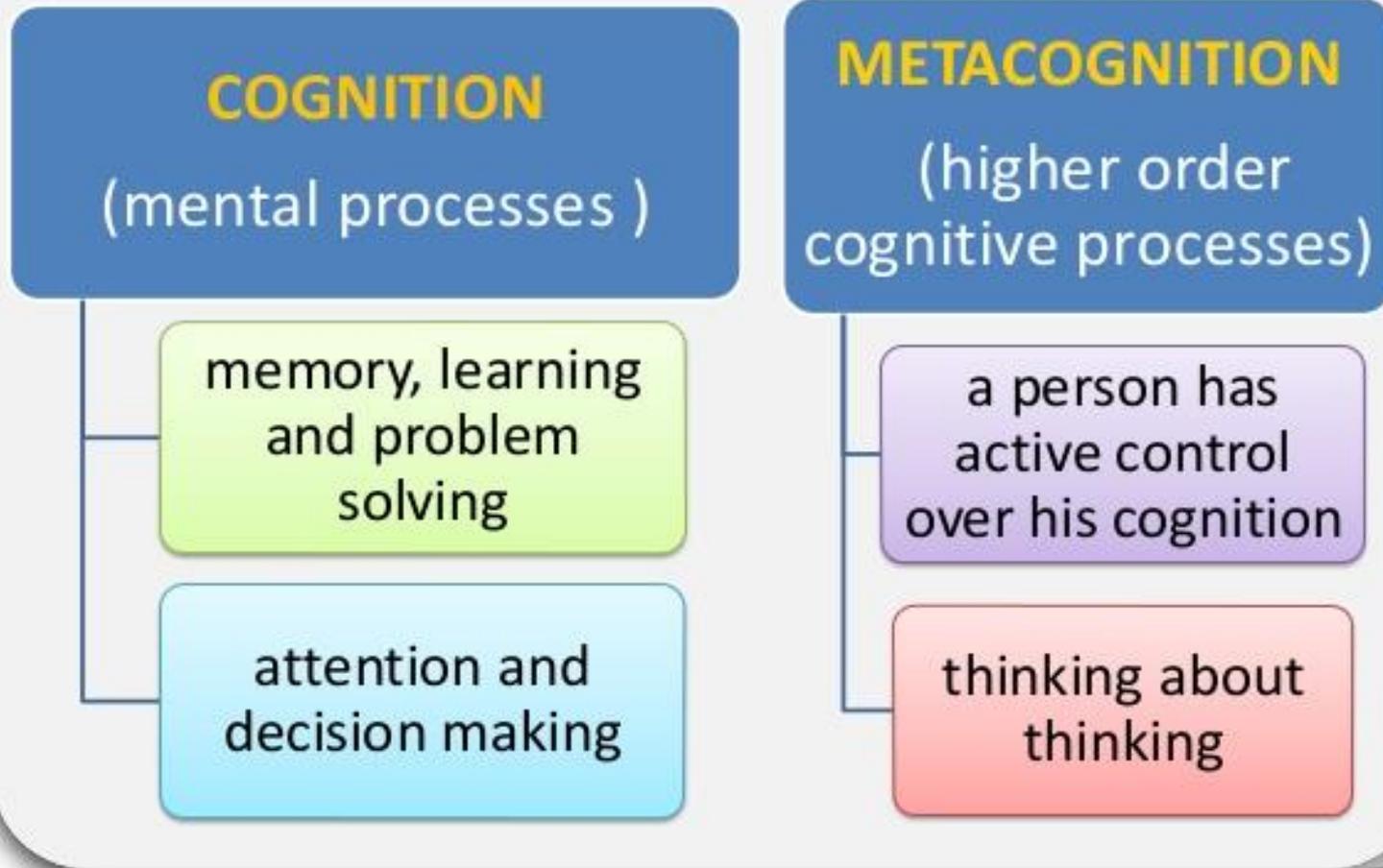


HOW TO STUDY EFFECTIVELY FOR YOUR STEM COURSES

Based on “Teach Yourself How to Learn, Strategies You Can
Use to Ace Any Course at Any Level, by Sandra Yancy
McGuire

COGNITION *VS* METACOGNITION



<https://www.slideshare.net/JohnPaulHablado1/cognitive-and-meta-cognitive-strategies-for-problem-solving-in-mathematics>

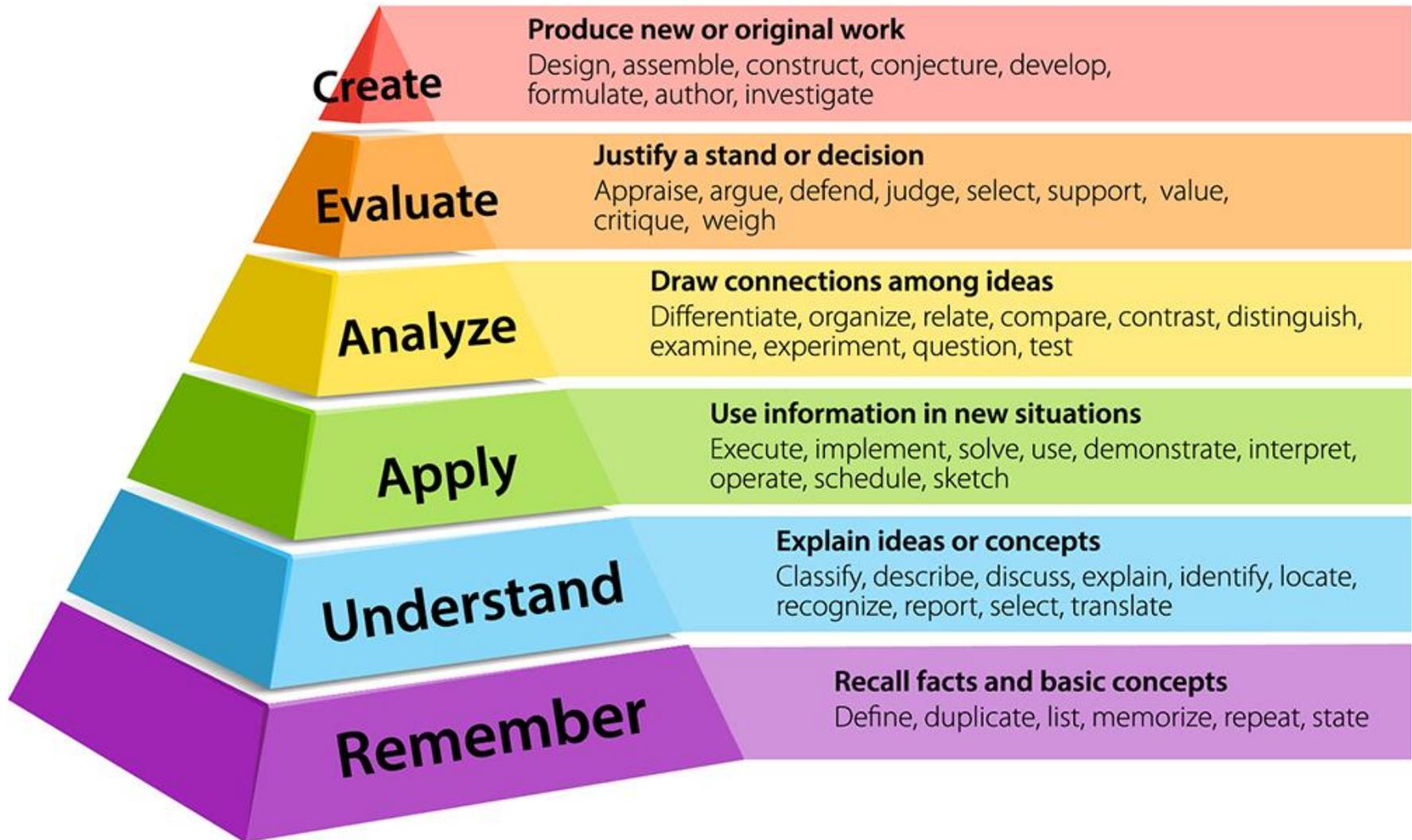
Metacognition

The ability to:

- think about your own thinking
- be consciously aware of yourself as a problem solver
- monitor, plan, and control your mental processing (e.g. “Am I *understanding* this material, or just *memorizing* it?”)
- accurately judge your level of learning
- know what you know and what you don’t know

Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), *The nature of intelligence* (pp.231-236). Hillsdale, NJ: Erlbaum

Bloom's Taxonomy



Reflection Questions

- What's the difference, if any, between *studying* and *learning*?
- For which task would you work harder?
 - A. Make an A on the test
 - B. Teach the material to the class

How do we teach students to move *higher* on Bloom's Taxonomy?



Teach them the Study Cycle*

**adapted from Frank Christ's PLRS system*

The Study Cycle

Assess

Assess your Learning – Periodically perform reality checks

- Am I using study methods that are effective?
- Do I understand the material enough to teach it to others?

Study

Study – Repetition is the key. Ask questions such as ‘why’, ‘how’, and ‘what if’.

- Intense Study Sessions* - 3-5 short study sessions per day
- Weekend Review – Read notes and material from the week to make connections

Review

Review after class – As soon after class as possible, read notes, fill in gaps and note any questions.

Attend

Attend class – **GO TO CLASS!** Answer and ask questions and take meaningful notes.

Preview

Preview before class – Skim the chapter, note headings and boldface words, review summaries and chapter objectives, and come up with questions you’d like the lecture to answer for you.

Intense Study Sessions

1	Set a Goal	1-2 min	Decide what you want to accomplish in your study session
2	Study with Focus	30-50 min	Interact with material- organize, concept map, summarize, process, re-read, fill-in notes, reflect, etc. Do homework problems like test problems
3	Reward Yourself	10-15 min	Take a break– call a friend, play a short game, get a snack
4	Review	5 min	Go over what you just studied

Effective Homework Strategy

- **Study material first**, before looking at the problems/questions
- **Work example problems** (without looking at the solutions) until you get to the answer
- **Check** to see if **answer** is correct
- If answer is not correct, **figure out where mistake was made**, without consulting solution
- **Work homework** problems/answer questions **as if taking a test**