

MakerSpace

Norwood Public School

Why Teach STEM?

- * STEM- Science, Technology, Engineering and Math
- * STEM-STEAM-STREAM: Exposes students to 21st Century Skills
 - * Collaboration and Teamwork
 - * Creativity and Imagination
 - * Critical Thinking
 - * Problem Solving

STEM/ Technology Initiative

- * 1:1 Initiatives- Device per student
- * MakerSpace- Lab/Room with different tools to spark creative design
- * 3D Printing- Create and bring designs to life
- * Individualized Learning
- * STEM/CTE Program
- * Digital Literacy
- * 21st Century Skills
- * Spark Inquiry
- * Project-Based Learning

Why Teach STEM?

21st century skills directly relate to the skills every employer is looking for:

- * [Top 10 skills employers are looking for](#)
- * [21st Century Skills Related to Industry](#)
- * Over 2 million “open” STEM jobs
 - * Difference Making Careers
 - * Job Security
 - * High Demand and projected to grow
 - * Highest Wages
 - * [STEM Outlook Here](#)

What is a MakerSpace?

A MakerSpace is a place where students can gather to create, invent, tinker and explore individually or cooperatively with one another.



History of Makerspace

- From DIY, LifeHacks
- Community
- “Show and Tell”
- Open source
- “Everyone is an innovator”



MakerFaire



MakerSpace





School Connections

- Connects to project-based learning (PBL)
 - Project-based learning (PBL) has been shown to improve students' understanding of science, as well as their problem-solving and collaboration skills, to a greater extent than traditional methods (Geier et al., 2008; Gordon, Rogers, Comfort, Gavula, and McGee, 2001; Kolodner et al., 2003).
- More engaging
 - Students who learn science or technology through project-based learning also report that they find it more engaging than traditional instructional techniques (Geier et al., 2008; Yazzie-Mintz, 2010).

Why Tinkering is Important?

- Tinkering helps children understand how things are made, enables children to have focused and unstructured time to explore and test ideas. Through the processes of exploration and invention lies the potential for innovation.
- Dale Dougherty, MAKE Magazine and MakerFaire founder - "This idea of making something is very fundamental to human beings, and children really get that. We are not just consumers. We are makers of



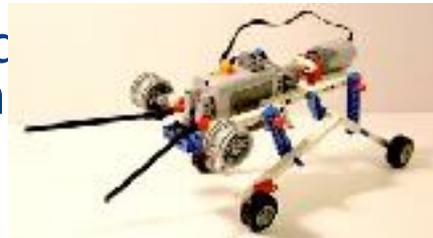
Benchmark and Goals

- **Risk taking and resilience**

How well does a child learn through experimentation and failure? How willing is a child to try something even when it might be wrong? How long will a child stick with a problem?
- **Visualization**
 - How well can a child “see” the problem or represent it or describe it in different ways?
- **Applying knowledge to new situations**
 - How well can a child use their knowledge of a material or a concept toward solving a problem?
- **Collaboration**
 - How well can a child work with others to share, borrow, adopt, and adapt ideas?

LEGO WeDo

- * LEGO WeDo is a robotics hardware and software platform specifically designed for K-4 Students. As with other LEGO Education products it follows the 4 C's process - Connect to a story, Construct a model, Contemplate its function, and Continue improving its design



Makey Makey

- * Let's say you load up a piano. Then, instead of using the computer keyboard buttons to play the piano, you can hook up the Makey Makey to something fun, like bananas, and the bananas become your piano keys
- * Or let's say you Google for an online Pacman game and draw a joystick with a pencil:



**INVENT
ANYTHING.**

Design

How it works:

Generic placeholder image

1. Place

Shapes are basic building blocks of Tinkercad. A shape can add or remove material. Import your own, or work with existing shapes.

2. Adjust

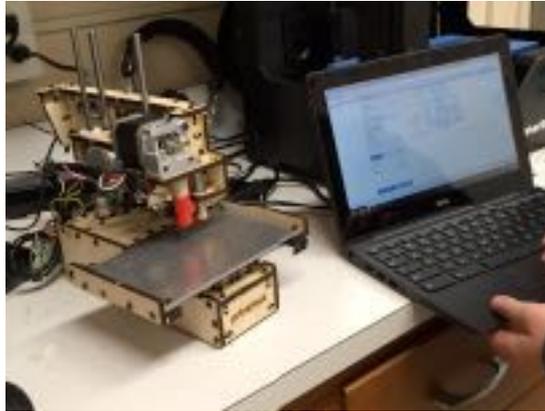
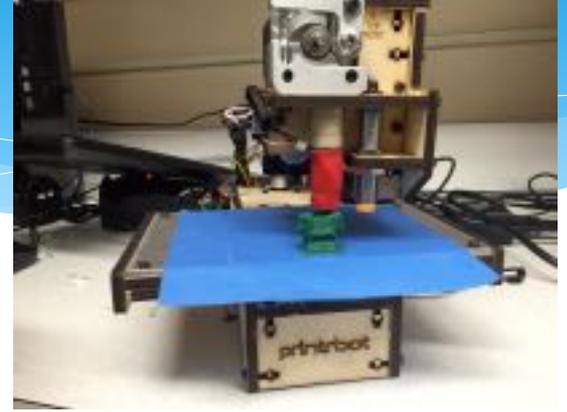
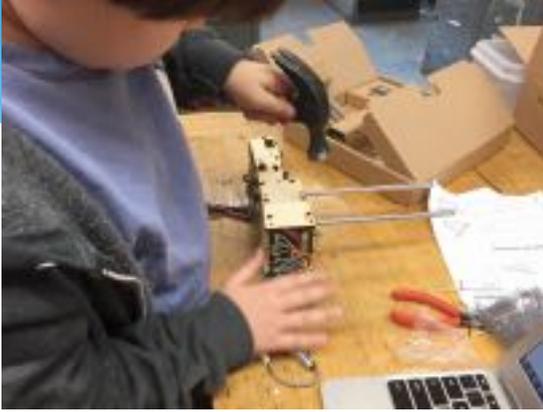
Move, rotate and adjust shapes freely in space. Use tools like the ruler to input exact dimensions.

3. Combine

Group together a set of shapes to create models as detailed as you want.



3-D Printing



Lego Wall



MAKERSPACE

WISH LIST



Wiggle-Bots Activity Set- (2 - 10 pack) \$150.00

http://www.demco.com/products/TeacherGeek-reg-Wiggle-Bots-Activity-Kit/_/A-B00384276&s=wiggle-bot+%20activity%20kit

Ozobot Set- (18 pack) \$1,200

http://demco.com/products/Educational-Resources/Science/STEM/Ozobot-reg-Robotics-Kits/_/A-B00322297

Arduino / LittleBits (4 sets) - \$400

http://www.demco.com/products/littlebits-trade-Arduino-Starter-Kit/_/A-B00330582&s=arduino%20starter%20kit

Blue Bot Hive (6 pack) - \$749.95

<https://www.bee-bot.us/bee-bot-bundles/hot-hive.html>

Makey/Makey- (10 units) \$500

<http://www.makeymakey.com/>

Tumble Trax Magnetic Marble Run - (2 sets) \$50

[https://www.learningresources.com/product/tumble+trax-\\$182-->+magnetic+marble=run.do](https://www.learningresources.com/product/tumble+trax-$182-->+magnetic+marble=run.do)

Cublets Set- (2 - 12 pack) \$660

<http://www.madrobotics.com/cublets/>

Marvy Uchida Styrofoam Cutter - \$35.00

Lego Wall - cost varies

<http://renovatedlearning.com/2014/09/12/the-epic-library-lego-wall-how-to-build-one/>



What is Makerspace?

Makerspace is a place where students can gather to create, invent, tinker, explore, collaborate and discover using a variety of tools and materials

We need your help!

We are looking for donations of the following items:

Blocks	Duct Tape	Wires	Marbles
Legos	Aluminum Foil	Tinker Toys	Clothes Pins
K'Nex	Cardboard	Safety Goggles	Safety Gloves
Index Cards	Zip Ties	Magnets	Wheels of any kind
Straws	Fabric	Pipe Cleaners	Paper Plates
Rope	Yarn	Sewing Materials	Feathers
Glue Sticks	Glue Gun	Buttons	Plastic Cups
Styrofoam	Tissue Paper	Old Electronics	Paper Towel Rolls
Post-its	Play Dough	Tissue Paper	Toilet Paper Rolls
Felt	Pompons	Tools - kid friendly	Markers
Painter's Tape	Canvas/paint	AA & AAA Batteries	All Types of Paper
Bottlecaps	Popsicle Sticks	Playing Cards	Paint Strips Swatches
Lincoln Logs	Twine	Dry Erase Markers	Marble Run
Fabric	Crochet Hooks	Knitting Needles	Clean Water Bottles

STEM: IT

STEM:IT Recap-

STEM:IT Was created by our staff of curriculum developers, technology integration specialists, and STEM industry professionals. We worked with our schools to create a program that would fit into existing classrooms and MakerSpaces with the goal of reinforcing core subject matter and exposing students to STEM. Through a ton of innovative partnerships across the country, STEM:IT will soon be utilized in over 1,000 schools, thus allowing STEM Fuse to create a teacher connection program. The teacher connection program will allow schools across the country to share their successes with the STEM:IT challenges, and to submit suggestions around new challenges for STEM Fuse to create.

Other K-8 Resources-

Read:IT- K-5 Reading program using the individualized learning model RTI. Read:IT has the highest improvement rates in the country, and can be used as a standalone program, SPED/ Intervention, or after/before school reading groups.

Responsive Classroom

- * *Responsive Classroom* is an approach to teaching based on the belief that integrating academic and social-emotional skills creates an environment where students can do their best learning. The *Responsive Classroom* approach consists of a set of practices and strategies that build academic and social-emotional competencies. This approach works well with many other programs and can be introduced gradually into a teacher's practice.

Responsive Classroom



Responsive Classroom

- * **Shared Practices (K-8)**
- * **Interactive Modeling**—An explicit practice for teaching procedures and routines (such as those for entering and exiting the room) as well as academic and social skills (such as engaging with the text or giving and accepting feedback).
- * **Teacher Language**—The intentional use of language to enable students to engage in their learning and develop the academic, social, and emotional skills they need to be successful in and out of school.
- * **Logical Consequences**—A non-punitive response to misbehavior that allows teachers to set clear limits and students to fix and learn from their mistakes while maintaining their dignity.
- * **Interactive Learning Structures**— Purposeful activities that give students opportunities to engage with content in active (hands-on) and interactive (social) ways.
- * **Elementary Practices (K-6)**
- * **Morning Meeting**—Everyone in the classroom gathers in a circle for twenty to thirty minutes at the beginning of each school day and proceeds through four sequential components: greeting, sharing, group activity, and morning message.
- * **Establishing Rules**—Teacher and students work together to name individual goals for the year and establish rules that will help everyone reach those goals.
- * **Energizers**—Short, playful, whole-group activities that are used as breaks in lessons.
- * **Quiet Time**—A brief, purposeful and relaxed time of transition that takes place after lunch and recess, before the rest of the school day continues.
- * **Closing Circle**—A five- to ten-minute gathering at the end of the day that promotes reflection and celebration through participation in a brief activity or two.