

EARTHQUAKE PROOFING ACTIVITY SHEET

2017

YEAR OF
RISK



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Engineering buildings to withstand earthquakes is extremely important in earthquake-prone areas. Before doing this activity you should research how buildings in MEDC and LEDC countries can be designed and retrofitted to be resistant to earthquakes.

TASK 1: BUILDING DESIGN PLAN

You are part of a construction company that has been given the task of designing an earthquake resistant skyscraper. Work with a partner to fill in your design plan below.



Company Name:

Building name:

Location:

(Your building must be built in an MEDC where the risk of earthquakes is high!)

Building features - Lower

How will the lower section of your building be designed to resist collapse in an earthquake?

Building features - Middle

How will the middle section of your building be designed to resist collapse in an earthquake?

Building features - Top

How will the top section of your building be designed to resist collapse in an earthquake?

Earthquake procedures

What information would people be given so that they knew what to do in an earthquake?

Other design features to increase earthquake resistance

THINGS TO THINK ABOUT:

- Your building will be built in an MEDC country – how will this affect your materials and budget?
- Could you incorporate cross bracing, counter weights or shock absorbers?
- What is the geology and landscape like? Will this affect your building?
- How would people evacuate safely?
- How would communications, gas and water pipes be protected?

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TASK 2: BUILD AN EARTHQUAKE RESISTANT STRUCTURE

In groups design an earthquake resistant structure using classroom materials (card, paper straws, lollipop sticks, masking tape etc.). Your structure must be at least 30cm tall, have 3 floors and each floor must be able to support a 50g weight.

Use the space below to draw your structure design and to make any notes on how you will construct your earthquake resistant structure

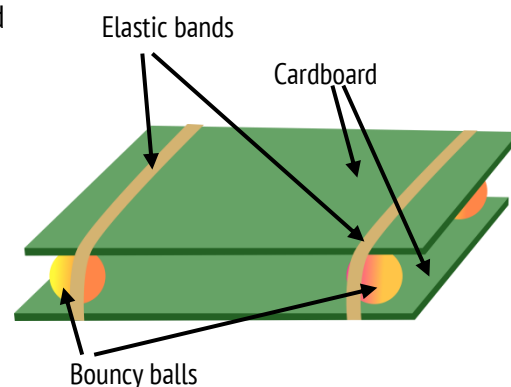
YOU WILL NEED:

- Paper straws/lollipop sticks
- Card
- Masking tape
- 3x 50g weights (whatever you have handy!)
- Elastic bands x2
- Sheet of cardboard/thin wood x2
- Rubber bouncy balls x4

Using your design plans, build your earthquake resistant structure.

Make an earthquake shake table using two sheets of cardboard or thin wood (old ring binder covers work well), two elastic bands and four rubber bouncy balls as in the diagram opposite. Gently pulling and releasing the top board of the shake table will cause a movement that simulates the movement of the ground during the earthquake.

Test your structure by placing it on your shake table and simulating an earthquake. To survive the earthquake your structure must not collapse and the weights must stay in place for 30 seconds.



EXTRA TASK

Look back at the building design plan you made in Task 1. How would you adapt this plan if your building was now going to be a school building built in an LEDC? Write your new plan on a separate piece of paper or in your exercise book.