

CELEBRATING 50 YEARS

# PAST IS PROLOGUE

BUILDING A BRIDGE TO THE FUTURE

## The EMMET Project

Dr. Darren Ackley – Vice  
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Center Coordinator

Mr. Paul Proulx – NTC Board  
Trustee



***Northcentral***  
**TECHNICAL COLLEGE**

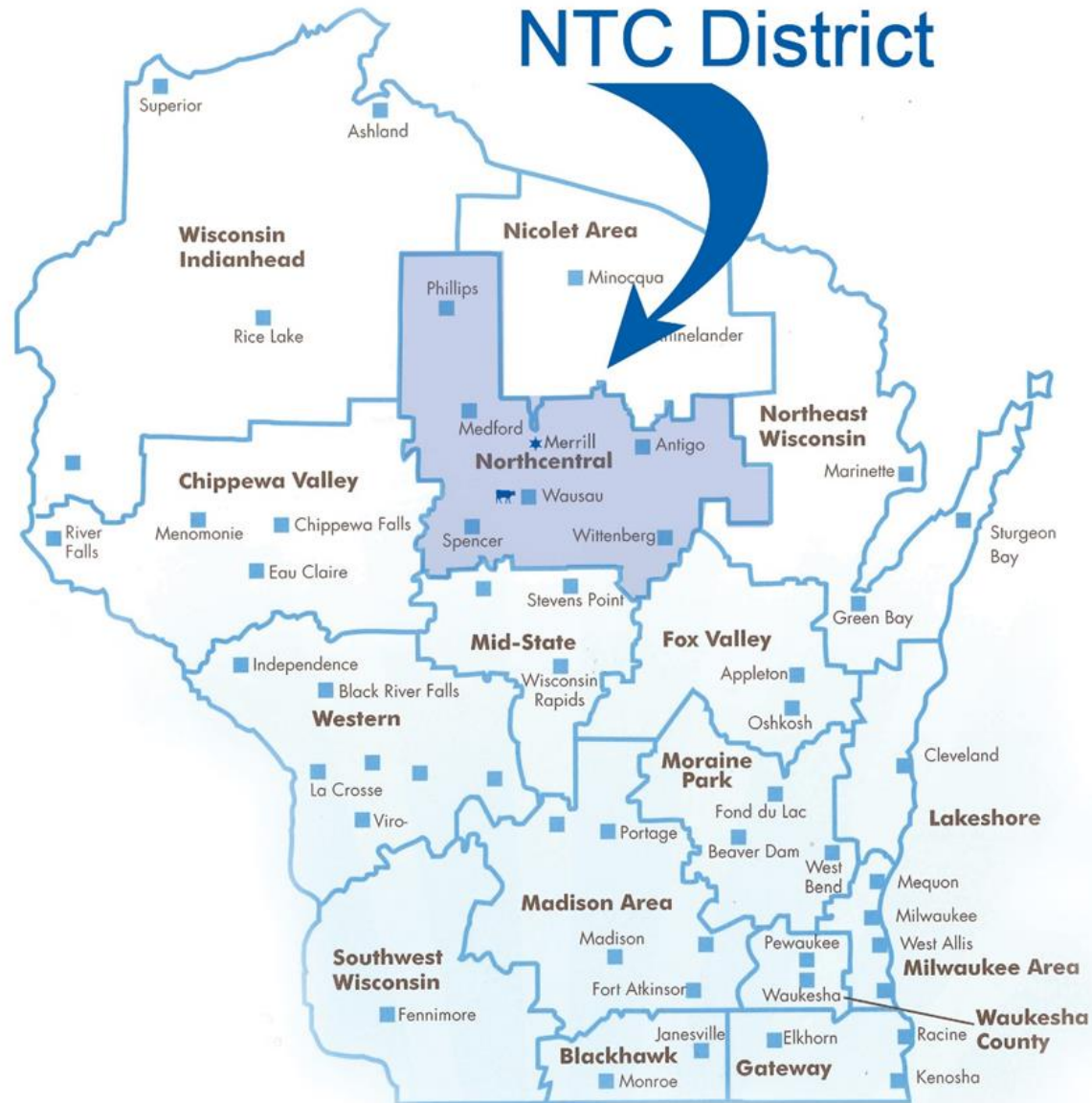
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#ACCT2019





# NTC District





# Wisconsin





# Wisconsin





# Who we are

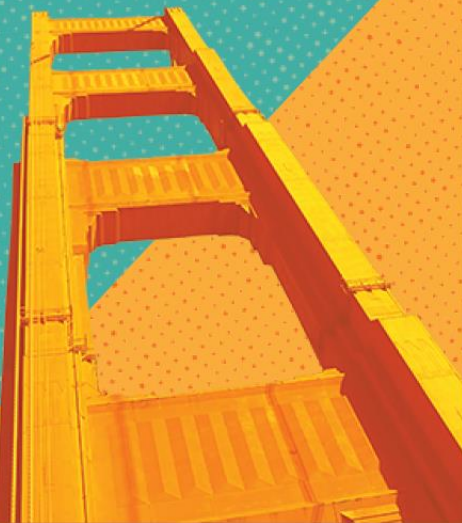
- The purpose of this National Science Foundation project is to bring STEM+Computational Thinking concepts and applications to rural Wisconsin communities. The goal of this NSF Project is to create a sustainable Maker+Mentor cultural environment within these communities. The scope of this NSF Project is to support a sustainable STEM+C Maker environment by providing resources and personnel to assist in its perpetuation.*





# What we do

- *We explore **making** through mobile emerging technologies, and to engage rural communities of northcentral Wisconsin in STEM+C learning, we will utilize NTC's existing mobile makerspace to deliver a range of learning experiences and technological innovations to rural communities that typically do not have access to these resources.*
- *EMMET will travel to local community-based organizations and events (e.g. public libraries, county fairs, and youth clubs) and offer informal activities ranging from short demonstrations to day-long making events.*

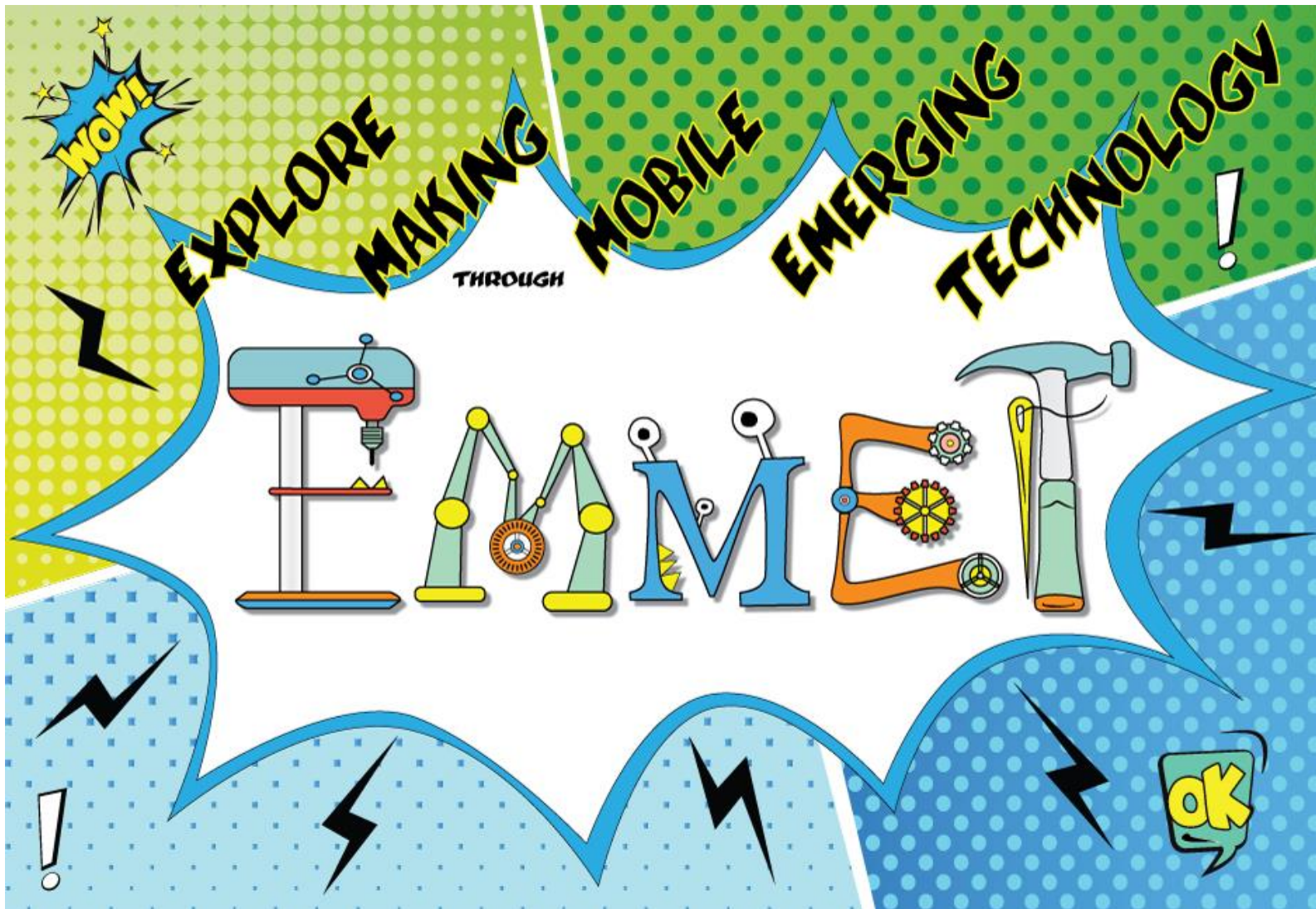




# Partners

- National Science Foundation
  - Funding
- UW – Madison
  - Research and Evaluation
- Children's Museum of Pittsburgh
  - Mentoring and facilitation



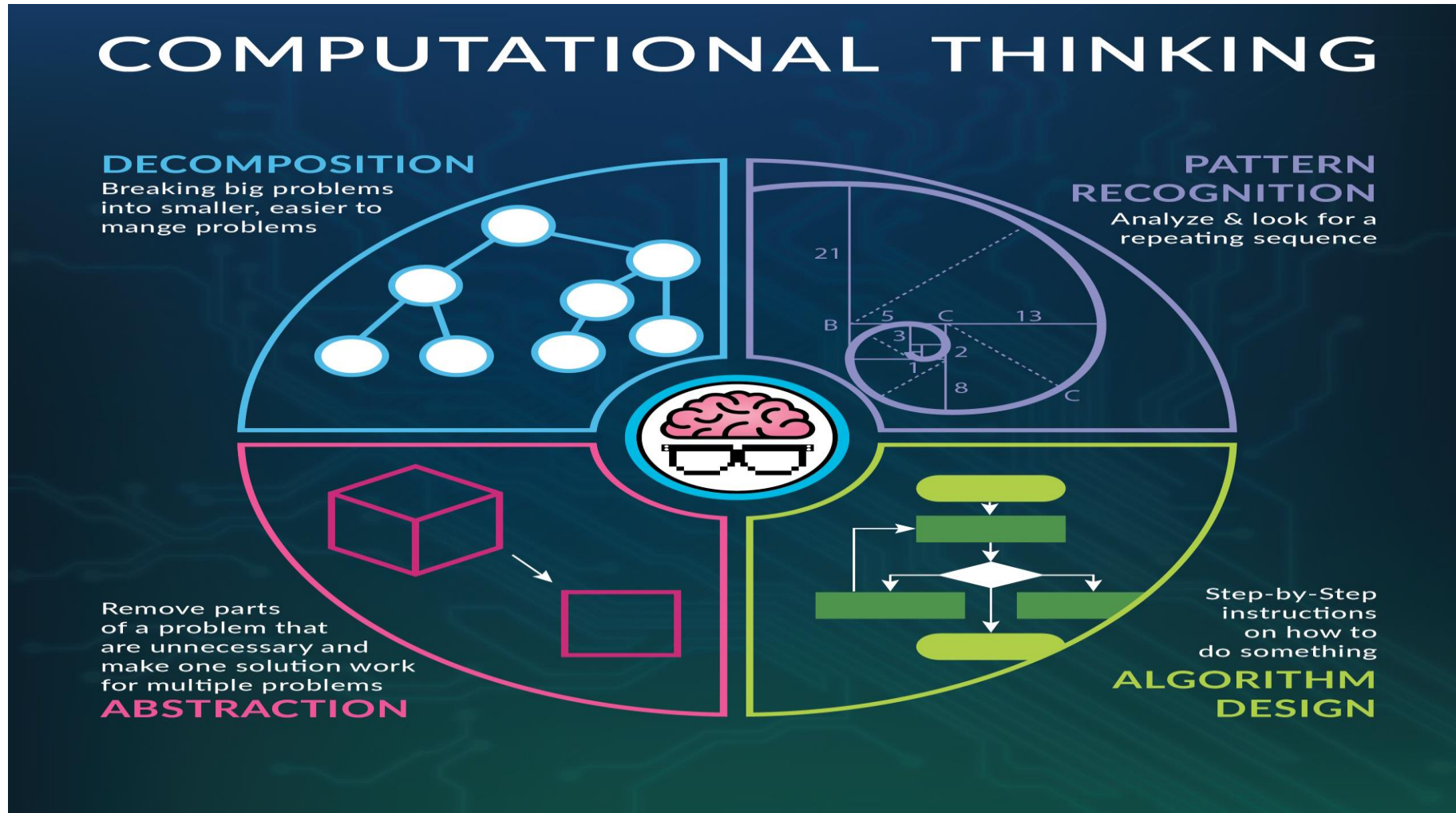


- <https://stemforall2019.videohall.com/presentations/1581>





# Computational Thinking





# Computational Thinking Example

- What is the sum if you add all of the numbers from 1 to 200 together?
- You can work with a person next to you if you wish
- You have 1 minute/ Good luck!
- Ready Go!!!
- Anyone have the answer?
- How did you approach it?
- Decompose and Pattern recognition
- ( $1+200=201$ ,  $2+199=201$ ,  $3+198=201$ .....)
- 100 pairs of numbers x 201 for each pattern = 20,100





# Curriculum Design

## Purpose – Structured Informal STEM+C Skill Building Maker Activity

- 1) To introduce basic programming concepts utilizing an Ozobot Evo robot with color line sensing logic to an autonomous driving vehicle.
- 2) To introduce the basic concepts of Computational Thinking.
  - Decomposition: Breaking a task into to smaller parts
  - Pattern recognition: Looking for things that are the same
  - Abstraction: Finding what is important and what is not important
  - Algorithmic Design: Creating a step- by- step instructions





# Curriculum Delivery

## Exposure

- 15 seconds to 15 minutes
- Demonstration of technology or hands on
- Offered in a drop in format

## Skill Building

- 30 to 90 minute sessions
- Participants gain a skill
- Prior registration required

## Making

- Half day to multiple days
- Bring together skills learned





# Curriculum Delivery

## Exposure





# Curriculum Delivery

## Skill Building





# Curriculum Delivery Making





# High School Mentors Facilitating

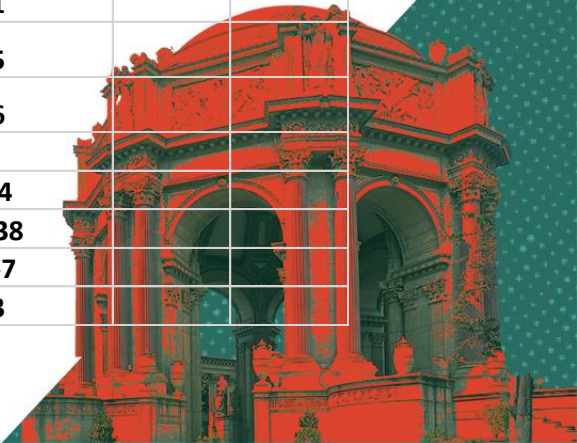
## Challenges

- Recruitment
  - Motivation

## Successes



	College Preparadness / Resume	Expand Knowledge	Pay	Trip Opportunities	Fun / Social Contact	Access to NTC Equipment	NTC Certificate	Student Controlled Equipment		
Student A	5	8	2	3	6	7	1	4		
Student B	8	4	5	7	6	3	1	2		
Student C	7	6	4	5	8	2	1	3		
Student D	7	8	6	2	3	5	1	4		
Student E	8	6	2	5	4	3	7	1		
Student F	6	2	7	8	3	1	5	4		
Student G	8	6	7	3	4	2	5	1		
Student H	8	5	2	4	1	6	7	3		
Student I	2	8	6	3	4	1	5	7		
Student J	1	6	7	8	2	4	5	3		
Student K	4	3	8	7	5	6	2	1		
Student L	7	8	2	6	3	4	1	5		
Student M	8	1	7	4	5	2	3	6		
Total	79	71	65	65	54	46	44	44		
Average	6.08	5.46	5.00	5.00	4.15	3.54	3.38	3.38		
Range	1-8	1-8	2-8	2-8	1-8	1-7	1-7	1-7		
Median	7	6	6	5	4	3	3	3		





# High School Mentors Facilitating

## Challenges

- Recruitment
  - Motivation
- Schedule for Training
- Variety of Student Interests
- Schedule for Events



## Successes

- 13 Dedicated Maker Mentors
- Female Representation
- Leadership Growth
- Technology Skill Growth
- STEM Facilitator Certificate



# CBO Partnerships

## Challenges

- Having staff to participate
- Random participants
- Staffing changes
- Knowing their staffing situations upfront

## Improvement Strategies

- Having a dedicated facilitator for a CBO
- Getting buy-in by accommodating their needs





# EMMET

## Successes

- Sustainability plan
- Full calendar of events
  - 100's of events, 1,000's of participants reached
- Dissemination
  - STEM Facilitation Certificate
  - STEM Leadership Committee





# Research and Outcomes

1. How are rural communities impacted by mobile making experiences that involve community mentors as instructors?
2. What do maker mentors learn as a result of their participation in facilitating mobile making experiences?
3. What aspects of the community-involved maker experiences sustain beyond institutional intervention?



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## Questions



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