Today’s Presenters

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Make, Do, Share:
Getting Started with STEM in a Box

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Annotation Tools

**Click on the marker** at the top left corner of the screen and the tool buttons will open.

**Check mark**

- Half-way down menu, click on square.
- Use the drop-down menu and choose the check mark.
- Click on slide to indicate choice.
I’m here because...

STEM is terrifying!

My boss told me to.

All the cool kids seem to be doing it.

I love, love, love STEM!
Agenda

✓ Make Do Share Project Overview
✓ Road Map: Planning and Learning Guide
✓ Play Book: Program Outlines and Ideas
✓ Q & A
Make Do Share

Kitsap Peninsula

Map of the Kitsap Peninsula with cities like Bremerton, Poulsbo, and Seattle labeled. A group photo of people, possibly event attendees or workshop participants, is also shown.
Why STEM?

**Job Growth**

STEM careers growing 3x faster than non-STEM


**New Economy**

30 of the fastest growing jobs (2008-2018) will require a STEM related skill

Preparing for jobs that don’t yet exist


**Student Performance and Readiness Gaps**

35th out of 64 in math and 27th in science on 2012 PISA

45% of high school graduates ready for college work in math, 30% in science (2011)

The Condition of College & Career Readiness. Iowa City, IA: ACT, Inc., 2011

Why STEM in libraries?

- Built-in capacity to support informal learning
- Diverse audiences and underserved populations
- Low-stakes, hands-on environment
Start with **Growth Mindset**

**Fixed Mindset**
- Intelligence is static
- Leads to a desire to look smart and therefore a tendency to...
  - avoid challenges
  - give up easily
  - see effort as fruitless or worse
  - ignore useful negative feedback
  - feel threatened by the success of others

As a result, they may plateau early and achieve less than their full potential. All this confirms a deterministic view of the world.

**Growth Mindset**
- Intelligence can be developed
- Leads to a desire to learn and therefore a tendency to...
  - embrace challenges
  - persist in the face of setbacks
  - see effort as the path to mastery
  - learn from criticism
  - find lessons and inspiration in the success of others

As a result, they reach ever-higher levels of achievement. All this gives them a greater sense of free will.

Road Map
Planning and Learning
Study, Listen, Look!

- Demographic data
- Community mapping
Resources for further learning:

**Annie E. Casey Foundation.** *Kids Count Data Center.*  
http://datacenter.kidscount.org/

**Ready by 21.** *Program Landscape Mapping Packet.*  
http://www.readyby21.org/resources/program-landscape-mapping-packet

**U.S. Department of Education.** *Data and Research.*  
http://www2.ed.gov/rschstat/landing.jhtml?src=image

**Work Group for Community Health and Development.**  
“Assessing Community Needs and Resources Toolbox”  
Community Toolbox. University of Kansas.  
Focus on Facilitation

Build Relationships with Youth and Families through

• Knowledge of ages and stages
• Community building
• Youth voice
Resources for further learning:

David P. Weikart Center for Youth Program Quality. *Youth Works Methods Series* (Fee based print materials and online training). [http://www.cypq.org/products_and_services/training/YWM](http://www.cypq.org/products_and_services/training/YWM)


Develop Community Connections

- Increase Capacity
- Achieve stronger outcomes
Resources for further learning:


**STEM Ecosystems.** Key Resources. [http://stemecosystems.org/key-resources/](http://stemecosystems.org/key-resources/)
Plan for Impact

"It isn't really about the tech, it is not about coding. It's about a philosophy of learning." bit.ly/1xiXeUO
you can try/hands-on

sense of wonder

involved someone who cared about us

INSPIRATION

DO SOMETHING NEW

Trusted Mentor
Partners in learning (taking risks together)

HAVE FUN

Know your limits but don't let them stifle you.

multi-sensory

Emotionally invested

Human connection

ongoing — not an isolated experience
Program Examples

**Library A** hosts a robotics program. Staff layout equipment and step-by-step instructions and help youth to build a robot.

**Library B** hosts a multi-session STEM program. Staff ask youth to design a robot to address a particular problem or issue that exists in their life. After presenting on their ideas and getting feedback from the group, youth research the basics of the library’s existing robotics equipment and as a group, decide how it might be used to address one of the afore-mentioned problems. Participants discuss the actions required to build the robot, identify who is in charge of each aspect, and work together on their creation. Once the robot is built, they test its ability to solve the intended problem and iterate the activity as necessary.
Outcomes

The change in skill, behavior, attitude, or belief that a recipient will have as a result of attending your program.
Outcomes for Informal **STEM** Programs

- **STEM Interest**
  
  "I like to do this."

- **STEM Skill Building**
  
  "I can do this."

- **STEM Pathways**
  
  "This is important to me"

In order to achieve those outcomes...

- Integrate youth voice and encourage youth ownership
- Focus on relationships
- Make time for planning and reflection
- Build a network
- Embrace continuous learning
PRACTICE
Youth gain skills through supporting STEM learning
Interns, volunteers, participating youth
Youth interest
Youth Voice

BITS
“I like to do this”
Develop an interest in STEM and STEM learning activities
Active participation in STEM learning opportunities
Curiosity about STEM topics and concepts

ENGAGE
“This is important to me”
Value the goals of STEM and STEM learning activities
Understand values of STEM in society
Awareness of STEM professions

EXPLORE
“I can do this”
Develop a capacity to productively engage in STEM learning activities
Ability to engage in STEM process of investigation
Exercise STEM-relevant life and career skills
Developing a Plan

**Pre-plan**
- Who is your audience?
- What are their interests?
- Is anyone in your community doing this type of STEM programming?

**Planning**
- Identify program outcomes
- Incorporate youth interest
- Understand STEM programming content

**Reflection**
- Did the plays work?
- What would you change?
- Next step programming
**Example Play:** Hi everyone, in today’s program we are going to be working with Snap Circuits. You’ll learn to build all sorts of electronic devices like a radio, solar powered lights and a lie detector. The whole idea of this program is to give you time to try things out, see what you can do, and get some ideas about how electronic circuits work. So, don’t worry about getting it right all the time. Have fun and see what happens.

Also, feel free to work in groups on something and ask each other for ideas, help, etc. At different times during the program I’ll give you all a chance to show-off to the group what you’ve been working on and ask questions or give suggestions.

Before you get started I want to give everyone a chance to get to know each other. I’m going to get us started with a short group introduction activity.

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**Example Play:** IF........

Before the session starts write out a series of “if” questions on index cards. For example, if you could go anywhere in the world where would it be? Or, if you were able to have any kind of animal as a pet what would it be? Have youth sit in a circle with the index cards in the middle. Have each youth select a card and answer the question.

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**Play #2**

**Community Builder**

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**Play #3**

**Intro to Materials**

Start the hands-on activity with an overview of the materials available and what youth can accomplish with them. Show youth some examples of what they might create and give them a chance to ask some getting started questions.
Play Package Part 2: Challenge

Play #4 Challenge

Challenges are a great way to give program participants a focus while also giving youth the chance to put their own spin on using the tools and technologies. Some youth and families may not feel comfortable simply “playing” with materials. Challenges help guarantee that everyone is involved and learning.

As the youth work on the challenge(s), adults and teen interns or volunteers should walk around, help out, and cheer youth on whenever possible. As they move around the room adults and teen interns or volunteers can ask youth to:

- Explain what they are doing and why
- Talk about what they are having trouble with/what’s most challenging
- Talk about what they are finding easy to do
- Discuss what was surprising and why

Play #5 Check-in with Groups

As youth finish the initial challenge give them the chance to:

- Expand on the challenge by adding to what they started
- Try a new challenge that library staff or teen interns provide
- Teach someone else in the group how to complete the challenge
Throughout the STEM program, youth will be showing what they created. As a final showcase, you can ask youth to show the work they ended up with, and have them talk about what they liked, didn’t like, what they would change, etc.

Make sure that you have at least 10 minutes at the end of the program for youth to think about and articulate what they learned during the session. Each reflection play can help you to assess learning outcomes. As you take part in the reflection activities with youth, think about the following outcomes:

STEM Ideas
Comfort
Interest in STEM
Program Assessment

Did you achieve outcomes?
Reflect on community?
Did the plays work?
What would you change?
Get feedback from teen interns and volunteers?
Develop next step programming?
Q&A