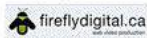


Engaging Girls in the Technology Classroom

DR. TAMARA FRANZ-ODENDAAL & SALLY MARCHAND



Who we are?



**NSERC
CRSNG**

Chairs for Women in Science and Engineering
Chaires pour les femmes en sciences & génie

Réseau National Network

BC & Yukon | Prairies | Ontario | Québec | Atlantic



Dr. Tamara Franz-Odendaal,
Professor of Biology at Mount Saint Vincent University
NSERC Chair for Women in Science and Engineering – Atlantic
Region



Sally Marchand, BSc, BEd
Program Coordinator for WISEatlantic since 2013.



About WISEatlantic



www.WISEatlantic.ca

- Establishing a **network** for girls to meet female role models in STEM
- Developing Girls Get WISE Science Summer **camps** & Science **retreats**
- Launching **webinars** for teachers, school guidance and students to broaden their knowledge of careers in science and engineering.
- Conducting **research** to assess how youth perceive careers in STEM and how they make their career decisions
- Developing **role model videos** as a resource for students, parents, and teachers

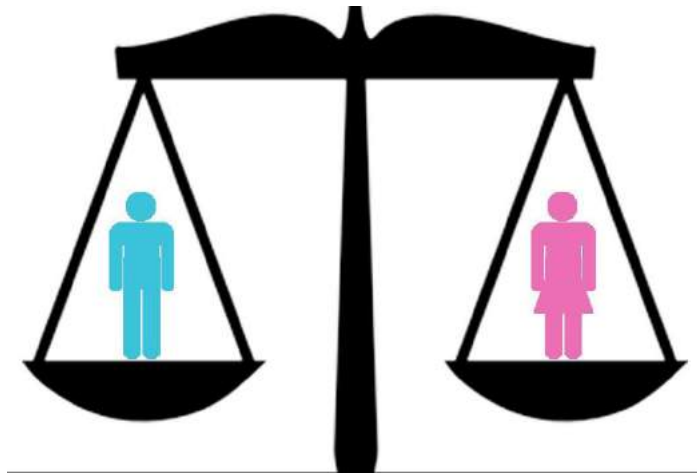


Overview

- Gender equity in technology sector
 - Why it is still an issue
- Contributing factors
- What can teachers do?

Gender Equity

is a human issue

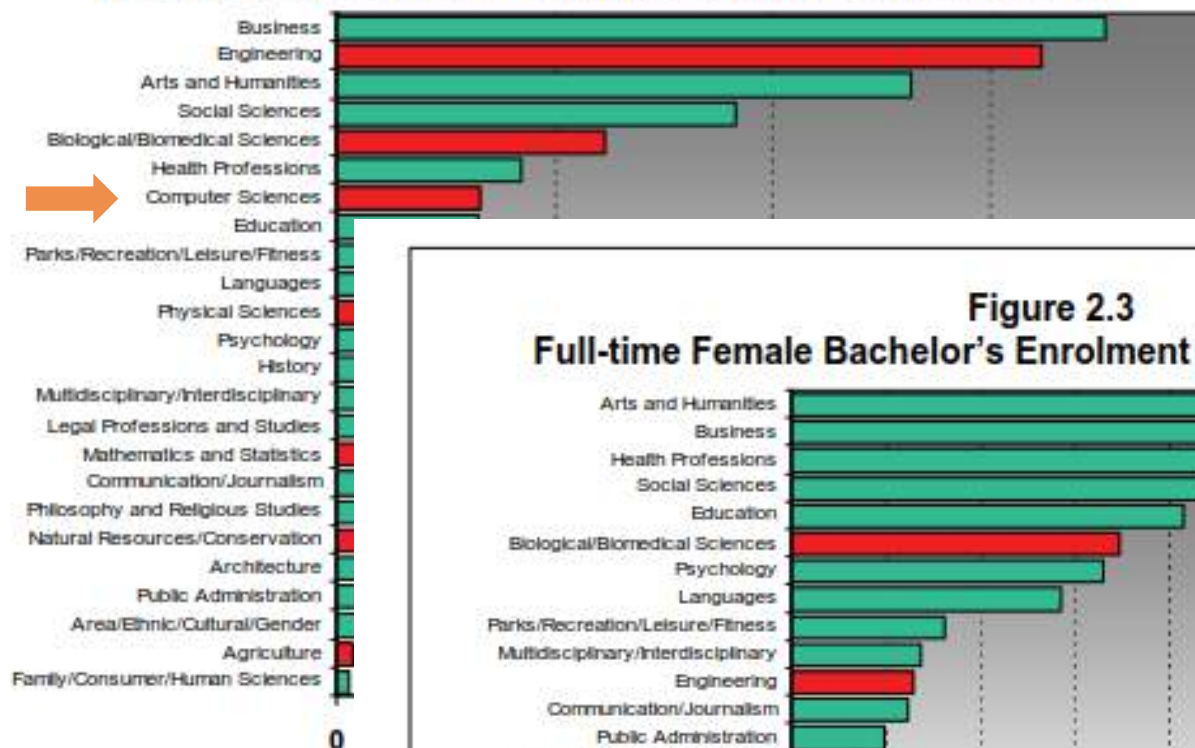


“Didn’t we solve this problem already?”

1. The tech sector is not gender balanced

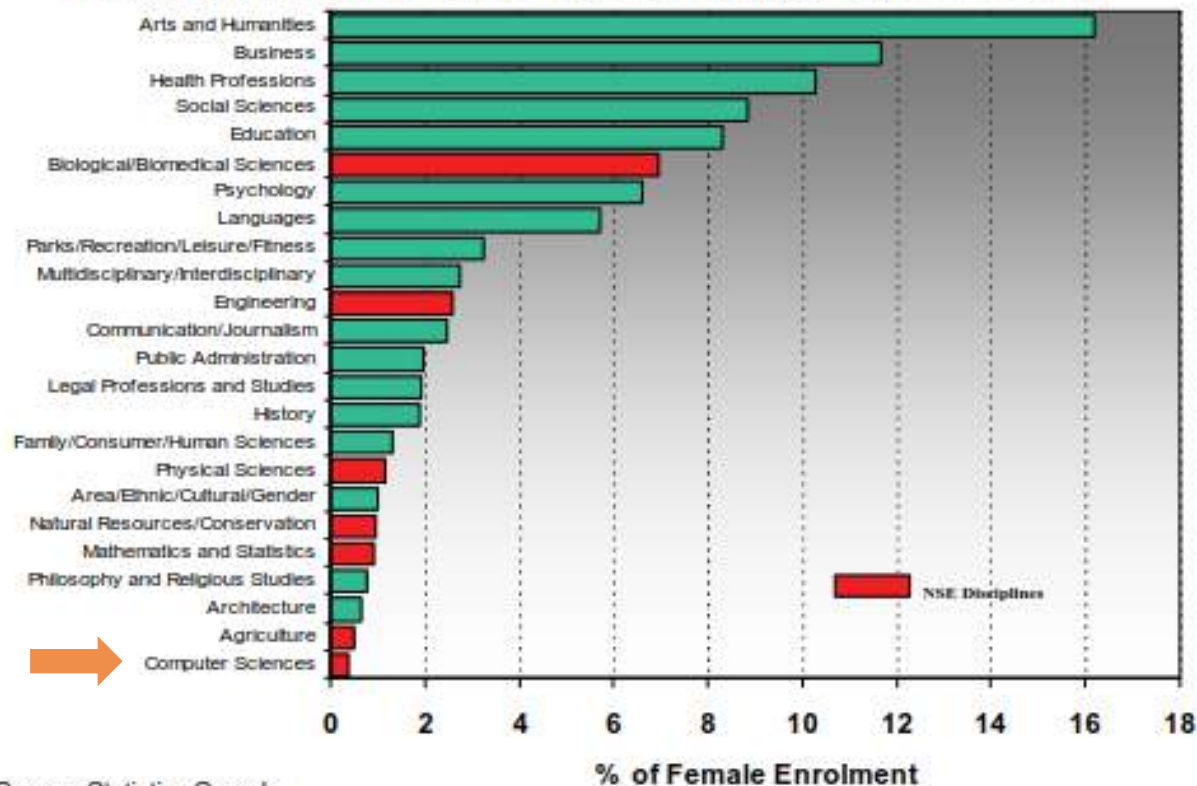


Figure 2.4
Full-time Male Bachelor's Enrolment by Discipline, 2008-09



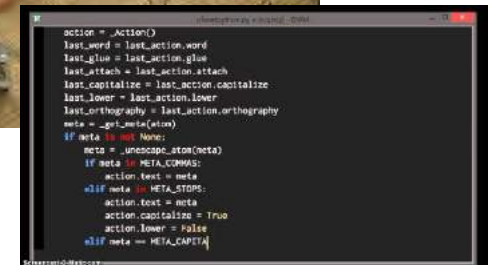
Source: Statistics Canada.

Figure 2.3
Full-time Female Bachelor's Enrolment by Discipline, 2008-09



Source: Statistics Canada.

2. Seeing girls using technology does not mean there is no problem

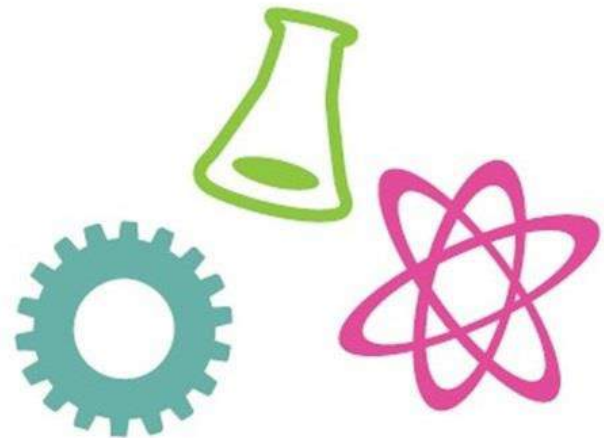


There is a big difference between USING technology and CREATING IT

“Didn’t we solve this problem already?”

NO

Contributing factors that steer girls away from the technology sector



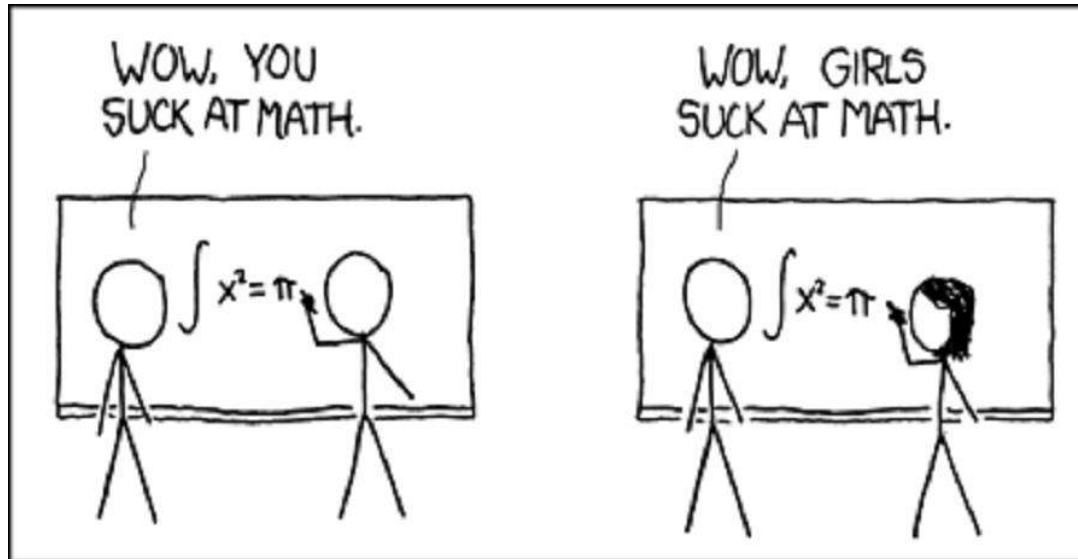
1. Incorrect perceptions about the Tech sector held by girls (not boys)

- “Geek Culture” Stereotype – male, socially awkward, ‘genius’



- Perception that it requires ‘brilliance’ – they aren’t good enough
- Perception that it is isolating (not-people orientated)

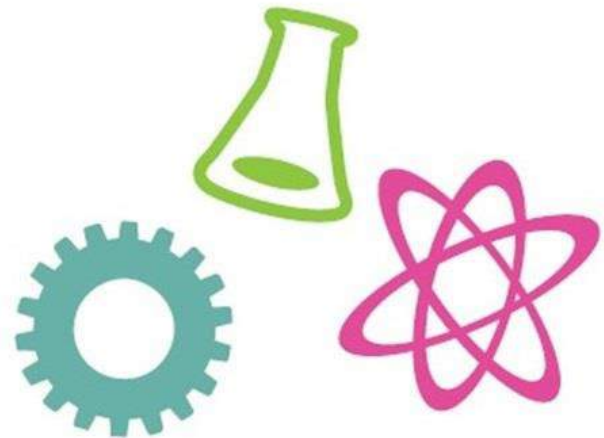
2. Stereotype Threat



CODE Video – Stereotype Threat

Unconscious Gender Bias in the Classroom

Regardless of your gender, you probably have some level of unconscious bias



Unconscious Gender Bias in the Classroom

- Teachers tend to call on boys more often in class than girls for answers
- Teachers tolerate boys calling out answers more than girls
- Teachers often extend boy's answers by asking a follow-up question or by asking them to support their previous response.
- Girls usually receive more attention than boys: wrt physical appearance.

(Sadker & Sadker, 1994, 2002)

Gender bias is present when teachers grade math tests

Victor Lavy and Edith Sand (2015)

Method: The students were given two exams, one graded by outsiders that did not know students names, the other graded by teachers who knew students names.

Results: In math, girls outsourced boys when graded by outsider, opposite case when graded by teacher who knew their names.

This effect was not true for tests on other subjects such as English and Hebrew.

Conclusion:

“...classroom teacher’s behavior explains part of the differences over time between boys and girls”

These **cumulative messages** from teachers/parents and society at large indicate to girls that they don't belong in this field

+

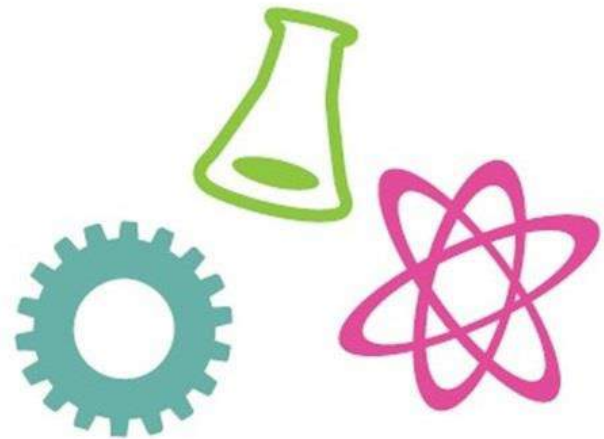
Girls often **underestimate** how well they do in STEM fields

Why we need to support girls in particular in the tech classroom?

- Statistics (the tech sector is not gender balanced)
- Incorrect perception of the tech sector held by girls
- Stereotype threat
- Cumulative messages from society
- Girls underestimate their skills



What can teachers do?



TIP #1

- Be aware of your own level of unconscious gender bias



A MAN AND HIS SON
WERE IN A CAR ACCIDENT



THE MAN DIED ON THE WAY TO THE HOSPITAL,
BUT THE BOY WAS RUSHED INTO SURGERY.



Unconscious Gender
Bias!



Let's Take the Harvard Implicit Gender Bias Test!

[Take the Test](#)

TIP #2

- Tell students you are unintentionally biased and are trying not to be



TIP #3

Praise Effort



We send an important message to our daughters when we praise **what they do** rather than **what they achieve**.

Shows you value the work rather than the goal.

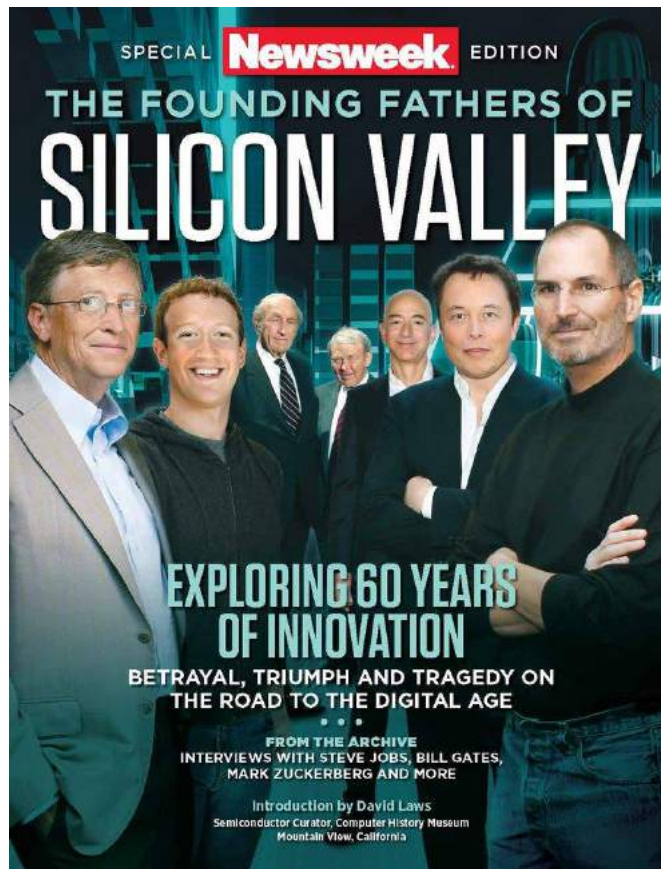
TIP #4



- Effort more so than 'natural ability' allow one to excel in IT careers
- STEM skills can be learned and/or improved
- Motivation is key
- Important reminder for students: you do not need A+ grades to go into STEM courses or careers!

TIP #5

Discuss the Tech sector:



**But tell a different story
to your classes!**

Bill Gates. Mark Zuckerberg. David Packard. Bill Hewlett. Jeff Bezos. Elon Musk. Steve Jobs

Code Movie Chpt 10

A Women's History of Silicon Valley



Judy Estrin

Part of research group credited with founding the internet

Lynn Conway

Lost her job because she underwent a gender transition. Pioneer in supercomputing and microchip technologies



Sandy Kurtzig

First software entrepreneur to become a multimillionaire

Donna Dubinsky

Founding Chief Executive of Palm (Palm Pilot)



TIP #6

Showcase Careers: Tech careers are varied - team oriented, creative, & help society

Software Engineer

Web developer

Computer Systems Analyst

Business Analyst

Database Administrators

Graphic Designer



Natasha D'Souza: Technology Entrepreneur



Karen Smyth: Information Technology

WISEatlantic.ca/videos.asp

TIP #7

Focus on using technology as a tool to solve problems, create relevant and meaningful projects

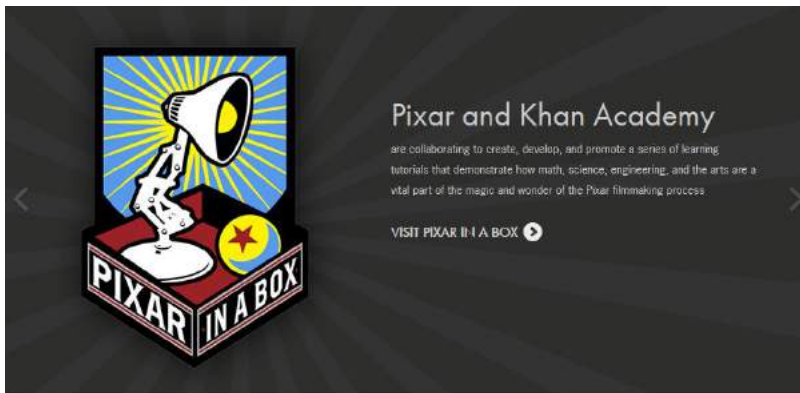


E.g. Not program a robot to race to a finish line – that appeals to boys;

Rather program a robot to address a society/human challenge – appeals to girls

“Don’t just play on your phone, program it” – President Barack Obama

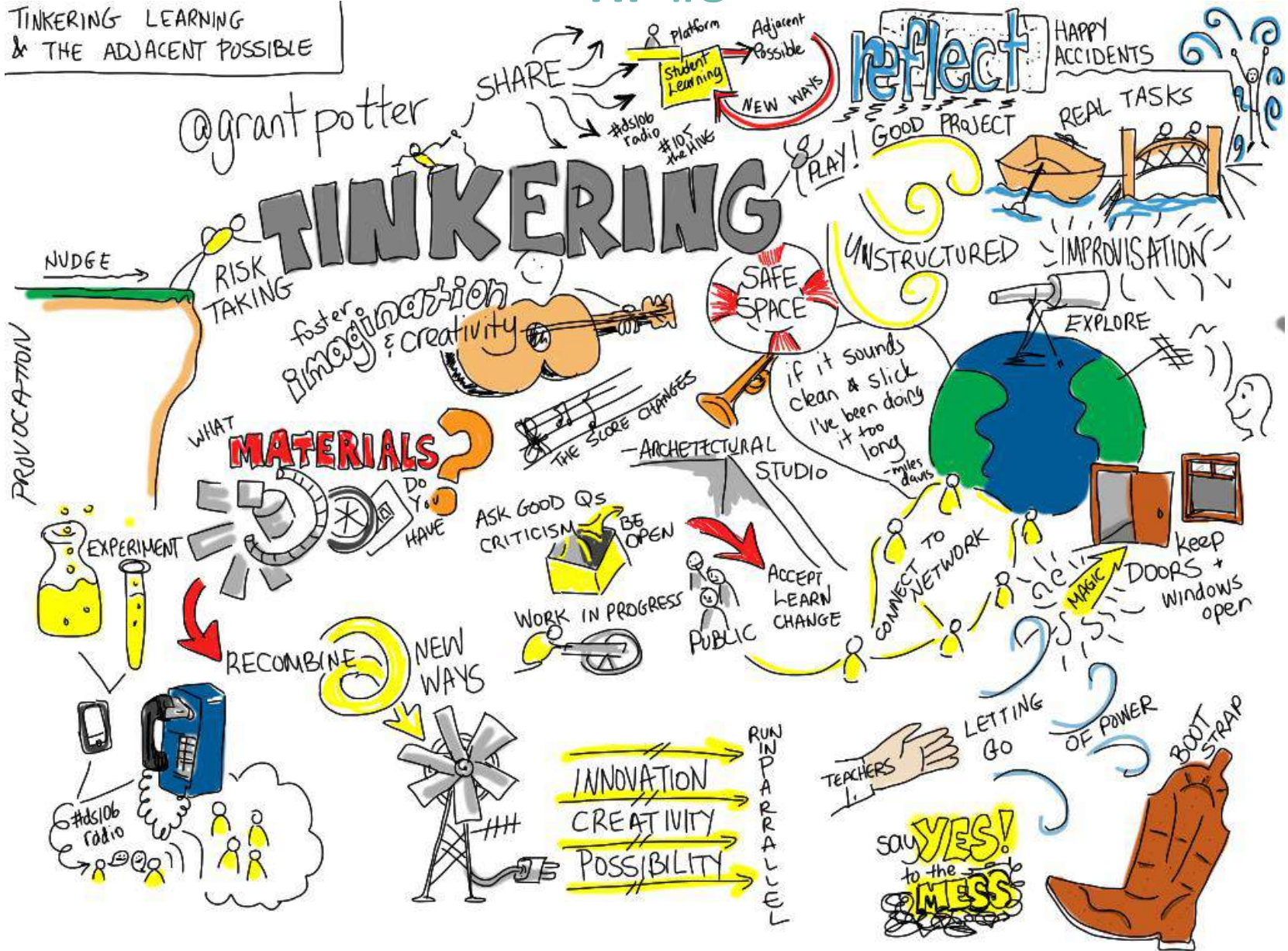
Hour of Code is great...but not enough!



Using various technologies and programs in all classes is encouraged but also think outside the box, *how are some of these tools created?*

TIP #8

TINKERING LEARNING
& THE ADJACENT POSSIBLE

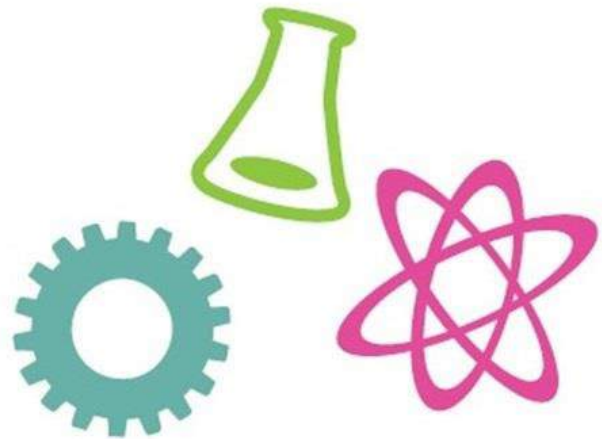


TIP #9 and #10

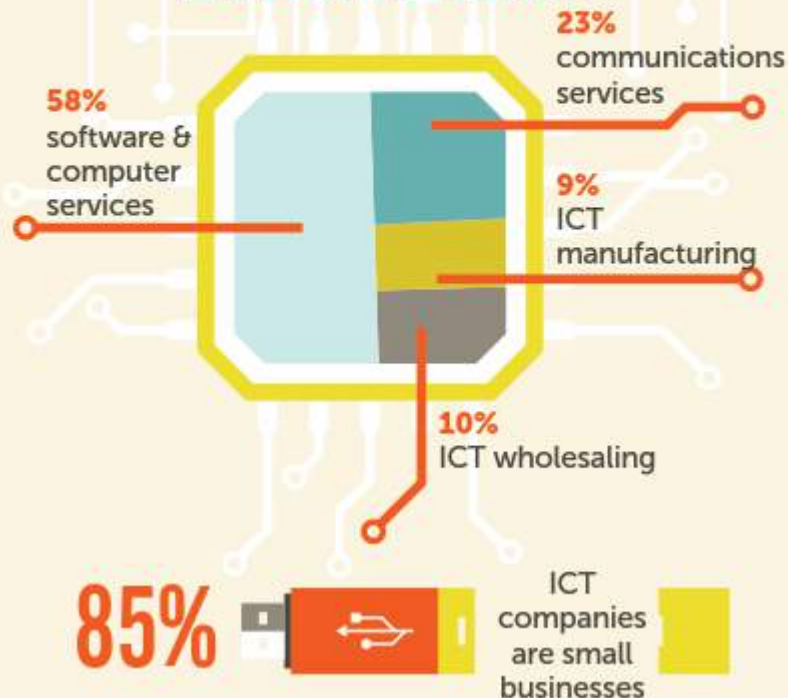
Evaluate your classroom Environment and Encourage Group Work



Why?



ICT JOBS ARE EVERYWHERE



Technology is the major gateway to technical careers –replacing math in that role a generation earlier. (Sanders, 2010)

Technology careers are central to our economy



Twice the number employed in the energy sector, & more than the auto sector

www.WISEatlantic.ca

- **Teacher Resources & Lesson Plans**
- **Videos**
- **Upcoming events**
- **Sign-up for our quarterly newsletter!**
- **Research study on Career influencers and interest of youth in Nova Scotia**



Like us on Facebook and follow us on Twitter and Instagram for up-to-date info on events, resources, and articles of interest in STEM.



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