day and time that the rescheduled session is set.
- The SI Leader must then:
 - Announce the change in class and on their Blackboard site.
 - Post a sign on the door of the regular session location with updated information.
 - Make note of the change on the Session Sign-In Sheet and/or Online Session Attendance Log.

Time Reporting

Every SI Leader is responsible for completing and submitting a timesheet and TimeTraq every other Wednesday by 5 p.m. in accordance with the university's bi-weekly pay periods. Student employees are paid every two weeks. The pay period lasts two weeks, beginning on a Thursday and ending on a Wednesday. You will receive your paycheck for the previous two weeks on the Friday following the close of a pay period. Late or incomplete timesheets or TimeTraq submissions will result in a delay in receiving a paycheck. You are responsible for making sure that your timesheet and TimeTraq submissions are complete, accurate, signed, and on time. To be paid, TAMUCC requires that you sign up for Direct Deposit through the university's Single Sign On (SSO) system (<https://sso.tamus.edu/Logon.aspx?ReturnUrl=%2f>). You can update and access all of your information electronically including copies of your W-2 form in SSO, and will be given instructions as needed by your supervisor. No SI Leader shall knowingly submit inaccurate or untruthful information for or on any FITW record, report, or document, including TimeTraq.

- Paper timesheets must be completed using blue or black ink.

Employee Evaluations, Rehire, and Resignations

Employee Evaluations

All SI Leaders working for the FITW Program will be evaluated at least two times per semester, which will include employee evaluations for face-to-face sessions and employee evaluations for online sessions. Employee evaluations are conducted to ensure SI Leaders are performing job duties and conducting sessions according to the standard UMKC model and principles of Supplemental Instruction as discussed and demonstrated in training meetings. All employee evaluations will be discussed with the SI Leader after they are conducted to provide the SI Leader with feedback about the evaluated session. Training will be provided as needed in the areas that the SI Leader needs improvement.

All employee evaluations will also be discussed at the SI Leader end of semester employment evaluation conducted the end of the semester. These employee evaluations are not for research purposes and are only utilized for employment purposes.

Performance Evaluation and Rehire

Each SI Leader is eligible for rehire each semester and will be evaluated to determine continued employment. Many factors such as GPA, work performance via evaluations, duty compliance, absences/tardiness, and professionalism will be considered when deciding if a SI Leader will remain employed. You are encouraged to discuss your performance with your supervisor at any time that you deem necessary. Evaluations can be very educational and helpful in securing future employment.

Resignation

If at any point you choose to terminate employment, you should notify your supervisor at least two weeks prior to your intended end date. All SI Leaders are required to complete a resignation letter which should include your name and your last date of employment. You should also ask your supervisor for permission to list them as a reference or request a letter of recommendation for future employment.

Disciplinary Action

Disciplinary action is designed to identify and correct problems that may affect a SI Leader's work performance or the overall performance of the FITW Program. This process provides you and your supervisor the opportunity to talk about specific problems, determine when and how to correct these problems, and agree to set goals and follow-up dates.

Strike Sheet

In the event that a SI Leader does not submit the required documents or links within the week they are due, then they will be required to sign the Strike Sheet. The supervisor will schedule an appointment to meet with the SI Leader, explain the issue, and have the SI Leader sign the document in the appropriate place. The SI Leader still must submit the documents they are missing or will be required to sign the Strike Sheet again. In the event that the SI Leader has to sign the Strike Sheet in one area more than three times, then they will be placed on probation. Termination of employment will occur if the Strike Sheet has to be signed in one area more than four times.

Progressive Disciplinary Action

Progressive Disciplinary Action will be utilized by your supervisor in the event of excessive absences, neglect of assigned duties, failing to attend mandatory staff meetings and trainings, insubordinate behavior, inappropriate behavior that is not conducive to a productive academic setting, and anything else that is deemed unprofessional and detrimental to your position as a SI Leader. Each case is considered on an individual basis. A SI Leader who receives three notices of disciplinary action will be immediately terminated from employment.

Progressive Disciplinary Action refers to the following steps:

- Step 1 – Counseling and/or Verbal Warning
- Step 2 – Written Warning
- Step 3 – Probation
- Step 4 – Termination of Employment

Depending on the situation, steps 1, 2, or 3 may be repeated, skipped, or not followed in sequence.

Termination of Employment

The FITW Program has the right to terminate your employment at any time for any reason not prohibited by law without prior notice. In the case of serious infractions, you may be discharged on the first offense. Serious infractions include, but are not limited to the following:

- Insubordination
- Academic dishonesty
- Neglect of assigned duties
- Unauthorized possession or concealment of weapons while on the premises
- Possession, use, sale, or purchase of non-prescribed drugs and intoxicants on the premises and/or working under the influence of alcohol or illegal drugs
- Fighting
- Theft
- Destruction of property

- Sleeping on the job
- Sexual harassment
- Falsification or improper alteration of records, including but not limited to timesheets
- Disclosure or misuse of confidential information
- Misuse of the University's electronic information systems
- Unprofessional conduct such as the use of vulgar language, participating in inappropriate conversations, creating a hostile environment, and/or discriminating on the basis of sex, color, race, religion, national origin, or disability

Supplemental Instruction Overview

SI Program Definition

Supplemental Instruction (SI) is a non-traditional form of academic assistance that utilizes peer-assisted study sessions to help students understand material learned in difficult courses while increasing their learning strategies and study skills.

SI Program History

The program was developed at the University of Missouri-Kansas City by Dr. Deana Martin in 1973. Learning strategists were asked to determine why a high percentage of students in the school of medicine, pharmacy, and dentistry were failing and dropping out of their programs. Students identified disconnects between course lecture and laboratory practical experiences. Therefore, Deana Martin was hired on a \$7000.00 grant to assist with researching and remedying the situation. She proposed a plan to implement peer-led study sessions utilizing a student who had previously made an A in the courses to assist students with understanding the material and bridge the gaps in the learning process.

Dr. Martin successfully pilot tested the first Supplemental Instruction course, which was Human Anatomy in the UMKC School of Dentistry. The SI sessions proved successful as data results showed that grades increased and D, F, W rates decreased. As a result, the program increased and was implemented at the undergraduate level in 1981. In addition, UMKC received its certification as an Exemplary Educational Program from the Joint Dissemination Review Panel in 1981. Today, the SI program has spread worldwide, and the UMKC International Center for Supplemental Instruction has trained faculty and staff from more than 1,500 institutions in more than 29 countries.

SI Program Goals

- To increase retention within targeted historically difficult courses, which are courses that have a consistently high rate of D or F grades and course withdrawals
- To improve student grades in targeted courses
- To increase graduation rates of students
- Assist students with developing study strategies such as thinking and reasoning,

responsibility, and reflection so they can successfully complete the targeted course and future courses

SI Program Logistics

- SI a non-remedial approach and does not identify high risk students, but rather identifies historically difficult classes.
- SI provides regularly scheduled, out-of-class, peer facilitated study sessions.
- SI provides an opportunity for students to learn how to learn while learning what to learn and focuses on both course content and study skills.
- SI Leader assistance and support for students and faculty begins the second week of the semester after session assignments have been determined and session schedules have been created.
- Student participation in SI is voluntary and free of charge.
- SI sessions are open to all of the students in the course and not just to the students who are struggling.
- SI sessions are comprised of students of varying abilities, and no effort is made to segregate students based on their academic ability.

SI Program is NOT

- Tutoring.
- Teaching or re-teaching.
- Remedial or make-up instruction.
- TA or clerical assistance for the professor.
- A replacement for other support services.

SI Program Benefits

Students

- Earn higher course grades and withdraw less often than non-SI participants. Data shows that students who regularly participate in SI sessions can earn up to a letter grade higher

in the course than those who do not attend. Data also shows higher re-enrollment and graduation rates for students who participate in SI sessions.

- Discover appropriate application of study strategies such as note taking, problem solving, and test preparation as they review content material.
- Have the opportunity to become actively involved in the course material as the SI Leaders use the text, lecture notes, and supplementary readings as the vehicle for refining skills for learning.
- Learn time management skills
- Promotes assimilation into university life
- Build friendships and study partners

Faculty and Institution

- Reduces attrition and raises course grades
- Supports faculty as they maintain high expectation and standards
- Enhances classroom experience
- Cost effective

SI Leader

- Increases knowledge of course content
- Improves learning strategies and study skills
- Improves communication skill

SI Leader Roles and Responsibilities

Roles

SI Leader and the Professor

Do:

- Treat the instructor as your ally, never your adversary.
- Be professional at all times and treat him or her with respect.
- Meet with the professor on a regular basis to discuss course content and clear up any uncertainties you may have regarding material discussed in the SI sessions or the lectures.
- Email professor if you have any questions or if you are going to miss a class due to illness/emergency.
- Provide the instructor with feedback about how the sessions are going. If your professor wants to understand how SI works, then schedule a time for him/her to attend one of your sessions. However, the professor should only observe and not interact or be involved with presenting information or answering questions.
- Show the professor the handouts you plan to share with the students attending SI sessions. He or she can help make your handouts more appropriate to the course material.
- Work with your professor to promote SI sessions and make announcements in each class. Be creative about how you motivate students to attend.
- Be helpful to the professor whenever possible. You do not have to assume the role of being the professor's assistant but offer to assist the professor in tasks such as helping with computer equipment, distributing materials, etc.
- Refer the professor to the SI Program Manager regarding any questions or concerns that are outside of your responsibilities.

Do Not:

- Answer any student questions about the research project, refer these questions to the PI.
- Criticize the professor or the course during a SI session. Students will report this to the professor and it is not helpful. Students are responsible for their academic performance, regardless of the professor's style.

- Miss a class without informing the professor and SI Program Manager first.
- Attempt to cover material beyond what is being covered in the course lecture.
- Grade papers or tests or be involved in constructing exam items.
- Proctor exams/assignments without the professor being present.
- Independently create exams/assignments in which students receive a grade.
- Set yourself up as a teacher. Your purpose is to facilitate the learning of the material, not to do or evaluate the teaching.
- Do not use previous course exams or instructor-created study guides for any SI sessions without direct approval from your course professor.
- Answer questions the professor poses to the class or involve yourself in class discussions unless the professor directly invites you to do so.
- Hesitate to refer the professor to the SI Program Manager if he or she requests anything about which you are uncertain or with which you are uncomfortable.

SI Leader and the Student

Do:

- Maintain confidentiality.
- Be professional at all times.
- Have concern and show concern about their progress.
- Get to know their names.
- Keep the relationship informal. Attempt to treat all students as you would treat a friend.
- Be encouraging.
- Provide your Islander email address to students so they can contact you with course questions.
- Maintain frequent communication with your students, which includes regular class and email announcements and prompt responses to student questions.
- Answer questions asked in class, sessions, or office hours.
- Provide straightforward, truthful responses to student inquiries.
- Recognize the limits of your role as a SI Leader. You are a peer who is competent in the course material, trained to assist students in learning and understanding it. Your course professor is the “expert.”

- Acknowledge when you do not know an answer and work with your professor to provide the information.
- Refer students to appropriate campus resources when they share issues that are outside your expertise. Use the Campus Resources information provided.
- Refer all questions about the FITW STEM-OSIP research project to the Principle Investigator, Dr. Patricia Spaniol-Mathews.

Do Not:

- Give students copies of your lecture notes.
- Cancel a session or office hour without informing the students and SI Program Manager first.
- Enter into a dating relationship with any student in your SI course during the time you are an SI Leader for the course.
- Tutor students individually outside of your SI sessions.
- Give out your personal email address or phone number.
- Make a Facebook/Twitter account for the SI course.
- Allow yourself to be drawn into an argument with students for any reason.
- Demand that students have to defend themselves to you. For instance, if they miss a session, then act concerned but don't demand an explanation.
- Say anything that would make you sound like a parent, teacher, judge, or authority figure of any kind.
- Feel obligated to fix problems that students create and can solve for themselves. Just remember to be diplomatic when you decline the invitation to get involved.
- Allow yourself to become involved with assisting students with personal issues outside your expertise.
- Answer any questions regarding the FITW STEM-OSIP research project.

SI Leader and the SI Program Manager

Do:

- Check email daily for important announcements or messages from SI Program Manager or professor.
- Email SI Program Manager requests for time off, questions, reminders, and needed

recommendations. Email is the best way to communicate a need.

- Communicate on a regular basis regarding progress of sessions and course or any other matter/question that needs to be discussed.
- Immediately communicate problems with professor or students so issues can be resolved.
- Immediately report any conflict that occurs with rooms, schedules, faculty/staff, technology, etc.
- Immediately report a need to miss a class, session, office hour, or planning hour so arrangements can be made to reschedule the session and/or obtain the information missed in class.
- Check email daily for important announcements or messages from SI Program Manager or professor.
- Request materials needed for sessions.
- Share suggestions for improving the program as appropriate.
- Handle yourself with professionalism, learn from your mistakes, and balance all roles well.
- When in doubt...ask the SI Program Manager! Communication is the key to your position!

Do Not:

- Act on behalf of the SI Program Manager in any matter.
- Make changes to your SI session schedule/locations without consulting with the SI Program Manager.
- Cancel a session or office hour without discussing it with the SI Program Manager first.
- Hide mistakes. Owning up to and learning from errors is better for everyone involved.
- Lay things on the SI Program Manager's desk without it being discussed first.
- Assume the SI Program Manager can read minds. Communication is key!

SI Leader in the Classroom

Do:

- Support classroom instruction in every way.
- Introduction SI leader by PI or CO-PIs on the first day of class.
- Continually announce in class SI session and office hour schedule and room locations

- Write session dates and times on the board in the classroom where lecture is conducted.
- Arrive five to seven minutes early to every class
 - Walk around the room, talk to students, and remind them of sessions.
- Inform students of times and locations of double sessions.
- Be the model student.
- Attend every class.
- Ensure that the professor knows you are present in the class and ask if anything is needed.
- Sit in different locations so that you can meet new students in the class.
- Talk to students before and after class.
- Write session times and locations on the board before each class.
- Check in with the professor and assist as needed.
- Take notes appropriate for session planning.
 - SI Leaders are **NOT** allowed to share their notes with any students.
- Refer all questions about the FITW STEM-OSIP research project to the Principle Investigator, Dr. Patricia Spaniol-Mathews.

Do Not:

- Miss class.
- Show up late to class.
- Blend into the background.
- Ignore the students.
- Answer any questions regarding the FITW STEM-OSIP research project.

SI Leader in Session

Do:

- Review content to discuss in SI sessions.
- Organize the session with built-on flexibility to adapt to the needs of attendees.
- Use the language of the discipline.
- Integrate *how to learn* with *what to learn*.
- Get students organized and get them started, but **don't do the work for them**.
- Consistently implement new collaborative learning strategies to increase student-to-

student interaction.

- Integrate content and learning skills.
- Redirect questions and discussion to the entire group.
- Refer all questions about the FITW STEM-OSIP research project to the Principle Investigator, Dr. Patricia Spaniol-Mathews.

Do not:

- Lecture to students.
- Only provide answers.
- Ignore disruptions.
- Answer any questions regarding the FITW STEM-OSIP research project.

Semester Responsibilities

Beginning of Semester

- New SI Leaders must complete all trainings assigned to them on TrainTraq as well as complete CITI training.
- All SI Leaders must:
 - Meet with the SI Program Manager to schedule online and face-to-face sessions.
 - Meet with professor and discuss expectations and needs.
 - Ask to be added to the professor's Blackboard site.
 - Ensure the professor has your contact information.
 - Ask if the professor prefers you to sit in a specific seat for the semester.
 - Obtain and read class syllabus.
 - Provide a copy of syllabus to SI Program Manager.
 - If test dates aren't listed on syllabus, then ask professor and provide them to the SI Program Manager.
 - Become familiar with Blackboard and WebEx sites.
 - Become familiar with the workings of your assigned MacBook and Boogie Board.

During First Class

- Arrive early and sit near the front.
- Write your name and Islander email on the board.
- On the first day of the course the PI and/or CO-PIs will explain SI and the FITW STEM-

OSIP research project. They will hand out two copies of the informed consent form and read the signed consent form regarding the research to the students. One copy will be turned in if the student is going to participate and one is for the student's future reference. The PI or CO-PIs will answer questions about the research. All students with questions pertaining to the research that cannot be answered by the CO-PIs must be referred to the Principle Investigator, Dr. Patricia Spaniol-Mathews, at (361) 825-3163 or patricia.spaniol-mathews@tamucc.edu.

- After the PI or CO-PIs have answered the research questions the students who want to participate will be asked to sign the informed consent form and will be informed they have a week to make a decision. Any students who need more time to think about attending SI will be told by the PI and/ or CO-PIs they can turn in their forms to the PI or drop them in her mailbox at Classroom West Room 121A.
- The PI or CO-PIs will inform any student under 18 years of age they are under the age limit to participate in the research. However, they are able to attend the face to face sessions and no data will be collected, and they will receive a face to face session schedule.

Second Week of Classes

- The CO-PI SI Program Manager will email all session information (face-to-face/online) assignments, and session schedule directly to each student who turned in a signed consent form.
- Submit class syllabus and test dates to CO-PI SI Data Manager.
- Begin conducting SI sessions.

Face-to-Face Session Responsibilities

General Session Behavior

- Gather necessary materials for sessions (dry erase markers and erasers, chalk, pens, papers, etc.).
- Arrive five to seven minutes early to every session.
- Acknowledge the students coming to the session and get to know their names.
- Promote student involvement, group acceptance, and learning.
- Keep the room clean and organized.

Every session

- Pass out Sign-In Sheet and ask students to sign in using their A#.
 - Place Sign-in Sheet in Sign-In Sheet envelope and seal the envelope.
 - Turn in a Sign-In Sheet regardless of attendance to CO-PI SI Program Manager.
 - If no one attends the session, then write “no attendance” on the Sign-In Sheet and submit it.
- Wait in scheduled session room for at least **30 minutes** to ensure that no late students show up to attend a session. If no students show up after the 30-minute mark, then you are free to leave the room.
 - Put your name, course, and next session day and time on the board just in case someone shows up after you leave.
- Conduct a 50-minute session with students who attend.
 - Wrap up sessions starting at the 45-minute mark to answer last-minute questions and clean up room.
- Utilize Lesson Plan to facilitate a discussion of course content and study strategies.

Throughout the Semester

- Schedule Double Sessions (test reviews).
- Email SI Graduate Assistant all room requests for test review or rescheduled sessions.
 - Include in email the date, time, and room size needed.
 - Inform students of test review/rescheduled session day, time, and location once it is confirmed by the SI Graduate Assistant.
- Create and pass out handouts/reviews to be utilized during sessions.
- Remind students of current, cancelled, and/or rescheduled sessions and/or office hour times and locations.
- Answer student emails.

Online Session Responsibilities

General Session Behavior

- Log in three to five minutes early to every session so you are ready to start on time.
- Acknowledge the students logging into the session.

Every session

- Schedule your meetings for the days and times that your sessions are schedule.
- Assign a password to your meeting and share it with the students assigned to online sessions.
- Turn on camera and connect to audio.
- Ensure students can see your face on camera during the session.
- Turn off the presenter function on all attendees except for yourself.
- Conduct a full session (no less than **30 minutes**) regardless of attendance.
- Utilize Lesson Plan to facilitate a discussion of course content and study strategies.

Throughout the Semester

- Schedule Double Sessions (test reviews).
 - Post the test review session day and time on Blackboard site.
- Create and upload handouts/reviews to Blackboard to be utilized in sessions.
- Post reminders of current, cancelled, and/or rescheduled sessions and/or office hours on Blackboard and remind the students in class.
- Answer student emails or posts on the Blackboard Discussion Board.

Office Hour Responsibilities

- Assist the students who attend and answer all questions that they have.
- Request a room if you anticipate a large number of students attending a face-to-face office hour.
- If students do not attend the office hour, then work on Lesson Plans or handouts.
- Be respectful to those working around you.

Planning Hour Responsibilities

- Plan sessions – work on Lesson Plans or handouts/reviews for sessions and upload to Blackboard.
- Be respectful of those working around you.

Training Meeting Responsibilities

- Attend and actively participate in all training meetings.

- Contact supervisor ASAP if unable to attend training meetings.
 - Schedule an individual meeting with supervisor to receive the information covered in the meeting.

Data Collection and Paperwork Responsibilities

- Submit all of the following required documents on time.
 - Session Sign-In Sheet Envelope
 - Office Hour Sign-In Sheet Envelope
 - Lesson Plans
 - Timesheets
 - Self-Evaluation

End of Semester Responsibilities

- Confirm final exam day and time with professor and decide when to conduct at least one final review session for students assigned to face-to-face sessions and one for the students assigned to online sessions.
- Email SI Graduate Assistant the room request for face-to-face final review session(s).
 - Include in email the date, time, and room size needed.
- Schedule an evaluation meeting with the SI Program Manager.
- Complete a Self-Evaluation Form and bring it to the evaluation meeting to be discussed.
- Reading Day marks the end of conducting regularly scheduled office hours and sessions.
- Submit all Sign-In Sheets envelopes immediately after final sessions are completed, no later than **5 p.m. on the last day of finals.**
- Return all equipment and textbooks checked out to you by **5 p.m. on the last day of finals.**
- Submit last timesheet of the semester no later than **5 p.m. on the last day of finals.**

Administrative Responsibilities

The following is a list of administrative responsibilities that each SI Leader is accountable for throughout the semester in which they work. Every item discussed is a legal document and very important to the FITW Program. SI Leaders must thoroughly complete and submit all paper documents and online submissions on time to avoid disciplinary action. All submissions will be assessed and discussed with SI Leaders as needed in the case that something needs improvement.

- Please note that all paper documents must be completed in **blue or black ink only**.

Blackboard

FITW SI

Every SI Leader is assigned to the course in Blackboard titled “FITW SI.” SI Leaders upload Lesson Plans to the site as well as timesheets. In addition, there are training videos posted for SIs to watch who have questions about topics such as using WebEx or the Boogie Boards.

SI Course Site

Every SI Leader has a Blackboard site, which is identified by the SI course name and is used for the students assigned to the online sessions. The SI Leaders must upload all handouts/reviews created for the students. In addition, SI Leaders must respond to any posts on the Discussion Board and post changes to their session/office hour schedule.

- Please note that no SI Leaders are allowed to change the format of their Blackboard page for any reason.

Lesson Plans

- Lesson Plans are located and submitted on Blackboard.
- Use one Lesson Plan for a full week of sessions.
- All Lesson Plans are due in Blackboard **Fridays by 5 p.m.** for the current week of sessions.
- Upload the blank Lesson Plan fillable PDF document from the “SI Documents” folder.
- Save the blank document to your computer before filling it out.
- Thoroughly complete the document with concepts to cover and strategies to use in your SI sessions.

- Save the document, and title it with the dates of the week in which they occur.
- Upload the completed document in the folder that is titled with your personal name, which is located on *FITW SI* Blackboard page in the folder titled “Lesson Plan Folders.”
- Lesson Plans will be reviewed and approved. Incomplete Lesson Plans will be discussed in a meeting between the SI Leader and the SI Program Manager. The meeting will determine if training is necessary to ensure that the document is completed according to UMKC SI standards.

Session Sign-In Sheets and Office Hour Sign-In Sheets

Session Sign-In Sheets and Office Hour Sign-In Sheets are important to our program. The FITW SI Data Manager relies on these documents for reporting attendance data, which is the purpose of the research grant. Therefore, we expect all SI Leaders to thoroughly complete the documents, put them in an envelope, and submit them after sessions are conducted so that all attendance data can be updated and assessed regularly.

- Blank Sign-In Sheets and Office Hour Sign-In Sheets can be found on the rack next to Classroom West #118. SI Leaders are encouraged to keep a small stack of these documents with them to ensure they have them for all sessions. Notebook paper cannot be used as a Sign-In Sheet or Log, the document must be used.
- Blank Sign-In Sheets are also located in the “SI Documents” folder on the Blackboard site for printing purposes only.

Office Hour Sign-In Sheets

- Put the document in an envelope and submit in the locked mailbox outside Classroom West #118 right after the office hour is conducted.

Session Sign-In Sheets

- Submit Sign-In Sheets in the required sealed envelope and place in the box outside Classroom West #118 right **after each session.**
- Submit one for every session regardless of attendance, just note “no attendance” on the document and turn in.
- Complete a yellow Session Sign-In Sheet in the event that you are conducting a double exam session. Put it in an envelope and submit it in the locked mailbox outside Classroom West #118 **after the double session.**

SI Session Cancellation Form

- SI Leaders who have to cancel a session must complete this form at least a week in advance of the cancellation to reschedule the session.
- SI Leaders must upload the form from the FITW SI Blackboard site, complete it, and email it to the SI Program Manager.

Timesheets

- All paper timesheets and TimeTraq submissions are due **every other Wednesday at 5 p.m.** according to the university's scheduled pay periods.
 - Please refer to the document located in your folder for timesheet due dates.
- Submissions must be filled out completely and must match each other or they will not be approved, which will delay your pay.
 - Please refer to the document located in your folder for thorough instructions on what needs to be included on each paper timesheet.
- Paper timesheets must be written in blue or black ink only or they will not be approved.

Conducting a Session

Session Logistics

10-minute Warm-Up

30-minute Work-Out

10-Minute Cool Down

=50-Minute SI Session

Introduction (10 minutes)

- Remind the students of your name, course, contact information, and session schedule.
- Open the session with activities that get the students motivated to learn.
 - Review what was discussed at last SI session.
 - Summarize lecture/main points.
 - Conduct an informal quiz over lecture or reading material.
 - Lead a note review.
- Reinforce the purpose of Supplemental Instruction.

Middle of the Session (30 minutes)

- Utilize strategies and games that review course material.
 - Utilize a Vocabulary/Concept Matrix.
 - Work problems and create step-by-step guide.
 - Review formulas important concepts using games.
- Keep the students involved and engaged.
- Utilize “Wait Time” and “Redirecting Questions” strategies.
- See the “Session Strategies” section for new ideas.

Ending the Session (10 minutes)

- Summarize the material reviewed in the SI session.
 - Conduct an informal quiz.
 - Predict test questions.
 - Orally summarize what was learned at the SI session
 - Identify the “big idea” or most important points.
 - Create study guide (SI Leader will keep copy to use as a study guide for exam).
- Check for student understanding.
- Remind the students of the next SI session.

SI Session Basics

- Personally invite students to the sessions. Don't act insulted if they offer an excuse for not attending.
- Maintain eye contact.
- Arrange furniture to promote group interaction.
- Introduce yourself and the SI Program to students. Encourage them to introduce themselves.
- Make use of the language of the particular discipline, course, and instructor.
- Be assertive: If you want them to work together, put them into groups. You need to take charge of your session and do not let students dictate control of a session.
- Direct students through the entire activity. Explain what you want them to do, who they should work with, how long they have, and what will happen when they finish the task.
- Do not lecture to the students. Avoid standing in front of the room and writing on the board yourself. Involve the students in every step of the session.
- Wait for students to volunteer an answer before answering, even if it takes an uncomfortable amount of time. It takes time to provide a well-developed answer, so after asking a question the SI Leader should:
 - Wait 15 seconds for student to think and/or respond.
 - Wait 30-60 seconds before directing students to their notes or book for answers.
- If students are unable to answer the question, ask for the source of information. For example, ask for the date of the lecture that contained the information and search for the answer together. **Do not simply provide answers!**
- Encourage students to summarize the major concepts of the lectures. Let other students fine-tune the responses. If the information is incorrect, ask students to find specific references in the text or notes that will clarify the correct answers.
- Encourage and support students during sessions. If they get the answer incorrect, try not to make them feel inferior.
- Avoid interrupting student answers. SI should provide a comfortable environment for students to ask questions or attempt answers. Protect students from interruptions, laughter, or from those with louder voices.

- Refer to the syllabus regularly. Check that students understand the requirements and dates of reading assignments, projects, and tests.
- Use the board to involve the students in the session. Write large enough for everyone to read. Prepare boards before the session begins.
 - When you work problems on the board make sure the students explain how they worked the problem. Do not just let a student write the answer, ask them to explain the steps.
- Sit with the students during the session as much as possible to show them that you are a peer actively involved in the discussion and not an authority teaching them.
- If your group has more than six students, divide students into groups. Provide discussion topics/problems that the groups can explore, and have them write answers or work problems on the board. Have each small group report back to the large group.
 - Move from group to group, participating from time to time, reassuring the group that you are still there for them. Do not just sit in the back of the room away from the group. You must always be involved with the students!
- Encourage the students to form small study groups outside of SI to perpetuate learning

The Core Principles of Supplemental Instruction

Redirecting Questions

Redirecting questions can be considered the process most central to the Supplemental Instruction program. The process itself is fairly simple to understand but difficult to practice without a context to do so. The goal of this process is to encourage more and better student-to-student interactions in the sessions. It is based on the concept that we all learn better when we have to explain something to someone else. The natural tendency for anyone is to answer questions asked; this process requires the leader to suppress that tendency and redirect questions back to the group. Perhaps it is easier to illustrate this process with a few examples.

Sample Interactions:

Student to Leader: Who came up with the law of relativity?

Leader: Does someone have the answer to this question?

[Resist the natural urge to provide a quick answer, so you can go on with more complex questions. Redirect back to the group to avoid a Question & Answer session.]

Student to Leader: What is the derivative of a constant?

Leader: Can anyone find an answer to that in your notes or text?

[Use the resources that students have. Useful when it is obvious that students don't know the answer. Makes students think for themselves and process the material in a way that will be helpful for them.]

Student to Leader: I don't understand how temperature affects a chemical reaction.

Leader: I'm glad you brought that up! Why don't we analyze #5 on the handout to see if we can understand how temperature affects different reactions?

Let's see if we can come up with the reasons by the end of the session.

[Remember to use responses that offer positive reinforcement. Leaders often will anticipate problem areas and have sample problems on a handout. A useful handout may structure the answers and list steps.]

Student to Leader: I don't know how to do this problem.

Leader: What part(s) of the problem do you understand?

[This will help narrow the question and divide it up in more useful parts.]

Student to Leader: I understand how to get the derivative, but I don't know what to do next.

Leader: Would someone please go to the board and scribe as we work the problem out together? Or: Would someone please put what you have for this problem on the board?

[Note: This interaction demonstrates that there may be a two- or three-phase process. SI leaders get questions redirected back to them, for example. In that case, help the students to structure the problem, redirecting as you go.]

The Inside Scoop on Redirecting Questions

One of the most important moments of an SI session happens when a member of the study groups asks the SI leader a direct question. If the leader answers the question for the group member, SI sessions will soon be reduced to the SI leader answering questions and re-lecturing over the material. It is, therefore, critical to the overall goal of SI that questions be redirected to the group to be answered. This is more difficult than it sounds because it is counter intuitive not to answer a question to which you know the answer.

Questions that require students to think – It's all in the verbs!

- ❖ Level 1 (Knowledge) – define, repeat, record, list, recall, name, relate, underline
- ❖ Level 2 (Comprehension) – translate, restate, discuss, describe, recognize, explain
- ❖ Level 3 (Application) – interpret, apply, employ, use, demonstrate, sketch,
- ❖ Level 4 (Analysis) – distinguish, analyze, differentiate, calculate, test, compare
- ❖ Level 5 (Synthesis) – compose, plan, design, arrange, collect, create, prepare
- ❖ Level 6 (Evaluation) – judge, evaluate, compare, value, score, revise, assess

Directing Discussion Back to the Group

- ❖ Does anyone know the answer to that question?
- ❖ Can anybody help Mary answer that question?
- ❖ Can anyone find the answer to that in your notes?
- ❖ Let's look that up in the book.

- ❖ What do you think about that?
- ❖ How would you say that in a different way?
- ❖ What are we trying to find out?
- ❖ What do you mean by . . . ?
- ❖ Tell us more. . .
- ❖ What else did they do?
- ❖ Can you be more specific?
- ❖ In what way?
- ❖ What are you assuming?
- ❖ Why would that be so?
- ❖ How can that be?
- ❖ How would you do that?
- ❖ Are you sure?
- ❖ Give an example of that.
- ❖ How is that related to . . . ?
- ❖ Can you summarize the discussion up to this point?
- ❖ How does your response tie into . . . ?
- ❖ If that is true, then what would happen if . . . ?
- ❖ What would _____ say about that?
- ❖ Would any of you like to add something to this answer?
- ❖ How is your answer (point of view) different from _____ ?
- ❖ How could we phrase that into a question to ask Dr. X next class?
- ❖ What do we need to know in order to solve the problem?
- ❖ Which words in the question do you not understand?
- ❖ Let's rephrase it on the board and figure out what information we will need to answer it.
- ❖ What is this question asking for?
- ❖ Why are you thinking of it in that way?
- ❖ Can you think of another way to think about this?
- ❖ Let's write down everything we know about this topic/problem/theory.
- ❖ How can you relate this to everyday life?
- ❖ Okay, that's the book definition, but how do we define that (i.e. in your own words)?

So, how do you think you can redirect questions?

Practice Exercise

1. Have each participant write down a question that could be asked in a session for his/her discipline.
2. Make sure that the group is in a circle to avoid even this practice exercise's evolving into a mini-lecture.
3. Select one participant to take the role of an SI leader.
4. Have the participants ask the questions they have written down.
5. Have the leader redirect the questions to the group. Group members should answer as naturally as possible.
6. After several exchanges, change who is taking the role of the leader and repeat the process.

Discussion and Debrief:

1. How does this process attempt to break the *Dependency Cycle*?
2. Map the interaction patterns that occurred during this exercise. Discuss how effective the interactions were in promoting student learning.
3. What would you do if the response by the student after the leader's redirect were "If I knew how to do this problem, I wouldn't have to come to SI"?
4. Make sure you are redirecting the right questions. Can you give an example of a redirection that shows that the leader misunderstood the question?
5. Are there some questions that should not be redirected? Give an example.
6. Give an example of an additional sample phrase for redirecting questions.

Wait-Time

Definition:

Wait-time is the time that elapses between an SI leader-initiated question and the next behavior (student response or the leader talking again). There are two kinds of wait-time:

1. The time the leader waits after asking a question, and
2. The time the leader waits after a response.

Rationale:

Wait-time is an important factor in successful SI sessions. Extensive research has demonstrated that the quality and quantity of students' verbal responses increases significantly if teachers (SI leaders) regularly utilize at least three seconds of wait-time. Wait-time (2) seems to be even more significant than wait-time (1). So, once again, if SI leaders resist the natural temptation to jump in too quickly to answer or rephrase, student learning improves. Increased wait-time probably allows the brain more opportunity to consolidate information, which allows for deeper processing of information. According to de Jong and Ferguson-Hessler, deep-level knowledge is associated with comprehension, abstraction, critical judgment, and evaluation. Deep-level knowledge "has been thoroughly processed, structured, and stored in memory in a way that makes it useful for application and task performance."

A 1987 study showed amazing results when the amount of wait-time after a question is asked was increased from one to three seconds.

<i>Wait 1 second</i>	<i>Wait 3 seconds</i>
3 responses	37 responses
7 words/response	28 words/response

When Students Don't Respond:

SI leaders may worry about what to do if no one responds. After waiting 5-10 seconds with no responses, they may want to try one of the following:

- ❖ Repeat the question
- ❖ Rephrase the question
- ❖ Simplify the question
- ❖ Ask a student to attempt to rephrase the question
- ❖ Break down the question into its component parts
- ❖ Make the question more specific

❖ Ask students what it is about the question they do not understand

*After each alternative, wait an additional 5-10 seconds.

Practice Exercise:

1. What can you as an SI leader do if no one answers a question?
2. Write one possible question from your discipline to actually demonstrate the technique.
Write down several anticipated responses.
3. Use the *Think-Pair-Share* technique with the others in the group using the question you just wrote down in #2. [See *Think-Pair-Share in the Collaborative Learning Techniques*.]
4. What are some ways you can remind yourself to wait? (Examples: take a drink of water, look at each of the students, etc.)

Checking for Understanding

Definition:

The learning strategies that SI leaders use in their sessions are designed to promote student-to-student interactions. We cannot automatically assume, however, that the students are gaining understanding from their interactions. Instead, we must check for understanding by asking the students to confirm that they have learned the content.

Rationale:

The most common method of checking understanding is to ask the students a closed-ended question like, “Do you understand?” This question can be answered with a simple yes or no. This is not effective because students are sometimes uncomfortable admitting that they still do not understand a concept, especially if considerable time has just been spent on it during the session. Instead, questions that check for understanding should be open-ended and require higher-order thinking skills.

Type of Question	Connection to Bloom’s	Example Questions
Close-Ended Questions	Appropriate for Knowledge level of learning.	“Is this a homozygous or heterozygous plant?”
	Helps you and students confirm their understanding and quickly identify knowledge gaps.	“What is the definition of reward power?”
Open-Ended Questions	Appropriate for Comprehension through Evaluation levels of learning.	“Why are diamonds not considered scarce in economic terms?”
	Requires students to “dive deep”: explain, make connections and associations, and develop deeper understanding of concepts.	“When would an aligning action be detrimental?” “What disease would create the bone deformity that you see in this picture?”

It is essential that students can explain the discussed topic in their own words so the leader knows that students understand before proceeding to the next topic. If there is any doubt that the students have not “got” it, the concept should be discussed again. The leader should make sure that the students get a chance to demonstrate their understanding so that demonstrating understanding becomes a part of the SI sessions. This will improve student preparation and learning.

“*Which one*” questions ask students to collect information and make informed decisions.

Example: “Which serious public health issue most deserved research funding from NFS?”

“*How*” questions ask students to understand problems, weigh options from different points of view, and propose solutions.

Example: “Propose a solution to a specific environmental problem in Utah. Explain how your proposal will work, and why it is the best option.”

“*What if*” or hypothetical questions ask students to use the knowledge they have to pose a hypothesis and consider options.

Example: “What if unique censorship laws were enacted for the internet that are different than print media?”

“*Should*” questions ask students to make a moral or practical decision based on evidence.

Example: “Should we discontinue trade with China?”

“*Why*” questions ask students to understand cause and effect, to understand relationships, and to help them get to the essence of an issue.

Example: “Why do people abuse children?”

Possible Ways to Check for Understanding:

1. Always maintain eye contact with the students during the SI session. By making eye contact, you will likely see when a student is confused.
2. Ask a student to summarize the concept just covered. If he or she struggles, ask the group to help him or her.

3. Ask for a volunteer to write the main points of the discussion on the board.
4. Ask a question that requires the student to understand in order to answer correctly. For example, if you just covered the difference between the logical rules of interference, Disjunctive Syllogism and Modus Ponens, ask the group, “So I can use Disjunctive Syllogism on this argument, right?” when you cannot, based on the discussion. When they reply, “No, of course not”, ask them why not.
5. Once in a while, intentionally make mistakes on the board. The students will catch you if they understand. If no one notices, probe the group about the content on the board until they discover the mistake. (Frequent use of this strategy may confuse students.)
6. Ask the students to rephrase the question you asked originally or the summary another student gave.
7. Ask for real-life examples or applications of the concept.
8. Ask for a similar problem, metaphor, or analogy.
9. Informal Quiz

When time permits, the informal quiz will help students put all of the important ideas together. We have provided information about the informal quiz in the Strategies Section.

10. Predict Test Questions

Divide students into groups of two or three. Have them write a test question for a specific topic, ensuring that all major topics have been covered. Ask students to write their question on the board for discussion. This technique requires more time but the benefit is that students see additional questions which focus on the specific material that has just been presented.

11. Identify the “Big Idea”

Ask each person to tell what he or she thought was the most important concept, idea or new understanding they learned during the session. We call these “take homes.” That is, if they could only take home one thing from the information presented, what would it be? Ask each student to offer a different “Take home.” This technique can be useful if you’re nearly out of time. If there is sufficient time, have students organize the selected topics into more generalized concepts. We know that students frequently feel overwhelmed by the sheer volume of information that they have to deal with during the term. They need practice with organizing all of the information presented.

12. Predict the Next Lecture Topic

Have students predict the next lecture topic. See if there are connections between the last lecture and the next one. This activity helps to prepare them for new material, especially if it can be connected to information they have just mastered in the SI session.

13. Summarize the Procedure/ Steps/ Etc.

Sometimes it is more important to go over how an answer was arrived at, rather than reviewing the process itself. Remember to give time to the process of learning.

The Board-Work Model

Definition:

Well-organized board work in SI sessions is crucial to helping students understand how to solve specific problems. The *Board-work Model* is a method of organizing board work in order to facilitate an understanding of problem-solving strategies as a process. It requires four types of information to be collected for each problem: (1) prerequisite knowledge, (2) mathematical steps, (3) a narrative of the steps, and (4) identification, solution, or construction of a similar problem. SI leaders use this model when (1) students don't know how to solve a problem, (2) students are stuck within a problem/solution or (3) to check student understanding of how to solve each type of problem, or (4) to help organize and “chunk” different types of problems.

Rationale:

Problem-solving courses like chemistry, physics, or mathematics are major obstacles for many students. Students often don't know how to begin to attack a problem or do not know what to do when they encounter difficulty in the midst of finding a solution. In general, SI creates a “safe haven” for students to learn general problem-solving skills. In SI sessions, attendees help each other by actively exchanging strategies for problem-solving. Students need to become part of a *collaborative, mutual-help team, attacking a common problem and solution together by pooling resources*. When students get stuck, the manner in which SI leaders handle the situation determines whether the student gains an understanding of the process or merely gets a right answer.

Procedure:

- a. Arrive early and organize the board into four columns. Label like the diagram on the next page. Allow enough room for two people to write at once.
- b. Ask for a volunteer to write on the board. If you encounter reluctance, reassure them that the group will tell the scribe what to write (they don't need to know what to do already).
- c. As a group, brainstorm all formulas, equations, rules, etc. required to solve the problem.
- d. Ask for another volunteer to scribe.
 - i. The first volunteer will list the mathematical steps in the solution; the second will write out the narrative of the steps in the solution. This

should be done simultaneously, and the steps in each column should be numbered. The narrative is very important because students need to verbalize the steps in their own words.

- ii. Encourage students whose skills are verbal to try their hand at the mathematical steps and vice-versa. Remember, the group will help them.
- iii. Depending on the ability level of the group, identify, solve, or construct and solve a similar problem. Generally, weaker students should begin by identifying similar problems, but do not underestimate their ability to or how much they will benefit from constructing a problem. If they can get inside a problem enough to construct another one, it will help them understand problem-solving more thoroughly.

Board-Work Model Examples

Example 1

This is the standard *Board-work Model*. The model can be adapted to fit various problem-solving disciplines.

Prerequisites	Mathematical Steps in the Solution	Narrative of Mathematical Steps	Similar Problem: Identify, Construct, Solve
Include relevant equations, formulas, charts, and general rules for solving the type of problem. Include the source of this information (notes, text, previous course)	Solve the problem step-by-step. Number each step:	Describe what is happening in each step of the solution. Try to introduce students to the language of the discipline.	Check understanding by asking students to identify, construct, and solve similar problems. Provide the answer and the source of any problems used.
For example:	1.	1.	
	2.	2.	
	3.	3.	
% yield = $\frac{\text{actual}}{\text{theoretical}}$	4.	4.	
	4.	5.	
	5.		

Below is an example of how the *Board-work Model* may be used in a computer science programming course. Notice that the columns serve a slightly different purpose here than they do above. However modified, it is always important to include the narrative of the steps taken to solve the problem.

Example 2

Prerequisites	Narrative of Mathematical Steps	Rules	Similar Problem
<p>1. While (condition)</p> <pre>{ 2.do something; 3.increment; }</pre>	<p>1. While is a word reserved for a loop. The condition determines when the loop will end; in other words, which condition will be checked for “true” every time the loop runs.</p> <p>2. This step(s) will be repeated every time the loop runs.</p> <p>3. The increment increments the variable used in a determined loop to avoid an infinite loop.</p>	<p>The condition must follow valid logic.</p>	<p>1. While (x<10)</p> <pre>{ 2. cout<<"Hi"; 3. x++; }</pre>

Study Skills

Study Skills are the tools SI Leaders teach and reinforce in SI sessions to help students learn to study more effectively. Given the knowledge that many students come to college without the necessary study skills, the job of teaching students how to study becomes even more vital. Our goal, as SI leaders, should be to build up our students' study skill "tool box" with a variety of study skills that will be of benefit throughout their college careers. SI leaders should make it a point to not only introduce and demonstrate various study skills, but to also reinforce their use during the semester. Sharing those that have worked especially well for a particular class in the past is a huge bonus, and using these "favorites" repeatedly in sessions is encouraged.

The idea is not to introduce a new study skill each session just for the sake of doing something new. Rather, the idea is to introduce several that are useful to the course (and other courses) and then to give plenty of opportunity to practice this skill. You may even repeat a skill a few times because one is more effective for the course content than others. This constant exposure is what helps students learn how to effectively use the study skills and to be convinced of their effectiveness. As a suggestion, try introducing a new study skill during one session of the week and then practice using it at the next session. On another note, test review sessions are a great time to not only review content to be covered on the test but to also review the study skills presented since the last test to remind students to utilize them.

As a point of distinction, activities in SI sessions are different than study skills. Study skills are techniques that can be effectively utilized when individual students study at home. Activities, on the other hand, may be used to practice a study skill and are generally planned to be done in session with the whole group. Examples of activities are: 1) playing Jeopardy, 2) having a competition with flashcards to see which team answers the most correctly in the shortest amount of time, 3) for subjects that have multiple parts of an object/organism to be learned, hand out pictures with the parts indicated but not labeled – divide into groups and have each group determine the appropriate labels, 4) do group problem solving – send as many people as possible to the board and have them work on the same problem – compare answers and discuss with the whole group why the problem was worked that way. As you notice, each of these activities include study skills, but they are utilized in a way that allows the group to participate.

Group Work

Collaborative learning, better known as group work, is a critical SI technique that encourages students to learn from each other. This is one of the reasons why we call SI peer-assisted group study. Not only do we have peers leading the sessions, but we also have session attendees learning from each other.

There are a number of different ways to utilize group work in a session, and below are just a few of those:

- a. Group Discussion – a general discussion of an issue or topic by the group where individual members are free to contribute as they wish. Ideally, everyone is equally involved, and the SI leader should pay close attention to encourage everyone to participate and to not allow any one member to dominate the discussion.
- b. Clusters – group participants are divided into smaller groups for discussion. You may allow them to self-select their small group sometimes whereas you mix it up purposefully at others. After discussion has occurred in the cluster, remember to allow each cluster to report their ideas back to the large group. Another way to utilize clusters is to assign different parts of the same problem or issue to different groups. After they've had time to work on their components, have everybody share with the larger group.
- c. Turn to a partner – group members work with a partner on an assignment or discussion topic. Once time has been allotted for partner discussion, the leader should bring everyone back together to hear and share ideas from each pair.
- d. Think/Pair/Share – group members work on an assignment or project individually and then pair up to share their ideas. The intention here is to give individuals the chance to think about a topic or problem before they discuss it with a partners. Research shows that answers differ dramatically when people are given time to contemplate. Announce a specific amount of time to thin and then have participants turn to their partner and share their ideas. Ask for volunteers to share with the whole group.
- e. Create teams to compete in games
- f. Pair stronger students with those struggling to work cooperatively on problems.

Spectrum of Diverse Learners

Texas A&M University-Corpus Christi has become home for many students from a multitude of different races, religions, backgrounds, countries, cultures, and academic preparation. As an SI Leader, you will need to be sensitive to the types of students you will encounter in your sessions. The types of learners you will encounter in your sessions include but are not limited to the following categories.

Traditional Students

A traditional university student has completed their high school degree and immediately enrolled at the university. Typically, these students are enrolled as full-time students, and their lives center around their academic and social pursuits at the university.

Non-Traditional Students

The term “Non-traditional Student” encompasses any student who does not fit the definition of a traditional student. Many of these students have not had any formal schooling in seven years or more. Many of them have families or dependents such as spouses, partners, and/or children. These students return to the university to complete unfinished degrees, fulfill prerequisites for professional or graduate schools, or to simply continue their education. Their expectations and assumptions about university coursework may vary from the traditional student because of their previous experiences with academia.

International Students

Texas A&M University – Corpus Christi has a large percentage of international students. With this type of enrollment, it is likely that your classes will have at least one or more international students. The English language could be a barrier for some of the students. Cultural expectations about education vary greatly from one country to another, and adjusting to the demands of university education in the U.S. may be difficult.

Students with Learning Disabilities

Learning disabilities are a general set of disorders that can affect a person's ability in the areas of listening, speaking, reading, writing, and mathematics. People with diagnosed learning disabilities are not "dumb" or "lazy." In fact, most people with diagnosed learning disabilities have average to above average intelligence, but they process information differently than most people. Unlike other disabilities, learning disabilities are "hidden" and are often not apparent until the person is in an educational setting.

There is no one specific sign that shows a person has a learning disability.

Characteristics* that may be apparent include:

- Not making use of reading to gather information
- Making many errors when reading aloud, and repeating and pausing often
- Focusing on word recognition to such a degree that it detracts from reading comprehension
- Not understanding what he or she reads
- Showing persistent problems with spelling
- Having sloppy handwriting that is difficult to read or holding a pencil awkwardly
- Struggling to express ideas and communicate in writing
- Having trouble following directions
- Having difficulty with verbal memory and processing large amounts of spoken language
- Not following the social rules of conversation, such as taking turns, and standing too close to the listener
- Not knowing where to begin a task or how to go on from there
- Having problems with abstract reasoning
- Difficulties with socio-emotional skills and behavior
- A lack of "executive functions," including self-motivation, self-reliance, self-advocacy and goal-setting; or problems with attention, which may be accompanied by hyperactivity, distractibility or passivity

*list of characteristics taken from Florida's Focus on Adults with Learning Disabilities

(<http://www.floridatechnet.org/bridges/factsandstats.pdf>)

Students with Learning Difficulties

Not all students with learning difficulties have a learning disorder.

Many students may struggle with reading, writing, math, memory, anxiety, etc. These struggles do not reflect a student's intelligence, but rather a limited skill-set in academics. Students with learning difficulties or learning disabilities can learn effective self-management, study, and organizational strategies to help them become academically successful.

Physical Disabilities

Physical disabilities impair a person's motor or sensory abilities. These conditions may be debilitating but in no way reflect the student's cognitive abilities or intelligence. Examples of physical impairments you may encounter in your SI sessions are:

- Low-vision or blindness
- Paraplegia or quadriplegia (limb paralysis)
- Hearing impairments
- Motor impairments (cerebral palsy, Tourette's syndrome)
- Speech impediments
- Temporary injuries (sports injuries, accidental injuries, etc.)

Bloom's Taxonomy

Bloom's Taxonomy provides an important framework for teachers to use to focus on higher order thinking. By providing a hierarchy of levels, this taxonomy can assist teachers in designing performance tasks, crafting questions for conferring with students, and providing feedback on student work

This resource is divided into different levels each with **Keywords** that exemplify the level and questions that focus on that same critical thinking level. **Questions for Critical Thinking** can be used in the classroom to develop all levels of thinking within the cognitive domain. The results will be improved attention to detail, increased comprehension and expanded problem solving skills. Use the keywords as guides to structuring questions and tasks. Finish the Questions with content appropriate to the learner. Assessment can be used to help guide culminating projects. The six levels are:

Level I Knowledge/Remember

Level II Comprehension/Understand

Level III Application

Level IV Analysis

Level V Synthesis/Evaluate

Level VI Evaluation/Create

Blooms Level I: Knowledge/Remember

Exhibits memory of previously learned material by recalling fundamental facts, terms, basic concepts and answers about the selection.

Keywords:

Who, what, why, when, omit, where, which, choose, find, how, define, label, show, spell, list, match, name, relate, tell, recall, select

Questions:

- What is...? • Can you select? • Where is...? • When did ____ happen?
- Who were the main...? • Which one...? • Why did...? • How would you describe...?
- When did...? • Can you recall...? • Who was...? • How would you explain...?
- How did ___happen...? • Can you list the three...? • How is...? • How would you show...?

Assessment:

Match character names with pictures of the characters.

Match statements with the character who said them.

List the main characteristics of one of the main characters in a WANTED poster.

Arrange scrambled story pictures and/or scrambled story sentences in sequential order.

Recall details about the setting by creating a picture of where a part of the story took place.

Blooms Level II: Comprehension/Understand

Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptors and stating main ideas.

Keywords:

Compare, contrast, demonstrate, interpret, explain, extend, illustrate, infer, outline, relate, rephrase, translate, summarize, show, classify

Questions:

- How would you classify the type of...? • How would you compare...? Contrast...?
- Will you state or interpret in your own words...? • How would you rephrase the meaning?
- What facts or ideas show...? • What is the main idea of? • Which statements support...?
- Which is the best answer...? • What can you say about ...? • How would you summarize...?
- Can you explain what is happening...? • What is meant by...?

Assessment:

Interpret pictures of scenes from the story or art print.

Explain selected ideas or parts from the story in his or her own words.

Draw a picture and/or write a sentence showing what happened before and after a passage or illustration found in the book (Visualizing).

Predict what could happen next in the story before the reading of the entire book is completed.

Construct a pictorial time-line that summarizes what happens in the story.

Explain how the main character felt at the beginning, middle, and /or end of the story.

Blooms Level III: Application

Solve problems in new situations by applying acquired knowledge, facts, techniques and rules in a different, or new way.

Keywords:

Apply, build, choose, construct, develop, interview, make use of, organize, experiment with, plan, select, solve, utilize, model, identify

Questions:

- How would you use...? • How would you solve ___ using what you've learned...? • What examples can you find to...? • How would you show your understanding of...?
- How would you organize _____ to show...? • How would you apply what you learned to develop...?
- What approach would you use to...? • What other way would you plan to...?
- What would result if...? • Can you make use of the facts to...?
- What elements would you use to change...? • What facts would you select to show...?
- What questions would you ask during an interview?

Assessment:

Classify the characters as human, animal, or thing.

Transfer a main character to a new setting.

Make finger puppets and act out a part of the story.

Select a meal that one of the main characters would enjoy eating: plan a menu, and a method of serving it.

Think of a situation that occurred to a character in the story and write about how he or she would have handled the situation differently.

Give examples of people the student knows who have the same problems as the characters in the story.

Blooms Level IV: Analysis

Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.

Keywords:

Analyze, categorize, classify, compare, contrast, discover, dissect, divide, examine, inspect, simplify, survey, test for, distinguish, list, distinction, theme, relationships, function, motive, inference, assumption, conclusion, take part in

Questions:

- What are the parts or features of . . . ? • How is _____ related to . . . ?
- Why do you think . . . ? • What is the theme . . . ? • What motive is there . . . ?
- Can you list the parts . . . ? • What inference can you make . . . ? • What conclusions can you draw . . . ?
- How would you classify . . . ? • How would you categorize . . . ?
- Can you identify the different parts . . . ? • What evidence can you find . . . ?
- What is the relationship between . . . ? • Can you make a distinction between . . . ?
- What is the function of . . . ? • What ideas justify . . . ?

Assessment:

Identify general characteristics (stated and/or implied) of the main characters.

Distinguish what could happen from what couldn't happen in the story in real life.

Select parts of the story that were the funniest, saddest, happiest, and most unbelievable.

Differentiate fact from opinion.

Compare and/or contrast two of the main characters.

Select an action of a main character that was exactly the same as something the student would have done.

Blooms Level V: Synthesis/Evaluate

Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.

Keywords:

Build, choose, combine, compile, compose, construct, create, design, develop, estimate, formulate, imagine, invent, make up, originate, plan, predict, propose, solve, solution, suppose, discuss, modify, change, original, improve, adapt, minimize, maximize, theorize, elaborate, test, happen, delete

Questions:

- What changes would you make to solve...? • How would you improve...?
- What would happen if...? • Can you elaborate on the reason...?
- Can you propose an alternative...? • Can you invent...?
- How would you adapt _____ to create a different...?
- How could you change (modify) the plot (plan)...? • What facts can you compile...?
- What way would you design...? • What could be combined to improve (change)...?
- Suppose you could _____ what would you do...? • How would you test...?
- Can you formulate a theory for...? • Can you predict the outcome if...?
- How would you estimate the results for...? • What could be done to minimize (maximize)...?
- Can you construct a model that would change...? • How is _____ related to...?
- Can you think for an original way for the...? • What are the parts or features of...?
- Why do you think...? • What is the theme...? • What motive is there...?
- Can you list the parts...? • What inference can you make...? ...? • What ideas justify...?
- What conclusions can you draw...? • How would you classify...? • How would you categorize...?
- Can you identify the different parts...? • What evidence can you find...?
- What is the relationship between...? • Can you make the distinction between...?

Assessment:

Create a story from just the title before the story is read (pre-story exercise). Write three new titles for the story that would give a good idea what it was about. Create a poster to advertise the story so people will want to read it. Use your imagination to draw a picture about the story. Create a new

product related to the story. Restructure the roles of the main characters to create new outcomes in the story. Compose and perform a dialogue or monologue that will communicate the thoughts of the main character(s) at a given point in the story. Imagine that you are the main character. Write a diary account of daily thoughts and activities. Create an original character and tell how the character would fit into the story. Write the lyrics and music to a song that one of the main characters would sing if he/she/it became a rock star and perform it.

Blooms Level VI: Evaluation/Create

Present and defend opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria.

Keywords:

Award, choose, conclude, criticize, decide, defend, determine, dispute, evaluate, judge, justify, measure, compare, mark, rate, recommend, rule on, select, agree, appraise, prioritize, opinion, interpret, explain, support importance, criteria, prove, disprove, assess, influence, perceive, value, estimate, deduct

Questions:

- Do you agree with the actions/outcome...? • What is your opinion of...?
- How would you prove/ disprove...? • Can you assess the value or importance of...?
- Would it be better if...? • Why did they (the character) choose...?
- What would you recommend...? • How would you rate the...? • How would you evaluate...?
- How would you compare the ideas...? The people...? • How could you determine...?
- What choice would you have made...? • What would you select...?
- How would you prioritize...? • How would you justify...?
- What judgment would you make about...?
- Why was it better that...? • How would you prioritize the facts...?
- What would you cite to defend the actions...? • What data was used to make the conclusion...?
- What information would you use to support the view...?
- Based on what you know, how would you explain...?

Assessment:

Decide which character in the selection he or she would most like to spend a day with and why.

Judge whether or not a character should have acted in a particular way and why.

Decide if the story really could have happened and justify reasons for the decision.

VARK Modalities

The acronym VARK stands for Visual, Aural, Read/Write, and Kinesthetic sensory modalities that are used for learning information. Fleming and Mills (1992) suggested four modalities that seems to reflect the experience of the students and teacher. Although there is some overlap between they are defined as follows.

Remember life and work are multimodal so there are no hard and fast boundaries.

Visual (V):

This preference includes the depiction of information in maps, spider diagrams, charts, graphs, flow charts, labeled diagram, and all the symbolic arrows, circles, hierarchies, and other devices that people use to represent what could have been presented in words. It **does not include** still pictures or photographs of reality, movies, videos, or PowerPoint. It **does include** designs, whitespace, patterns, shapes, and the different formats that are used to highlight and convey information. Using a whiteboard to draw a diagram with meaningful symbols for the relationship between different things is helpful for those with a Visual preference. **It must be more than mere words in boxes.**

Aural/Auditory (A):

This perceptual mode describes a preference for information that is “heard or spoken.” Learners who have this as their main preference report that they **learn best** from lectures, group, discussion, radio, email, using mobile phones, speaking, web-chat and talking things through. The Aural preference includes talking out loud as well as talking to oneself. Often people with this preference want to sort things out by speaking first, rather than sorting out their ideas and then speaking. They may say again what has already been said, or ask an obvious and previously answered question. They have need to say it themselves and they learn through saying it-their way.

Read/Write (R):

This preference is for information displayed as word. Being able to write well and read widely are attributes sought by employers of graduates. This preference emphasizes text-based input and output-reading and writing in all its forms but especially manuals, reports, essays, and assignments. People who prefer this modality are often **addicted to** PowerPoint, the Internet, list,

diaries, dictionaries, thesauri, quotations, and **words, words, words**.

Kinesthetic (K):

By definition this modality refers to the “perceptual preference related to the use of experience and practice (simulated or real).” Although such an experience may invoke other modalities, the key is that people who prefer this mode are connected to reality, “either through concrete personal experiences, examples, practice, or simulation” (Fleming and Mills, 1992, pp. 140-141). **It includes** demonstrations, simulations, videos, and movies of “**real**” things, as well as case studies, practice and applications. **The key is the reality or concrete nature of the example.** If it can be grasped, help tasted, or felt it will probably be included. People with this as a strong preference learn from the experience of doing something and they value their own background of experience and less so the experiences of other.

What about Mixtures? Multimodality (MM):

Life is multimodal. There are seldom instances where one mode is used, or is sufficient, so that is why there is a four-part VARK profile. That is why the VARK questionnaire provides four scores and also why there are mixtures of those four modes. Those who do not have a standout mode with one preference score well above other scores, which is the definition of multimodal.

There are two types. There are those who are flexible in their communication preferences and who switch from mode to mode depending on what they are working with. They are context specific. They choose a single mode to suit the occasion or situation. If they have to deal with legalities, they will apply their Read/Write preference. If they are to watch the demonstration of a technique, they will be expressing their kinesthetic preference. They are described as **VARK Type One**, and they may have two, three, or four almost-equal preferences in their VARK scores. There are others who are not satisfied until they have had input (or output) in all of their preferred modes. They take longer to gather information from each mode and, as a result, they often have a deeper and broader understanding. They may be seen as procrastinators or slow-deliverers, but some may merely be gathering all the information before acting. Their decision making and learning may be better because of that breadth of understanding. They are described as **VARK Type Two**.

- Accessed from: <http://www.vark-learn.com/english/page.asp?p=categories>

VARK Learning Styles

The learning styles model that we use in SI relates to how learners use their various senses to acquire and process information. The model is referred to as VARK, which stands for **Visual, Auditory, Read-Write, Kinesthetic** learning and teaching strategies. While this model appears simple or “common sense”, it is quite effective in guiding you to plan and prepare your teaching methods/learning activities so that your SI sessions will maximize your students’ comprehension of the course material that you review.

Learning Style	Teaching and Learning Tips
<p style="text-align: center;">Visual</p> <p>The visual learner needs to see, observe, record, write.</p>	<ul style="list-style-type: none"> ❖ Use pictures, videos, computer software, textbooks, diagrams, graphs, charts, and tables ❖ Use color to organize and identify information ❖ Visualize words and facts to be retained, develop examples, analogies and metaphors
<p style="text-align: center;">Auditory</p> <p>The auditory learner needs to talk and listen.</p>	<ul style="list-style-type: none"> ❖ Use audio clips, videos, podcast ❖ Participate in discussions, group assignments, group problem-solving, debates, study groups, and paired learning activities ❖ Ask students to provide oral explanations ❖ Provide oral summaries of information: to self or others
<p style="text-align: center;">Read-Write</p> <p>The read-write learner needs to read material and organize information through writing (and/or typing).</p>	<ul style="list-style-type: none"> ❖ Review and discuss notes, textbooks, handouts, glossaries, PowerPoint presentations, and supplemental readings. ❖ Rewrite notes; turn diagrams, charts, etc. into organized outlines ❖ Create lists, flashcards, paragraph summaries, tables, and charts ❖ Write out practice test questions and answers
<p style="text-align: center;">Kinesthetic</p> <p>The tactile learner needs to be physically involved by doing and/or touching: “hands on” experience.</p>	<ul style="list-style-type: none"> ❖ Use physical material to explain or represent concept: models, objects, computer programs, “props” to represent abstract concepts, subject-related games and puzzles ❖ Use a white board to solve problems and draw diagrams, charts, tables, etc. ❖ Rehearse, memorize while walking or exercising ❖ Study by writing (or typing) over and over

Planning a Session

Planning Logistics

- Determine your learning objectives.
 - Learning objectives are the map for each session. They guide you in the following:
 - Determining information to review in a SI session
 - Assessing the learning levels expected of students by their professor
 - Selecting the strategies that will actively involve students in learning the course material
 - Use the following questions to develop learning objectives for your sessions:
 - What were the main concepts taught by the professor? What concepts will be the most difficult for students to understand?
 - What other concepts could likely be on the exam and were discussed only briefly or were in the assigned reading and not discussed?
 - What prerequisite information is necessary for students to understand so that they can learn the important and/or most difficult concepts?
- Selecting Strategies
 - Select appropriate strategies that will help your students become actively involved in achieving the learning objectives.
 - Do not choose strategies that do not support your objective because you risk creating a session plan that confuses or frustrates the students.
 - Use the following questions to determine strategies to utilize in sessions:
 - Will the strategy students learn how to learn the material?
 - Does the strategy help students become more independent learners?
 - Does the strategy help students understand the material better?
 - Does the strategy allow the students reason, think, analyze, organize, and collaborate?

Session Planning Basics

- Running a successful session requires careful planning. Never go into a group intending to “play it by ear” or “answer questions.”
- Ask students during class if they will be attending sessions. This can help you plan because you will have a general idea of the size of session to expect. Always plan for more than expected just in case.
- Build flexibility into the organization of your sessions. Be prepared to deviate and adapt your plan to meet student needs. Be sure to leave enough time at the end to cover questions.
- Make SI worth students’ time by planning each session thoroughly while still maintaining flexibility. Have specific activities to work on, and don’t expect students to come with questions. They will have more questions after the activity.
- Don’t feel tied to keeping up with the content. You will not be able to review every bit of content provided by the instructor and the text. Pick and choose the main ideas, but don’t cover additional items or skip ahead of the material the professor is discussing in class.
- It is more effective to “model” how successful students learn a particular subject than it is to “tell” students what they need to know. Show them how to be independent learners.

Strategies for Sessions

Organizational/Visual Strategies

Venn Diagram

A Venn Diagram can be used to compare the similarities and differences between two concepts, systems or theories. Two overlapping circles are drawn on the board with each circle labeled as one of the two concepts. Students will then write the similarities in the overlapping portion and then differences in the outer portion of the circles. This is a good visual technique for reviewing similar yet contrasting concepts.

Vocabulary Development

Chunking related terms into meaningful groups can be more helpful than drilling students on exact definitions. Compose a list of key terms from the lecture ranging in levels of specificity. Scramble the terms and then encourage pairs of students to organize the terms into several categories that are meaningful to them. Then have them define or give an example of terms where appropriate. Finally, have each pair discuss their categories with the entire group. Get the students to check the spelling!

K♦W♦L

Helps students to activate prior knowledge and link to new information to make connections with what is already known. Title 3 columns:

What I **K**now;

What I **W**ant to know

What I **L**earned.

Can be used to help focus the session on particular concepts that students are having difficulties with.

Towards end of session go back to chart and have students go back to the K column to see if any info needs to be corrected, then see if there are any questions left unanswered and then complete the L column.

Visuals

Don't forget the importance of using visual study aids to emphasize important points. Visuals should be used to help students grasp the "big picture." The key idea is to visualize the

information and use as few words as possible.

Matrices

Information presented during lectures and the text are usually related to other topics. A matrix is an excellent way for students to see the relationships between different topics throughout the course. Reference your leader's manual for an example and exact directions for constructing a matrix. The SI leader can initially provide the framework and a few clues for completing the matrix, but eventually the students should be responsible for designing the framework and complete the entire matrix.

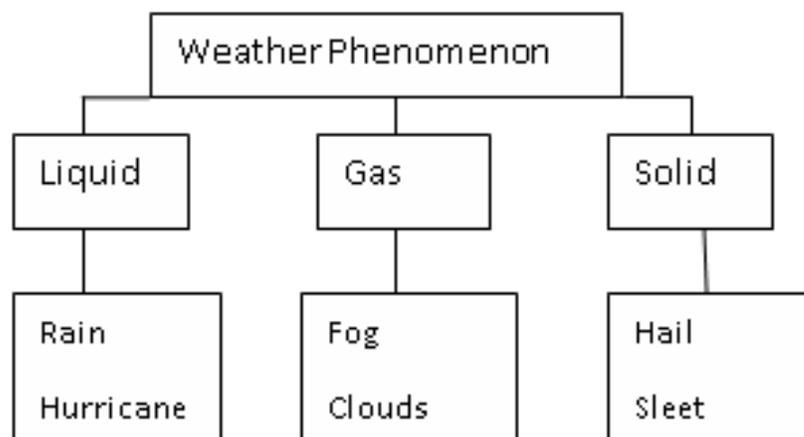
Affinity Grouping

This activity can help students break down a topic to identify and classify its parts. First each student generates ideas about a specific concept and writes each item on a sticky note. Then in small groups or one large group depending on number of attendees, sort and organize slips into categories on board or wall to identify common themes. Have students create a heading for each grouping. If using small groups have each group review each other's or have them explain their categories. Make sure students are only writing one idea per sticky note.

Hierarchies

Forming hierarchies is a method to organize information which utilizes different levels. The levels are based on whether a piece of information fits into a specific group, where higher level groups are much more inclusive and lower level groups are much more exclusive.

Example:



Concept Mapping

This strategy will look like a big spider web on the board when you are finished. Have the students break into small groups and encourage them to identify the central word, concept, or question around which to build the map. Start with a circle in the middle of the board and include the main idea within. Extend branches out from the central circle that includes all the subtopics from the main idea. Continue to add additional branches with related topics and circle groups of branches that are linked. This mapping encourages students to see the overall picture and helps bring focus away from minute details and back to the main ideas. End with an overall discussion of the topic.

Problem Solving Strategies

Peer Lessons

Select several problems over related material. Divide the students into 4-5 groups. Give each group one problem and have them write out the solution, using their textbook and class notes, on a transparency or at the board. Have each group come up and explain the problem in as much detail as they can. Have them show their thought processes and methods used in finding the solution. The SI leader adds or corrects anything he/she feels is necessary.

Grab Bag

This started out as a MLA grab bag where each student had to pull out a magazine, a paper, or a text book, etc. and reference it properly as if they were writing a theme paper. Other leaders realized that this idea could be adapted to objects that have to be identified and explained in a Biology session or word problems on cards in a hat for Math sessions. The options are bound only by your imagination. The intrigue, of course, is in not knowing which one you will pull out.

Boardwork Model

This is a method of organizing board work in order to facilitate an understanding of problem-solving strategies. The board should be divided into 4 sections:

- 1- Prerequisite knowledge,
- 2- Mathematical steps,
- 3- Narrative of the steps,
- 4- Additional sample problem.

Encourage one student to fill out section 1 on the board. Then, encourage two students to simultaneously complete section 2 and 3 on the board. Lastly, have another student complete the 4th section. Encourage students to use this model when studying outside of the SI session.

Paired Problem Solving/Think Aloud

This strategy requires students to verbalize what they are thinking about as they read a passage or solve a problem. Start by pairing the students into groups, one student should be the thinker/problem solver while the other student is the listener. The thinker must vocalize every step in the reasoning process and the listener must listen and understand every step the thinker is making. The pair should be working together. Be sure the listener continually encourages the thinker to vocalize. The listener should also point out any errors. After the problem is solved, the groups should rejoin the large group and share the problem solving process with the group.

Structured Problem Solving

Identify the steps in solving the particular problem, and separate the students into groups. Because the steps for solving the problem are given, it is easier for the students to handle large complex problems and they have greater confidence. Assign them a sample problem and give them a specific time period, at the end of which the group must have reached a consensus for the answer. Ask the students to report their solution and explain the steps that led to their answer. This strategy is most helpful for larger multi step problems.

Send a Problem

This strategy can work in pairs or individually depending on size of group. Works well in Math and Chemistry after a new concept has been taught to check for understanding.

Generate a list of problems and assign each a different problem. Have students complete Step 1. After a minute have them pass their problem to the right and then complete Step 2. Continue process until all steps are complete.

First Line Only

Problem-solving courses, particularly in the Sciences, are often perceived as major obstacles for many students. Frequently, students do not know where to commence or approach a problem. The First Line Only Strategy is particularly useful for students who need to be encouraged “to take the first step” towards finding the solution. In order to complete this exercise, the following is recommended: Firstly, you need to present a variety of types of problems so that the learner builds confidence in addressing the first level of the problem. Secondly, you will also need to

give a strict time limit so that only the first step towards the solution is addressed, e.g. for Calculus.

Summarizing the Procedure/Steps

This technique reviews the process of the learning that has taken place. It is important to cover how an answer was obtained rather than just making sure the answer was correct. This technique will insure that they will be able to satisfactorily complete more of the same type of problems in their homework or on a test.

Recall/Review Strategies

Around the World

To play a game of "Around the World" is a fun and simple activity, and is especially good for exam reviews and large groups. Before the session, the SI leader should make up a number of questions with simple answers (one-word or a short phrase). The fun begins when you have two students stand up next to each other and ask a question; the first person to answer correctly moves on to the next student to try another question against a new opponent, while the other sits back down. To win the game, a student must travel "Around the World," or win against every other student in the classroom. If no one succeeds in going completely "Around the World," the winner is whoever went around the furthest from their original seat.

Reciprocal Questioning

This strategy improves students' questioning and reasoning skills by encouraging the students to consider the quality and type of question. The leader should prepare ten to twelve varied questions over an important lecture or section of text. Once at the session, ask the students to read or review the assigned material to understand it 100%. Then, allow them to ask you questions. If students' questions extend beyond the reading, model your think process for them. After students have finished asking their questions, begin by asking them questions directly from the text or lecture. Then move on to higher order questions (refer to leader manual pg. 30-31). Finally, lead a discussion concerning what type of questions were asked? What were the differences and similarities between the students' and leader's questions?

Memory

This strategy works as a great opener for an SI session. The SI leader should prepare between 12-24 note cards. Half of the note cards should have vocabulary terms and the other half should have corresponding definitions (feel free to be creative). At the session, the SI leader should shuffle the note cards and place them facedown. Allow the first student to turn over 2 cards at a time until a match is found. Once a match is found, have the student remove that pair of cards and allow another student to take a turn finding a match. Allow the students to continue taking turns until all the cards have been paired together.

Informal Quiz

The Informal Quiz is a procedure, used in small group study sessions, which is educationally compatible with the goals and objectives of SI. Although the title implies a testing tool, this quiz is not intended to be used as a method of formally evaluating student work. The focus is on learning rather than grading. In general, the Informal Quiz is used to develop and reinforce comprehension, improve retention of information, stimulate interest in the subject area, and promote student participation in the study session. More specifically, the Informal Quiz enhances an educational experience in the following manner:

1. Allows weaker students to participate equally with stronger students, in the same session, since questions are designed to have more than one correct answer.
2. Permits each student an opportunity to demonstrate competence. Allowing the random answering of questions, it lets the shy or unsure students volunteer to answer the one or two questions for which they have answers.
3. Promote student self-testing of their comprehension level.
4. Provides the SI leader an opportunity to reinforce student participation.
5. It allows students to work with test material in a cooperative rather than competitive way.
6. Facilitates students' ability to interpret, answer and predict test questions.
7. This is a non-threatening activity because of SI activity features:
 - a. everyone is writing, even if they do not know the answer since they can write down the question instead
 - b. uses scrap paper

- c. paper is not turned in or seen by the other students
8. Provides a mind-set for the SI session.

The goals may appear to be excessive for what is feasible within an SI session; however, these goals can be accomplished in a small way each time the procedure is used. The informal quiz frequently is used at the beginning of the session. The whole procedure may take no more than 10 to 15 minutes. However, the discussion generated by one or more questions may become the focus of the SI session.

Procedure

Give the students the following instructions:

1. Get out a piece of scrap paper. (*This makes the quiz more informal*)
2. Ask them to write the question if they do not know the answer. (*This will prevent students from seeing who knows the answer and who doesn't*)
3. Tell them referring to notes or the text is permitted, but they should try to answer without looking first. (*This will promote self-testing*)

Ask a majority of questions requiring short multiple answers; e.g., “Name one of the three ways...” or true/false questions. (*False statements generate more discussion*)

Debriefing the students:

1. In answering questions, ask who would like to answer – **any question**. Starting with any question rather than the first contributes to the informality of the quiz and allows a student who only answered a few questions to actively participate.
2. **Call on weaker students first**, whenever they have raised a hand. This allows the weaker students to participate equally with the better students and helps foster a cooperative rather than a competitive spirit.
3. **Restate the question** before the answer is given.
4. If possible, find something complimentary to say about the wrong answers. (e.g., “That’s a good guess. *If I weren’t sure, I would have guessed that.*”) – but don’t let wrong answers stand.
5. Keep it **light and short**. Use a maximum of ten questions.

Verbal Volleyball

In pairs students will review as many key concepts from class that they can remember. Student A will shout out any concept, idea, issue covered in class (make sure student explains idea), followed by student B. Students will continue volleying concepts back & forth until they run out of ideas. They cannot repeat something said by their partner. Spend approx. 8-10 min.

Once in large group ask students for 1 concept/ idea and explain it. Once all have shared, the leader can list any concept that may have been missed or needs further discussion. This is a good opener or closing activity for reviewing class material. It can engage all learners in the review and work in large or small groups.

Two Lies and a Truth

The leader prepares two false statements about a topic, and one true statement. These statements are then read aloud to the students, and they are asked to identify the true statement. The false statements are then discussed to determine why they are false, and how they could be made true. (This strategy works well to present, "Which of the following statements are true?" questions from old exams).

3:2:1

This strategy can be very useful before an exam. Have each student come up with: 3 topics that they know well enough to “teach” to the other students, 2 topics that they do not understand and need further assistance with, and 1 possible test question. Then have each student write their 3:2:1 topics on the board. Most of the time, the students’ topics will overlap allowing students to “teach” the other students who need additional assistance. Follow up with discussion of the possible test questions.

One Minute Paper

The one-minute paper is designed to help students realize what they know or do not know i.e. ‘check for understanding’. The leader should ask the students to take out a piece of a paper and write on the topic presented by the leader. Remind them it is most important that they put their thoughts on paper in their own words, not that they produce polished piece of writing. Then have each student share their response with the group. Additionally, the leader may choose to encourage conversation regarding similarities and differences between students’ ideas.

Make/Take a Practice Quiz

Divide the students into two or more groups. Instruct each group to make a practice quiz for another group and provide answers to their own quiz on a separate piece of paper. Be sure to provide examples but allow them to be creative. Ask the groups to exchange quizzes and give them time to complete the other group's quiz. Then, have each group compare their answers with the answers that the other group previously composed. Be sure to allow for time to discuss questions that remain unclear.

Jeopardy

This is a fun way to check to see if students know the material well enough for a test or quiz. The key is being well prepared with about 30-35 "answers" at different levels of difficulty and in different categories. Form small groups and let them know the rules: No books or notes. Designate a different person to answer each question but the team can discuss the concept before giving the answer. If the question is missed, other teams can steal. Teams keep control of the board with correct "questions" or alternate from group to group.

Taboo

This strategy can be very useful before an exam. The SI leader should prepare multiple note cards with vocabulary or identification words and one additional related word or term. Once at the session, ask the students to divide into groups and split the note cards amongst the groups. One person in the group must explain the vocabulary term to the other group members without using any of the words written on the note card. The group members must then guess the vocabulary word based on the student's explanation. Have each student take a turn explaining. Once the group has guessed correctly, have them add 2 additional words to the card to make it more challenging for the next group. After all the words have been guessed, have the groups switch cards. The SI leader can sporadically join the groups and play along.

Rainbow Brain Dump

This activity does a quick review of the lecture and at the same time gets the students up and actively involved. As the students are coming in, put four or five main topics from the lecture on the board. Give different colored markers to each student and ask everyone to write anything they remembered from the lecture about each topic. They should be allowed to "feed" off of information written by others. A rainbow of colors should result. When everyone sits down, start

the discussion from what is on the board.

Vocabulary Activities

All disciplines have technical terms which have precise definitions in that subject matter, and may mean something quite different in another context. One of the purposes of most introductory courses is to teach students to speak “the language of the discipline”. Therefore, a clear understanding of the technical vocabulary in the course is essential for the students in your study group. Students must be able to do more than simply “parrot back” definitions of terms. They must be able to paraphrase the meaning of the term, understand how it fits in with the topic under discussion.

Vocabulary Activity Goals:

1. Identify key technical terms in their notes and text and be able to generate a precise definition.
2. Paraphrase the definitions in their notes and text.
3. Understand the relationship between one term and other key terms which fall under the same topic.
4. Create a parallel example to the one given in the notes or text.
5. Be comfortable enough with the terms to “speak” the language of the course, both in the group and on tests.

Procedure (Tips & Suggestions):

1. Don’t translate – use the term yourself. For example, if a student in an economics supplement were to talk about “product satisfaction”, the SI leader might ask, “And what is the economic term that means satisfaction?” Then, the student will use the economic term “utility”, rather than the equivalent translation, satisfaction. Remember, on essay tests, one of the things instructors are looking for is whether the students can use terms correctly.
2. Before a test, create a handout to help students identify terms in their notes by passing out red pens and suggesting that they circle all key terms in red. Then, have one of the students record the complete list on the board. Put students in groups of two or three. Ask that they refer to their definitions of all of the terms and pair together terms that they feel

are connected in some way. Then, report back to the larger group.

3. Create a vocabulary matrix. Get students to work together to fill in the matrix (see example below). One student can work with lecture notes and the other with the text. They may also work together to create the new example.

Term	Meaning	Example from Notes	Example from Text	New Example
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4. Create vocabulary note cards for a quick review.
5. When appropriate, introduce the meaning of Greek or Latin roots that will help students remember their technical terms. For example, in sociology, students who know that the root “gam” means “marriage” have an advantage on a test question which asks about exogamy. A good way to present key roots is to put the root on the board and ask the students to write as many words as they can that contain the root.

Example: “GAM” – bigamy, polygamy, exogamy, endogamy, monogamy

Vocabulary Review

Reviewing exact terminology for the course is imperative. Therefore, using technical terms rather than a translation will encourage better understanding of the material. Pick the key terms from the lecture and compare them with other terms in the same topic. Ask for a parallel example to the one given in the lecture or text.

Collaborative Learning Techniques (Ideas for Group Work)

Collaborative learning is a type of active learning that takes place in student teams. It centers on the students' discovery, study, and use of information in a collaborative manner, rather than an instructor simply lecturing and the students individually, passively taking notes. Their analysis generally requires interpretation, assessment, evaluation, synthesis, and so on.

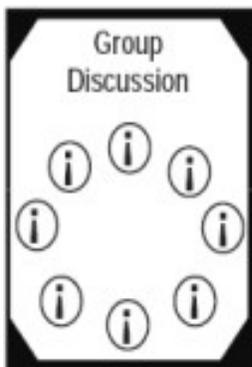
Benefits of Collaborative Learning

Collaborative learning aids in students' socialization, and requires them to divide up tasks, provide feedback, and debate different conclusions. It encourages problem solving skills, understanding complex relationships and decision making in open-ended situations. Such problem solving processes also mirror "real world" working environments. Collaborative learning often allows for "peer coaching", when the higher achieving students can help their less achieving team members understand a problem and possible solutions.

Also, in many cases, the answers the students derive from a problem or issue through collaborative learning tend to be better than they would otherwise come to on their own. In addition, all students become actively involved in learning information on the topic of the course.

The Role of the SI in Collaborative Learning

In collaborative learning, the Supplemental Instructor acts more as an organizer, facilitator, and mediator than as a transmitter of knowledge. Collaborative learning often involves challenging students with analytical problems which they must solve in teams by obtaining information or utilizing information given to them.



Group Discussion

A group discussion is, more or less, just like it sounds: a general discussion of an issue or topic by the group. Individual members are free to contribute or not contribute.

HINTS:

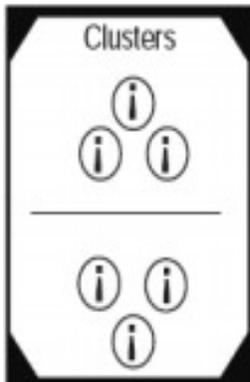
This is the most common form of collaborative learning. It is also the form that requires the most skill to use successfully. Ideally, everyone is actively involved in the discussion and the discussion topic is of equal interest to all group members.

The Inside Scoop on Group Discussion

Group Discussion is probably the most common activity associated with collaborative learning. As such, we tend to take it for granted and rarely give much thought to the dynamics facilitating a successful group discussion. When group discussion is successful, it may be difficult to determine who is actually leading the discussion.

However, even slight changes in the way we approach a group discussion can make an important difference in the manner in which group members elect to involve themselves. For instance, instead of asking a group to read a set of material and then discuss it, ask the group to underline the key ideas and then discuss them. In this case, underlining the material as you read it encourages active reading rather than passively skimming of the material.

Sometimes the least effective way to start a group discussion is to throw out a question and wait for a response. Why do you think that is the case?



Clusters

In *clusters*, group participants are divided into smaller groups for discussion. They may also be allowed to self-select the small group they want to be in. After discussing the assigned topic, the cluster may report findings to the larger group.

HINTS:

If possible, see that each group is provided a flip chart or a space on the blackboard to record the main points of their discussion. Allow time for each group to report back to the larger group. You may have to assign someone from each group to report back.

The Inside Scoop on Clusters

A *Cluster* is really just a group that is broken down into smaller groups. To be effective, a cluster should be no larger than three or four people. Using **clusters** can be a powerful way to change the interactions within a group. Breaking people into smaller groups accomplishes several things: 1.) It makes them more accountable, 2.) It promotes active processing of material, and 3.) It encourages participation by everyone.

This sounds great, doesn't it? But it is not as simple as it sounds. Most SI leaders quickly learn they are likely to encounter resistance when they ask students in their sessions to break into

smaller groups. It turns out that students have other ideas about what an ideal session should be. In students' minds it would be ideal to simply walk into the session, sit on the back row, not have to say or do anything, and have the SI leader fill their heads with all the information they need to do well in the course. And that will happen . . . when pigs fly! But until then, the SI leader must find a way to involve SI participants with the material. Cluster groups are a surefire way to do so.

The key to making a cluster group work is to be firm. The first time you tell participants into smaller groups, you must show resolve. Otherwise you'll encounter resistance each time you ask them to break into groups.

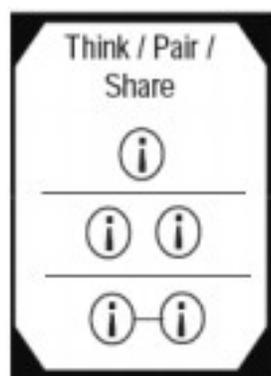


Assigned Discussion Leader

One person in the group is asked to present on a topic or review material for the group and then lead the discussion for the group. This person should not be the regular group leader.

HINTS:

When assigning a discussion topic to individual members of the group, you may need to be prepared to allow a little time for the person leading the discussion to prepare for the discussion. This technique works best when everyone or nearly everyone in the group is given an assignment to be the “expert” on.

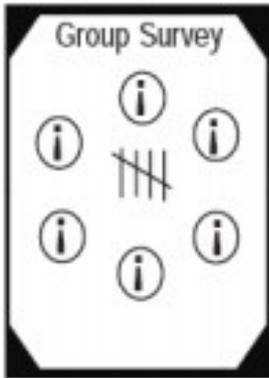


Think/Pair/Share

Group members work on an assignment or project individually and then share their results with a partner.

HINTS:

The goal of a Think/Pair/Share is to allow participants time to think before they discuss. Research shows that when people are given time to contemplate an answer to a question, their answers differ from those they would give if they responded immediately. When conducting a Think/Pair/Share activity, give participants a specific amount of time for the “think” portion.

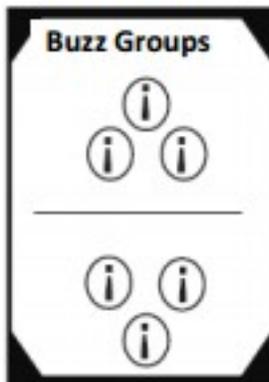


Group Survey

Each group member is surveyed to discover their position on an issue, problem, or topic. This process insures that each member of the group is allowed to offer or state their point of view.

HINTS:

A survey works best when opinions or views are briefly stated. Be sure to keep track of the results of the survey.

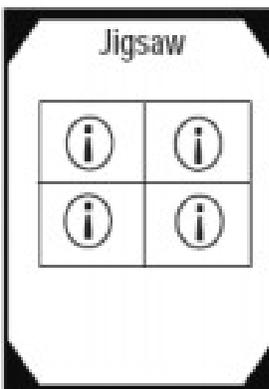


Buzz Groups

A variation of clusters, buzz groups are set up to brainstorm ideas as quickly as possible. Ideas are always shared with the larger group.

HINTS:

Small groups should always assign one person to be a recorder and one person to be a spokesperson. Create a list of ideas when shared with the large group. When sharing, recorders can cross out their small group ideas that have been shared.

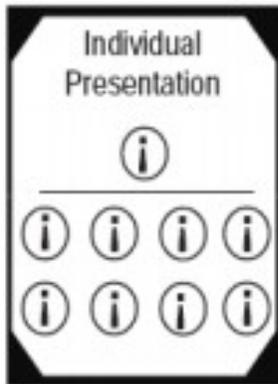


Jigsaw

Jigsaws, when used properly, make the group as a whole dependent upon all of the subgroups. Each group provides a *piece of the puzzle*. Group members are broken into smaller groups. Each small group works on some aspect of the same problem, question, or issue. They then share their part of the puzzle with the large group.

HINTS:

When using *Jigsaw*, make sure you carefully define the limits of what each group will contribute to the topic that is being explored.

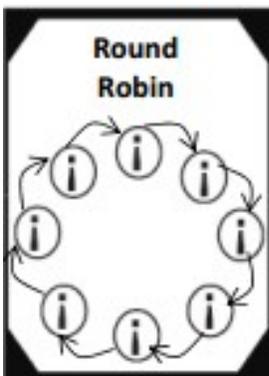


Individual Presentation

An individual presentation is an uninterrupted presentation by one person to the group. The group members present on a topic, question, or issue to the group. Unlike an “Assigned Discussion Leader” this is a formal presentation delivered to a captive audience.

HINTS:

Use of *individual presentations* should typically be used sparingly and only when independent research is required.

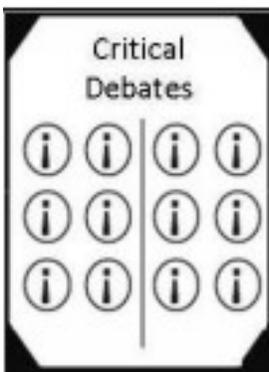


Round Robin

Generate ideas by speaking in order, moving from one student to the next. Use this method to structure brainstorming sessions and ensuring that all students participate.

HINT:

A student can “pass”, but be certain to establish the expectation that you will return to him/her.

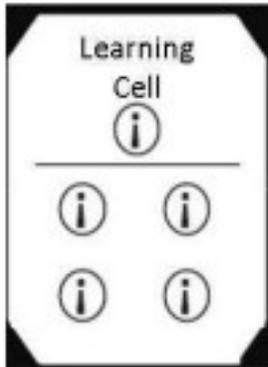


Critical Debates

Students take the side of an issue that is in opposition to their personal views, and then argue that side of the issue. This method helps students develop critical thinking skills and challenges assumptions.

HINTS:

This method works well in dueling partners, or works well when a larger group is divided into two. *Round Robin* can also work as a “four corners” method or continuum line.



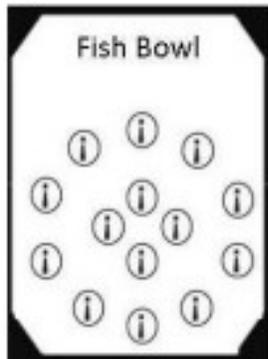
Learning Cell

Students develop questions individually, then quiz each other based on these questions. A facilitator can compile all questions for future use as practice quizzes or exams.

HINT:

Encourage students to create quiz questions based on notes, books, and other resources. Encourage a variety of questions (based on Bloom's

Taxonomy) for deeper understanding.



Fish Bowl

Form two concentric circles. The smaller, interior group discusses a topic, while the larger, exterior group observes. (*Also known as Socratic Seminar*)

HINT:

Describe how this activity presents students with an opportunity to model or observe group processing behaviors. Reverse the roles as needed to ensure student participation. Try to rotate the perspectives of the observers.

Divide and Conquer

This strategy is designed to conquer a difficult reading assignment. The assignment should be divided up into meaningful sections and each student (or group) should be assigned one section. Ask the students to read and summarize their section. After they all have read the material, have each student read aloud their summary. Encourage students to ask questions and be prepared to emphasize areas students may have overlooked. Lastly, discuss the article as a whole

Study Skills

Post Exam Survey

The post exam survey is a self-test for students to assess how successfully they studied for an exam. The survey can be used in an SI session after an exam to target areas on which students need to improve. The SI leader should tailor survey to the specific class and emphasize what they feel is important. The leader should assign a specific point value to each survey question that adds up to 100. Then the leader should read each question and have the student score themselves based on the specific value of the question. After all the survey questions have been asked, the student should total their score and see how close their survey score is to their exam score. This should lead into a discussion of the most effective way to study for the next exam.

Note Cards

Note cards can be used for vocabulary, formulas, concepts, questions, etc. Take a stack of index cards with you to your sessions and have the students construct the cards during the session. Be sure to show the students how to make them and how to use them during your session. Note cards are also portable and can be used as a quick review before tests and exams. Encourage the students to place the relevant cards in a place where they can see them regularly to assist them in remembering important information.

Procedure:

1. Three-by-five cards can hold important information from notes and reading. Write the cue or question on one side of the card and write the definition, description, or answer on the other side.
2. Begin compiling the cards early in the term. Carry the cards with you and review the information many times during the day and evening.
3. The information that does not come to mind readily can be reviewed more often or placed in a “critical” stack. Repetition is the best way to learn the material.

Outline Text Chapter

Have students work in groups of 2-4 to make an outline using the headings from an important chapter from the text. Be sure to point out that the size and the placement of the headings are important for determining the main ideas and supporting details. After you have this “skeleton”

outline of the chapter, have the students read to determine the important points under each heading. If the students have trouble determining the important points, have them turn the headings into questions and then read to find the answers. The answers are (most likely) the important points. Who, what, why, when, where, and how are good questions with which to begin. Have groups compare important points with other groups.

Oral Reading of Lecture Notes

Note review is a good strategy to use early in the academic term. This is because students see the importance of taking comprehensive notes, students can fill in the gaps in their own notes as well as clear up discrepancies and misinformation, each student has the chance to participate, and SI leaders highlight and discuss the language of the discipline – new vocabulary. Students identify meaningful examples and check for understanding.

Procedure

1. Tell the group that you will begin reading from your lecture notes and will ask the student on your right or left to continue where you stop. Let them know that the role of the reader will move to each student in the circle.
2. Look at the student and encourage them to let everyone know if something is left out or inconsistent with what they have recorded. To note inconsistency does not mean that someone is necessarily right or wrong; moreover, members of the SI group will discover how to remedy the problem through the following resources: (1) ask the students to compare notes, (2) check the textbook for clues, or (3) if a consensus is not reached, work with the students to formulate questions to ask the professor during the next lecture.
3. The pressure of reading may unnerve a student who believes that his or her notes are too rough to read. Since reading aloud is a form of performance, some students may be reluctant. Gently encourage the student, but do not force him or her.
4. As you approach the end of the SI session and material has not been discussed, suggest to members of the group that they should finish reading through their notes. If they have any questions or blanks in their notes, tell them to work with another student to find the answers or to bring questions to the next SI session. If time does not permit the discussion of major concepts or vocabulary, draw attention to these items.

Textbook Activities

1. Write a study guide for a chapter in the textbook. Distribute this to students attending SI. Encourage students to prepare their own study guides for other chapters.
2. Have students compare two sources of information about the same topic – the text and the lecture. Note information found in both sources as especially important.
3. Preview chapters during the SI sessions.
4. Have the students survey the chapter for several minutes.
5. Occasionally, the instructor assigns text chapters, but tests only on class notes. It is not a bad study skill for a student to eventually realize this and use the text only as a backup to the notes. Avoid suggesting the text is not important, but gradually de-emphasize it during SI if you find this to be the case.

Reading Textbooks

1. As SI leader, ask yourself the following questions:
 - a. *What should students know when they finish this chapter?* What are the major concepts presented? What supporting information or details should they remember?
 - b. *What should students be able to do when they finish the chapter?* What background information is essential to perform the required task?
2. Draw attention to the items you believe are important for success in this course. Ask students why the items are important.
3. Encourage students to read assignment before the topic is discussed in class. Suggest that previewing the reading sets the students up to better manage their time and information gathering. From time to time do this together in SI sessions.
4. Review how to read charts, graphs, and diagrams. Discuss the importance of understanding the information gleaned from the graphic.
5. Help students formulate questions from textbook headings, vocabulary, and diagrams.
6. Integrate lecture notes with readings. Does the information in the text complement or extend the lecture information?
7. Show students how to supplement their notes using the index of the text. For example, topics may not be addressed within the pages assigned. Check the index to see if the topic is addressed in another section of the text.

Marking the Textbook

Working in pairs, ask students to jot down guidelines for how they currently mark their textbook.

In a large group, discuss the following specific to your course:

1. Why read the chapter?
2. What are your goals for reading the chapter?
3. Why mark the text?
4. What do you do with your markings?

Then share the pertinent marking textbook suggestions. Pick a chapter from their text and have them read a few pages and apply the suggestions. Have the students compare their markings.

Other tips

Finish reading before marking. Never mark until you have finished reading a full paragraph or headed section and have paused to think about what you just read.

Be extremely selective. Don't underline or jot down so many items that they overload your memory or cause you to try to think in several directions at once. Be stingy and concise, but complete and thorough.

Use your own words. Since your own words represent your own thinking they will be powerful cues later on.

Be brief. Underline brief but meaningful phrases, rather than complete sentences. Make your marginal jottings short and to the point.

Be swift. You don't have all day for marking! Read, go back for a mini-overview, and make your markings.

Be neat. Neatness takes conscious effort, not time. When you review, the ideas will be easily read and perceived.

Organize facts and ideas under categories. Items within categories are far more easily memorized than random facts and ideas.

Try cross-referencing. Find multiple sources of the same information.

Be systematic. There are many ways to mark the text. Use your method of marking consistently so you will remember what they mean at review time.

Incomplete Outline

The Incomplete Outline is an excellent means of helping students recognize the main points and the organizational pattern of information given in lecture. It can also be used for textbook information. Determining the major points can help to sort information and locate the ideas being communicated, making connections easier to find and understand. It helps the student to figure out what's important.

Procedure

Create a set of incomplete lecture notes by making an outline with some of the parts missing.

Events that led to the start of WWI

- 1.
- 2.

The groups must then work through their notes to figure out how to fill in the outline. The incomplete outline is an excellent means of promoting group work. It also helps the students recognize the main points and the organizational pattern of information given in lecture. At the beginning of the term, provide outlines that are nearly complete with some of the items filled in and all of the numbers and letters filled in. As the term progresses, make the outlines more and more incomplete, putting fewer and fewer entries, then eliminating the notation. By the end of the term, students should be able to complete their own outlines without assistance.

Note Taking

1. Full-sized, three-ring notebooks are best for containing all lecture notes, handouts, and notes from the text and readings. Why? Pages can be arranged chronologically with pertinent handouts inserted into lecture notes for easy reference. If you miss a lecture, you can easily add the missing notes. Course materials are together in one notebook.
2. Date and number your note pages and your handouts. It will help with continuity.
3. Give yourself plenty of blank spaces in your notes, as well as plenty of room to write. This will allow you to make additional notes, sketch helpful graphics, or write textbook references. Your notes will be easier to read if you write in pen and use only one side of the paper.
4. Law-ruled or summary-margin paper is helpful with its three-inch margin on the left hand

side of the page. If you can't find this paper, draw the margin on each piece of paper. This sets one up for using the Cornell format of note taking. Write your notes on the right hand side of the line. After the lecture, use the left margin for key words or phrases, or sample questions when you review the notes.

5. Take as many notes as you can. If you miss something, leave a space; you may be able to fill in the blanks later. Do not stop taking notes if you are confused or if you want to ponder a particular concept. You will have time for that later. Abbreviations are extremely helpful in speeding up the note taking process.
6. It may be difficult to make your notes look great or to have them extremely organized as you write them. Work with your notes as soon after class as possible when your recall is at its best. You may be able to fill in some blanks. Color coding can bring some organization to your notes. For example, identify concepts and categories by highlighting items with a particular color. If you still have problems organizing your notes, begin to formulate a specific question for your professor or study groups.
7. As you review your notes, look at the information as answers to questions. As these questions become clearer to you, jot down the questions in the left margin. You may also write key words or phrases in the left hand margin that cue your recall of definitions, theories, models, or examples. Now you are ready to try to recall the information in your notes. Cover the right side of your notes, leaving only these cues (whether there are questions or key words) to test yourself.
8. As you begin to put the material of the course together, add a somewhat generic question – WHY? – to your answers. You need to know why any particular answer is correct. You need to know why the information is pertinent to the course. This will also prepare you for essay exams as well.

Cornell Method of Note Taking

Have the students make several sheets of paper using the following directions:

1. Create a recall column by drawing a vertical line down the page about 1" from the margin.
2. Create a summary area by drawing a horizontal line across the page about 1" from the bottom.

Have students take notes in the main area of the page, leaving the left and bottom blank. Ask them to take notes, using this format, during the next lecture. At the next session you could use the note

review strategy to ensure all students have the same important information in their notes. Then have them make up cue questions to put in the recall column. These questions should get at the important information in the notes to the right. Be sure students include both general and specific questions in the Recall Column so that they can test themselves on all the information. Finally, have the students write a brief summary of the important material in their notes.

Note Review

Students don't always take good notes. By focusing on notes from the beginning of the semester, you are modeling for them the importance of lecture notes for this course. Highlighting difficult vocabulary: students may not recognize when they are expected to memorize, understand, and use new vocabulary. Using *Note Review* on a lecture where this vocabulary is introduced will stress the importance of learning and using new words.

Procedure

Tell the group that you will begin reading from your notes and will ask the student on your right to pick up where you stop. The role of the leader will move to each student in the group.

1. Encourage students to let everyone know if something is left out or inconsistent with their notes.
 - a. Ask the student who disagrees to read from his or her notes
 - b. Ask the group if their notes compare
 - c. Check the text for support; add the page reference to notes
 - d. If consensus is not reached, work with the students to formulate specific questions to ask the instructor next class.
2. If time does not permit the discussion of major concepts or vocabulary, draw attention to them.

This is a method of getting the students to work together to review and augment their lecture notes in an organized way. Suggest that when students take notes in the lecture they include an "SI question" in the margin for the aspects in the lecture they would like to discuss in the SI session. Sometimes it is difficult to recall what those questions were if SI sessions are not right after the lecture!

Predict Test Questions

Put students in groups of two or three and assign them to write a test question for a specific topic, ensuring that all topics have been covered. Ask students to write their question on the board or on an overhead for discussion (would the professor ask this question?, what is the answer?, etc.) Students will have the benefit of learning to think like the teacher and they'll be able to see additional questions that other students have written.

Lecture Review

1. During the first 10-15 minutes of the SI session have the students summarize the most recent lecture, or have them identify the key words from that lecture.
2. Give students three minutes to find support in their lecture notes for a given generalization.
3. Ask the students to predict the direction of future lectures based upon the past lectures.
4. Have students arrange terms from lecture and text into a structured outline.
5. Reinforce new terms or important information by using clearly constructed handouts. *(Can be complete or nearly complete at the beginning of the term but should gradually require more and more filling in as the group becomes more accustomed to working together.)*
6. Review material from previous sessions and lectures.
7. Take a couple of minutes at the end of the SI session to summarize the main idea covered during the session. Ask the students to help summarize.
8. Have students write a one paragraph summary of the lecture. List the new vocabulary terms introduced with this lecture.
9. Formulate potential exam questions based on the main ideas from the lecture.
10. Formulate potential answers from details in the lecture notes.

Summarize Lecture

As a group, summarize the lecture from the previous class. You may have to provide prompts for the students. For example, "The first concept discussed was Civil Liberties and Public Policy, what did the professor highlight regarding this?" You may want to ask them to try summarizing without

looking at their notes; however, if they are having a difficult time remembering, tell them to refer to their notes.

Predict the Next Lecture Topic

This technique helps students prepare for new material, especially if it can be connected to information they have just mastered in the SI session. Have students predict the next lecture topic. Encourage them to make connections between the last lecture and the next one.

Identify the “Big Idea”

Ask each student to tell what he or she thought was the most important concept, idea or new information they learned during a particular lecture or even a session. “if you could only take one thing from the information present, what would it be?” Ask each student to offer a different “take home.” Students often feel overwhelmed by the sheer volume of information they have to deal with and this technique helps them identify and organize the information presented.

Reading Quiz / Notes Quiz

The reading or note quiz will include questions from the most recent reading assignment or lecture notes. You can facilitate the quiz verbally by having a few questions ready (approximately five to seven, since you want to make sure you have time to review the answers) or you can create a short paper quiz. You can have the students work on the paper quiz individually or in pairs.

Create a Calendar

This “Study Skill” activity can be especially helpful to students at the beginning of the semester, and may encourage students to manage their priorities effectively throughout the semester. Have the students review their syllabi and create a timeline for studying for an upcoming quiz, completing assigned reading, or completing homework and other assignments. Since you only have 15 minutes for a warm-up, you will probably have to work on one timeline per session. In the best-case scenario, each student will bring his or her calendar and syllabus with them, and will be ready to create his or her own timeline for completing tasks. If some students come unprepared, ask them to work on a timeline anyway and they can transfer dates to their calendars at a later time.

Matrix/Integration

The purpose is to integrate lecture notes with the textbook or other resources such as lab work. Primarily this is a reorganization of notes in a more systematic manner including references such

as page numbers of brief explanations about information presented elsewhere. Start by making

sure everyone has a reasonably equivalent set of notes by doing a notes quiz for a warm-up. List the notes' major topics across the top of the board and the resources down the left side. Invite participants to create this on their own and fill in the information presented by each resource.

The Matrix

A *matrix* is used when the same types of information are provided in the notes or text for a set of topics. A matrix helps students organize information by showing its relationship to similar categories of information.

Sample Vocabulary Matrix

TERM	PARAPHRASED DEFINITION	EXAMPLE FROM LECTURE	EXAMPLE FROM TEXTBOOK	NEW EXAMPLE
<i>Oligopoly</i>	A market where a new firm produce all or most of the market supply of a good or service	Airlines	Soft drink manufacturers	Domestic car makers (G.M., Ford, Chrysler)
<i>Monopoly</i>	A firm that produces the entire market supply of a good or service	Niagara Mohawk	-none-	New York local telephone service

Mnemonic Devices

Mnemonic devices are aids for improving one's memory. These devices can be much more efficient than rote memory techniques (learning by simple repetition). Mnemonic devices are more effective because they generally attach new information to be learned to old

information already mastered, or to catch words or phrases that are more easily remembered.

Jingles

Days in each month – 30 days hath September, April, June, and November

Spelling generalization – I before e except after c

Acronyms

The Great Lakes – HOMES

The only spot in the U.S. where four states meet – CANU

Acrostics

The color of the spectrum – Roy G. Biv

The order of the planets – My Very Educated Mother Just Served Us Nine Pickles

Procedure for Developing Acronyms and Acrostics:

1. Present information to be learned. Underline the first letter of each word.
2. Devise a word or phrase using each letter underlined.
 - a. Example: Psychology – 4 symptoms of schizophrenia
 - i. Withdrawal
 - ii. Hallucinations
 - iii. Inappropriate emotional response
 - iv. Delusions

→catchword: *whid*

If a series of phrases needs to be learned, have the students first circle the key word, or most significant word in each phrase. Then, underline the first letter of each key word and form the catchword/phrase as outlined below.

For example: Psychology – Abraham Maslow's theory of basic human needs:

1. Biological need
2. Safety need

3. Need for Companionship
4. Esteem need
5. Need Self-Actualization
6. Catch phrase: *Bob sings clearly each afternoon.*

Visual Techniques

Some students learn well by creating visual study aids. This type of learner may actually picture the page of notes when answering essay questions on a test. Therefore, notes that are clear, concise and well organized are essential. There are a variety of ways to summarize notes in a few words.

Some of these techniques include mapping and picturing. The best visual techniques do more than just condense notes; they help students understand the relationship between topics covered in various lectures and provide a “big picture”. Students who simply memorize their notes as if they contained a series of several hundred unrelated facts may easily miss the point. Visual techniques help pull the ideas together.

Mapping and **picturing** are used to draw a picture of the concept presented verbally in the lecture. The relationships between the topics are stressed in the map by the use of arrows. There are many types of mapping and picturing techniques. Two are shown below. These must be adjusted to fit the subject matter. The key idea is to visualize the information and to use as few words as possible.

Concept Mapping

Concept mapping may be useful for: (1) summarizing a lecture, (2) review for an exam, (3) learn a new process, or (4) clarify information.

Procedure:

1. Put students into small groups or pairs.
2. Have them identify the central word, concept, or question around which to build the map.
 - a. List the concepts, items, or questions that are associated with the central word or concept. Work from general to specific.
 - b. Write in the linking words on the lines connecting the nodes.

- c. Use arrows to join ideas from different branches. If a group of branches are related draw a circle around them.
3. You may want to write a few sentences in the map to explain, question, or comment on some aspect of the map.
 4. You may want to begin with a list of words or links and have students put them into the map.

Active Reading Strategies

- ***Ask yourself pre-reading questions.*** For example: what is the topic, and what do you already know about it? Why has the instructor assigned this reading at this point in the semester?
- ***Identify and define any unfamiliar terms.***
- ***Bracket the main idea or thesis of the reading, and put an asterisk next to it.*** Pay particular attention to the introduction or opening paragraphs to locate this information.
- ***Put down your highlighter. Make marginal notes or comments instead.*** Every time you feel the urge to highlight something, write instead. You can summarize the text, ask questions, give assent, protest vehemently. You can also write down key words to help you recall where important points are discussed. Above all, strive to enter into a dialogue with the author.
- ***Write questions in the margins, and then answer the questions in a reading journal or on a separate piece of paper.*** If you're reading a textbook, try changing all the titles, subtitles, sections and paragraph headings into questions. For example, the section heading "The Gas Laws of Boyle, Charles, and Avogadro" might become "What are the gas laws of Boyle, Charles, and Avogadro?"
- ***Make outlines, flow charts, or diagrams that help you to map and to understand ideas visually.***
- ***Read each paragraph carefully and then determine "what it says" and "what it does."*** Answer "what it says" in only one sentence. Represent the main idea of the paragraph in your own words. To answer "what it does," describe the paragraph's purpose within the text, such as "provides evidence for the author's first main reason" or "introduces an opposing view."
- ***Write a summary of an essay or chapter in your own words.*** Do this in less than a page. Capture the essential ideas and perhaps one or two key examples. This approach offers a great way to be sure that you know what the reading really says or is about.

- ***Write your own exam questions based on the reading.***
- ***Teach what you have learned to someone else!*** Research clearly shows that teaching is one of the most effective ways to learn. If you try to explain aloud what you have been studying, (1) you'll transfer the information from short-term to long-term memory, and (2) you'll quickly discover what you understand – and what you don't.

Problem-Solving Techniques

Problem-solving courses like chemistry, physics, or mathematics are major obstacles for many students. Students often don't know how to begin to attack a problem or do not know what to do when they encounter difficulty in the midst of finding a solution. Many college instructors do not have time to present problem-solving strategies in class. In general, SI creates a "safe haven" for students to learn general problem-solving skills.

In SI sessions, attendees help each other by actively exchanging strategies for problem-solving. Students need to become part of a *collaborative, mutual-help team, attacking a common problem and solution together by pooling resources*. When students get stuck, the manner in which SI leaders handle the situation determines whether the student gains an understanding of the process or merely gets a right answer.

A model of board work that facilitates a process understanding of problem-solving strategies in chemistry is presented below. It shows how four types of information are placed on the board as problem-solving is modeled in an SI session.

This model employs essential components for understanding neatness, orderliness, logical development, and visual models. Well organized board work in SI sessions is crucial in helping students understand how to solve specific problems.

SI leaders use the board work model when (1) students don't know how to solve a problem, (2) students are stuck within a problem/solution, or (3) to check student understanding of how to solve each type of problem.

The board work model includes the following:

1. Allow students to ask questions at any point in the modeling process.
2. Rules for solving the problems are written in narrative form on the board. This allows students to utilize verbal skills in understanding the problem.
3. Students need to be given a chance to practice by doing a similar problem on their own.

4. SI leaders must avoid re-lecturing or simply telling students how to solve the problems.

5. Numbering each step is a great help to students because they can clearly identify each step in an actual solution.

Chalkboard Model			
Prerequisites	Steps in the Solution	Rules	Similar Problem
<p>This first step includes relevant <i>equations, formulas, charts, and general rules</i> for solving this type of problem, along with the source.</p> <p>For example:</p> <p style="text-align: center;">% yield = $\frac{\text{actual}}{\text{theoretical}}$</p>	<p><u>XXX</u> <u>XXX</u> = XX XX</p> <p>The SI leader or the student(s) model the solution step-by-step with <i>what is done in each step of a solution and why it is done.</i></p> <ol style="list-style-type: none"> 1. 2. 3. 4. 	<p>Here, a narrative description of what is done in each step of a solution is written down.</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 	<p><u>XYZ</u> <u>XXYYZZ</u> = XX XYZ</p> <p>Here, students check their understanding using prerequisites, steps in solutions and rules as learning aids.</p> <ol style="list-style-type: none"> 1. 2. 3. 4. <p>Answer and a source for the answer.</p>

Exam Preparation

Often students become anxious simply by the language of the question. It is important that students in your group begin to develop the skill of predicting test questions. Once they discover that the origin of test questions is not always mysterious, they will feel much more confident going into their test. You can help students develop this confidence and skill by creating practice exams in the study groups. This type of activity is good shortly before an exam when you have a larger number of non-regular participants in the study group. Plan to work together to create study sheets for each predicted question at the next study group before the test.

Review Dates

The dates of exams should be reviewed regularly so that students are reminded to start studying early.

Identify Exam Format

Discuss with the students the kinds of questions to expect on exams. Also explore the amount of emphasis that will be placed on the text, lecture, and outside readings. For example, one half of the points are earned through multiple choice items that focus on information from the lecture and text; the other half of the possible points is earned through two essay questions that focus on the supplemental readings or assigned novels.

Develop Practice Exams

Have students submit 3 to 5 questions. These questions can be assembled into a practice or review exam and returned to students for study. If appropriate, periodically offer practice essay questions. Ask students to outline the answer first. Initially, have the students use their book and lecture notes, but work toward a normal test situation. Provide sample summary sheets for each exam which provide less and less information, thus forcing students to progressively become more and more independent and able to write their own summaries. The first summary sheet could be written by the SI participants as a group. If the professor distributes a sample question or has a file of previous tests on reserve in the library, discuss the wording of the question in SI.

Use Practice Exams in the SI Session

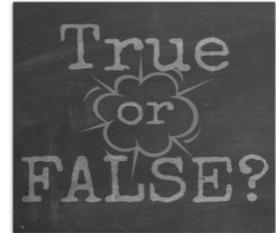
Ask the instructor to look over questions and make suggestions. With the instructor's

permission, announce to the class that the practice exam will be used in the next SI session. If possible, ask the professor to suggest that students take the practice exam

Strategies for Exam Sessions

True/False Exam Questions

1. Remember to read the directions for the exam before you begin.
2. Determine the number of questions and budget your time. Many times when True/False questions are given there are a large number of questions. If so, answer each question quickly. It may not be worth a lot of time to get one question right if the question is only worth two points on a 100 point test.
3. Read each question carefully. Remember that if any part of a statement is false, the entire statement is false. Most questions contain a combination of who, what, when, where, or how facts. If any one of those facts is wrong, the statement is false.
4. Look for qualifiers. Words like *never*, *all*, *none*, *only*, and *always* generally indicate a statement is false. On the other hand, *sometimes*, *generally*, *often*, *frequently*, and *mostly* indicate a statement is true.
5. Answer the question you know first. Often answers to questions you don't know are supplied in other questions. Go back to answer the difficult questions later.
6. When guessing, do not change answers. Research indicates your first answer is usually best. However, don't be afraid to change answers when you have a good reason for doing so.
7. Answer all questions. Unless points are deducted for incorrect responses, leave enough time to answer all questions. Mark all remaining or unfinished questions true; in a true/false exam, a slight majority of the answers are usually true.
8. "Reason" statements tend to be false. When something is given as the "reason" or "cause" or "because" of something else, the statement will tend to be false.



Multiple Choice Exam Questions

1. Remember to read the directions for the exam before you begin.

2. Attempt to answer the question without looking at the options. If necessary, cover the answers with your hand.
3. Eliminate the distractors. Analyze the options as true/false questions. In a negatively worded question (as in “which of the following is NOT . . .”), put a T or F beside each option, then simply select the false statement.
4. Never be afraid to use common sense in determining your answer. It is sometimes easy to confuse yourself by attempting to recall the “right” answer rather than simply reasoning through the question. Make sure your answer makes sense.
5. Answer the questions you know first. Often, answers to questions you don’t know are supplied in other questions. Go back to answer the difficult questions later.
6. When guessing, do not change answers. Research indicates your first answer is usually best. However, don’t be afraid to change answers when you have a good reason for doing so.
7. When guessing, choose answers that are not the first or last option. Research indicates that the option in the middle with the most words is usually the correct response.
8. Answer all questions. Unless points are deducted for incorrect responses, leave enough time to answer all questions.
9. If the first option is a correct one, look at the last option to make sure it is not an “all of the above” option. The same is true for the “none of the above” question.
10. If options appear similar, chances are one of them is the correct response. The same is true for quantities that are almost the same.
11. Allow time at the end to check for carelessness.

Matching Exam Questions

1. Remember to read the directions for the exam before you begin.
2. Determine the pattern of the matching questions. Take a moment before you begin answering questions to determine exactly what is being matched. Are they people with quotes, words with definitions, or events with descriptions?
3. Answer the questions you know first. Often answers to questions you don’t know are supplied in other questions. Go back to answer the difficult questions later.
4. Choose the longest column to read first. One column will generally have more reading material than the other. If you begin by reading the column with the greatest amount of reading, matching it to the column with the least amount of reading, you can avoid having to

reread the lengthy material each time.

5. With each answer cross out the items used from both columns. This will help you save time by not rereading the material and help you answer more difficult questions by visually taking you through the process of elimination.

Essay Exam Questions

1. Remember to read the directions for the exam before you begin.
2. Don't study for total recall of names, dates, facts, and figures as you might for an objective test. Don't merely memorize material.
3. Do learn main ideas, key terms, steps in an argument, stages in a process, etc. Also memorize verbatim at least some key phrases, definitions, or short passages. These will give an authoritative air to your answer.
4. Do anticipate exam questions. If, for example, you have studied both the fall of Greece and the fall of Rome since the last test, you can anticipate a question which asks you to compare and contrast these two cities.
5. Read through the whole test first. Answers will come to mind immediately for some questions. Jot down key words now while they are fresh in mind, but don't start writing your answer.
6. Budget your time. Allow enough time at the end to go back and finish incomplete answers and to proofread your paper. When the time is up for one question, stop writing and begin the next one. On a six question exam, for example, six incomplete answers will usually receive more credit than three complete ones, so try not to leave any questions completely unanswered.
7. Answer the questions you know best first. And don't panic about any you think you don't know. Stay calm.
8. Take time to structure your answer, even if you are in a hurry. Whenever you can, work from a brief outline jotted down on scratch paper before you begin to write. Select what is clearly relevant; try to avoid a rambling effect.
9. Come straight to the point in your answer. Make your very first sentence sum up your main point. If you are writing a lengthy answer, summarize the key points you intend to make in an introductory paragraph.
10. Take time at the end to reread the exam. Make sure you have answered all parts of the

question.

11. Qualify answers when in doubt. It is better to say “Toward the end of the 19th century” than to say “in 1884” when you can’t remember the exact date. The approximate date may be all that is necessary, but you may lose credit for an incorrect date.

Common Words Used in Essay Exams

<i>Compare</i>	examine qualities, or characteristics, in order to determine resemblances.
<i>Contrast</i>	stress dissimilarities, differences, or unlikeness of associated things.
<i>Criticize</i>	express your judgment with respect to the correctness or merit of factors under consideration.
<i>Define</i>	write concise, clear, authoritative meanings, keeping in mind the class to which the item belongs, and whatever differentiated it from all other classes.
<i>Discuss</i>	examine, analyze carefully, and present considerations pro and con regarding the problems or items.
<i>Enumerate</i>	a list or outline form of reply; recount, one-by-one, in concise form, the points required.
<i>Evaluate</i>	present a careful appraisal, stressing both advantages and limitations.
<i>Explain</i>	clarify, elucidate, and interpret the material you present.
<i>Illustrate</i>	present a figure, diagram, or concrete example.
<i>Interpret</i>	translate, exemplify, or comment upon the subject, and, usually, give your judgment or reaction.
<i>Justify</i>	prove your thesis or show grounds for decision.
<i>List</i>	present an itemized series or tabulation.
<i>Outline</i>	give main points and essential supplementary materials in a systematic manner.
<i>Prove</i>	establish something with certainty by citing evidence or by logical reasoning.
<i>Relate</i>	emphasize connections and associations.
<i>Review</i>	analyze and comment briefly, in organized sequence, upon the major points.
<i>State</i>	express the high points in brief, clear form.

Summarize give in condensed form the main points or facts

Trace give a description of progress, sequence, or development from the point of origin

Short-Answer/Fill-in-the-Blank Exam Questions

1. Remember to read the directions for the exam before you begin.
2. There are few if any “tricks” for this type of exam question. Only one of a dozen publications on “test taking skills” surveyed for this topic had a category for short-answer/fill in the blank questions (this entry contained only two paragraphs that was each only two lines long)!
3. It is best to “overstudy”. You need to know your subject backwards and forwards; the chances are that you will either know it or you won’t. Unlike an essay test, you will not have the opportunity to reveal what you do know in place of what you don’t.
4. Answer the questions you know first. Often answers to questions you don’t know are supplied in other questions. Go back to answer the difficult questions later.
5. When you prepare for the exam, focus on facts and key words. Look over the materials as though you were going to write the exam. Try to predict questions appropriate for this type of exam.

A Dozen Reasons to Review a Returned Test

1. Check the point total to make sure it is right. Look for mistakes in grading.
2. Know what questions you missed and why you missed them. The reason you missed the questions is often as important as the correct answer.
3. Study the instructor’s comments, especially for essay questions, so that you will know what to expect next time.
4. Look for the kinds of questions that instructor likes to use.
5. See if the questions came from the text or the lecture. Concentrate more on that source for the next exam.
6. Correct and understand what you missed. This is information you need to know. It may appear on a later test or the final.
7. Analyze the type of problems you missed so you can review strategies for that type of question.
8. Review to get an idea of what kind of test the instructor might give next time.
9. Review to put information back into long-term memory.

10. You want to ask questions while the test is “fresh.”
11. Review how you studied for the exam. Look for better ways.
12. Reviewing gives you a good reason to talk to your professors and let them know you want to improve.

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