Grades 3-5 Science Enrichment

Understanding Coastal Systems, Habitats, and Conservation

These upper-elementary enrichment classes for grades 3-5 engage students in structured field study of Southern California coastal systems in 4-week sessions. Students will investigate La Jolla, Mission Beach and Mission Bay, and Torrey Pines through observation, introduction to field journaling, collecting simple data, map reading, water testing with guidance, and conservation-centered art and modeling. The course is organized as three 4-week sessions that can stand alone or function as a connected course over 12 weeks. Across the full course, students compare protected and non-protected areas, analyze how landforms and human actions influence habitats, and communicate findings through writing, models, and presentations.

Course Rationale

Students in grades 3-5 are ready to move from observation and discussion to organizing evidence. This course repeatedly asks them to compare habitats, use information from maps and field notes, and explain why some organisms are better suited than others to particular coastal conditions. Because the program visits multiple coastal systems, students build a coherent understanding of biodiversity, erosion, coastal engineering, watershed connections, and community-based conservation.

Fieldwork and Lab-Style Learning

The course includes repeated field investigations, recording data, species and habitat observations, simple water testing, and art projects that are evidence of learning. These features are the foundation of our hands-on science enrichment program.

Instructor Value

A marine biologist with 20 years of career experience provides site-specific field expertise and current conservation context, while an experienced educator with a M.Ed. in Learning and Instruction supports upper-elementary literacy integration, note-taking, CER development, and age-appropriate assessment.

All Grade 3-5 Learning

This is environmental science and marine science enrichment with integrated literacy, visual arts, and public speaking. There will be opportunities to connect local conservation issues to community decisions, protected areas, and human activity.

Mixed-Grade Differentiation

Hands-on fieldwork will vary in expectation according to grade-level, including using journals, data tables, observational sketches, and teacher-guided scientific tools.

Grade 3 students receive more support with understanding evidence statements and labeled diagrams. Grades 4-5 work with greater independence in map interpretation, data comparison, multi-sentence CER responses, and explanation of how different San Diego communities protect resources and habitat.

Essential Questions

1. How do different coastal habitats support different organisms?
2. How do topography, wave energy, erosion, and human engineering shape coastal environments?
3. What evidence can we gather to compare ecosystem health in beaches, bays, tidepools, and bluff systems?
4. How can art, models, and presentations communicate scientific learning and conservation messages?

Key Course Learning Goals

1. Coastal ecology and habitat comparison
2. Use evidence to compare organisms and habitat conditions across several Southern California coastal
3. systems.
4. Maps, landforms, and change
5. Interpret maps and observations to describe beaches, bays, cliffs, bluffs, lagoons, and erosion patterns.
6. Community conservation
7. Explain how protected areas, public rules, and local organizations help care for natural resources.
8. Communication and products
9. Create clear journals, models, artwork, and presentations that show accurate science understanding.

Key Learning Targets

1. Record field observations using notes, sketches, and simple data tables.
2. Compare how organisms survive in tidepools, sandy beaches, bays, lagoons, and bluff environments.
3. Use maps to identify patterns in coastal landforms and seafloor or shoreline features.
4. Explain how communities and agencies use science ideas to protect coastal resources and habitats.
5. Develop evidence-based claims about habitat differences, wildlife protection, and human impact.
6. Create models and art products grounded in field observations.

Course Outcomes

1. Construct evidence-based explanations about why some organisms survive better than others in particular habitats.
2. Analyze information from observations, maps, and simple measurements to compare multiple coastal systems.
3. Describe ways communities use science ideas to protect Earth's resources and local environments.
4. Produce visual and written products that accurately communicate coastal science learning.
5. Present findings using age-appropriate claim, evidence, and reasoning.

Primary California Standards Alignment

Area	Code	Short Description	Relevance to 12-Week Course
CA NGSS	3-LS4-3	Construct an argument that in a habitat some organisms survive well, some less well, and some not at all.	Fits repeated comparisons of tidepools, bays, beaches, and cliff/bluff habitats.
CA NGSS	4-ESS2-2	Analyze and interpret data from maps to describe patterns of Earth's features.	Supports use of Marine Protected Area (MPA) maps, shoreline maps, and landform interpretation.
CA NGSS	4-ESS2-1	Make observations and/or measurements to provide evidence of weathering or erosion.	Aligns to Torrey Pines erosion study and sand movement observations.
CA NGSS	5-ESS3-1	Obtain and combine information about ways communities use science ideas to protect Earth's resources and environment.	Supports discussions of MPAs, wildlife protection, beach management, and watershed stewardship.
CA NGSS	3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes.	Connects to conservation solutions and responsible human action.
EP&Cs	Principles I, II, V	Healthy ecosystems support communities; human systems affect coastal and marine systems; decisions involve many considerations.	This is the course framework specifically at Mission Beach, Mission Bay and La Jolla and Torrey Pines MPAs
ELA	W.3.2 / W.4.2 / W.5.2	Write informative/explanatory texts to convey science ideas clearly.	Used in journals, instructions, summaries, and CER writing.
ELA	SL.3.4 / SL.4.4 / SL.5.4	Report on a topic using appropriate facts and descriptive details.	Supports oral reporting and group presentations.
Arts	3-5 VA:Cr2 / VA:Pr6	Create and present art using safe procedures and purposeful choice.	Supports paper making, landscape modeling, and painting tied to field evidence.

12-Week Sequence Overview

Three 4-Week Sessions	Primary Sites	Main Science Lens	Culminating Product
La Jolla coastal ecology, MPAs, and wildlife protection	La Jolla Shores, Dike Rock, Ellen Browning Scripps Park, Children's Pool	Topography, tidepools, ecosystem comparison, MPA effectiveness	Field journal + recycled paper (conservation project) + Claim, Evidence, and Reasoning (CER) on MPAs
Mission Beach and Mission Bay engineering and habitat comparison	South Mission Beach, Mission Point Park, Crown Point, De Anza Cove	Coastal engineering, bay/ocean systems, water conditions, habitat effects	Water testing data summary + bay vs beach landscape model + CER on impact of manmade vs. natural habits
Torrey Pines terrain, erosion, watershed connections, and coastal change	Torrey Pines bluff/shore sites	Erosion, watershed influence, wave energy, coastal change evidence	Coastal painting/message art + CER on erosion, coastal change and/or watersheds

Key Course Learning Goals

Focus	Key Learning Targets
Coastal ecology and topography	Interpret coastal topography and seafloor mapping, discuss MPA policy, identify plants and animals, explain how topographic information helps scientific decision-making.
Field data collection	Use scientific tools to collect samples and data. Measure wave period, conduct organism counts, record structured data, evaluate habitat differences, and discuss monitoring methods.
Conservation through art	Study recycled-material art, learn two handmade paper methods, produce paper for a field journal, and brainstorm waste-to-useful-product ideas.
Protected vs. nonprotected comparison	Evaluate ecosystem health, discuss MPA effectiveness, present scientific claims, and connect to marine careers.
La Jolla Coastal engineering & ecology	Use maps to observe underwater topography, discuss management agencies, measure water conditions, and generate field questions.
Mission Beach/Bay ecosystem analysis	Compare bay and ocean systems, evaluate ecosystem health, discuss how human engineering influences habitat, present scientific claims, and connect findings to coastal engineering.
Tidepools	Conduct organism counts, record data, evaluate animal and plant habitat differences, and discuss coastal monitoring methods.
Landscape modeling	Enter field data, use maps and observations to draft an idea, construct a simple creative model related to coursework, and defend the design.

Assessment and Evidence of Learning

Assessment	Description	Standards Emphasis
Field notebook / journal	Notes, sketches, species names, safety instructions, and reflections from all sessions.	SEP 3, 4, 8; ELA writing
Structured field datasets	Organism counts, simple water data, and habitat comparison records.	3-LS4-3; 4-ESS2-1
Map and landform analysis	Interpretation of MPA and coastal maps, and learning to recognize terrain features.	4-ESS2-2
Creative projects	Handmade paper using recycled waste and natural elements, introducing coastal models, and art that reflects coastal-change.	Arts + EP&Cs
Claim-Evidence-Reasoning (CER) presentations	Oral or written claims about habitat suitability, conservation, or erosion	5-ESS3-1; ELA speaking/listening