

# Changing the Face of Science

## A STEM Biography Project

2014 NSTA National Conference- Boston



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[Horizons](#) at Woodward- Executive Director

MS Discipline Board

Middle Five Points Advisor

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WA



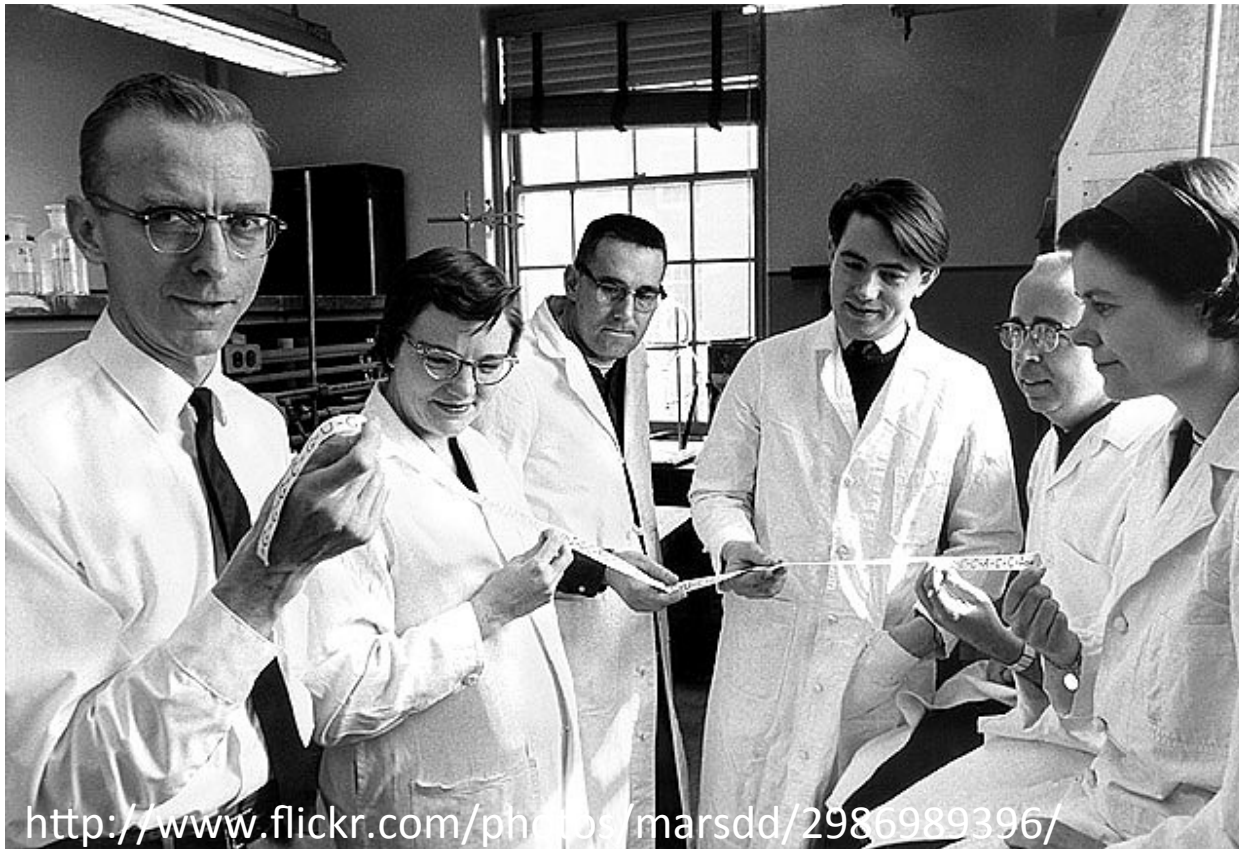






# Warm Up:

Whose image comes to mind upon hearing the words scientist or mathematician?



<http://www.flickr.com/photos/marsdd/2986989396/>





TED



SOS



# SAVE OUR SCIENCE

*How to Inspire a New Generation of Scientists*

**AINISSA RAMIREZ**



# Drowning in content

# SCIENCE



## THE ELEMENTS OF A SUPER-HERO

COMMON AND NOTABLE POWERS, ABILITIES AND ORIGINS

1 <b>O</b> Orphan											2 <b>A</b> Alien						
3 <b>F</b> Flight	4 <b>S</b> Strength																
11 <b>I</b> Invulnerability	12 <b>SP</b> Speed																
19 <b>VX</b> X-Ray Vision	20 <b>VH</b> Heat Vision	21 <b>FR</b> Fire Control	22 <b>AQ</b> Water Control	23 <b>FZ</b> Ice Control	24 <b>NF</b> Military	25 <b>W</b> Weaponry	26 <b>Tc</b> Technology	27 <b>AR</b> Armor	28 <b>G</b> Gadgetry	29 <b>Dc</b> Detective	30 <b>Fm</b> Toughness	31 <b>KF</b> Martial Arts	32 <b>Tk</b> Telekinesis	33 <b>TP</b> Telepathy	34 <b>My</b> Mystic	35 <b>TL</b> Time-Lost	36 <b>LG</b> Legacy Hero
37 <b>SN</b> Super-Senses	38 <b>Wx</b> Claws	39 <b>H</b> Healing	40 <b>St</b> Weather Control	41 <b>Iv</b> Plant Control	42 <b>DB</b> Sonics	43 <b>Ec</b> Earth Control	44 <b>Dz</b> Light Control	45 <b>Lc</b> Luck	46 <b>Fs</b> Transmutation	47 <b>AG</b> Agility	48 <b>Sz</b> Alternate Form	49 <b>Rr</b> Stretching	50 <b>Ff</b> Force Fields	51 <b>IL</b> Illusions	52 <b>Pc</b> Precognition	53 <b>V</b> Vigilante	54 <b>Sk</b> Sidkick
55 <b>SH</b> Shapeshifting	56 <b>PY</b> Shrinking	57 <b>GR</b> Growth	58 <b>MG</b> Magnetism	59 <b>L</b> Electricity	60 <b>B</b> Bouncing	61 <b>TR</b> Triplication	62 <b>FE</b> Metallic Form	63 <b>Gv</b> Gravity	64 <b>U</b> Shadows	65 <b>Ds</b> Tracking	66 <b>EA</b> Matter-Eating	67 <b>TE</b> Teleportation	68 <b>IS</b> Invisibility	69 <b>T</b> Time-Travel	70 <b>MB</b> Mental Blast	71 <b>GE</b> Intelligence	72 <b>AN</b> Animalistic
73 <b>Du</b> Duplication	74 <b>Nu</b> Nullification	75 <b>AB</b> Absorption	76 <b>PQ</b> Porcupine Quills	77 <b>FB</b> Fire Breath	78 <b>IL</b> Infectious	79 <b>CL</b> Color Control	80 <b>Sf</b> Stone Form	81 <b>TW</b> Two Heads	82 <b>EY</b> Multiple Eyes	83 <b>GT</b> Giant Turtle	84 <b>AF</b> Arms Fall Off						

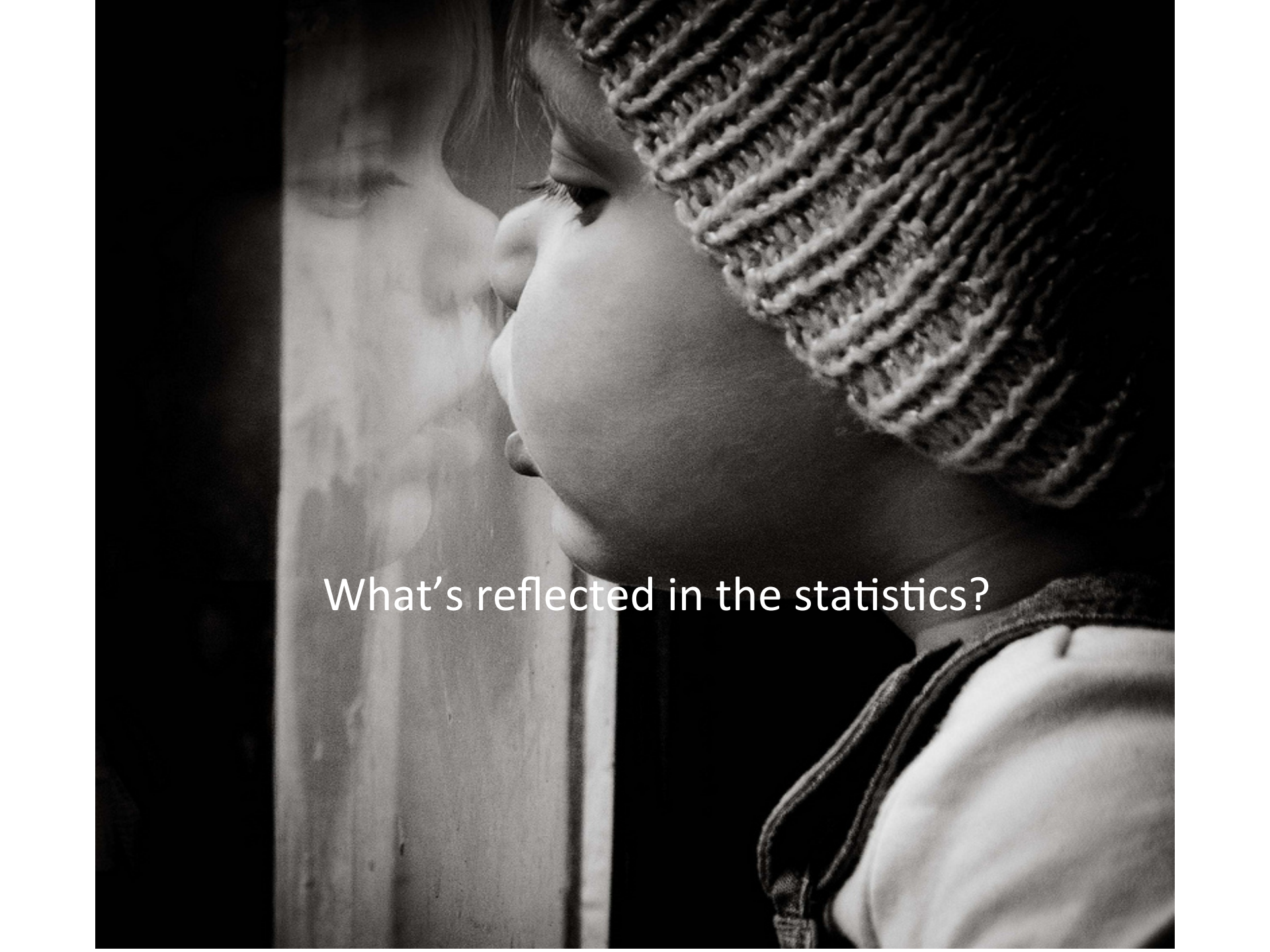
ORIGIN  
STORIES

PHYSICAL  
POWERS

MENTAL  
POWERS



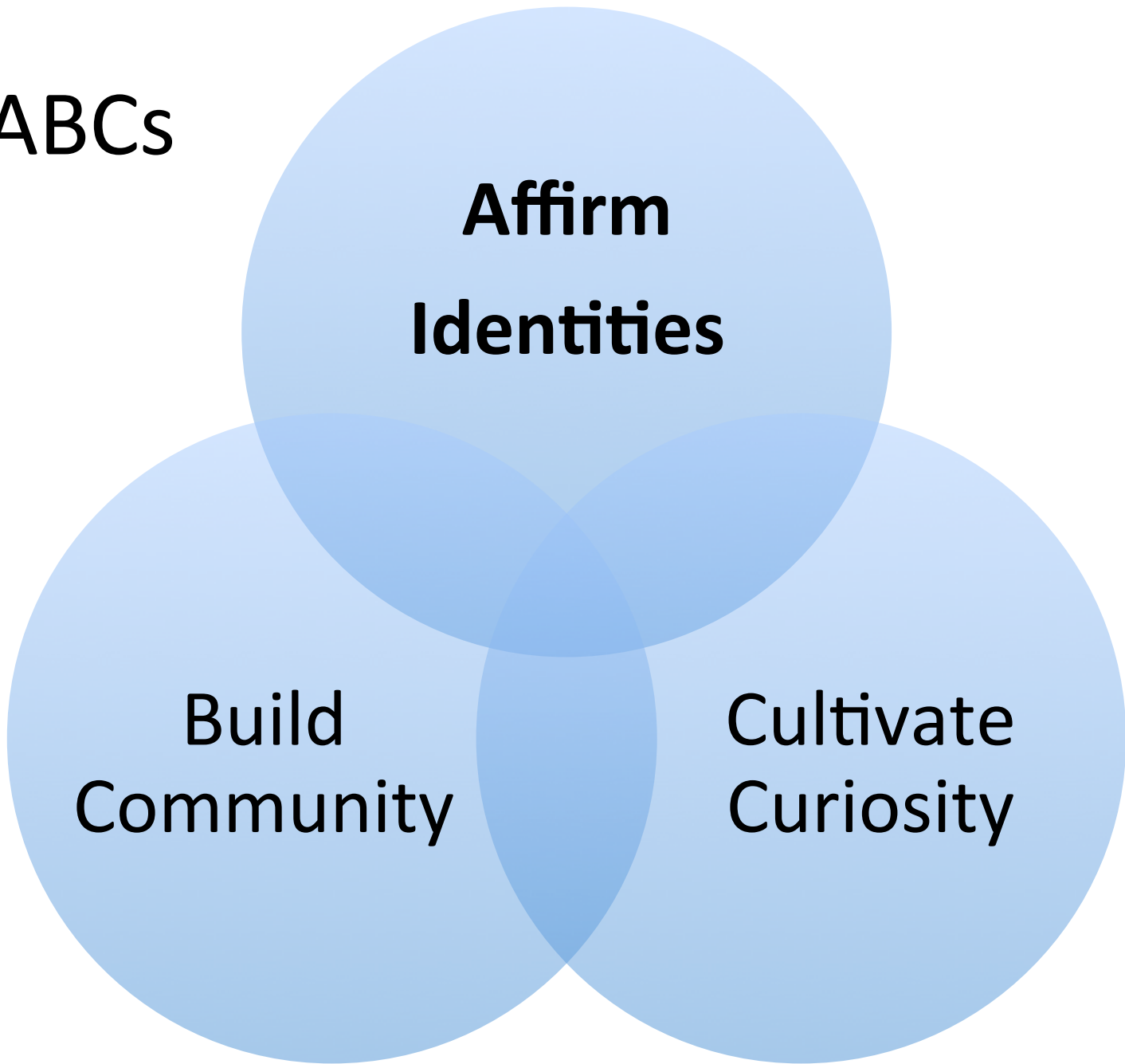




What's reflected in the statistics?



ABCs



**Affirm  
Identities**

**Build  
Community**

**Cultivate  
Curiosity**

Red and  
yellow, black  
and white...



“The true sign of intelligence is not knowledge, but imagination.”

~Albert Einstein



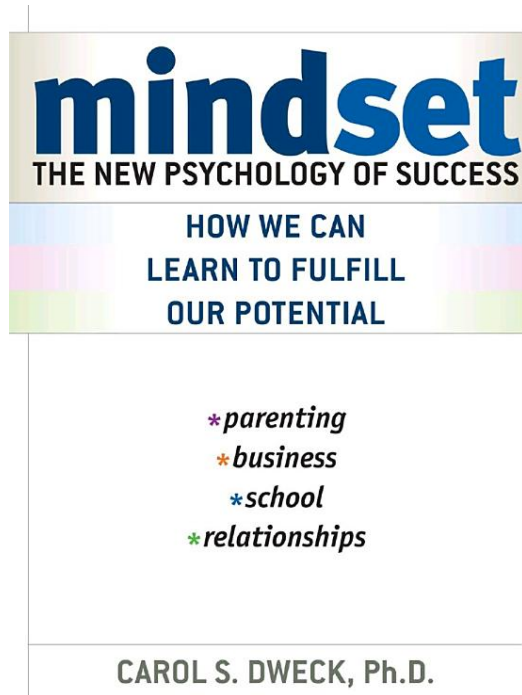
## Mission & Vision

“...In a broadly diverse and caring community, Woodward *embraces the uniqueness of each individual...*”

“...developing critical thinkers and ethical problem solvers, in an *inclusive* community...”



# Reading the Mission & Vision

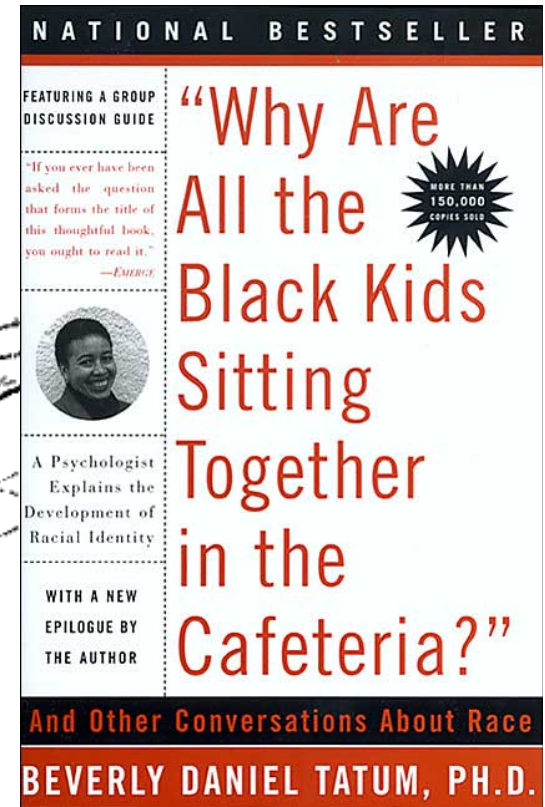
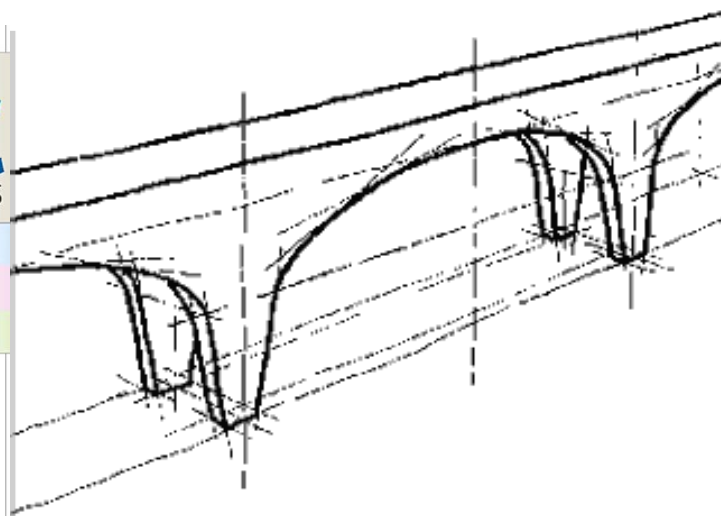


**mindset**  
THE NEW PSYCHOLOGY OF SUCCESS

HOW WE CAN  
LEARN TO FULFILL  
OUR POTENTIAL

- \*parenting
- \*business
- \*school
- \*relationships

CAROL S. DWECK, Ph.D.



NATIONAL BESTSELLER

FEATURING A GROUP DISCUSSION GUIDE

"If you ever have been asked the question that forms the title of this thoughtful book, you ought to read it."  
—EMERGE

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**“Why Are All the Black Kids Sitting Together in the Cafeteria?”**

A Psychologist Explains the Development of Racial Identity

WITH A NEW EPILOGUE BY THE AUTHOR

And Other Conversations About Race

**BEVERLY DANIEL TATUM, Ph.D.**





WA



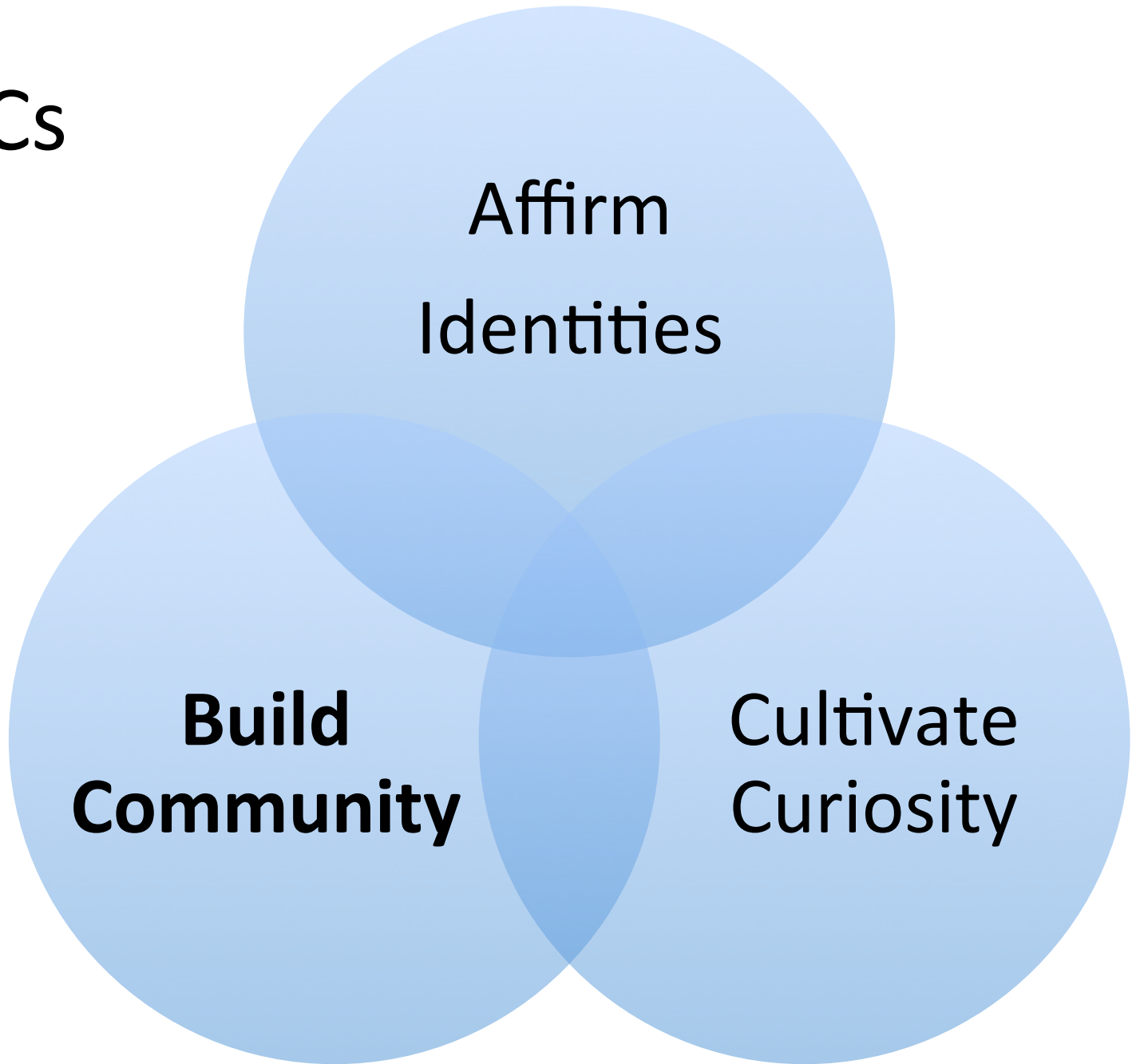


# Diversity to Inclusion





# ABCs



Affirm  
Identities

**Build  
Community**

Cultivate  
Curiosity



**Amber Teamann**  
@8Amber8

What you do in the first five days shows what you value in your classroom. #ISTE13

6/25/13, 2:03 PM

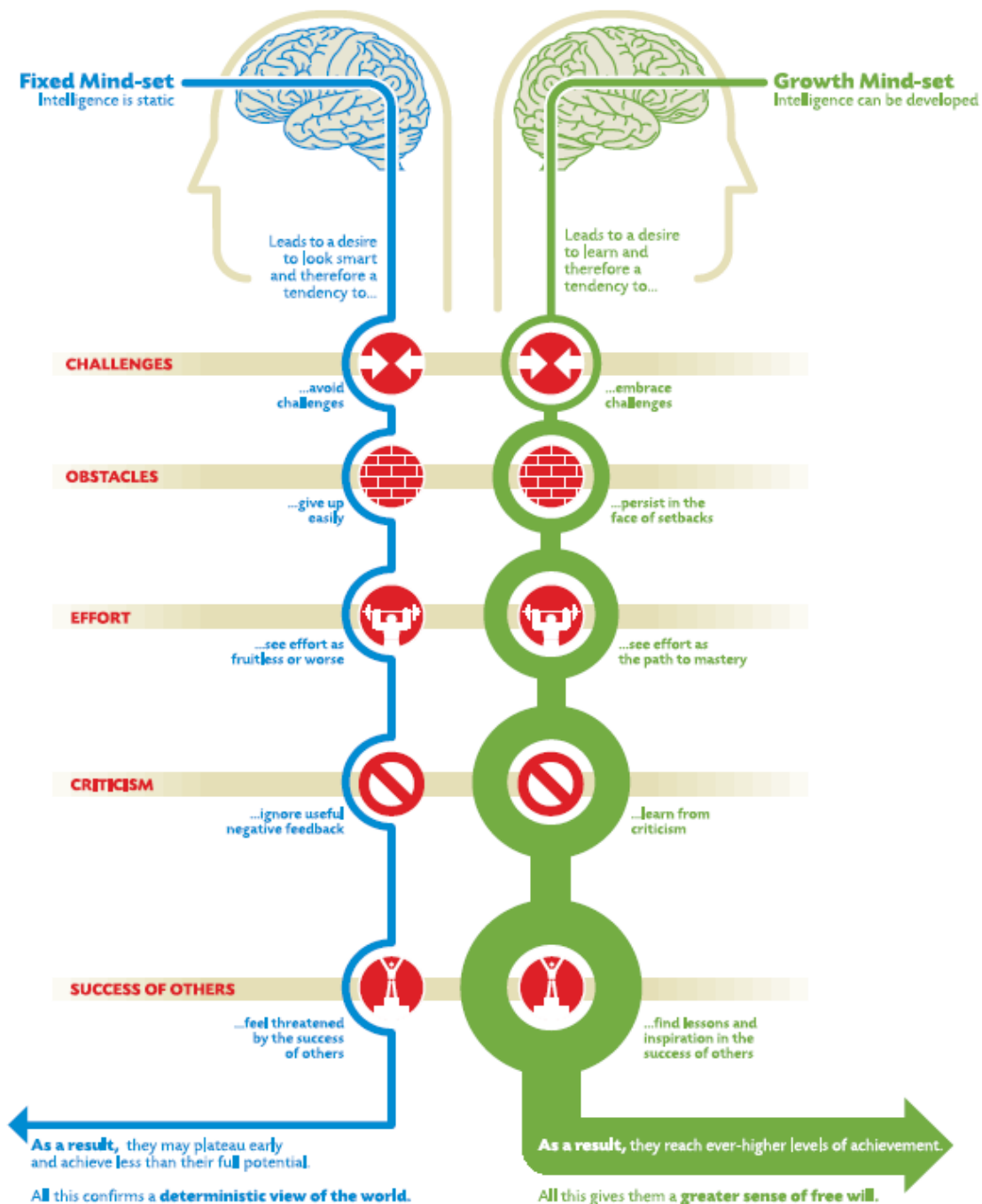
21 RETWEETS 10 FAVORITES



**Kenneth Durham** @Princip... 6/25/13

RT "@8Amber8: What you do in the first five days shows what you value in  
#ISTE13"

# Easy Lesson: use a graphic organizer



[Graphic organizer by Nigel Holmes](#)

Expanding the sphere...



Community



<http://goo.gl/PYCBs>

# Robotics / Computer Science





# The Project (Idea to Action)

## Framework:

- Research a STEM career area of interest
- Interview or research a STEM professional in that field
- State the identifying factor(s) shared with STEM professional
- Tell their story
- Choice of final product





# The Project (Idea to Action)

www.sciencebuddies.org/science-fair-projects/science\_careers.shtml#lifesciences



The header of the Science Buddies website features a dark background with various scientific icons. On the left is the Science Buddies logo. To the right is a search bar with the text "Search sciencebuddies.org" and a dropdown menu for "All Results". Further right are links for "DONATE", "Log In / Sign Up", and social media icons. Below the header is a navigation bar with several colored buttons: Home, Project Ideas, Project Guide, Ask An Expert, Blog, Science Careers (highlighted in green), My Science Buddies, Who Are You?, and More.

## Careers in Science

Earth & Physical Sciences

Life Sciences

Engineering

Math & Computer Science

Health

### Explore Careers in Life Science

Want to know more about careers in life science? Browse through detailed information on over 100 careers to discover what scientists really do and what it takes to prepare for these careers. Each career profile provides basic career information such as salary, job outlook, degree requirements, etc. We have also included videos featuring interviews with real scientists or on the job profiles.

### New Scientist Profiles



**Meet Katie Hilpisch**, a Senior Biomedical Engineer at Medtronic who is helping to find medical therapies for patients with heart problems.

### Career List

Life Science

Behavioral and Social Science

# Guiding questions



“Biographies can be a source of inspiration – they can become mentors in print.”

# Organizer (Google Docs)

Changing the Face of Science ☆

shelley.paul@woodward.edu

Comments

Share

File Edit View Insert Format Tools Table Help Last edit was made on January 31 by jessica.parsons

Rich text editor toolbar with options for text color, background color, bold, italic, underline, link, unlink, bulleted list, numbered list, indent, outdent, and text color.

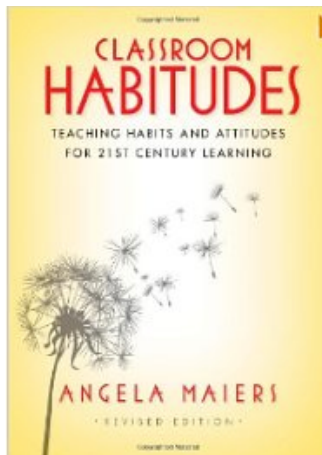
Changing the Face of Science

Question	Information/Notes	Source(s)
Introduce the scientist by their full name. Where were they born? Where'd they go to school? Where are they now?		
Why did you choose this scientist? How do you <i>identify</i> (race, gender, ethnicity, learning ability...) with this scientist?		
What events early in the scientist's life might indicate or have sparked an interest in science?		



# “Ask Genius to Show Up...”

Angela Maiers



Art+  
Science=  
Genius

# Student Examples



Create

Learn & Support

Explore

## Mayim Bialik

Born: I was born in San Diego, California, where my grandparents lived. My parents and older brother and I then moved to Los Angeles where I was raised. I was born on December 12, 1975. I'm 37.  
 Education: UCLA for Undergrad and Grad School  
 Now: ActreSS on Big Bang Theory and a neurobiologist



<http://bit.ly/2k8v8ic>

Changing the Face of Science: Gathering Notes Framework

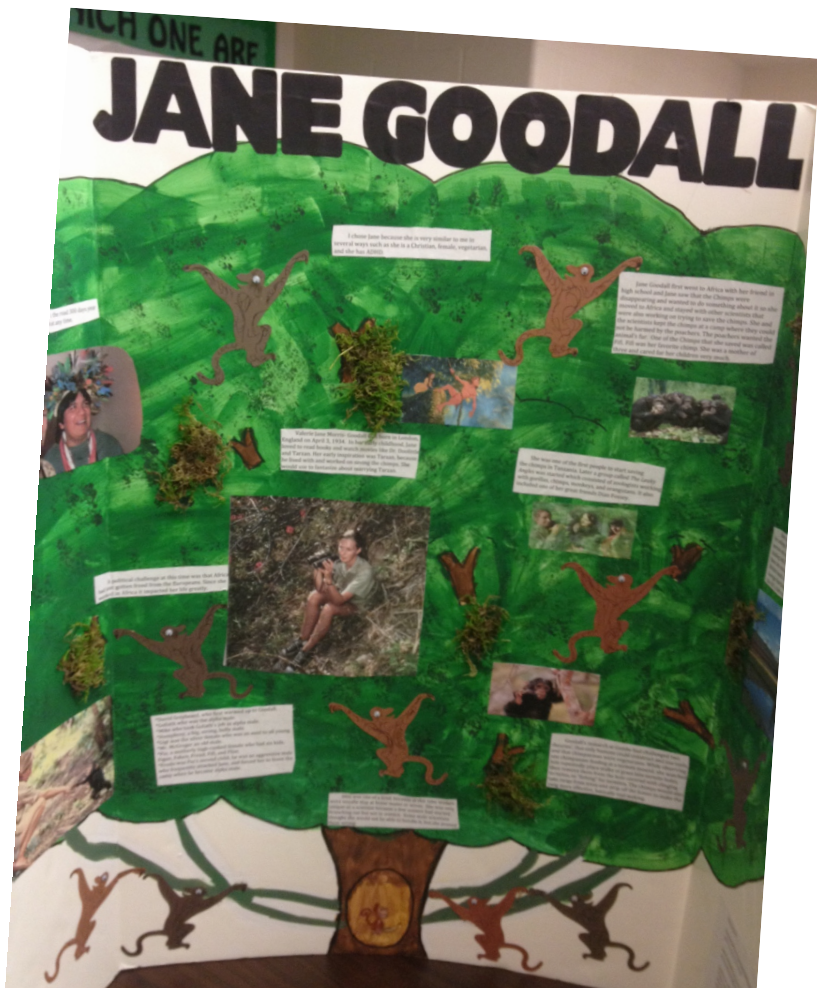
Question	Information/Notes	Source(s)
Introduce the scientist by their full name. Where were they born? Where'd they go to school? Where are they now?	Born: I was born in San Diego, California, where my grandparents lived. My parents and older brother and I then moved to Los Angeles where I was raised. I was born on December 12, 1975. I'm 37. Education: UCLA for Undergrad and Grad School Now: Actress on Big Bang Theory	Mayim
Why did you choose this scientist? How do you identify (race, gender, ethnicity, learning ability) with this	Neurobiology has always interested me. We are both females.	

Alex's interview of Mayim

... until I  
... oms.  
... be a  
... surgeon.  
... so much  
... out the  
... fferent  
... of

Her  
I wasn't a "Y  
was much be  
had to work e  
CS, while the  
even trying! I  
had to remembe  
do it perfectl

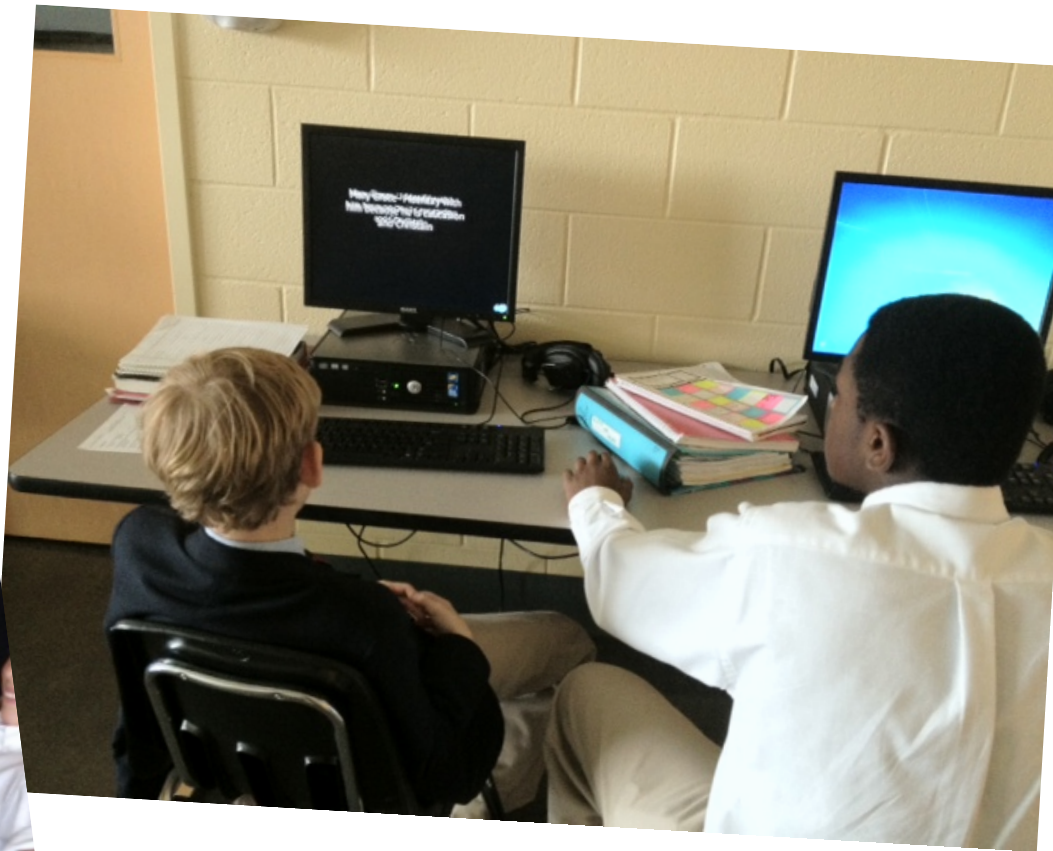
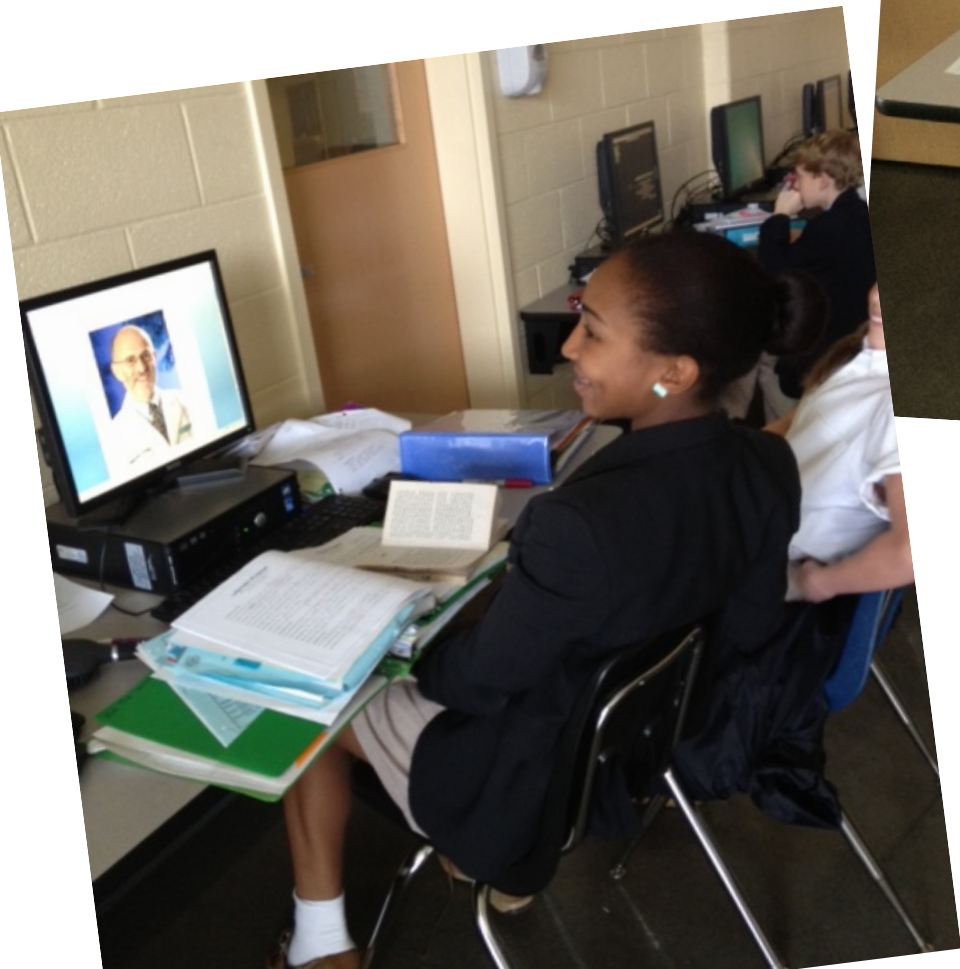
# Student Examples



Cheyenne's tribute to her dad, CDR Early

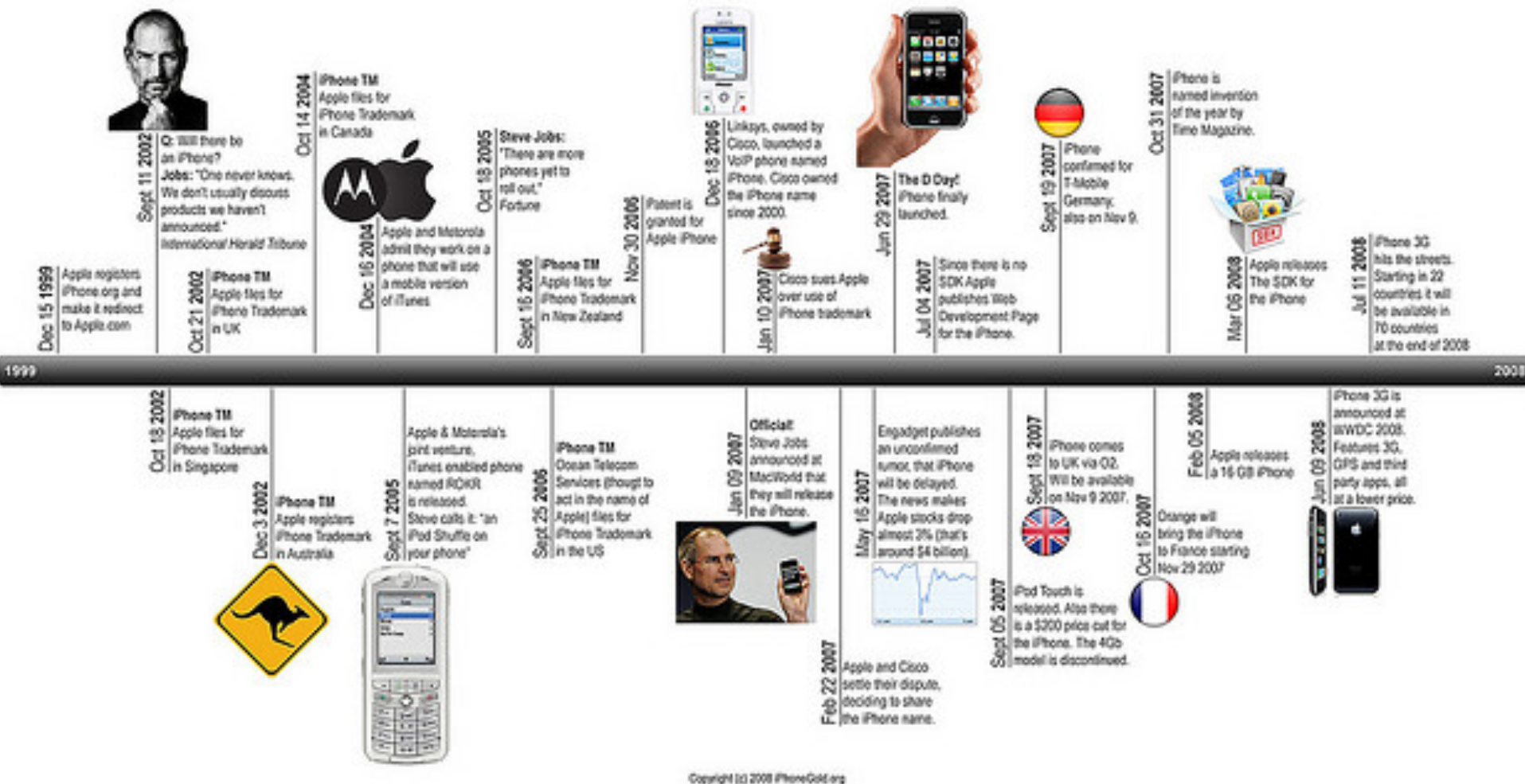


Kia's **Skype** interview with Dr. Kevin Carroll

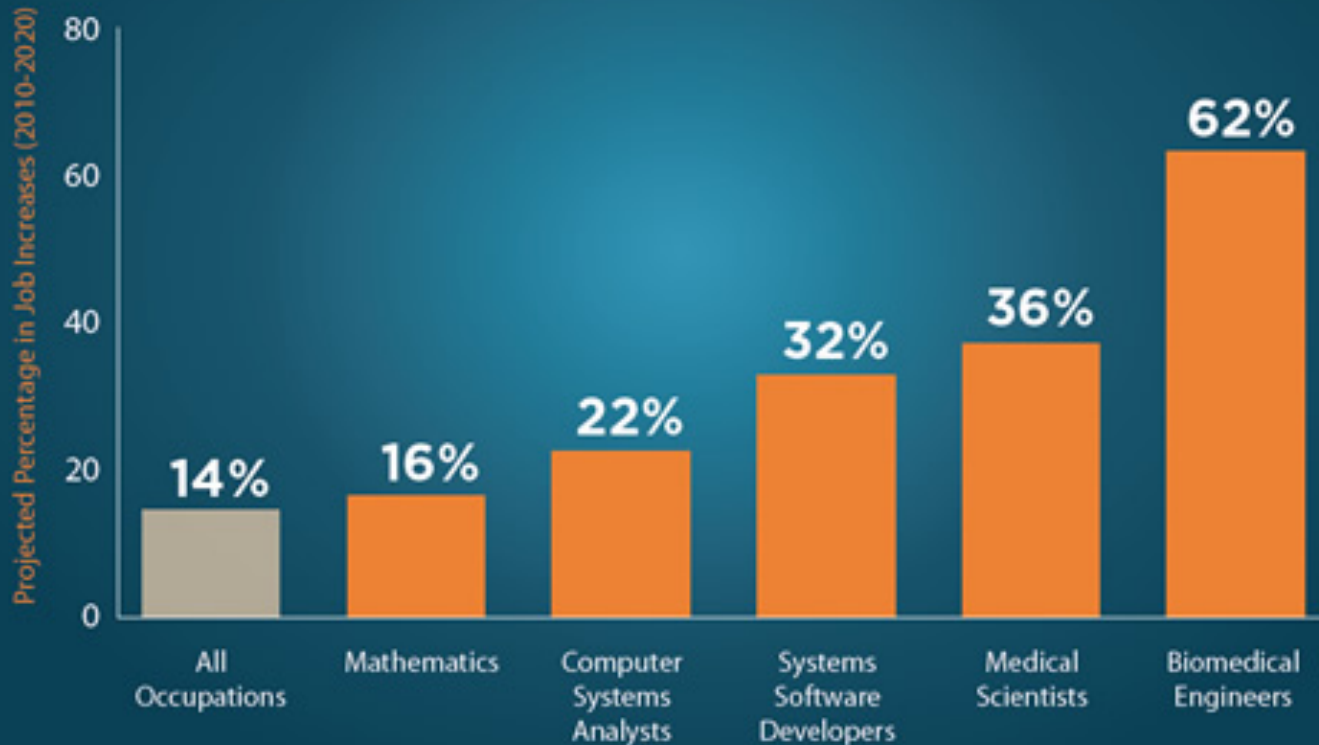


Students discover the triumphs of Dr. Daniel Hale Williams, the first African American surgeon

# Context of Time



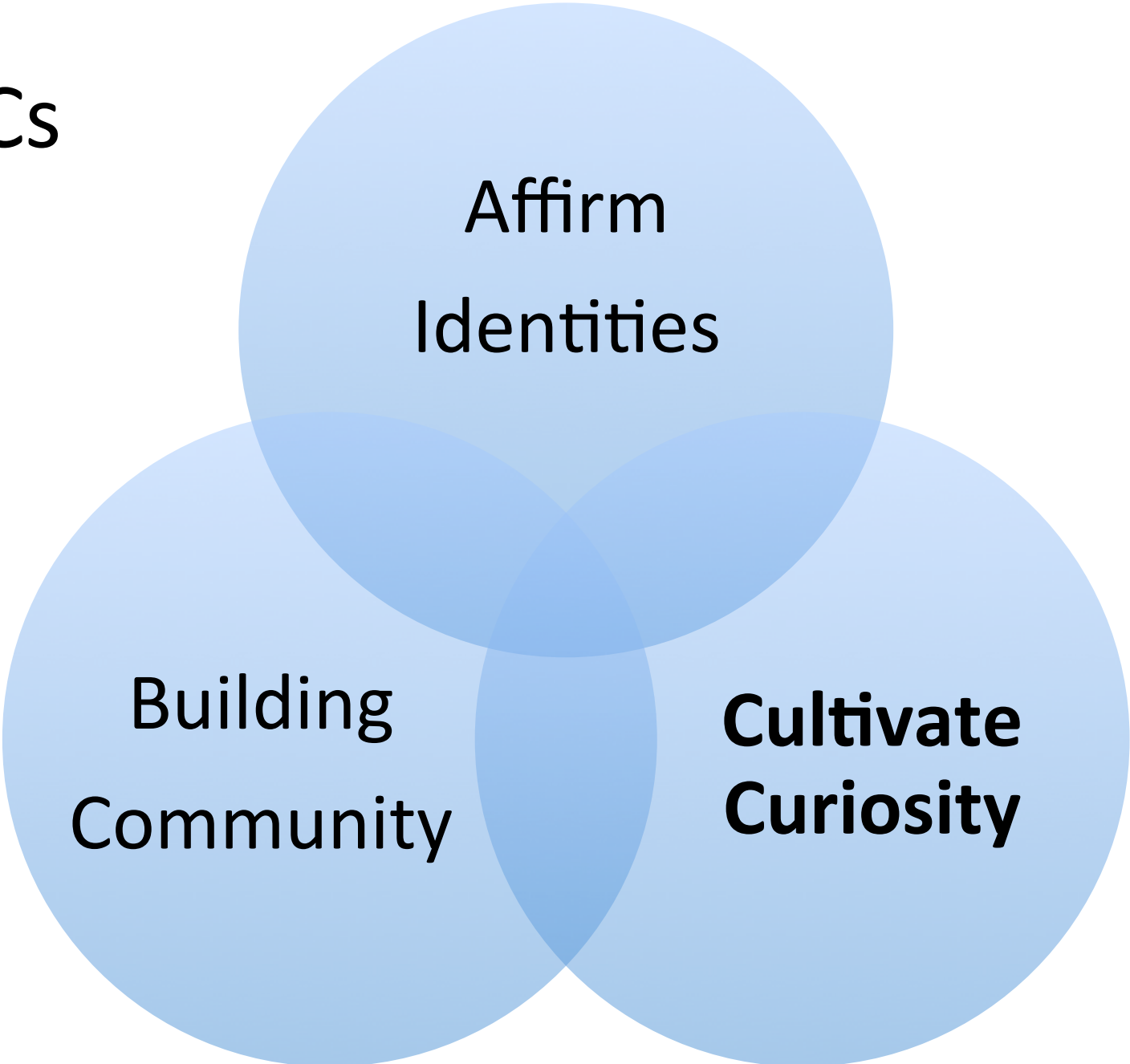
# PROJECTED PERCENTAGE INCREASES IN STEM JOBS: 2010-2020



<http://www.ed.gov/stem>



# ABCs

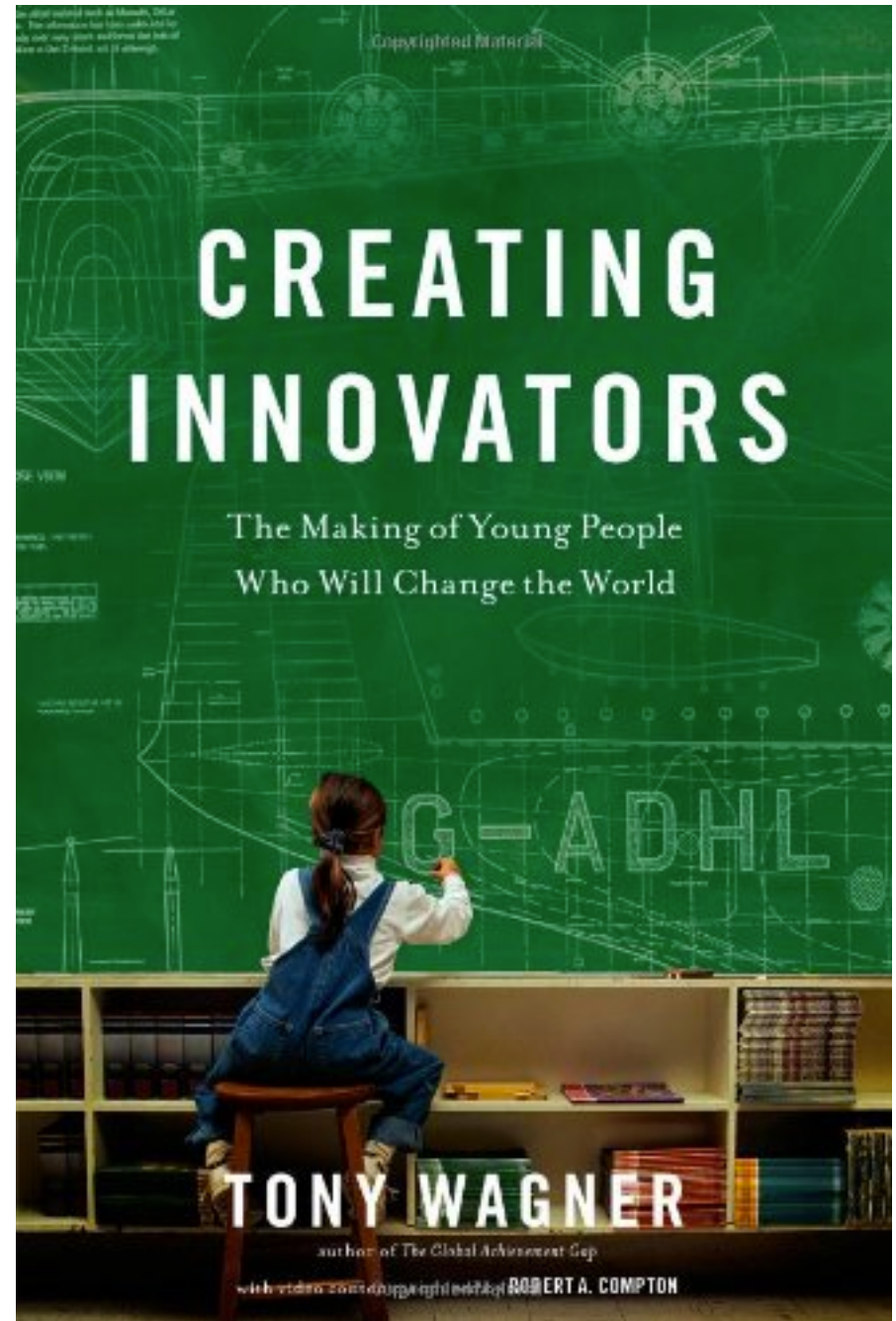


Affirm  
Identities

Building  
Community

**Cultivate  
Curiosity**

“To be a successful science teacher, make it fun...”





**TEDEd**

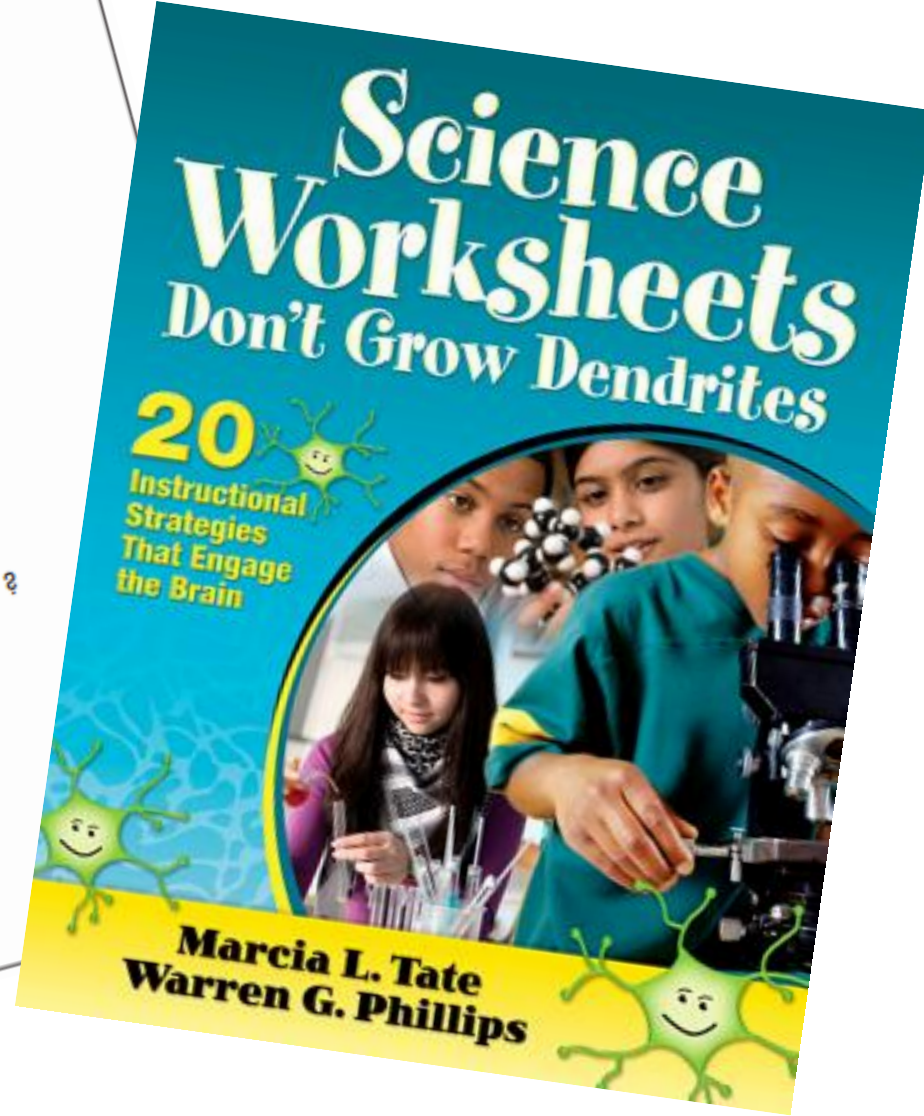
Lessons Worth  
Sharing



# iWonder Project

## Genius Questions

- What if . . . ?
- I wonder why . . .
- If . . . ?
- What is it that . . . ?
- When is it . . . ?
- Who could . . . ?
- Is it possible to . . . ?
- When is . . . ?
- What could happen if . . . ?
- If it were possible . . . ?
- Are there . . . ?
- Why is . . . ?
- How . . . ?
- Where did . . . ?
- Do you . . . ?
- Is . . . the reason for . . . ?
- Can . . . ?
- Would you rather . . . ?
- What would it take to . . . ?
- Why is it like that . . . ?
- How is . . . like . . . ?
- If I . . . , could . . . ?
- Does it matter if . . . ?
- How can . . . ?
- What is your opinion about . . . ?
- Is it right to . . . ?
- I wonder when . . .
- I'm wondering if . . . ?
- How could it . . . ?
- Why are . . . ?





# Yeah, but....

- I have a homogeneous classroom.
- I can't take time away from content.
- How can I do such a project if everyone else isn't "on board?"





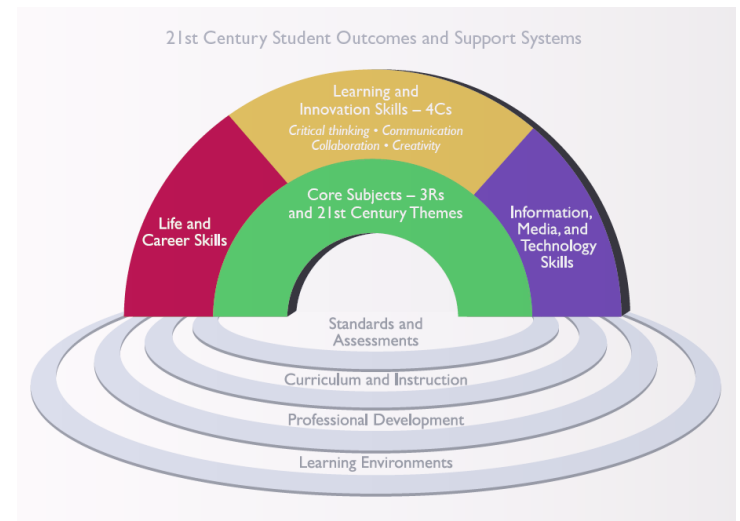
# 21C Connections

## The 4Cs:

Communication,  
Collaboration,  
Critical Thinking  
& Creativity



PARTNERSHIP FOR  
21ST CENTURY SKILLS



# 21C Connections

**The CCSS & NGSS:**

Fewer

Clearer

Higher



# 21C Connections

The CCSS ELA:

1. Building knowledge through content-rich nonfiction
2. Reading, writing, and speaking grounded in evidence from text, both literary and informational
3. Regular practice with complex text and its academic language







<http://www.techyes.net/>



Create Learn Explore

Ben Carson



# Science Explorations

Home Tables and Graphs

Virginia Satir  
Family/Marriage Therapist

Mixbook | Learn About Mixbook [Photo Books](#) | Create your own [Photo Book](#)

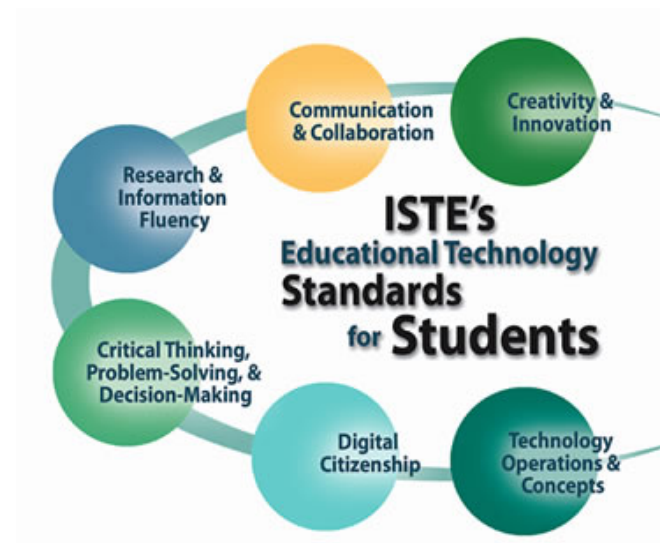
<http://brownham.weebly.com/virginia-satir.html>

<http://eagletscience101.weebly.com/ben-carson.html>

# 21C Connections

## Digital-age skills (ISTE Standards)

- Creativity and Innovation
- Communication and Collaboration
- Research and Information Fluency
- Critical Thinking, Problem Solving, & Decision Making
- Digital Citizenship
- Technology Operations & Concepts



# Why my students need me



By Heidi Siwak



# Session Evaluations QR Codes

**Online: [www.nsta.org/evaluations](http://www.nsta.org/evaluations)**



**Brief instructions:**



# Other Resources

- Alsop, [Analysing Exemplary Science Teaching](#)
- Dweck, [Mindset](#)
- Tate, Marcia. [Science Worksheets Don't Grow Dendrites](#)
- Tatum,  
[Why are all the black kids sitting together in the cafeteria?](#)
- Wagner, [Creating Innovators](#)
- 21<sup>st</sup> Century Classroom: The Amaryllis,  
[My students need me after all](#)
- <http://waeagles220.weebly.com>