

Surface, Deep, and Transfer Matrix

The purpose of this matrix is to match skills, instructional strategies, and the three phases of learning so educators can make decisions about optimal learning strategies for their students.

We first define surface, deep, and transfer learning. Then we dive into the recommended instructional strategies with corresponding skills, engagement examples, and tips to support each level of student learning. For each strategy, we suggest a variety of student engagement moves proven to activate learning.

At the end of this resource, we include question stems and prompts that demand varying levels of surface, deep, and transfer level thinking.

Examples

Deep Learning: Making Meaning

STRATEGY AND SKILLS	STRATEGY ENGAGEMENT EXAMPLES	STRATEGY TIPS
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. <ul style="list-style-type: none"> • Make observations • Compare • Draw conclusions • Explain 	<ul style="list-style-type: none"> • Exit ticket or journal prompt (flip book p. 13) • Error analysis (flip book p. 8) • Self-reported grades (flip book p. 21) 	<ol style="list-style-type: none"> 1. Give students opportunities to share questions and confusion: "What questions do you have? What was most confusing about the material we explored today?" 2. Think aloud and model your think process by asking and answering the following questions: What do I know about this topic? Have I done a task like this before? What strategies worked last time? What do I need to do first? How am I doing? What should I do next? Should I try a different strategy? What could I do differently next time?
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. <ul style="list-style-type: none"> • Interpret • Develop logical arguments • Justify • Cite evidence 	<ul style="list-style-type: none"> • Think-ink-pair-share (flip book p. 27) • Jigsaw I & II (flip book p. 12) • Fishbowl 	
Concept Mapping: Concept maps, like flow charts, help learners chunk information based on meaningful connections while allowing them to visualize relationships between different topics. <ul style="list-style-type: none"> • Compare and contrast • Analyze similarities and differences • Organize • Draw conclusions 	<ul style="list-style-type: none"> • Concept mapping (flip book p. 6) • Graphic organizers (flip book p. 11) • Flow chart 	<ol style="list-style-type: none"> 1. Create a partially completed map with some concepts and labels missing, and have students fill in the blanks. 2. Model reciprocal teaching for students and ask them to share what they notice. 3. Chart or distribute role cards to clarify student role expectations. Give students time to offer one another affirming and adjusting feedback on fulfilling their roles. 4. Digitize concept mapping with tools like Popplet, MindMeister, and Prezi.
Reciprocal Teaching: Students learn how to ask meaningful questions when they are actively engaged in the learning process through a structured dialogue. <ul style="list-style-type: none"> • Recite • Identify patterns • Interpret • Use context clues 	<ul style="list-style-type: none"> • Reciprocal teaching (flip book p. 19) • Send-a-problem (flip book p. 22) • Student roles for active engagement: summarizer, clarifier, questioner & predictor 	

Skills

Tips

Definitions

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.

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 estimates 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.

TRANSFER LEARNING is the ability to apply previously acquired knowledge, skills, and information learned in one context to new situations or problems. It is the process of moving from theoretical concepts to actual, practical applications. It is a retrieval practice that enables learners to use past learning experiences in new situations or learning opportunities, highlighting knowledge retention and information processing. As Hattie (2012) describes, it involves developing initial understanding and then deepening it to effectively use learning in different contexts.

Download the digital version of the Achievement Teams Instructional Strategy Flip Book!

Within this matrix, the highlighted student engagement strategies labeled “flip book” can be found in our Achievement Teams Instructional Strategy Flip Book.



Surface Learning: Building Knowledge and Making Connections

STRATEGY AND SKILLS	STRATEGY ENGAGEMENT EXAMPLES	STRATEGY TIPS
<p>Outlining: Using an outline at the beginning of the writing process helps learners clarify ideas while demonstrating the student's thinking process.</p> <ul style="list-style-type: none"> • Arrange • Illustrate • Categorize • Classify 	<ul style="list-style-type: none"> • Graphic organizer (flip book p.11) • Timeline of events • Create a reverse outline 	<ol style="list-style-type: none"> 1. Model the strategy during "unit zero" or the beginning of a unit. 2. Cue students when to stop and take notes, then scaffold cues away as students become more self-sufficient. 3. Provide a "notes answer key" so students can check their notes. 4. Digitize outlining and note-taking with tools like Creately, Corgi, or Miro.
<p>Note-Taking: Recording key information is a powerful cognitive tool that actively engages the brain to retain information while increasing self-efficacy.</p> <ul style="list-style-type: none"> • Define • Recall facts • Organize • Categorize 	<ul style="list-style-type: none"> • Concept mapping (flip book p. 6) • Illustrate meanings • Use visual images 	
<p>Summarizing: Capturing the most important ideas while excluding irrelevant and repetitive information improves memory and comprehension.</p> <ul style="list-style-type: none"> • Restate • Organize information • Summarize major events 	<ul style="list-style-type: none"> • GIST (flip book p. 10) • Captioned photo summary • Headline summaries 	<ol style="list-style-type: none"> 1. Give students a limit on how many words they can use in their summary. For example, you could tell them that each word costs \$1 and they have a spending limit of \$20. 2. Ask students the following framework questions: <ol style="list-style-type: none"> a. What are the main ideas? b. What are the crucial details necessary for supporting the main ideas? c. What information is irrelevant or unnecessary? 3. Round out vocabulary word understanding with a definition, using in a sentence, and drawing a picture or visual representation.
<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> <ul style="list-style-type: none"> • Recite • Identify patterns • Interpret • Use context clues 	<ul style="list-style-type: none"> • Card sorts (flip book p. 5) • Sketching words to show meaning • Analyzing word parts 	



Deep Learning: Making Meaning

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<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> <ul style="list-style-type: none"> • Interpret • Develop logical arguments • Justify • Cite evidence 	<ul style="list-style-type: none"> • Think-ink-pair-share (flip book p. 27) • Jigsaw I & II (flip book p. 12) • Fishbowl 	
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Transfer Learning: Applying Understanding

STRATEGY AND SKILLS	STRATEGY ENGAGEMENT EXAMPLES	STRATEGY TIPS
<p>Identifying Similarities & Differences: Comparing and contrasting strategies, like metaphors and analogies, help learners make connections to prior knowledge and categorize concepts.</p> <ul style="list-style-type: none"> • Make observations • Connect and relate ideas • Use evidence to justify • Compare and contrast 	<ul style="list-style-type: none"> • Contracts or independent projects (flip book p. 7) • Debate from a given perspective • Conduct or critique a designed investigation 	<ol style="list-style-type: none"> 1. Model peer tutoring to demonstrate characteristics of productive feedback, as well as the differences between directive and non-directive tutoring. 2. List peer tutoring prompts to encourage on-task conversation. 3. Provide students with a peer tutoring graphic organizer to streamline feedback.
<p>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.</p> <ul style="list-style-type: none"> • Explain how • Assess • Synthesize • Apply information from more than one discipline 	<ul style="list-style-type: none"> • Feedback (flip book p. 9) • Teammates consult (flip book p. 26) • Teach-write-discuss 	
<p>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.</p> <ul style="list-style-type: none"> • Make connections • Use evidence to justify • Design and conduct • Produce-present 	<ul style="list-style-type: none"> • Metacognitive inquiry writing (flip book p. 14) • Practice and challenge by choice (flip book p. 17) • Project-based learning 	<ol style="list-style-type: none"> 1. Provide students with prompts that support them in coaching each other's problem-solving. 2. Review rubrics for effective presentations. 3. Allot time daily or weekly for students to share transdisciplinary connections. Post these on a unit bulletin board or other prominent place.
<p>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.</p> <ul style="list-style-type: none"> • Connect and relate ideas • Applying information from more than one discipline • Connect and relate ideas • Make generalizations 	<ul style="list-style-type: none"> • RAFT (flip book p. 18) • Learning menus (flip book p. 15) • Debates or socratic seminar 	



Strategy Templates

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Question Stems

SURFACE LEARNING	DEEP LEARNING	TRANSFER LEARNING
Designed to help students gain foundational skills and move them into making connections.	Designed to help students move from making connections between skills and concepts to raising their level of cognition to probe reasoning and in-depth integration of conceptual knowledge.	Designed to raise students' level of cognition from strategic thinking to extending their ability to transfer prior knowledge to new and novel situations.
<p>Can you recall _____?</p> <p>What is the formula for _____?</p> <p>How can you recognize _____?</p> <p>What approach/tools would you use to _____?</p> <p>How would you apply what you learned to develop _____?</p> <p>How are _____ alike? Different?</p> <p>What questions would you ask in an interview/survey about _____?</p> <p>How can you find the meaning of _____?</p> <p>Can you explain how _____ affected _____?</p> <p>How would you apply what you learned to develop _____?</p> <p>How would you compare _____? Contrast _____?</p> <p>How would you classify _____?</p> <p>How could you show your understanding of _____?</p> <p>Can you identify _____?</p> <p>What examples/non-examples can you find to _____?</p> <p>How would you organize _____ to show _____?</p>	<p>How or why would you summarize _____?</p> <p>What examples/non-examples can you find to _____?</p> <p>How would you organize _____ to show _____?</p> <p>How could you show your understanding of _____?</p> <p>What approach/tools would you use to _____?</p> <p>How would you apply what you learned to develop _____?</p> <p>Explain and apply abstract terms and concepts to real-world situations.</p> <p>What is your prediction and why?</p> <p>How would you organize these facts/observations?</p> <p>If you changed these elements _____, what would/might happen?</p> <p>What facts are relevant to show _____?</p> <p>What questions would you ask in an interview/survey about _____?</p> <p>What question is being asked in this problem?</p> <p>How can you prove that your solution or estimate is reasonable?</p>	<p>Can you construct a model that would change _____?</p> <p>Can you think of an original way to apply _____?</p> <p>Write a thesis, drawing conclusions from multiple sources.</p> <p>Design and conduct an experiment. Gather information to develop alternative explanations for the results of the experiment.</p> <p>Write a research paper on a topic.</p> <p>Apply information from one text to another text to develop a persuasive argument.</p> <p>What changes would you make to solve or address this major problem or issue?</p> <p>How would you improve upon this invention or innovation?</p> <p>Can you propose an alternative solution to _____?</p> <p>In what way would you design or redesign _____ and why?</p> <p>What evidence would you cite to defend the actions of _____?</p> <p>How would you prioritize criteria for making this decision and why?</p>

