



# Standards-Based Instruction in Science

Nancy Narvaez-Garcia, K-12 Science Program Specialist  
Office of STEAM



## Objectives

- Participants will learn about Tier 1 Science Instructional Support
- Participants will support best practices in science instruction
- Participants will learn about K-12 science educational support and resources

# Office of STEAM



**PJ Duncan**  
*Director of  
STEAM*

[Patricia.Duncan@fldoe.org](mailto:Patricia.Duncan@fldoe.org)



**Ashley  
Harvey**  
*Elementary  
Mathematics  
Specialist*

[Ashley.Harvey@fldoe.org](mailto:Ashley.Harvey@fldoe.org)



**Courtney  
Starling**  
*Secondary  
Mathematics  
Specialist*

[Courtney.Starling@fldoe.org](mailto:Courtney.Starling@fldoe.org)



**Jennifer  
Infinger**  
*STEAM  
Specialist*

[Jennifer.Infinger@fldoe.org](mailto:Jennifer.Infinger@fldoe.org)



**Nancy  
Narvaez-Garcia**  
*K-12 Science  
Specialist*

[Nancy.Narvaez-Garcia@fldoe.org](mailto:Nancy.Narvaez-Garcia@fldoe.org)

# Introduction

Nancy Narvaez-Garcia

K-12 Science Specialist

[Nancy.Narvaez-Garcia@fldoe.org](mailto:Nancy.Narvaez-Garcia@fldoe.org)

(850) 245-0946

- Geoscience/Secondary Science Education
- Former middle school science teacher
- Job Duties: provide standards and instructional support in science education



## Sharing

- Name and grade or science course you teach
- Have you ever visited the Florida Department of Education (FDOE) website?



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# MTSS Tier 1 Instructional Support

## Tier 1 Science Instruction

1. Aligned to the Next Generation Sunshine State Standards (NGSSS)
2. Course Descriptions
3. Grade-level Instruction
4. Standards-based Learning Opportunities



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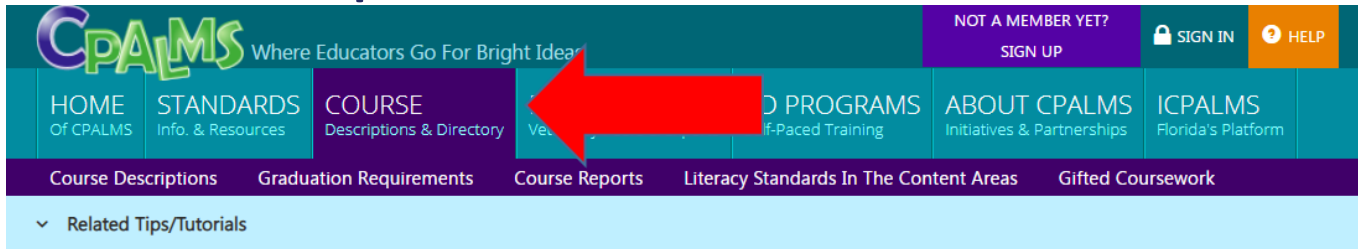
# Course Descriptions



## Course Descriptions

- Course descriptions tell which standards are in a particular course.
- Adopted by the State Board of Education.
- Standards tell what to teach, not how to teach it. *They are **not** placed in the order in which they should be taught.*

# Course Descriptions



CPALMS Where Educators Go For Bright Ideas

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HOME Of CPALMS STANDARDS Info. & Resources **COURSE** Descriptions & Directory *←* VIDEOS Video-Faced Training ABOUT CPALMS Initiatives & Partnerships ICPALMS Florida's Platform

Course Descriptions Graduation Requirements Course Reports Literacy Standards In The Content Areas Gifted Coursework

Related Tips/Tutorials

## Browse and Search Courses

You can apply different filters and search terms to browse the Courses

Enter Search Phrase..  Section  Grade

Select A Grade To Filter By

Grades PreK to 5 Education Courses  Grades 6 to 8 Education Courses  Grades 9 to 12 and Adult Education Courses

Show Color  Show Clarifications

3152 items

- Grades PreK to 12 Education Courses
- Administrative, Curricular and Service Assignments
- Exceptional Student Education
- Career and Technical Education
- Adult General Education

# Course Descriptions

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Related Tips/Tutorials

## Browse and Search Courses

You can apply different filters and search terms to browse the Courses

Enter Search Phrase..  Section ▾ Grade ▾ Subject ▾ **Sub-Subject ▾**

Select A Sub-Subject To Filter By X

<input checked="" type="checkbox"/> Biological Sciences	<input type="checkbox"/> Environmental Science	<input type="checkbox"/> Marine Sciences
<input type="checkbox"/> Chemistry	<input type="checkbox"/> General Sciences	<input type="checkbox"/> Physical Sciences
<input type="checkbox"/> Earth/Space Sciences	<input type="checkbox"/> Integrated Sciences	<input type="checkbox"/> Remedial

Grid View   
  List View   
  Show Color   
  Show Clarifications

25 items

<p><b>Anatomy and Physiology (#2000350)</b>  <b>Section:</b> Grades PreK to 12 Education Courses  <b>Grade:</b> Grades 9 to 12 and Adult Education Courses  <b>Subject:</b> Science  <b>Sub-Subject:</b> Biological Sciences</p>	<p><b>Anatomy and Physiology Honors (#2000360)</b>  <b>Section:</b> Grades PreK to 12 Education Courses  <b>Grade:</b> Grades 9 to 12 and Adult Education Courses  <b>Subject:</b> Science  <b>Sub-Subject:</b> Biological Sciences</p>	<p><b>Biology 1 (#2000310)</b>  <b>Section:</b> Grades PreK to 12 Education Courses  <b>Grade:</b> Grades 9 to 12 and Adult Education Courses  <b>Subject:</b> Science  <b>Sub-Subject:</b> Biological Sciences</p>	<p><b>Biology 1 Honors (#2000320)</b>  <b>Section:</b> Grades PreK to 12 Education Courses  <b>Grade:</b> Grades 9 to 12 and Adult Education Courses  <b>Subject:</b> Science  <b>Sub-Subject:</b> Biological Sciences</p>
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# Course Descriptions

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## Biology 1 (#2000310)

Version for Academic Year:

2014 - 2015 | **2015 - 2022 (current)** | 2022 - And Beyond

Export | Print | Create CMAP

**Course Standards** 93

Course Standards

Filter and display options ▾

93 Items

**Course Information**

**Educator Certifications** 3

**Equivalent Courses** 4

**Student Resources** 300

**1433**  
Resources related to the standards

**SC.912.E.7.1** Analyze the movement of matter and energy through the different biogeochemical cycles, including water and car... Resources: 26 Courses: 23

**SC.912.L.14.1** Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process o... Resources: 12 Courses: 13

**SC.912.L.14.2** Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes ... Resources: 45 Courses: 18

**SC.912.L.14.3** Compare and contrast the general structures of plant and Resources: 17 Courses: 16



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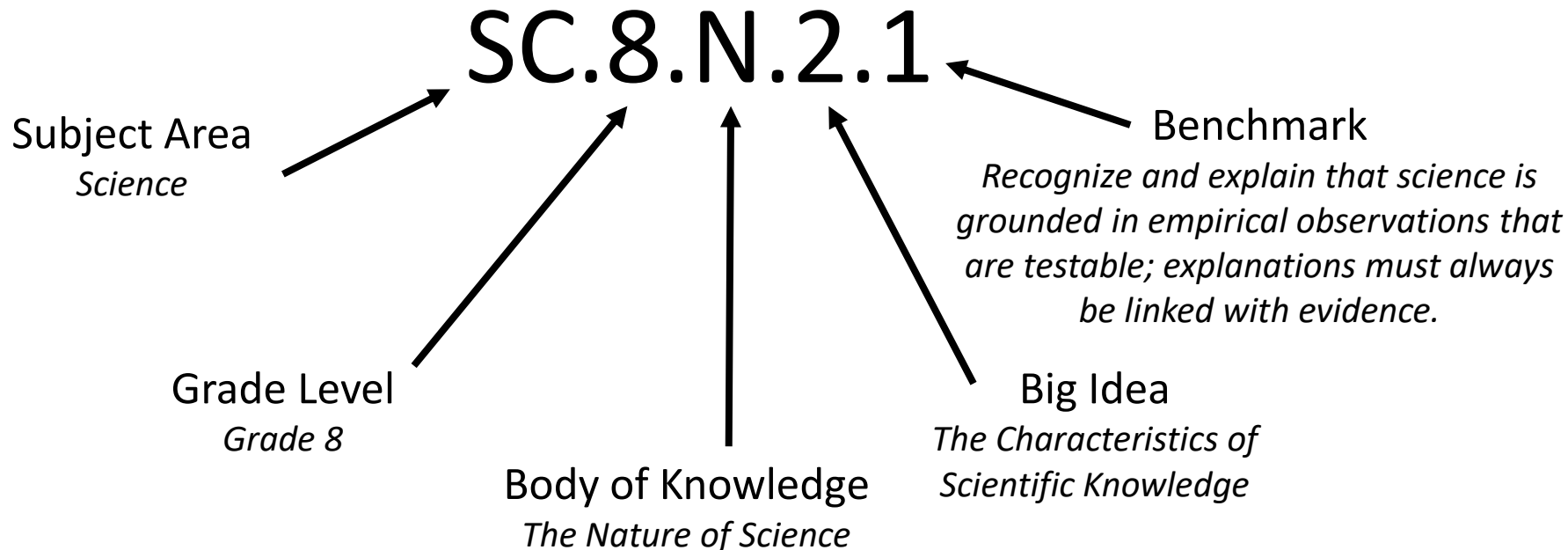
# Florida Next Generation Sunshine State Standards (NGSSS)

## Florida Science Standards

- Next Generation Sunshine State Standards (NGSSS)
- ~~Next Generation Science Standards (NGSS)~~

# Benchmark Classification System

Each benchmark in the NGSSS is labeled with a system of numbers and letters:





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# Florida Statewide Science Assessments (FSSA)



## Florida Statewide Science Assessments (FSSA)

- Grades 5 and 8
  - **Cumulative** assessments for grades 3-5 and 6-8
- Biology End-of-Course Assessment (EOC)
- For more information on science assessments, please visit the Bureau of K-12 Student Assessments  
<https://www.fldoe.org/accountability/assessments>

## Item Specifications

- A resource that defines the content and format of the test and test items for item writers and reviewers
- Tool for understanding the assessment
- Not to be used as a planning tool for instruction

## Item Specifications

- Not all standards are tested, but that doesn't mean that some standards are more important than others
- All standards are not easily assessed
- Many non-assessed standards **support** those that are assessed

## Item Specifications

- Test Design Summary

**Table 2: Statewide Science Assessment Content Categories**

Grade	Nature of Science	Earth and Space Science	Physical Science	Life Science
5	17%	29%	29%	25%
8	19%	27%	27%	27%

**Table 3: NGSSS EOC Assessments Content Categories**

Test	Category	Percentage
<b>Biology 1</b>	Molecular and Cellular Biology	35%
	Classification, Heredity, and Evolution	25%
	Organisms, Populations, and Ecosystems	40%

[http://www.fldoe.org/core/fileparse.php/5662/urlt/NGSSS\\_TestDesignSummary\\_Final.pdf](http://www.fldoe.org/core/fileparse.php/5662/urlt/NGSSS_TestDesignSummary_Final.pdf)

## Discussion

- How does understanding the assessments (FSSA Grade 5, Grade 8, or Biology EOC) help inform instruction?

## Item Specifications

- Scenario-based questions
  - Requires application of knowledge to a new situation

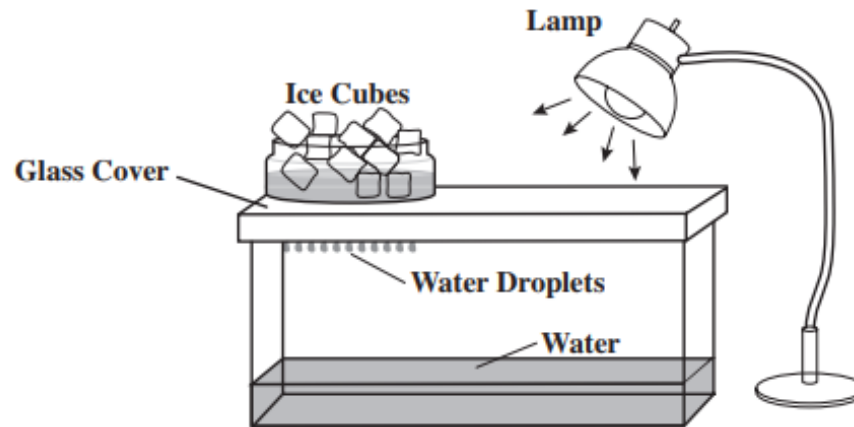
# Item Specifications

- Scenario-based questions – 5<sup>th</sup> grade

Sample Item 10

SC.5.E.7.1

A model of the water cycle was made using an aquarium with a glass cover, a container of ice cubes, water, and a lamp.



Which part of the water cycle causes the water droplets to form on the glass cover?

- ★ A. condensation
- B. evaporation
- C. precipitation
- D. runoff

## Item Specifications

- Scenario-based questions – 8<sup>th</sup> grade

**Sample Item 17**

**SC.8.P.9.2**

When a candle is lit, the wick burns, the wax melts, the candle changes shape, and the air around the candle heats up. Which of the following is an example of a chemical change?

- ★ **A.** the wick burning
- B.** the wax melting
- C.** the candle changing shape
- D.** the air around the candle heating up



## Item Specifications

- Scenario-based questions – Biology EOC

**Sample Item 9**

**SC.912.L.15.6**

Organisms classified as fungi have unique characteristics. Which of the following characteristics is found only in organisms classified in the kingdom Fungi?

- A. single cells without a nucleus
- B. multicellular with chloroplasts
- ★ C. multicellular filaments that absorb nutrients
- D. colonies of single, photosynthetic cells that reproduce asexually

## Discussion

- What do you think you can do as part of your instruction that will help students succeed in an assessment?

## Student Prior Knowledge

- Grade 5 and Grade 8 statewide science assessments and Biology EOC require prior knowledge and understanding of standards taught in previous grades

### **Benchmark**

**SC.5.E.5.1** Recognize that a galaxy consists of gas, dust, and many stars, including any objects orbiting the stars. Identify our home galaxy as the Milky Way. (Also assesses SC.3.E.5.1, SC.3.E.5.2, and SC.3.E.5.3.)

### **Also Assesses**

**SC.3.E.5.1** Explain that stars can be different; some are smaller, some are larger, and some appear brighter than others; all except the Sun are so far away that they look like points of light.

**SC.3.E.5.2** Identify the Sun as a star that emits energy; some of it in the form of light.

**SC.3.E.5.3** Recognize that the Sun appears large and bright because it is the closest star to Earth.

## Student Prior Knowledge

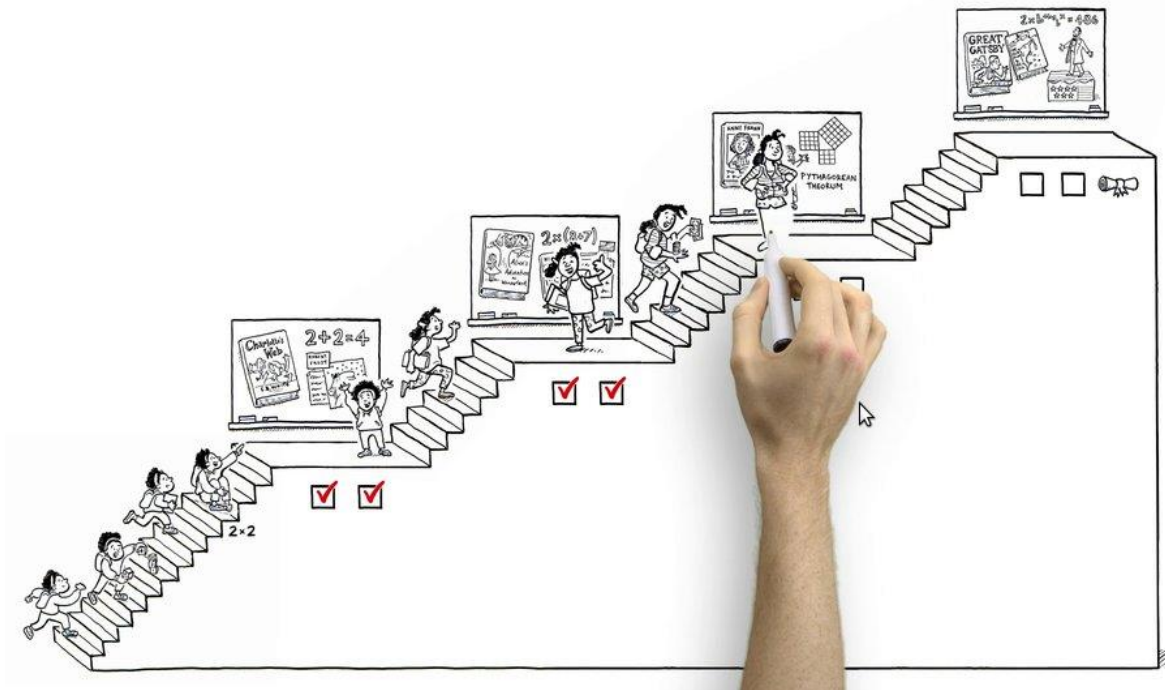
- SC.912.L.17.9 Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels.

### **Prior Knowledge**

Items may require the student to apply science knowledge described in the NGSSS from lower grades. This benchmark requires prerequisite knowledge of SC.7.L.17.1, SC.7.L.17.2, SC.8.L.18.3, SC.8.L.18.4, SC.6.E.7.4, SC.7.P.11.2, SC.7.P.11.3, and SC.8.P.9.1.

# Progression of Learning

- As educators, it is important to be aware of the standards in the course you teach.



## Overview

- Solid Tier 1 instruction
- Course description
- Florida Next Generation Sunshine State Standards (NGSSS)
- Florida Statewide Science Assessments (FSSA)
- Progression of learning



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# Teacher Resources

# FDOE Science Website



## SCIENCE

Science

Mathematics

STEM Programs

Sunshine State Scholars

## Science

### Standards

The **Next Generation Sunshine State Standards for Science** were adopted by the Florida State Board of Education in February 2008.

- [2008 Science Next Generation Sunshine State Standards](#)

### Instructional Support

- [Teacher Toolkits](#)
- [Assessments](#)
- [Safety in Science](#)
- [Elementary Science Resources](#)
- [Secondary Science Resources](#)

### Instructional Series for K-12 Science Teachers

- [Teaching Science in Florida: Understanding the Next Generation Sunshine State Standards \(NGSSS\)](#)
- [Teaching Science in Florida: CPALMS Resources for Science Instruction](#)

### Elementary Science Webinars

- [Elementary Science Webinar- Science Integration Through Literacy](#)

### Secondary Science Webinars

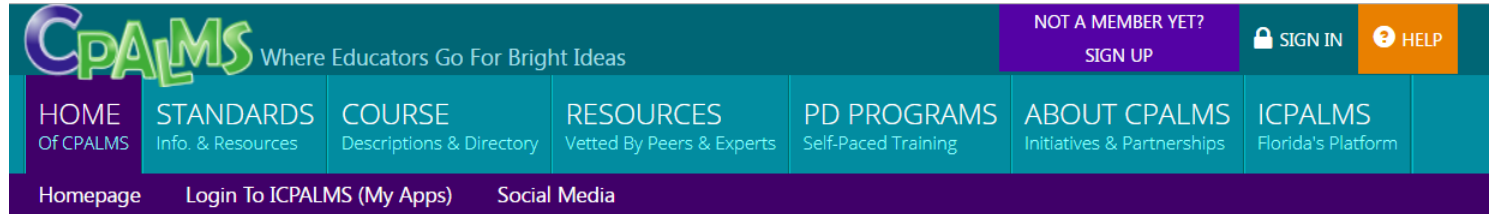
- [Secondary Visual Arts and Science Webinar July - Ceramics + Chemistry \(7/17/18\)](#)
- [Secondary Science Webinar September - Physics & the Arts \(9/28/2017\)](#)
- [Secondary Science Webinar March - Biology & the Arts \(3/30/2017\)](#)
- [Secondary Science Webinar - Science Strategies for Improving Student Health and Academic Achievement \(3/23/2017\)](#)



<http://www.fldoe.org/academics/standards/subject-areas/math-science/science>



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Homepage | Login To ICPALMS (My Apps) | Social Media

## Welcome to CPALMS

Our team is working hard to support educators, parents, and students during this challenging time. We revised our homepage to showcase resources and tools that can help with traditional or online teaching and learning. Choose one of the options to get started:

I am a Florida  
**Teacher**

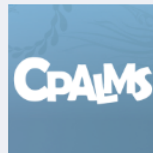
I am a Florida  
**Parent**

I am a Florida  
**Student**

I am  
**Not from Florida**

### Standards Viewer App

Explore Florida's standards directly on your mobile device. Available for iOS and Android and devices. [Click here for more information](#) or use the buttons below to download the app.



### New to CPALMS?

CPALMS is an online toolbox of information, vetted resources, and interactive tools that helps educators effectively implement teaching standards. It is the State of Florida's official source for standards information and course descriptions.

[Click here to watch an introduction video!](#)

# Florida Students



Florida  Students  
educational resources for learning

Search

HELP

Let's get started! 



English Language Arts

337 Original Tutorials  
80 Other Resources



Mathematics

243 Original Tutorials  
568 Other Resources



Science

331 Original Tutorials  
194 Other Resources



Social Studies

105 Original Tutorials  
241 Other Resources

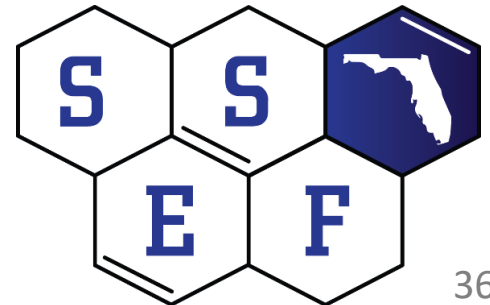
## Florida Association of Science Teachers (FAST)

- Open to K-12 science educators
- Host annual conference, virtual events and provide educators with grants
- For more information, visit <https://fastscience.wildapricot.org/>



## State Science Engineering Fair (SSEF) of Florida

- The SSEF of Florida is a three-day display of science project exhibits prepared by aspiring scientists and engineers in grades 6-12.
- Regional and state fairs are hosted yearly.
- For more information:
  - Website: <https://ssefflorida.com/>
  - Nancy Besley: [nancybesley@gmail.com](mailto:nancybesley@gmail.com)



# Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST)



Administered by the National Science Foundation  
(NSF) on behalf of the White House  
Office of Science and Technology Policy (OSTP)

## PAEMST 2021-2022

- Nominations for grade K-6 teachers in Science, Technology, Engineering, Math and/or Computer Science are now open and will close January 7, 2022.
- Applications are now open and are due February 6, 2022.
- Please visit [www.paemst.org](http://www.paemst.org) to submit your nominations or to apply.
- For more information, email Alicia Foy [Alicia.Foy@fldoe.org](mailto:Alicia.Foy@fldoe.org).

## Questions and Feedback



[https://forms.office.com/Pages/ResponsePage.aspx?id=exC\\_Y2\\_Lc0GMHBQGu1y3lFKru1D3GilBrNJ2tJoNhchUNFdaNzFNT01GWVINOTRIR004MFQ2Q0g1TC4u](https://forms.office.com/Pages/ResponsePage.aspx?id=exC_Y2_Lc0GMHBQGu1y3lFKru1D3GilBrNJ2tJoNhchUNFdaNzFNT01GWVINOTRIR004MFQ2Q0g1TC4u)

**Date of Presentation:** 10/21/2022

**Time of Session:** PM

**Presenters:** Nancy Narvaez-Garcia

### Contact:

Nancy Narvaez-Garcia  
K-12 Science Specialist  
Office of STEAM

[Nancy.Narvaez-Garcia@fldoe.org](mailto:Nancy.Narvaez-Garcia@fldoe.org)



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