

ThinkWell-LearnWell™ Diagram

Metacognitive Learning Goals

Bloom's Higher Order Thinking Skills

Corresponding Learning Outcomes

Lower Order Thinking Skills

Higher Order Thinking Skills

To Identify or Define Information

To Explain Information

To Apply Information to New Situations

To Compare and Contrast Information

To Make Judgments About Information

To Introduce, Develop a Viewpoint

Remembering

Understanding

Applying

Analyzing

Evaluating

Creating

Able to Recall Information

Able to Provide Rationales for Information

Able to Apply Information to Different Situations

Able to Discern Nuances of Information

Able to Reach Conclusions with Information

Able to Produce New Information

Surface Approach to Learning

Deep Approach to Learning



Learning Task	Example from history class	Example from biology class	Example from math class	Typical words in the question
Remember Recall fundamental knowledge – concrete facts, dates, definitions, etc.	When was the 4th Amendment ratified?	What is DNA?	What is the difference-quotient definition of the derivative?	define, identify, label, match, name, recall, recognize, sort
Comprehend/Understand Give the meaning and/or significance of facts, events, and so forth. Be able to explain or summarize them.	What is the meaning of the 4th Amendment?	Explain the role of DNA in protein synthesis.	What does the derivative represent with respect to the graph of the original function?	discuss, explain, generalize, give examples, interpret, restate, summarize
Apply Use your understanding of a subject to address a new situation.	What sorts of realities may have gone into drafting the 4th Amendment?	What would happen if a point mutation turned an amino acid codon into a stop codon?	Find the equation of the tangent line to the graph of $f(x) = x^2$, at the point $(1, f(1))$	apply, demonstrate, hypothesize, imitate, predict, relate, show, solve, use
Analyze: Compare one subject’s parts, characteristics, overall meaning, and so forth, with another’s.	What may be some common issues between Amendments 3, 4, and 5?	Why does it matter that DNA is antiparallel?	What does each term in the difference-quotient definition of the derivative represent graphically?	analyze, break down, contrast, discriminate, outline
Evaluate Critique or judge a subject, based on its own attributes, and on the ways in which it compares with other subjects.	Which Amendment is most relevant to modern society?”	Develop an argument against splicing insecticidal genes into the corn genome.	Why is the derivative also said to represent “instantaneous rate of change” and how does this definition compare with the “slope of a tangent line” definition?	argue, assess, compare, decide, evaluate, persuade, rate, support, verify
Create Design or invent a new model, scenario, or project based on the subject you’ve learned.	Argue for or against warrantless wiretapping, based on the 4th Amendment.	Propose a single-gene splice that would create an interesting fish for the pet trade.	The commonly used difference-quotient definition is not unique. Give another representation for the notion of the derivative and sketch a graph labeling the parts of this representation.	adapt, combine, compose, design, imagine, plan, synthesize, transform Anderson ,Krathwohl et al (eds.) <i>A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom’s Educational Objectives.</i> New York: Longman, 2001.

Applying Think Well / Learn Well

Thinking Skill Learning Goal	Questions to Guide Studying	Example: Math (Distributive Property)	Example: Reading a piece of literature (a short story)
Remembering Identify & Define	Can I list and define key terms? (<i>What is...?</i>) (<i>Who is...?</i>) (<i>When did ...?</i>)	What is the distributive property? (A rule for eliminating or adding parentheses to an expression using multiplication.) $a(b + c) = ab + ac$	What is the plot of the story? Who are the main characters?
Understanding Explain	Can I explain the reasoning behind the ideas? (<i>Why does...?</i>)	Why do we have to distribute? (So we can simplify expressions, combine like terms, and solve equations.)	Why does the main character act as he or she does? Why is the setting important to the story?
Applying Apply Information to New Situations	Can I apply this information to a new or different situation, problem, or context? (<i>How should...?</i>)	All the examples in the text had 2 terms in the parentheses, but the next homework problem has 4 terms. How do I apply the distributive property? $2(x + y)$ versus $2(x + y + xy + 3)$	Given the information provided by the author, what will happen in the end of the story? What events have been foreshadowed by the author?
Analyzing Compare & Contrast Information	Can I distinguish processes, procedures, or principles from seemingly identical processes, procedures, or principles?	How is the distributive property related to factoring out a GCF? (They are opposite operations)	How are two characters alike or different? How is one short story by an author similar/different to another by the same author?
Evaluating Make Judgments	Can I determine the best rationale or course of action, given the information?	When solving this equation, what should I do first? Should I distribute first, or is there an easier way to solve it? $2(x + 4) = 10$	How well does the short story succeed as literature? How relevant are the author's themes to your own life?
Creating Form & Develop a Viewpoint	Can I add to the existing body of knowledge?	Create a linear equation with the solution $x = 2$ that requires the distributive property to solve.	Write a new ending or a sequel to a short story. How might those characters act in different situations?