# The Interactive Equity Guide

## *Gender, Race, & Culture*



This material is based upon work supported by the National Science Foundation under Grant No. HRD-1232461. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.



Recommended citation: Koch, M., Sadker, D., Lara-Meloy, T. , Fujii, R., & Snow, E. (2013). *The Interactive Equity Guide: Gender, Race, and Culture*. Menlo Park, CA: SRI International.

# Table of Contents

"They have to come to the [gender equity] insights; they can't be told the insights."

*– David Sadker*

# Background

This guide was designed for active reading, so it works best if you are doing the activities as you read along. The guide will serve as a reference after you've used it in professional development sessions or on your own. Active reading of this guide will generate equity insights that you can employ with the youth you serve.

## Why is this guide needed

Information and communication technology (ICT) jobs are predicted to grow faster than all other professional sector jobs, up to 22% over the next decade. Yet participation by women and men from certain racial/ethnic groups is low.[i] In 2009, African-American women and men made up 5% of entry-level technical careers and less than 3% of high-level positions, while Latinos/as made up nearly 9.5% of entry-level and only 2.5% of high-level technical positions.[ii] African-Americans and Latinos/as received 10.5% and 8.2% of 2009 computer science bachelor degrees, respectively.[iii] African-Americans and Latinos/as make up approximately 15% of the population.

Youth are often turned away from computer science (as well as other STEM learning careers) in the classroom, in subtle and explicit ways. For example, research shows that there is a hierarchy by gender and race for who gets attention and called upon the most in classrooms. White boys receive the most attention, followed by boys of color (not including Asian). White girls are next and girls of color receive the least amount of attention from teachers.[iv]

Afterschool settings show promise of sparking the interest of and increasing the preparation of underrepresented youth in STEM careers.[v] Research shows that relative to school, afterschool programs provide more equitable (gender, race, and socioeconomic status (SES) opportunities for youth to develop.[vi] Programs adhering to a youth-development framework (e.g., hands-on, culturally relevant, and social impact activities) are more likely to promote positive outcomes.[vii] The presence of caring youth development facilitators who are trained to attend to the whole child plays a critical role in girls' and boys' healthy development and persistence in achieving academic goals and forming STEM identities.[viii]

Researchers have advocated for curriculum that provides culturally relevant and meaningful activities for boys and girls to engage in computer science and professional development for educators that focuses on equitable practices (i.e., activities and pedagogies that engage both girls and boys and are culturally relevant) in the classroom.[ix] These equity practices (gender and culture) are both interwoven and distinct and have been used in coeducational settings to encourage underrepresented populations to pursue IT learning and career interests.

Both the Build IT™ and ICT4me™ curricula and professional development (PD) incorporate these cultural and gender-focused practices. This guide provides details on the key equity issues and best practices so that you can implement them throughout the curriculum. (Note: The curriculum refers to both Build IT™ and ICT4me™ throughout this guide.)

## A word about gender

Our research study does rely on the traditional male-female dichotomy of sex or gender and does not delve into how these categories are in fact socially constructed and performed. While in this research study the researchers map biological sex (male and female) onto gender (male and female, respectively), the researchers recognize that there are multiple genders (e.g. transgender, intersexed, genderqueer) and encourage facilitators to create an environment of gender equity for all. Everyone is welcome in information and communication technology learning and career pursuits.

## Activity 1: Checking in on Equity in Our Lives

Respond to each of the following:

a. Can you remember an example from your childhood of how your race or gender was used to explain your behavior, or prevent you from participating in an activity? How did it make you feel?

b. Do you recall a time when your race or gender was used to explain your behavior or prevent you from participating in an activity as an adult? How did that make you feel?

c. Can you remember an example of how you or a colleague used a youth's race or gender to make a decision in a school or afterschool environment? Was it appropriate? Why? How did you feel? If the decision was inappropriate, did you say or do something about it?

d. Have you ever used race or ethnicity or gender categories to organize or implement a youth activity? Describe it. Do you feel it was appropriate – or would you do it differently now? What insights do you have today about the role of gender or race or ethnicity in working with youth?

Take a few minutes to write down one or more responses to questions a-d. Now in small groups, take a minute or two to share your comments. Then answer the questions:

1. Is it ever appropriate to use a demographic like gender or race or ethnicity in a teaching situation? If so, describe when it is.
2. What are the greatest challenges to fair and equitable instruction?
3. With equity in mind, how will you recruit youth to Build IT™ or ICT4me™?

## Recruitment

The research literature and advice from the field suggest that how, where, when, and by whom youth are recruited into technology programs matter. Below are some best practices for recruiting youth into technology programs, especially youth who may not think they are interested in technology.

***What* content you use** to recruit youth matters. Images in flyers, videos, or other media used to recruit youth should include youth or adults who look like them (i.e. same gender and same racial background):

1) People engaged in using and creating technology
2) People collaborating
3) People creating, building, making something
4) People making a difference for society

Here are a few messages you might use in your flyers, inspired by recruitment slogans from the National Association of Engineers:

- Technology professionals help shape the future
- Technology is essential to our health, happiness and safety
- Technology professionals are creative problem-solvers
- Technology professionals make a world of difference
- Developing new technologies is exciting and rewarding.

***Where*** youth are recruited from matters. If you recruit youth only from mathematics, science or technology classes, you will probably reach students who already have an interest in computers and you may inadvertently discourage those students who don't feel they have the knowledge or interest in computers. Recruit from places where youth are hanging out with their friends, in non-math, science, and technology settings, to encourage youth to attend together or to bring their friends. Make sure your setting reflects your message that the curriculum is really for anyone, anywhere. Word of mouth can be very important. Let networks of parents, teachers, and peers help you.

***Who*** recruits the youth matters. Adults –parents, teachers, and you—are great recruiters. Even better are other students. Encourage students to invite their friends to participate in the curriculum. Write down names of people and organizations that can help you recruit. Develop your recruitment plan and share with others online.

## Activity 2: Brainstorming for Recruitment

1. What would attract middle school boys and girls in your community, primarily from African American and Latino/a backgrounds, to the curriculum? Write down your ideas.
2. Take a look at the sample **Build IT flyers** at http://buildit.sri.com/resources/recruitment.html

   Build IT is a curriculum similar to ICT4me™ developed for the Girls Inc. network of afterschool affiliates. What do you notice about the flyer? How would you use it? How would you modify it? Write down your ideas.
3. Take a look at the **Build IT video**. How might you use the video in your recruiting?
4. Take a look at the **activities in the curriculum**. What activities might you highlight to entice the youth in your community to participate

# In The Classroom

## Everyone has a voice to be heard

Much of equity—whether it's gender, race or otherwise—is what youth development is all about: giving everyone a voice, encouraging participation, supporting the development of the whole child. The sense of belonging and abilities that youth development supports and encourages in youth is often times in contrast to the messages society gives these students about their belonging and ability. The key to equity is to make sure that everyone's voice is heard and their participation is encouraged and appreciated.

So, what else should you look out for? Pretty much you are looking at society's biases, what biases the youth may bring, and your own biases (it's ok, we all have them). At times, you'll want to have discussions about those biases. At all times, you'll want to be sure that everyone is participating. Let's take a look at some potential equity opportunities in the curriculum, classroom environment, classroom management, and interactions with IT professionals.

## Activity 3: Seeing Equity in Action

The NBC Dateline video entitled *Equal Possibilities* shows Dr. Workman and two of his calculus based high school physics classrooms. One classroom is a traditional coeducation class, while the other class is composed of all girls. Dr. Workman approaches teaching these classrooms in very different styles. Watch the videos and share your reactions to these two approaches.

Following the discussion of initial reactions, consider and discuss the following questions:

1. Which teaching style do you prefer?
2. Does it matter whether the students are single sex or coed when using this style?
3. Identify at least 6 teaching activities that Dr. Workman employed in his all-girls class in school that you can use in an all-girls, an all-boys, or a coed afterschool class.

Is the issue single sex or coeducation classes? Or are we watching two different teaching styles: one student based and the other teacher-based? Either style can be used in a single sex or coeducation class. A student-based approach has a better chance of being equitable since it is focused on the needs of the learners.

## Curriculum

Research has shown the benefits of incorporating the following gender-equitable and culturally relevant practices into curriculum and professional development to foster positive classroom interactions among students and between student and educator.[x] These form the foundation of the equitable practices in the curriculum:

### *Address stereotype threat*

Stereotype threat is the threat of being viewed through the lens of a negative stereotype or the fear of doing something that would confirm that stereotype.[xi] The curriculum builds on research that suggests that teaching students about stereotype threat (the explicit and implicit messages that tell a youth they have a set ability because of their gender or race)[xii] and exposing them to role models in math and science[xiii] can alleviate the threat. Carol Dweck's research that advocates for encouraging students to think of their math learning requiring effort rather than innate abilities can lift stereotype threat and positively affect students' performance.[xiv]

Stereotyping affects all of us. The National Center for Women in Information Technology (NCWIT) in their publication, *Girls in IT: The Facts* (2012), highlights the following examples:

- White male engineering students get lower-than-usual test grades when told in advance that Asian students typically score higher than any other group on math tests.[xv]
- Other experiments have shown that African American students underachieve on academic tests when told racial stereotypes about intelligence prior to testing.[xvi]
- Women underperform on math tests when gender is called to their attention.[xvii]

To learn more ways to reduce stereotype threat, see http://reducingstereotypethreat.org/.

### *Provide role models*

ICT role models are important for girls and boys in alleviating stereotype threat and encouraging their pursuit of STEM careers.[xviii] Youth need to see people who look like them in ICT careers. Research on the curriculum has shown the aspirational value of providing afterschool staff with professional development to engage effectively with STEM professionals to maximize the benefits of these role models for girls.[xix] The curriculum provides resources for all stages of engaging with ICT professionals. The curriculum helps you identify, recruit, plan visits and fieldtrips, support, co-facilitate with, and stay connected to ICT professionals for activities and interactions with your youth.

### *Encourage effort-focused mindset*

Dweck's research on ability-focused (intelligence is fixed) versus effort-focused (intelligence can grow and be modified) thinking shows the power of having youth engage in activities and reflection that help them see that effort and an effort-focused mindset are more important than ability.[xx] In the curriculum, we use discussion and activities that expose the benefits of an effort-focused mindset to encourage these individuals to persist specifically in mathematics and technology. In mathematics and computer science, where girls may feel performance anxiety, girls who adopt an effort-focused mindset have shown persistence.[xxi] Tai and his colleagues show that interest and confidence in mathematics are better predictors of persistence in achieving a STEM career than mathematics performance.[xxii]

See the Growing Minds Activity in the Youth Activities section for an example of how to bring these ideas into your afterschool program.

### *Encourage collaboration*

Collaboration is important in technology design and development.[xxiii] Youth need to experience collaboration in ways that encourage the participation of boys and girls. Pair programming— two programmers work together at one workstation—and collaborative design teams have shown value for girls in gaining interest in computer science learning and career pursuits.[xxiv] Collaboration also benefits boys; however, coeducational settings often require specific strategies to encourage equal participation of girls and boys.[xxv] The curriculum weaves collaborative design teams throughout the curriculum, beginning in Unit 1 with simple pair teams. By Unit 5, youth are leveraging expertise in diverse, whole class teams to design a game, similar to software engineering teams.

### *Provide time for play: tinkering and non-programming computer play*

Researchers have noted that access to technology outside the school day that allows for tinkering and play encourages technology interest; this type of access may be elusive for girls, African-Americans, Latinos/as, and youth from low socio-economic backgrounds.[xxvi] Youth who do not have regular physical access to technology and a community of peers or mentors who encourage this computer play do not have the opportunities to tinker.

In addition to tinkering on the computer, non-programming, often technology-free activities in which youth engage with computing concepts in fun hands-on activities can encourage these underrepresented populations to explore ICT. A wide array of computer science tasks done offline such as design, usability testing, troubleshooting, problem solving, leadership, and collaborative team-building provide inroads into computing for those who would not necessarily find a path to a computer science career, such as girls and African American and Latino boys.[xxvii] The curriculum includes many design-based challenges that encourage computer play and exploration of non-programming information technology tasks.

### *Show the social impact of technology and computer science*

Girls especially benefit from seeing and experiencing how technology and computer science careers can help people.[xxviii] The social impact of technology can also encourage boys in these careers. Here are a few examples: the Internet has changed the way we access and use information, do business, learn, and play; mobile devices have changed how and when we communicate. Both of these technologies have made scores of other technologies either possible or accessible. The curriculum provides an opportunity for youth to explore and create these technologies and their social impacts.

### *Connect content to their lives and their communities*

Both boys and girls need opportunities to connect their cultural identity and their ties to their family and ethnic group with their STEM achievement.[xxix]

In addition, to encourage youth's interest in ICT, the curriculum includes the following:

- Opportunities for reflection on what they are learning
- Discussion of how to achieve these careers, including courses they would need to take (connect long-term goals)

- Project- and design-based activities
- Diverse roles on teams for collecting information about careers and for developing technology – everyone experiences all the roles at least twice, then they can choose what they prefer.

## Activity 4: Checking Your Surroundings

There is an expression, "If the walls could talk." Actually, they do. What is posted on the walls and in the display cabinets and all around the building convey expectations and values to youth, possible futures as well as less likely or impossible futures. The building's walls send a powerful message of what society expects. Take an inventory of your building, of the messages being sent. As you contemplate the displays (posters, photos, artwork, awards, names, etc.), consider:

- What are these walls saying to you?
- Which genders, races, and ethnicities are depicted?
- How are members of these groups portrayed?
- Are there groups missing? Which ones?
- How would you characterize the treatment of these different groups and genders?
- Are all groups represented in careers, or is there career segregation?
- What careers are valued? (Are STEM and IT careers valued?)
- Are there awards or trophies displayed? What behaviors are being honored?
- What roles do youth play in deciding what should be honored and displayed? What role do they play in creating such displays?
- What is the most powerful display? Why?

Now, what do you need to do to make the environment inviting to all? Check out the next section, Classroom Environment.

## Classroom Environment

### *The Hidden Curriculum*

These are unstated lessons that youth learn in afterschool (note: we are not taking on the school's hidden curriculum. Only if youth bring it up for discussion do you address it.) "The hidden curriculum is the running subtext through which educators communicate behavioral norms and individual status in the [after]school culture and process of socialization that cues children into their place in the hierarchy of larger society."[xxx] Pay attention to the subtle and not so subtle messages you and the youth are giving each other about their place in the hierarchy. Discuss these messages and what new approach everyone may need to take to create an equitable environment.

### *Language*

Avoid using pronouns that indicate gender (e.g., talk about users, people, parents instead of he, she, mom, dad). Use inclusive words (e.g. firefighter instead of fireman). For help with inclusive words, see *The Nonsexist Word Finder* by Rosalie Maggio. You can get a used copy for under $1 on Amazon.com.

***Environment.*** All youth need to feel welcome and part of the group. Hearing and seeing that their voice and participation matters to you and other youth is critical.

1. Set norms and expectations for oral participation (e.g. listening when others speak, making sure that they contribute meaningfully to the conversation) and behavioral participation (e.g. taking on all roles offered at some point, doing the hands-on activities.)
2. Ask the youth why these norms and expectations are important. Encourage them to recognize that all voices matter, everyone gains from everyone's participation (what they learn, how much fun they have in class, etc.). It's not a *have to*, but a *want to* for the collective benefit.
3. Encourage youth to participate in keeping the environment equitable. If they see someone being left out or feeling left out, encourage them to participate. Respectfully, call the facilitator's attention to the issue.

Be sure that the physical space itself is pleasing to girls and boys of multiple cultures and backgrounds. Create a space where everyone is encouraged to design and collaborate. Arrange the room to reflect this creative space as much as you can (e.g. arrange desks in small groups or a horse shoe; putting interesting objects and bright colors on the walls; put up posters of IT folks (men and women, multiple races) collaborating).

### *Stereotypes*

The curriculum is designed to address stereotypes about computer science. For example, many youth think that a computer scientist or anyone who writes computer code or builds computers is a white male working alone in a cubicle and is socially challenged. The word 'scientist' often denotes images of Albert Einstein-type characters. The ICT professionals you introduce youth to, plus the posters you have in the room, and the conversations you have about women, African Americans, and Latinos/as in the fields will work to counter these stereotypes.

When youth see people who look like them in these careers, who frequently interact with people in their work, have families, AND are capable and expert in designing, coding, and creating new technologies, youth's images of these careers begin to change. Now, the outside world telling youth that people like them aren't in those careers is still there. Be prepared to have conversations about stereotypes in general, why there are so few women and certain racial groups in these fields, and why it's important that all people feel welcome in a field. Here are a few tips:

- ***What is a stereotype?***
  A widely-held and oversimplified image or idea of a particular type of person or thing. Here we are concerned with stereotypes that discourage youth from pursuing learning and career interests.

- ***Why are there so few women, African Americans, and Latinos/as in technology?*** A combination of access and stereotype-threat play a role in getting started in STEM. Strengthening youth's effort-focused mindsets can help them continue their pursuits, STEM or otherwise. The curriculum addresses these three barriers for mathematics, computer science, and technology.
- ***Why is it important that all people feel welcome in the field?*** All of us are technology consumers, in terms of want or need. If only a subset of the population is designing these tools, we all are denied innovations that can meet our needs.

See the Reducing Stereotypes Activity in the Youth Activities section for an example of how to bring these ideas into your afterschool program.

### *Encouragement*

The curriculum has activities that encourage youth to experience and understand that achievement in STEM requires effort rather than innate ability. You'll want to be sure that beyond these activities your praise and encouragement of all youth reflect this effort-focused mindset. Here's a comparison of ability- vs. effort-focused statements:

| **Ability-focused (inspire fixed mentality)** | **Effort-focused (inspire growth mentality)** |
|---|---|
| You are either good at math or you are not. | Anyone can learn mathematics, if they try. |
| You have to have spatial reasoning skills to be an engineer. | You need to learn spatial reasoning skills to be an engineer. |
| You are great with technology. | You did a good job developing that website. |
| You must be really smart to have done these mathematics problems. | You must have worked hard at these mathematics problems. |
| Euclid and Lovelace are two brilliant mathematicians who were geniuses. They had natural talent in mathematics. | Euclid and Lovelace were dedicated mathematicians committed to mathematics. Overtime, their passion for math led them to develop extraordinary mathematics skills. |
| Teacher compares students to each other. (e.g. grading on a curve) | Teacher compares individual students' last performance to their current performance, noting change. |

See the Growing Minds Activity in the Youth Activities section for an example of how to bring these ideas into your afterschool program.

## Activity 5: Encouraging Interaction

Addressing bias, stereotypes and inequality doesn't always come easy, and it certainly doesn't automatically become part of one's repertoire simply by reading a book or attending a lecture. Role play or rehearsal gives us an opportunity to safely play act some of the

inequities presented and to practice different ways to respond, address, and behave when confronted with them. The following role playing games offer an opportunity to see subtle and not so subtle biases acted out, and to practice addressing them using some of the methods discussed earlier. These scenarios are based on research studies, and you may find some of them quite familiar.

Each role-playing game involves 5 players (either adults or youth), and any number of observers. The players enact an after-school situation, with one person acting as the facilitator and the others as youth. In each game, the players are endowed with specific biases and stereotypes to enact. Observers are asked to analyze and comment on what biases and inequities they see and what methods they observed the facilitator using. If you have a large group, you can have several groups enact each game and then compare observations about strategies.

**Preparation:**

1. Below are four research-based games. There is no need to do all, and you can create other situations that closely reflect equity challenges that you are likely to encounter while teaching the curriculum.
2. Have a time-keeping device available. Each game should take 10 minutes and debrief another 10 minutes.
3. Use as context a technology-based endeavor to relate to the curriculum experiences you'll soon have, such as designing a new technology, creating a website, or building a new toy or game.
4. Print rules cards for the players, but do not show them to the observers or each other.
5. Be prepared to moderate time, and ask these debrief questions at the end of each game.
    a. Ask the observers to describe the inequalities they saw. If done subtly enough, they might not see anything at all.
    b. Ask observers and participants to describe the facilitation techniques that were tried out.
    c. Ask all to report on additional strategies for addressing the gender imbalance.
6. Make a list of facilitation moves to address the inequalities uncovered in the games.

### GAME 1: INEQUITY, BOTH VERBAL AND NON-VERBAL

2 Players are female
2 Players are male
1 Facilitator

**Rules:**

**Facilitator:** Your goal is to determine the type of gender or race imbalance in the group and develop some facilitation moves to address them.

**Males**:

- Talk more often than females
- Interrupt when females speak
- Take up more space
- "Do" the work (experiment, keyboard,

**Females**:

- Do not interrupt when males speak
- Take notes
- Record readings
- Hold equipment

etc.)

- Watch

### Game 2 – Reverse Gender Roles

Game 2 reverses the roles of males and females in the role play. The audience is frequently more likely to see the bias issues when the genders are reversed.

2 Players are female

2 Players are male

1 Facilitator

**Rules:**

**Facilitator**: Your goal is to determine the type of gender or race imbalance in the group and develop some facilitation moves to address them.

**Females**:

- Talk more often than males
- Interrupt when males speak
- Take up more space
- "Do" the work (experiment, keyboard, etc.)

**Males**:

- Do not interrupt when females speak
- Take notes
- Record readings
- Hold equipment
- Watch

### Game 3 – Apply to Race or Ethnicity Groups

2 Players are Latino/a and/or Black

2 Players are White

1 Facilitator

**Rules:**

**Facilitator:** Your goal is to determine the type of gender or race imbalance in the group and develop some facilitation moves to address them.

**White students:**

- Talk more often than Latino/a and/or Black students
- Interrupt when Latino/a and/or Black students speak
- Take up more space
- "Do" the work (experiment, keyboard, etc.)

**Latino/a and/or Black students:**

- Do not interrupt when whites speak
- Take notes
- Record readings
- Hold equipment
- Watch

### GAME 4 – REVERSAL OF ROLES FOR RACE OR ETHNICITY GROUPS

2 Players are Latino/a and/or Black

2 Players are White

1 Facilitator

**Rules:**

**Facilitator:** Your goal is to determine the type of gender or race imbalance in the group and develop some facilitation moves to address them.

**Latino/a and/or Black students:**

- Talk more often than whites
- Interrupt when whites speak
- Take up more space
- "Do" the work (experiment, keyboard, etc.)

**White students:**

- Do not interrupt when Latino/a and/or black youth speak
- Take notes
- Record readings
- Hold equipment
- Watch

**Discussion**

Discuss what you know from the research (shared above), the next section on Classroom Management, and your own experience to remediate these biases, if they have not been mentioned and added to the list of useful facilitation moves. The following points may also be used as discussion topics:

- Effective teaching means equitable teaching. If some youth are not included, and do not learn the skills as well as others, the effectiveness of the teacher is compromised.
- A group that dominates the verbal content and the physical space is demonstrating its entitlement, its privileged status. This same phenomenon is true for individuals who dominate. Such domination can detract from the effectiveness and harmony of working teams, as well as lose the talents and insights of all members.
- Part of our job is to teach not only IT and STEM content, but the skills needed for success and fairness in the STEM learning environment and in the workplace. No one person or group has a monopoly on all the skills and insights needed for success. No one group or person should dominate the conversation, the air waves or the work space. Everyone's comments and insights should be considered.
- Research tells us that some groups dominate, while others are relegated to the background. For example, boys and men tend to talk more in public. So boys could use some practice learning how to listen more carefully. Put another way, boys need to work on developing a "public ear", and girls a "public voice". (This is also often the case among many adults, as men often talk more and women typically listen more.) Males also take up more space, at work and at home. Dominating the space and the airwaves is a sign of power, and in our culture, men act as though they are more powerful – and often they do not even know this! But in a learning climate, or in a workplace, these inequalities can be problematic. Attending to these culturally

accepted inequalities early means insuring fairness in the learning climate. Creating equitable workspace and discourse is more than promoting *political correctness* or being "pc": it establishes a more equitable and effective learning climate.

While some genders and racial groups may dominate, not everyone in the group does. So individuals, regardless of group membership, must be considered as individuals, and insured equal learning opportunities. So when a female dominates the conversation, she must learn that this is a problem (for her and others). The instructor must insure that there are opportunities for the other youth to ask and answer questions as well. Likewise, the quiet boy needs to develop a public voice, so that his insights and thoughts can be heard and considered. While group membership tells us who is more likely to act in one way or another, the individual learner trumps group membership. The bottom line is to make certain that all youth are involved equitably.

## Classroom Management

### *Voice*

Everyone has one and it needs to be heard. Have a method for making sure you are calling on everyone as equally as possible. Let youth know that's the deal. Everybody's voice is important and let them help you make sure everyone is heard. Here are a few ideas for how to make that happen. Feel free to add your own:

- Think Pair Share. After you ask a question, give youth a minute to *think* about their answers (individually). Then, ask youth to get together in *pairs* to share their answers. Finally, ask the question again, and you'll be surprised how many youth are willing to *share* their responses. You can also ask youth to share their partner's thoughts or what they found interesting about what their partner shared.
- Popsicle sticks and a jar. Put the name of each student on a popsicle stick. Each time a student engages in the discussion, put their stick in the jar. Before the end of class, notice who hasn't spoken and encourage them to share.
- Establish norms with the youth about classroom discussions that encourage everyone to share. For example, everyone shares at least once a session. If you've shared more than 3 times, encourage others to share. Let youth help you create the norms given the premise that "everyone has a voice to be heard and hands to help."

### *Groups*

The curriculum provides guidance on how best to organize small groups for specific activities. Here are a few general guidelines to help you:

- Establish the classroom norm for the whole group as well as small groups: Everyone has a voice to be heard and hands to be used.
- In co-education settings, sometimes you want co-ed groups and sometimes single sex. For example, if there are equal number of boys and girls, do more co-ed groupings. If there are fewer girls in the class, make sure more than one girl is in any small group.

- Make sure that all group members (whether small groups or large groups) experience all roles. In other words, the same person should not be always driving the computer or the lead on taking pictures on field trips.

## ICT Professionals

Selection of ICT professionals is very important. Make sure that you do have **at least two ICT professionals for each unit**. More is even better. Youth need to see people who look like them doing technology. The curriculum provides you with three guides to help you find, plan, and work with ICT professionals. One guide, the ICT Professional Planner, will help you prepare for the ICT professional visit or fieldtrip. The other guides, the ICT Professional Visit Packet and the ICT Professional Fieldtrip Packet, are for you to give to each ICT professional to help him or her prepare for what to do before, during, and after their visit to your site or a fieldtrip to their offices.

A few key elements regarding the ICT professional visits and fieldtrips relevant to this study are:

1. The ICT Professional should look like youth in that class. That means for all boys, mostly men; all girls, mostly women; co-ed, have an equal mix. The ICT professionals should reflect the races of youth as well. Have pictures on the walls in the classrooms that show an equal mix of men and women in these careers.
2. We know that logistically for fieldtrips and visits, it will be helpful to have all youth from each of the three conditions (i.e. class/group of all boys, all girls, co-ed) attend. Make sure that youth in each condition interact with the ICT professional *separately*. That is if youth from all three conditions are going on a site visit together, for convenience, allow each condition to have separate interactions with the ICT Professional. The reason for this is that in this study, we are investigating the impact of these conditions on the youth so mixing the conditions disrupts the study. The solution? Think stations.
    - On Fieldtrips, a professional interacts with one condition, while other two conditions are doing something else (e.g. scavenger hunt, developing a website, interacting with other IT professionals). The conditions can cycle through the stations
    - Site visits from an ICT professional: while one condition interacts with the ICT professional, the other two conditions are doing something else (sports, homework, relevant stations, etc.). The conditions can cycle through the stations.

## Resources

**National Center for Women in Information Technology (NCWIT)**

*https://www.ncwit.org/*

*Excerpted from website:* NCWIT works to correct the imbalance of gender diversity in technology and computing because gender diversity positively correlates with a larger workforce, better innovation, and increased business performance. Increasing the number of women in technology and computing also has the potential to improve the design of products and services to better serve a more diverse population, and increase economic and social well-being by providing more women with stable and lucrative careers. NCWIT provides valuable research summaries and resources (https://www.ncwit.org/resources) on the state of women and girls in computing.

**Reducing Stereotype Threat**

http://reducingstereotypethreat.org/

*Excerpted from website:* This website is for faculty, teachers, students, and the general public interested in the phenomenon of stereotype threat. It offers summaries of research on stereotype threat and discusses unresolved issues and controversies in the research literature. Included are some research-based suggestions for reducing the negative consequences of stereotyping, particularly in academic settings.

***Unlocking the Clubhouse: Women in Computing***

By Jane Margolis and Allan Fisher

http://www.amazon.com/Unlocking-Clubhouse-Computing-Jane-Margolis/dp/0262632691/ref=sr_1_1?s=books&ie=UTF8&qid=1367440779&sr=1-1&keywords=unlocking+the+clubhouse

*Excerpted from Amazon.com:* The information technology revolution is transforming almost every aspect of society, but girls and women are largely out of the loop. Although women surf the Web in equal numbers to men and make a majority of online purchases, few are involved in the design and creation of new technology. It is mostly men whose perspectives and priorities inform the development of computing innovations and who reap the lion's share of the financial rewards. As only a small fraction of high school and college computer science students are female, the field is likely to remain a "male clubhouse," absent major changes.

***Stuck in the Shallow End: Education, Race, and Computing***

By Jane Margolis, Rachel Estrella, Joanna Goode, Jennifer Jellison Holme, and Kimberly Nao

http://www.amazon.com/Stuck-Shallow-End-Education-Computing/dp/0262135043/ref=sr_1_1?s=books&ie=UTF8&qid=1367441023&sr=1-1&keywords=stuck+in+the+shallow+end

*Excerpted from Amazon.com:* The number of African Americans and Latino/as receiving undergraduate and advanced degrees in computer science is disproportionately low,

according to recent surveys. And relatively few African American and Latino/a high school students receive the kind of institutional encouragement, educational opportunities, and preparation needed for them to choose computer science as a field of study and profession. In *Stuck in the Shallow End,* Jane Margolis looks at the daily experiences of students and teachers in three Los Angeles public high schools: an overcrowded urban high school, a math and science magnet school, and a well-funded school in an affluent neighborhood. She finds an insidious "virtual segregation" that maintains inequality.

***Still Failing at Fairness: How Gender Bias Cheats Girls and Boys in School and What We Can Do About It***

By David & Myra Sadker & Karen R. Zittleman

http://www.amazon.com/Still-Failing-Fairness-Gender-Cheats/dp/B002PJ4J2O/ref=sr_1_1?s=books&ie=UTF8&qid=1367445160&sr=1-1&keywords=still+failing+at+fairness

*Excerpted from Amazon.com:* Despite decades of effort to create fair classrooms and schools, gender bias is alive and well, and in some ways growing. School practices continue to send boys and girls down different life paths, too often treating them not as different genders but as different species. Teachers and parents often miss the subtle signs of sexism in classrooms. Through firsthand observations and research, *Still Failing at Fairness* brings the gender issue into focus.

The authors provide an in-depth account of how girls' and boys' educations are compromised from elementary school through college, and offer practical advice for teachers and parents who want to make a positive difference. The authors examine today's pressing issues -- the lack of enforcement for Title IX, the impact of the backlash against gender equity, the much-hyped "boys' crisis," hardwired brain differences, and the recent growth of single sex public schools. This book documents how teaching, current testing practices, and subtle cultural attitudes continue to short-circuit both girls and boys of every race, social class, and ethnicity. Hard-hitting and remarkably informative, *Still Failing at Fairness* is "a fascinating look into America's classrooms" (National Association of School Psychologists).

## Youth Activities

1. Growing Minds
2. Recognizing Stereotypes

# Growing Minds

## *Summary*

### Schedule

| | | |
|---|---|---|
| **Warm-Up** | Youth act out skits showing the fixed and growth mindsets.<br>Youth learn that math and technology design and development take work, but everyone can do them. | 25 min |
| **Total Time** | | **25 min** |

### Materials

- Two Mindsets PDF
- Skit scenario handouts

## *Getting Ready*

### Overview

During this 25 minute activity, youth will act out several skits of different mindsets leading to a discussion about how they can learn to "grow their brains" with practice.

### Glossary

- **Mindset**. A mental belief about something that predetermines a person's responses to and interpretations of situations.
- **Malleable**. Capable of change or ability to adapt to different circumstances.

### Background

According to the research by Carol Dweck, there are two kinds of mindsets. There are people who believe that intelligence is innate, and others who believe that intelligence is developed. We've created an activity based on the Doing What Works website to help you get youth to start believing that their intelligence is like a muscle and that the more they exercise it, the more it grows/changes and is capable of handling more work.

## Preparation:

Make sure you give yourself about an hour for learning the material that's provided at http://dww.ed.gov/practice/practice_landing.cfm?PA_ID=8&T_ID=18&P_ID=34. It's up to you to repeat throughout the summer and school year some of these mantras, and remind the youth that they can learn math, science or anything if they set their minds to it.

Print and enlarge the Two Mindsets PDF to have a resource youth can see in the room throughout the summer program.

## Sources:

- Doing what works: http://dww.ed.gov/practice/practice_landing.cfm?PA_ID=8&T_ID=18&P_ID=34.
- Carol Dweck, change your mindset: http://www.mindsetonline.com/changeyourmindset/firststeps/index.htm

## Warm-Up

| | |
|---|---|
| **Time:** | 25 minutes |
| **Purpose:** | Youth act out skits showing the fixed and growth mindsets. Youth learn that math and technology design and development take work, but everyone can do them. |
| **Materials** | • Overhead or flipchart paper<br>• Two Mindsets PDF<br>• Markers<br>• Skit scenarios handouts |

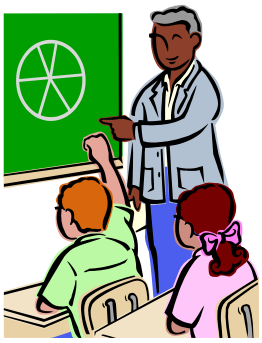
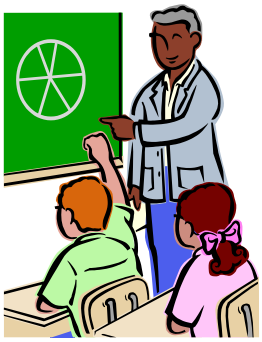
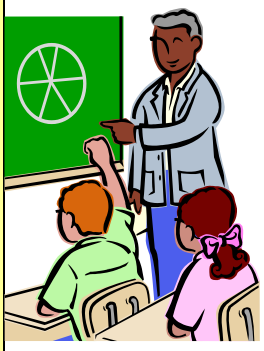
## To Do:

1. Put up an eye-catching poster (colorful-handwritten flipchart is fine) with the headline phrase: You Can Grow Your Intelligence: New Research Shows the Brain Can Be Developed Like a Muscle!
2. Include the following text on the poster: Many people believe that a person is born either smart, average or dumb—and stays that way for life. But new research shows that the brain is more like a muscle—it changes and gets stronger when you use it. Your brain gets stronger when you learn!
3. Tell youth that they will act out short skits to show different ways of thinking about intelligence and talent.
    a. Hand out a skit packet to trios of youth. Each packet should include one scenario, one fixed mindset quote, and one growth mindset quote.
    b. Say: one of you will read out the scenario and the other two will present their views on what the narrator should do (based on their handouts). Tell them this is like a debate – even if they don't agree with cards, they should try to portray the two opposing views genuinely.
    c. Give youth 5 minutes to discuss their scenario and plan a 30 second skit.
4. Give each team 30 seconds to play out their skit. After every skit, ask the public – the rest of youth - to select the point of view showing a person who is growing their brain and their intelligence/talent, and which point of view represents someone who will not gain from this challenge or setback.
5. Place the growth phrase on the growth side of the Mindset PDF where everyone can see it. Do the same with the fixed mindset phrase.
6. (5 min) Have participants discuss examples from their own experiences when they grew their own intelligence.

# Activity Pages

- Two Mindsets (see separate PDF)
- Scenario Packets

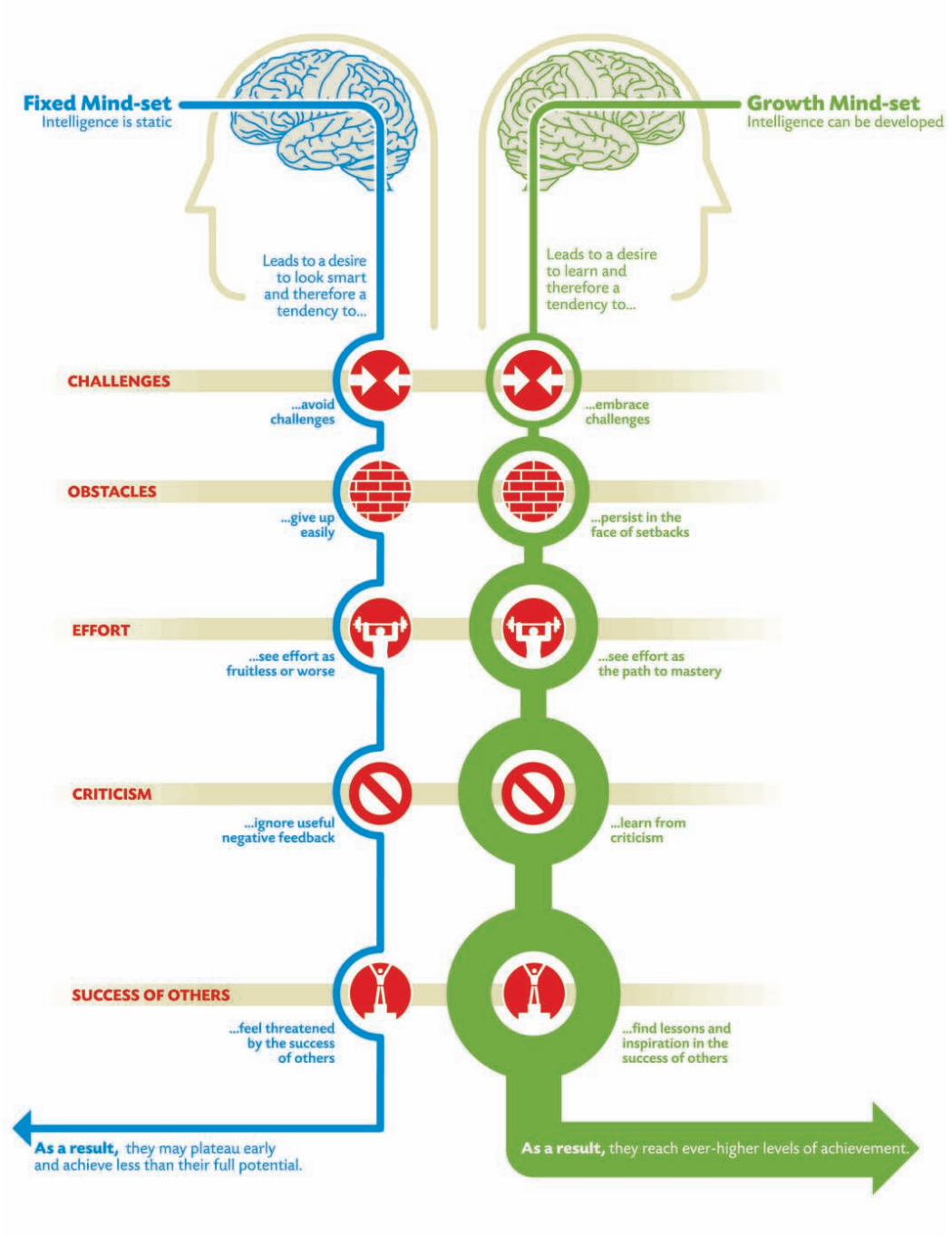
## Scenario Packets

| | Scenario | FIXED Mindset | GROWTH Mindset |
|---|---|---|---|
| Challenge |  You just moved and started a new school. You are doing ok in all your classes, but you are still a bit nervous about being new. During your second week of school, the math teacher asks you to solve the problem of the day in front of the class. What goes through your mind? What do you do? | *"Are you sure you can do it? Maybe you don't have the talent."* | *"I will try because it will push me to become better."* |
| |  You just moved and started a new school. You are doing ok in all your classes, but you are still a bit nervous about being new. During your second week of school, the math teacher asks you to solve the problem of the day in front of the class. What goes through your mind? What do you do? | *"What if you fail—you'll be a failure"* | *"Most successful people had failures along the way."* |
| |  You just moved and started a new school. You are doing ok in all your classes, but you are still a bit nervous about being new. During your second week of school, the math teacher asks you to solve the problem of the day in front of the class. What goes through your mind? What do you do? | *"If you don't try, you can protect yourself and keep your dignity."* | *"If I don't try, I automatically fail. Where's the dignity in that?"* |

| | | | |
|---|---|---|---|
| **Setback** |  Today you got back your score on a biology test that you studied for. Your score was 72%. What goes through your mind? What do you do? | *"This would have been a snap if you were truly smart."* | *"Basketball wasn't easy for Michael Jordan and research wasn't easy for Jane Goodall. They had a passion and put in tons of effort."* |
| **Effort** |  You are a part of the drama club that is putting on Rent. You still have lines to memorize for tomorrow's rehearsal, but your friends are going over to Jenny's to play videogames this afternoon. What goes through your mind? What do you do? | *"I'm good at this, I can read my lines tomorrow before rehearsal and I'll be fine."* | *"I have to put in the effort: paid actors have to work hard to learn their lines."* |
| **Criticism** |  Your soccer coach calls you to the sidelines and privately offers you some constructive criticism on your technique. He says that you need to accelerate away from the defender next time. What goes through you mind? What do you do? | *"It's not my fault. It was something or someone else's fault."* | *"If I don't take responsibility, I can't fix it. Let me listen—however painful it is– and learn whatever I can."* |
| **Success of others** |  You and your older sister have been practicing for a solo dance competition. She is really good at practicing everyday. You feel confident in your ability to dance better. As it turns out, your sister wins the dance competition and you don't even qualify for third place. What goes through your mind? What do you do? | *"Who does she think she is? I'll put her in her place."* | *"My sister deserves to win. What can I learn from her?"* |


**Figure 1. Go to http://dww.ed.gov/launcher.cfm?media/MathScience/Girls/NF/See/467_nf_two_mindsets.pdf to download a higher resolution copy of these two images from the Doing What Works Clearinghouse.**

Two Mindsets—*Graphics by Nigel Homes based on research by Carol Dweck*



# Recognizing Stereotypes

## *Summary*

### Schedule

| | | |
|---|---|---|
| **Warm Up** | Youth learn what a stereotype is. | 10 min |
| | Youth experience being stereotyped and reflect on its impact. | 20 min |
| **Total Time** | | **30 min** |

### Materials

- Overhead or flip chart paper
- Markers
- Adhesive labels, one per youth

## *Getting Ready*

### Overview

During this 30-minute activity, youth will define stereotype and participate in activity to connect stereotype threat and their impact on career and education goals.

### Glossary

- **Stereotype**. A widely held and oversimplified image or idea of a particular type of person or thing.
- **Stereotype Threat**. The threat of being viewed through the lens of a negative stereotype or the fear of doing something that would confirm that stereotype.

### Background

Research has shown that stereotypes and stereotype threat situations have a profound impact on how people perform in a specific situation and long-term impacts on their education and career choices. To learn more about stereotyping and stereotype threat, review the *Gender Equity Guide* provided with the curriculum.

## Preparation:

Obtain the same number of adhesive labels as there are youth in your class, and write a stereotypic attribute on each label. Some examples include *deaf, blind, elderly, athletic, cute, overemotional, incompetent, good at math, bad at math, good at computers, bad at computers, lazy, untrustworthy, musical, materialistic, diseased, unintelligent, exotic, forgetful,* and *frail*. Include the math and computer examples since you want to talk about those stereotypes specifically in the curriculum.

## Sources:


- Adapted from Goldstein, S. B. (1997). The power of stereotypes: A labeling exercise. *Teaching of Psychology*, *24*, 256-258.
- Social Psychology Network http://www.understandingprejudice.org/teach/activity/labels.htm
- Discovery Education's Understanding stereotypes http://www.discoveryeducation.com/teachers/free-lesson-plans/understanding-stereotypes.cfm

## Warm-Up

| | |
|---|---|
| **Time:** | 30 minutes |
| **Purpose:** | Youth learn what a stereotype is.<br>Youth experience being stereotyped and reflect on its impact on their education and career goals. |
| **Materials** | • Overhead or flipchart paper<br>• Adhesive labels, one per youth<br>• Markers |

### To Do:

### Part I

1. Ask youth: If you needed to know where the computer lab is in a new school, who would you ask? [Write youth's responses down so all can see. Possible responses include: a teacher, a youth, a youth carrying a computer]
2. Ask youth: How do you find out when basketball practice is on Friday at the same school? [Possible answers: cheerleader, tall youth, youth with athletic builds, youth with basketball jerseys, jocks]
3. Ask youth: What are all of these things called that we've listed here? [labels, categories]
4. Explain that categorizing or labeling can be based on such characteristics as clothing, looks, the way a person talks, or the groups to which he or she belongs. Explain that categorizing things or people is a natural human inclination. It's how we make sense of the world.
5. Ask youth: Now, what if made assumptions about these groups of people. What if we expected all jocks to be dumb and all youth carrying computers to be smart? [youth may offer the word stereotype or bias]
6. If youth have not offered the words stereotype or bias, ask youth: What's it called when we make assumptions about groups of people we don't know? [bias, stereotype]

### Part II

7. Ask youth:
    a. What stereotypes have you seen or experienced?
    b. How do you think stereotypes make people feel?
    c. Do you think stereotypes impact how people behave? How?
8. Invite youth to participate in a labeling activity. Tell youth that the experiences they each have in the activity will aid them in having a discussion about the impact of stereotypes. Tell youth that participation in this exercise is optional, and that anyone who prefers not to participate can play the role of an observer.

9. Next, attach a pre-made label on each youth's back so that the label is not visible to the wearer. Make clear that these labels are being assigned randomly. You might have youth line up to receive a label and show that you are pulling labels in order.
10. Ask youth to spend 10 minutes talking with each other about "future goals in education and their careers". Tell youth that they should talk as many youth as they can, and that they should treat one another according to the other person's labeled attribute. For example, someone labeled "forgetful" might be repeatedly reminded of the instructions.
11. After 10 minutes, reconvene the class and ask youth to leave their labels on for a little while longer (if the class size and furniture allows, it's best to sit in a circle). Then ask youth to share how they felt during the exercise, how they were treated by others, and how this treatment affected them. [Possible responses might be discomfort not only with being stereotyped but with treating others stereotypically.]
12. Tell youth that they can now remove/read their labels. Then lead a whole group discussion. Below are some questions to prompt discussion:
    - Did you guess your label? Were you surprised by it?
    - When people stereotyped you, were you able to disregard it?
    - Did you try to disprove the stereotype? If so, did it work?
    - How did you feel toward the person who was stereotyping you?
    - If your attribute was positive (e.g., "good at math"), how did you feel?
    - Is there a difference between “good” and “bad” stereotypes?
    - When stereotyping others, how easy was it to find confirming evidence?
    - When stereotyping others, how did you react to disconfirming evidence?
13. Finally, lead a discussion asking youth: How can we, in this class, work to address stereotypes? Encourage youth to share their thoughts. Make sure the following ideas are covered in the discussion:
    - Discuss the impact of stereotypes and stereotype threat so that people realize it’s not them, but a bias that people have. Stereotype threat is the threat of being viewed through the lens of a negative stereotype or the fear of doing something that would confirm that stereotype.
    - Provide role models of people who look like them who have achieved. They can share their story and inspire others to achieve.
    - Encourage effort-focused mindset. Remind youth of Growing Minds activity.
    - Have high standards
    - Believe in yourself and your abilities as an individual
    - Realize that stereotyping causes anxiety. Find ways to calm yourself and persist.

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