Skills Canada Alberta

Skills Exploration Days

2023 Teacher Guide

WHAT IS SKILLS EXPLORATION DAYS?

Skills Exploration Days is a career exploration experience designed to complement and support Alberta Education's Career and Technology Foundations (CTF) Program of Studies.

The purpose of Skills Exploration Days is to:

Inspire junior high students to identify inherent skills and interests

Connect skills and interests to trade and technology careers through interactive, hands-on experiences that promote creativity, empathy and exploration

Promote trades and technologies as valuable and rewarding career choices

Skills Exploration Days is an opportunity for teachers and junior high students (grades 7-9) to participate in an authentic and meaningful skilled trade and technology career exploration experience. Building on the Maker Day model, the goal of the program is to encourage the use of empathy through design thinking, inquiry, making, and experiential learning. Registered schools will be provided with a toolbox that includes the tools and materials students need to participate in Skills Exploration Days. 7 Learn-A-Skill activities are also included to help students familiarize themselves with the tools and materials available for building their prototype. Using the skills learned with the Learn-A-Skill activities, students will come together for an interactive live-stream to build a prototype that provides a solution to the Design Challenge and share their finished projects.

Please note Skills Exploration Days is an in-classroom program which heavily relies on teacher facilitation. Teachers are responsible for guiding their students through the Learn-A-Skill activities, the Design Thinking Process, and ensuring students are using the tools and materials provided in a safe and appropriate manner. Our hope is that Skills Exploration Days is as exciting for teachers as it is for students and will inspire educators to implement the Maker Model year-round in their schools! Questions regarding Skills Exploration Days programming can be sent to **clairel@skillsalberta.com.**

REGISTRATION	**September 27, 2023**	8:30am
INTERACTIVE LIVE-STREAM	**December 5, 2023**	9:00am-2:15pm

New registered schools will be provided with a toolbox that includes the tools, materials and PPE that students need to build their prototype. Schools that have previously attended Skills Exploration Days and received a toolbox are provided with a "top up" toolbox. These toolboxes will remain with the school to support your programs! **Toolboxes will be shipped to all schools.**

Note: Schools are encouraged to supplement the building with tools, technology and scrap/recycled materials already available at their school. See page 8 for a list of items included in the toolbox and to be supplied by the school.

The registration fee is $250 per new school and a $150 top-up fee per returning school with 30 students per school. **Schools have 7 days to drop their spot following the date of their registration. Any drops past the 7 day period will result in being invoiced 100% of the registration fee.** Teachers can request additional spots by making a waitlist request on the registration portal. Registration and additional student spot requests are rewarded on a first-come first-serve basis.

HOW DO I REGISTER?

Your school must be registered with Skills Canada Alberta to participate.

- Registering as a Skills School is free of charge. Visit **https://skillsalberta.com/resources/become-a-skills-school/** to create and submit your profile. Once registered, a username and password will be emailed to you.
- Login to the **www.skillsalberta.com** registration portal using your username and password by selecting the ***"Login"*** link that is found in the top navigation bar of our website.
- Login to the registration portal and select the "Skills Exploration Days" tab.
- Once registration opens, click on the green "Add New" and select the number of spots you would like. These spots will be added under "Registered Participants". If a spot is not available or if you would like to request additional spots, click "Add New" in the Waitlist Request section. Waitlist granting will take place on **October 4, 2023.**
- Questions regarding registration can be sent to **javierad@skillsalberta.com.**

GET STARTED IN THE CLASSROOM!

Follow these steps to ensure all in-classroom activities are completed prior to attending Skills Exploration Days

Step 1: Visit the Skills Exploration Days Website- Watch the Skills Exploration Days video to see what a day of exploration looks like, learn the 5 steps of the Design Thinking Process and why design thinking is important to build a meaningful prototype. Under the downloads section, find all of the resources you need to facilitate the in-class program**.**

Step 2: ***Read the 2023 Teacher Guide*****-** In our teacher guide, you'll find helpful information such as dates, online registration instructions, schedule of the day, sample floor plan and a list of tools, technology, and materials available to build with.

Step 3: ***Set-up the Learn-A-Skill Kits in the Classroom*****-** To be used prior to Skills Exploration Days. These skill exploration kits are designed for students to learn the basic skills, knowledge and safety associated with the tools and materials supplied in the toolbox. We recommend setting up the 7 kits around the classroom and groups of students (4-5/group) rotate through. Each kit includes an instructional video with safety information students must access via a QR code. Need additional information about the tools and how to use them safely? Check out more tool safety videos by scanning the QR code stickers included with your toolbox. All Learn-A-Skill videos and additional tool safety videos can also be accessed on the **Skills Exploration Days YouTube playlist.**

Step 4: ***Research the Design Challenge "Innovations in Water Conservation" in the Classroom***- A **design challenge** is a real life problem that needs to be solved. It is important to research and understand the concepts and vocabulary embedded in the challenge. The more background knowledge the students gain, the more successful they will be during the design thinking worksheet which will result in more creative and meaningful prototypes. We've provided just a few suggested resources to get started but we encourage you and your students to delve deeper into the design challenge topic with further research.

Step 5: ***Complete the Human-Centered Design Thinking Worksheet*****-** Now that students are experts on the design challenge topic, teachers will guide them through the design thinking process using the Human-Centered Design Thinking worksheet (included in the toolbox). Students will work in groups of 4 to complete the worksheet. Don't worry, teachers! Our **Design Thinking Presentation** will guide you in facilitating this process. Lastly, students will sketch their million dollar design in the Final Prototype Sketch section which will be the blueprint to build their prototype.

Step 6: ***Check out the Skills Exploration Days Padlet & Kahoot***- Get students familiar with the Skills Exploration Days ***Padlet*** (interact and post photos on the wall) and ***Kahoot*** (a fun feedback game to find out how the day went).

Step 7: ***Set up Work Stations for Building at Skills Exploration Days***- Students will visit a variety of hands-on stations and use power tools and a variety of materials to build their prototype. Teachers are responsible for supervising the stations to ensure students are safe. If possible, we highly encourage teachers to invite volunteers or industry experts to help at the work stations during Skills Exploration Days. Station signs, a sample floor plan, and a list of tools and materials needed for each station will be provided on page 8. Be part of the show! We recommend using a large screen to project the interactive live-stream of Skills Exploration Days so all the students can see! And don't forget to turn those speakers up!

Step 8: ***Tune in to the Skills Exploration Days Interactive Live Stream and Build a Prototype!***- Let the building begin! With their Final Prototype Sketch in hand, students will come together for an interactive live-stream to build their prototype and showcase their million dollar design! Students will work in their groups of 4 to build a prototype. Students can post pictures on the ***Padlet*** for a chance to win prizes or have their prototype featured on the big screen!

BONUS: ***Continue the Maker Movement in Your Classroom!*****-** Check out the ***Taking Making into Classrooms Resource*** on our Skills Exploration Day website for all the information you need to keep the excitement alive! See **Section 12** for 31 sample design challenges teachers can use in their classroom today!

A DAY OF VIRTUAL SKILLS EXPLORATION

Time	Event
Day Before	**Please ensure the work stations, tools, and materials are safely set up.**
8:50 AM	**Please log onto the live-stream Skills Exploration Days link (received via email)**
9:15 AM	**Welcome Announcements & Safety Video**
9:30 AM-11:30 AM **Check out the Skills Exploration Days Padlet!** **Use the QR Code for easy access!**	**Build Prototype** Using their final prototype sketch, students will have **3 hours and 15 minutes** to build a prototype by implementing the skills and knowledge acquired during the in-classroom Learn-A-Skill kits. Students will visit 8 work stations including **Electrical Installation, Fashion Technology, Graphic Design, Painting & Decorating, Plumbing, Sheet Metal, Woodworking (Carpentry/Cabinet Making), and Photography.** Everyone must wear **PPE** (gloves, safety glasses, ear protection) provided by SCA in the toolboxes. Students **must** wear close-toed shoes and long pants. Anyone with long hair must have it tied back. Along with using the tools and materials at the work stations, students can also use crafting materials at the **Pantry** and scraps at the **Reuse Centre** where they will be challenged to recycle, reuse, and become aware of environmentally-friendly materials. **Teachers are required to be present and onsite all day.** Be engaged and active with your students but allow them to independently construct their prototype as much as possible. Teachers are responsible for ensuring students are on-task and demonstrating safe behaviors. If possible, have volunteers or industry experts help at the work stations.
11:30 AM-12:00 PM	**Lunch Break** Please have students bring a bagged lunch.
12:00 PM-1:15 PM	**Finish Building Prototype and Create a Title Page** Schools are encouraged to have **Graphic Design** computers available so students can create and print the prototype title page on Photoshop (or a similar software). Students can use markers and paper if computers are not available. Students may also visit the Photography station to take a photo of their prototype.
1:15 PM-1:30 PM	**Clean up & Display Prototype** Students will clean up their workspaces and make their thinking visible by displaying the original prototype sketch, the prototype title page, and their completed prototype on a table for the Gallery Tour.
1:30 PM	**Gallery Tour** Students get the chance to test their prototype, answer questions and visit other displays. Skills Alberta will also highlight some student prototypes from the Padlet on the big screen!
2:00 PM	**Reflection & Evaluation** Finally, all students will appraise their skills and knowledge used to respond to the challenge by participating in a fun reflection and evaluation game via KAHOOT. **Please have computers or devices available to play.** **Use the QR Code to easily access KAHOOT!** The game pin will be provided and displayed by the Skills Alberta Host.
2:15 PM	**Closing Remarks/Depart**

SKILLS EXPLORATION DAYS DESIGN CHALLENGE

Innovations in Water Conservation

Overview

Most of us start the day in a similar way: we head to the bathroom, brush our teeth, wash our hands, take a shower, and make ourselves breakfast. It's easy to forget that these normal morning activities can use over a hundred litres of water, even before lunch!

While our lifestyles have changed a great deal over the past century, one thing has remained constant; we have always needed water to survive. Early on, humans prioritized access to fresh water by building settlements and towns near lakes, rivers, and streams. As towns and cities grew, new infrastructure was built to make water access more convenient. Pipes carrying water to each building made daily activities easier and significantly improved both sanitation practices and public health. But with convenience also came waste.

On average, Canadians use approximately 215 litres of water per day[1] and Canada is ranked as one of the top water wasting countries[2]. Despite having a large portion of the world's fresh water, there are still communities across the country without clean access to this valuable resource. Globally, there are still approximately 2 billion people without safely managed drinking water[3].

Design Rationale

Canada has 1/5 of the world's fresh water. We need to become leaders in the conservation and stewardship of the planet's most vital resource. As a developed nation, we have an even greater responsibility to examine every opportunity to conserve and reuse water. Many of us take for granted our abundant access to water and have no idea how much we consume and waste in our everyday activities. By reflecting on our daily habits and adopting even a few water conservation practices, we can significantly reduce our water footprint and model responsible water management for others.

Problem Scenario

Implementing the principles of sustainable development, your team has been selected to develop a prototype of a water conservation solution for your home, school, or community. The purpose of the prototype should be to minimize the amount of water that is wasted or provide ways to capture and filter existing water. Consider the following concerns that may apply when designing your prototype:

- Must address the need for sanitation, if necessary (potable vs non-potable water)
- Must be safe (someone cannot fall into it)
- Should be protected from extreme temperatures and the environment
- Should limit or reduce evaporation

Success Determinants

Success will be determined by the degree to which your design solution:

- ☐ Addresses the design challenge
- ☐ Addresses an identifiable need
- ☐ **Is original** (not an exact copy of something that already exists) **and as realistic as possible**.
- ☐ Utilizes the tools and materials provided in a creative and safe manner
- ☐ Aligns to the design motto: *Make it smaller, stronger, do more, be easier to use, be cheaper.*

***Prototype:** a model that illustrates the functionality of an idea or design. It may be life sized or scaled to a model that fits in your hand.

***Water Conservation**: a series of methods aimed at reducing our use of freshwater resources[4]

***Water Stewardship**: using water in a way that is socially equitable, environmentally sustainable, and economically beneficial[5]

SUGGESTED RESOURCES TO GET YOU STARTED

Design Challenge Background Information	
Sustainable Development Goals[3:] Clean Water and Sanitation	https://www.un.org/sustainabledevelopment/ water-and-sanitation/
Water Scarcity	https://www.unwater.org/water-facts/water-scarcity
7 Countries that Waste the Most Water[2]	https://earth.org/countries-that-waste-the-most-water/
Survey of Drinking Water Plants[1]	https://www150.statcan.gc.ca/n1/daily-quotidien/210817/ dq210817c-eng.htm
Why is Water Conservation Important?[4]	https://www.masterclass.com/articles/water-conservation-explained
Water Stewardship Definition[5]	https://www.unido.org/our-focus/safeguarding-environment/ resource-efficient-and-low-carbon-industrial-production/industry-and-adaptation/water-stewardship#:~:text=Water%20 steward-ship%20is%20defined %20as,site%20and%20catchment% 20based%20actions
Water Conservation	
Water Use and Conservation	https://www.calacademy.org/educators/fresh-solutions-water-use-and-conservation
How to Save Water	https://www.watercalculator.org/how-to-save-water/
100+ Water Saving Tips	https://wateruseitwisely.com/100-ways-to-conserve-water/?view=list
20 Ways to Conserve Water at Home	https://www.thezebra.com/resources/home/how-to-conserve-water-at-home/#kitchen
Self Sustainable Zero Waste Productive Home in Melbourne Demonstrates Fu-ture	https://video.link/w/uOHzd
Creating Innovative Water Recycling Showers for the Future	https://about.ikea.com/en/behind-scenes/innovation-technology/2022/11/17/creating-innovative-water-recycling-showers-for-the-future

HUMAN-CENTERED DESIGN THINKING ACTIVITY

Look for printed student copies of the worksheet in your toolbox!

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1. EMPATHIZE: Design something meaningful for your partner

Have a conversation with your partner to find out what they know about the topic, make personal connections, and find out what is most important to them by asking them questions.

What does the term *water conservation* mean to you? Tell me about your water use at home. Which of your daily activities uses the most water? Do you recycle water at home for different purposes? What's a barrier that stops you from using less water? What are some examples of irresponsible water use that you see happening in your school or community? How could you reduce your water use at home or school? Ask them to: "tell me stories", "tell me why you feel that way", or follow up on a comment.

2. DEFINE: What is the problem your partner is trying to solve?

_____

Partner's name

needs a way to _____

What: Pick ONE problem that is most important to your partner that you need to solve. What are they most concerned about? What are they most passionate about?

because _____

_____

_____

Why: Explain why this problem is important to your partner. Use facts or stories from #1 to help explain.

3. IDEATE: Brainstorm & sketch solutions to solve your partner's ideas

Sketch 2-4 ideas to help solve the problem

Add lots of detail. Use words and arrows to help describe your sketches.

Share your sketches, gain feedback & redesign ONE idea

Share your sketches with your partner. Use their feedback to modify, redesign or create a new idea.
Share this sketch with your group. Who has the best solution to the design challenge?
Everyone needs to sketch the final idea on the Final Prototype Sketch.

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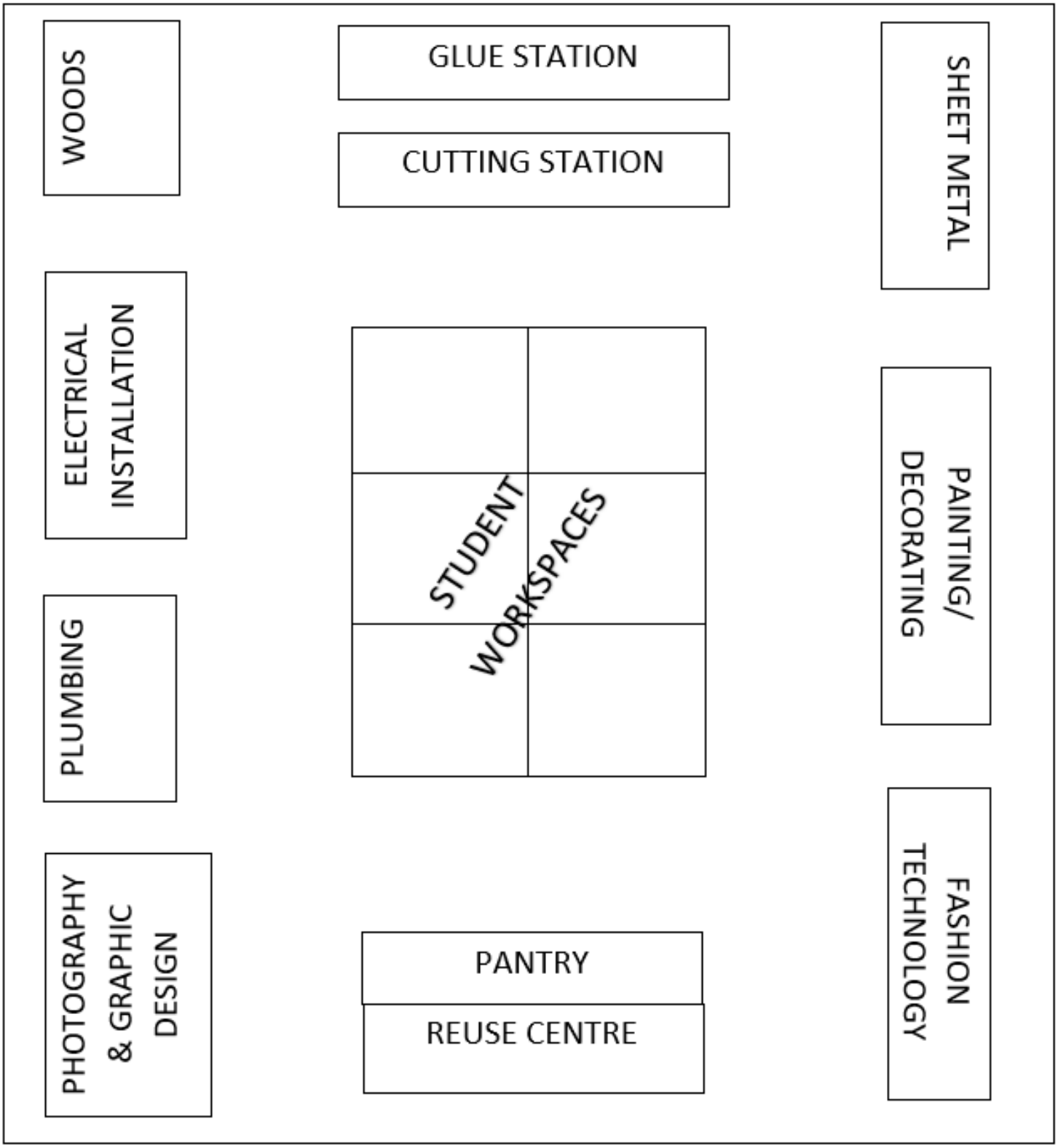
Final Prototype Sketch

Please use this sketch at Skills Exploration Days – it will be the blueprint to help you build your prototype.
Don't forget to add a title for your prototype!

SAMPLE FLOOR PLAN

Here is a sample floor plan to show the work stations needed during Skills Exploration Days to build the prototype. Please modify to meet your needs.



WORK STATIONS

These are some tools and materials that **MIGHT** be included in the toolbox.
Use the chart below to place the tools and materials from the toolbox into the correct work stations.

STATIONS	TOOLS	MATERIALS	SAFETY
WOODWORKING (Carpentry & Cabinet Making)	Cordless Jig Saw Hand Saw Cordless Dremel Tool Cordless Drill Cordless Orbit Sander Hammer Tape Measure Multi Bit Screwdriver Combination Square Saw Horse Brackets	***Teachers must include scrap pieces of wood*** Work Station Sign Jig Saw Blade Dremel Tool Kit Drill Bit Set & Driver Bit Set Spade Bit Set Sanding Disks & Sponge Nails & Screws Clamps Wood Glue	High Adult Supervision Must Wear Safety Glasses, Ear Protection and Gloves
ELECTRICAL INSTALLATION	Linesman Plier Wire Stripper	Work Station Sign Solar Power Kit Wire Switches & Plugs Marrettes	Low Must Wear Safety Glasses and Gloves
PLUMBING	Manual Mitre Box Tape Measure Hand Saw	Work Station Sign Pipe Fittings C-Clamps	Medium Must Wear Safety Glasses and Gloves
SHEET METAL	Riveting Tool Tin Snips & Hacksaw Bender & Metal File	Work Station Sign Sheet Metal Rivets Hacksaw Blades	Medium Must Wear Safety Glasses and Gloves
PHOTOGRAPHY	Camera	Work Station Sign Film	Low
GRAPHIC DESIGN	***Teachers may provide computers (optional)***	Please utilize materials you have on hand	Low
PAINTING & DECORATING	Please utilize materials you have on hand	***Teachers should use cardboard or plastic to protect tables*** Work Station Sign	Low
FASHION TECHNOLOGY	Cordless Hand Sewers	Work Station Sign Fabric Landscape Fabric Thread, Needles & Buttons Heat Press & Transfer Paper	Medium Must Wear Gloves to Prevent Burns When Using Heat Press
CUTTING STATION	Utility Knife & Scissors Metal Ruler	Workstation Sign	Medium Must Wear Gloves to Prevent Cuts
GLUE STATION	Hot Glue Guns	Workstation Sign Hot Glue Sticks	Medium Must Wear Gloves to Prevent Burns
PANTRY	N/A	**Teacher are given a $100 gift card to purchase crafting items (ex: popsicle sticks, zip ties, velcro, magnets, tape, etc)**	N/A
REUSE STATION	N/A	***Teachers must provide pieces of cardboard, foam, fabric, etc***	N/A
SAFETY	First Aid Kit Foam Earplugs Safety Glasses Work Gloves	Work Station Sign Duct Tape (secure cords to floor) Sanitizer (wipe down tools)	