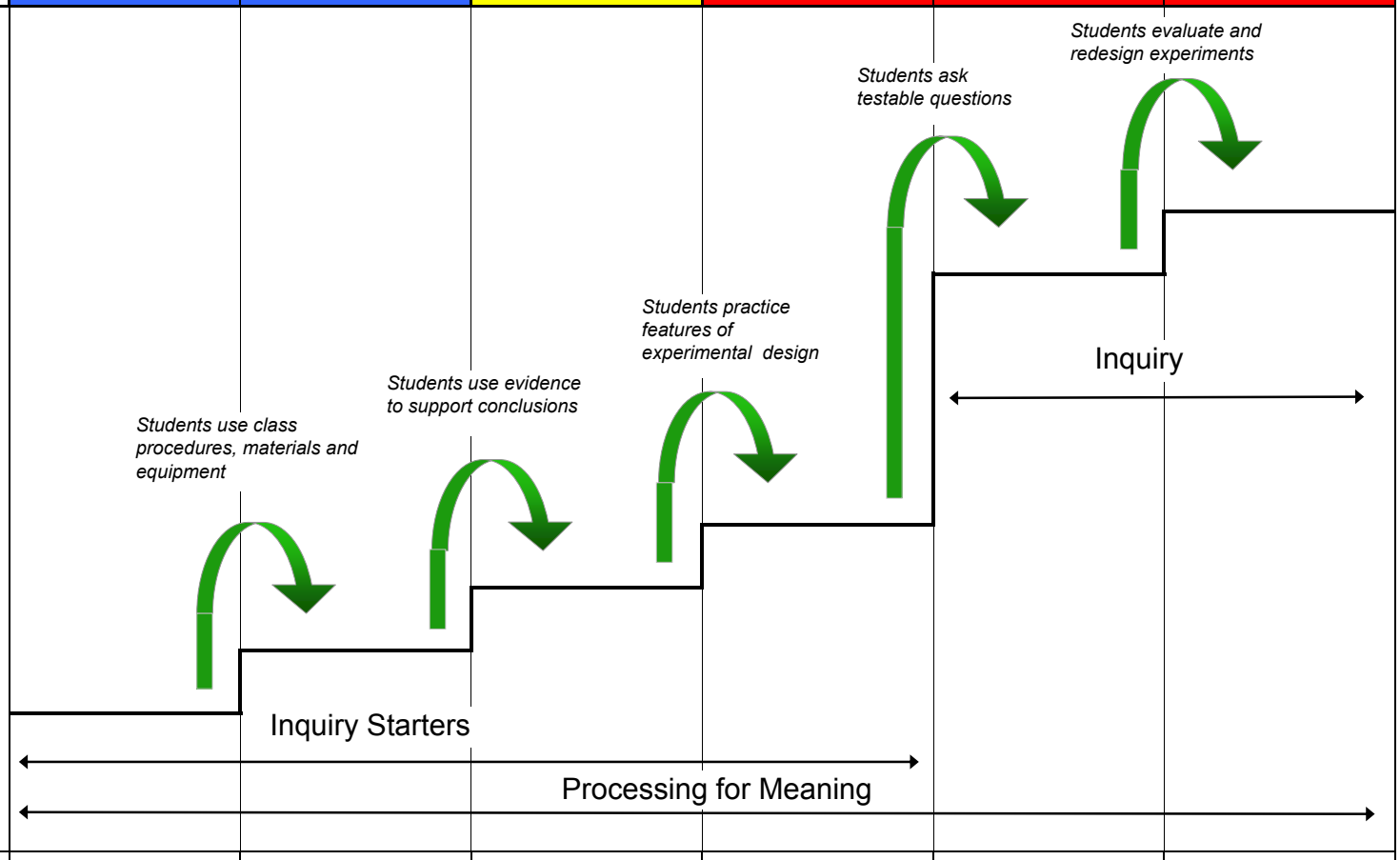
INQUIRY CONTINUUM

		Lecture/Reading Video/Demo	Cookbook Lab	Structured Lab	Challenge Lab	Student-Directed Inquiry	Student-Designed Inquiry
Leading the Inquiry Process	Science Concept	TEACHER				Teacher Student	
	Testable Question						
	Materials				Teacher Student		
	Procedures / Design						
	Results / Analysis			Teacher Student			
	Conclusions						



Teaching the Components of Scientific Inquiry		Lecture/Reading Video/Demo	Cookbook Lab	Structured Lab	Challenge Lab	Student-Directed Inquiry	Student-Designed Inquiry
Learning through the Inquiry Process	**Science Process Developed**	TEACHER AND/OR CURRICULUM IMPARTS INFORMATION TO STUDENTS: Students read about, hear about, or see others "doing" science.	TEACHER SETS ONE PROCEDURE & STUDENTS CONFIRM KNOWN RESULT: Teacher directs all decisions relating to activity—from the topic to the single conclusion.	TEACHER SETS ONE PROCEDURE & STUDENTS' RESULTS VARY FROM GROUP TO GROUP: Students are expected to reach their own conclusions based on supportive evidence.	TEACHER POSES CHALLENGE PROBLEM & STUDENTS DESIGN THE PROCEDURES: Students design and test solutions and evaluate how well the design solves a problem.	TEACHER GUIDES STUDENTS TO DO INVESTIGATION: Students generate testable questions centered on teacher-selected content area, then design and test possible solutions.	STUDENTS DIRECT UNIQUE EXPERIMENT (TRUE SCIENTIFIC INQUIRY): Students independently select a topic, identify a problem, and formulate a testable question; they design and carry out the experiment.
	Skills Developed	COLLECTING INFORMATION SKILLS: reading, extracting information from lecture or text sources, note taking, observation.	BASIC LAB SKILLS: reading and following directions; using lab equipment; obtaining a class data set; arriving at a common conclusion.	DATA ANALYSIS SKILLS: collecting data; introduces concept of variability of results and need for replication; making inferences and drawing conclusions from one set of data/evidence.	PROBLEM SOLVING SKILLS: developing confidence to put forth own ideas; designing, conducting and evaluating trials; repeating process to achieve solution; drawing conclusions from range of results.	CRITICAL THINKING SKILLS: developing own procedures; interpreting data; writing conclusion based on evidence/results.	SCIENCE PROCESS USED: writing own question in testable form; creating complete experimental design; analyzing and interpreting data; evaluating methods of investigation and writing a results-based conclusion.
	Limitations/Costs	Little critical thinking. Concepts and processes are not internalized.	Does not model true science process as outcome is known, i.e., only one possible conclusion; hands-on but not necessarily minds-on.	Students not involved in making decisions about experimental design.	Does not involve student-generated questions. Competition may limit student collaboration.	Requires investment of time; equipment needs cannot always be anticipated when students design investigations.	Guiding and supporting 30-150 students who are pursuing individual investigations.
	Example	Students attend a lecture and video on mollusks.	Students dissect a slug using the lab book provided.	Students follow the written lab procedures and observe slug behavior when presented with three foods provided.	Students design a system using slug slime as an adhesive from which you can suspend and hold 100 grams of washers.	In a class study of slugs, each student designs a test to determine a slug's preference for light or dark.	Students independently decide to conduct an investigation on slug mucus as an adhesive.