



READY, SET, MAKE!

a tcea **MAKERS** eBook

makerspaces provide a place for students to **explore** questions, bounce ideas off one another, **build** something together, **fail** and try again all in a **safe, creative** environment.

-Lori Gracey
Executive Director
TCEA

3D printing and design

Baking

Coding

Drones

Engineering inventions

Food/Culinary arts

Graphic design

Origami

Programming

Rube Goldberg devices

Tinkering

Videography

Alternative energy

Beading

Crafts

Duct tape

Fashion

Gaming

Jewelry

Papercraft

Recycling and repurposing

Sewing

Toys

Wearable technology

Woodworking

Architecture

Cardboard

Crocheting/Knitting

Electricity/Electronics

Flight/Kites

Gardening

Music/Musical instruments

Photography

Robotics

Sustainability

Transportation/
Vehicles

Weaving

What is a makerspace?

A MAKERSPACE IS:

Hands-on and exploratory

Fun

Based on student interests

Hard

Filled with experimentation
and possible failure

A change in the way we think
and teach

A MAKERSPACE ISN'T:

Just playtime

Easy

Limiting

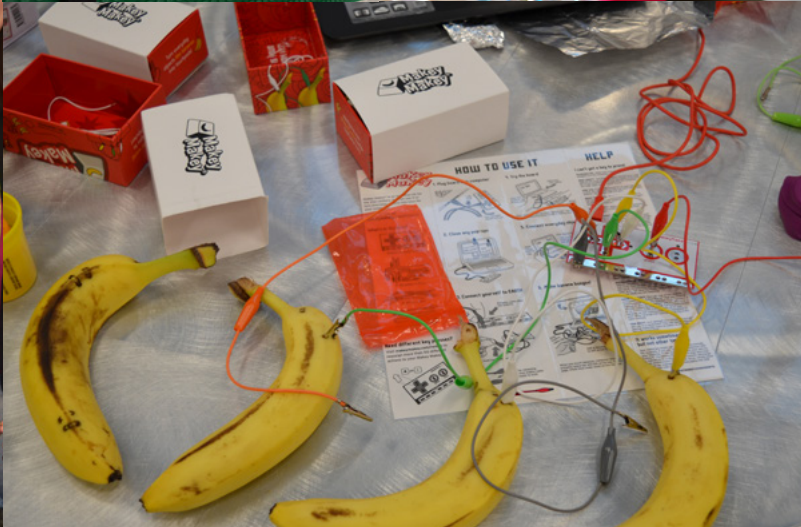
Too structured

About buying “cool stuff”

End products that all look the same
(not a cookie cutter approach)



A makerspace looks like:





A makerspace sounds like:



MAKING IS ABOUT A CULTURE OF THINKING. IT'S NOT ABOUT STUFF.

"A makerspace can be anything from a repurposed book cart filled with arts and crafts supplies to a table in a corner set out with LEGOs to a full blown fab lab with 3D printers, laser cutters, and hand tools. No two school makerspaces are exactly alike, nor should they be. Makerspaces are as unique as the school cultures they represent. There is no such thing as one form of making being more valid or better than the other."

-Diana Rendina
Librarian Teacher
Stewart Middle Magnet School

Makerspaces come in all shapes, sizes, and styles, and are applicable across all grade levels and disciplines.

But what you should see happening in a makerspace is the same in every space:

- | | | |
|-----------------|--------------|----------------------|
| Thinking | Solving | Self-Expression |
| Trying | Learning | Persevering |
| Problem Solving | Creating | Encouragement |
| Questioning | Teamwork | Struggling |
| Failing | Enjoying | Teaching by Students |
| Reflecting | Independence | Collaborating |
| Designing | Inventing | |

The TCEA core beliefs of making:

Students should have choice.

To fail is NOT bad. It is the First Attempt in Learning.

Makerspaces are possible on any budget.

Students should rely on one another.

**Embrace frustration as part
of the process.**

Celebrate and showcase all creations.

YouTube is a wonderful resource for the how-to.

**It is not about the “shiny things;” the making process
is more important than the final product.**



Laying the Groundwork

“making pairs our knowledge with our imagination, and imagination is something that has never been a school priority after about kindergarten. Imagination will determine the direction of our kids’ futures. making also fosters a few other things in short supply in both school and life in general—joy, wonder, and productive failure.”

-Randy Rodgers
Director of Digital Learning Services
Sequin ISD

CONSIDERATIONS BEFORE STARTING YOUR MAKERSPACE

Consider the physical space. What kind of equipment and storage is accessible? Do you have storage space for a certain size of equipment and supplies?

- If you are a 1:1 campus, a device might be all the maker equipment students need. With a computer you can code, create digital art, and produce stop-motion animation.
- Go on a treasure hunt through your campus, repurposing resources that were purchased but never used. One man's trash is another man's treasure.
- Ask your students what they want to make. Don't spend your maker money in the wrong area.
- Find experts on your campus, in your district, or in your community. Parents, grandparents, and a senior citizen center are valuable resources. People are full of talents.
- Start with one making idea. Build your capacity little by little.
- Start with something you already know and are comfortable with. Are you a hobby crafter? Happen to have a lot of cardboard around? Skilled at graphic design? It doesn't matter your level of ability in a given area. Just start with something you are familiar with and find a way to share it with your students.

Start up budget

- | | | | |
|------------------------------|-------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> \$0 | <input type="checkbox"/> \$50 | <input type="checkbox"/> \$100 | <input type="checkbox"/> \$100+ |
|------------------------------|-------------------------------|--------------------------------|---------------------------------|

Preparation time

- | | | | | |
|-------------------------------|------------------------------|---------------------------------|-------------------------------|---|
| <input type="checkbox"/> none | <input type="checkbox"/> low | <input type="checkbox"/> medium | <input type="checkbox"/> high | <input type="checkbox"/> colleague(s) to assist |
|-------------------------------|------------------------------|---------------------------------|-------------------------------|---|

Actual room for a makerspace

- | | | | | |
|-------------------------------|-------------------------------|--|-------------------------------------|--------------------------------|
| <input type="checkbox"/> none | <input type="checkbox"/> cart | <input type="checkbox"/> corner of the library | <input type="checkbox"/> whole room | <input type="checkbox"/> other |
|-------------------------------|-------------------------------|--|-------------------------------------|--------------------------------|

Storage space for student projects

- | | | | |
|-------------------------------|-----------------------------------|---|--------------------------------|
| <input type="checkbox"/> none | <input type="checkbox"/> a little | <input type="checkbox"/> substantial amount | <input type="checkbox"/> other |
|-------------------------------|-----------------------------------|---|--------------------------------|

Technology

- | | | | | |
|-------------------------------|-----------------------------------|--|--|--------------------------------|
| <input type="checkbox"/> none | <input type="checkbox"/> a little | <input type="checkbox"/> cart of devices | <input type="checkbox"/> 1:1 environment | <input type="checkbox"/> other |
|-------------------------------|-----------------------------------|--|--|--------------------------------|

Group size

- | | | | |
|-------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| <input type="checkbox"/> Individual | <input type="checkbox"/> pair | <input type="checkbox"/> small group | <input type="checkbox"/> team |
|-------------------------------------|-------------------------------|--------------------------------------|-------------------------------|

Resources

- | | | | | |
|-----------------------------|---------------------------------|--|-----------------------------------|---|
| <input type="checkbox"/> me | <input type="checkbox"/> expert | <input type="checkbox"/> books/
magazines | <input type="checkbox"/> websites | <input type="checkbox"/> YouTube videos |
|-----------------------------|---------------------------------|--|-----------------------------------|---|



Who can be a maker?

THE ANSWER IS:

EVERYONE!

However, here is some advice you might want to consider, depending on your specific student population.

Population	Special Considerations
Everyone	Make sure to have safety procedures in place.
Pre-school	No sharp scissors and no button batteries. Give fewer choices and make concrete objects.
Elementary	Establish cleanup and storage routines. Decide if you need specific rules for a makerspace that vary from your classroom rules.
High School	Make sure to have guidelines in place for YouTube videos. Make more complex products.
ESL	Use a picture dictionary or have rules in multiple languages. Employ audio-based procedures.
Special Needs	No small objects, such as pony beads or buttons. Consider soft items, string, yarn, and playdough. Review 504 accommodations for a makerspace.

Things to remember:

START SMALL!

Choose one grade level and start with a small club. The club could start during lunch or after school. Meet one time per week or every other week. Start with one thing; it doesn't matter what. Try something you are passionate about. Don't get in over your head. If you provide a makerspace, they will come. Don't get overwhelmed. You have to enjoy it also. Find somebody to help you out.

MAKERSPACE NO-NOS

- No assessment. Resist the urge to grade anything produced in the makerspace.
- No right or wrong. Provided students are following all safety measures and school rules, there should be few creative limits in the makerspace.
- No bad projects. Making is about the process, not the final product.
- No giving up. Encourage students to consider failure a part of the process.
- No working only by yourself. Encourage student collaboration or asking for help when needed.



Ready, Set, Make!

Sample Activities to Enter the World of Making

“making opens up a world of infinite possibilities for our students. According to Walt Disney, “If you can dream it, you can do it.” Those words have never been truer than in the world of making. Students are inventing, designing, and creating prototypes to solve real world problems, today. Making gives every student the opportunity to discover their genius and share it with the world.”


-Michelle Cooper
Library Media Specialist
White Oak ISD



Activity card key:

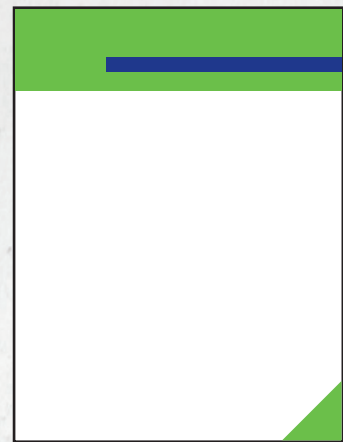
Each card is designed to let you see at a glance if the activity would be a good fit for your makerspace.




 = Arts and Crafts
Maker Stations






















 = Building Maker
Stations



 = Digital Maker
Stations

Each activity contains an information bar that shows you the level of cost, preparation time, storage space, technology needed, and group size.



Cost		Preparation Time		Storage Space		Technology		Group Size	
	\$0		none		none		none		individual
	under \$50		low		minimal		a little		pair
	\$50 - \$100		medium		substantial		a cart full		small group
	over \$100		high				1:1		team

MATERIALS:

Corrugated cardboard

grocery store, hardware store, mattress store, donations

Cardboard rolls

gift wrap, paper towel, and toilet tissue

TOOLS:

Klever Cutter

[Amazon](#) (\$2)

[ULINE](#) (\$2)

TOOLKITS:

Make.do

\$12.50 per kit

FASTENERS:

Mr. McGroovy's Box Rivets Half and Half Kit

[Amazon](#) (\$20)

INSPIRATION:

Caine's Arcade

[Cardboard Challenge](#)

HELP:

[15-second tutorials](#)

(punch a hole, join, cut, and fold)

[Cardboard attachments](#)



Suggestion Box:



Resist putting full boxes in the cardboard supply space as students might simply use them without modification.



Only accept donations without the packaging peanuts.

MATERIALS:

Solid and patterned duct tape

ONLINE:

[50 Duct Tape Crafts for Kids](#)

[Duct Tape Crafts](#)

BOOKS:

Tape it & Make It

by Richela Fabian Morgan

Stick it!: D.I.Y. Duct Tape Projects

by T.L. Bonaddio

Duct Tape Crafts

by Kitty Moore



Suggestion Box:

Duct tape comes in 8, 10, 15, or 20 yards.

Be sure you check price and yardage. Buying in bulk is only cost effective if you get the yardage.

michaels' coupons will save you money.

Check stores for discontinued patterns.



Build It!

COST \$\$\$ | PREP ⌚ | STORAGE 🗑️ | TECH 📏 | GROUP any size

MATERIALS:

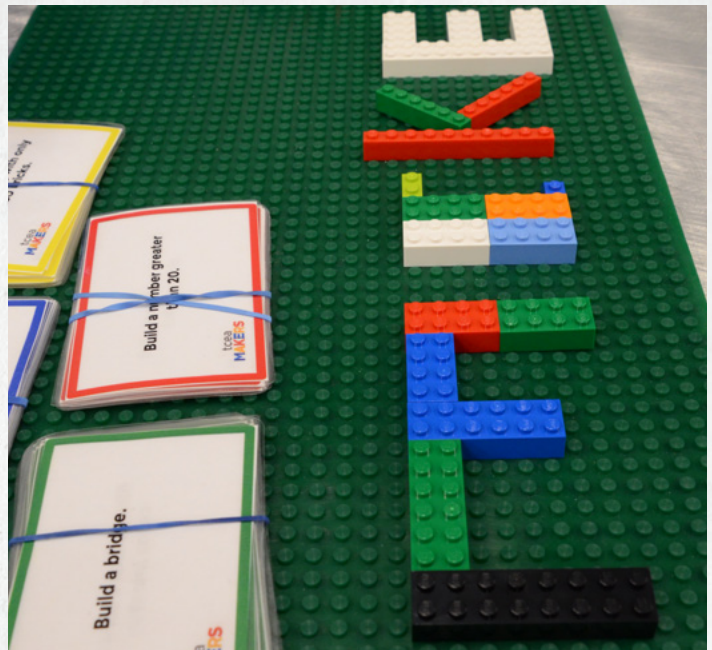
LEGOs
Keva Planks
Lincoln Logs
K'NEX
Magnetic building pieces

INSPIRATION:

TCEA Maker Cards
[Download the full set.](#)

In this maker station, students use LEGOs, KEVA planks, and more to build cleverly-designed contraptions and structures.

See what great heights your students can reach while developing problem-solving skills and visual-spatial awareness. Building also helps students improve fine motor manipulation, focus, and confidence. On the following page, you'll find a list of possible building materials to include in this station.





Build It!

COST **\$\$\$** | PREP | STORAGE | TECH | GROUP any size

Building Materials	Pieces/ Approx. Cost	Description
Duplos	95 / \$40	Duplo bricks by LEGO are designed for children ages 1½ to 5 years old.
Imagination Playground Blocks	Tabletop set / \$59.95 Medium set / \$749.95	Imagination Playground waterproof foam blocks are made for indoors and outdoors. Wide variety of shapes including cubes, bricks, cogs, curves, and cylinders.
KEVA Planks	200 / \$90 400 / \$150 1000 / \$400	KEVA planks are about ¼ inch thick, ¾ inch wide, and 4½ inches long. You build structures by simply stacking the planks. No glue, no connectors.
K'NEX	863 / \$50	K'NEX is a construction kit based around a series of rods which can be joined together by connectors.
LEGOs	790 / \$48	LEGO bricks come in different sizes and colors. You attach other LEGO pieces with the studs on both the top and the bottom of a brick.
Lincoln Logs	111 / \$39	Notched miniature logs with a 2 cm diameter. Additional parts include roofs, chimneys, windows, and doors.
Magna-Tiles	100 / \$120	Tiles with magnets along the edges. Construct by stacking, making flat patterns and 3D shapes, and creating complex Magna-Tiles creations.
Nova Interlocking Blocks	92 / \$49	Handmade wooden building blocks that lock together with protruding dowels on top and holes in the bottoms of the blocks.
Tinkertoys	200 / \$42	Tinkertoy construction kits are available in plastic and Classic (wood) sets. Parts include spool, wheels, caps, couplings, pulleys, and sticks.
ZOOB	250 / \$32 500 / \$45	ZOOB is a building set with five different styles of pieces that snap together in 20 different ways. Make connections that rotate, limbs that extend, and axles that spin.



Paper Designs

COST



PREP



STORAGE



TECH



GROUP



MATERIALS:

Various colors of card stock or 12x12 scrapbooking paper

Great for jumpstarting creativity, team-building, collaboration, and experiencing the making spirit.

PREPARATION

- Cut shapes into different sizes of circles, squares, diamonds, triangles, rectangles, trapezoids, arches, etc.
- Group 64 different shapes using three or four colors. You could group by shades of a particular color also.
- Then split those 64 pieces into eight per pint-sized Ziploc bag so that each bag has eight shapes.
- Label each bag with a sticker. I had eight bags for each group.

PAPER DESIGNS ACTIVITY

1. You will receive a Ziploc bag of paper shapes.
2. Find the sticker on your Ziploc bag.
3. Locate your group of eight people.
4. Create a design together using the shapes provided.
5. Take a picture of the finished design and upload it to our collaboration site (Google Drive, Pic Collage, Padlet, etc.).

Suggestion Box:

Walmart has \$5 scrapbooking paper pads.

Activity can be adjusted for number of participants and number of shapes.



When I designed this activity, I just cut out random shapes using lots of color. Then I went back and grouped them with a variety of colors and various shapes.



Get Your MacGyver On

COST



PREP



STORAGE



TECH



GROUP



MATERIALS:

- 1 golf ball
- 3 marbles
- 1 paper towel roll
- 20 dominoes
- 4 straws
- 1 large clip
- 2 clothespins
- 2 pipe cleaners
- 4 tongue depressors
- 4 balloons
- 1 large rubber band
- 12 inches of string
- 1 large plastic spoon
- 1 push pin
- 1 stick pin
- 1 pizza box
- 2 solo cups

Great for jumpstarting creativity, team-building, collaboration, and experiencing the making spirit.

PREPARATION

- Collect and divide material into pizza boxes.

ACTIVITY (PART ONE)

- Create a contraption that is engineered to pop a balloon in as many steps as possible. See next page for additional activity options.



Get Your MacGyver On

COST



PREP



STORAGE



TECH



GROUP



Suggestion Box:

Visit the Dollar Store.

Dominoes purchased at the Dollar Store were not wide enough, and buying dominoes from Amazon was a better deal.

Donated pizza boxes

Optional Twists for the Get Your MacGyver On

ACTIVITY (PART TWO)

- To make the contraption unique for each group, have them come up to the MacGyver table and choose one additional item.
- Suggestions for the MacGyver table: Hot Wheel cars, yo-yos, wind-up toys, funnel, ramps, bungee cords, etc.

COLLABORATION CREATE (PART THREE)

- Divide into groups of two to four people each.
- Break into the pizza box and check out your supplies.
- Plan out your contraption.
- Oh, wait you have a number. Select one person in your group to visit the MacGyver table and add one specialized thing-a-ma-gig to your contraption.

MATERIALS:**Computer and template**

Pixel Art is making images out of a small grid with a limited number of colors.

DIRECTIONS

1. Make a copy of the template, which you can find [here](#).
2. Click on the tab in the template titled “Draw.”
3. For easy reference, the 20-color key will be displayed at the top with each color in the column with its corresponding letter.
4. To color in the cells, simply **type in any lower-case letter from “a” to “s”** and the corresponding **color will be applied to the cell**. If you want white, just leave the cell **blank**.

INCLUDES:

Weaving potholders and soda straws

Finger knitting

Knitting

Arm knitting

Crocheting

Latch hook rugs

Sewing

MATERIALS:

Yarn

Knitting needles

Crochet hooks

Looms

Scissors

Fabric (felt is great starting material for sewing)



The best way to learn fiber arts is visually. YouTube videos or a guest maker (parent, grandparent, or visitor from the Senior Center) work best for demonstrating how it's done.

GETTING STARTED PROJECTS:

- bracelet
- bookmark
- scarf
- rug

Technique	Tutorial
Arm Knitting	www.youtube.com/watch?v=IBIzVCaX7HU
Crocheting a Single Chain	www.youtube.com/watch?v=BCDA44Sijx4
Crocheted Button Bracelet	www.makeandtakes.com/crochet-bracelet-with-a-button
Finger Knitting	www.wikihow.com/Finger-Knit
Inspiration	www.craftyarncouncil.com/i-love-yarn-day-inspiration
Knitting	www.youtube.com/watch?v=ONVQCK_rKc
Latch Hook Rugs	www.youtube.com/watch?v=sdWArMj4AxA
Potholders with Loom	craftprojectideas.com/how-to-use-a-weaving-loom-to-make-a-potholder
Sewing	www.redtedart.com/sewing-projects-for-kids/
Soda Straw Weaving	www.kid-at-art.com/htdoc/lesson9.html

MATERIALS:**Device and internet connection****A Google Site and a Google Form per breakout** GAMES:**[Breakout Edu Digital Games](#)****[Digital Breakouts by Tonya Coffey](#)****[50 States Digital Breakouts by TCEA](#)****[Tom's Digital Breakouts](#)** TUTORIAL:**[Breakout Edu Digital How-To](#)**

What is a digital breakout game?

Individual, pair, or small groups of students search for clues in the form of hidden hyperlinks in images and text on the game website. These clues may lead to puzzles that, when solved, reveal the combinations to assorted digital locks on the game page.

However, each website has additional text, images, and information that are called “red herrings” or distractors that will lead players to a dead end or that do not provide a solution to one of the puzzles.

Students have 30 to 45 minutes to use clues they find to solve the digital puzzles and find the combinations to all the locks.

1. Plan out your game on paper.
2. Decide how many locks to include.
3. Find your content (text, images, and linked webpages).
4. Realize that in discovering your content, the kinds of locks will present themselves.
5. Create your Google Site.
6. Create the Google Form.
7. Embed the Form into the Google Site.
8. Drop in your text, images, and hyperlinks.

PROCESS

1. Have your students experience three to four digital breakouts,
2. Students then create their own digital breakout for others to enjoy.

MATERIALS:

App

Tablet

Green screen

Very low cost. Buy a green plastic tablecloth to be your green screen.

Props

Props are fun, but not necessary. (If you really want props, visit a party store or thrift store for hats, ties, and glasses. Feather boas are fun, but feathers tend to get everywhere.)

APPS:

Do Ink App (\$2.99) or Touchcast (free)

STEPS

1. Use a graphic organizer to guide the process. Write down important details, props needed, and desired background.
2. Write a script. Share it with others for editing. Is it clear? Does it make sense? Does it flow well? Does it tell the desired story?
3. Find or make props, if needed.
4. Rehearse and practice script.
5. Add props to the rehearsal time. (A challenge is to memorize the lines.)

Read [this blog](#) for more great ideas.

Suggestion Box:

Avoid handheld props on sticks. They tend to get in the way of the speaker's mouth and easily get damaged. And there are sticks involved...I do not have to say anything more.

Ideas for a green screen: book trailer, holiday greeting, PSA, morning news, skit, weather forecast, or sports show.

STEPS USING THE IPAD APP “GREEN SCREEN BY DO INK”



1. Take or find a photo for your background image. The photo will automatically be saved to your camera roll.
2. Stand in front of the green screen. Use the video option on your Camera to record a short video of your partner(s). The video will automatically be saved to your Camera Roll.
3. Open the Green Screen by Do Ink app and upload the picture from the Camera Roll. This image will need to be on the bottom track.
4. Add your video to the middle track.
5. Use the red slide bars on the two layers to make them the same length.
6. Click the blue Save button and select Save to the Camera Roll.



Marble Run

COST \$ | PREP ⌚ | STORAGE 🗑️ | TECH ← | GROUP any size

☐ MATERIALS:

Four 10-foot pieces of $\frac{3}{4}$ inch PVC pipe

To be cut into 1, 1½, and 2 foot pieces

Ten each of $\frac{3}{4}$ inch PVC Connectors

90-degree elbows

45-degree elbows

Connectors

End caps

Tee-fittings

Four-way fittings

☐ TOOLS:

Hacksaw or copper tube cutter

Can your students use the power of gravity and simple machines to move a marble from point A to point B?

Making a marble run sounds like a simple task, but it opens the door for all types of skill building and problem solving. Students will use PVC pipe and connectors to build their run and will discover that, with a little patience and creativity, there are a million ways to reach their goal.

Suggestion Box:



Use a copper tube cutter to cut your PVC pipe. It is worth the money and you will not have to sand nearly as much. [This is one option.](#) Plus, it is much safer to use than a hacksaw. Check the diameter of the cutter.



Use buckets or laundry baskets to store marble run pieces.



Robots

COST \$\$\$ | PREP ⌚ | STORAGE 📦 | TECH 📱 | GROUP | any size

MATERIALS:

See chart on the following page for a listing of the different types of robot kits you can get.

Robots are a great item for a makerspace. They come in all different sizes with different ways to program. So use wooden blocks, cubes, an app, or a computer to program them.



Some robots you can decorate, some you can code, and many you can collaborate with. One way you can use an autonomous robot is to program the robot to run through a maze.

1. Brainstorm ideas for the maze.
2. Design the maze.
3. Build the maze.
4. You can use bridges and ramps also.
5. Program the robot.
6. Test the program.



Robots

COST **\$\$\$** | PREP | STORAGE | TECH | GROUP **any size**

Type	Cost	Level	Description	Tech
Bee-Bot	\$90	EC, K, 1	Small bee-shaped robot with button commands.	No screen
Code & Go Robot Mouse	\$60	EC, K, 1	Build a maze and then use the coding cards to create a step-by-step path for the programmable Robot Mouse.	None
Cubetto	\$225	EC, K, 1	Wooden cube robot programmed with blocks and placed on a wooden control board.	No screen
Dash	\$150	K-5	Dash is a small robot that responds to voice, navigates objects, dances, and sings.	iOS and Android
KIBO	\$230-500	EC,K,1, 2	Build a robot with KIBO, program and decorate it. Uses wooden KIBO blocks to program.	None
LEGO Boost	\$160	2+	The LEGO kit includes a tilt sensor, a color and distance sensor, and a motor.	iOS or Android
LEGO EV3	\$380	4-12	Intelligent brick computer that controls the system made of modular sensors, motors, and LEGO building pieces.	PC/Mac, Chromebook, iPad
LEGO WeDo 2.0	\$180	K-5	LEGO kit with drag and drop programming.	iOS tablet PC/Mac Computer
Ollie/Sphero	\$99-129	3-8	App-enabled robotic cylinder or ball.	iOS, Android, and Windows
Ozobot	\$100	K-12	A tiny robot, measuring one inch in height. To program, draw OzoCode color codes on paper or a tablet.	iOS and Android
VEX Robotics	\$280	Vex IQ 4-8 Vex EDR 7-12	Starter kit includes motors, sensors, controller, and 850 building components.	iOS, Android, or PC/Mac Computer



Reflecting on the Learning

“It has been amazing to watch students try, try, try, and try again. Our Imaginasium makerspace has created an environment where students aren’t afraid to fail because they know that it’s an opportunity for them to learn and grow. The challenges presented to them are so engaging and motivating that they stick with them until they complete them. This stick-with-it-ness has spilled over into the classroom with academics and in the lives of our students and it’s a beautiful thing to see!”

-Jeannine Freeman
District Instructional Technology Specialist
Fort Sam Houston ISD

Reflecting on the making experience enhances its meaning and encourages insight and complex learning. We foster our own growth when we control our learning, so reflection can be done on an individual basis or with one's peers.

Teachers can use many strategies to guide student reflections:

- Discussions
- Interviews
- Questioning (oral or written)
- Logs
- Journals
- Inventory Cards (see pages 35 and 36)

SAMPLE QUESTIONS:

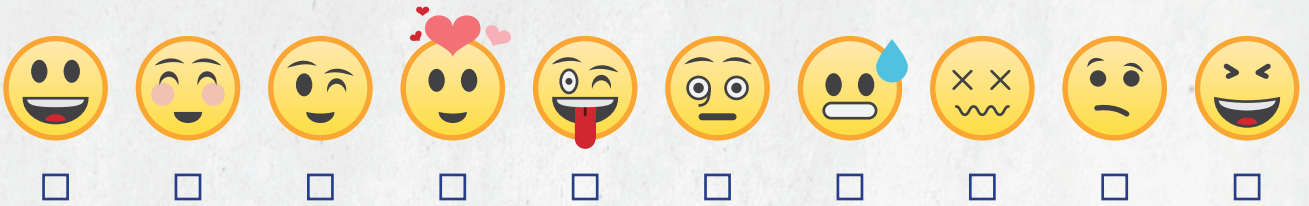
- Share one thing you learned.
- Share a question for future investigation.
- Respond with a word.
- What worked? What didn't work?
- What is one part of your work that you are proud of?
- How would you change your process next time?

Complete this page to record your maker reflections or use it as a template to create your own “My Maker Reflections” page.

Name: _____

I made: _____

My emotions during my project. (Pick all that apply)



CHOOSE ONE OR MORE TO ANSWER.

What did I learn? What worked? What didn't work? What would I change? What would I tell others? What new skill did I learn? What will I do differently next time?

My Maker Reflections

My Maker Reflection	All of the Time	Most of the Time	Sometimes	Never
I continued with my makerspace project even when it was hard.				
My work is neat and put together well.				
I used my time wisely.				
I put forth my best effort.				
I learned something important.				
Notes:				



Facilitator Reflection

MAKERSPACE REFLECTION FOR THE FACILITATOR

What worked? _____

What did not work? _____

What new project/space/challenge will I introduce next year? _____

The logo consists of the word "tcea" in a lowercase, sans-serif font above the word "MAKERS" in a bold, uppercase, sans-serif font, both contained within an orange circle.

tcea
MAKERS

About TCEA

TCEA (www.tcea.org) is a member-based organization devoted to the use of technology in education. Our primary focus is on integrating technology into the PreK-12 environment and providing our members with state-of-the-art information through conferences, workshops, newsletters, the Internet, and collaborations with higher education and business. For more information on the benefits of becoming a member, visit www.tcea.org/membership/

TCEA offers a number of workshops specifically devoted to makerspace implementation and best practices throughout the year. For more upcoming makerspace workshops and other exciting professional development opportunities, visit: www.tcea.org/events.

For great tips, resources, and ideas to help you better integrate technology into your school, classroom, or library, visit our popular TechNotes blog at www.tcea.org/blog. We update frequently with innovative content on everything from makerspaces to cool new apps to try in the classroom and the latest ed tech news.

With  **tcea** you've got this.

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