# Engaging Diverse Youth in STEM Programming

Ruby Mendenhall Sociology & African American Studies Assistant Dean, Carle Illinois College of Medicine

April 2, 2021

Integrating Human-Centered

# Thank You More Than Words Can Say

nassi inilori

Program Co-ordinators Social Workers Longh Throat Antidata Human Services Counsellors Carporter Probation Officers Pharmacy Technicians Correctional Propriation Couriers Water Workers Power Engineers viaintenance Wo Emergency Medical Dispatchers Custodia **Correctional Programmers** Corrections Officers industrial Mechanici -erry uperato Security Officers Recreation and Culture Program Officers icensed Practical Nurses Clerical and Administrative Workers Human Resource Development Officers Maintenance & Tracke-Carbonters

Source: IB Workers

### **1968 Sanitation Workers' Strike in Memphis**

Dr. King said "our society will come to respect the sanitation worker if it is to survive, for the person who picks up our garbage, in the final analysis, is as significant as the physician, for if he doesn't do his job, diseases are rampant. All labor has dignity."

#### Source: Gene B. Sperling. April 24, 2020

"Martin Luther King Jr. Predicted This Moment: The coronavirus shows us clearer than ever before that "all labor has dignity." *New York Times.* 

### Economic Dignity (higher pay)







## "Sacred Work" – Frederick Douglass to President Lincoln Third Reconstruction & Renaissance



Title: "New Opportunities: Artist: Danielle Hunter

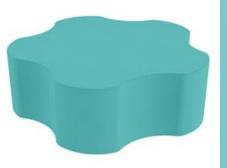


Facebook

## **Third Reconstruction – Renaissance – All Levels**



Apply Pressure, Maintains Shape



Create New Shapes System is Diffuse and Like a Squishy Ball – NSF Workshop

**Bronfenbrenner's Ecological Systems Theory** 

**Chronosystem** Changes Over Time

Macrosystem Social and Cultural Values

Exosystem Indirect Environment

> Mesosystem Connections

Microsystem Immediate Environment

CHILD

(C) The Psychology Notes Headquarters https://www.PsychologyNotesHQ.com

The "squishy ball" of system (Lois Weis, Margaret Eisenhart, Kristin Cipollone)

https://journals.sagepub.com/doi/abs/10.3102/0002831215604045

# Points

- Motivation
- DREAMing & Designing Spaces of Hope (Communiversity)
- STEM IL Communiversity Wellness Center & Think & Do Tank
- STEM IL Nobel Project
- CI MED Health Maker Lab: Designing Resiliency and Well-Being (DRAW)





# **Assistance Needed**

- Project Manager Role
- FarmBots assemble FarmBot, teach Python
- Satellites teach Python
- Community Health Workers Training, Toolkits, DREAM Accelerator (entrepreneurship and wealth creation)
- Research Team transcribing interviews, analyzing data, co-authoring papers, documentaries, etc.





Book by Bob Adelman (1972) called Down Home

GirlTrek – "Daughters of" Campaign I am the daughter of ...

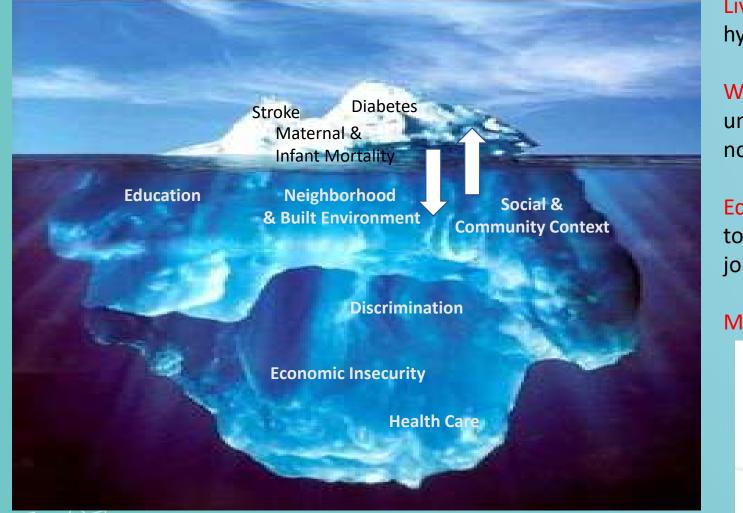
### I am the descendant of enslaved humans...

Great, Great Great Grandmother	Polly Marshall (enslaved)	Unknown	
Great, Great Grandmother	Francis Marshall Jackson (enslaved)	?Emily Buck "They didn't talk about anything like that (slavery)." Mom	
Great Grandmother	Rosa Jackson Isom	Dora Jamison (Black & American Indian)	
Grandmother	Mary Francis Isom Mendenhall	Marie Jamison Prince	
Great Aunt	Rosanelle Isom		
Mother	Ruby Mendenhall		

MGGGM (human enslaved) Story: saw a mother sold away from nursing baby, slept by the fire Sundown Town, Jim Crow Water Fountain Dismantle Interlocking Systems of Oppression!

## Training: Structural Competence and Social Determinants of Health

Documentary - Unnatural Causes: Is inequality Making Us

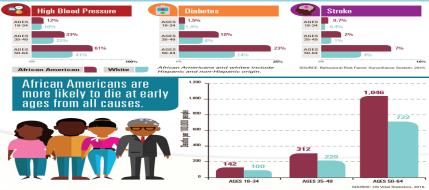


Living Conditions: residential segregation, hyper surveillance, affordable housing, etc.

Working Conditions: unemployment and underemployment (skills mismatch, low pay, not enough hours, etc.)

Education: inadequate education, lack of access to higher education or training for living-wage jobs

### Mental Health: drug and alcohol addiction, etc.



Culture of Health: funding for prevention/wellness strategies, mental health workers, economic development, housing, etc.

**I** ILLINOIS

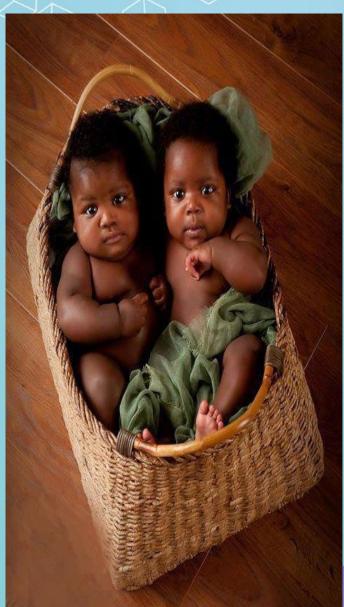
Carle Illinois College of Medicine

Carle

# Infant Mortality and African Americans

- African Americans have 2.3 times the infant mortality rate as non-Hispanic whites.
- African American infants are 3.8 times as likely to die from complications related to low birthweight as compared to non-Hispanic white infants.
- African Americans had over twice the sudden infant death syndrome mortality rate as non-Hispanic whites, in 2017.
- In 2017, African American mothers were 2.3 times more likely than non-Hispanic white mothers to receive late or no prenatal care.

.S. Dept of Health and Human Services, Dep of Minority Health

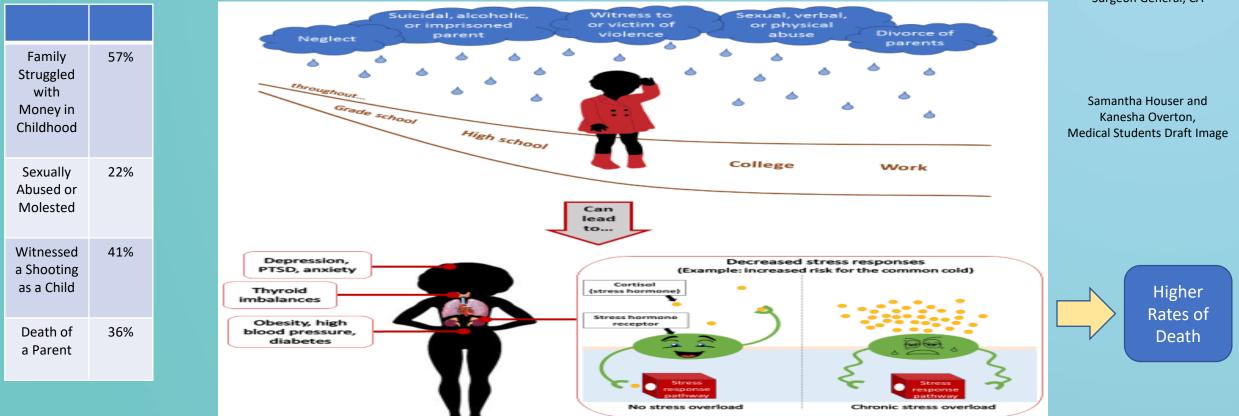


## ACEs Training: (Racial) Trauma Over the Life Course

## CHILDREN CAN THRIVE

Nadine Burke Surgeon General, CA

#### Chicago Research, ~100 Black Mothers



### Communicate to patients

### 

Carle Illinois College of Medicine



- "We are living in war zones."
- Stephon Clark's Aunt
- https://m.facebook.com/story.php?story\_fbid=2500156170004398&id=155869377766434&\_rdr

# What's Left Behind?



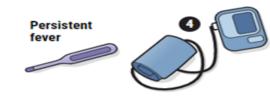
Charisma Pryor https://www.youtube.com/watch?v=vRTCliY4yTg

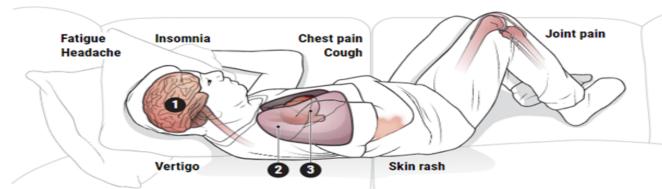
# **COVID-19 PANDEMIC**

US: 234,223 Deaths and 9.5 Million Cases (possible lingering effects) Source: NYT, 11.5.20

### **Pain that lingers**

A subset of COVID-19 patients experiences ongoing symptoms and complications such as organ damage, and researchers are proposing reasons for some of them (bottom). Scientists are trying to identify such symptoms, how common they are, how long they last, who's at risk, and how to treat and prevent them.





#### 1 Brain fog

Difficulty thinking can occur after acute COVID-19 infection. The virus may damage brain cells, and inflammation in the brain or body may also cause neurologic complications. Other viral infections can also lead to brain fog.

#### 2 Shortness of breath

Doctors are eyeing lung and heart complications including scarring. Patients who become critically ill with COVID-19 seem more likely to have lingering shortness of breath, but those with mild cases are also at risk.

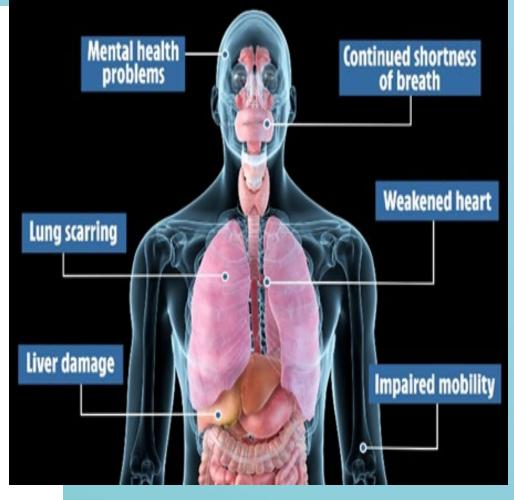
#### 3 Heart arrhythmia

The virus can harm the heart, and doctors are concerned about long-term damage. How the heart heals after COVID-19 could help determine whether a patient develops an irregular heartbeat.

#### 4 Hypertension

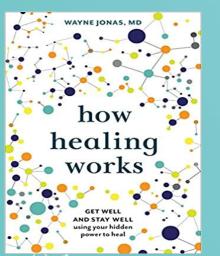
Some patients have high blood pressure after an acute infection, even when cases were relatively mild and people were previously healthy, possibly because the virus targets blood vessels and heart cells.

V. ALTOUNIAN/SCIENCE



# Training – Everyone as an Expert

- "Its just not only stress for adults it's a lot on the kids. Kids ask you a lot of questions... Like my son friend got shot in the eye at the gas station on his way to school and died."
- Black female college professors



Cultural Sensitivity: rituals, practices, resiliency, interior, etc.

-Normal Stress Levels Chronic Stress Overload Acute stressors 1 Time -Strong response Poor response to to acute stressors acute stressors Low baseline High baseline stress levels stress levels With normal stress levels at baseline, the With chronic stress overload at baseline, body is able to handle acute stressors the body is less able to handle acute strassors due to duescarticaid resistance

The Body's Ability to Respond to Stress

Samantha Houser and Kanesha Overton, Medical Students Draft Image – Trauma Over the Life Course We Need a Social Movement that Democratizes Health Education!!

### NAACP – Health Committee

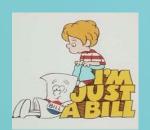
Black Panthers – Free Clinics, Campaigns (SSD), etc.

### Train Corps of Health Workers (100 million+)

- Health Workers (CNAs, doctors, etc.) Nobel Project
- Citizen/Community Scientists (COVID-19 Project)
- Community Health Workers (Morehouse College of Medicine
- Everybody else (grandmothers, farmers, etc.)
  - Psychological First Aid (CU)
  - Psychological Recovery (CU)
  - Verbal First Aid (Pager & Acosta)
  - Neuroscience (body, mind & soul)
  - Genomics and Epigenetics

### Mechanisms

- Community Centers & Clinics
- Online Education & Certificate
- Media (ex. School House Rock)
  - I'm Just A Bill: https://www.youtube.com/watch?v=FFroMQlKiag



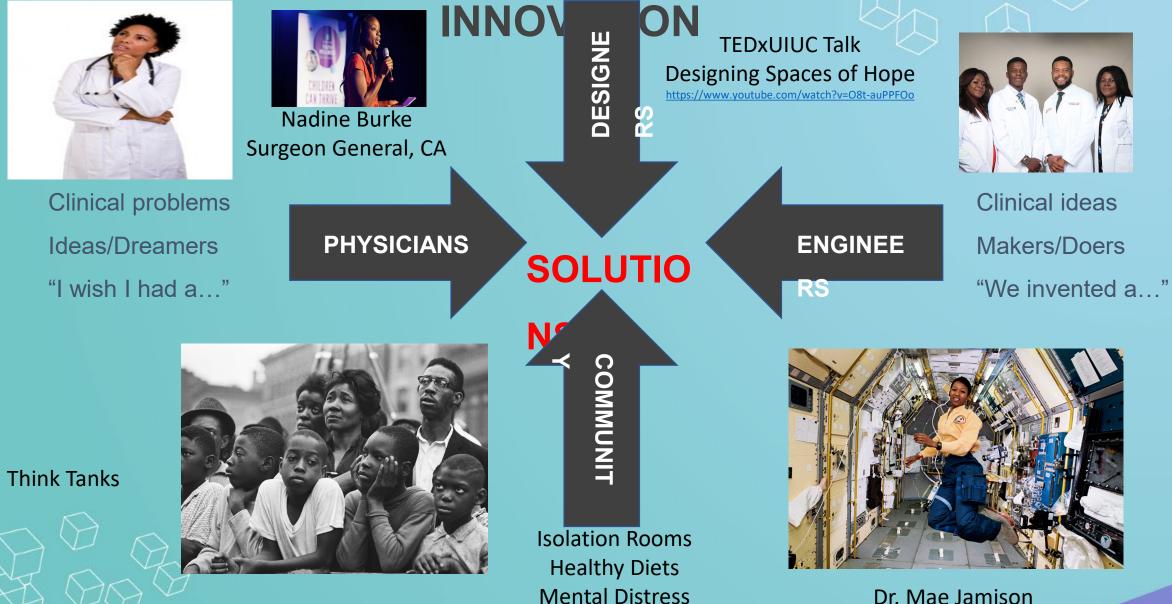
	JOIN THE TRAUMA & RESILI	ENCE INITIATI	VE FOR
	Psychological Fir Skills for Psychologic <b>TRAIN</b>		
	MON. OCT. 26TH 10:30 AM - 12:30 PM &	You will get a Certificate of Completion in PFA & SPR ! PFA & SPR are evidence-based practice designed to address community-level tro and mental health needs, and triage th who are most in need of care.	
LOOK LISTEN LINK	FRI. OCT. 30TH 1:00 PM-4:00 PM This training will re-enforce the skills needed to conduct PFA & SPR!		
	You can also complete the full online training at the link below!	You must attend both sessions. (CEUs are available for this training)	
https://www.eventbrite.	://learn.nctsn.org/course/index.php?categoryid Register for free at com/e/healing-solutions-virtual-fall-training-ticke ceives grant funding from the Champaign County Wental Health Board and the Champaign County Co	ets-122712074117	PLEASE CALL/TEXT FOR MORE INF (217) 673 7122 Or Email: Samyra@traumaresilienceinc

### Karen Simms, Trauma Resiliency Initiative

# Research Questions - QUESTs

- How does stress get "under your skin" to negatively affect your health?
- How do you prevent those deaths (resiliency and transcendence)?
- How does living in racially segregated neighborhoods with high levels of violence affect mental and physical health?
- How do you foster STEM identities and help kids see themselves as scientists, mathematicians, technology experts, and engineers?
- How do you build STEM confidence and fosters critical social and emotional skills?
- How do you help a students and parents achieve their DREAMs?
- How do you open new doors of opportunity by providing unprecedented access?

## **TRAINING: CONVERGENCE SCIENCE, COMPETENCE &**



Dr. Mae Jamison



## Community Healing and Resistance (C-HeARTS) Focus Groups – Gun Violence

**Digital Stories** 

#### **Treasure Boxes**

PRESENTED BY THE COMMUNITY HEALING & RESISTANCE THROUGH STORYTELLING (C-HEARTS) TEAM

### VOICES OF COMMUNITY HEALING DIALOGUE

Funded by the Illinois Program for Research in the Humanities (IPRH)

September 8, 2018 @ 6:00 PM Douglass Community Center Gymnasium

FREE ADMISSION

Come share a meal together while discussing stories of community healing among African Americans in the Urbana-Champaign area!

Engage with the C-HeARTS Team and discuss partnership opportunities!

CONTACT chearts.research@gmail.com or 217-300-7607



C-HeARTS Community Healing Vison Session Communiversity



## STEM IL Communiversity Wellness Center Lincoln Square Mall

Elder Chair, Antoinette Burton



FREEdom Library



## STEM IL Communiversity Think and Do Tank



Office Hours Mutual Knowledge Exchange





Webcasts





Multimedia Studio (School House Rock)

## Community & University Art Gallery Artists-in-Residence, 2019-2020





Xin Ran (Ruby) Wang, International Student, China

Kelli Stretesky Art for Hospitals+ "Thoughts"

Jenny Davis Anthropology, GWS & American Indian Studies "17 Year Cicada"







# Think and Do Tank Webcasts

DREAM Incubator Parents & Youth





Learn how to grow wealth in all areas of your life!

Please send questic for Dr. Jolly to Molly Galloway:

FEATURING DR. PAMELA JOLLY

**Intergenerational Wealth** 



Marianna Thadison Middle School DREAM: Own Bakery Scholars-in-Residence Pre-med Students Artists (Jenny & Kelli) Farmers (plan)



A ROAD MAP TO BECOMING A **DOCTOR** 

FEATURING

DRS. KAMENO BELL.

CHRISTOPHER HICKS.

AND GARTH WALKER

Join us to hear about their **dreams** as children, their

role models, their time as

student-athletes, and their

careers as medical doctors.

questions for our guests to

You can submit your

mgallow2@illinois.edu

Communiversity **Think and Do Tank** Webcast Saturday, November 14th 8:30-9:30am CST



**Dr. Kameno Bell** Emergency Medicine Physician Former Fighting Illini Running Back





Dr. Christopher Hicks Orthopedic Surgeon Former Fighting Illini Basketball Player

Dr. Garth Walker Emergency Medicine Physician

College of Medicine, MCB, CS, etc. Pathway Program

## The Nobel Project

A Free Computer Science Program Grades: 6th-12th

#### **Program Details**

- Program Starts: October 2020
- Meetings: Two hours a week for a year
- Compensation: Up to \$400 for attending weekly meetings online & creating a digital book
- No computer experience required
- How to Apply:
- https://surveys.illinois.edu/sec/1286772601
- For more information, please contact Molly Galloway at mgallow2@Illinois.edu or (872) 356-2049

Funded by the National Science Foundation



Carle Illinois COLLEGE OF MEDICINE

### What is Computer Science?

Wellness TrackingArtificial IntelligenceDronesCodingVideo GamingData VisualizationsEntrepreneurshipMathPhone App CreationMusic ProductionTelehealthVirtual Reality









#### CREATING A SUPPORTIVE CIRCLE

## TAKING GRIEF BY THE HAND

Time: 6 - 7:30 pm CST Dates: Tuesdays - Nov 17, Dec 1, Dec 8, & Dec 15, 2020





#### SHANDRA SUMMERVILLE & INVITED GUESTS

HOSTED BY RUBY MENDENHALL COMMUNIVERSITY WELLNESS CENTER

Register for this class at: https://us02web.zoom.us/meeting/register/tZUvc-CvqT0tGtGS4nZweSciiEPJ7EH1z3dv





### THE POWER OF ART TO HEAL, INFORM, AND TRANSFORM A Virtual Art Class with Kelli Stretesky



2- 3 pm on Saturday December 12, 2020

Zoom Link: https://illinois.zoom.us/webinar/register/ WN\_xyljfZ29R0Ses4QTVZmskQ

> stretesky.com artforhospitals.org

Stay tuned for information about an upcoming art competition

Carle Illinoi COLLEGE

Carle IIIINO





COMMUNIVERSITY THINK & DO TANK

### THE EXPLOSIVE NATURE OF MUSIC AS A MENTAL HEALTH TOOL





REGISTRATION LINK:

### SATURDAY - FEB 27TH - 3:00-4:30 PM

## The Art and Science of Black Farming



STEM IL Communiversity Think and Do Tank Please register at: <u>https://go.illinois.edu/TheArtandScienceofBlackFarming</u>





## **Nobel Laureates**



Dr. Robert Grubbs Nobel Prize in Chemistry in 2005 Development of the metathesis method in organic synthesis

Speaking to Students: April 10, 2021

STEM ILLINOIS

**Dr. Richard Roberts** Nobel Prize in Physiology or Medicine in 1993 Gene Splicing

Nobel Prize spiration

Speaking to Students: April 24, 2021

2

**DREAM Incubator** 

Bakery, sports, computer scientists, food banks, etc.



Digital Book: DREAMs



This Photo by Unknown Author is licensed under <u>CC BY-SA</u>

### Youth Wealth Incubator

- Inventor Toolkit
- Youth Intellectual Property Clinic





## Identities as Knowledge Producers





CyberGIS Center for Advanced Digital and Spatial Studies

### Make-A-Thon, 11.18.20 Community Mapping & COVID-19

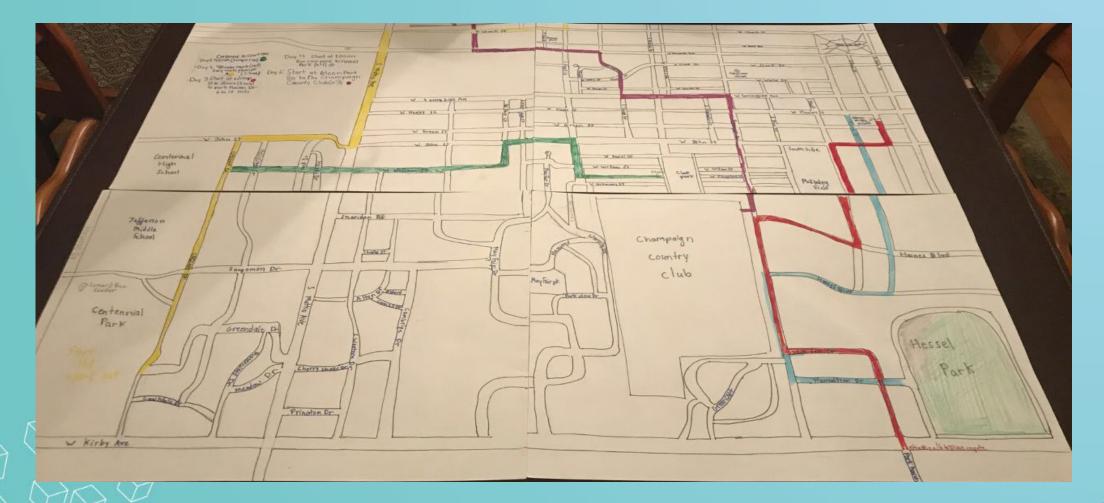
1<sup>st</sup> Place: \$300 2<sup>nd</sup> Place: \$200 3<sup>rd</sup> Place: \$100

Math Music Production Wealth & Entrep.





# Nicholas Wilson, Adam DeLong & Logan Walford Increase Testing Sites



## **FIRST PRIZE WINNER**

## Ruly Mendartal

**RUBY MENDENHALL** Co-Director of STEM IL



#### LISA GOODPASTER Associate of Project Management

Molly Galloway

MOLLY GALLOWAY Program Evalautor

### THIS IS PRESENTED TO

# Siri Polk

for exemplary performance in the Community Mapping Make-A-Thon Hosted by the STEM Illinois Nobel Project





Problem: Senior citizens and citizens unable to go into stores to buy masks.

**Solution:** Make wooden boxes with hooks on the inside and a sliding door. Each hook will have a few masks hung on it. We will then plant these all around the neighborhood so anyone that needs a mask can take one. **Impact:** This will help because then people without masks can get masks without having to go into stores and have the risk of getting COVID-19. My solution will help reduce stress of going outside, it would also help older people that don't want to go into stores. If one of the people that took a mask has COVID-19, that could lower the risk for others.



Samuel Tronconis



RUBY MENDENHALL Co-Director of STEM IL



LISA GOODPASTER Associate of Project Management

Molly Galloway

MOLLY GALLOWAY Program Evalautor

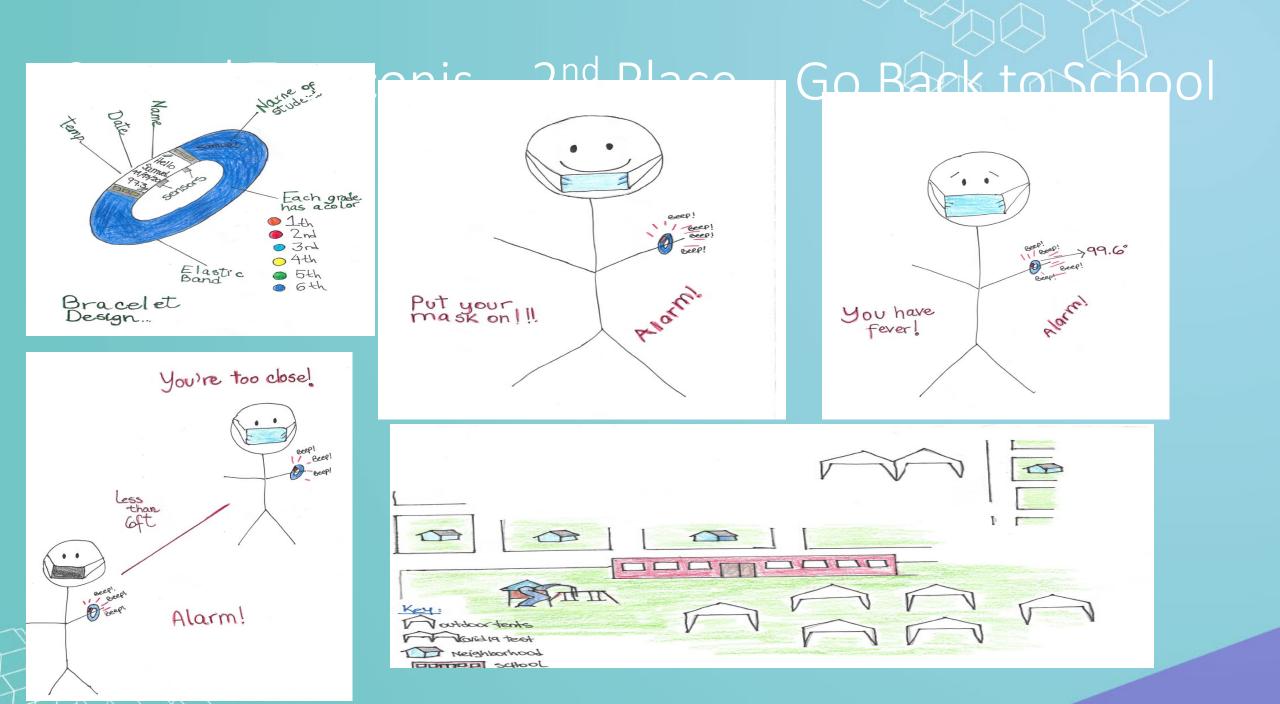
## **SECOND PRIZE WINNER**

### THIS IS PRESENTED TO

# Samuel Tronconis

for exemplary performance in the Community Mapping Make-A-Thon Hosted by the STEM Illinois Nobel Project







Hector Davila



Ruly Mardarkal

RUBY MENDENHALL Co-Director of STEM IL



LISA GOODPASTER Associate of Project Management

Molly Galloway

MOLLY GALLOWAY Program Evalautor

## THIRD PRIZE WINNER

### THIS IS PRESENTED TO

Hector Davila

for exemplary performance in the Community Mapping Make-A-Thon Hosted by the STEM Illinois Nobel Project



# Hector Davila – 3<sup>rd</sup> Place – Masks for All



Courtesy Photo

**Problem:** Some individuals do not wear masks.

**Solution:** One way of doing so would be to put a box with free, individually wrapped, masks in it. This would be similar to the Little Free Library, which can now be found all over the community. T

**Impact:** This will greatly help my Champaign-Urbana community because the number of COVID cases keeps rising and we all need to stay in this together. As our governor Pritzker says we have to be "All in Illinois" to stop this spread of COVID-19.

We Need a Social Movement that Democratizes Health Education!!

NAACP – Health Committee

Black Panthers – Free Clinics, Campaigns (SSD), etc.

**Foster Black Wellness Ecosystem – BMWC** 

#### Train Corps of Community Health Workers - 100,000

- Citizen/Community Scientists
- Neuroscience, Genomics and Epigenetics
- Psychological First Aid (CU)
- Psychological Recovery (CU)
- Verbal First Aid (Pager & Acosta)
- Cultural Practices (heal body, mind & soul)

#### Mechanisms

- Community Centers & Clinics
- Online Education & Certificate
- Media (ex. School House Rock)
  - I'm Just A Bill: https://www.youtube.com/watch?v=FFroMQlKiag



how

healing works







Nature

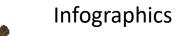
"Coming Home to the Body"-Movement Markera Jones



CONTRACT STATES AND A STATES AN



AILEY. EXTENSION REAL CLASSES FOR REAL PEOPLE

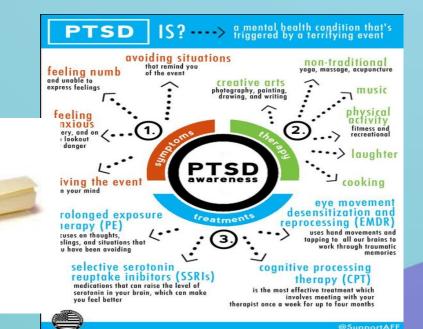


Cultural Wisdom





Joy, calming Self-care – "students made the treasure boxes" Link to Latest Science Verbal First Aid



shutterstock.com · 548117332





#### the Home



## Unity in Action Magazine Graphic Art (Tanya Parker)

#### USING ART AS A WAY TO SPREAD PUBLIC AWARENESS AND ADDRESS THE HEALTH ISSUE ( COVID)

THES ART COMPETION WILL ALLOW FOR THE ENTIRE COMMUNITY TO GET INVLOVED OF ALL AGES

IUWING A CRAILCE TO EXPRESS AND SAVE LIVES

USING FUR ACTIVITIES TO ADDRESS SERIOUS ISSUES



## Unity in Action Magazine Host Event (Tanya Parker)



Integrating Human-Centered Design

Illinois Extension

#### Paradigm Shift – Democratize Resources



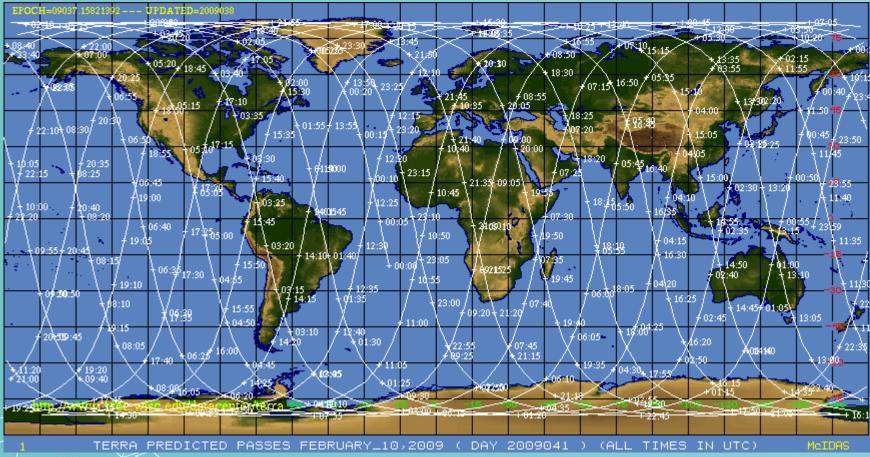
HEALTH Makerlab

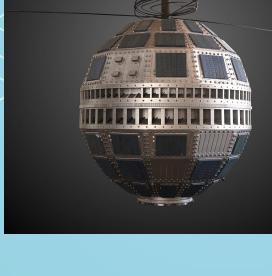
HEALTH**MAKER**LAB

"Billion Dollar Garage" **New Node: Designing Resiliency and Well-being Social Determinants of Health Health Disparities Health Equity** 

> Carle I ILLINOIS Carle Illinois College of Medicine

### Forage i Satellite – Keith Jacobs



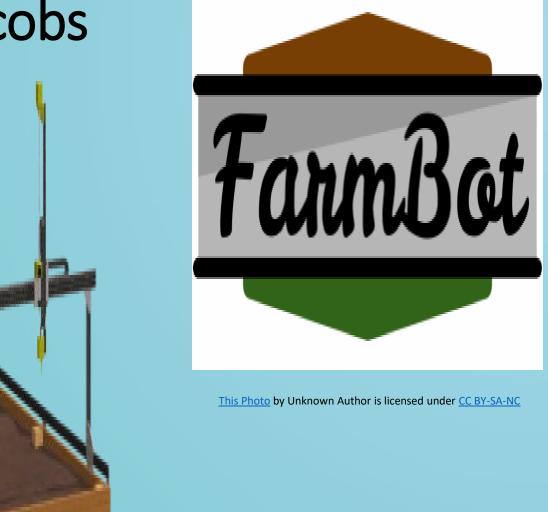


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## FarmBots – Keith Jacobs



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## Industrial Fabrics

Timothy Stark & Farshid Vahedifard Civil and Environmental Engineering Black Farmers Reclaim 1,000 Acres

1 Acre = 43,560 Feet Total = 43,560,000 Feet



Greenhouses



Weed Control



**Insect Protection** 



#### **Blueberry Netting**





Henrietta Gomez and Gilbert Suazo, Sr., receive a Taos Pueblo squash in 2018. ANDI MURPHY

Native American's Efforts to Reclaim Land & Seeds



#### Frances Perkins (1880-1965) Secretary of Labor 1933-1945 Re-Imagining Society

PBS Documentary – Summons: Frances Perkins & the General Welfare: <u>https://francesperkinscenter.org/summoned/</u>

#### New Deal – Social Security Act & other policies fundamentally changed this society

- Farmers
- Immigrants
- Black women migrating from the south
- Residents in Chicago slums
- Child laborers
- Elderly
- Unemployed
- Uninsured

How: conversations, engagement, thoughtfulness, empathetic, boldness, etc.

### "Sacred Work" – Frederick Douglass to President Lincoln Third Reconstruction & Renaissance



Title: "New Opportunities: Artist: Danielle Hunter



Facebook



## **Assistance Needed**

- Project Manager Role
- FarmBots assemble FarmBot, teach Python
- Satellites teach Python
- Community Health Workers Training, Toolkits, DREAM Accelerator (entrepreneurship and wealth creation)
- Research Team transcribing interviews, analyzing data, co-authoring papers, documentaries, etc.





# THANK YOU

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