Central Massachusetts STEM Network - STEM Together Challenge

Activity Name: | Cardboard Creations: Phone Stand

Grade Level: | 4-8

Prep Time: | 5min

Project Time: | 30-45min

Description: | Design and craft your own phone stand to use during movie-making or animation projects, or for comfortably watching STEM videos! We'll use recycled cardboard to create a simple stand, and explore the importance of measurement and precision in the engineering process.

Followup Challenge: Design your own phone stand using only cardboard, no adhesives allowed.

Materials:

- A flat piece of corrugated cardboard larger than your phone
- Scissors (safety scissors may not cut cardboard easily)
- Tape
- Measurement ruler
- Paper and pencil
- Your phone

Steps:

1. Lay your phone flat on a piece of cardboard and trace your phone's perimeter. Notice the lines in the cardboard? Your phone should be positioned lengthwise, so it runs across the corrugated lines, like in *Diagram 1.* This will improve the structural strength of your stand.
2. Using *Diagram 2* and a ruler, calculate and draw the dimensions of your stand in the lower left corner of your phone's outline.
3. Cut out your stand. Try to keep it flat and undamaged, if possible.
4. Use the edge of your ruler to help fold the triangle portion of your stand inward so it makes a right angle with the rectangular portion. See the example in *Figure 3.*
5. Use a piece of tape to fasten only the rectangular portion of the stand to the back of your phone, like in *Figure 4*. The bottom edge of the stand should be aligned with the edge of your phone.
6. Try standing your phone up! It's likely that the phone will need to be leaning back more for stability. This can be helped by cutting off tiny wedges from the bottom of the triangle, like in *Figure 5.* What angle is the most comfortable for you?
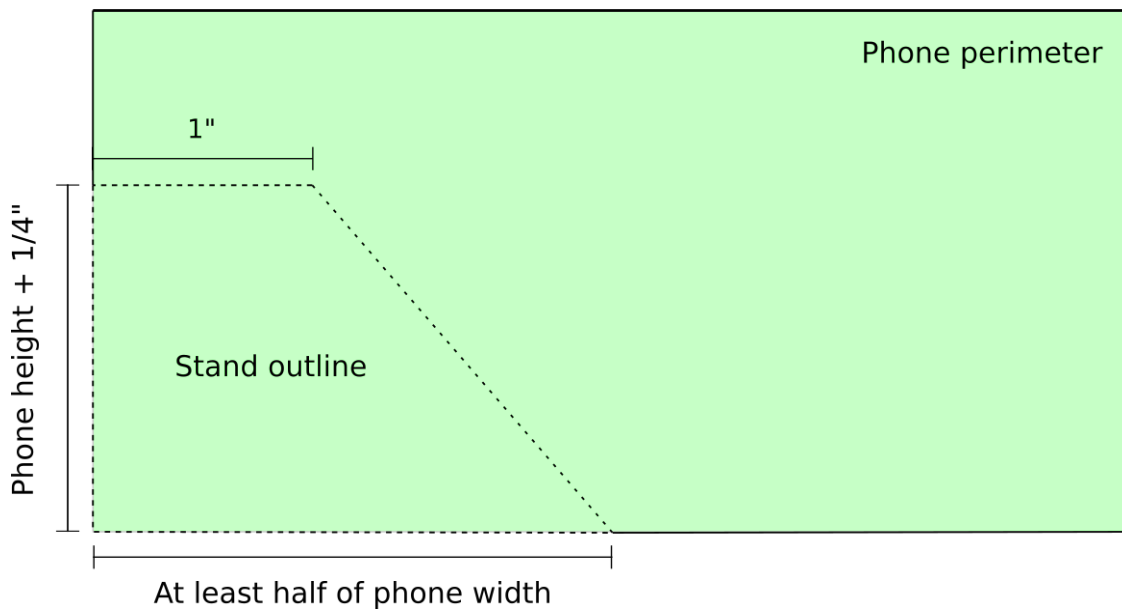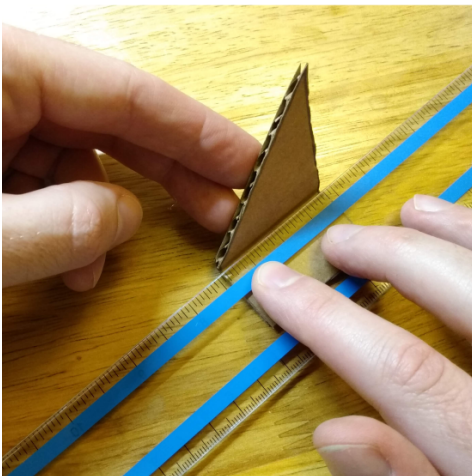
Diagram 1

Direction of corrugation

Diagram 2

Phone perimeter

1"

Phone height + 1/4"

Stand outline

At least half of phone width

Diagram 3

Diagram 4

Diagram 5

Created by Adam Zelny