

World-Building Maker Summer Program

Resources for Facilitators

In addition to the curricular breakdown on the following pages, these resources will be helpful to you as begin to prepare to run the summer maker program.

Family Permission Letter	Customize a letter to introduce families to the summer making program.
Materials List	Review materials needed for the maker program. Most are common craft, school, or office supplies or can be collected from the community.
Donations Letter	Customize a letter asking your community to donate items to the making program.
Donations Flyer	Post a flier around your school so you can collect materials donations for students to use.

Week 1	Monday	Tuesday	Wednesday	Thursday
Themes	Engineering Design Process Imagine a World	Make a Journal	Work with Clay	Work with Cardboard
Theme Explanations	<p>The Engineering Design Process is a framework for understanding and describing the creative process.</p> <p>Students will think about the settings of their personal lives or favorite stories and construct an inventory of the items that make up those worlds as they work towards creating a world, real or imaginary, using the tools and skills they develop over the course of the summer sessions.</p>	<p>Journals are places to capture ideas. Through words, drawings, lists, doodles, or reflections, journals are records of a process.</p> <p>Students construct journals to collect ideas, plans, and notes about the components of the world they want to make. Students will use these journals in subsequent sessions to reflect on their work and their maker experiences.</p>	<p>Students will choose a character from their world-building brainstorm and use clay or model magic and clay-sculpting tools and techniques to make a 3D version of that character.</p>	<p>Students will explore various cardboard-manipulation techniques.</p> <p>Students will use a cardboard cutting tool called a canary cutter to practice four different cardboard construction techniques that will help them build stable, strong objects for their worlds.</p>
Objectives	<p>Students will understand the Engineering Design Process through a design challenge. Students will learn to organize ideas into categories.</p>	<p>Students will understand the purpose of documenting their ideas and progress. They will design and fabricate their own journal and learn to sew a bookbinding, including using a hammer and a nail to</p>	<p>Students will explore clay as a building material and begin to determine what objects, shapes, and textures are most suitable to be made out of clay. Students will learn several clay-shaping</p>	<p>Through exploring a new material, cardboard, students will make discoveries about what gives cardboard its strength. Students will experiment with different techniques to make scores,</p>

		create holes, threading a needle, and sewing a basic stitch or learn to wrap a bookbinding using a scissors and thread.	techniques, including rolling, coiling, and pinching and how to add texture with clay-sculpting tools.	cuts, curves, and slots in cardboard.
Challenge Level	2 out of 5	3 out of 5	2 out of 5	3 out of 5
Daily Activities	World-building Curriculum Intro Activity: Page 14 Activity 1: Imagine a World (Page 19)	World-building Curriculum Activity 2: Make a Journal (Page 27)	World-building Curriculum Activity 3: Work with Clay (Page 47)	World-building Curriculum Activity 4: Work with Cardboard (Page 58)
Daily Presentation	World-building Presentation Intro Activity (Slides 1-10) Activity 1: Imagine a World (Slides 11-22)	World-building Presentation Activity 2: Make a Journal (Slides 23-36)	World-building Presentation Activity 3: Work with Clay (Slides 37-46)	World-building Presentation Activity 4: Work with Cardboard (Slides 47-57)
Home/School Connections	Children can practice imagining the details of a new world by asking family to share pictures of unfamiliar relatives or friends and learning about them. Students can then pick an individual and decide on the age, mannerisms, and voice of that person. Invite family members to interview the child in character, learning about that person's favorite	There are a whole host of reasons why open-ended journaling is a good thing. Aside from it being a way to organize one's thinking or process one's feelings or one's day, taking time for writing without time constraints or output requirements supports writing stamina and creativity. Ask your child to name a favorite spot in the	Try making playdough with your child from every-day pantry items. All you need is a mixing bowl, flour, salt, oil, cream of tartar, boiling water and food coloring. Check out this site or this video for the proportions of each and step-by-step instructions. Squish and roll and layer away as you build something new! Try a pet sculpture, the furniture in a room, or a free-	Got some boxes? How about a pair of scissors and some packing tape? You have the world at your fingertips! Watch this video about Cane , a 9-year old boy who built a full-scale arcade out of cardboard and other everyday objects and had an influx of customers he did not expect. Create an arcade game out of cardboard with your child and invite others

	foods, clothing styles, and hobbies.	home and head over there with some paper and things to write or draw with, and go at it.	form piece that speaks to your inner artist!	to play!
Spirit day	<p>Favorite Character Day Come dressed as a favorite character or person from a story, movie, television show, or place in one's life.</p>	<p>Best Memory Ever Day Have a favorite birthday party, vacation or other memory that makes you feel good when you think about it? Bring in something that reminds you of that memory or even come dressed up as that favorite memory, and be ready to share!</p>	<p>Bright Idea Day Wear your "brightest idea" on an old t-shirt.! Ask students to draw a picture of their most ingenious invention on an old t-shirt. Have an idea for a crazy rollercoaster? Interested in a bike that only goes sideways? Want a missing toy detector, well...draw it and wear it proudly!</p>	<p>Cardboard Accessory Day What is your favorite accessory? A head band? A watch? A hat? A piece of jewelry? Come to club wearing a cardboard or paper version of your favorite fashionable add-on!</p>
Additional Resources	<p>On EDP</p> <ul style="list-style-type: none"> • PBS video on the Engineering Design Process • Teach Engineering Design Process Video • Design impacts our everyday experiences; even the design of our own bodies! Become aware of how significant the design of your ears are! 	<p>On journal making</p> <ul style="list-style-type: none"> • Journal Making 	<p>Extension activities</p> <ul style="list-style-type: none"> • Building with Playdough • Marbles and Playdough 	<p>On worldbuilding with cardboard</p> <ul style="list-style-type: none"> • Helpful Tools for Working with Cardboard • Connecting Students to the World with the Cardboard Challenge

Week 2	Monday	Tuesday	Wednesday	Thursday
Themes	Work with Cardboard	Build with Blocks	Light Up an LED	Light Up an LED (continued)
Theme Explanations	<p>Students will explore various cardboard-manipulation techniques.</p> <p>Students will use a cardboard cutting tool called a canary cutter to practice four different cardboard construction techniques that will help them build stable, strong objects for their worlds.</p>	<p>Students will explore how to make block sculptures using hot glue guns.</p> <p>Students will create 3D block sculptures for their world. They will then diagram their structures and use it to recreate their creation at a hot glue gun station.</p>	<p>Students will explore simple circuits as they learn how to use a battery and copper tape to man an LED light up.</p>	<p>Students will continue exploring simple circuits as they learn how to use a battery and copper tape to man an LED light up.</p>
Objectives	<p>Through exploring a new material, cardboard, students will make discoveries about what gives cardboard its strength. Students will experiment with different techniques to make scores, cuts, curves, and slots in cardboard.</p>	<p>Students will gain confidence and experience with using a new tool: a hot glue gun. When they transfer a 3D object to a 2D drawing, students come to understand that creating <i>diagrams</i>, or visual representations, of planned objects can be a key tool in the Engineering Design Process.</p>	<p>Students will learn the mechanics of a simple circuit, developing the understanding that a circuit is an uninterrupted path through which electricity continuously moves.</p>	<p>Students will continue learning the mechanics of a simple circuit, developing the understanding that a circuit is an uninterrupted path through which electricity continuously moves.</p>

Challenge Level	3 out of 5	3 out of 5	4 out 5	4 out 5
Daily Activities	World-building Curriculum Activity 4: Work with Cardboard (Page 58)	World-building Curriculum Activity 5: Build with Blocks (Page 75)	World-building Curriculum Activity 6: Light up an LED (Page 83)	World-building Curriculum Activity 6: Light up an LED (Page 83)
Daily Presentation	World-building Presentation Activity 4: Work with Cardboard (Slides 47-57)	World-building Presentation Activity 5: Build with Blocks (Slides 58-67)	World-building Presentation Activity 6: Light up an LED (Slides 68-76)	World-building Presentation Activity 6: Light up an LED (Slides 68-76)
Home/School Connections	What can you do with all those cardboard boxes in your home? Check out this blog for 25 craft ideas families can work on together.	Ready for a stack and balance challenge? Grab 8 objects from your pantry - boxes of noodles or rice or cans of beans or sauce are all great. Now work together to build something that is narrower on the bottom than on the top using at least 3 of those objects. Can you increase it to 4 or 5? Talk about how the difficulty of the challenge changes with different objects and why that would be.	Work together to make a shadow puppet show . Cut out paper characters and attach them to sticks (or spoons, or skewers or anything long). Place a flashlight on a table about 2 feet from a light colored wall. As you tell a story about your characters, move them in front of the light source and check out their shadows. How can you make the shadows bigger or smaller?	Try your hand at nighttime family flashlight limbo! Turn off the lights and shine a flashlight so the beam shines parallel to the ground. Get some music going and take turns making your way under the beam, making sure body parts avoid illumination!
Spirit day	Cardboard Accessory Day Continue to rock your favorite accessory by coming to club wearing a cardboard or paper version of your favorite fashionable add-on. It could be a new one or the same one!	Maker Hat Day Using leftover cardboard materials, come to club ready to create an original hat designed by you. Want to make multiple? Go for it! You can try to balance and stack your designs high in the air!	Favorite Colors Day Come to school rocking your favorite colors!	Human Rainbow Day Create a human rainbow. Pick a color of the rainbow and come dressed in that color!

Additional Resources	Extension activities <ul style="list-style-type: none"> • Ways to connect cardboard • Cardboard Box Adventures • Doghouse design project 	Extension activities <ul style="list-style-type: none"> • Get Moving with Blocks • Building Blocks Challenge 	On teaching paper circuits <ul style="list-style-type: none"> • How to Teach a Paper Circuit Workshop 	On teaching paper circuits <ul style="list-style-type: none"> • Paper Circuits • Circuit templates Extension activities <ul style="list-style-type: none"> • Build a Flashlight
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Week 3	Monday	Tuesday	Wednesday	Thursday
Themes	Make a Light-Up Sign	Make a Light-Up Sign (continued)	Make an Object Move	Make an Object Move (continued)
Theme Explanations	Building on what students learned about circuits in Activity 6, students will continue to explore simple circuits by designing a light-up sign to showcase the name of their world.	Building on what students learned about circuits in Activity 6, students will continue to explore simple circuits by designing a light-up sign to showcase the name of their world.	Students will continue to explore how circuits work by using batteries and motors to create an object that moves or has moving parts.	Students will continue to explore how circuits work by using batteries and motors to create an object that moves or has moving parts.
Objectives	Students will employ and build on their knowledge of circuits to design, create, and test a light-up sign.	Students will employ and build on their knowledge of circuits to design, create, and test a light-up sign.	Students will learn how to create a circuit that turns on a motor.	Students will learn how to create a circuit that turns on a motor.
Challenge Level	4 out of 5	4 out of 5	3 out of 5	3 out of 5
Daily Activities	World-building Curriculum Activity 7: Make a Light-Up Sign	World-building Curriculum Activity 7: Make a Light-Up Sign	World-building Curriculum Activity 8: Make an Object Move	World-building Curriculum Activity 8: Make an Object Move

	(Page 96)	(Page 96)	(Page 105)	(Page 105)
Daily Presentation	World-building Presentation Activity 7: Make a Light-Up Sign (Slides 77-84)	World-building Presentation Activity 7: Make a Light-Up Sign (Slides 77-84)	World-building Presentation Activity 8: Make an Object Move (Slides 85-91)	World-building Presentation Activity 8: Make an Object Move (Slides 85-91)
Home/School Connections	<p>Make your own shadow puppet show and explore how you can change the shape or size of your puppet's shadow.</p> <ul style="list-style-type: none"> • Shadow puppet activity 	<p>Design a sign for your house. Maybe it's a welcome sign for guests, or a reminder sign to walk the dog. Or maybe it's a sign for your bedroom, asking people to knock before entering! Sketch out your idea, decide on the materials you'll need, and remember to include a way to display your sign (hang it, tape it, etc) in your design.</p>	<p>Powering a motor with a battery is one way to make something move. But it's not the only way! What about wind or water or a rubber band? Try some experiments at home and discover the power of these different forms of energy!</p> <ul style="list-style-type: none"> • Simple Catapult • Rubber-band powered car 	<p>Make an obstacle course and get moving. Using the objects and spaces in your home (laundry baskets, chairs, and boxes are light, easy things to include) create an obstacle course that requires players to jump, crawl, run and skip. Time everyone - the fastest time gets to pick that night's dessert!</p>
Spirit day	<p>Light it Up Day Pass out glow sticks and jewelry, decorate the hallways and classrooms with string lights, and give your room a glow!</p>	<p>Sidewalk Chalk Day Take time to be outside and use sidewalk chalk to decorate surfaces with colorful pictures and positive words. And if anyone is up for it, throw in a diagram of circuit to get those around your neighborhood thinking about it too!</p>	<p>Show your Moves Day Get ready for a dance off! Gather round and pirouette, moonwalk or show off the latest TikTok dance trend.</p>	<p>Dance Party Day Play music during class. Play a song for students to dance to or just get everyone together for a big old dance jam to kick off or end the day.</p>

Additional Resources	On making light-up cards <ul style="list-style-type: none">• Make Paper Circuit Light Up Card	Extension activities <ul style="list-style-type: none">• Taking the Light Up Card a Step Further	Extension activities <ul style="list-style-type: none">• Making a Simple Electric Motor• Get inspired by, and thinking about, other types of energy that can make objects move by watching Audri and his amazing Rube Goldberg Machine	Extension activities <ul style="list-style-type: none">• Get Your Motor Running
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Week 4	Monday	Tuesday	Wednesday	Thursday
Theme	Make a Virtual Object	Refine and Finish World	Refine and Finish World	Host a Showcase
Theme of the day (explanations)	Students will learn introductory 3D modeling software skills using Tinkercad, a free web-based program.	Students will inventory the items they have made, select which they'd like to include in their worlds, determine which they'd like to refine, and decide what additional items they want to include in their worlds.	Students will inventory the items they have made, select which they'd like to include in their worlds, determine which they'd like to refine, and decide what additional items they want to include in their worlds.	Students organize their worlds for display, practice interacting with visitors, and share their creations with visitors during a public showcase.
Objectives	Students will learn fundamental 3D modeling software features, including stretching, rotating, grouping, creating holes, lifting, and changing color.	Students will refine and finalize their world by deciding on what items they will like to include.	Students will refine and finalize their world by deciding on what items they will like to include.	Students' work in the Maker Club will be concluded with a public showcase.
Challenge Level	5 out of 5 (This activity will likely be most successful with grades 5 and up)	The challenge-level of this activity will vary depending on the tools required and the complexity of desired outcomes.	The challenge-level of this activity will vary depending on the tools required and the complexity of desired outcomes.	n/a
Daily Activities	World-building Curriculum Activity 9: Make a Virtual Object (Page 114)	World-building Curriculum Activity 10: Refine and Finish World (Page 133)	World-building Curriculum Activity 10: Refine and Finish World (Page 133)	World-building Curriculum Conclusion: Host a Showcase (Page 138)

Daily Presentation	World-building Presentation Activity 9: Make a Virtual Object (Slides 92-102)	World-building Presentation Activity 10: Refine and Finish World (Slides 103-109)	World-building Presentation Activity 10: Refine and Finish World (Slides 103-109)	n/a
Home/School Connections	So you learned how to design a virtual object. How about working together to make virtual characters dance to Lil Naz X? Check out this Code a Dance Party challenge from code.org's Hour of Code Challenges.	What's something in your room that you want to improve or fix? A messy drawer? Make a drawer organizer out of cardboard! A wiggly dresser drawer knob? See who has a screwdriver and tighten up that hardware! What other pesky things can you fix or improve with your maker skills?	Who is that person in your life who has a lot of tools and is good at fixing things? Maybe a relative? A neighbor? Someone else in your community? What about a parent? Ask this person if you can help out next time they fix something. Maybe someone with lots of tools can give you a tour of their workspace or toolbox and teach you how to use a tool you haven't seen before.	Invite students to share their worlds and talk about the making process with family who could not attend the showcase.
Spirit day	Future Me Day Who would have thought about virtual objects and 3-D printing just 10 years ago? Invite students to come to school dressed as their future selves.	Pajama Day Get comfy AND get to work finishing up or fixing the objects for your world.	Pajama Day Get comfy AND get to work finishing up or fixing the objects for your world.	Black Tie Day Get dressed to the nines on this big day as you proudly show your world to event guests.
Additional resources	On teaching 3D programs <ul style="list-style-type: none"> • How to Teach an Intro to 3D Printing 	n/a	n/a	On running a showcase <ul style="list-style-type: none"> • Planning a Student Showcase

	Class to Students			<ul style="list-style-type: none">• Running a Student Showcase
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Handouts for Families

Summer Program 2023

Spirit Day Calendar



Week 1:



Monday: [Favorite Character Day](#)

Come dressed as a favorite character or person from a story, movie, television show, or place in one's life.

Tuesday: [Best Memory Ever Day](#)

Have a favorite birthday party, vacation or other memory that makes you feel good when you think about it? Bring in something that reminds you of that memory or even come dressed up as that favorite memory, and be ready to share!

Wednesday: [Bright Idea Day](#)



Wear your "brightest idea" on an old t-shirt! Draw a picture of your most ingenious invention on an old t-shirt. Have an idea for a crazy rollercoaster? Interested in a bike that only goes sideways? Want a missing toy detector, well...draw it and wear it proudly!

Thursday: [Cardboard Accessory Day](#)

What is your favorite accessory? A head band? A watch? A hat? A piece of jewelry? Come to club wearing a cardboard or paper version of your favorite fashionable add-on!

Summer Program 2023

Spirit Day Calendar



Week 2:

Monday: Cardboard Accessory Day

Continue to rock your favorite accessory by coming to club wearing a cardboard or paper version of your favorite fashionable add-on. It could be a new one or the same one!



Tuesday: Maker Hat Day

Using leftover cardboard materials, come to club ready to create an original hat designed by you. Want to make multiple? Go for it! You can try to balance and stack your designs high in the air!

Wednesday: Favorite Colors Day

Come to school rocking your favorite colors!

Thursday: Human Rainbow Day

Create a human rainbow. Pick a color of the rainbow and come dressed in that color!



Summer Program 2023

Spirit Day Calendar



Week 3:

Monday: Light It Up Day

Teachers will pass out glow sticks, jewelry and string lights so that students can give our classroom a glow! If you have materials at home that could be useful, feel free to bring those in too.

Tuesday: Sidewalk Chalk Day

Students will take time to be outside and use sidewalk chalk to decorate surfaces with colorful pictures and positive words. And if anyone is up for it, throw in a diagram of circuit to get those around your neighborhood thinking about it too!

Wednesday: Show Your Moves Day

Get ready for a dance off! Students will gather round and pirouette, moonwalk or show off the latest TikTok dance trend.

Thursday: Dance Party Day

Music will be played in the classroom for students to dance to or just get everyone together for a big old dance jam to kick off or end the day.



Summer Program 2023

Spirit Day Calendar



Week 4:

Monday: Future Me Day

Who would have thought about virtual objects and 3-D printing just 10 years ago? Students are invited to come to school dressed as their future selves.

Tuesday: Pajama Day

Wearing your PJs, get comfy AND get to work finishing up or fixing the objects for your world.

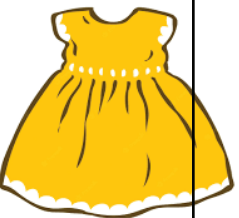


Wednesday: Pajama Day

Wearing your PJs, continue to be comfy AND get to work finishing up or fixing the objects for your world.

Thursday: Black Tie Day

Get dressed to the nines on this big day as you proudly show your world to event guests.



Summer Program 2023

Home Connections



Week 1:

Monday: Imagine a World Day

Children can practice imagining the details of a new world by asking family to share pictures of unfamiliar relatives or friends and learning about them. Students can then pick an individual and decide on the age, mannerisms, and voice of that person.

Invite family members to interview the child in character, learning about that person's favorite foods, clothing styles, and hobbies.

Tuesday: Make a Journal Day

There are a whole host of reasons why open-ended journaling is a good thing. Aside from it being a way to organize one's thinking or process one's feelings or one's day, taking time for writing without time constraints or output requirements supports writing stamina and creativity. Ask your child to name a favorite spot in the home and head over there with some paper and things to write or draw with, and go at it.

Wednesday: Work with Clay Day

Try making playdough with your child from every-day pantry items. All you need is a mixing bowl, flour, salt, oil, cream of tartar, boiling water and food coloring. Check out the links below for the proportions of each and step-by-step instructions. Squish and roll and layer away as you build something new! Try a pet sculpture, the furniture in a room, or a free- form piece that speaks to your inner artist!

<https://artfulparent.com/no-cook-versus-cooked-homemade-playdough-recipe/>
<https://www.youtube.com/watch?v=zTQ8NMhIFg4>

Thursday: Work with Cardboard Day 1

Got some boxes? How about a pair of scissors and some packing tape? You have the world at your fingertips! Watch the video below about a 9-year old boy who built a full-scale arcade out of cardboard and other everyday objects and had an influx of customers he did not expect. Create an arcade game out of cardboard with your child and invite others to play!

<https://www.youtube.com/watch?v=faIFNkdq96U>

Summer Program 2023

Home Connections



Week 2:

Monday: [Work with Cardboard Day 2](#)

What can you do with all those cardboard boxes in your home? Check out the blog below for 25 craft ideas families can work on together.

<https://artscraftsymom.com/things-to-make-with-cardboard-boxes/>

Tuesday: [Build with Blocks Day](#)

Ready for a stack and balance challenge? Grab 8 objects from your pantry - boxes of noodles or rice or cans of beans or sauce are all great. Now work together to build something that is narrower on the bottom than on the top using at least 3 of those objects. Can you increase it to 4 or 5? Talk about how the difficulty of the challenge changes with different objects and why that would be.

Wednesday: [Light up an LED Day 1](#)

Work together to make a shadow puppet show like the activity below. Cut out paper characters and attach them to sticks (or spoons, or skewers or anything long). Place a flashlight on a table about 2 feet from a light colored wall. As you tell a story about your characters, move them in front of the light source and check out their shadows.

How can you make the shadows bigger or smaller?

<https://www.sciencebuddies.org/stem-activities/shadow-puppets>

Thursday: [Light up an LED Day 2](#)

Try your hand at nighttime family flashlight limbo! Turn off the lights and shine a flashlight so the beam shines parallel to the ground. Get some music going and take turns making your way under the beam, making sure body parts avoid illumination!

Summer Program 2023

Home Connections



Week 3:

Monday: [Make a Light-Up Sign Day 1](#)

Make your own shadow puppet show and explore how you can change the shape or size of your puppet's shadow. Check out the link below for inspiration!

<https://www.sciencebuddies.org/stem-activities/shadow-puppets>

Tuesday: [Make a Light-Up Sign Day 2](#)

Design a sign for your house. Maybe it's a welcome sign for guests, or a reminder sign to walk the dog. Or maybe it's a sign for your bedroom, asking people to knock before entering! Sketch out your idea, decide on the materials you'll need, and remember to include a way to display your sign (hang it, tape it, etc) in your design.

Wednesday: [Make an Object Move Day 1](#)

Powering a motor with a battery is one way to make something move. But it's not the only way! What about wind or water or a rubber band? Try some experiments at home, find some examples linked below, and discover the power of these different forms of energy!

<https://kidsactivitiesblog.com/28871/catapult-for-kids-to-make>
<https://inspirationlaboratories.com/challenge-and-discover-make-a-vehicle/>

Thursday: [Make an Object Move Day 2](#)

Make an obstacle course and get moving. Using the objects and spaces in your home (laundry baskets, chairs, and boxes are light, easy things to include) create an obstacle course that requires players to jump, crawl, run and skip. Time everyone - the fastest time gets to pick that night's dessert!

Summer Program 2023

Home Connections



Week 4:

Monday: [Make a Virtual Object Day](#)

So you learned how to design a virtual object. How about working together to make virtual characters dance to Lil Naz X? Check out the challenge linked below from code.org's Hour of Code Challenges and give one a shot.

<https://code.org/dance>

Tuesday: [Refine and Finish World Day 1](#)

What's something in your room that you want to improve or fix? A messy drawer? Make a drawer organizer out of cardboard! A wiggly dresser drawer knob? See who has a screwdriver and tighten up that hardware! What other pesky things can you fix or improve with your maker skills?

Wednesday: [Refine and Finish World Day 2](#)

Who is that person in your life who has a lot of tools and is good at fixing things? Maybe a relative? A neighbor? Someone else in your community? What about a parent? Ask this person if you can help out next time they fix something. Maybe someone with lots of tools can give you a tour of their workspace or toolbox and teach you how to use a tool you haven't seen before.

Thursday: [Host a Showcase Day](#)

Invite students to share their worlds and talk about the making process with family who did not attend the showcase.