

	Name of Course: Environmental Field Studies (SNHU Env-250 Research Methods) Team Members: Erin Hobbs Number of Days: 10	
Unit	Narrative writing	
Essential Questions	What is your personal connection to the Merrimack River Watershed?	
Content Standards	ELA-WCA 3. Write narratives to develop experiences or events using effective literary techniques, well-chosen details, and well-structured sequences. a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create an appropriate progression of experiences or events. b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole. d. Use precise words and phrases, telling details, and figurative and sensory language to describe settings and characters and establish mood and tone. e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative. RCA-ST 7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.	
Concepts and Subskills	Difference between qualitative and quantitative data APA format Supporting inferences with scientific evidence	Science and Engineering practices S1. Asking questions (for science) and defining problems (for engineering). S2. Developing and using models. S3. Planning and carrying out investigations. S4. Analyzing and interpreting data. S5. Using mathematics and computational thinking. S6. Constructing explanations (for science) and designing solutions (for engineering). S7. Engaging in argument from evidence. S8. Obtaining, evaluating, and communicating information

Content Objectives (Student Friendly Language)	I can write a narrative using personal experiences in the Merrimack River Watershed. I can use narrative techniques such as dialog to enhance the story. I can demonstrate proper use of APA format for page set-up, in-text citations, and work cited in a narrative paper. I can integrate scientific research to enhance my narrative.
Content Vocabulary	Tier One Vocabulary
	Tier Two Vocabulary
	Inference Conclusion
	Tier Three Vocabulary
	Qualitative and quantitative data
Assessments, Products, Projects	Narrative paper
Text, Materials, and Resources	Google Classroom

	Name of Course: Environmental Field Studies (SNHU Env-250 Research Methods) Team Members: Erin Hobbs Number of Days: 28
Unit	Merrimack River and Field Work Introduction
Essential Questions	What environmental challenges does the Merrimack River Watershed face? What field methods can be utilized to study the Merrimack River Watershed?

Content Standards	***This unit focuses on all the Science practices outlined by the State Standards. ELA-RI 7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., charts, graphs, photographs, videos, maps) as well as in words in order to address a question or solve a problem.	
Concepts and Subskills	Dams in Merrimack River Structure of Salt marshes Mercury and Dragonflies Eutrophication and Reservoirs Wastewater treatment and CSO Testing water chemistry (P, N, pH, DO, e coli, temp, salinity, etc) Quadrat sampling Probe sampling Plankton sampling Salt marsh grass transects Graphing and analysis	Science and Engineering practices S1. Asking questions (for science) and defining problems (for engineering). S2. Developing and using models. S3. Planning and carrying out investigations. S4. Analyzing and interpreting data. S5. Using mathematics and computational thinking. S6. Constructing explanations (for science) and designing solutions (for engineering). S7. Engaging in argument from evidence. S8. Obtaining, evaluating, and communicating information
Content Objectives (Student Friendly Language)	I can ask questions about my local environment. I can develop and use models to explain what is observed in the Merrimack River watershed. I can plan and carry out an investigation. I can analyze and interpret data I collected. I can use mathematical and computational thinking to help explain my observations. I can construct a scientific explanation for what is being observed in my local environment. I can use scientific evidence to explain observations I am making in our environment. I can obtain, evaluate and communicate my findings.	
Content Vocabulary	Tier One Vocabulary	
	Tier Two Vocabulary	
	Dams Sediment Salt Marsh	

	Wastewater Reservoir
	Tier Three Vocabulary
	Transect Salt marsh zonation Plankton P, N, pH, DO, e coli, temp, salinity, etc
Assessments, Products, Projects	Aquatic ecosystem research project Literature presentation Dams research assignment Combined Sewer Overflow Research assignment Field work participation
Text, Materials, and Resources	Google Classroom

	Name of Course: Environmental Field Studies (SNHU Env-250 Research Methods) Team Members: Erin Hobbs Number of Days: 18
Unit	Research and Literature Review
Essential Questions	What local environmental problems in the Merrimack River Watershed exist? What environmental problems are not well understood or researched locally?
Content Standards	***The science content will vary for each student during this unit as they work on individual research projects. ELA-RI 7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., charts, graphs, photographs, videos, maps) as well as in words in order to address a question or solve a problem. ELA-W 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. ELA-W 5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. a. Demonstrate command of standard English conventions. b. Demonstrate the ability to select accurate vocabulary appropriate for audience, purpose, and style.

	ELA-W 7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. ELA-W 8. When conducting research, gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. ELA-W 9. Draw evidence from literary or informational texts to support written analysis, interpretation, reflection, and research, applying one or more grades 11–12 standards for Reading Literature or Reading Informational Text as needed.	
Concepts and Subskills	Identifying an Environmental problem that is not well understood or researched locally Primary vs secondary literature sources Writing an annotated bibliography Writing a scientific Literature review Using proper APA format	Science and Engineering practices S1. Asking questions (for science) and defining problems (for engineering). S2. Developing and using models. S3. Planning and carrying out investigations. S4. Analyzing and interpreting data. S5. Using mathematics and computational thinking. S6. Constructing explanations (for science) and designing solutions (for engineering). S7. Engaging in argument from evidence. S8. Obtaining, evaluating, and communicating information
Content Objectives (Student Friendly Language)	I can ask a scientific question that is testable. I can integrate and evaluate primary scientific research that is aligned with my research question. I can use evidence from my research to support the need for future scientific investigation. I can use proper APA formatting for page set-up and citations.	
Assessments, Products, Projects	Research Problem of practice assignment Annotated Bibliography Literature Review	
Text, Materials, and Resources	Google Classroom	

	Name of Course: Environmental Field Studies (SNHU Env-250 Research Methods) Team Members: Erin Hobbs Number of Days: 10	
Unit	Podcast Challenge	
Essential Questions	How do you examine an environmental problem through different perspectives? How does one present varying perspectives through a podcast in an unbiased way?	
Content Standards	***The science content will vary for each student during this unit as they work on group environmental research podcasts. ELA-SL 1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively. a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas. (See grades 11–12 Reading Literature Standard 1 and Reading Informational Text Standard 1 for specific expectations regarding the use of textual evidence.) b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed. c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. ELA-SL 2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. ELA-SL 3. Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.	
Concepts and Subskills	Obtain multiple points of view on a particular topic Identify and interview experts in the field of interest Create a Podcast	Science and Engineering practices S1. Asking questions (for science) and defining problems (for engineering). S2. Developing and using models. S3. Planning and carrying out investigations.

		S4. Analyzing and interpreting data. S5. Using mathematics and computational thinking. S6. Constructing explanations (for science) and designing solutions (for engineering). S7. Engaging in argument from evidence. S8. Obtaining, evaluating, and communicating information
Content Objectives (Student Friendly Language)	I can identify credible contributors to address an environmental issue with varying perspectives. I can outline, plan and carry out a successful interview. I can compile multiple interview, evaluate the contents and communicate the information by creating a concise podcast story that addresses an environmental issue.	
Assessments, Products, Projects	Final Podcast	
Text, Materials, and Resources	Google Classroom NPR	

	Name of Course: Environmental Field Studies (SNHU Env-250 Research Methods) Team Members: Erin Hobbs Number of Days: 25	
Unit	Methods and Conducting Field Work	
Essential Questions	How does one study an environmental problem in the Merrimack River watershed that is not well understood or researched?	
Content Standards	ELA-W 7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	
Concepts and Subskills	Identify methods to study environmental problem Identify statistical analysis necessary to analyze the findings	Science and Engineering practices S1. Asking questions (for science) and defining problems (for engineering). S2. Developing and using models.

	Write methodology Conduct field work and carry out investigation	S3. Planning and carrying out investigations. S4. Analyzing and interpreting data. S5. Using mathematics and computational thinking. S6. Constructing explanations (for science) and designing solutions (for engineering). S7. Engaging in argument from evidence. S8. Obtaining, evaluating, and communicating information
Content Objectives (Student Friendly Language)	I can plan and carry out a scientific investigation using the scientific method. - I can identify field methods and statistical analysis methods that align with my research question. - I can write a concise and thorough methodology. - I can create a timeline (research plan) and successfully complete all my field work.	
Assessments, Products, Projects	Written Methods draft Completion of field work Evaluating and modifying Methods draft	
Text, Materials, and Resources	Google Classroom	

	Name of Course: Environmental Field Studies (SNHU Env-250 Research Methods) Team Members: Erin Hobbs Number of Days: 20	
Unit	Analysis and Conclusion	
Essential Questions	What observation can be made when studying an environmental problem in the Merrimack River watershed? Using scientific reasoning, what conclusions can be made regarding your research?	
Content Standards	8. When conducting research, gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. 9. Draw evidence from literary or informational texts to support written analysis, interpretation, reflection, and research,	

	applying one or more grades 11–12 standards for Reading Literature or Reading Informational Text as needed.	
Concepts and Subskills	Analyze data collected during field work Use of statistical analysis Present data through graphs and tables demonstrate claim, evidence and reasoning in a scientific paper	Science and Engineering practices S1. Asking questions (for science) and defining problems (for engineering). S2. Developing and using models. S3. Planning and carrying out investigations. S4. Analyzing and interpreting data. S5. Using mathematics and computational thinking. S6. Constructing explanations (for science) and designing solutions (for engineering). S7. Engaging in argument from evidence. S8. Obtaining, evaluating, and communicating information
Content Objectives (Student Friendly Language)	I can analyze and interpret data to construct an argument using evidence from my investigation. I can use primary scientific literature to support my analysis and conclusion.	
Assessments, Products, Projects	Final paper including Lit Review, Methods, Results and Conclusion.	
Text, Materials, and Resources	Google Classroom	