CS-LISTEN

National Science Foundation

UC San Diego

Session 1

CSListen

Session 1: Refining Research Questions & Operational Definitions

ESCONDIDO UNION HIGH SCHOOL DISTRICT 1894

SWEETWATER UNION HIGH SCHOOL DISTRICT

SAN DIEGO UNIFIED SCHOOL DISTRICT

VISTA UNIFIED SCHOOL DISTRICT EXCELLENCE INNOVATION

CS-LISTEN Student Co-Researchers!

Students:

Anyone who hasn't done so, please sign in using this link or the QR Code to the right.

http://bit.ly/CSLstudentinfo

Share a device with someone if you don't have one.

CS-LISTEN

CReaTe EDS Education Studies

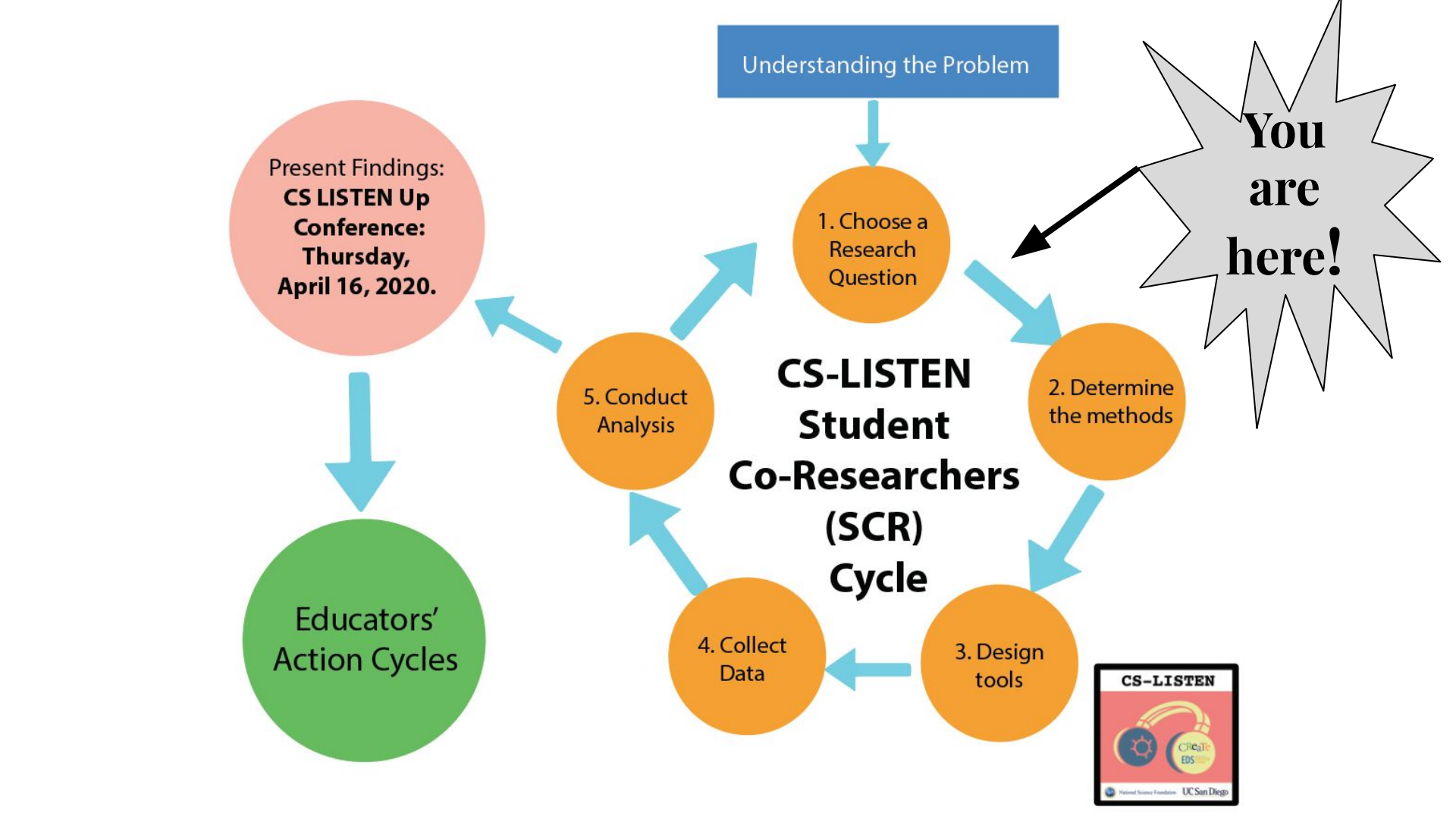
National Science Foundation UC San Diego

UC San Diego's Consent forms/Assent forms

To participate in the research part of this study, we need to gather **two forms** from you:

1. **Parent Consent form** -- Signed by NEXT week (you can turn it into your teacher anytime before next week if you'd like)
2. **Student Assent form** -- You can sign now and turn it into Beth, Susan, Kirk or Minh this week.

If you don't get the forms signed, you CAN still participate in the project. But we can't learn from you, so we would LOVE it if you provide the forms back to us.


Understanding the Problem
You are here!
Present Findings: CS LISTEN Up Conference: Thursday, April 16, 2020.
1. Choose a Research Question
2. Determine the methods
3. Design tools
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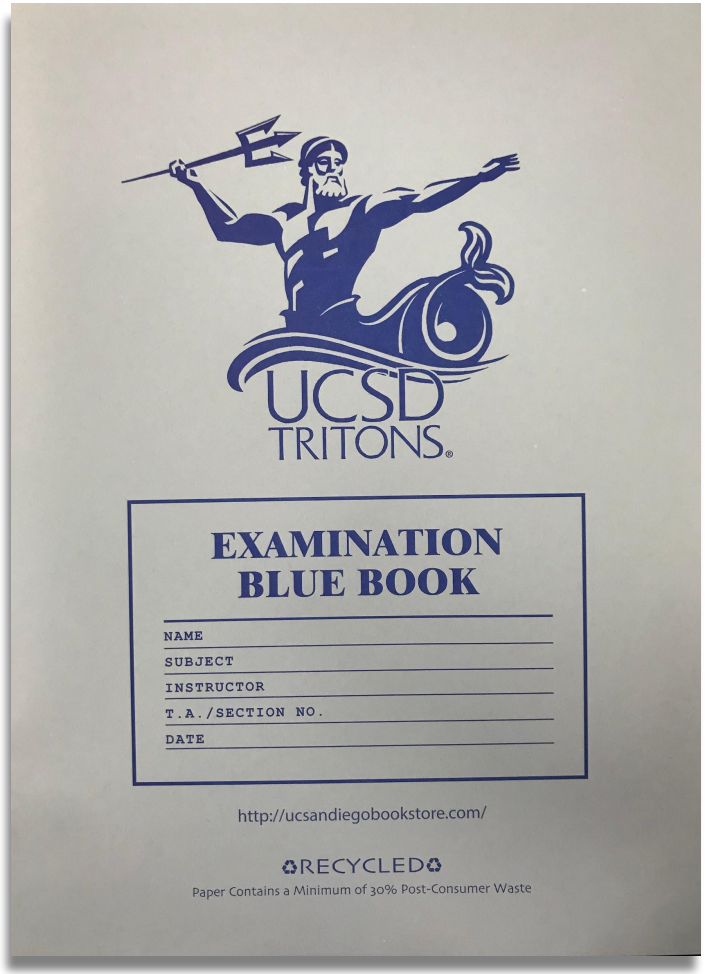
REMEMBER to:
Record notes in your blue book -- write your name and school's name on your blue book



Escondido Schools 2019-2020: CS LISTEN SCR Teams' Research Questions

San Pasqual RQ: 1. How does the spread of accurate information about CS lead to a more diverse class? 2. How does misinformation lead to a less diverse CS class? 3. How can we effectively spread accurate information about CS to all staff and students to our school? 4. How can we petition the district or administration to improve CS access in our school or district? 5. How do we decide to pick classes? 6. What information do you need to decide classes? 7. What do you think CS is?

Orange Glen RQ: Which factors heavily affect the number of students taking CS at Orange Glen?

Escondido RQ: What are the causes (reasons) for different diverse groups to take or not take on the idea of being in a computer science class?

Sweetwtaer and San Diego Unified 2019-2020: CS LISTEN SCR Teams' Research Questions

Sweetwater RQ: -- Why is CS not known or talked about?

Castle Park RQ: To what extent do stigmas revolving around computer science limit students' participation?

Hoover RQ: -- How will students' interest/opinion in CS differ if it was open to all and applied real world and interactive approaches to learning?

Morse RQ: 1. [Starred] How can we expose CS to underrepresented groups and lessen the stigmatisms (stigmas) around the topic?; 2) How can we make CS more appealing to underrepresented groups? What could our school do? How do we get involved?; 3) How can we make CS more appealing? What makes you think that CS is technical or not in your interest? How can we get underrepresented individuals to have more confidence in taking CS?; 4) How do people learn about CS? And what can be done to improve its appeal?

Vista Unified 2019-2020: CS LISTEN SCR Teams' Research Questions

Rancho Buena Vista RQ: Why aren't Hispanic girls taking computer science?

Revised Question: *What prevents RBV high school females [and those who identify as non-binary] who are Hispanic or of Spanish-speaking backgrounds, from being involved with the different variations of CS\ classes (e.g. AP CSP, AP CS A, Intro to Computer Science) and clubs (e.g. Code Queens) at RBVHS or outside of RBVHS.*

Mission Vista RQ: Of the women at MVHS who are interested in CS but aren't taking the class, why aren't they taking the class? How can we encourage those women to take the class?

How can your team refine your RQ to be more powerful/specific?

Reminder: OUR PROBLEM = Lack of Diversity in Tech/CS.

- Who/what population(s) is your question studying? Is your question about a specific population of students? Teachers? Counselors? Administrators? Parents? Others? On or off your campus?
- Underline key terms/variables in your RQ and Take a few minutes to DEFINE those terms/variables…

Ex: Why do Black/African American high school students take a fourth-year mathematics courses less frequently than other groups?

Ex: Black/African American = ALL students who have self-identified as Black or African American in a student survey, regardless of appearance or mixed-race status.

Every quantitative research question/hypothesis will include VARIABLES? What are they?

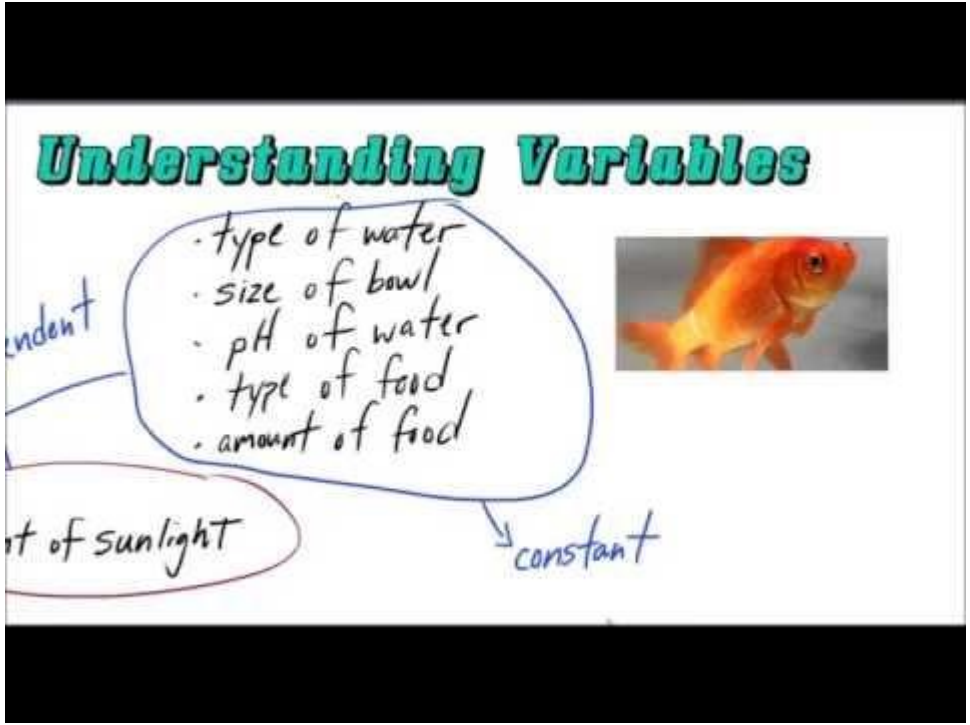
Variables are the things you think matter/have influence on the problem or outcome.

In a **quantitative study** (one where you are actively trying to measure something with numbers or experiment with), variables are also the things you would want to:

- hold constant/control,
- vary on purpose, and/or
- measure/try to change.

If you are doing a quantitative study -- Variables might come with labels like:

- Independent (things you are trying to change on purpose),
- Dependent (things you are measuring as outcomes),
- Constants (things you are trying to “control”)



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Social Science Examples of quantitative studies:

Independent Variable(s)	**Dependent Variable(s)**	**(Possible) Controlled Variables/Constants**
Stress	Mental State of Human Beings	
Work Promotion	Employee Motivation	Job Title
Good night sleep	Test score	
Education, Income, Age, Weight	# of cigarettes smoked per day	Gender
Grade Level	Cafeteria Food Rating	Lunch Period

Revisit your research question. What are the variables for your question?

Remember: Variables are the things you think matter/have influence on the problem or outcome.

Variables are also the things you want to:

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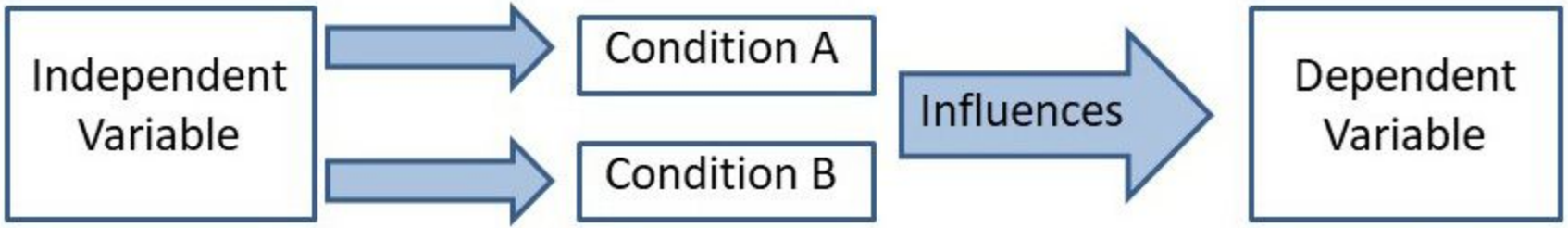


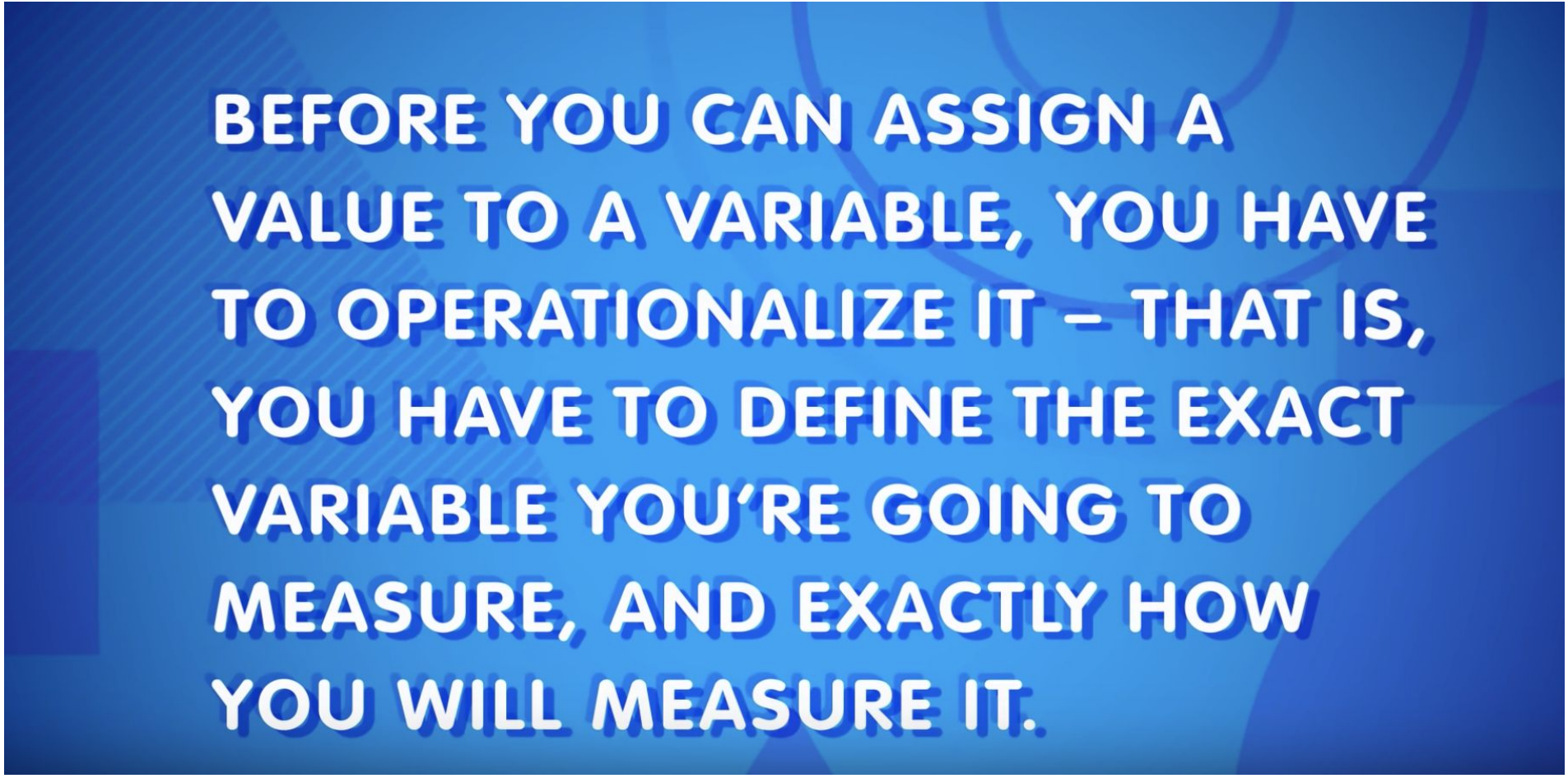
Social Scientists also try to make sense of the naturalistic world around them, and the people in it:

Qualitative research methods help ask and answer questions about HOW, WHY and in what ways something occurs or doesn't occur.

-- In these types of studies, researchers do not always have variables controlled or manipulated.

-- **But they DO still try to define what they mean by the variables or concepts being studied in their research question(s).**

Operational Definition: What is it? Why should we care?



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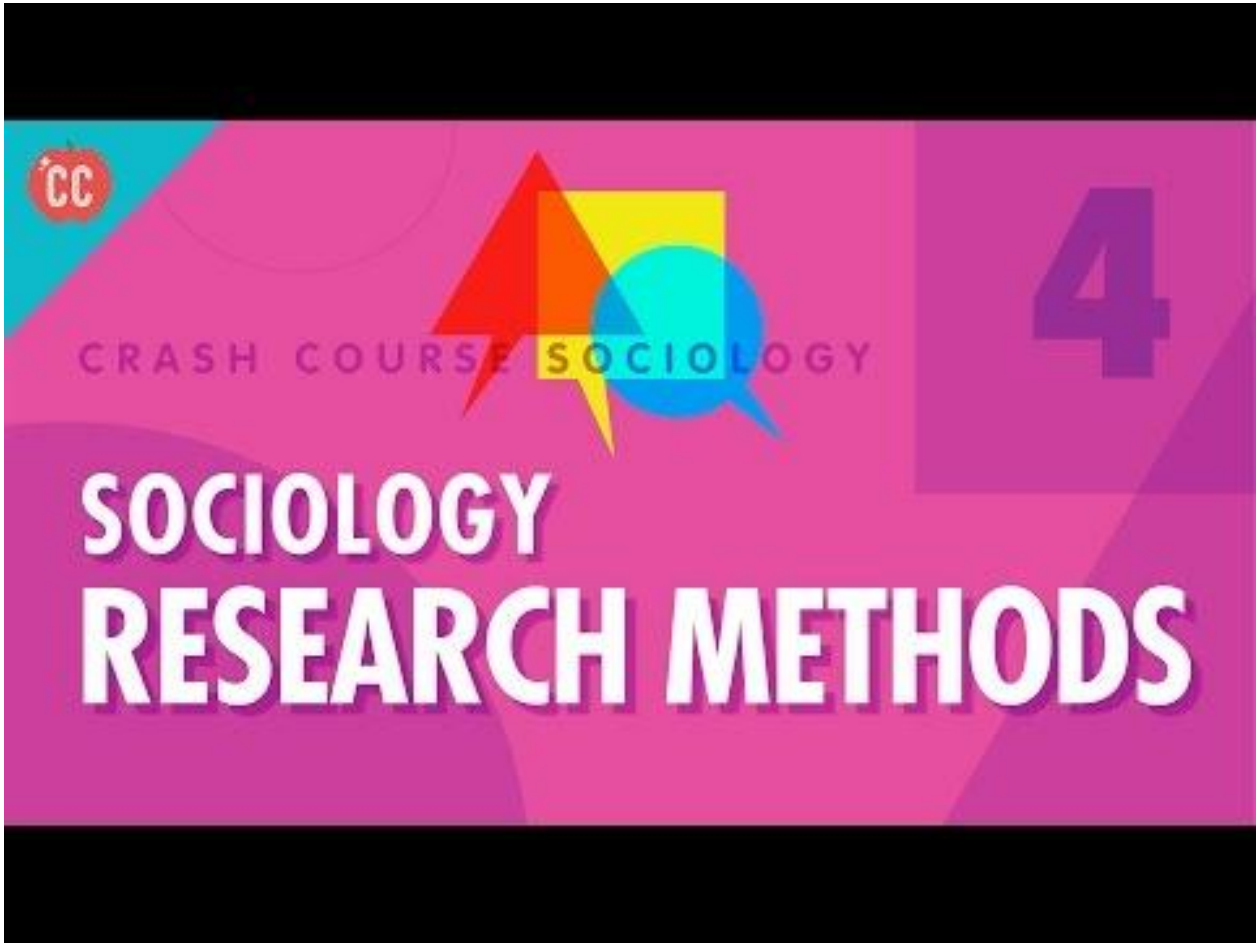


RESEARCH METHOD

A SYSTEMATIC PLAN FOR
GATHERING AND ANALYZING OBSERVATIONS
ABOUT THE WORLD.

Research

1. Starts with a Question

What are your team’concepts?

Do we all have the same definitions?

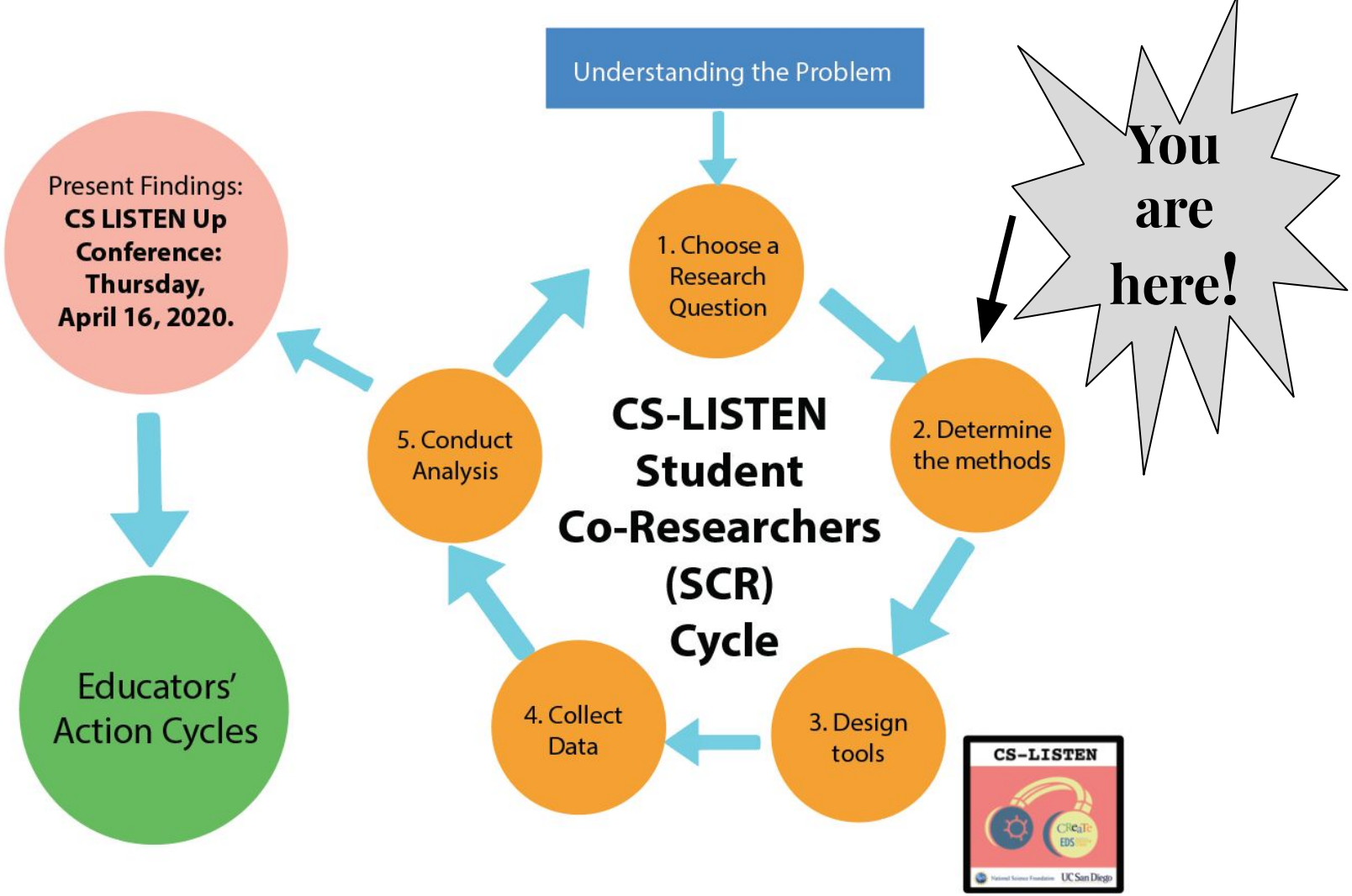
Now that you have a more refined question, ask yourselves?

- ❑ Is your question clear and concise?
- ❑ Can it be easily understood by outsiders (not too wordy)?
- ❑ Is it manageable to answer in a couple of months (completed by the beginning of April)?

Three steps

to writing a

good research question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You are ready to move on... to BACKGROUND KNOWLEDGE!

Determine:

1.) What do you (as a group) already KNOW about this topic/question?
2.) What do you NEED to know?
3.) What kinds of data/information could help in gaining a better understanding of the question your group is investigating?

Write your answers in your blue book.

You are ready to move on... to Methods!

Methods: Quantitative vs. Qualitative...

Write down what you already know about quantitative or qualitative methods, if anything?

Quant Vs Qual

Qualitative is KEY to explaining Quantitative Results

Research Question:
What percentage of Computer Science majors at UCSD are from underrepresented groups?

Analysis:
23% women
3% Black/African American
4% Latino/a/x

Qualitative is KEY to explaining Quantitative Results

Research Question:
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This helps me how??

HYPOTHESIS

A STATEMENT OF A
POSSIBLE RELATIONSHIP
BETWEEN TWO VARIABLES.

IN ORDER FOR YOUR MEASUREMENT TO BE VALID, IT HAS TO ACTUALLY MEASURE SOMETHING THAT DIRECTLY REFLECTS THE CONCEPT THAT YOU'RE TRYING TO STUDY.

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Session 2

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Session 2: Continue Refining Research Questions & Operational Definitions

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