



Outreach Playbook

Dallas SWE – Design Your World – Spring 2022

Delivered: March 19, 2022

Presented by: Dallas SWE

Location: Girl Scouts STEM Center of Excellence

Metrics:

Grade Level:	# of Student Participants:	Duration (hrs):	# of SWE Volunteers:	Partner orgs (if any):
6-12	60	8	60	Girl Scouts of Northeast Texas (gsnetx.org)

Overview of Activity



On Saturday, March 19th, Dallas SWE delivered our award-winning flagship outreach event, Design Your World, to over 60 Girl Scouts from across the Northeast Texas area. Dallas SWE partnered with Girl Scouts of Northeast Texas to deliver this year's program and the event was held at the Girl Scouts STEM Center of Excellence at Camp Whispering Cedars in Dallas.

Design Your World Spring 2022 was held after a two-year break from in-person, hands-on outreach. Dallas SWE greatly appreciates all of the volunteers that helped support the continuation of this event post-pandemic. Dallas SWE had a terrific volunteer turnout, with over 60 volunteers from across the Dallas metroplex representing a variety of industries and backgrounds.

The event consisted of rotating through three hands-on, STEM activities with guided mentorship from our volunteers:

1. Structural Towers
2. Prosthetic Design
3. Floatation Devices

Through these activities, the girls were introduced to a variety of engineering concepts and methodology.

The Structural Towers activity was led by [Activity Lead]. [Activity Lead 1] explained the concepts of structural engineering and common design elements in architecture. [Activity Lead 1] then led the girls through the marshmallow tower activity where the girls were able to design and build a tower using these structural principals and compete for the tallest structure.

For a detailed lesson plan for the activity, please see this presentation.



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The Prosthetic Activity, led by [Activity Lead 2], introduced biomedical engineering and the real-world impact of prosthesis on society. [Activity Lead 2] explained the design thinking process and the iterative methodology used when designing a new device. During the activity, the girls applied this methodology to design, build, and test a prosthetic leg that had to withstand their body weight while being comfortable and easy to put on.

For a detailed lesson plan for the activity, please see this presentation.



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The Floatation Device activity, designed to explain materials science to the girls, was led by [Activity Lead 3]. [Activity Lead 3] shared real life examples of material properties and how different construction materials may be used to provide buoyancy and other functional needs. The girls were able to explore and test physical properties of common materials and test their buoyancy by designing a floatation device designed as a life vest for a corgi. During the activity, the girls utilized the iterative design process by refining their designs after testing.

For a detailed lesson plan for the activity, please see this presentation.



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Between the activities, the girls heard an engaging panel of professionals in engineering discuss their careers and STEM journeys. Our panelists, [A, B, C, D, E], gave advice on learning about STEM as a girl and shared their experience on how they overcame any challenges they faced. After the panel, the girls participated in speed networking with the volunteers which allowed the girls to learn more about STEM fields in a small group setting. As there were a variety of volunteers with different backgrounds and paths, the girls were able to hear about many exciting engineering disciplines.

Here is what some of our volunteers had to say about the event:

"The students were very engaged, and it was fun working with them and seeing how they came up with ideas for the prosthetic activity!"

"The activities were great, very well organized, fun and engaging for the girls (and volunteers!)"

"It was very inspirational to see the panelists and girls being inspired."

"I had so much fun volunteering with SWE today! I love talking about engineering careers, so being on the career panel was an honor and pleasure."

"I am honored to have had the chance to experience this event and I am excited for more opportunities to volunteer and give back to the Dallas community."

Dallas SWE would like to thank several teams that helped make this day possible. First, the Design Your World Outreach Committee, consisting of [Names], for helping to plan and coordinate the event. In addition, we would like to recognize the 60+ volunteers that



supported this event. Thanks to our committed volunteers, we were able to have a strong ratio of volunteers to girls, allowing the girls to explore many engineering fields and opportunities. Dallas SWE would also like to recognize the support of our partner, Girl Scouts of Northeast Texas, for allowing us complete creative control in designing the program and activities for the girls.

Outline and Script



The detailed description of the steps and optional talking points are contained within the above 3 attachments (Activity Guides) for each of the activities. There are no additional materials that contain talking points or other script like materials than the 3 Activity Guides.

Other helpful reference materials that were referred to are listed below:

[Corgi – Think Like an Engineer Overview](#)

[Corgi – Think Like an Engineer Demo](#)

[Prosthetic Device – Think Like an Engineer Demo](#)

Lessons Learned

- We conducted weekly meetings to check in on progress of planning the event and distributed detailed minutes with action items following each meeting
- Prior to each meeting, we prepared and distributed an agenda with talking points ahead of time
- We assigned roles and responsibilities so that each element of the activity was owned by an individual
- We worked closely with Girl Scouts to align on expectations and met with them on a bi-weekly basis, distributing agenda and meeting notes after each meeting
- We conducted regular communications to our volunteers and held a volunteer orientation, going over each of the Activity Guides and general day-of expectations prior to the event
- We conducted a post-event feedback survey from our volunteers to gauge what went well and opportunities for improvement
- Please see the attached PDF for a full list of our best practices and process documentation



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Accessibility Adaptations

- We provided Accessibility parking spaces on site at the Girl Scout Center of Excellence. These spots were ADA ramp compliant and located in areas next to the presentation facilities to minimize walking and mobility requirements.
- For budgetary savings, the supplies may be leveraged from one activity to the other. For example, both the Corgi activity and Prosthetic require use of rulers, duct tape, rubber bands, and scissors. Both the Structure Tower activity and the Prosthetic activity require use of yard sticks and/or rulers. As well, journals may be swapped for pieces of loose leaf paper.
- We recorded volunteer orientation so that any volunteers not in attendance may still be able to access the materials. You may see our recordings at this link. We received many compliments on providing this to increase awareness of the activities and expectations prior to the event, making for a smoother knowledge transfer and delivery of the activities.
 - [Recording Link](#): Volunteer Orientation Overview Presentation (slide deck attached)
 - [Recording Link](#): Corgi Activity (slide deck attached)
 - [Recording Link](#): Prosthetic Activity Recording (refer to attached slide deck for first couple slides)
- We also required an online COVID waiver to be filled out prior to arriving at the event to ensure everyone is COVID free.



Materials and Costs

Below is a guide we put together to help describe the type of materials and quantity we would like for our welcome kits and our 3 activities: Structural Marshmallow Towers, Corgi Floatation Device, and Prosthetic Device. Our estimates were based on 150 Girl Scouts in attendance.

1. Welcome Items

Overview: we recommend providing a small journal and a sharpened pencil at check-in that the girls can use throughout the day. Each of the activities we will do features a design portion, where having a notebook or journal may come in handy for drafting/drawing.

Below are a few illustrative examples for reference. Sample items do not need to be sourced exactly as shown.

Supplies:

Item	Quantity per Girl	Total Quantity	Sample Item	Sample/ Estimated Cost
Journal or notebook	1	150	Example 1 Link Example 2 Link Example 3 Link	\$750.00
Sharpened pencil	1	150		\$7.00
Approx. Total				\$757.00

Kitting Instructions:

Have the journals/notebooks and pencils available at registration for each girl to pick up and keep with them throughout the day.

Other Items for Volunteer Check In:

- Sharpies for Volunteers to write their names on the sticky badges (Dallas SWE will provide the sticky name badges)

2. Structural Marshmallow Towers Activity

Activity Lead: [contact information xxx]

Overview: Girls will design and build structures using spaghetti and marshmallows. Girls will be placed in groups of 4. Each team will build their own structure and structure height will be recorded.

Supplies:



Item	Quantity per Group	Total Quantity	Notes	Approximate Total Cost
Spaghetti – 16 oz box	Half a box (8 oz)	23 boxes		\$23.00
Mini-marshmallows – 10 oz bag	Half a bag (5 oz)	23 bags		\$35.00
Ziploc bags – gallon size (or other suitable size, for kitting)	1	46 bags	Kit with: <ul style="list-style-type: none"> • ½ bag of 10oz mini marshmallows • ½ box of 16oz spaghetti 	\$10.00
Mini tape measure or ruler	1	19		\$16.00
Yard stick	N/A	Up to 5	If available, these will be used by judges to measure exceptionally tall towers	\$20.00
Approx. Total				\$104.00

Other Items:

- Please print off the Measuring Towers Worksheet - 6 copies of Evaluation tab and 5 copies of evaluation tabs 2-8. Emailed separately
- Students should use the journal/pencil they received at registration to complete the Measuring Towers Worksheet
- Clean up Trash bags, Hand wipes, Hand Sanitizer

Kitting Instructions:

- Each kit should include half a box of spaghetti, and half a bag of marshmallows
- Please make 46 kits. This will allow for 38 groups of 4 girls, 1 extra kit for Ana, and a few extras just in case



3. Corgi Floatation Device

Activity Lead: [contact information xxx]

Overview: Corgis have a hard time swimming because of their short legs. Girls will design and engineer a life vest for a Corgi so it can float. Girls will be placed in groups of 5. Large tubs of water will be needed for this activity so the girls can test their floatation devices in.

Supplies:

Item	Quantity per Group	Total Quantity	Example Item	Approximate Total Cost
2L bottles with caps	1	40	PepsiCo will provide	N/A
Closed cell foam	2 1-foot sheets	1 package	Link	\$24.00
Heavy-duty Aluminum Foil – precut sheets	2 sheets	1 box	Link	\$26.00
Cardboard	2 sheets	4 packages	Link	\$72.00
Balloon	6 balloons	1 package	Link	\$28.00
Bubble wrap	2 sheets	3 packages	Link	\$57.00
Sandwich bags	2 bags	1 box	Link	\$11.00
Bag of large rubber bands (Qty 120+)	2 bands	1 bag	Link	\$10.00
Scissors	1 pair	1 pack	Link	\$26.00
20 rolls of duct tape	1 roll	4 packages	Link	\$21.00
Bags for kitting	1 bag		Link – option 1 Link – option 2 Alternatively, a 5-gallon bag might also work	\$147.00
Approx. Total				\$422.00

Other Items:

- Water will be needed for this activity so the girls can test their floatation devices in.
- Tubs will be required for this activity. We are giving GS the option of using Dallas SWE’s tubs or purchasing 6 tubs. Example links: [round tub](#), [rectangular tub](#)

Kitting Instructions:

- If purchasing the closed cell foam linked above, cut into 1-foot sections for a total of 60 sections



4. Prosthetic Device

Activity Lead: [contact information xxx]

Overview: Students will be put into groups of 4 to design a prosthetic lower limb.

Supplies: links are examples of items that fit the item description. Products do not have to be purchased from Amazon or match the link exactly.

Supplies:

Item	Quantity per Group	Total Quantity	Example Item	Approximate Total Cost
Large Reinforced, sturdy cardboard tubes – 16” length Must be reinforced and not thin cardboard tubes	4 per group	160	Link	\$320.00
Wooden rod - ½” - ¾” in diameter. 16” length Length of rod and cardboard tubes should be the same.	1 per group	40	Link	\$26.00
Saran wrap	5 groups share 1 roll.	4 rolls	Link	\$16.00
Twine	8ft per group	4 rolls total	Link	\$28.00
1 ruler	not kitted	19		
Felt	2 sheets	80 sheets or 3 orders of the 28 pack in the link	Link	\$42.00
Large Rubber bands	4 rubber bands	140 rubber bands or 1 orders of the 150-packs in the link	Link Note, we can share rubber bands with the other activity	\$13.00
Regular sized rubber bands	5 rubber bands	200 rubber bands	Link	\$9.00
Scissors	not kitted	19	use scissors from inventory	
Duct tape (large rolls)	8 groups share 1 roll	5 rolls	Link	\$50.00
Bubble wrap	1 - 12”x12” squares	40 sheets. 1 x 180ft roll	Link	\$26.00
Sponge	1 sponges	40	Link	\$11.00
Plastic cups	1 cups	40	Link	\$9.00



Item	Quantity per Group	Total Quantity	Example Item	Approximate Total Cost
XL ziploc bags for kitting	1	40	Example 1 Example 2 If paper bags as linked in the Corgi device are purchased, we may also use those	\$12.00
Approx. Total				\$562.00

Kitting Instructions:

- Kit in extra large ziplocs (see link above for example)
- Girls will be in groups of 4 which means there will be 38 groups. Each group will have a kit. Please make **40 kits** so we have 2 kits left over for demonstration and/or extra materials if needed.
- Please contact activity lead by text or email if questions.
- Saran wrap, scissors, rulers, and duct tape should not be kitted. Will keep at front for groups to come use as needed.