

GINGERNEERING STRUCTURE

Design Challenge



NATIONAL
INSTITUTE OF
AEROSPACE



NASA
eClips™



Structures: parts arranged to resist forces

Functions of a structure:



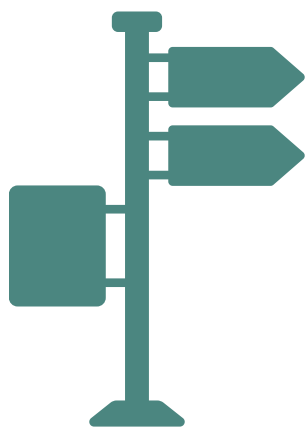
Supporting



Sheltering



Containing



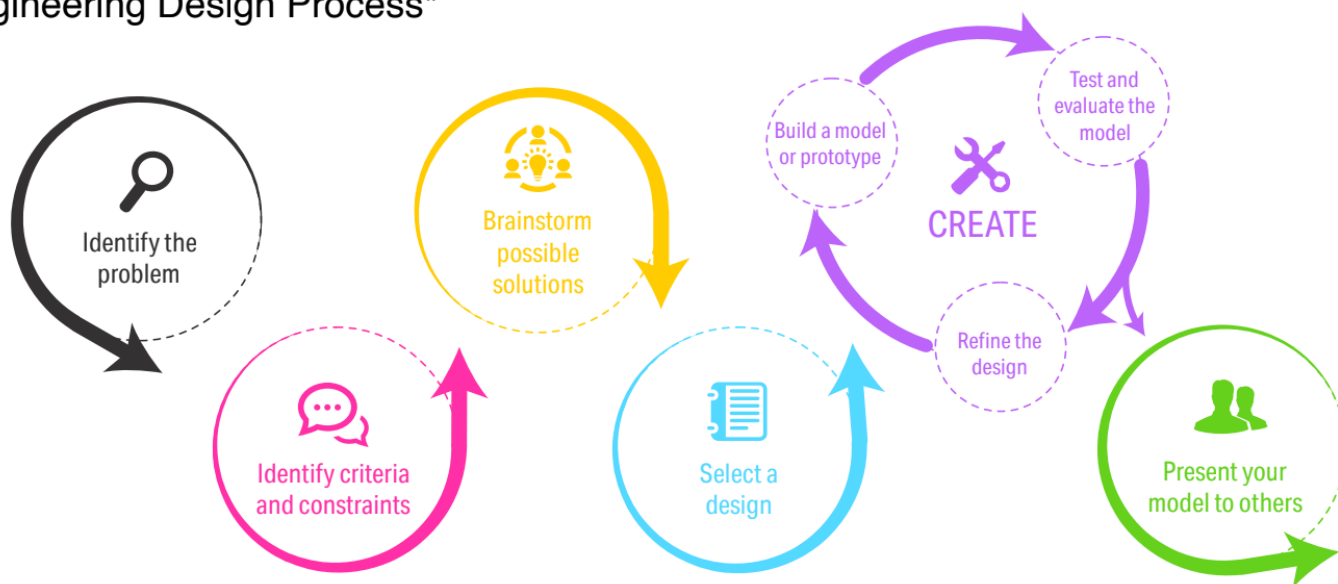
Directing



Transporting

Engineering Design Process

Engineering Design Process*



Select a Design



Build a model/prototype



Test the model; evaluate



Refine the design



Share with others

The Challenge



Background:

Your family is excited about Artemis: NASA's program to return to the Moon. This year your family wants to create an edible structure and Moon surface for gingerbread astronauts.

Design Challenge:

Design and create an edible structure on the surface of the Moon with your family.

Criteria:

Your structure must:

- have walls.
- have a roof.
- be freestanding.
- be constructed completely of edible materials.
- use at least five (5) different food items.
- have a height greater than seventeen (17) centimeters.



All members of your team must contribute to the planning and building.

The Process



1. **State the challenge in your own words** - What are you trying to accomplish? What is the criteria, and what materials are provided?



2. **Brainstorm ideas** for the shelter - size, shape, special features, etc.



3. Select the best idea and draw the **plan on paper**. Add labels and measurements to your plan.



4. **Work with your team** to collect supplies, build, and solve any issues that may arise during construction. Have fun!



5. **Redesign** as needed to correct any problems or **make improvements**.



6. **Share your design!** Other families will visit your space to look at your work. Make sure you **clean up** and add a sign that names your shelter and provides any other information you'd like to share. **Display your plan** to help others understand your design.

Inspiration

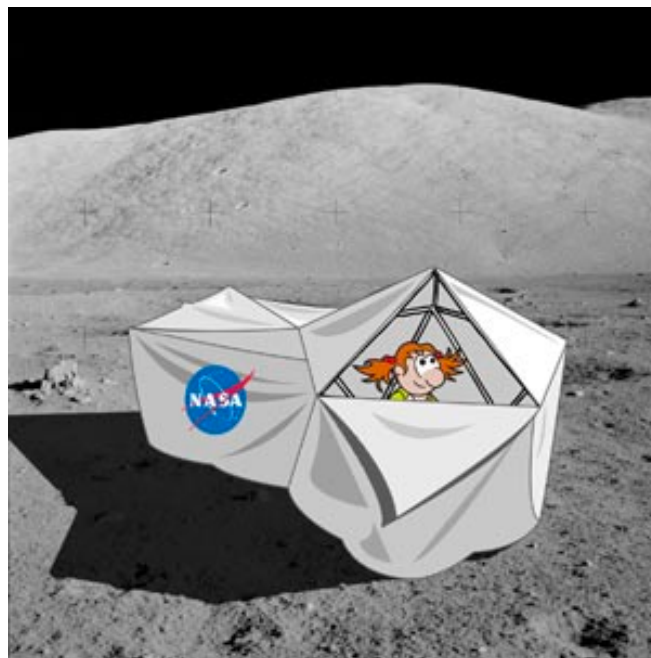
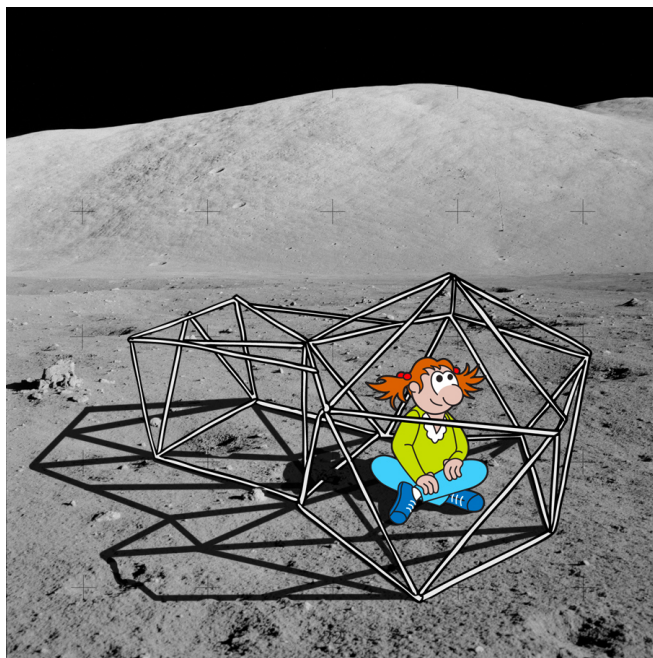
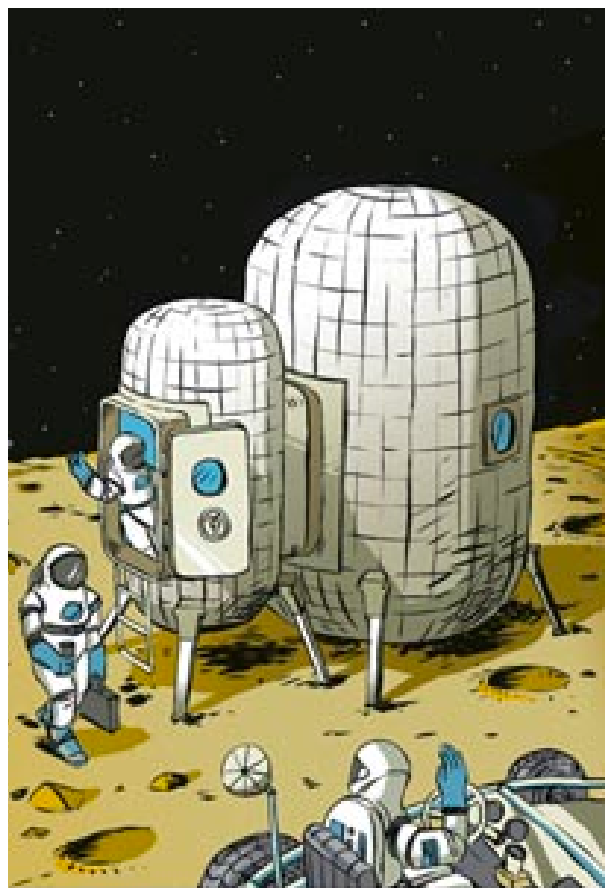


Image credit: NASA Space Place



Illustration of NASA astronauts on the lunar South Pole. Credit: NASA



Carl DeTorres (with permission)

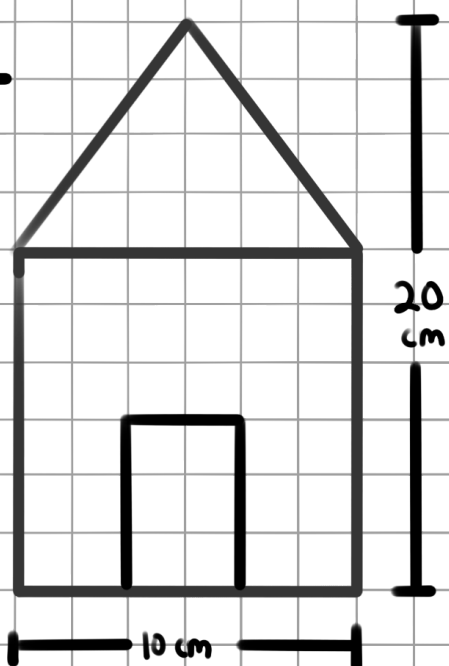


Orthographic View Multiview Drawings

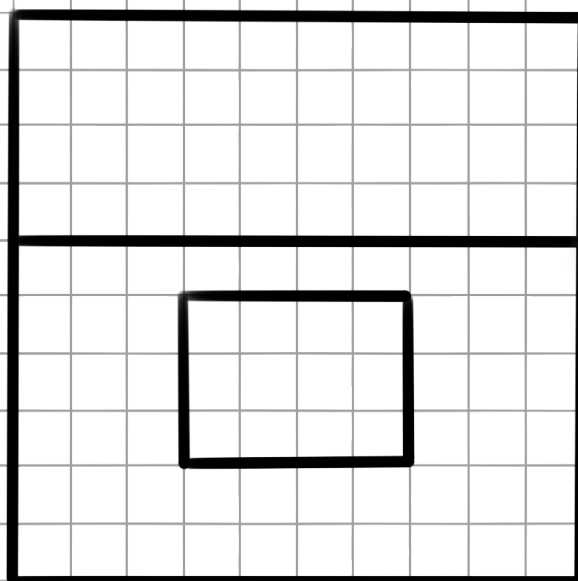


two-dimensional drawings of the top, front, and side of the object.

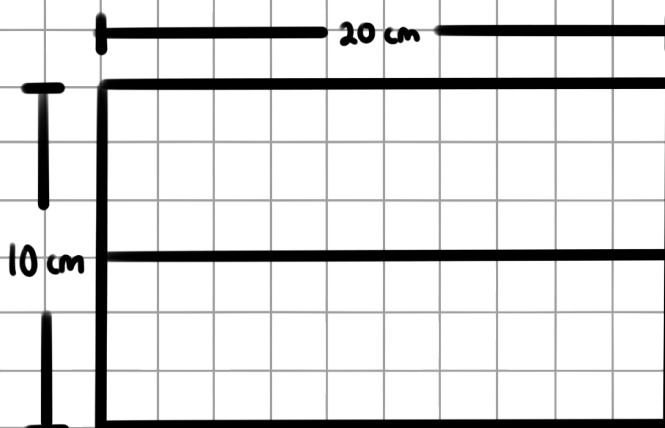
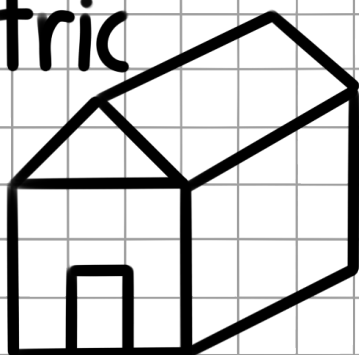
front



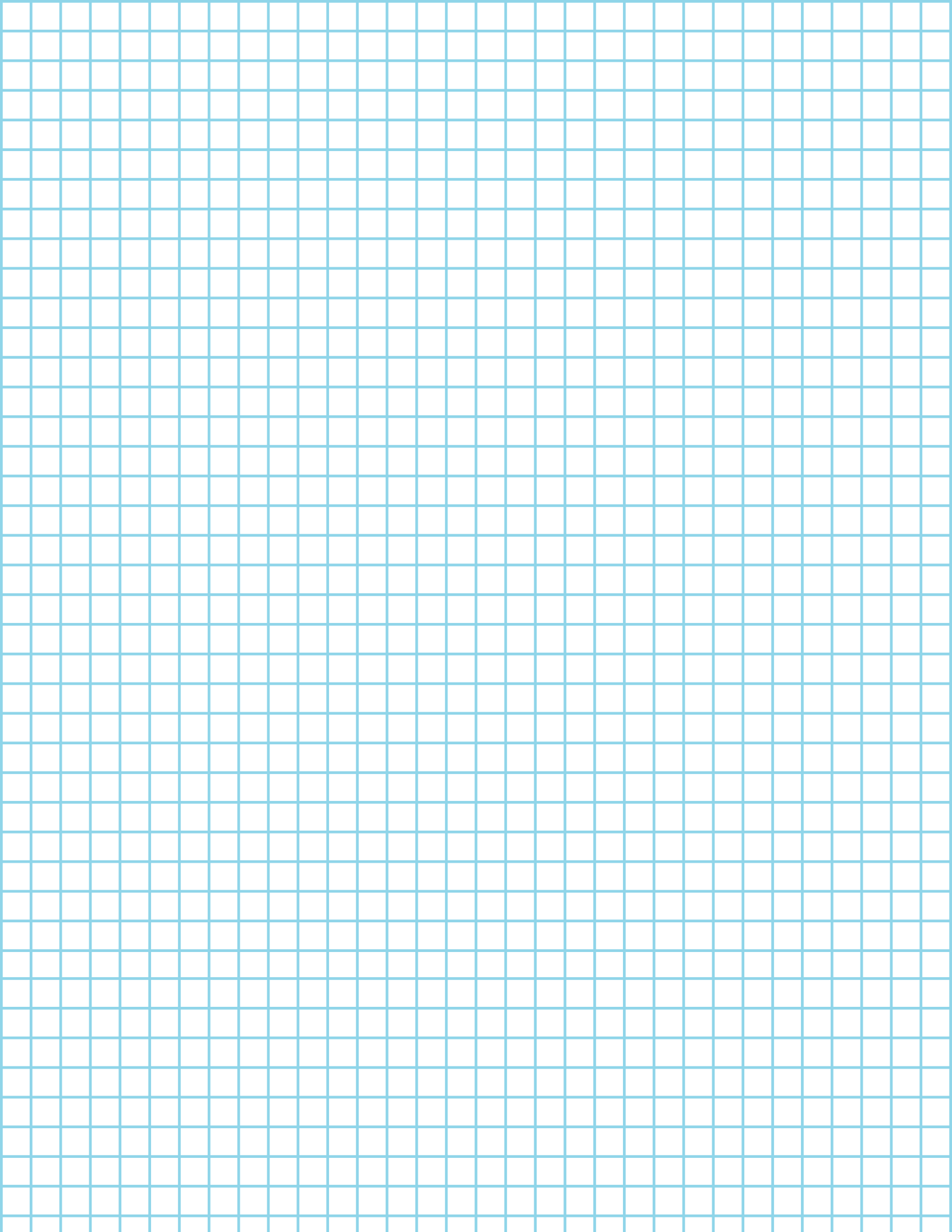
side

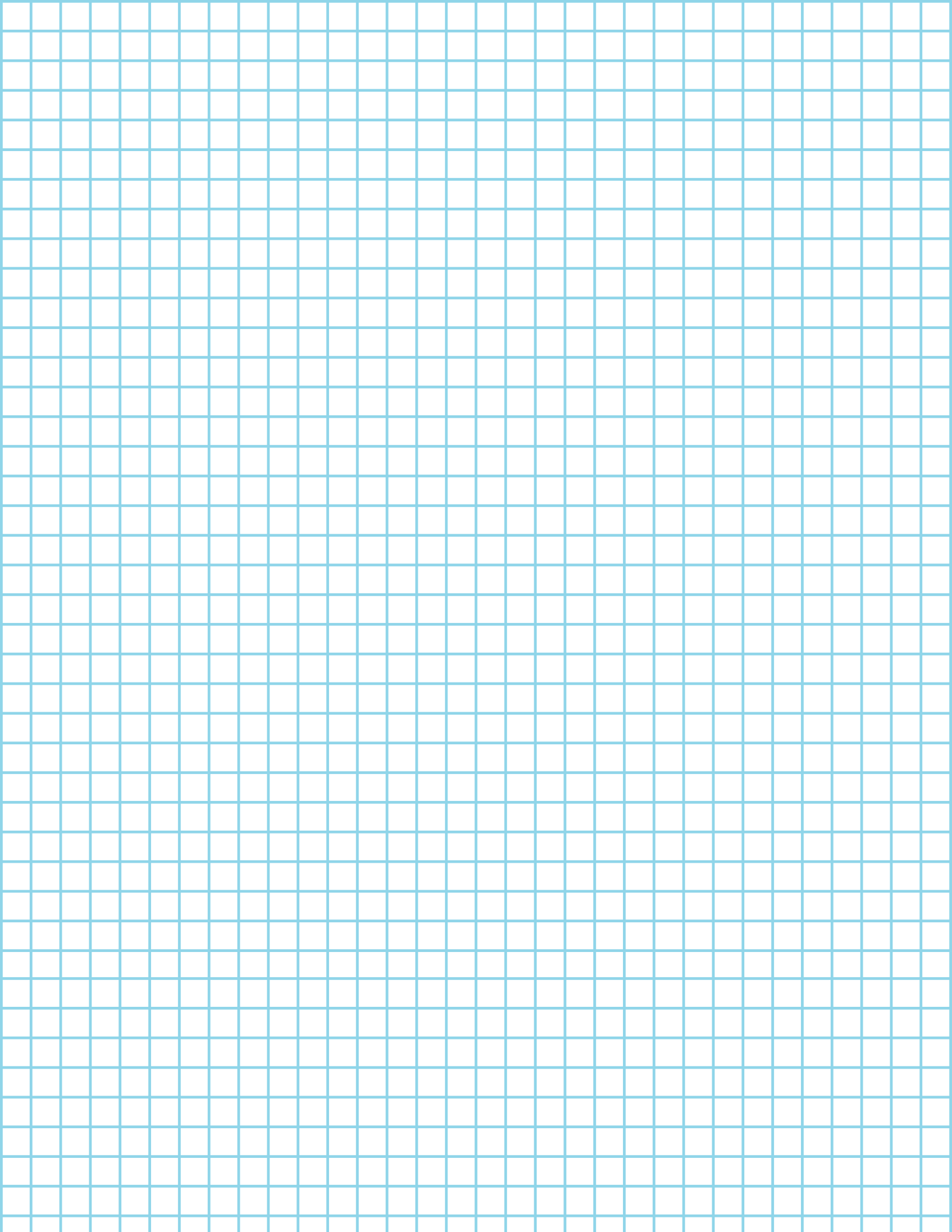


isometric
view



top

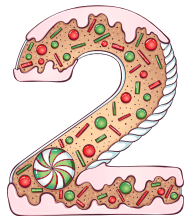




Gallery Walk



Visit each table and look at the designs of other families.



Look with your eyes only and read their signs.



Pass out the ribbons to the designs they best fit.



Ribbons



*Best in
Show*

*Team
Leaders*

*Most
Creative*

*Most
Colorful*

*Cleanest
Work
Station*

*Vacation
Destination*

Ribbons



I would live here

Tallest Structure

Shortest Structure

Candyland

Tastiest Looking

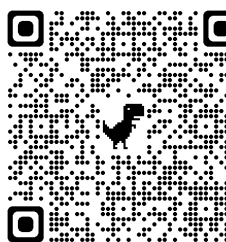
THANK YOU FOR GINGERNEERING WITH US!!



**Interested in
learning more
about NASA's
Artemis Program?
Check out these QR
codes!**



Artemis Website



**Lunar Living: NASA's
Artemis Base Camp
Concept**



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