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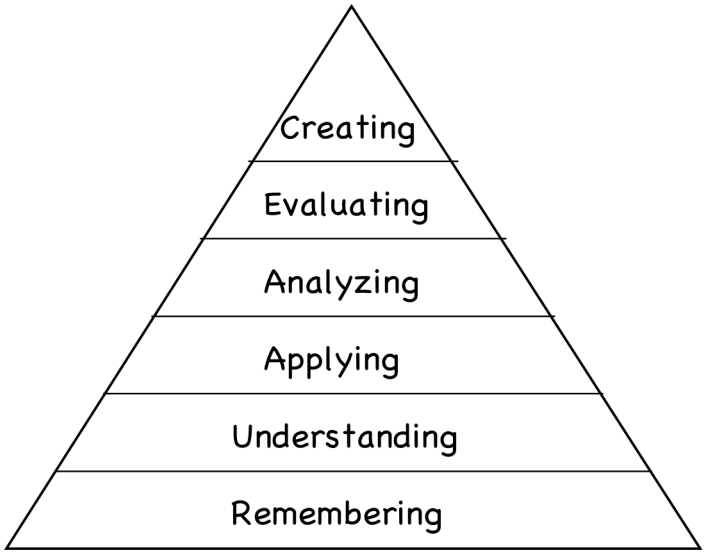
NAVIGATING THE DIFFERENT LEVELS of LEARNING



Bloom's taxonomy (revised):
Source: Anderson, L.W., & Krathwohl, D.R. (Eds.) (2001). A taxonomy of learning, teaching, and assessment: A revision of Bloom's taxonomy of educational objectives. New York: Longman.

1. REMEMBERING
   Recognize, list, describe, identify, name, label, select, repeat, know…
   Can you RECALL information?

2. UNDERSTANDING
   Interpret, exemplify, summarize, infer, paraphrase, associate, explain…
   Can you EXPLAIN ideas or concepts?

3. APPLYING*
   Implement, carry out, use, demonstrate, apply, transfer…
   Can you USE the new knowledge in another familiar situation?

4. ANALYZING*
   Compare, attribute, organize, analyze, discriminate, contrast, dissect…
   Can you DIFFERENTIATE between constituent parts?

5. EVALUATING*
   Check, critique, judge, assess, justify, evaluate,…
   Can you JUSTIFY a decision or course of action?

6. CREATING*
   Design, construct, plan, produce, integrate, synthesize, propose, invent…
   Can you GENERATE a new product, idea, or way of viewing things?

Please note: All levels of learning are important. You cannot achieve the higher levels of learning without the basic ones. But as you add more levels your understanding and grasp of the material (and of the natural world) will get deeper and more relevant. **LEARNING LEVELS 3-6** require **ACTIVE** learning and are considered ***CRITICAL THINKING SKILLS**.

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How to create your own study questions:
You can use these as templates for all your science (and non-science) courses: create your own study questions and make sure they cover all learning levels.

1. REMEMBERING
    - Who, what, when, how…?
    - Describe… from memory

2. UNDERSTANDING
    - Explain…
    - Translate… into your own words.

3. APPLYING
    - How is… an example of…?
    - How is… related to…?
    - Why is… significant?
    - Find a (new) exception of… and explain why.
    - Find another (new) instance where this… applies and explain how.

4. ANALYZING
    - What are the parts or features of…?
    - Classify… according to…?
    - How does… compare with…? (what is similar, what is different?)
    - Can you explain… step-by-step?
    - What is the problem with... and why?

5. EVALUATING
    - Do you agree…?
    - What is the most important…?
    - Place the following in order of priority…
    - How would you decide about…?
    - What criteria would you use…?
    - What is the best solution for…?

6. CREATING
    - What would you predict/infer from…?
    - What ideas can you add to…?
    - How would you create/design a new…?
    - What might happen if you combined…?
    - What solutions would you suggest for…?
    - Can you integrate this with previous topics?

How to acquire the higher level learning skills:
After each lecture generate 3 questions per level on that day's lecture material. Answer these questions by writing down the answer. What helps is a sense of curiosity, a critical spirit, an understanding of the difference between lower and higher level learning, a willingness to expand and change preconceived concepts, and a willingness to monitor and self-evaluate your progress. It takes a bit getting used to, but then it will be the most effective use of your time and gives you a real understanding of the material.