**Metacognitive Reading**

Questions designed to stimulate metacognitive thinking while reading : When you come to the end of a sentence, or punctuation in a complex sentence, stop and ask yourself:

1. Do I understand what I just read?
2. What do I already know about what I just read?
3. Can I say it in my own words?
4. Can I think of another example?
5. It is important enough to put in my notes (or to map, to chart, or to use another organizational tool)?

Strategies to Help Metacognition and Comprehension

1. Divide reading into manageable chunks. When previewing decide places that would provide good breaks. Try to read in 15-20 minute blocks. Take a break, get up, stretch, let your mind relax a minute and then begin again. Overall comprehension is better using this strategy.
2. Stop and ask yourself questions as you read. Can you say it in your own words, do you understand it, what do you know about it, should you include this in your map—What can you do if you don’t understand or cannot say it in your own words?
3. Organize the information. Look how the ideas are structured, identify main ideas and supporting details, compare and contrast information, and create maps.
4. Elaborations. Help to store the information so that you can recall it and work with it.

To assist with Metacognitive reading….below are a couple of other CATs that might prove useful.

**Plus-Minus-Question (+ - ?)**

Ask students to mark each paragraph (or figure, graph, etc.), immediately after reading it, with one of the following three symbols:

A plus sign (+) if they are convinced they clearly understood the paragraph and could explain it to another student;

A minus sign ( -- ) if they are sure they did not understand it; or

A question mark (?) if they are not sure whether they understand it and need to discuss or check further.

You can then invite students to nominate the 2 or 3 paragraphs they have marked with minus signs and/or question marks for discussion within assigned study groups or sections.  Small groups of students can often sort most of the minuses and questions out among themselves.  And/or you may respond to the most challenging or critical ones yourself -- perhaps building up a database of issues and responses for future use.  This technique can work in fully online, blended or face-to-face contexts, but I prefer eliciting students' responses in advance of class meetings via the LMS or other online tools.

**Other Metacognitive Activities**

1. **Think Aloud.** Report your thoughts while performing a difficult task. Discover any potential errors in thinking to address any sabotaging thoughts or language while learning new information.
2. **Think like biologists (Learn like a practitioner) - Metacognitive Modeling by the Teacher for Students**

Teacher will model how they think and have students think like a biologist.

Self – regulation question: “Do I understand it the way I need to use it?

Share explicitly how you, as a biologist, think procedurally in solving a problem---how you start, how you decide what to do first and then next, how you check your work, how you know when you are done.

1. **One Minute Papers**

Teachers can better judge from week to week whether students understand the material if students write "one-minute papers" at the end of each class session. Light suggests that these papers simply summarize the main point of a lecture or discussion, raise any questions the student may have, and be anonymous, to relieve the pressure to perform that many students feel. (Richard Light Harvard) The other important part is to provide students with time to reflect on their cognitive processes during the class and solidify what they learned and didn’t learn.

1. **What is the most significant thing you learned today?**
2. **What question(s) do you still have?**

Other potential questions to use:

**Interest:**

* \*Without looking at your notes, what was most memorable or stands out in your mind about today’s class?
* \*What was the most surprising and/or unexpected idea expressed in today’s discussion?
* \*Looking back at your notes, what would you say was the most stimulating idea discussed in today’s class?
* \*For you, what interesting questions remain unanswered about today’s topic?

**Relevance:**

* \*In your opinion, what was the most useful idea discussed in today’s class?
* \*During today’s class, what idea(s) struck you as things you could or should put into practice?
* \*What example or illustration cited in today’s class could you relate to the most?

**Attitudes/Opinions:**

* \*Would you agree or disagree with this statement: . . .? Why?
* \*What was the most persuasive or convincing argument (or counterargument) that you heard expressed in today’s discussion?
* \*Was there a position taken in today’s class that you strongly disagreed with, or found to be disturbing and unsettling?
* \*What idea expressed in today’s class strongly affected or influenced your personal opinions, viewpoints, or values?

**Analysis:**

* \*What did you perceive to be the major purpose or objective of today’s class?
* \*What do you think was the most important point or central concept communicated during today’s presentation?

**Conceptual Connections:**

* \*What relationship did you see between today’s topic and other topics previously covered in this course?
* \*What was discussed in class today that seemed to connect with what you are learning or have learned in other course(s)?

1. **How I Got An A**

Students write a short paper titled “HOW I EARNED AN A IN THIS COURSE,’

Dated the last day of the semester. This activity helps students set a high goal for themselves, but it also induces them to develop a plan for attaining that goal.

1. **RSQC2**    
   Recall, Summarize, Question, Connect and Comment. At the end of class students recall meaningful points, summarize the most important points in one sentence, formulate questions, connect these points with the course learning outcomes and comment on the value of their learning.
2. **Lesson Reflection and Rating**  
   At the end of a lesson student indicates a global understanding of the day’s lesson on a 0 to 100 rating scale. Then, they wrote down the concepts that they found difficult to grasp, and their plans to enhance their understanding of them. Finally, at the end of the week students answer three multiple choice questions about the week. Additionally, students write down their confidence in their answers to these questions on a scale also ranging from 0% to 100%.