Simple Principles from the Science of Learning: Implications for the Art of Teaching

This chart was adapted from a 2008 compilation by Erin Driver-Linn of "Evidence-Based Principles of Student Learning: Implications for Best Teaching Practices." It's meant to showcase best practices in teaching based on science of learning principles and provide instructors with concrete examples to implement in their courses with minimal barriers.

	Best Practices	Underlying Principles	Examples
	1. **Aim**. Clearly and specifically identify your learning objectives.	Being explicit about purpose reduces confusion for beginners.	▪ Be explicit about learning objectives in the syllabus, and in assignments/tests ▪ Create and convey a simple agenda for each class
COGNITIVE			
Knowledge, Comprehension, Long-term memory, Meta-cognition	2. **Detect**. Find appropriate ways to gauge what your students know and don't know.	Prior knowledge and misconceptions are influential.	▪ Use a "pretest" or other way to diagnose background knowledge at the start of course ▪ Use informal assessments to gauge learning
	3. **Scaffold**. Simplify, chunk, categorize, and contextualize, so students will remember.	Simplifying, chunking and repeating facilitate retention; scaffolding supports learners as they construct new knowledge.	▪ Organize readings and assignments in conceptually meaningful units (not just chronological order) ▪ Introduce, exemplify and summarize at the end 3-5 main conceptual points
BEHAVIORAL			
Skills, Habits, Abilities, Practices	4. **Model**. Demonstrate and explain the reasoning behind what you do, and behind your opinions.	Modeling academic methods explicitly fosters connection of knowledge to practice.	▪ Make teaching methods & rationales transparent ▪ Make transparent disciplinary methods and scholarly debates connected to course content
	5. **Activate**. Provide well-timed, varied, contextual opportunities for students to develop & practice what they've learned.	Practicing what is learned in spaced, variable, contextually meaningful situations fosters transfer.	▪ Give varied, spaced assignments / tests over the course of the semester ▪ Create ways for students engage with material, and be tested in various ways during class
	6. **Guide**. Offer feedback explaining not just what to change, but how and why.	Feedback geared toward "self-editing" fosters metacognition and transfer.	▪ Offer feedback that is well-timed and takes advantage of drafts, peer review, self-assessment ▪ Offer opportunities to try again after feedback
AFFECTIVE			
Interest , Motivation, Emotional engagement	7. **Connect**. Get to know your students and create ways for them to get to know you, each other, and your discipline.	Epistemological development depends upon relationships; personally relevant examples facilitate retention; individualized attention, as well as collaborative work, boost engagement.	▪ Learn students' names, backgrounds ▪ Tailor in-class responses to individual students ▪ Design ways for students to learn in small groups
	8. **Expect**. Communicate high expectations *and* the capacity for improvement.	Praise and criticism are tricky to deliver in a way that increases interest and resiliency to challenges.	▪ Use a grading scheme that is challenging and includes the ability to improve ▪ Communicate a fluid theory of intelligence in the delivery of praise and criticism
	9. **Assess**. Determine what went well and could use improvement.	A virtuous cycle of gathering evidence ensures ongoing improvement.	▪ Gather feedback (quick reflections, mid-semester evaluations); interpret and integrate ▪ Interpret course evaluations in relation to learning objectives; integrate & revise accordingly

Sources and more details: ***hilt.harvard.edu/conference***