Stage	Standard	Indicator
I	**11A** - Stu	1
I	**11A** - Stu	2
I	**11A** - Stu	3
I	**11A** - Stu	4
I	**11A** - Stu	5
I	**12C** - Stu	3
I	**12C** - Stu	4
I	**12C** - Stu	5
I	**12D** - Stu	3

I & J	**13A** Stud	1
I & J	**13A** Stud	2
I	**13B** - Stu	1
I	**13B** - Stu	2
I	**13B** - Stu	3
I	**13B** - Stu	4
J	**11A** - Stu	1

J	**11A** - Stu	2
J	**11A** - Stu	3
J	**11A** - Stu	4
J	**11A** - Stu	5
J	**11B** - Stu	1
J	**11B** - Stu	2
J	**11B** - Stu	3
J	**11B** - Stu	4
J	**11B** - Stu	5
J	**12C** - Stu	1

J	**12C** - Stu	2
J	**13B** - Stu	1
J	**13B** - Stu	2
J	**13B** - Stu	3
J	**13B** - Stu	4
J	**13B** - Stu	5

	Chpt 1-- Scientists' tools	Chpt 2-- antacids
1. Formulate independent content-specific hypothesis referencing pertinent reliable prior research, or proposing options for appropriate questions, procedural steps, and necessary resources.	Section 1.3, Lab 1.3	
2. Design an inquiry investigation which addresses proposed hypothesis, determining variables and control groups, incorporating all procedural and safety precautions, materials and equipment handling directions and data-collection formatting preparations, or securing approval for all procedures, equipment use and safety concerns.	Section 1.3, Lab 1.3	
3. Conduct inquiry investigation, using technologies for observing and measuring directly, indirectly, or remotely, completing multiple, statistically-valid trials, or accurately and precisely recording all data.	Section 1.3, Lab 1.3	
4. Interpret and represent analysis of results to produce findings that support or refute inquiry hypothesis, evaluating data sets to explore explanations of outliers or sources of error and trends, or applying statistical methods to compare mode, mean, percent error and frequency functions.	Section 1.3, Lab 1.3	
5. Present and defend process and findings in open forum, generating further questions, explaining impact of possible sources of error, or reflecting on and evaluating peer critiques and comparable inquiry investigations for consolidation or refinement of procedures.	Included in all the	
3. Apply scientific inquiries or technological designs to investigate the atomic and nuclear structure of matter, examining historical atomic theories and quantum theory, modeling nuclear and electron configurations and their reactions, or predicting bonding and molecular structure.		
4. Apply scientific inquiries or technological designs to explain how physical and chemical structures of matter affect its properties, relating bonding types and shapes of molecules to organic and inorganic compounds, or examining the colligative properties of solutes on the properties of solutions/mixtures.		
5. Apply scientific inquiries or technological designs to investigate kinetic theory and laws of thermodynamics, describing the ideal gases, analyzing the gas laws, or explaining entropy/ enthalpy, exothermic/endothermic reactions, and/or Hess's law.		
3. Apply scientific inquiries or technological designs to explore atomic and nuclear physical systems, describing historic, current, and proposed research to explain purposes and impact of discoveries, or explaining radioactivity in terms of atomic decay, nuclear reactions, and emissions.		

1. Apply appropriate principles of safety, following established procedures to maintain both personal & environmental safety when handling & disposing of chemicals, estimating risks/benefits to alternative procedures, mapping classroom laboratory facilities for safe egress & distances/times to access safety treatment features, manipulating, reading and troubleshooting scientific equipment safely, communicating school science storage and disposal policies for classroom investigations, demonstrating safety practices and emergency procedures pertaining to laboratory and field work, researching community disposal procedures (e.g., mercury thermometers or lead batteries), or participating in household waste and hazardous waste pickup programs in Illinois.		
2. Apply scientific habits of mind to curricular investigations in life, environmental, physical, earth, and space sciences, identifying instances of how scientific reasoning, insight, creativity, skill, intellectual honesty, tolerance of ambiguity, skepticism, persistence, openness to new ideas, and sheer luck have been integral to discoveries, identifying specific studies which demonstrate how scientific conclusions are open to modification as new data are collected, or researching classroom and real-world standards for peer review.	Scientific processes, including communication of results & peer review	
1. Analyze the pure and applied research nature of science, evaluating public perceptions of value of scientific research, or assessing short- and long-term risks/benefits of specific pure research which directly led, or may lead, to direct applications.		
2. Analyze career and occupational decisions that are affected by a knowledge of science, associating scientific concepts considered in career-specific decisions (e.g., use of pesticides by farmers, choosing ink for printing), or explaining chemical/physical interactions in occupational settings (e.g., insect abatement programs, waste water treatment).		
3. Analyze how resource management and technologies accommodate population trends, explaining factors needed to sustain and enhance the quality of Earth's water, quantifying benefits, costs, limitations and consequences involved in using scientific technologies or resources, or assessing global consequences of ecosystem modifications.		
4. Analyze claims used in advertising and marketing strategies for scientific validity, collecting statements of purported scientific studies to evaluate mathematical validity, or researching scientific foundations use (or manipulation) in marketing and advertising strategies for target populations.		
1. Formulate issue- hypothesis, reviewing literature as primary reading sources, differentiating between subjective/objective data and their usefulness to the issue, or examining applicable existent surveys, impact studies, or models.		

2. Design an issue investigation, proposing applicable survey and interview instruments and methodologies, selecting appropriate simulations, or projecting possible viewpoints, variables, applicable data sets and formats for consideration.		
3. Conduct issue investigation (following all procedural and safety precautions), using appropriate technologies, interviewing associated entities or experts, testing applicable simulation models, or completing all data collection requirements.		
4. Interpret and analyze results to produce findings and issue resolution options, evaluating data sets and trends to explore unexpected responses and data distractors, evaluating validity and reliability, or substantiating basis of inferences, deductions, and perceptions.		
5. Report, display and defend the process and findings of issue investigation, critiquing findings by self and peer review, generating further questions or issues for consideration, evaluating comparable issue resolutions or responses for action, or generalizing public opinion responses.		
1. Formulate proposals for innovative technological design, generating ideas for innovations and variables, identifying design constraints due to access to tools, materials, and time, or researching applicable scientific principles or concepts.		
2. Design and conduct technological innovation testing, developing the sequence of the design with visualizations, incorporating the appropriate safety, available technology and equipment capabilities into construction of design, or repeating procedural steps for multiple trials.		
3. Collect and record data accurately, using consistent metric measuring and recording techniques and media with necessary precision, documenting data from instruments accurately in selected format, or graphing data appropriately to show relation to variables in design solution proposal.		
4. Interpret and represent results of analysis to produce findings, comparing data sets to design criteria for suitability, acceptability, benefits, or proposing explanations for sources of error in the data set for process or product design flaws.		
Report the process and results of a design investigation, explaining application to appropriate scientific principle or concept, communicating anecdotal and quantitative observations, analyzing a logical explanation of success or errors, or generating additional design modifications which can be tested later.		
1. Apply scientific inquiries or technological designs to explain chemical bonding and reactions, balancing chemical reactions using formulas and equations to quantify reaction masses, volumes and ratios, examining factors that affect capacity to react or rates (concentrations, pH, catalysts, molarity, temperature, etc.), or referencing the bonding potential and strengths within and between atoms and molecules.		chemical reactions, factors affecting rates

Apply scientific inquiries or technological designs to explain atomic and sub-atomic structures and energy, describing the composition of the nucleus and its transformations in nuclear reactions and predicting energy released and absorbed, explaining atomic structures to masses, volumes, charges, and isotopic connections, or explaining schematic designs for devices to detect, analyze, produce such structures or processes.		
1. Analyze challenges created by international cooperation and competition in scientific knowledge and technological advances, explaining multinational corporations' challenges or impact for resource acquisition, or researching the cooperative efforts and dilemmas associated with global partnerships		
2. Analyze scientific breakthroughs in terms of societal and technological effects, citing how beliefs and attitudes influence advances, examining global distribution of energy, natural or fiscal resources, or evaluating how scientific advances from different cultures are received.		
3. Analyze environmental impact studies, describing the design and procedures, synthesizing the findings and justifying the recommendations, or comparing methods for minimizing pollution or procedures for monitoring environmental quality.		
4. Analyze local, state, national, global scientific policies in terms of costs, benefits, and effects, identifying policies which have affected local needs, costs, or products, assessing national or global costs of policies from American or non-American perspectives, or evaluating data used in media explanations of resource, technology, or policy impact.		
Analyze how scientific and technological progress have affected job markets and everyday life, investigating projected trends over 2-3 decades, or assessing costs for technological progress on personal, governmental, economic and ecosystem impact in the sciences.		

Chpt 3--Airbags	Chpt 4--Light	Chpt 5--soaps	Chpt 6--sports drinks	Chpt 7--hot/cold packs	Chpt 8--industry	Chpt 9--Forensics	Chpt 10--Batteries	Chpt 11--Polymers

at least 1 time per chapter

at least 1 time per chapter

at least 1 time per chapter

at least 1 time per chapter

e labs asking for students to white-board results, share with class, discuss discrepencies and adjust their conclus

	Atomic & electronic structures	Bonding & molecular structures						
		Bonding & properties	Colligative properties & solutions					Bonding & properties of organic molecules
Kinetic molecular theory, gas laws & ideal gas				thermodynamics				
	history of atomic discovery							

all labs

	modifications of scientific understanding							
					chemical engineers, environmental chemists	Forensic chemists		
					Environmental chemistry			
			Evaluating marketing strategies (intro information)					

								Final project 11
								Final project 11

all labs

all labs

all labs

		chemical bonding	stoichiometry (reaction masses, volumes, ratios)					

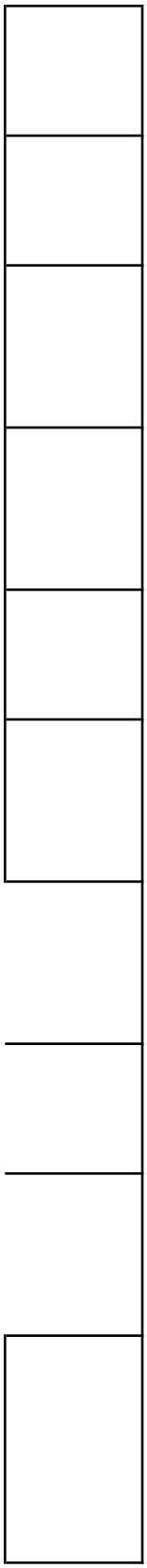
Chpt 12--
nuclear

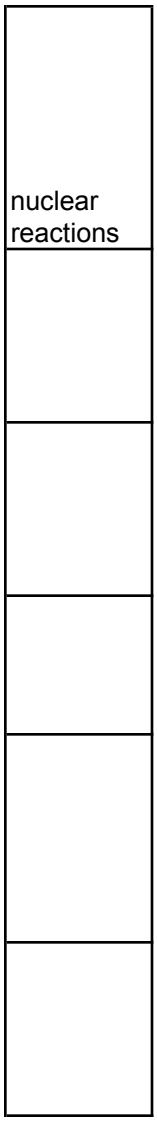
sions

nuclear
reactions &
emissions

public perception of nuclear chemistry

Final project 12




nuclear
reactions