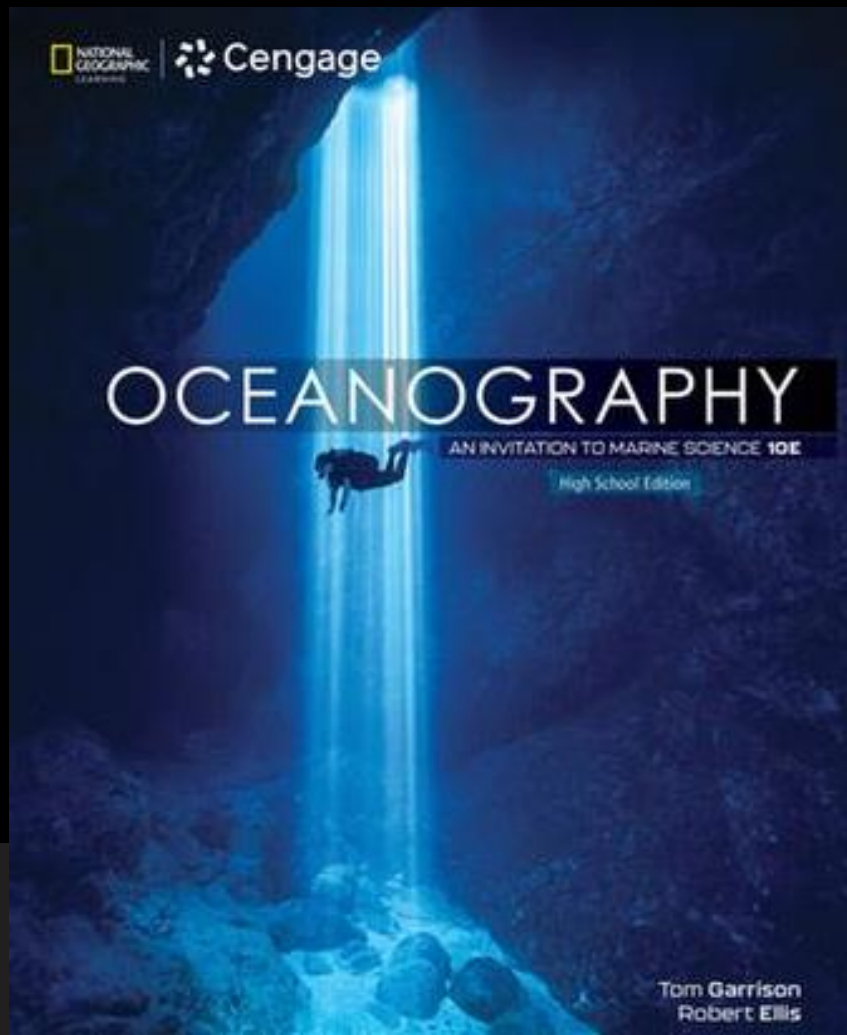


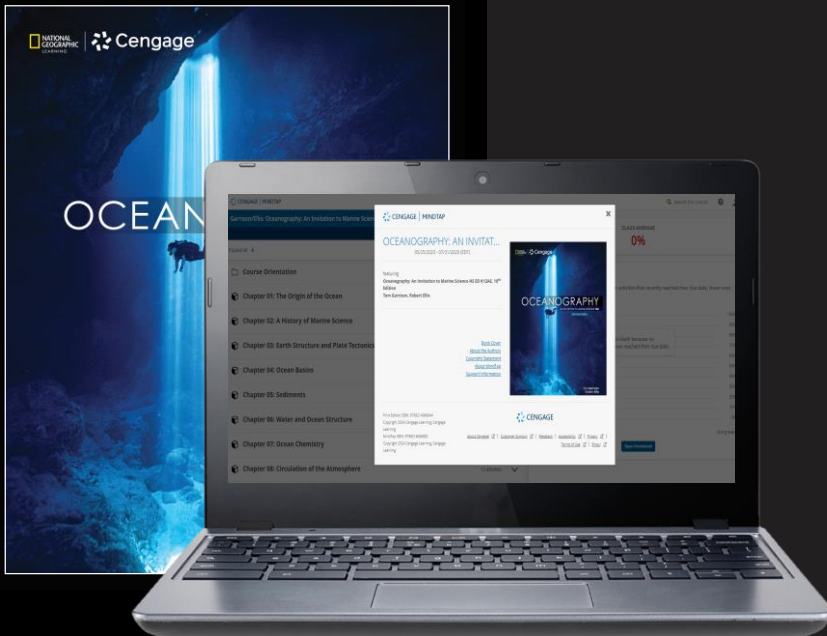
Oceanography

For Texas Aquatic Science

SCOPE AND SEQUENCE



SCOPE AND SEQUENCE WITH PACING



Use the relative times shown as one tool to help prioritize segments of your course instruction and homework assignments. Timing is based on 50-minute periods or 90-minute blocks with consideration given to the amount and depth of the content presentation and the TEKS addressed.

As you allocate time, consider your students' backgrounds and their available resources. Many activities require very simple or no materials or advance preparation and may be assigned as homework, such as the Case Study/Tying It All Together activities, Minilabs, and Data Analysis activities.

Assessment tools such as the Section Reviews, Chapter Reviews, Performance Tasks, and Chapter Assessments are not included in this scope and sequence as their application varies widely with teacher discretion.

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Image courtesy of NASA. Photo of Deep Seafloor and Seamount, 2015 September Expedition of the Nautilus

CHAPTER 1 *The Origin of the Ocean*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
1.1 Earth Is an Ocean World	1	0.5	(12A) SE pages 3-5 (12Ai) SE pages 3-5 (12B) SE pages 3-5 (12Bii) SE pages 3-5 (12Biv) SE pages 3-5
1.2 Marine Scientists Use the Logic of Science to Study the Ocean	1	0.5	(1A) SE page 7 (1Ai) SE page 7 (1Aii) SE page 7 (1Biii) SE page 7 (1Bvi) SE page 7 (1H) SE pages 7-8 (1Hi) SE pages 7-8 (2Bii) SE page 8 (4A) SE pages 7-8 (4Ai) SE pages 7-8 (4Aii) SE pages 7-8 (4Aiii) SE pages 7-8 (4Aiv) SE pages 7-8 (4Av) SE pages 7-8 (4Avi) SE pages 7-8 (4Avii) SE pages 7-8 (4Aviii) SE pages 7-8 (4Aix) SE pages 7-8 (4Ax) SE pages 7-8 (4Axi) SE pages 7-8 (4Axii) SE pages 7-8 (4C) SE page 6 (4Ci) SE page 6 (4Cii) SE page 6 (11D) SE page 8 (11Di) SE page 8 (11Dii) SE page 8 (12Biv) SE pages 7-8 (12B) SE pages 7-8 (12Bii) SE pages 7-8
1.3 Stars Form Seas	1	0.5	(1H) SE page 9 (1Hi) SE page 9
1.4 Earth, Ocean and Atmosphere Accumulated in Layers Sorted by Density	1	0.5	
1.5 Life is Tied to the Ocean	1	0.5	
1.6 What Will be Earth's Future?	1	0.5	
1.7 Are There Other Ocean Worlds?	1	0.5	
Lab 1: The Scientific Method, the Metric System and Scientific Notation	3	2	
Total Chapter 1	10.	5.5	

CHAPTER 2 *A History of Marine Science*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
2.1 Understanding the Ocean Began with Voyaging for Trade and Exploration	2	1	

2.2 The Age of European Discovery	0.3	0.15	
2.3 Voyaging Combined with Science to Advance Ocean Studies	1	0.5	(4Biii) SE pages 42-49 (4Bvi) SE pages 42-49
2.4 The First Scientific Expeditions Were Undertaken by Governments	1	0.5	(4B) SE pages 44-58 (4Bi) SE pages 44-49 (4Bii) SE pages 44-49 (4Biii) SE pages 42-49 (4Biv) SE pages 44-49 (4Bv) SE pages 44-49 (4Bvi) SE pages 42-49
2.5 Contemporary Oceanography Makes Use of Modern Technology	1	0.5	(4Bviii) SE pages 50-56 (4Bix) SE pages 50-56 (4Bx) SE pages 50-56 (4Bxi) SE pages 50-56 (4Bxii) SE pages 50-56
Chapter Review			(4A) SE page 60 (4Ai) SE page 60 (4Av) SE page 60 (4Aix) SE page 60 (4B) SE page 60 (4Bi) SE page 60 (4Bii) SE page 60 (4Biii) SE page 60 (4Biv) SE page 60 (4Bv) SE page 60 (4Bvi) SE page 60 (4Bvii) SE page 58 (4Bvii) SE page 60 (4Bviii) SE page 58 (4Bviii) SE page 60 (4Bix) SE page 58 (4Bix) SE page 60 (4Bx) SE page 58 (4Bx) SE page 60 (4Bxii) SE page 58 (4Bxii) SE page 60
Lab 2: Organization of Invertebrate Communities	1	0.5	
Total Chapter 2	6.3	3.15	

CHAPTER 3 **Earth Structure and Plate Tectonics**

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
3.1 Pieces of Earth’s Surface Look like They Once Fit Together	0.25	0.10	
3.2 Earth’s Interior Is Layered	0.25	0.10	
3.3 The Study of Earthquakes Provides Evidence of Layering	1	0.5	
3.4 Earth’s Inner Structure Was Gradually Revealed	1	0.5	(11A) SE page 74 (11Aiii) SE page 74 (11Aiii) SE page 74
3.5 The New Understanding of Earth Evolved Slowly	0.5	0.3	
3.6 Wegener’s Idea is Transformed	0.25	0.1	

3.7 The Breakthrough: From Seafloor Spreading to Plate Tectonics	0.5	0.3	
3.8 Plates Interact at Plate Boundaries	1.5	1	
3.9 A Summary of Plate Interactions	0.25	0.1	
3.10 The Confirmation of Plate Tectonics	1	0.5	
3.11 Scientists Still Have Much to Learn about the Tectonic Process	0.25	0.1	
Chapter Review			(4A) SE page 106 (4Ai) SE page 106 (4Av) SE page 106 (4Aix) SE page 106
Lab 3: Geocaching with a Global Positioning System	2	1	
Total Chapter 3	8.75	4.6	

CHAPTER 4 *Ocean Basins*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
4.1 Mapping the Ocea Floor is Challenging	1	0.5	
4.2 Ocean Floor Topography Varies with Location	0.5	0.3	(6A) SE pages 113-139 (6Aii) SE pages 113-139 (6Avi) SE pages 113-139 (11B) SE pages 113-138 (11Bi) SE pages 113-138
4.3 Continental Margins May Be Active or Passive	2	1	(6A) SE pages 113-139 (6Aii) SE pages 113-139 (6Avi) SE pages 113-139 (8Bvii) SE pages 124-125 (8Bxiv) SE pages 124-125 (11B) SE pages 113-138 (11Bi) SE pages 113-138 (11D) SE pages 114-125 (11Di) SE pages 114-125 (11Dii) SE pages 114-125
4.4 The Topography of Deep-Ocean Basins Differs from That of the Continental Margin	3	2	(6A) SE pages 113-139 (6Aii) SE pages 113-139 (6Avi) SE pages 113-139 (11B) SE pages 113-138 (11Bi) SE pages 113-138
4.5 The Marine Environment is Classified in Distinct Zones within Ocean Basins	0.5	0.3	(6A) SE pages 113-139 (6Aii) SE pages 113-139 (6Avi) SE pages 113-139
4.6 The Grand Tour	0.3	0.15	(6A) SE pages 113-139 (6Aii) SE pages 113-139 (6Avi) SE pages 113-139
Chapter review			(6Aii) SE page 146 (6Avi) SE page 146 (8Bvii) SE page 145 (8Bxiv) SE page 145 (11B) SE page 146 (11Bi) SE page 146
Lab 4: Properties of Seawater: Salinity and pH	1.5	0.75	

Total Chapter 4			
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CHAPTER 5 *Sediments*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
5.1 Ocean Sediments Vary Greatly in Appearance	0.5	0.3	
5.2 Sediments Are Classified by Particle Size	0.5	0.3	
5.3 Sediments May Be Classified by Source	1	0.5	
5.4 Neritic Sediments Overlie Continental Margins	0.5	0.3	
5.5 Pelagic Sediments Vary in Composition and Thickness	1	0.5	(8Bvii) SE page 160 (8Bxiv) SE page 160
5.6 Researchers Have Mapped the Distribution of Deep-Ocean Sediments	0.5	0.3	
5.7 Geologists Use Specialized Tools to Study Ocean Sediments	0.5	0.3	
5.8 Sediments Are Historical Records of Ocean Processes	0.1	0.3	
5.9 Marine Sediments Are Economically Important	0.4	0.25	
Lab 5: Ocean Acidification	2	1	
Total Chapter 5	7	4.05	

CHAPTER 6 *Water and Ocean Structure*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
6.1 A Note to the Reader	0.1	0.05	
6.2 Familiar, Abundant, and Odd	0.1	0.05	
6.3 The Water Molecule Is Held Together by Chemical Bonds	1	0.5	(5A) SE pages 179-180 (5Ai) SE pages 179-180 (5Bi) SE pages 180-181 (5Bi) SE page 181 (5Bii) SE page 180 (5Biii) SE page 180 (5Biii) SE page 181
6.4 Water Has Unusual Thermal Characteristics	2	1	(5Aii) SE pages 181-188 (5B) SE pages 181-188 (5Biii) SE page 187 (5Biv) SE pages 181-182 (5Biv) SE page 187 (5Biv) SE page 188 (5Bv) SE pages 181-187 (5Bv) SE page 187 (5C) SE pages 182-184 (5C) SE page 188 (5Ci) SE pages 182-184 (5Ci) SE page 188
6.5 Surface Water Moderates Global Temperature	1	0.5	

6.6 The Ocean Is Stratified by Density	1	0.5	(5C) SE pages 194-197 (5Ci) SE pages 194-197 (11A) SE page 194 (11Aii) SE page 194 (11C) SE pages 195-197 (11Ci) SE pages 195-197 (11Cii) SE page 195
6.7 Refraction Can Bend the Paths of Light and Sound Through Water	0.5	0.3	
6.8 Light Does Not Travel Far Through the Ocean	0.5	0.3	
6.9 Sound Travels Much Farther Than Light Through the Ocean	1	0.5	
Chapter Review			(5A) SE page 209 (5Ai) SE page 209 (5Aii) SE page 209 (5B) SE page 209 (5Bi) SE page 209 (5Bii) SE page 209 (5Biii) SE page 209 (5Biv) SE page 209 (5Bv) SE page 209 (5C) SE page 209 (5Ci) SE page 209 (11A) SE page 209 (11Aii) SE page 209
Lab 6: Introduction to Microscopes and Cells	2.1	1	
Total Chapter 6	9.3	4.7	

CHAPTER 7 *Ocean Chemistry*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
7.1 Water Is a Powerful Solvent	.25	0.1	(5A) SE pages 212-214 (5Ai) SE pages 212-214 (5Aii) SE pages 212-214 (6A) SE pages 212-222 (6Aiii) SE pages 212-222 (6Aiii) SE page 215 (6Avii) SE pages 212-222 (9Av) SE page 213
7.2 Seawater Consists of Water and Dissolved Solids	1	0.5	(6A) SE pages 212-222 (6A) SE page 215 (6Aiii) SE pages 212-222 (6Avii) SE pages 212-222 (6Avii) SE page 215 (7C) SE pages 222-223 (7C) SE page 223 (7Ci) SE pages 222-223 (7Ci) SE page 223 (7Cii) SE pages 222-223 (7Cii) SE page 223 (8Bv) SE page 222 (8Bvi) SE page 222 (8Bxii) SE page 222 (8Bxiii) SE page 222
7.3 Gases Dissolve in Seawater	0.5	0.3	

7.4 The Ocean's Acid-Base Balance Varies with Dissolved Components and Depth	1	0.5	
Chapter Review			(6Aiii) SE page 230 (6Avii) SE page 230
Lab 7: Marine Microbes	2.5	1.5	
Total Chapter 7	5.25	2.9	

CHAPTER 8 *Circulation of the Atmosphere*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
8.1 The Atmosphere and Ocean Interact with Each Other	0.5	0.3	(6B) SE page 234 (6B) SE pages 234-259 (6Bi) SE page 234 (6Bi) SE pages 234-258 (6Bii) SE page 234 (6Bii) SE pages 234-258
8.2 Atmospheric Conditions Are Influenced By Air Composition and Density	1	0.5	(6B) SE pages 234-259 (6Bi) SE pages 234-258 (6Bii) SE pages 234-258
8.3 The Atmosphere Moves in Response to Uneven Solar Heating and Earth's Rotation	0.5	0.3	(6B) SE pages 234-259 (6Bi) SE pages 234-258 (6Bii) SE pages 234-258
8.4 Atmospheric Circulation Generates Large-Scale Surface Wind Patterns	1	0.5	(6B) SE pages 234-259 (6Bi) SE pages 234-258 (6Bii) SE pages 234-258
8.5 Storms Are Variations in Large-Scale Atmospheric Circulation	2	1	(6B) SE pages 234-259 (6Bi) SE pages 234-258 (6Bii) SE pages 234-258 (9B) SE pages 248-255 (9Bi) SE page 248 (9Bii) SE page 248 (9Biv) SE pages 249-257 (9Biv) SE page 257
Chapter Review			(5B) SE page 259 (5Biv) SE page 259 (5Bv) SE page 259 (6B) SE page 261 (6Bi) SE page 259 (6Bi) SE page 261 (6Bii) SE page 259 (6Bii) SE page 261 (14Biv) SE page 259 (14Bviii) SE page 259
Lab 8: Higher Invertebrates: Molluscs	2.5	1.3	
Total Chapter 8	7.5	3.9	

CHAPTER 9 *Circulation of the Ocean*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
9.1 Mass Flow of Ocean Water Is Driven by Wind and Gravity	0.5	0.3	(6A) SE pages 264-277 (6Ai) SE pages 264-281 (6Av) SE pages 264-277

9.2 Surface Currents Are Driven by the Winds	2	1	(6A) SE pages 264-277 (6Ai) SE pages 264-281 (6Av) SE pages 264-277
9.3 Surface Currents Affect Weather and Climate	1	0.5	(6A) SE pages 264-277 (6Ai) SE pages 264-281 (6Av) SE pages 264-277 (9Biii) SE page 274
9.4 Wind Can Cause Vertical Movement of Ocean Water	2	1	(6A) SE pages 264-277 (6Ai) SE pages 264-281 (6Ai) SE page 277 (6Av) SE pages 264-277 (6Av) SE page 277 (6Av) SE pages 277-281 (6Av) SE page 281 (9A) SE pages 274-287 (9Ai) SE pages 274-277 (9Aiii) SE pages 274-277 (9Av) SE pages 274-277 (9Avii) SE pages 274-277 (9B) SE pages 274-281 (9Biii) SE page 277 (11C) SE pages 274-287 (11C) SE page 287 (11Ci) SE pages 274-287 (11Ci) SE page 287
9.5 El Niño and La Niña Are Exceptions to Normal Wind and Current Flow	2	1	(6Ai) SE pages 264-281 (6Ai) SE pages 277-281 (6Ai) SE page 281 (9A) SE pages 274-287 (9B) SE pages 274-281 (9Bi) SE pages 277-281 (9Bii) SE pages 277-281 (11C) SE pages 274-287 (11C) SE page 287 (11Ci) SE pages 274-287 (11Ci) SE page 287
9.6 Thermohaline Circulation Affects All the Ocean's Water	1	0.5	(9A) SE pages 274-287 (11C) SE pages 274-287 (11C) SE page 287 (11Ci) SE pages 274-287 (11Ci) SE page 287
Chapter Review			(6C) SE pages 290-292 (6Ci) SE pages 290-292 (9B) SE page 295 (9Bi) SE page 295 (9Bii) SE page 295 (9Biii) SE page 295
Lab 9: Macroalgae	3	1.5	
Total Chapter 9	11.5	5.8	

CHAPTER 10 *Waves*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
10.1 Ocean Waves Move Energy across the Sea Surface	0.25	0.1	
10.2 Waves Are Classified by Their Physical Characteristics	0.5	0.3	(5Bii) SE page 300

10.3 The Behavior of Waves Is Influenced by the Depth of the Water They Move Through	0.25	0.1	
10.4 Wind Blowing over the Ocean Generates Waves	1	0.5	
10.5 Interference Produces Irregular Wave Motions	0.25	0.1	
10.6 Deep-Water Waves Change to Shallow-Water Waves As They Approach Shore	0.5	0.3	
10.7 Internal Waves Can Form between Ocean Layers of Differing Densities	0.25	0.1	
10.8 “Tidal Waves” Are Probably Not What You Think	0.25	0.1	
10.9 Storm Surges Form beneath Strong Cyclonic Storms	0.5	0.3	(9Biv) SE page 318
10.10 Water Can Rock in a Confined Basin	0.25	0.1	
10.11 Water Displacement Causes Tsunami and Seismic Sea Waves	1	0.5	
Lab 10: Fish Niche	2.2	1.1	
Total Chapter 10	6.75	3.6	

CHAPTER 11 *Tides*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
11.1 Tides Are the Longest of All Ocean Waves	0.5	0.3	
11.2 Tides Are Forced Waves Formed by Spatial Variations in Gravity	1	0.5	
11.3 The Dynamic Theory of Tides Adds Fluid Motion Dynamics to the Equilibrium Theory	1	0.5	
11.4 Most Tides Can Be Accurately Predicted	1	0.5	
11.5 Tidal Patterns Can Affect Marine Organisms	0.5	0.3	(9C) SE pages 344-345 (9Ci) SE pages 344-345
11.6 Power Can Be Extracted from Tidal Motion	0.5	0.3	
Lab 11: Animal Behavior	2.2	1.1	
Total Chapter 11	6.7	3.5	

CHAPTER 12 *Coasts*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
12.1 Coasts Are Shaped by Marine and Terrestrial Processes	1	0.5	(6Aii) SE pages 352-371 (6Avi) SE pages 352-371 (6C) SE page 354 (6Ci) SE page 354 (11D) SE pages 352-361 (11Di) SE pages 352-361 (11Dii) SE pages 352-361
12.2 Erosional Processes Dominate Many Rocky Coasts	1	0.5	(6Aii) SE pages 352-371

			(6Avi) SE pages 352-371 (11D) SE pages 352-361 (11Di) SE pages 352-361 (11Dii) SE pages 352-361
12.3 Beaches Dominate Depositional	1	0.5	(6Aii) SE pages 352-371 (6Avi) SE pages 352-371 (8Ai) SE pages 362-365
12.4 Larger Scale Features Accumulate on Depositional Coasts	0.5	0.3	(6Aii) SE pages 352-371 (6Avi) SE pages 352-371 (11B) SE pages 368-375 (11Bi) SE pages 368-375
12.5 Freshwater Meets the Ocean in Estuaries	0.5	0.3	(6Aiv) SE pages 371-378 (6Aviii) SE pages 371-378 (11B) SE pages 368-375 (11Bi) SE pages 368-375 12A SE pages 371-378 (12Ai) SE pages 371-378
12.6 Biological Activity Forms and Modifies Coasts	0.5	0.3	(6Aiv) SE pages 371-378 (6Aiv) SE page 378 (6Aviii) SE pages 371-378 (6Aviii) SE page 378 12A SE pages 371-378 (12Ai) SE pages 371-378
12.7 The Characteristics of U.S. Coasts	0.5	0.3	
12.8 Humans Interfere in Coastal Processes	1	1	(14D) SE pages 380-381 (14Di) SE pages 380-381 (14Dii) SE pages 380-381
Chapter Review			(6Aii) SE page 386 (6Avi) SE page 386 (11D) SE page 386 (11Di) SE page 386 (11Dii) SE page 386
Lab 12: Marine Mammal and Reptile Movements	2.2	1.1	
Total Chapter 12	8.2	4.8	

CHAPTER 13 *Life in the Ocean*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
13.1. Life on Earth Is Notable for Its Unity and Diversity	0.5	0.3	
13.2 The Concept of Evolution Helps Explain the Nature of Life in the Ocean	1	0.5	(13B) SE pages 391-393 (13Bi) SE pages 391-393 (13C) SE pages 391-393 (13Ci) SE pages 391-393
13.3 Rapid, Violent Change Can Lead to Mass Extinctions	0.25	0.1	
13.4 Life Is Classified by Evolutionary Heritage	0.5	0.3	(13A) SE pages 395-397 (13Ai) SE pages 395-397
13.5 The Flow of Energy Allows Living Things to Maintain Complex Organization	1	0.5	(7A) SE pages 396-404 (7Ai) SE pages 396-400 (7A) SE page 400 (7Ai) SE page 400 (7Aii) SE pages 396-400 (7Aii) SE page 400 (7Aiii) SE pages 396-400

			(7Aiii) SE page 400 (7Aiii) SE page 400 (7Aiv) SE pages 396-400 (7Aiv) SE page 400 (7Av) SE pages 396-400 (7Av) SE page 400 (7Avi) SE pages 396-400 (7Avi) SE page 400 (7Avi) SE page 400 (8C) SE pages 398-400 (8Ci) SE pages 398-400
13.6 Living Organisms Are Built from a Few Elements	0.5	0.3	(7A) SE pages 396-404 (7Aiv) SE page 401 (7Aix) SE page 400 (7Axii) SE page 400
13.7 Elements Cycle between Living Organisms and Their Surroundings	2	1	(6A) SE pages 401-404 (6Aiv) SE pages 401-404 (6Aiv) SE page 404 (6Aviii) SE pages 401-404 (6Aviii) SE page 404 (7A) SE pages 396-404 (7Avii) SE pages 401-404 (7Avii) SE page 404 (7Aviii) SE pages 401-404 (7Aviii) SE page 404 (7Aix) SE pages 401-404 (7Aix) SE page 404 (7Ax) SE page 401 (7Ax) SE pages 401-404 (7Ax) SE page 404 (7Axi) SE pages 401-404 (7Axi) SE page 404 (7Axii) SE pages 401-404 (7Axii) SE page 404 (9A) SE pages 401-404 (9A) SE page 404 (9Ai) SE pages 401-402 (9Ai) SE page 404 (9Aii) SE pages 401-402 (9Aii) SE page 404 (9Aiii) SE pages 403-404 (9Aiii) SE page 404 (9Aiv) SE pages 403-404 (9Aiv) SE page 404 (9Av) SE pages 401-402 (9Av) SE page 404 (9Avi) SE page 404 (9Avii) SE pages 401-404 (9Avii) SE page 404 (9Aviii) SE page 404
13.8 Environmental Factors Influence the Success of Marine Organisms	2	1	(7B) SE pages 404-410 (7Bii) SE pages 404-410 (7Bii) SE page 410 (7Biv) SE pages 404-410 (7Biv) SE page 410 (7C) SE pages 407-408 (7C) SE page 410 (7Ci) SE pages 407-408 (7Ci) SE page 410 (7Cii) SE pages 407-408 (7Cii) SE page 410

			(7D) SE pages 404-410 (7Di) SE pages 404-410 (11A) SE page 410 (11Ai) SE page 404 (11Ai) SE page 410 (11Ai) SE page 410
Lab 13: Intertidal Communities	2.2	1.1	
Total Chapter 13	9.95	5.1	

CHAPTER 14 *Primary Producers*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
14.1 Primary Producers Synthesize Organic Material	1	0.5	(7A) SE pages 416-419 (7Aiv) SE page 417 (7Av) SE pages 416-419 (7Ax) SE page 417 (7Axi) SE pages 416-419
14.2 Plankton Drift with Ocean Currents	1	0.5	(7A) SE pages 416-419 (7Av) SE pages 416-419 (7Axi) SE pages 416-419
14.3 Plankton Collection Methods Depend on the Organism's Size	1	0.5	(7A) SE pages 416-419 (7Av) SE pages 416-419 (7Axi) SE pages 416-419
14.4 Phytoplankton	0.5	0.3	
14.5 Lack of Nutrients and Light Can Limit Primary Productivity	0.25	0.1	
14.6 Production Equals Consumption at the Compensation Depth	0.3	0.15	
14.7 Phytoplankton Productivity Varies with Local Conditions	0.5	0.3	
14.8 Seaweeds and Marine Plants Are Diverse and Efficient Primary Producers	0.5	0.3	
14.9 Primary Productivity Also Occurs Deep in the Water Column, at Hydrothermal Vents, in Seabed Sediments, and in Solid Rock	1	0.5	
Chapter Review			(7Aiv) SE page 436 (7Ax) SE page 436
Lab 14: Estuaries	2	1	
Total Chapter 14	8.05	3.7	

CHAPTER 15 *Marine Animals*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
15.1 Animals Evolved When Food and Oxygen Became Plentiful	0.5	0.3	(13A) SE pages 442-469 (13Ai) SE pages 442-469
15.2 Invertebrates Are the Most Successful and Abundant Animals	1	0.5	(13A) SE pages 442-469 (13Ai) SE pages 442-469
15.3 The Worm Phyla Are the Link to Advanced Animals	0.25	0.1	(13A) SE pages 442-469 (13Ai) SE pages 442-469

15.4 Advanced Invertebrates Have Complex Bodies and Internal Systems	2	1	(13A) SE pages 442-469 (13Ai) SE pages 442-469
15.5 Construction of Complex Chordate Bodies Begins on a Stiffening Scaffold	0.25	0.1	(13A) SE pages 442-469 (13Ai) SE pages 442-469
15.6 Vertebrate Evolution Traces a Long and Diverse History	0.25	0.1	(13A) SE pages 442-469 (13Ai) SE pages 442-469
15.7 Fishes Are Earth’s Most Abundant and Successful Vertebrates	0.5	0.3	(13A) SE pages 442-469 (13Ai) SE pages 442-469
15.8 Fishes Are Successful Because of Unique Adaptations	0.5	0.3	(13A) SE pages 442-469 (13Ai) SE pages 442-469 (13B) SE pages 459-469 (13Bi) SE pages 459-469 (13C) SE pages 459-469 (13Ci) SE pages 459-469
15.9 Sea Turtle and Marine Crocodiles Are Oceangoing Reptiles	0.5	0.3	(13A) SE pages 442-469 (13Ai) SE pages 442-469 (13B) SE pages 459-469 (13Bi) SE pages 459-469 (13C) SE pages 459-469 (13Ci) SE pages 459-469
15.10 Some Marine Birds Are the World’s Most Efficient Flyers	0.5	0.3	(13A) SE pages 442-469 (13Ai) SE pages 442-469 (13B) SE pages 459-469 (13Bi) SE pages 459-469 (13C) SE pages 459-469 (13Ci) SE pages 459-469
15.11 Marine Mammals Include the Largest Animals Ever to Have Lived	1	0.5	(13A) SE pages 442-469 (13Ai) SE pages 442-469 (13B) SE pages 459-469 (13B) SE page 469 (13Bi) SE pages 459-469 (13Bi) SE page 469 (13C) SE pages 459-469 (13Ci) SE pages 459-469
Chapter Review			(13A) SE page 478 (13Ai) SE page 478
Lab 15: Fishing Down the Food Chain	2.5	1.25	
Total Chapter 15	8.25	5.05	

CHAPTER 16 *Marine Communities*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
16.1 Marine Organisms Live in Communities	0.25	0.1	(7Ai) SE page 482 (7Avii) SE page 482 (7B) SE pages 482-502 (7Bi) SE pages 482-502 (8C) SE pages 482-504 (8Ci) SE pages 482-504 (12A) SE pages 482-503 (12Ai) SE pages 482-503
16.2 Communities Consist of Interacting Producers, Consumers, and Decomposers	1	0.5	(7B) SE pages 482-502 (7Bi) SE pages 482-502 (7Bi) SE page 485 (7Biv) SE pages 483-488 (7D) SE pages 483-491

			(7Di) SE pages 483-491 (7E) SE pages 482-483 (7Ei) SE pages 482-483 (8C) SE pages 482-504 (8Ci) SE pages 482-504 (12A) SE pages 482-503 (12Ai) SE pages 482-503
16.3 Marine Communities Change as Time Passes	0.25	0.1	(7B) SE pages 482-502 (7Bi) SE pages 482-502 (7Biv) SE pages 483-488 (7Biv) SE page 485 (7D) SE pages 483-491 (7Di) SE pages 483-491 (8C) SE pages 482-504 (8Ci) SE pages 482-504 (12A) SE pages 482-503 (12Ai) SE pages 482-503
16.4 Examples of Shoreline Marine Communities	1	0.5	(7B) SE pages 482-502 (7Bi) SE pages 482-502 (7Biii) SE pages 486-502 (7Biv) SE pages 483-488 (7D) SE pages 483-491 (7Di) SE pages 483-491 (8C) SE pages 482-504 (8Ci) SE pages 482-504 (9Aviii) SE page 491 (9C) SE pages 486-491 (12A) SE pages 482-503 (12Ai) SE pages 482-503 (12B) SE pages 486-502 (12Bi) SE pages 486-502 (12Biii) SE pages 486-502
16.5 Examples of Nearshore and Open-Ocean Marine Communities	2	1	(7B) SE pages 482-502 (7Bi) SE pages 482-502 (7Biii) SE pages 486-502 (8C) SE pages 482-504 (8Ci) SE pages 482-504 (12A) SE pages 482-503 (12Ai) SE pages 482-503 (12B) SE pages 486-502 (12Bi) SE pages 486-502 (12Biii) SE pages 486-502
16.6 Examples of Deep-Sea Marine Communities	1	0.5	(7B) SE pages 482-502 (7Bi) SE pages 482-502 (7Biii) SE pages 486-502 (8C) SE pages 482-504 (8Ci) SE pages 482-504 (12A) SE pages 482-503 (12Ai) SE pages 482-503 (12B) SE pages 486-502 (12Bi) SE pages 486-502 (12Biii) SE pages 486-502
16.7 Organisms in Communities Can Live in Symbiosis	0.5	0.3	(7E) SE pages 503-504 (7Ei) SE pages 503-504 (8C) SE pages 482-504 (8Ci) SE pages 482-504
Chapter Review			(7D) SE page 507 (7Di) SE page 507 (7E) SE page 507 (7Ei) SE page 507

			(12B) SE page 505 (12Bi) SE page 505 (12Biii) SE page 505
Lab 16: Dead Zones	3	1.5	
Total Chapter 16	9	4.5	

CHAPTER 17 *Marine Resources*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
17.1 Marine Resources Are Subject to the Economic Laws of Supply and Demand	0.5	0.3	(14A) SE pages 510-527 (14Ai) SE pages 510-527
17.2 Physical Resources	1	0.5	(14A) SE pages 510-527 (14Ai) SE pages 510-527
17.3 Renewable Sources of Marine Energy	1	0.5	(2D) SE page 517 (2Dii) SE page 517 (10D) SE page 515 (10Di) SE page 515 (14A) SE pages 510-527 (14Ai) SE pages 510-527
17.4 Biological Resources	2	1	(14A) SE pages 510-527 (14Ai) SE pages 510-527 (14C) SE pages 523-524 (14Ci) SE pages 523-524 (14D) SE pages 517-527 (14Di) SE pages 517-527 (14Dii) SE pages 517-527
17.5 Non-extractive Resources Use the Ocean in Place	0.5	0.3	(14A) SE pages 510-527 (14Ai) SE pages 510-527 (14D) SE pages 517-527 (14Di) SE pages 517-527 (14Dii) SE pages 517-527
17.6 The Law of the Sea Governs Marine Resource Allocation	1	0.5	(14E) SE page 531 (14Ei) SE page 531
Chapter Review			(14B) SE page 534 (14Bi) SE page 534 (14Bv) SE page 534
Lab 17: Why do Zoos and Aquariums Matter?	3	1.5	
Total Chapter 17	9	4.6	

CHAPTER 18 *The Ocean and the Environment*

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
18.1 An Introduction to Marine Environmental Issues	.25	0.1	(14B) SE pages 540-566 (14Bi) SE pages 540-548
18.2 Marine Pollutants May Be Natural or Human- Generated	4	2.2	(14B) SE pages 540-566 (14Bi) SE pages 540-548 (14Bv) SE pages 540-548 (14C) SE pages 548-557 (14C) SE pages 548-557
18.3 Habitat Alteration Can Affect Entire Marine Communities	1	0.5	(14Bii) SE page 557 (14Biii) SE pages 557-559 (14Bvi) SE page 557

			(14Bvii) SE pages 557-559 (14C) SE pages 548-557 (14C) SE pages 548-557
18.4 Earth's Climate Is Changing	2	1	(2A) SE pages 561-566 (2Ai) SE pages 561-566 (2Ai) SE page 567 (2Aii) SE pages 561-566 (6B) SE pages 560-561 (6Bi) SE pages 560-561 (6Bii) SE pages 560-561 (14Biv) SE pages 560-566 (14Bviii) SE pages 560-566 (14E) SE pages 562-569 (14Ei) SE pages 562-569
18.5 Marine Protected Areas Are Refuges	1	0.5	(14E) SE pages 562-569 (14Ei) SE pages 562-569 (14F) SE pages 567-569 (14Fi) SE pages 567-569 (14Fii) SE pages 567-569
18.6 What Can Be Done?	0.5	0.3	(14A) SE pages 568-569 (14Ai) SE pages 568-569 (14E) SE pages 562-569 (14Ei) SE pages 562-569 (14F) SE pages 567-569 (14Fi) SE pages 567-569 (14Fii) SE pages 567-569
Chapter Review			(4A) SE page 573 (4Aii) SE page 573 (4Avi) SE page 573 (4Ax) SE page 573 (6B) SE page 573 (6Bi) SE page 573 (6Bii) SE page 573 (14Bi) SE page 573 (14Biv) SE page 573 (14Bv) SE page 573 (14Bviii) SE page 573 (14F) SE page 573 (14Fi) SE page 573 (14Fii) SE page 573
Lab 18: Plastics in the Ocean	3	1.6	
Total Chapter 18	11.75	6.2	

CHAPTER 19 A Closer Look at Freshwater Processes and Ecosystems

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
19.1 The Importance of Freshwater in Oceanography	0.5	0.3	(6Aiii) SE page 576 (6Avii) SE page 576 (10B) SE page 576 (10B) SE page 576 (10Bi) SE page 576 (10Bi) SE page 576
19.2 The Role of Freshwater in the Hydrologic Cycle	0.5	0.3	(6Aiii) SE page 576 (6Avii) SE page 576 (9Avi) SE page 576 (10B) SE page 576 (10B) SE page 576 (10Bi) SE page 576

			(10Bi) SE page 576
19.3 Water Stands in Some Freshwater Systems and Flows in Others	2	1	(5C) SE pages 577-579 (5Ci) SE pages 577-579 (6Ai) SE page 579 (6Av) SE page 579 (9Aii) SE pages 576-579 (9Aii) SE pages 576-579 (9Avi) SE pages 576-579 (9Aviii) SE pages 576-579 (10A) SE pages 576-577 (10Ai) SE pages 576-577 (10Aii) SE pages 576-577 (10Aiii) SE pages 576-577 (10B) SE page 577 (10Bi) SE page 577 (10C) SE pages 580-581 (10Ci) SE pages 580-581 (10Cii) SE pages 580-581 (10D) SE page 578 (10D) SE page 578 (10Di) SE page 578 (10Di) SE page 578 (11C) SE page 579 (11Cii) SE page 579 (11Cii) SE page 582 (12B) SE page 582 (12Bii) SE page 582 (12Biv) SE page 582 (14Bi) SE page 580 (14Bv) SE page 580
19.4 Inland Wetlands	1	0.5	(10D) SE page 588 (10Di) SE page 583 (10Dii) SE pages 583-586 (10Dii) SE page 588 (10Dii) SE page 588 (14A) SE pages 583-588 (14Ai) SE pages 583-588 (14Bii) SE pages 586-587 (14Bii) SE pages 586-587 (14Biii) SE pages 586-588 (14Biii) SE page 588 (14Bvi) SE pages 586-587 (14Bvi) SE page 588 (14Bvii) SE pages 583-586 (14Bvii) SE page 588 (14D) SE pages 583-586 (14D) SE page 588 (14Di) SE pages 583-586 (14Di) SE page 588 (14Dii) SE pages 583-586 (14Dii) SE page 588
19.5 Groundwater	1	0.5	(10A) SE page 589 (10Ai) SE page 589 (10Aii) SE page 589 (10Aiii) SE page 589 (10D) SE pages 589-590
19.6 Glaciers	0.5	0.3	

19.7 Sustaining Aquatic Biodiversity and Clean Water	1	0.5	(4C) SE pages 592-595 (4Ci) SE pages 592-595 (4Cii) SE pages 595 (14E) SE pages 592-593 (14E) SE page 593 (14Ei) SE pages 592-593 (14Ei) SE page 593 (14F) SE pages 592-593 (14F) SE page 593 (14Fi) SE pages 592-593 (14Fi) SE page 593 (14Fii) SE pages 592-593 (14Fii) SE page 593
Chapter Review			(4C) SE pages 592-595 (4Ci) SE pages 592-595 (4Cii) SE pages 595 (10A) SE page 594 (10Ai) SE page 594 (10Aii) SE page 594 (10Aiii) SE page 594 (10Ci) SE page 594 (10Cii) SE page 594
Total Chapter 19	6.5	3.4	

Appendix

CHAPTER OR SECTION TITLE	PERIODS	BLOCKS	TEKS
Appendix 4			(1G) SE Appendix 4 pages 584-585 (1Gi) SE Appendix 4 pages 584-585 (1Gii) SE Appendix 4 pages 584-585 (2Ai) SE Appendix 4 page 585 (2Aii) SE Appendix 4 page 585

MindTap for *Oceanography 10e*: Asset Description

This guide walks you through what the unique activities are, where you will find them, and why they have been built to better enable you to include them in your curriculum. The brief version of this guide includes only the Asset Description table indicating that this guide is in early release and awaiting the final product build. The detailed version of this guide includes the Asset Breakout where you will find the point value and number of activities.

In creating the digital learning path, we aimed to provide your students with a coherently structured experience. This document will outline some of the design decisions we made as part of ensuring your confidence in our ability to create an effective, quality learning experience.

Activity Name	Where it is	What it is	Why it matters	Seat Time
Get Started	Course Orientation	Introductory video explaining the MindTap course's organization and features.	This brief video orients students to how they can get the most from using MindTap in their course.	5 minutes
Brushing up on the Basics	Course Orientation	Conceptual Learning Activities that allow students to "brush up" on the quantitative and scientific skills necessary for success in an Oceanography course.	These activities provide students with an opportunity to engage with the basic graphing, data interpretation, and science process skills they will be further developing throughout the course.	45 minutes-1 hour
Knowledge Check	Start of each chapter	Pre-chapter knowledge check ensures students are prepared to learn the material.	These assessments give students insight into their baseline knowledge and allows them to plan their study time based on this information.	3-5 minutes
Chapter Reading	Every chapter	Readings offer an interesting, clear, current, and reasonably comprehensive overview of the ocean sciences.	Readings promote ocean literacy by providing an understanding of its fundamental concepts and encouraging students to recognize the ocean's influence on their daily lives.	45 minutes-1 hour
Check Your Understanding	Learn It (Every chapter)	Quiz that assesses student knowledge/comprehension of chapter reading.	These activities compel students to dive into the reading, become familiar with the material, and prepare for class discussions.	10-15 minutes
Concept Animation Quiz	Learn It (Select chapters)	3-6-minute animations that visually demonstrate chapter concepts followed by questions.	The processes involved in Oceanography are often complex. These animations and related questions bring these concepts to life visually for students.	5-10 minutes

Video Quiz	Learn It (Select chapters)	Videos show course concepts within a real-world context, followed by questions.	The processes involved in Oceanography are often complex. These videos and related questions bring chapter concepts to life and provide real-world context for course content.	5-10 minutes
Flashcards	Study It (Every chapter)	Digital flashcards of the key terms in each chapter. Decks can be shuffled and personalized.	Students can quiz themselves on key terms which will lead to better understanding of chapter content.	5-10 minutes
Media Library	Study It (Every chapter)	All chapter media grouped together for easy viewing.	Chapter media help students visualize Oceanography concepts.	10-20 minutes
Conceptual Learning Activity	Apply It (Select Chapters)	A collection of conceptually based questions with randomized variation that asks students to analyze and apply chapter concepts.	Conceptual Learning Activities help students go beyond rote memorization toward conceptual understanding. Multiple attempts with alternate versions and immediate feedback reinforce concepts and build students' critical-thinking skills.	10-30 minutes
Oceanography in Context	Apply It (Every chapter)	Oceanography in Context activities ask students to read scientific articles related to the chapter and answer critical thinking questions.	Oceanography in Context activities further engage students with chapter content through the critical analysis and interpretation of real-world scientific findings.	15-30 minutes
Map Analysis	Apply It (Select chapters)	Multi-step problems that ask students to interact with and analyze different map layers within ArcGIS to make decisions, conclusions, predictions, and/or recommendations.	Students directly interact with maps, developing their geographic literacy and spatial reasoning skills. Questions assess student understanding and application of the scientific method, as well as their ability to think critically.	15-30 minutes