Marine Science 1 (2002500) Marine 1 Honors (2002510) Scope and Sequence

Unit	Standards	Suggested Timeframe
Unit 1: Science Processes, History, and Ocean Research Equipment	SC.912.N.1.1, SC.912.N.1.2, SC.912.N.1.3, SC.912.N.1.4, SC.912.N.1.5, SC.912.N.1.6, SC.912.N.1.7, SC.912.N.2.1, SC.912.N.2.4, SC.912.N.2.5, SC.912.N.3.1, SC.912.N.3.5, SC.912.N.4.1, SC.912.N.4.2	11 Block Days
Unit 2: Geological Oceanography	SC.912.N.1.3, SC.912.N.1.5, SC.912.N.1.6, SC.912.N.2.4, SC.912.N.2.5 Supporting Standards: SC.912.E.6.1, SC.912.E.6.2, SC.912.E.6.3, SC.912.E.6.4, SC.912.E.6.5, SC.912.E.6.6	10 Block Days
Unit 3: Chemical Oceanography	SC.912.L.17.2, SC.912.L.17.10, SC.912.L.18.12 Supporting Standard: SC.912.E.7.1	10 Block Days
Unit 4: Physical Oceanography	SC.912.L.17.2, SC.912.L.17.3, SC.912.P.10.2, SC.912.P.10.20 Supporting Standards: SC.912.E.7.2, SC.912.E.7.3	9 Block Days
Unit 5: Marine Meteorology	SC.912.E.7.9 Supporting Standards: SC.912.E.7.4, SC.912.E.7.5, SC.912.E.7.6, SC.912.P.10.4 **Honors**: SC.912.E.7.6	9 Block Days
Unit 6: Marine Ecology	SC.912.L.17.1, SC.912.L.17.4, SC.912.L.17.6, SC.912.L.17.7, SC.912.L.17.8, SC.912.L.17.9, SC.912.L.17.10 Supporting Standards: SC.912.L.17.5, SC.912.L.18.7, SC.912.L.18.8, SC.912.E.7.1 **Honors**: SC.912.L.17.17, SC.912.L.17.18	11 Block Days
Unit 7: Marine Conservation	SC.912.L.14.6, SC.912.L.17.8, SC.912.L.17.11, SC.912.L.17.16 Supporting Standards: SC.912.E.6.6, SC.912.L.15.3, SC.912.L.15.9, SC.912.L.16.10, SC.912.L.17.13, SC.912.L.17.15, SC.912.L.17.17, SC.912.L.17.18, SC.912.L.17.20, SC.912.E.7.8, HE.912.C.1.3, HE.912.C.1.5 **Honors**: SC.912.L.16.10	13 Block Days
Unit 8: Marine Classification	SC.912.L.17.2, SC.912.L.15.13 Supporting Standards: SC.912.L.15.4, SC.912.L.15.5, SC.912.L.15.6, SC.912.L.15.7	9 Block Days

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GENERAL NOTES

Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).

Honors and Advanced Level Course Note:

Advanced courses require a greater demand on students through increased academic rigor. Academic rigor is obtained through the application, analysis, evaluation, and creation of complex ideas that are often abstract and multi-faceted. Students are challenged to think and collaborate critically on the content they are learning. Honors level rigor will be achieved by increasing text complexity through text selection, focus on high-level qualitative measures, and complexity of task. Instruction will be structured to give students a deeper understanding of conceptual themes and organization within and across disciplines. Academic rigor is more than simply assigning to students a greater quantity of work.

Instructional Practices

Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:

1. Ensuring wide reading from complex text that varies in length.
2. Making close reading and rereading of texts central to lessons.
3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.
4. Emphasizing students supporting answers based upon evidence from the text.
5. Providing extensive research and writing opportunities (claims and evidence).

Science and Engineering Practices (NRC Framework for K-12 Science Education, 2010)

- Asking questions (for science) and defining problems (for engineering).
- Developing and using models.
- Planning and carrying out investigations.
- Analyzing and interpreting data.
- Using mathematics, information and computer technology, and computational thinking.
- Constructing explanations (for science) and designing solutions (for engineering).
- Engaging in argument from evidence.
- Obtaining, evaluating, and communicating information.

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English Language Development ELD Standards Special Notes Section:
Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Science. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade level words, expressions, sentences and discourse to process or produce language necessary for academic success The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/sc.pdf

ELD.K12.ELL.SC.1: English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.

ELD.K12.ELL.SI.1: English language learners communicate for social and instructional purposes within the school setting.

Florida's Benchmarks for Excellent Student Thinking (B.E.S.T.) Standards
This course includes Florida's B.E.S.T. ELA Expectations (EE) and Mathematical Thinking and Reasoning Standards (MTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable. For guidance on the implementation of the EEs and MTRs, please visit https://www.cpalms.org/Standards/BEST_Standards.aspx and select the appropriate B.E.S.T. Standards package.

MA.K12.MTR.1.1: **Actively participate in effortful learning both individually and collectively.**
Mathematicians who participate in effortful learning both individually and with others:

- Analyze the problem in a way that makes sense given the task.
- Ask questions that will help with solving the task.
- Build perseverance by modifying methods as needed while solving a challenging task.
- Stay engaged and maintain a positive mindset when working to solve tasks.
- Help and support each other when attempting a new method or approach.

Clarifications
Teachers who encourage students to participate actively in effortful learning both individually and with others:.

- Cultivate a community of growth mindset learners.
- Foster perseverance in students by choosing tasks that are challenging.
- Develop students' ability to analyze and problem solve.
- Recognize students' effort when solving challenging problems.

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MA.K12.MTR.2.1: **Demonstrate understanding by representing problems in multiple ways.**
Mathematicians who demonstrate understanding by representing problems in multiple ways:

- Build understanding through modeling and using manipulatives.
- Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations.
- Progress from modeling problems with objects and drawings to using algorithms and equations.
- Express connections between concepts and representations.
- Choose a representation based on the given context or purpose.

Clarifications
Teachers who encourage students to demonstrate understanding by representing problems in multiple ways:

- Help students make connections between concepts and representations.
- Provide opportunities for students to use manipulatives when investigating concepts.
- Guide students from concrete to pictorial to abstract representations as understanding progresses.
- Show students that various representations can have different purposes and can be useful in different situations.

MA.K12.MTR.3.1: **Complete tasks with mathematical fluency.**
Mathematicians who complete tasks with mathematical fluency:

- Select efficient and appropriate methods for solving problems within the given context.
- Maintain flexibility and accuracy while performing procedures and mental calculations.
- Complete tasks accurately and with confidence.
- Adapt procedures to apply them to a new context.
- Use feedback to improve efficiency when performing calculations.

Clarifications
Teachers who encourage students to complete tasks with mathematical fluency:

- Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately.
- Offer multiple opportunities for students to practice efficient and generalizable methods.
- Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.

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MA.K12.MTR.4.1: **Engage in discussions that reflect on the mathematical thinking of self and others.**
Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:

- Communicate mathematical ideas, vocabulary and methods effectively.
- Analyze the mathematical thinking of others.
- Compare the efficiency of a method to those expressed by others.
- Recognize errors and suggest how to correctly solve the task.
- Justify results by explaining methods and processes.
- Construct possible arguments based on evidence.

Clarifications
Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others:

- Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.
- Create opportunities for students to discuss their thinking with peers.
- Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods.
- Develop students' ability to justify methods and compare their responses to the responses of their peers.

MA.K12.MTR.5.1: **Use patterns and structure to help understand and connect mathematical concepts.**
Mathematicians who use patterns and structure to help understand and connect mathematical concepts:

- Focus on relevant details within a problem.
- Create plans and procedures to logically order events, steps or ideas to solve problems.
- Decompose a complex problem into manageable parts.
- Relate previously learned concepts to new concepts.
- Look for similarities among problems.
- Connect solutions of problems to more complicated large-scale situations.

Clarifications
Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts:

- Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts.
- Support students to develop generalizations based on the similarities found among problems.
- Provide opportunities for students to create plans and procedures to solve problems.
- Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

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MA.K12.MTR.6.1: **Assess the reasonableness of solutions.**
Mathematicians who assess the reasonableness of solutions:

- Estimate to discover possible solutions.
- Use benchmark quantities to determine if a solution makes sense.
- Check calculations when solving problems.
- Verify possible solutions by explaining the methods used.
- Evaluate results based on the given context.

Clarifications
Teachers who encourage students to assess the reasonableness of solutions:

- Have students estimate or predict solutions prior to solving.
- Prompt students to continually ask, “Does this solution make sense? How do you know?”
- Reinforce that students check their work as they progress within and after a task.
- Strengthen students’ ability to verify solutions through justifications.

MA.K12.MTR.7.1: **Apply mathematics to real-world contexts.**
Mathematicians who apply mathematics to real-world contexts:

- Connect mathematical concepts to everyday experiences.
- Use models and methods to understand, represent and solve problems.
- Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.

Clarifications
Teachers who encourage students to apply mathematics to real-world contexts:

- Provide opportunities for students to create models, both concrete and abstract, and perform investigations.
- Challenge students to question the accuracy of their models and methods.
- Support students as they validate conclusions by comparing them to the given situation.
- Indicate how various concepts can be applied to other disciplines.

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ELA.K12.EE.1.1: **Cite evidence to explain and justify reasoning.**

Clarifications

9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.

ELA.K12.EE.2.1: **Read and comprehend grade-level complex texts proficiently.**

Clarifications

See Text Complexity for grade-level complexity bands and a text complexity rubric.

ELA.K12.EE.3.1: **Make inferences to support comprehension.**

Clarifications

Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like “Why is the girl smiling?” or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.

ELA.K12.EE.4.1: **Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations.**

Clarifications

In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.

ELA.K12.EE.5.1: **Use the accepted rules governing a specific format to create quality work.**

Clarifications

Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.

ELA.K12.EE.6.1: **Use appropriate voice and tone when speaking or writing.**

Clarifications

In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.