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| Class | Learning Goals | Topics | Activities | Materials | Assignments | Hours |
| 1: Discovering Our Environment | * discover how resources are used differently by various people.
 | * intro to course
* where students live
* how we use coastal ecosystems
 | * discuss course, review syllabus
* students use pushpins to indicate places of importance to them on map
* teacher points out and discusses places where field trip will take place
 | * computer plus projector
* course syllabus
* large map of local area (where students live) and where field trips will take place
* pushpins
 | * In preparation for assignments 2, 3, & 4, list the common and scientific names of three plants and three animals that live in *each* of the following ecosystems: sandy beach, rocky shore, salt marsh.
 | * 1.5
 |
| 2: Beaches | * SWBAT describe the formation, ecological conditions, and human impacts on beach ecosystems
 | * beach formation
* adaptations of plants and animals
 | * day at beach discussion
* powerpoint of beach ecology
* brainstorm about adaptations of plants and animals
 | * computer plus projector
* optional: sand from various locations
* images of beach organisms
 | * Investigate one plant and one animal that lives exclusively on local sandy beaches. Create a one page species profile for each (format provided) using four or more sources
 | * 45 min- 1 hr
 |
| 3: Rocky Shores | * SWBAT describe the formation, ecological conditions, and human impacts on rocky shore ecosystems
 | * rocky shore formation
* adaptations of plants and animals
 | * powerpoint of rocky shore ecology
* brainstorm about adaptations of plants and animals
 | * computer plus projector
* optional: barnacle encrusted rocks
* images of rocky shore organisms
 | * Investigate one plant and one animal that lives exclusively on local rocky shores. Create a one page species profile for each (format provided) using four or more sources
 | * 45 min- 1 hr
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| 4: Salt Marshes | * SWBAT describe the formation, ecological conditions, and human impacts on salt marsh ecosystems
 | * salt marsh formation
* adaptations of plants and animals
* brief description of freshwater wetlands
 | * powerpoint of salt marsh ecology
* brainstorm about adaptations of plants and animals
* extra time should be used to give students time to finish/edit assignments 2-4.
 | * computer plus projector
* optional: mud, mussel, or grass from marsh.
* images of salt marsh organisms
 | * Investigate one plant and one animal that lives exclusively in salt marshes. Create a one page species profile for each (format provided) using four or more sources
 | * 45 min- 1 hr
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| 5: Adaptations to coastal ecosystems | * SWBAT compare and contrast the appearances and adaptations of organisms to the three different ecosystems
 | * species found in various ecosystem
 | * Students display and view species profiles, fill in activity sheet.
* Quiz on ecosystems.
 | * Activity sheets
* Quizzes
* Literature Review Guidelines
 | * Following guidelines, create an outline for a literature review on the human impacts and historical uses of the ecosystem of your choice (salt marsh, rocky shore, sandy beach)
 | * 45 min- 1 hr
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| 6a: Project 1- Literature Review | * SWBAT locate peer-reviewed journal articles.
* SWBAT import article info into citation management software
 | * how to find journal articles
* how to cite articles
* how to write a literature review
 | * Students find articles on ecosystem of choice
* Students import info into citation management software
 | * Computers for every student.
* EndNote or RefWorks downloaded onto each computer
 | * Compose literature review.
* Exchange drafts with partner and edit accordingly.
 | * 1.5 hrs
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| 6b: Literature Review Criticism | * SWBAT use a rubric to give clear feedback
* SWBAT use feedback to edit literature review
 | * purpose of peer review
* do's and don’t's to effectively give and receive criticism
 | * Students exchange literature reviews and give critical feedback
* Students edit papers accordingly
 | * Rubrics
* Peer review instructions
* examples of effective and ineffective critiques
 | * Complete project 1
* Bring camera for field trip next week
 | * 1.5 hrs
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| 7: Field Trip 1- Exploring Our Coast | * SWBAT use tools such as journals and cameras to record observations
* Students observe similarities and differences in flora, fauna, and abiotic factors of two different environments.
 | * nature journaling
* nature photography
 | * Students visit local beach, salt marsh, or rocky shore.
* Students record observation data into notebook
 | * Guidelines for nature journaling
* Buckets
* Nets
* Clipboards and pencils
* Binoculars
* Field guides
 | * Visit one other coastal ecosystem and complete nature journal and take photos
* Upload observations and pictures from both sites.
* Write a descriptive essay comparing and contrasting sites
 | * 2 hrs
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| 8: Water Quality Testing (classroom) | * SWBAT use water quality testing equipment
* SWBAT discuss why different bodies of water support different life forms
 | * Water quality parameters and effects on organisms
* Water quality testing techniques
 | * Demo using equipment
* Students test parameters of four water samples.
* They then make predictions of where the samples were taken and what might live there
 | * Hydrometer, water test kit, water samples
* "How to write a lab report" handout
 | * Type and submit lab report
 | * 1.5- 2hrs
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| 9: Field Trip 2- Water Quality Testing (field) | * Students will practice collecting data in field
 | * Water quality testing
* Data collection, compilation, and analysis
 | * Split into groups, students go to different locations to test water independently
* In classroom, compare data collected, discuss problems.
 | * Water testing equipment
 | * Select a partner and brainstorm three ideas for research project: Ask
* *what is the effect of x on y?* or
* *does x cause differences in y at various locations?*
* Email or upload project ideas.
* Comment on three classmates' project ideas
 | * 2 hrs
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| 10: Sampling Methods (classroom) | * SWBAT describe point counts, CMR, transects, and quadrat sampling
 | * Population data collection methods
 | * Using models, students try each of the four sampling techniques
 | * Modeling equipment
 | * Select project idea.
* Determine which sampling method will work best for your question.
* List the materials and detailed methods for your project
* Upload, then critique 3 classmates' materials/methods
 | * 1.5-2hrs
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| 11: Field Trip 3- Sampling Methods | * Students will practice collecting data in the field
 | * Population sampling
* Data collection, compilation, and analysis
 | * Split into groups, students go to different locations sample independently
* In classroom, compare data collected, discuss problems.
 | * quadrats, etc...
* Outline for research proposal
 | * With partner, draft research proposal following format provided
* Upload, then critique 3 classmates' proposals
 | * 1.5- 2 hrs
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| 12: Preparing a Proposal | * SWBAT prepare a proposal following NSF format
 | * Purposes of proposals
* Common mistakes
 | * After discussion, students edit proposals.
 | * computers for each student
 | * Data collection: record data. Write two paragraphs describing difficulties encountered.
 | * 1.5-2 hrs
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| 13: Peer Review | * Students learn to offer and receive constructive criticism.
 | * Reviewing proposals and difficulties with data collection
 | * Students present proposals to class and preliminary data collection difficulties
 | * NA
 | * Data collection
* Refine proposal to meet classmates' criticism.
* Email to teacher
 | * 1.5- 2 hrs
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| 14: Data analysis | * SWBAT use Excel to conduct simple data analysis and generate graphics
 | * Data analysis
 | * Instructor will guide students in choice of statistical tests
* Students will produce graphics of data for project
 | * computers for each student
 | * Discuss results and conclusions, send to instructor.
 | * 1.5-2 hrs
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| 15: Presentation composition | * SWBAT create visually appealing, informative scientific posters
 | * Poster composition
 | * Discussion of poster tips and guidelines, samples of 'good' and 'bad' posters
* Students create posters
 | * computers for each student
 | * Final revision of paper, incorporating instructor's comments
* Finish poster, email for printing three or more days before class
 | * 1.5-2 hrs
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| 16: Science Fair | * SWBAT to discuss there projects for a wide audience
 | * Poster presentation
 | * Students will present posters to school community
 | * Pushpins/ tape, printed posters, and space for posters
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