The Tech Challenge | Kenya

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Testing Guide for Home and School

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When you are testing you will want to:

- ☐ Understand the importance of strong foundations and design in protection.
- ☐ Test and evaluate how your device / protective structure performs in strong wind (Upepo Mkali).
- ☐ Discuss as a team the observations you make as you write notes in the journal.
- ☐ Reflect on what makes your structure protective, stable, and durable.

This resource provides tips for **testing** a protective structure for The 2026 Tech Challenge Kenya, Survive the Storm. Make sure you review the **official rules** before you read through this guide. **See the website for the rules: thetech.org/kenya**

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Tips for testing your protective structure at school and at home.

Step 1: Just try it!

- Test parts of your protective structure as you build.
  - *Do the connections that hold your structure together work like you planned them to?*
  - *How much wind can your structure survive?*
- See how your protective structure works without building the paper cubes.
  - *Can your structure stay up if you blow wind on it?*
  - *Can it stay up if you use cardboard or plastic to create wind?*

Remember

Make sure your protective structure is not too big or too heavy!

- All parts of your structure must fit inside the provided extra large shopping bag.
- The protective structure inside the bag cannot weigh more than **600 grams.**

To test the weight of your protective structure.

Find a scale like one of these examples. Look at cereal shops and poshomills or in your school for a scale and weigh your protective structure.

- *Does your protective structure weigh more than 600 grams?*
- *What can you do to decrease the weight?*

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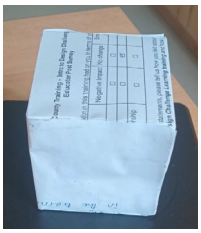
Step 2: Build some paper cubes and try to protect them with your structure.



Follow these directions to create a paper cube:

[YouTube Video: How to make a Paper 3D Cube with a4 paper // New Way]

[How to Make a Paper Cube PDF]

- Use regular paper or notebook paper.
- Make sure your cubes are the correct size. 7cm (L) x 7cm (W) x 7cm (H)

- Once you have some paper cubes, put them into stacks of 2 or 3.
- Then, place your protective structure in front of them.
- Try creating wind and see if your structure and the cubes stay up.

Here are some tips for creating wind if you do not have a fan.

- Use pieces of cardboard or any flat surface that can make a strong airflow. The wind should be produced manually by moving the cardboard up and down.
- Make sure you point the wind in the correct direction- straight at the structure instead of above. This might mean you have to kneel down if you are testing on the ground.

Remember to test the wind for at least 30 seconds. Try different strengths and speeds of the wind.

- *Does your protective structure stay up at the maximum wind speed?*
- *How many paper cubes fall down?*

Examples of creating wind if you don't have a fan.

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Step 3: Build a Test Rig for your School or Home

Make careful measurements

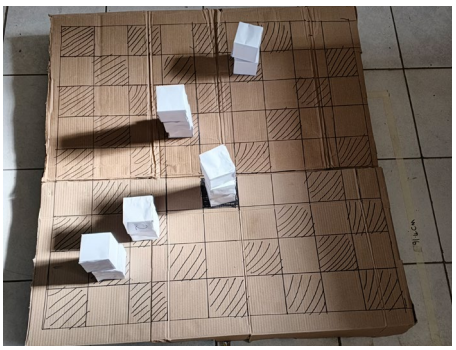
- When you need more detailed measurements to understand how your protective structure works, create a test rig at home or at school.
- Starting with a simple outline of the test area can help you understand where you will place your structure and how far away the wind will be.
- The rig is on two tables, but testing at your school can be done on any table or on the floor.

Create a DIY Build Area

Outline or draw the grid on a smooth, flat surface like cardboard, plastic, or wood. Place it on the ground or a table.

Example of Build Area on tables or desks

Example of Build Area on the ground



Example of Build Area made from cardboard. Place on any flat surface like the ground or a table.

Measure the distance for the 2 fans:

- It is very important that you test the same way every time.
- So check the **Diagrams on page 6** and make sure that you measure the exact location that the fans will be.

Test your protective structure on your home/school test rig:

- Try testing by having two students serve as fan operators. They can turn on the fans or wave cardboard to create wind.
    - If you only have one fan, you can move it back and forth between the locations as long as it is in the same place.
- Once you have a protective structure that is working well, look at the details for the 6 minute performance in the **Rules** and see if your team can set up and do 3 tests at different speeds in the time limit.

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Step 4: Test Trials in Partner Schools

- The Tech Challenge Kenya team will provide testing stations where teams could get a chance to test and keep on building their devices.
- Come test your device on our rigs in-person. Check the website for local **Test Trials events** and sign-up to test your device and get feedback from volunteers and professionals.

Remember:

The Tech Challenge team will provide a Test Rig for use during the Test Trials and Final Showcase.

Please DO NOT bring a rig to The Tech Challenge Test Trials or Showcase Day.
However, you can build your own to test at school or at home.

See the diagrams on the next few pages for details of dimensions.

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Diagrams of The Test Rig

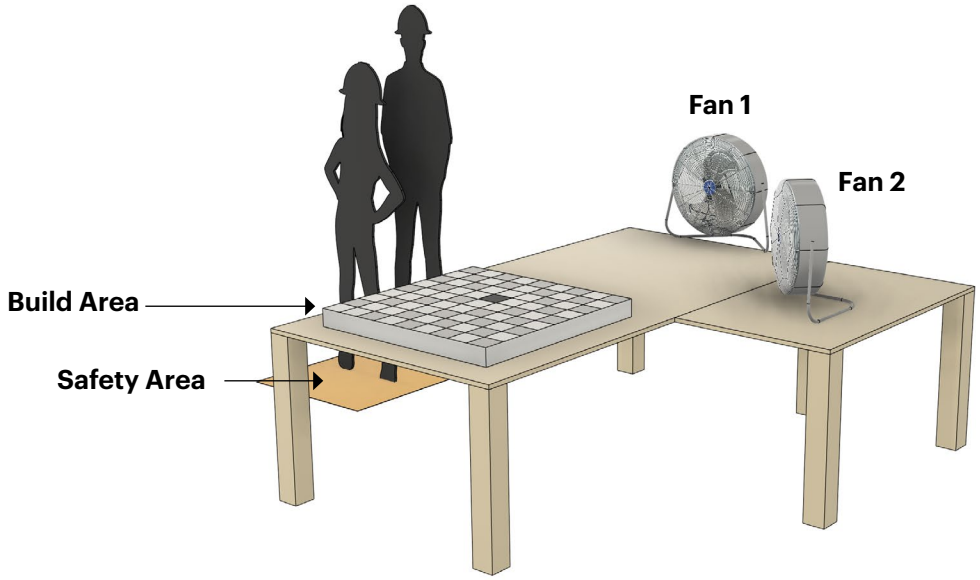

Figure 1: 3D diagram of the Rig for Grades 4-9 (For primary and JS)

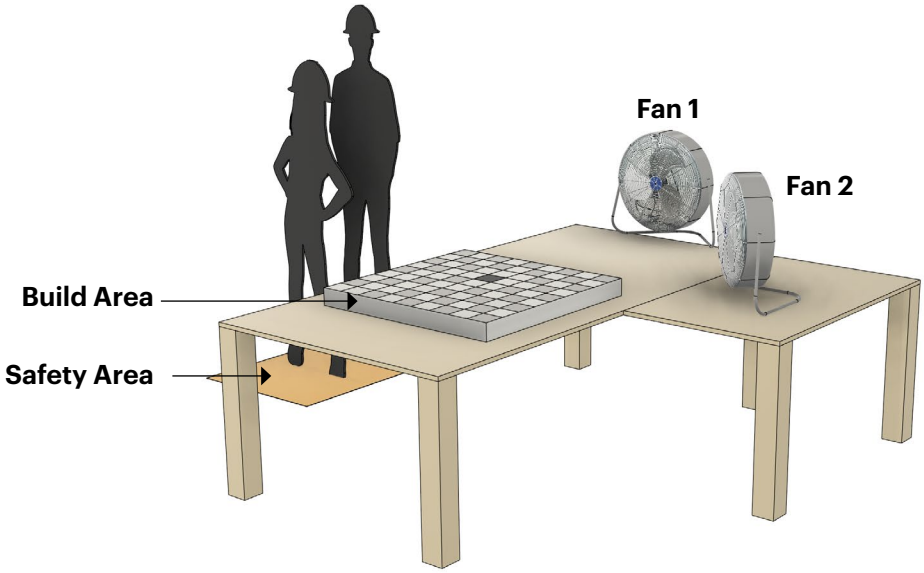

Figure 2: 3D diagram of the Rig for For Grade 10-F4 (For SS)

Note: only, the raised Build Area is moved 30 cm closer to Fan 1.
Both Fan 1 and 2 remain in the same position, pointing in the same direction.

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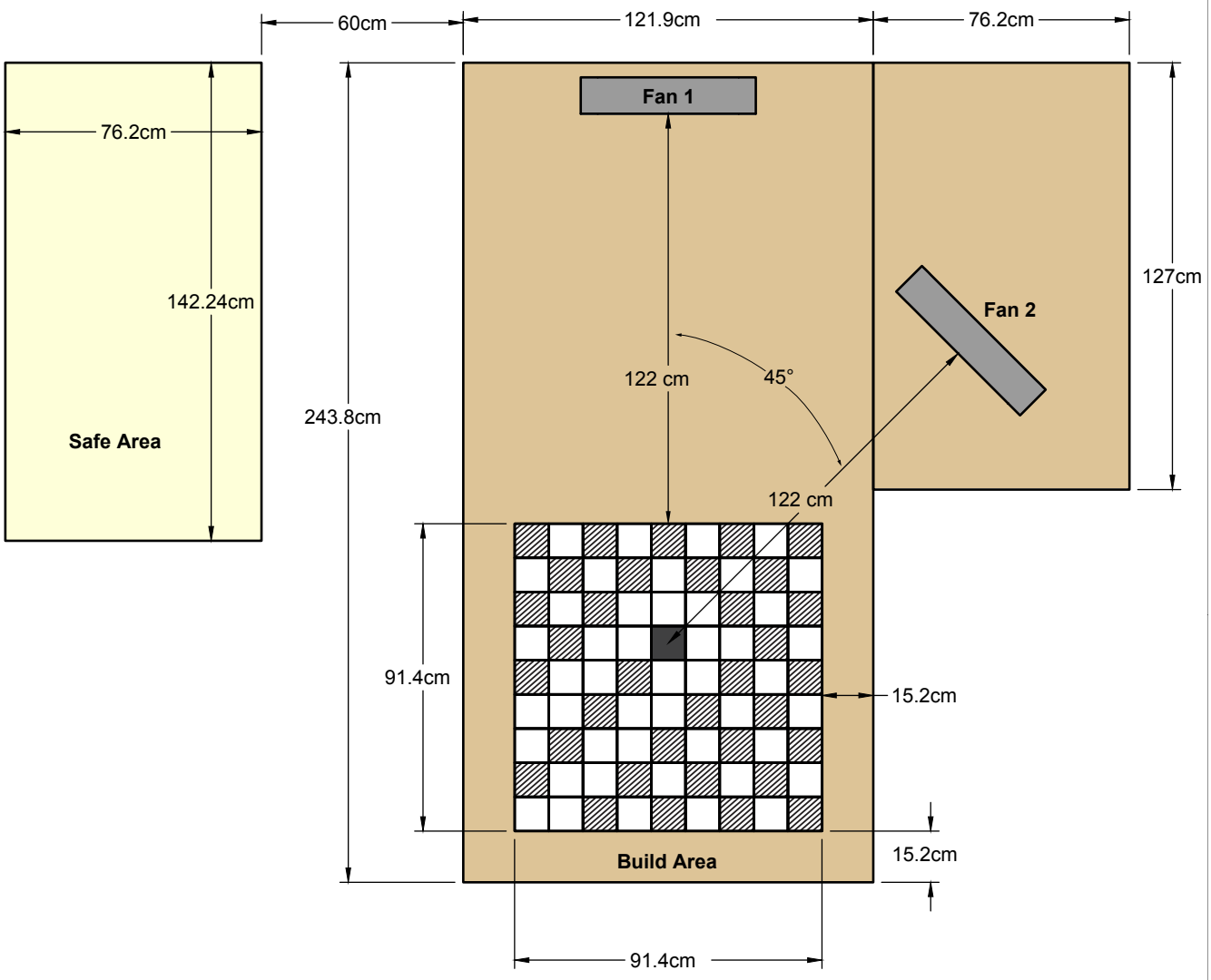

Figure 3: Aerial Diagram of The Rig with measurements for ***Grades 4-9 (For primary and JS)***

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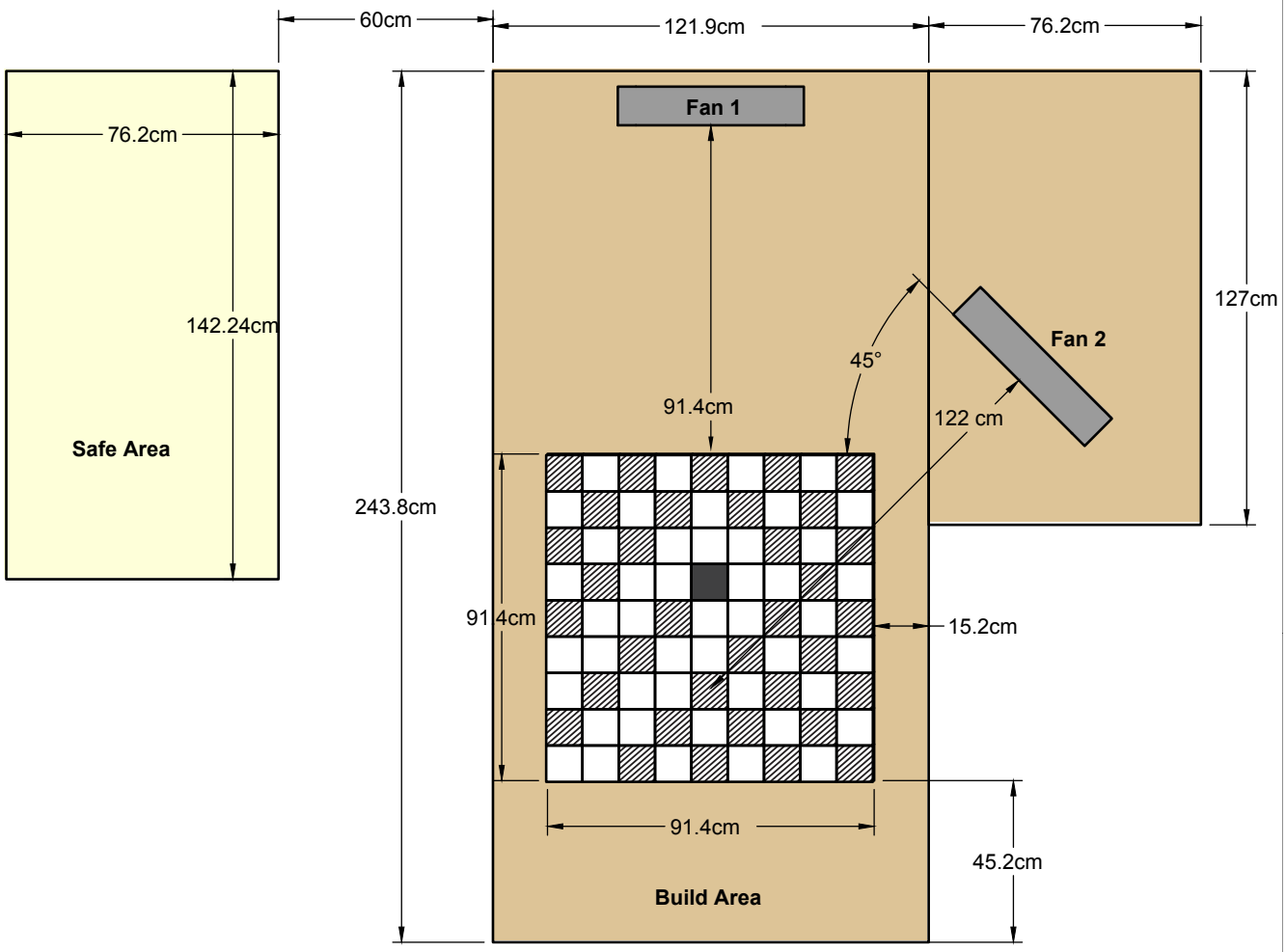

Please note:
*6.35mm tolerance is allowed on all measurements. All measurements are in cm.

Figure 4: Aerial Diagram of The Rig with measurements for ***Grade 10-F4 (For SS)***

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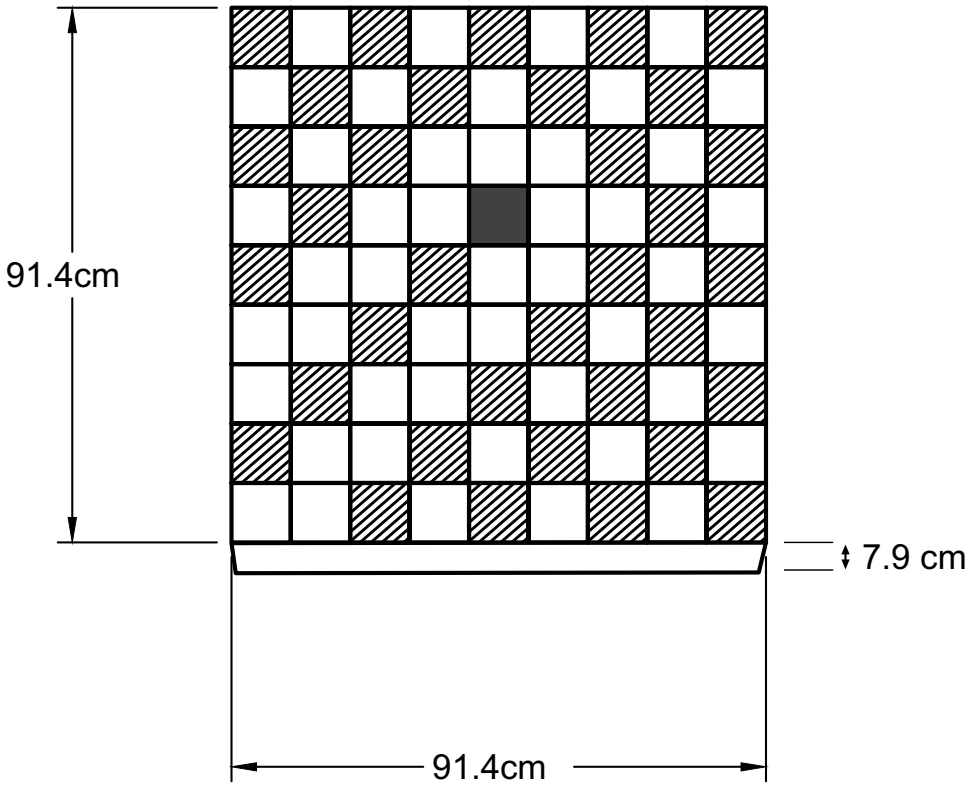
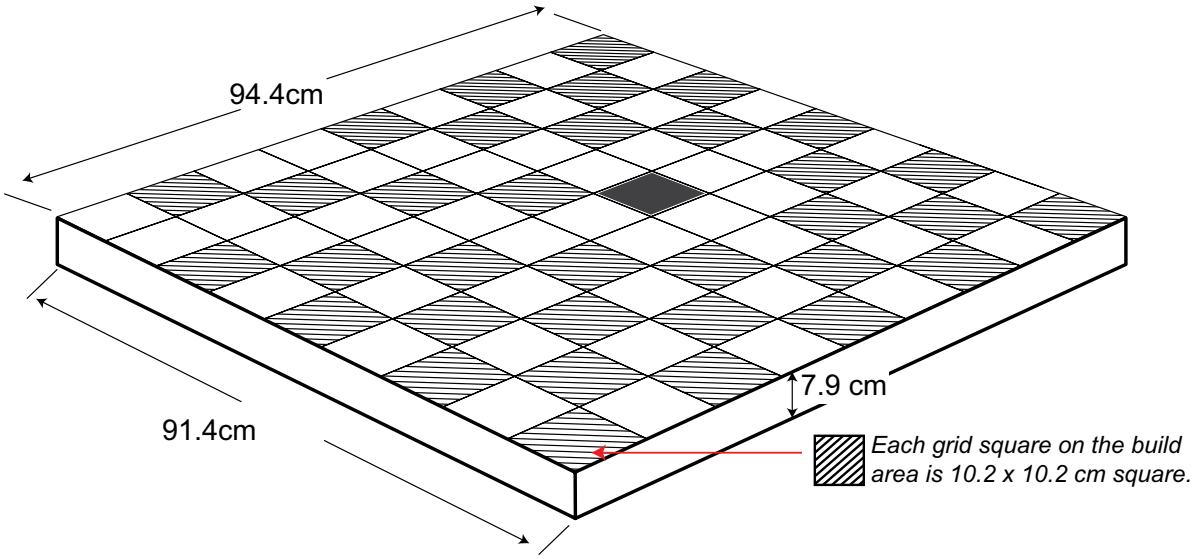
Figure 4: 3D diagram of the Build Area





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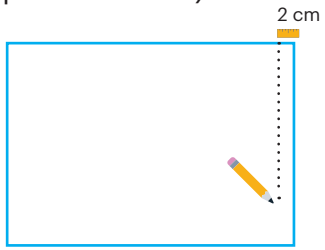
How to Make a Paper Cube!

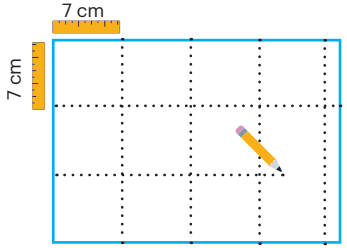
Supplies:
- A4 paper
- Pencil
- Ruler
- Scissors
- Glue

Follow the instructions on this page and watch this video to learn more:

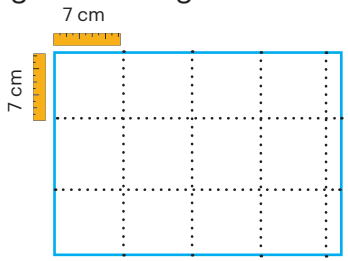
Step 1.
Measure and draw a 2 cm margin (from the right edge of the paper in landscape orientation).



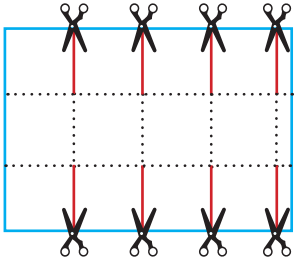
Step 2.
Measure and draw 7 cm rows and 3 columns on the rest of the paper.



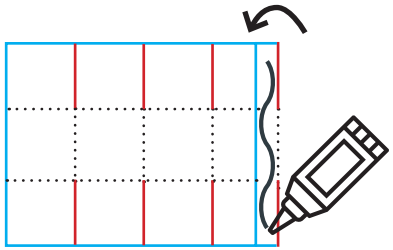
Check:
There should be 12 squares that are all 7 cm on each side and a thin 2 cm margin on the right side.



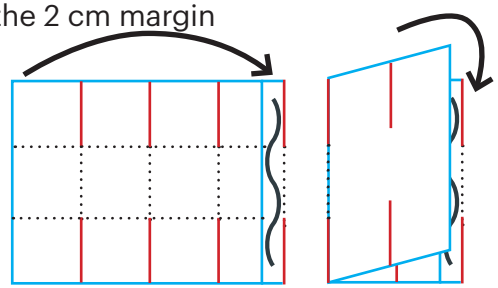
Step 3.
Make 8 cuts from the top and bottom edges. Stop at 7 cm. Do not cut through the middle section!



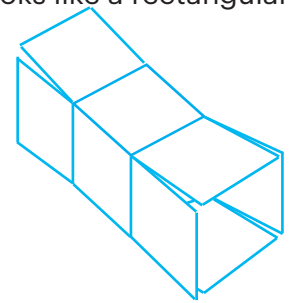
Step 4.
Fold the 2 cm margin and glue the back of it.



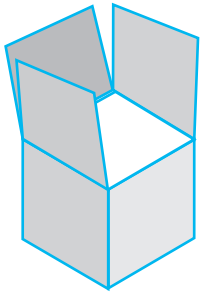
Step 5.
Fold the paper over the center line so the left side is glued to the back of the 2 cm margin



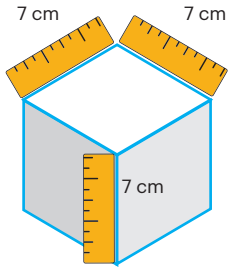
Step 6.
Adjust the folds from Step 2 so your page looks like a rectangular column.



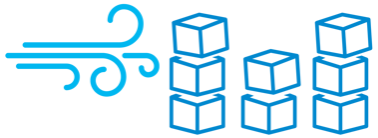
Step 7.
Fold and glue the square flaps (from your cuts in Step 3) on top of each other.



Check:
Your cube should measure 7 cm on each edge (length, width, and height)



Next Steps:
You will need 27 cubes in stacks of 2 or 3 to test your protective structure for Survive the Storm!



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Paper Cube Template

Fold on all dotted and solid lines

Cut on the 8 solid lines

Link to Instructions:

Glue the other side of this margin