

Team names: _____ Date: _____

Building a Sound Booth

Problem

How will you dampen the sound generated inside the sound booth?
How do different materials affect the ability of sound to travel?

Brainstorming

We think that the combination of _____, _____ and _____ will make the poster board box most sound-proof because...

Building Materials

- poster board (2-ft x 3-ft, or 61cm x 91cm)
- scissors
- ruler
- pencil
- Elmer's glue
- duct tape, ~30 cm
- Choose three of the following materials (**circle your choices**):
 - 50 jumbo cotton balls
 - 40 wide popsicle sticks (6-in x ¾-in or 15 cm x 2 cm)
 - 20 paper towels
 - 30 tissues
 - 1 large sheet of construction paper (2-ft x 3-ft, or 61cm x 91cm)

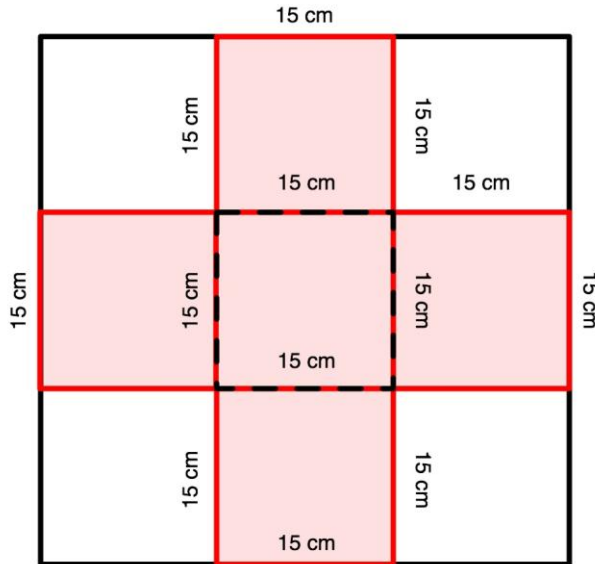
Blueprint Design

Draw a picture of your design in the space below. Specify dimensions, materials and amounts.

**Teacher
Approval**
(initials)

Building Instructions

1. Begin by tracing the outline of the box on the poster board as follows:



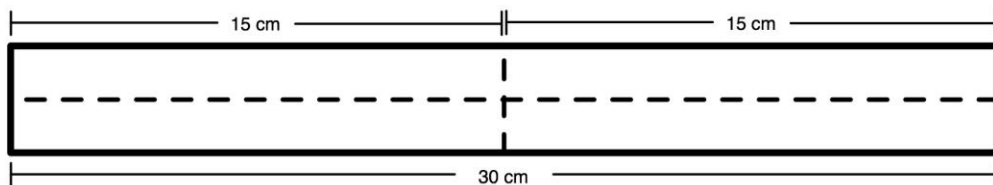
← In step #3, below, cut the poster board to create a box with only five sides.

The red (light gray) lines represent the outline of the box with each side having a length of 15 cm.

The black (dark) and red (light gray) dashed lines show where to fold the box.

Cut off and discard the white sections.

2. WAIT for the teacher to come around and approve your trace.
3. Cut out the box and fold on the dashed lines.
4. Paste your materials ONLY on the inside of the poster board.
5. Fold the box so that it has all but one side closed.
6. Cut the duct tape into four pieces by cutting it on the dashed lines as shown below.



7. To seal the box, place the duct tape on the outside of the box along the open edges.
8. Write your group members' names on your box.
9. Place materials into the sound booth as specified in your approved blueprint.

Testing Materials

- computer or device that can play audio
- small speaker
- sound meter
- (optional) homemade platform to sit sound booths into for a better seal (very helpful in obtaining accurate results)

Testing Instructions

1. Have your teacher connect a computer or audio playback device to a small speaker.
2. Place the speaker inside the sound booth with the booth positioned like an upside-down cup.
3. Play a small segment of a song or audio clip with the sound meter placed outside of the booth but next to it.
4. Record the maximum decibel level reached for the small audio clip for each group in the Data section below. (Make sure that the same audio clip is played when testing each sound booth.)
5. Present your sound booth to the class by describing your design in detail and specifying your materials.
6. Listen to each group explain how they designed their boxes.
7. Write down a description of each group's design and note the supplies they used.

Data Collection

Group #	Design Description	Sound Level (dB)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Analysis

1. Compare your results with the best performing box in the classroom.
2. What design features improved the performance of the sound dampening in the box?

Conclusion

Our hypothesis was _____ because _____

(Note: If your group did not perform the best, then your hypothesis is not correct.)

Describe the design improvements you could make to your sound booth if you had more time and/or supplies:
