Questions That Self-Regulated Learners Ask Themselves			
(adapted from Schraw, 1998 and Tanner, 2012)			
	Metacognition (also Elaborative Rehearsal)	**Meta-emotional**	**Environmental**
Planning before a learning or performance task (task analysis)	What kind of a task is this? What is my goal? How will I know I have reached it? What do I already know about the topic? What additional information, if any, will I need? What strategies should I use? (actively listening, taking notes, outlining, visually representing the material, occasionally self-quizzing, reviewing, or writing a summary) What strengths can I bring to the task? What are my weaknesses and how can I make up for them?	How interested and motivated am I to do the task, and how can I increase my interest and motivation if they are low? What's the value or relevance of what I'll be learning? How confident am I in my ability to learn this material? If not very, how can I increase my belief in my ability to learn it, without becoming over-confident? What similar tasks can I recall doing well in the past?	What is the best environment for the task that I can create? Am I in a good physical place and position to do this task? Is the temperature right for me? How about the back-ground sounds? Have I had enough sleep? Have I had the right amount of coffee today? Have I put potential distractions far, far away? How much time and what resources will I need? Are these resources handy?
Monitoring during a learning or performance task	Am I sure I know what I am doing? Does my approach to the task make sense? Am I making good progress toward my goal? How focused am I? Am I getting tired? If so, how can I keep myself focused and alert? How well are my strategies	If my interest and motivation are sagging, how is what I'm learning relevant to my experience or my future? What material is challenging what I've thought about	Should I try another environment to see if it works better? How about another physical position? How are the temperature and background sounds working out?

	working? What changes in approach or strategies should I make, if any? What material is the most important? What material am I having trouble understanding? How does what I am learning relate to what I already know? How is my thinking on the topic changing?	the subject? Am I resisting it? Am I starting to get discouraged or give up? Am I thinking I'm just no good at this subject? How can I change this negative thinking? What similar tasks can I recall doing well in the past?	Am I staying away from distractions? If not, I have to get further away from them. Do I need a short break to refresh my mind and body?
Evaluating after a learning or performance task	How well did I achieve my goal or master what I set out to learn? What can I recall and what do I need to review? What were the most important points I learned? Can I see and organize the interrelationships among them? What am I still having trouble understanding? What questions do I have to ask my instructor? How does what I learned relate to other things I've been learning or have experienced? How has my thinking on the topic changed? Which approaches and strategies worked well? Which didn't? What do I need to do differently next time I take on a similar task?	How am I reacting emotionally to my evaluation of my learning? Being pleased reinforces a learner's motivation and other positive emotions she generated about the material and her ability to learn it. Being disappointed may lead either to improving her learning strategies or her defensively withdrawing her energy from task. This last reaction in turn undermines the positive emotions needed to begin the next learning or performance task.	How well did I avoid distractions and stay on task? If not that well, how can I avoid distractions more effectively in the future? Do I need to experiment more with different physical factors to find the best working environment and break schedule for myself?

Reading and Discussion on "Learning" and "Thinking"

Learning (Your First Job), by Robert Leamnson (2002) at
http://www.udel.edu/CIS/106/iaydin/07F/misc/firstJob.pdf 12-page essay on the brain biology of learning; the difference between "understanding" and "remembering"; how to listen actively to a lecture and take notes; how to develop an interest in a subject; how to use out-of-class time productively; the difference between "knowledge" and "information" and how to use the former to make sense out of the latter; and how to prepare for and take exams. Leamnson gives wise, research-based advice on how to study and effectively drives home the point that learning involves work and effort for all students but can be very rewarding.

Learning to Learn, by Karl R. Wirth and Dexter Perkins (2008) at
http://www.macalester.edu/geology/wirth/learning.pdf 29-page manuscript (longer and more advanced than Leamnson's) on the failure of traditional teaching; the shift from teaching to learning; the student learning needs for the 21st century; thinking and learning in the cognitive, affective, and psychomotor domains; Fink's categories of significant learning; Kolb's learning cycle; the changes in the brain associated with learning; Perry's stages of intellectual development; Baxter Magolda's levels of intellectual development; Paul and Elder's elements of critical thinking; metacognition; Felder's learning style dimensions; the behavioral dimensions of grades; and the contrasting characteristics of successful, average, and struggling students.

If you assign this kind of reading, leave time for in-class **discussion** the date it is due. The discussion may start out with some recall (recitation) questions that warm up students' minds to the material, but a good *discussion* is an exchange of experiences and viewpoints, so it relies on asking questions with multiple correct answers, like these:

- What was the most important insight you gained from the reading?

- What surprised you most in the reading?

- What did you already know?

- Have you been taught how to learn before? Where? What did you learn about learning?

- What will you do differently during a lecture, if anything, given what you read?

- How will you prepare differently for exams, given what you read?

- Can you think of other good learning practices that the reading didn't mention?

- Did you identify with any of Kolb's learning styles? Which one or ones? (Wirth & Perkins, 2008 only)

- Which one of Perry's stages of intellectual development did you identify with? (Wirth & Perkins, 2008 only)

Self-Assessment Instruments on Metacognitive Skills

The first, designed by Cooper and Sandi-Urena (2009), is the 27-item **"Metacognitive Activities Inventory"** (MCAI) at http://pubs.acs.org/doi/abs/10.1021/ed086p240.
While these researchers created it for chemistry students, it can measure metacognitive problem-solving skills in other STEM areas as well. A few sample items:

- When I do assigned problems, I try to learn more about the concepts so that I can apply this knowledge to test problems.

- Once a result is obtained, I check to see that it agrees with what I expected.

- I jot down things that I know might help me solve a problem before attempting a solution.

- I start solving problems without having to read all the details of the statement.   (This item is phrased in reverse, like several others; agreeing indicates a lack of a metacognitive skill.

The second instrument, called the **"Metacognitive Awareness Inventory"** assesses general self-regulated learning skills across the disciplines and is accessible at https://www.harford.edu/~/media/PDF/Student-Services/Tutoring/Metacognition%20Awareness%20Inventory.ashx.
Schraw and Dennison (1994), it has 52 items that are classified by type of cognitive knowledge—declarative (DK), procedural (PK), and conditional (CK)—or by specific metacognitive process—planning (P), information management strategies (IMS), monitoring (M), debugging strategies (DS), and evaluation (E). Below are eight sample items, each representing a different classification:

- I have control over how well I learn. DK

- I am aware of what strategies I use when I study. PK

- I use my intellectual strengths to compensate for my weaknesses. CK

- I think about what I really need to learn before I begin a task. P

- I consider several alternatives to a problem before I answer. M

- I summarize what I've learned after I finish. E

- I draw pictures or diagrams to help me understand while learning. IMS

- I change strategies when I fail to understand. DS

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