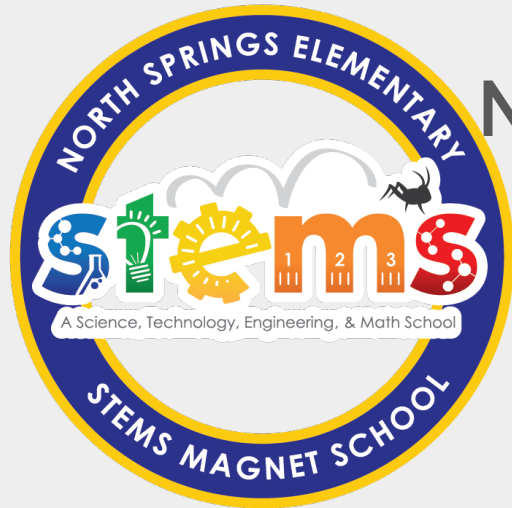


# Engaging Elementary Students in Engineering Design -- Strategies and Best Practice



Nicole Moses, M.A.T., M.Ed.

&

Regina E. Ciphrah, Ph.D.



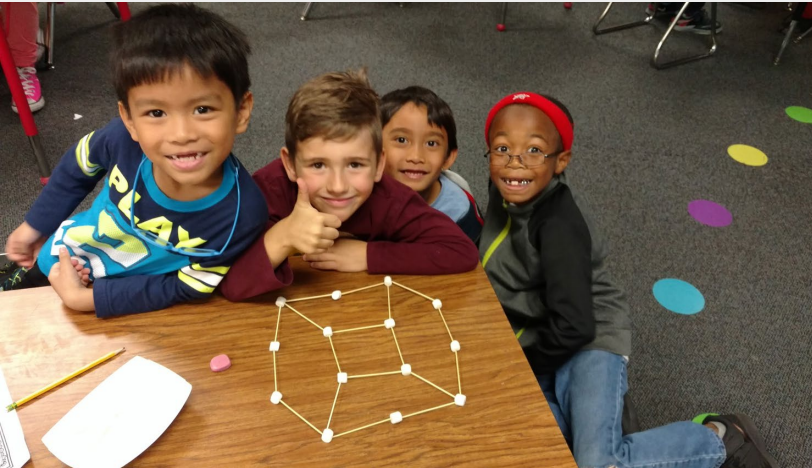
## **Session Objective**

Attendees will participate in evaluating and revising a sample lesson for elements of engineering design practices that are developmentally appropriate for elementary students

# Introductions

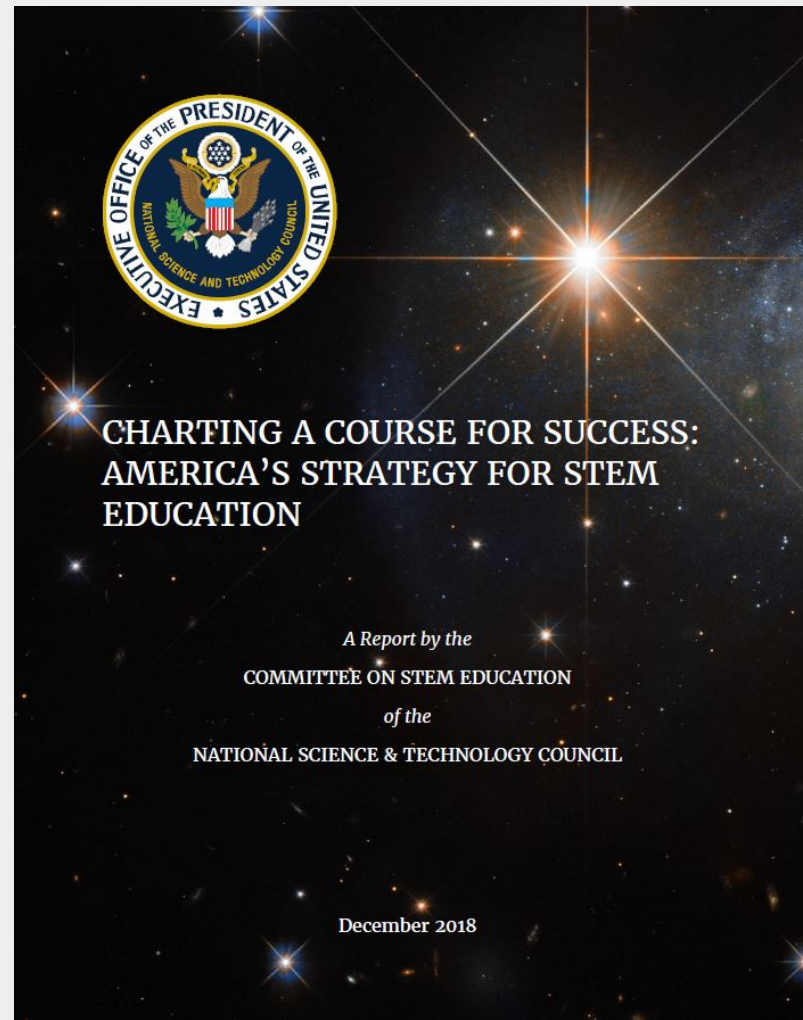
- Name
- Organization
- PDS Role
- Definition of STEM Education in Practice

# Context of STEM Education at North Springs Elementary



# Our Perspective of STEM

*America's Strategy* defines STEM education as “an **integrated and interdisciplinary approach** to learning and skill development [... that] includes the teaching of academic concepts through **real-world applications** and combines **formal and informal learning** in schools, the community, and the workplace. It seeks to impart skills such as **critical thinking** and **problem solving** along with soft skills such as **cooperation** and **adaptability.**” (CoSTEM 2018)

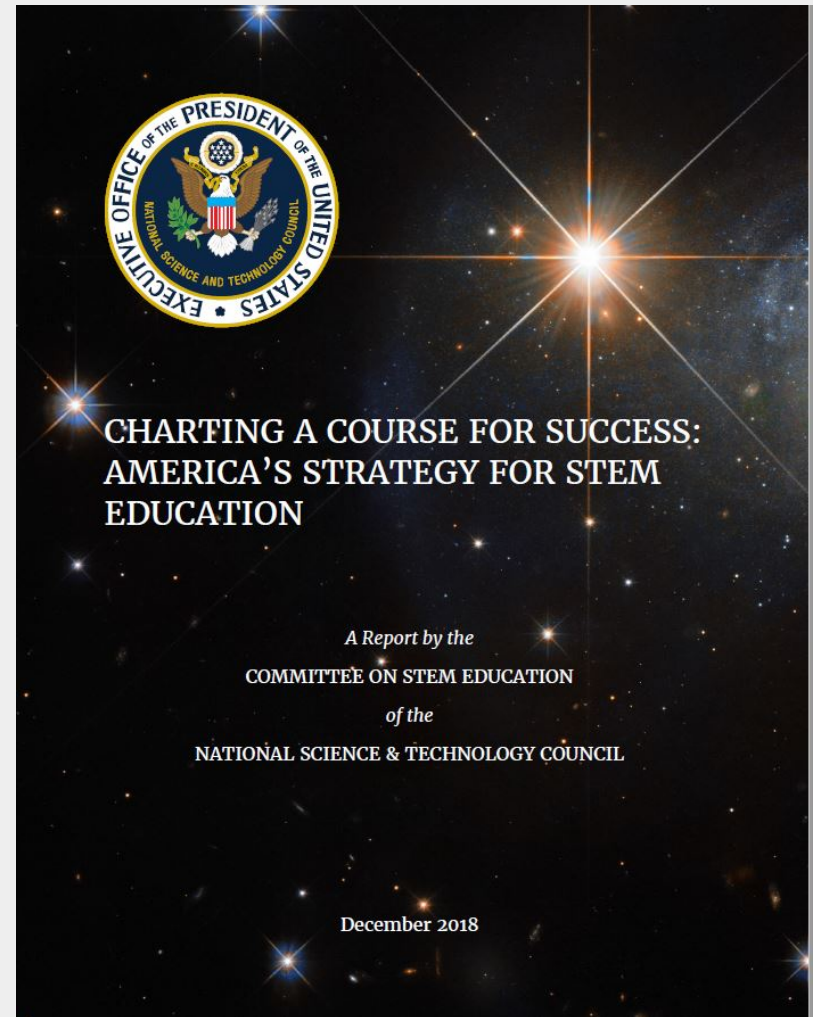


# Our Perspective of STEM

- Goals for American STEM Education
  1. Build strong foundations for STEM Literacy
  2. Increase DEI in STEM
  3. Prepare STEM Workforce for the future

(CoSTEM 2018)

***Our View: Implementing Engineering Education as early and comprehensively as possible will afford attainment of these goals***



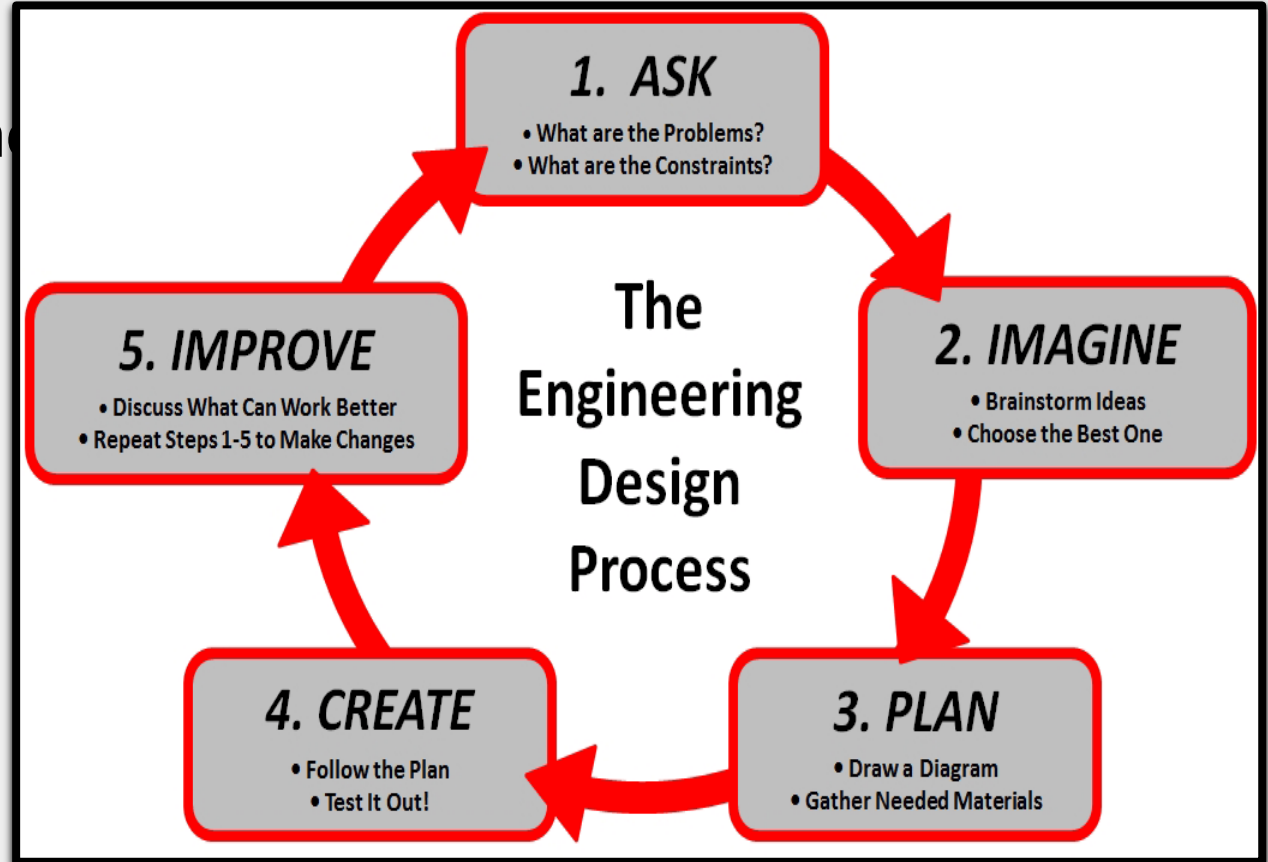
# PDS Focus: Engaging all learners in STEM experience, beginning with Engineering Design



# Engineering Design Practices (EDP)

EDP is a Science and  
Engineering  
Practice

The Engineering Is  
Elementary (EiE)  
Model defines EDP  
as...





# NSE Crickets Engineering Design Classroom Engagement Rubric

## ASK

Ask questions themselves to identify the problem  
Ask questions about criteria or constraints on the device or solution  
Define problems related to scientific concepts

## IMAGINE

Apply scientific concepts to solve problems and meet needs  
Organize, plan, and research to design/construct their devices or solutions  
Model/propose successful devices or solutions that reflect understanding of scientific concepts being studied

## PLAN

Organize, plan, and research to design/construct their devices or solutions  
Model/propose successful devices or solutions that reflect understanding of scientific concepts being studied

## CREATE

Build and test their knowledge and be able to explain what they are doing  
Build and test their own device and determine if the solution solves the problem

## IMPROVE

Analyze their data  
Evaluate and refine their tools/devices

## OBSERVATIONS OF STUDENTS

4-Consistent and independent  
3-Consistent with little to no teacher prompting  
2-Inconsistent and/or requires teacher prompting  
1-Experience difficulty even with teacher prompting  
0-The teacher does not provide the opportunity for students to engage in the criteria

LINKS TO ACTIVITIES FOR REVIEW

<http://bit.ly/1025SERVE>

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# Q&A



# Contact Information

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