Accelerating Student Engagement through Computer Science and Data Science

Supporting Educational Partnerships

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AGENDA

TI TALKS

11:45 – 12:00 CST Participant Login

12:00 – 12:05 CST Introduction

12:05 – 1:10 CST Featured Speakers

1:10 – 1:15 CST Q&A

1:15 – 1:25 CST TI Representative

1:25 – 1:30 CST Q&A/Closing

Santa Clara County Office of Education

Accelerating Student Engagement through Computer Science and Data Science

Presented by the Santa Clara County Office of Education, San Jose, CA

Introduction

Ma Bernadette Andres-Salgarino, Ed.D.
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Karen Larson
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Objectives

(1)Explore and develop a mindset of a designer through its integration with computational thinking with mathematical literacy;

(2)Design an interdisciplinary program of implementation for Data Science and Computer Science; and

(3)Increase student engagement using project-based learning experiences that combine content with hands-on learning and real life applications.

Design Thinking and Computational Thinking

Let's start with a story...

10 boxes you have to move from A to B

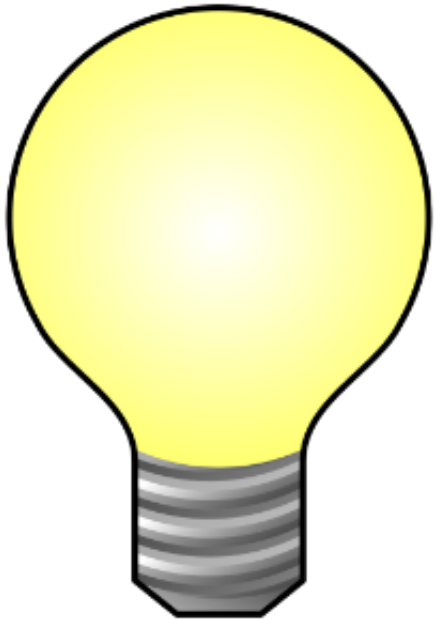
Computational Thinker

A set of instructions would be drafted, tested, and the most efficient route would be attained.

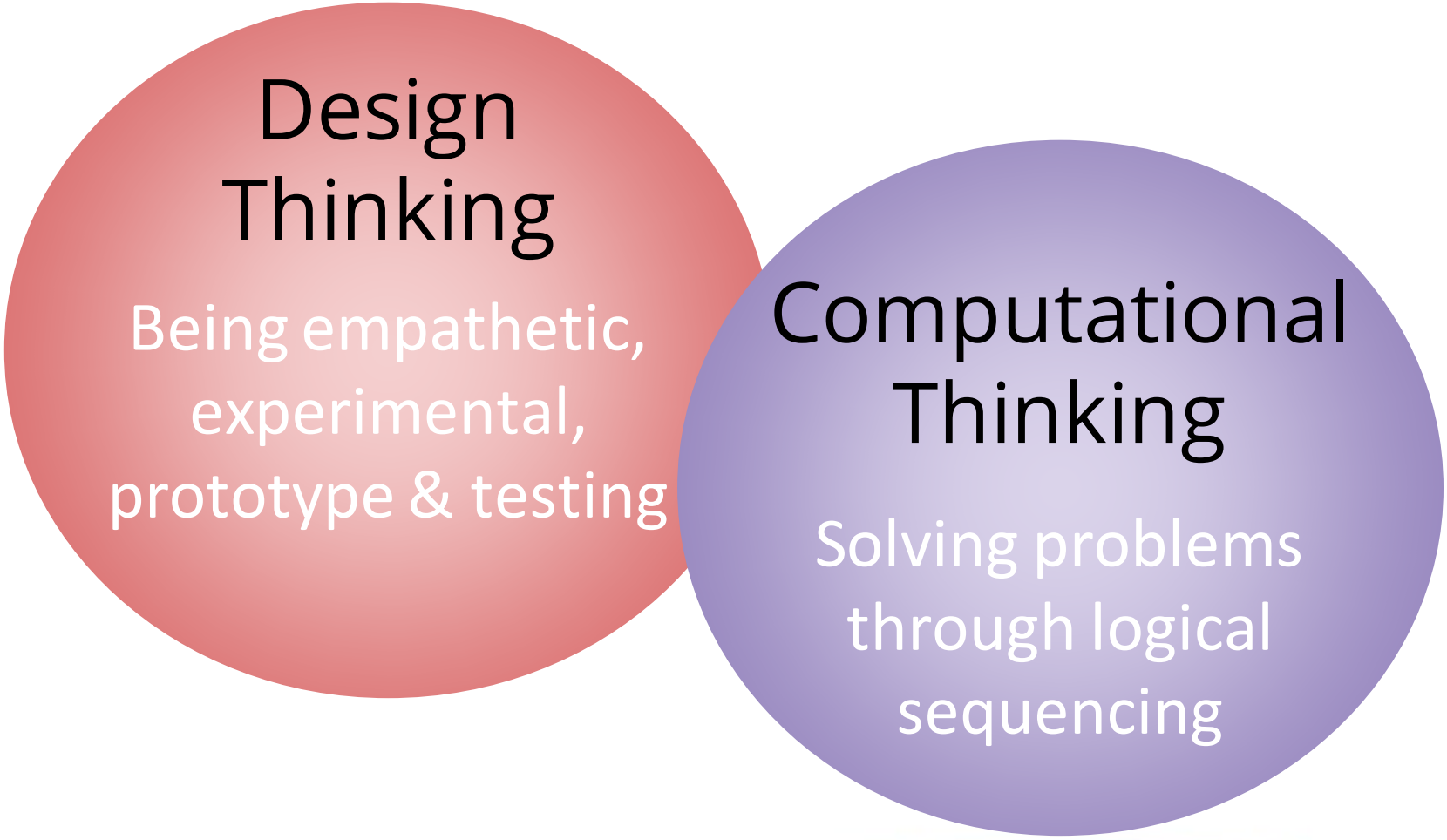
Questions:

- What are the sizes of the boxes?
- How heavy are they?
- Is anything fragile?

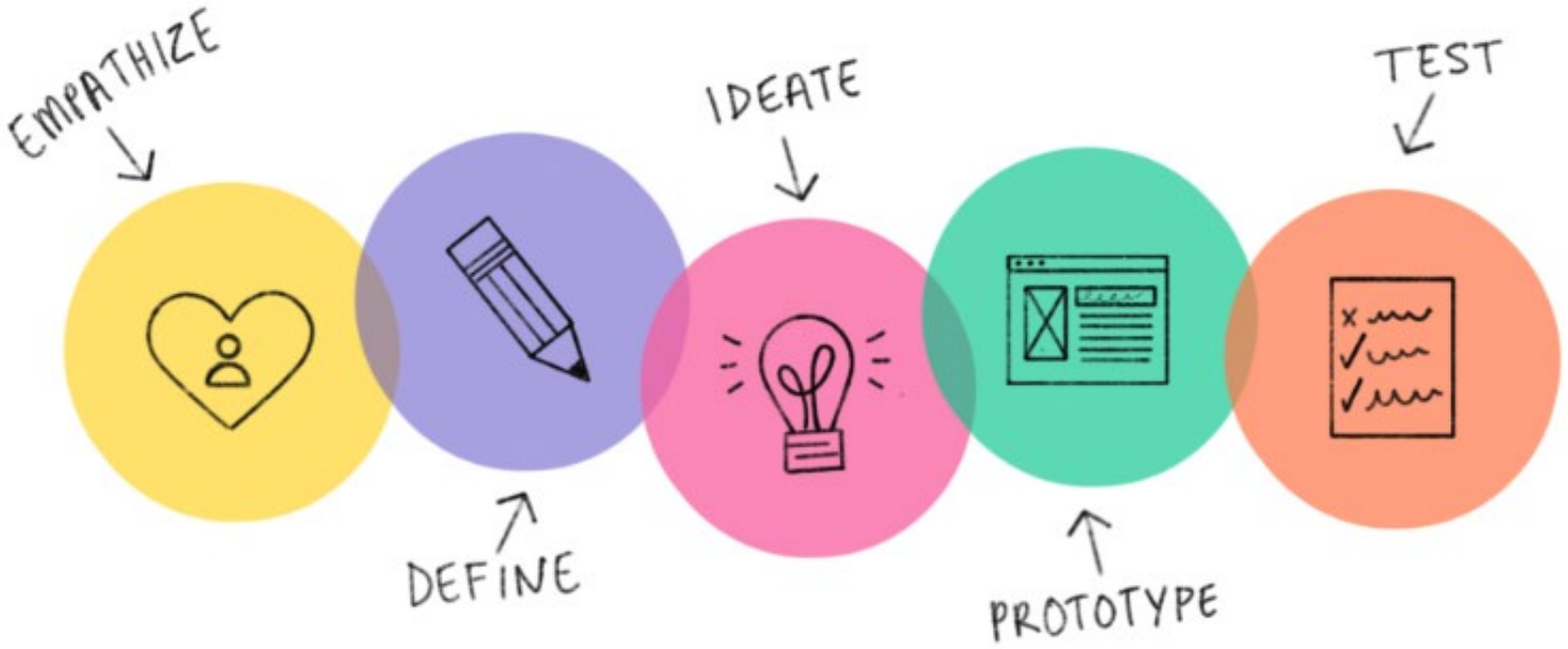
Design Thinker

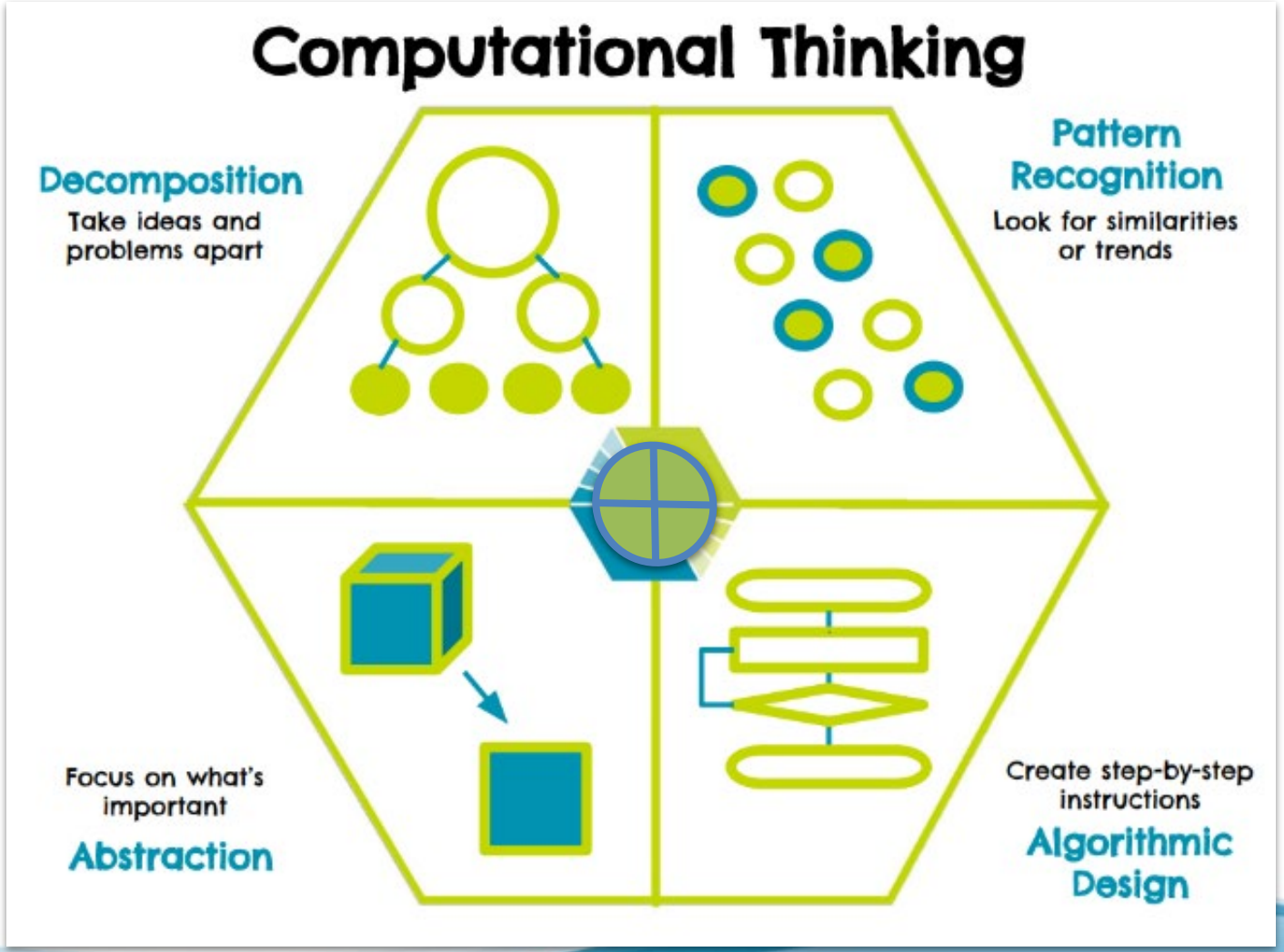


Why do you want to move the box in the first place?


Design Thinking
Being empathetic, experimental, prototype & testing
Computational Thinking
Solving problems through logical sequencing

Design Thinking

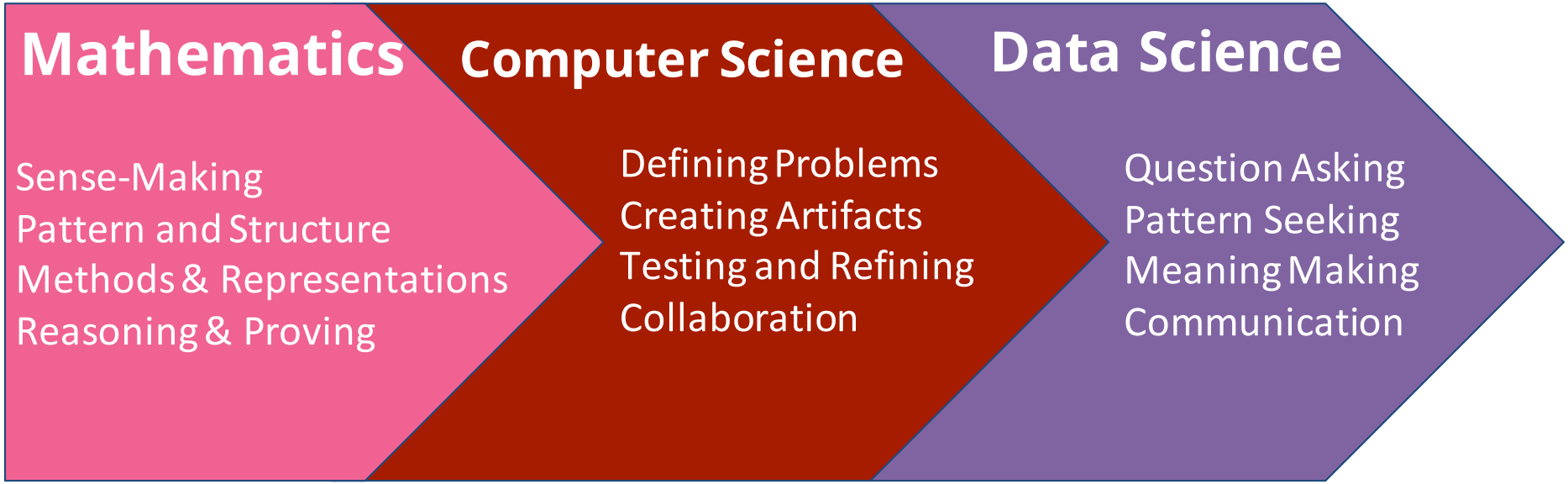



Computational Thinking
Decomposition
Take ideas and problems apart
Pattern Recognition
Look for similarities or trends
Focus on what's important
Abstraction
Create step-by-step instructions
Algorithmic Design

Design thinking shapes computational thinking and it is design thinking that needs to be given the highest priority in our education system.

A Solution

Intersections in Practices



Design Dash

Student Engagement

- Externalizing ideas - words, drawings, sketches, and prototypes
- Fast decisions = surprise, creativity, fun, and a lot of output
- Discovering and framing a challenge around human needs
- Learning about their own ideas

Design Dash

a super-fast introduction to design thinking methods & mindsets

TEAM MEMBERS (3-4)

Karen

Bernadette

Sam

Isabel

WAIT HERE TO PICK A CARD

Plan A Road Trip!

Get to know your TEAM

Each team member shares 3 ways they connect to this topic.

Name & Sketch

_____

_____

_____

Name & Sketch

_____

_____

_____

Name & Sketch

_____

_____

_____

Name & Sketch

_____

_____

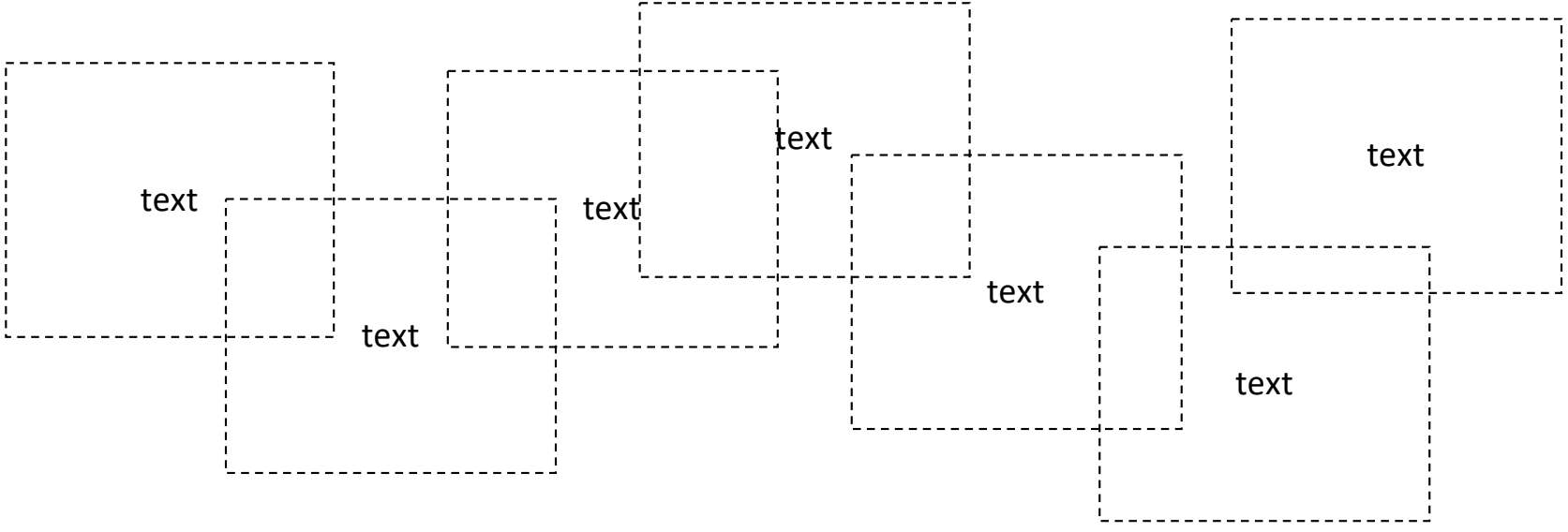
_____

OBSERVE a New Perspective

Invite an interviewee from another group to a conversation.

Get to know your topic through their eyes. Ask about the value and the challenges of involved in planning their road trip.

NOTES



Conversation Tips

- Listen 80% of the time; talk 20% of the time.
- Look for problems, pain points, and challenges.
- If you hear something interesting, ask "why?"

DEFINE your challenge

As a team, use your interview to frame a human-centered design problem.

WE TALKED TO

Draw a picture

WE'D NICKNAME THEM

e.g. Mr Clean, The Queen of DIY, The Calendar Wizard

THEY SAY THEY NEED TO

What do they think are the main problems and challenges?

HERE'S WHAT WE THINK IS THE UNDERLYING PROBLEM

What do you see that they don't see? What's the need behind their need?

youcubed K-12 Data Science

- The “why” behind data science
- K - 12 lessons
- High school data science course - draft
- Videos and resources

https://www.youcubed.org/resource/data-literacy/

Data Science

Data Science

- data gathering
- patterns
- sense-making
- communication

Data to Explore

- temperature and rainfall
- elevation
- length of rainy season
- distance of trip
- tourist season

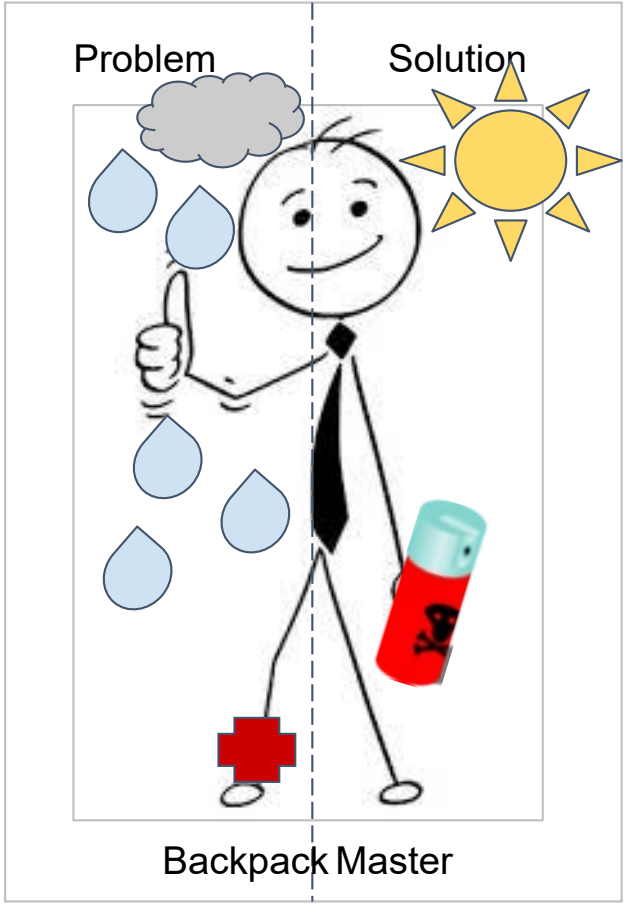
DRAW an idea

Use the chart paper to draw Backpack Master, then note the problems you heard and the solutions that could solve the problems.

Hints:

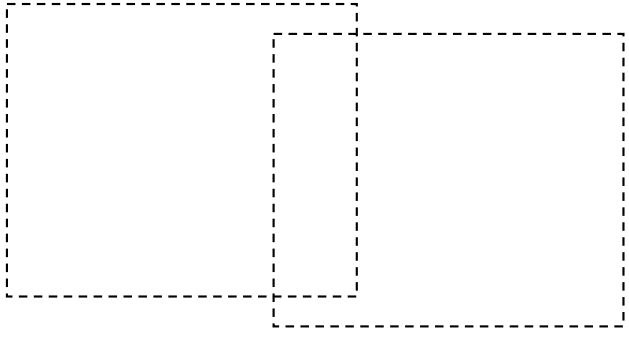
What do you see that they don't see?

What's the need behind their need?

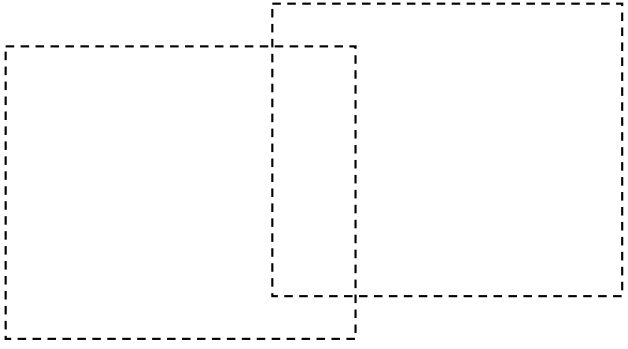


TEST your drawing

Hand your drawing to your interviewee. What do they think?

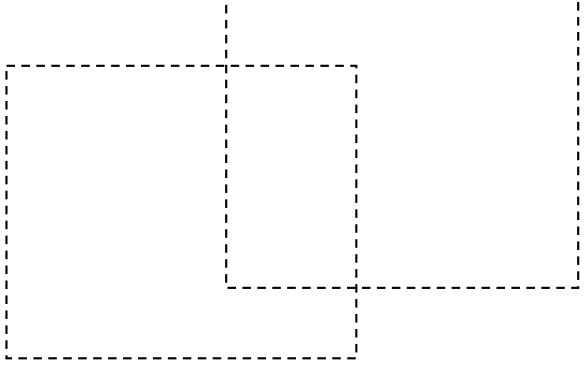


WHAT WORKS (AND WHY)

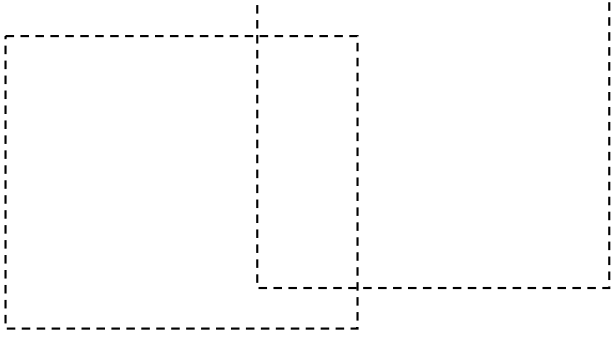


WHAT DOESN'T (AND WHY)

QUESTIONS WE HAVE



NEW IDEAS



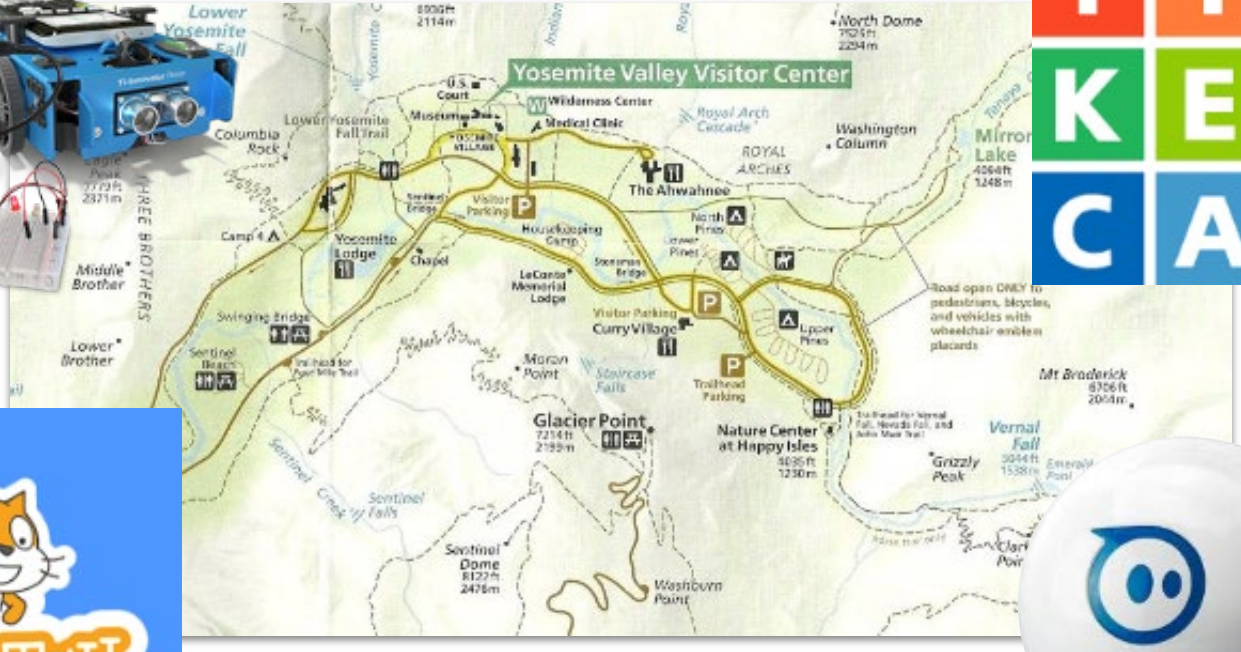
ITERATE your drawing

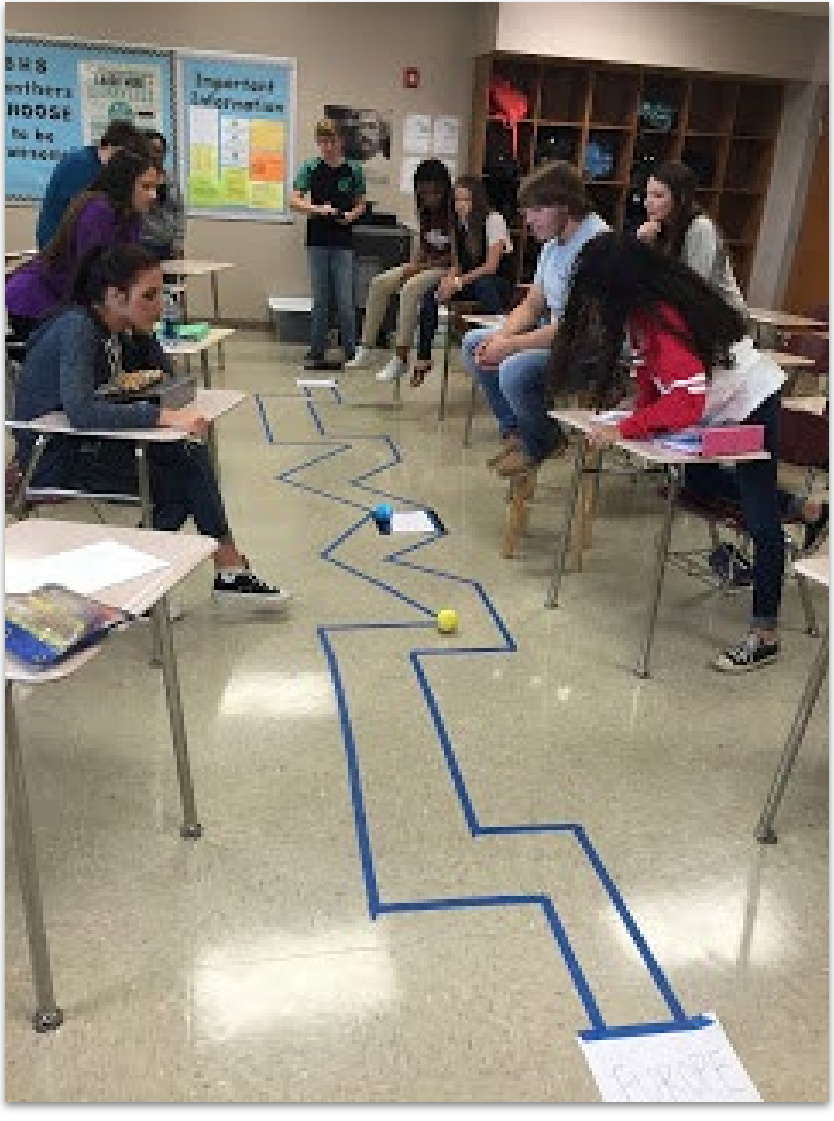
Finally, note on your drawing any improvements to your prototype based on the feedback you received.

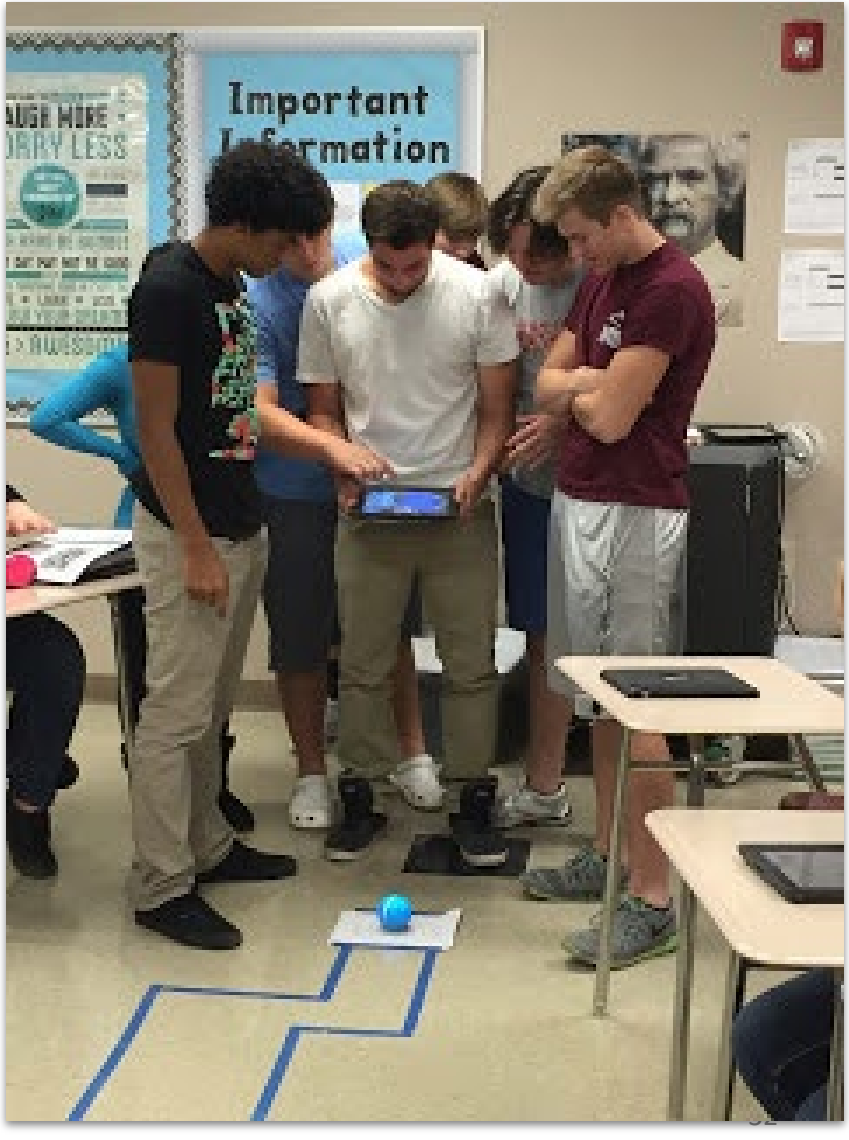
Be open to changing your assumptions about your interviewee and what they need.

Be prepared to share your drawing with the rest of the class and consider additional feedback.

Computer Science Integration



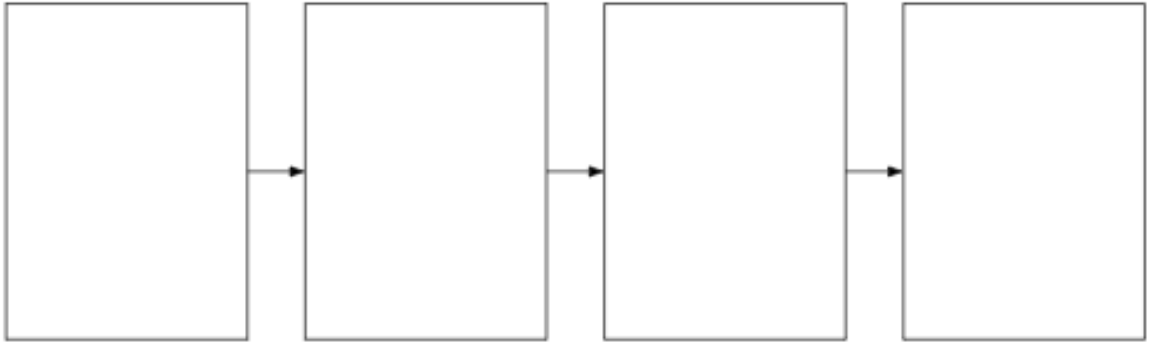



Important

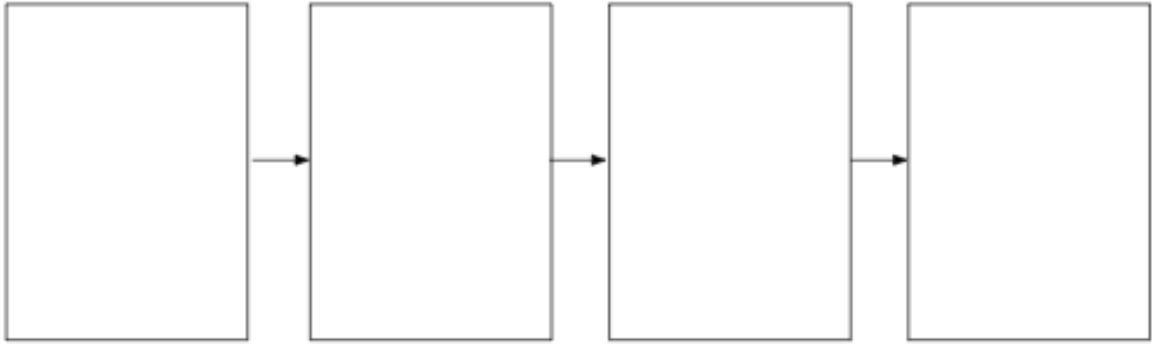
Character/Personality: _____

Character Actions:

*Put is sequential order

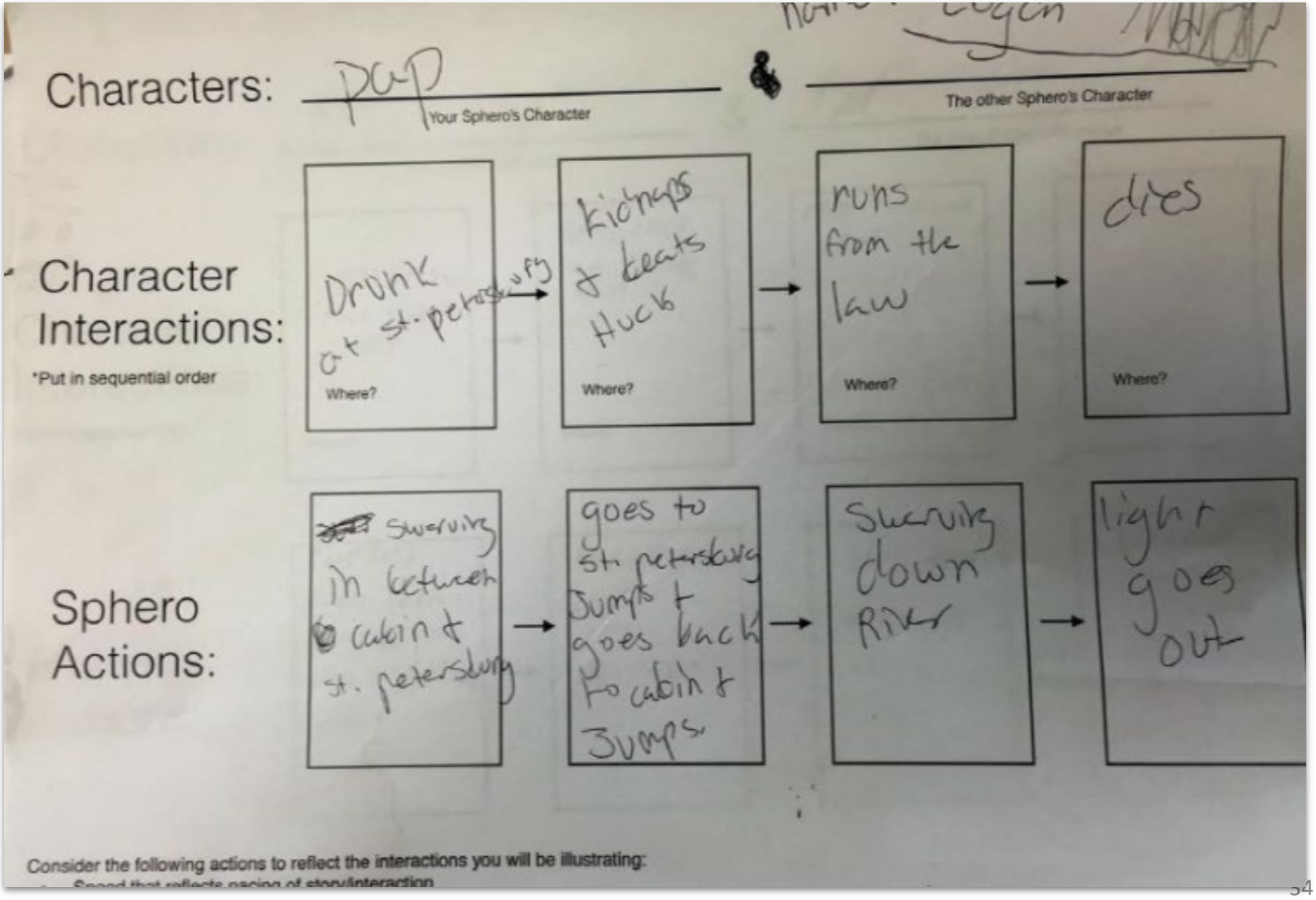


Sphero Actions:



Consider the following actions to reflect the interactions you will be illustrating:

- Changing colors to reflect mood
- Speed that reflects pacing of the story/interaction
- Interaction with other objects (including the other Sphero)
- Mimicking actions to suggest emotion (e.g., spinning, revolving, zigzagging, etc.)


Characters:
Pup
Your Sphero's Character
The other Sphero's Character
Character Interactions:
*Put in sequential order
Drunk at st. petersburg
Where?
kidnaps & beats Huck
Where?
runs from the law
Where?
dies
Where?
Sphero Actions:
surviving in between cabin & st. petersburg
goes to st petersburg jumps & goes back to cabin & jumps.
surviving down River
light goes out
Consider the following actions to reflect the interactions you will be illustrating:

Review and Reflect

Where might this fit in your school environment?

Jamboard - https://tinyurl.com/dashjam

#steamsccoe or #sccoetitalks

Connect with us!

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Q & A

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Meeting & Collaboration

TI TALKS

Learning Tools

Building Teacher Leaders

Professional Learning

Individualized Coaching

TI Educational Technology Consultant by State

Robyn Poulsen	ME, NH, VT, MA, CT, RI, NJ, MD, DE
Mr. Dana Morse	NY, PA
Jamila Gadsden	NC, SC, VA, Washington DC
Michelle Grooms	OH, IN, MI, KY, WV, WI
Beth Smith	FL, AL, GA, MS, LA, AR
Pareesa Schulte	TX ESCs 4, 10-13, 15, 18-20, AZ, NM
Marco Gonzalez	TX ESCs 1-3, 5-9, 14, 16, 17, OK
Brian Dunnicliffe	AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY
Ron Thomas	IL, MO, TN, MN, SD, ND, IA, NE, KS
Tom Steinke	Canada

Upcoming TI Events

TI Talks

May 6, 2021: 1 – 2:30 EST/Noon -1:30 CST
Engineering from Day One

Join us as our speakers from the Ira A. Fulton Schools of Engineering at Arizona State University share an initiative focused on creating paths to engineering for underrepresented populations: first-generation students, minorities, women and those with socio-economic needs.

https://education.ti.com/en/resources/funding-and-research/partners/ti-talks/may-event

Tuesday Webinars - https://education.ti.com/en/professional-development/teachers-and-teams/online-learning

Q & A
Closing

Thank you for joining us today!