

Surface Learning: Building Knowledge



Definition: Surface learning is factual learning, meaning that this type of learning is a prerequisite for deeper learning. In Achievement Teams, we encourage the use of learning progressions that contain prerequisite concepts and skills (surface) that lead to more advanced concepts and skills (deep). Therefore, surface learner strategies focus on recall or procedural information, like explaining, naming, note-taking, and restating.

Strategy	DOK 1 (recall/reproduction)	DOK 2 (skill/concept)	Activate Student Engagement
<p>Outlining: Using an outline at the beginning of the writing process helps learners clarify ideas while demonstrating the student's thinking process.</p>	<input type="checkbox"/> arrange <input type="checkbox"/> identify <input type="checkbox"/> list <input type="checkbox"/> illustrate <input type="checkbox"/> label <input type="checkbox"/> restate	<input type="checkbox"/> categorize <input type="checkbox"/> classify <input type="checkbox"/> summarize	<input type="checkbox"/> highlight key words <input type="checkbox"/> timeline events <input type="checkbox"/> graphic organizer <input type="checkbox"/> create a reverse outline <input type="checkbox"/> use information to rearrange and edit the outline
<p>Note-Taking: Recording key information is a powerful cognitive tool that actively engages the brain to retain information while increasing self-efficacy.</p>	<input type="checkbox"/> define <input type="checkbox"/> illustrate <input type="checkbox"/> list <input type="checkbox"/> recall facts	<input type="checkbox"/> categorize <input type="checkbox"/> organize <input type="checkbox"/> restate in own words	<input type="checkbox"/> label or locate parts <input type="checkbox"/> highlight <input type="checkbox"/> illustrate meanings <input type="checkbox"/> use visual images
<p>Summarizing: Capturing the most important ideas while excluding irrelevant and repetitive information improves memory and comprehension.</p>	<input type="checkbox"/> identify main ideas <input type="checkbox"/> recall facts and details <input type="checkbox"/> restate	<input type="checkbox"/> organizes information <input type="checkbox"/> summarize major events <input type="checkbox"/> use context clues	<input type="checkbox"/> captioned photo summary <input type="checkbox"/> diary <input type="checkbox"/> GIST strategy <input type="checkbox"/> headline summaries <input type="checkbox"/> journals <input type="checkbox"/> storyboard
<p>Vocabulary Instruction: Improve comprehension through the use of context clues, defining words in context, sketching words to show meaning, analyzing word parts, and semantic mapping.</p>	<input type="checkbox"/> define <input type="checkbox"/> recall <input type="checkbox"/> recite <input type="checkbox"/> illustrate	<input type="checkbox"/> construct <input type="checkbox"/> identify patterns <input type="checkbox"/> interpret <input type="checkbox"/> use context clues	<input type="checkbox"/> use of context clues <input type="checkbox"/> defining words in context <input type="checkbox"/> sketching words to show meaning <input type="checkbox"/> analyzing word parts <input type="checkbox"/> semantic mapping

Questioning Stems: Questions at this level are used to help students gain foundational skills (level 1) and move them into making connections (level 2).

DOK Level 1

Can you recall ____? Who was ____? What is ____? What is the formula for ____? How can you find the meaning of ____?
 When did ____ happen? How can you recognize ____? Who discovered ____? Can you identify ____? Can you recall ____?

DOK Level 2

Can you explain how ____ affected ____? What would you use to classify ____? What approach/tools would you use to ...?
 How would you apply what you learned to develop ____? How or why would you use ...? If you changed these elements ... what would/might happen?
 How would you compare ____? Contrast ____? What examples/non-examples can you find to ...? How would you apply what you learned to develop ...?
 How would you classify ____? How would you organize ____ to show ...? What questions would you ask in an interview /survey about ...?
 How are ____ alike? Different? How could you show your understanding of ...? What is your prediction ... and why?

Deep Learning: Making Meaning



Definition: Deep learning is a product of surface learning, where students can revisit and recall their surface-level knowledge and use it to obtain deeper learning. As John Hattie explains, there is a tendency to stay at the surface level of instruction. In fact, Hattie proposes that 90% of instruction is designed to be at the surface level of learning. Therefore, deep learning connects surface learning and combines them to progress to higher levels of achievement. Deep learning can be considered an extension of the student's prior knowledge.

Strategy	DOK 2 (skill/concept)	DOK 3 (strategic thinking)	Activate Student Engagement
<p>Metacognition: When students become aware of their own thought process by reflecting after learning has occurred, they are more confident and willing to take on new challenges.</p>	<input type="checkbox"/> interpret <input type="checkbox"/> make observations <input type="checkbox"/> modify <input type="checkbox"/> organize <input type="checkbox"/> restate in own words	<input type="checkbox"/> compare <input type="checkbox"/> construct <input type="checkbox"/> draw conclusions <input type="checkbox"/> explain	<input type="checkbox"/> 3-2-1 <input type="checkbox"/> exit ticket <input type="checkbox"/> K-W-L <input type="checkbox"/> take notes from memory <input type="checkbox"/> think aloud
<p>Class Discussion: During quality formal class discussions, the teacher designs a scenario for students to discuss a specific topic. The teacher becomes the facilitator with prepared, purposeful questions and invites students to speak, ask questions, and justify their thinking.</p>	<input type="checkbox"/> infer <input type="checkbox"/> interpret <input type="checkbox"/> make observations <input type="checkbox"/> visualize	<input type="checkbox"/> cite evidence <input type="checkbox"/> compare <input type="checkbox"/> construct <input type="checkbox"/> critique	<input type="checkbox"/> develop logical arguments <input type="checkbox"/> justify <input type="checkbox"/> debate <input type="checkbox"/> fishbowl <input type="checkbox"/> Socratic method <input type="checkbox"/> think-pair-share
<p>Concept Mapping: Concept maps, like flow charts, help learners chunk information based on meaningful connections while allowing them to visualize relationships between different topics.</p>	<input type="checkbox"/> categorize <input type="checkbox"/> compare-contrast <input type="checkbox"/> interpret <input type="checkbox"/> organize and display <input type="checkbox"/> summarize	<input type="checkbox"/> analyze similarities and differences <input type="checkbox"/> draw conclusions <input type="checkbox"/> formulate <input type="checkbox"/> organize <input type="checkbox"/> show cause and effect	<input type="checkbox"/> develop a storyboard <input type="checkbox"/> flowchart <input type="checkbox"/> hierarchy/chronological map <input type="checkbox"/> spider map <input type="checkbox"/> system mapping
<p>Reciprocal Teaching: Students learn how to ask meaningful questions when they are actively engaged in the learning process through a structured dialogue.</p>	<input type="checkbox"/> construct <input type="checkbox"/> infer <input type="checkbox"/> predict <input type="checkbox"/> summarize <input type="checkbox"/> use context clues	<input type="checkbox"/> draw conclusions <input type="checkbox"/> explain <input type="checkbox"/> infer <input type="checkbox"/> formulate <input type="checkbox"/> verify	<input type="checkbox"/> assign a reading passage and student roles for active engagement: <ul style="list-style-type: none"> • summarizer • clarifier • questioner • predictor

Questioning Stems: Questions are designed from making connections between skills and concepts (level 2) to raising students' level of cognition to probe reasoning and in-depth integration of conceptual knowledge (level 3).

DOK Level 3

How or why would you summarize ...?

What examples/non-examples can you find to ...?

How would you organize _____ to show ...?

How could you show your understanding of ...?

What approach/tools would you use to ...?

How would you apply what you learned to develop ...?

Explain and apply abstract terms and concepts to real-world situations.

What is your prediction ... and why?

How would you organize these facts/observations?

If you changed these elements ... what would/might happen?

What facts are relevant to show ...?

What questions would you ask in an interview/survey about ...?

What question is being asked in this problem?

How can you prove that your solution or estimate is reasonable?

Transfer Learning: Applying Understanding



Definition: Hattie (2012) defines transfer learning as, “the process of developing sufficient surface knowledge to then move to deeper understanding such that one can appropriately transfer this learning to new tasks and situation.”

Strategy	DOK 3 (strategic thinking)	DOK 4 (extended thinking)	Activate Student Engagement
Identifying Similarities & Differences: Compare and contrast strategies, like metaphors and analogies, help learners make connections to prior knowledge and categorize concepts.	<input type="checkbox"/> analyze similarities and differences <input type="checkbox"/> compare-contrast <input type="checkbox"/> draw conclusion <input type="checkbox"/> make connections <input type="checkbox"/> use evidence to justify	<input type="checkbox"/> analyze and synthesize information from multiple sources <input type="checkbox"/> connect and relate ideas <input type="checkbox"/> formulate <input type="checkbox"/> make generalizations	<input type="checkbox"/> conduct or critique a designed investigation <input type="checkbox"/> debate from a given perspective <input type="checkbox"/> analyze survey results
Peer Tutoring: When students are paired together, it’s a win-win. Both the tutor and the tutee benefit from improved communication, content mastery, and peer relationships.	<input type="checkbox"/> assess <input type="checkbox"/> explain <input type="checkbox"/> revise	<input type="checkbox"/> applying information from more than one discipline <input type="checkbox"/> collaborate <input type="checkbox"/> produce/present <input type="checkbox"/> synthesize <input type="checkbox"/> self-monitor	<input type="checkbox"/> buzz groups <input type="checkbox"/> critical problem-solving <input type="checkbox"/> mastery learning <input type="checkbox"/> “teach-write-discuss”
Problem-Solving Teaching: Presenting students with real-world problems to investigate, think critically about, and collaborate to solve allows them to consolidate knowledge with ease.	<input type="checkbox"/> compare-contrast <input type="checkbox"/> draw conclusion <input type="checkbox"/> make connections <input type="checkbox"/> use evidence to justify	<input type="checkbox"/> collaborate <input type="checkbox"/> design and conduct <input type="checkbox"/> produce/present <input type="checkbox"/> research <input type="checkbox"/> self-monitor	<input type="checkbox"/> complex reasoning <input type="checkbox"/> investigations <input type="checkbox"/> research report <input type="checkbox"/> simulations <input type="checkbox"/> solve problems or find solutions to high-relevant topics
Transforming Conceptual Knowledge: Debates, simulations, and case studies help learners progress from sorting and classifying information to making connections among ideas and, finally, to transferring concepts.	<input type="checkbox"/> analyze similarities and differences <input type="checkbox"/> compare-contrast <input type="checkbox"/> draw conclusion <input type="checkbox"/> make connections <input type="checkbox"/> use evidence to justify	<input type="checkbox"/> applying information from more than one discipline <input type="checkbox"/> analyze and synthesize information from multiple sources <input type="checkbox"/> connect and relate ideas <input type="checkbox"/> formulate <input type="checkbox"/> make generalizations	<input type="checkbox"/> case studies <input type="checkbox"/> create a short film <input type="checkbox"/> debates <input type="checkbox"/> simulations <input type="checkbox"/> video game

Questioning Stems: Questions are designed to raise students level of cognition from strategic thinking (level 3) to extending their ability to transfer prior knowledge to new and novel situations (level 4).

DOK Level 4

Can you construct a model that would change ...?

Can you think of an original way to apply ...?

Write a thesis, drawing conclusions from multiple sources.

Design and conduct an experiment. Gather information to develop alternative explanations for the results of an experiment.

Write a research paper on a topic.

Apply information from one text to another text to develop a persuasive argument.

What changes would you make to solve or address this major problem/or issue ...?

How would you improve upon this invention or innovation?

Can you propose an alternative solution to ...?

In what way would you design or redesign ... and why?

What evidence would you cite to defend the actions of ...?

How would you prioritize criteria for making this decision ... and why?