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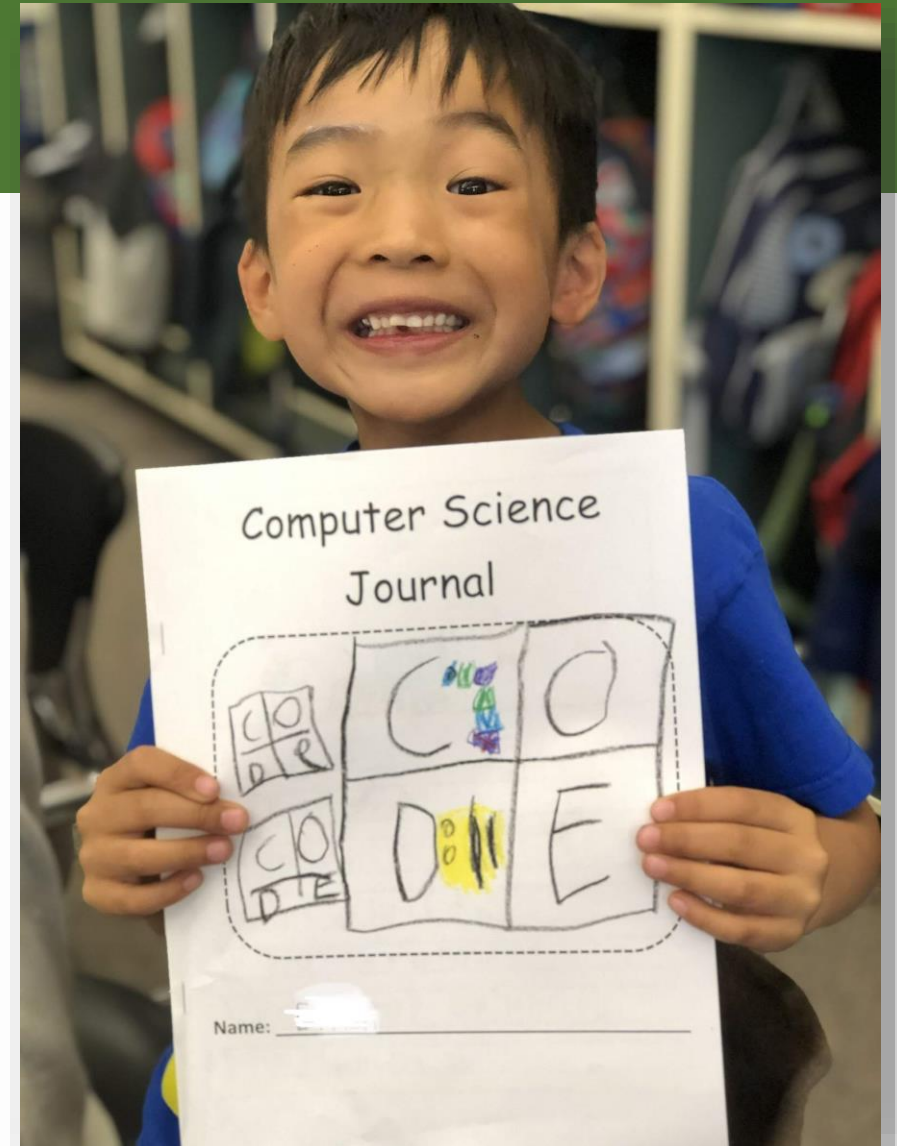
**Middle School STEM CS /Science Developer | Bellevue School District**





# Goals for Our Time

- Context for the BSD PreK-8 CS initiative
- Elementary model overview
- Middle school model for integrated CS in Science
- Program outcomes and looking forward



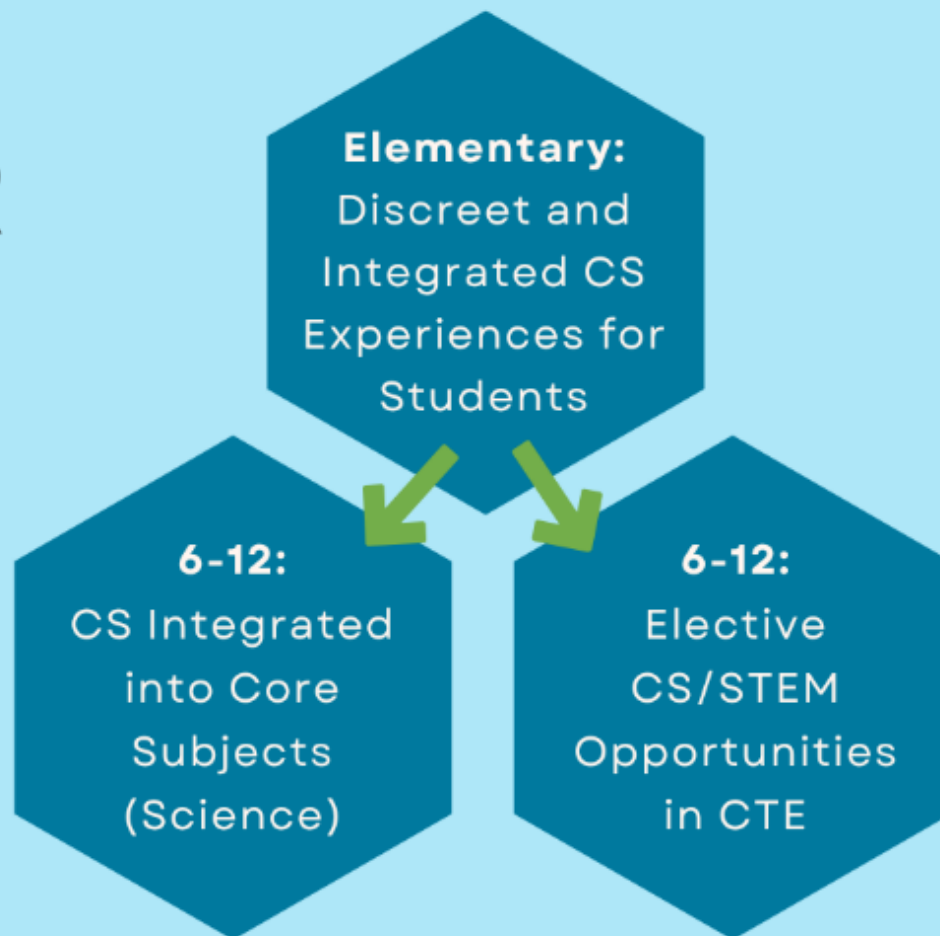




# Computer Science Pathway

## **BSD COMPUTER SCIENCE PreK-12** *pathway*

THE LEARNING THAT  
HAPPENS IN P-5 HELPS TO  
PREPARE STUDENTS FOR  
CS IN MIDDLE SCHOOL  
AND BEYOND





# PreK-8 Computer Science Goals



**High Quality Instruction:** Offer an integrated Computer Science curriculum for each and every student that applies computational thinking, programming and physical computing to analyze new problems, build predictive models and create innovative solutions.

**Creators of Their Future World:** Students effectively problem solve and lead for positive local and global change by developing global awareness and competency, and learn advanced skills in processing and applying information through the effective use of technology and engineering



# PreK-5: What does it look like?

## CS Specialists at our Title 1 schools

- Standalone CS classes for all students

## CS Facilitator at Wilburton

- All teachers integrate CS every week
- Facilitator is a coach who helps with planning, training, and implementation

## CS Leads

- Classroom teachers help to champion and promote CS
- Most schools represented by a Lead





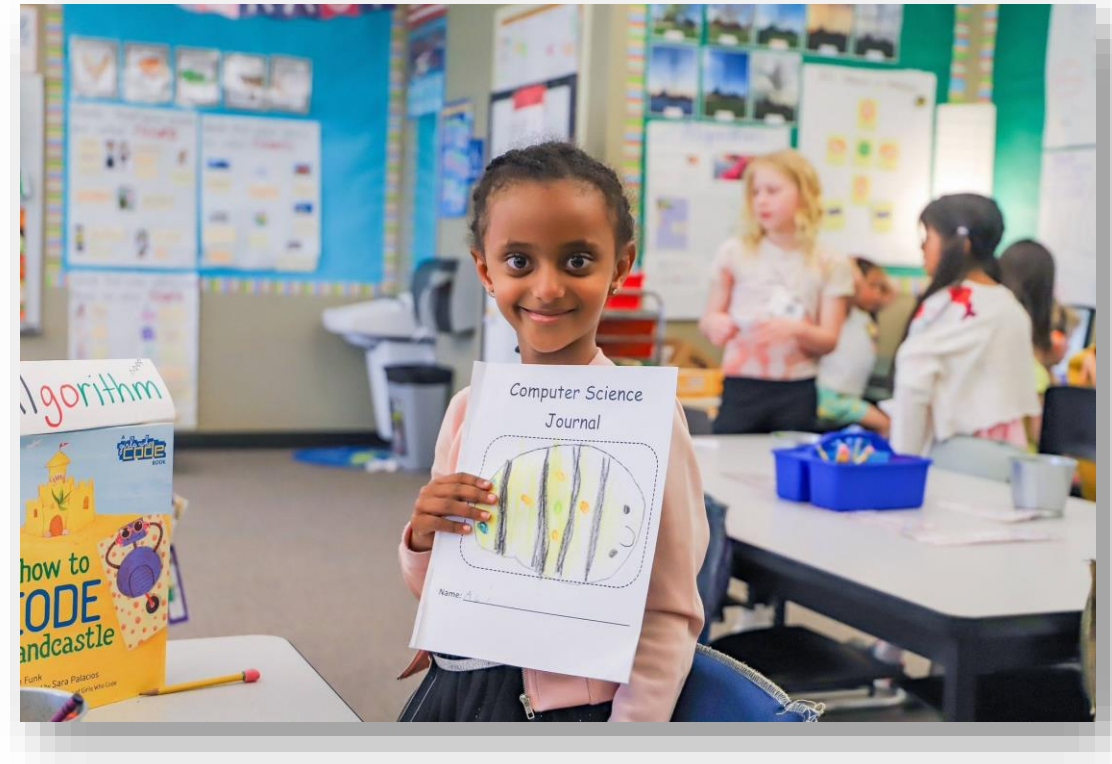
# PreK-5: What does it look like?

## Developing computational thinkers

- Analyzing & Predicting
- Debugging & Problem Solving
- Creativity
- Collaboration
- Abstraction & Decomposition
- Perseverance

## Opening doors for students

- Combating stereotypes from PreK onward
- Showing students that everyone belongs in CS
- Demonstrating all the creative ways that CS can support other passions





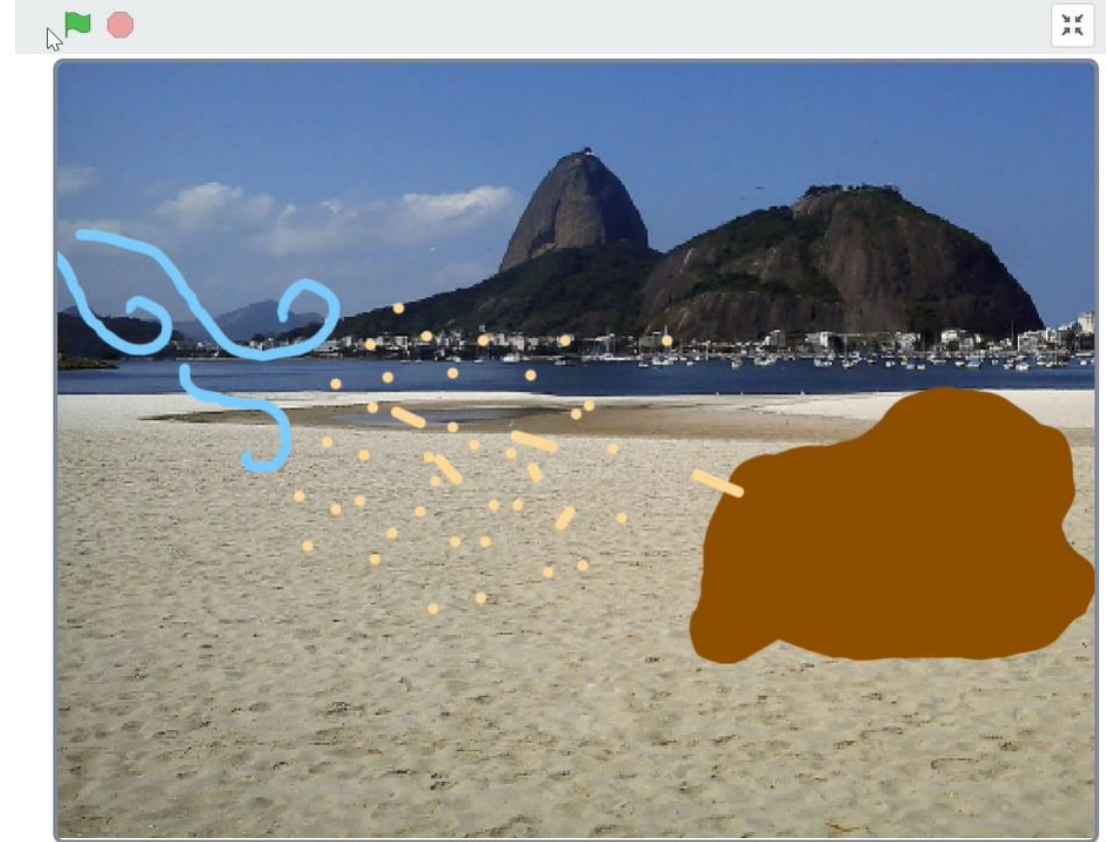


# PreK-5: What does it look like?

## Integration Across the Curriculum

Teachers have developed lessons that are integrated into core subject areas



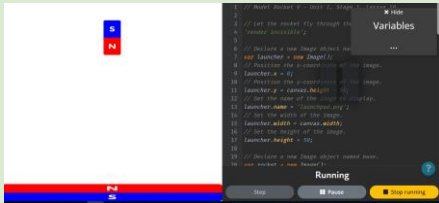
- Available for teachers around the district to use
- Students use coding to make models, share their ideas, and demonstrate their understanding
- These complement the computational thinking and CS disposition learning that students do



4<sup>th</sup> Grade Science: Weather & Erosion



# 6-8: Computer Science Integrated into Middle School Science

6 <sup>th</sup> grade	7 <sup>th</sup> grade In development	8 <sup>th</sup> grade in development
<p data-bbox="201 539 896 582">Coral Reef Restoration CS Internship</p> 	<p data-bbox="945 539 1538 582">Deforestation Design challenge</p> 	<p data-bbox="1719 539 2211 582">Magnetism and Modeling</p> 
<p data-bbox="188 926 881 1225">How can we use the power of computing and computational thinking to address and mitigate the challenges associated with declining coral reef health?</p>	<p data-bbox="940 926 1531 1348">How can we use the power of computational thinking and computing to address and mitigate the challenges associated with deforestation and reforestation?</p>	<p data-bbox="1595 926 2326 1162">How can we develop a model to test and predict the outcome of future magnetically assisted space launches without going to space?</p>





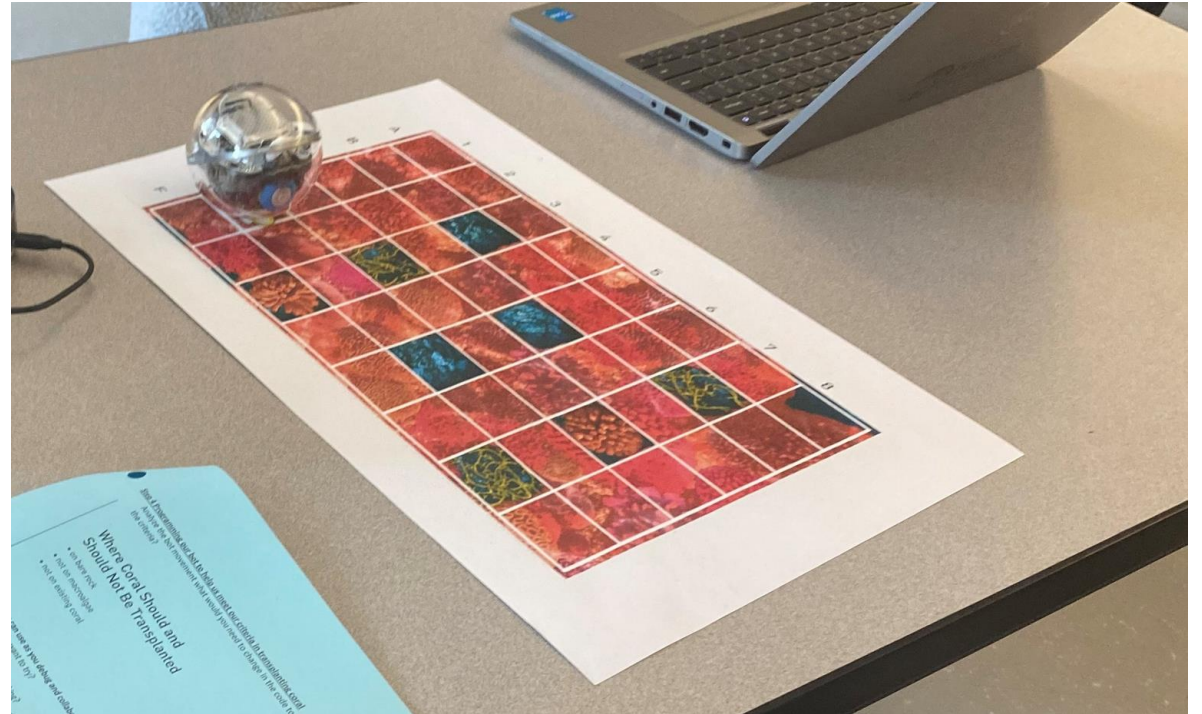
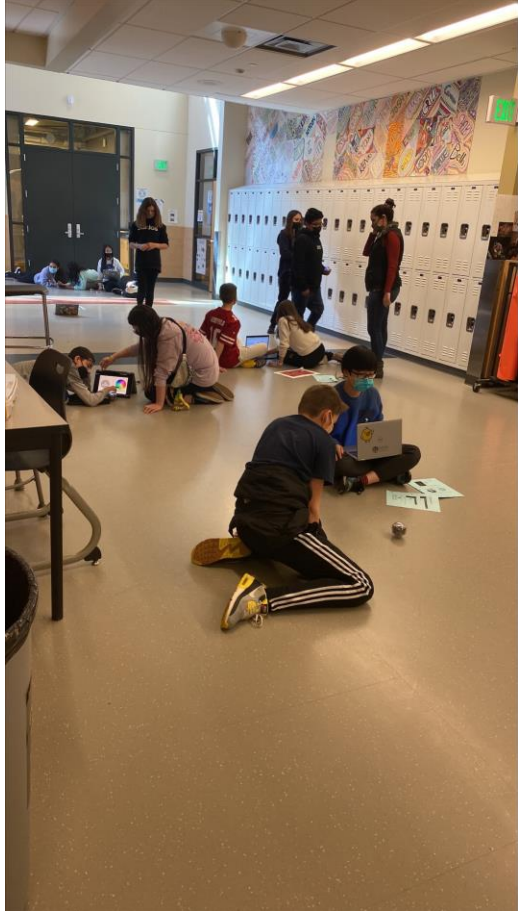
# CS Integration in Science 6-8: What does it look like?

The integration of the unit will occur in three phases: each phase taking about 1- 2 years:

1. **Experiment phase 1:** Trial run in 1-2 classes while unit is in development for the purpose of refining and adjusting the unit
2. **Experiment phase 2 :** Recruit interested teachers who would like to participate in trying the unit and continue to adjust according to the needs.
3. **Implementation phase:** All teacher in that specific grade level will implement the unit in their science classes and will have support from teacher leads that were part of the experiment phases.



# Student experience 6<sup>th</sup> grade CS Coral Reef unit



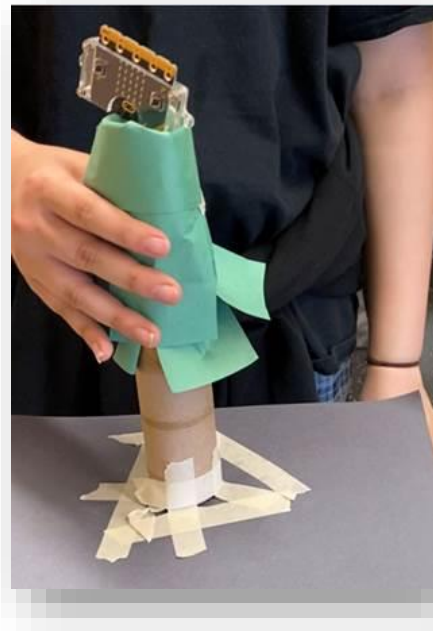


# The Student Experience during 7<sup>th</sup> grade Deforestation challenge

Use the motion sensor to detect illegal cutting

Use the temp sensor to detect optimum temperature to identify optimum conditions for trees to grow

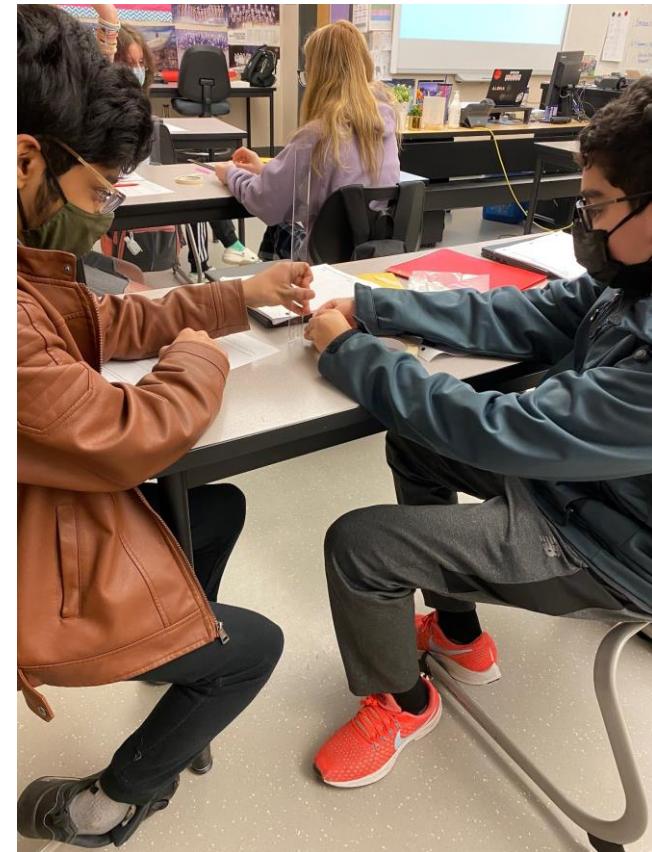
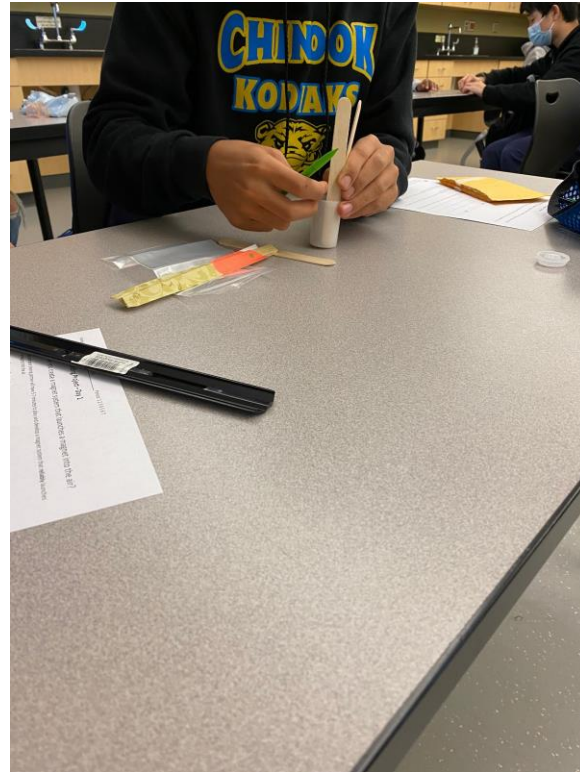
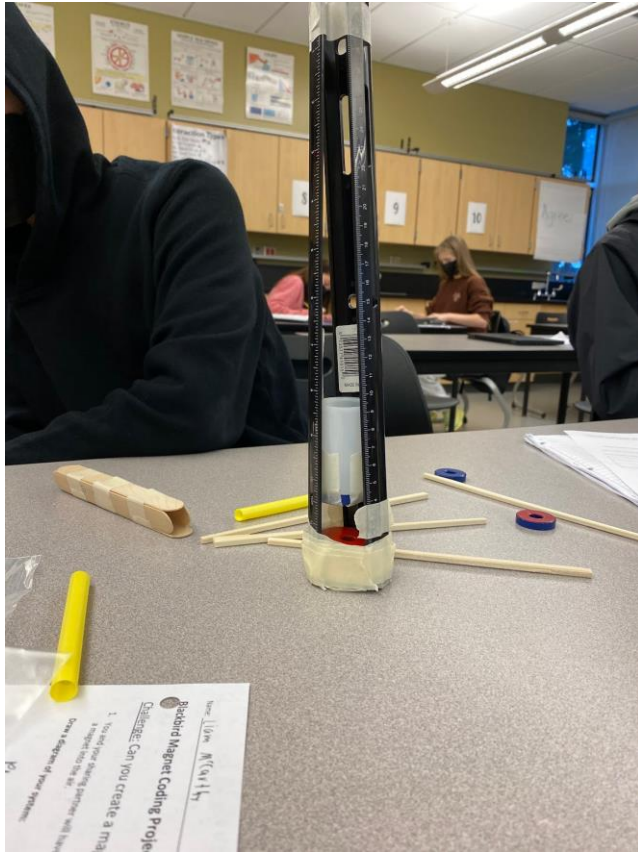
**Design challenge questions** In what ways can we use technology to help us in solving issues related to deforestation or help in reforestation globally?







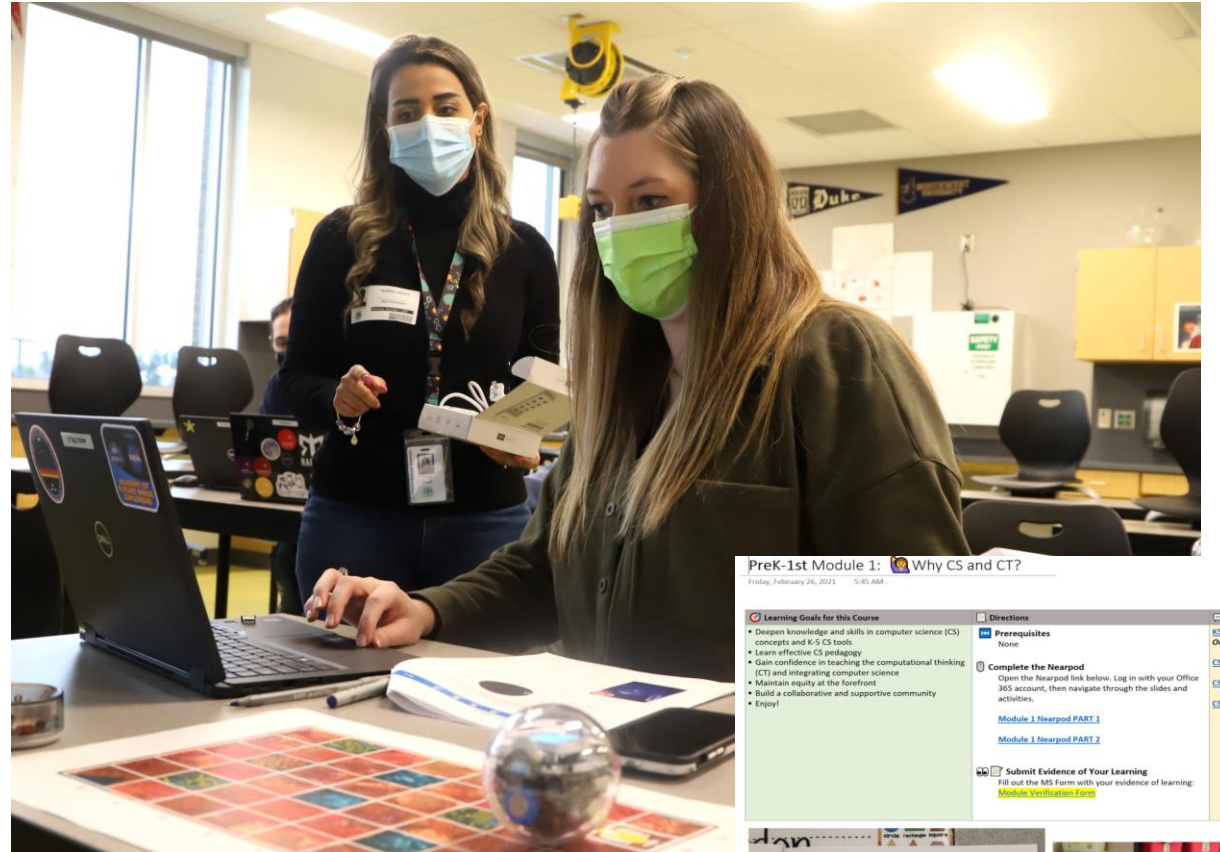
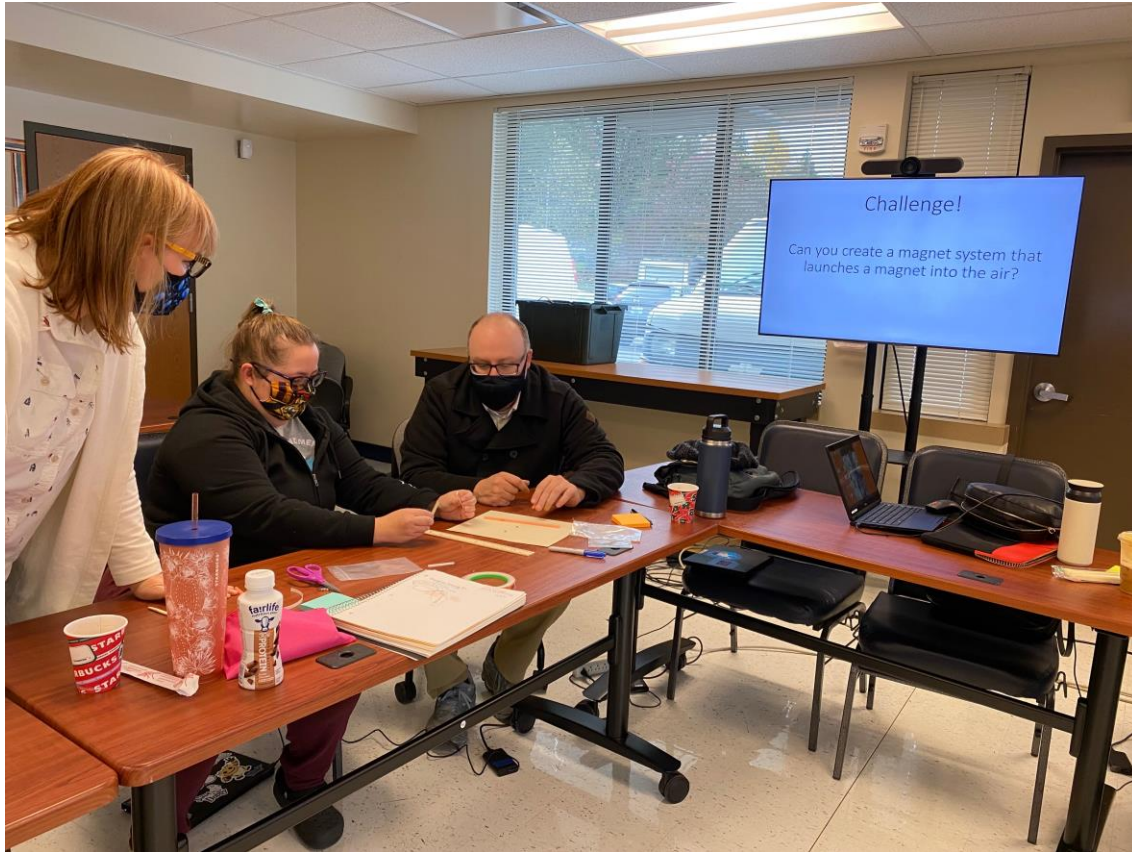
# Student Experiences From 8<sup>th</sup> Grade Magnet Rocket Blackbird unit







# Professional Learning for Classroom Teachers



PreK-1st Module 1: Why CS and CT?  
Friday, February 26, 2021 5:45 AM

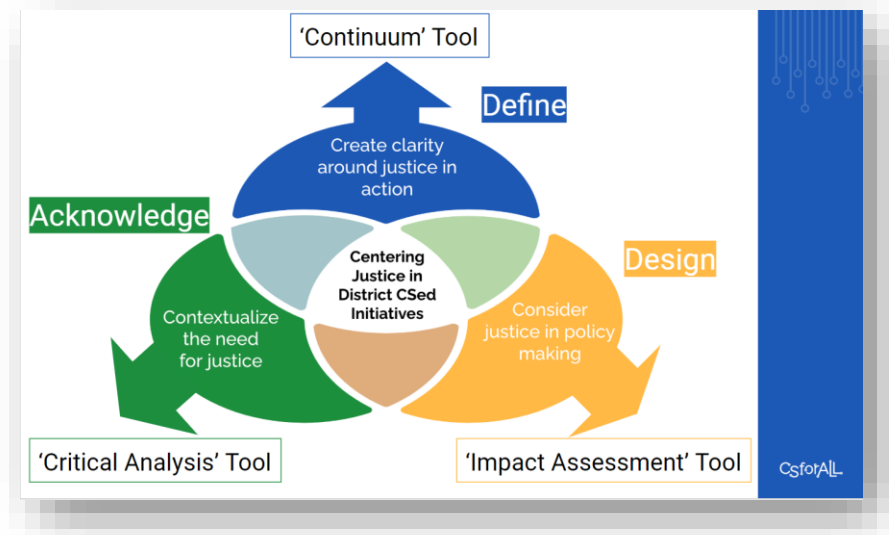
<b>Learning Goals for this Course</b> <ul style="list-style-type: none"><li>• Deepen knowledge and skills in computer science (CS) concepts and K-5 CS tools</li><li>• Learn effective CS pedagogy</li><li>• Gain confidence in teaching the computational thinking (CT) and integrating computer science</li><li>• Maintain equity at the forefront</li><li>• Build a collaborative and supportive community</li><li>• Enjoy!</li></ul>	<b>Directions</b> <ul style="list-style-type: none"><li>• Prerequisites: None</li><li>• Complete the Nearpod: Open the Nearpod link below. Log in with your Office 365 account, then navigate through the slides and activities.<ul style="list-style-type: none"><li><a href="#">Module 1 Nearpod PART 1</a></li><li><a href="#">Module 1 Nearpod PART 2</a></li></ul></li><li>• Submit Evidence of Your Learning: Fill out the MS Form with your evidence of learning: <a href="#">Module Verification Form</a></li></ul>	<b>Teacher Resources</b> <ul style="list-style-type: none"><li>• <a href="#">CS Computer Science Teacher OneNote with Lessons &amp; Resources</a></li><li>• <a href="#">CS Vocab Cards - English</a></li><li>• <a href="#">CS Vocab Cards - Spanish</a></li><li>• <a href="#">CS Vocab Cards - Mandarin</a></li></ul>
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- In-person and asynchronous virtual professional development for teachers



# National Partnerships: Computer Science Education







# 6-8 Program Outcomes

After the implementation of the computer science units:

- 8<sup>th</sup> grade Hispanic students reported an increase from 64%- 94% in their confidence in using technology, coding or computer science to create things.
- 6<sup>th</sup> grade Black students reported an increase from 50%-72% in interest in taking a computer science class in high schools.
- 8<sup>th</sup> grade female students reported an increase from 72%- 89% in confidence is using technology, coding, or computer science to create things.

# Computer Science in Science pathway



## MS & HS NEXT STEPS

	2021-2022	2022 - 2023	2023 - 2024	2024 - 2025
6 <sup>th</sup> Grade	Experiment phase 2	Implementation Phase – Year 1	Implementation Phase – Year3	Implementation Phase – Year4
7 <sup>th</sup> Grade	Experiment Phase 1	Experiment Phase 1	Experiment Phase 2	Implementation phase year 1
8 <sup>th</sup> Grade	Experiment phase 1	Experiment phase 2	Implementation phase year 1	Implementation phase year 2
9 <sup>th</sup> Grade				Experimental Phase 1
10 <sup>th</sup> Grade				Experiment Phase 1





# K-5 Program Outcomes

Based on Spring 2022 4<sup>th</sup> grade survey data at the 5 CS schools:

- 76% of students report liking coding and Computer Science
- 91% believe they can use technology, coding, and Computer Science to create things
- 100% of Black and multi-racial students reported that they believe that anyone can be successful in Computer Science
- 68% of students reported wanting to take Computer Science in middle school, including a higher percentage of girls than boys





# PRE K - 5 NEXT STEPS



1

Continue to build out engaging CS lessons integrated into core subject areas

2

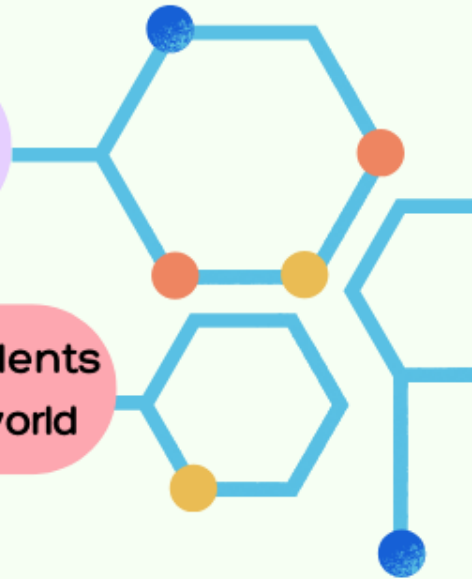
Engage more teachers in professional learning around effective CS pedagogy

3

Deepen the practice and impact of the CS Specialists in our Title schools

4

Begin to build CS modules into science units to reach all students with a focus on developing kids as creators of their future world





# Thank you! Questions?

