

Build an Earthquake-resistant House!

Name: _____

Date: _____

Student worksheet

Directions: Before starting your project, complete the design step below.

1. Design

In the space below, draw sketches of some ideas for your base isolation system before you start building it. Label the materials you will use. You might come back to this page to modify your sketch or make a new one as you test and redesign your house.

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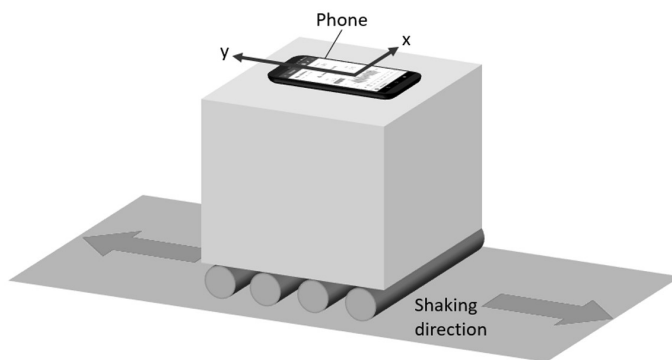
Directions: Follow these steps to test your earthquake-resistant house. After testing, try to modify your design to make it better and repeat these steps. Record the results for each test in your data table.

2. Test your house at your desk

- Attach an object that weighs about as much as the phone to the top of the house.
- Shake the cardboard base back and forth. Use a ruler and a stopwatch to measure and time how you shake the cardboard (for example, +/-1cm, 15 times in 10 seconds). Shake it the same way for each test you do.
- Observe how much the house moves. *Does it move as much as the cardboard does? Does it appear to stay in place while the cardboard moves back and forth under it?*

3. Test your house using a sensor app such as phyphox

- Take your house to the classroom testing station.
- Use double-sided tape to attach the phone to the top of your house, with the screen facing up and the phone's long direction lined up with the direction you will shake the house.
- Open the acceleration (without g) function in the phyphox app and go to the "Absolute" tab to measure the absolute acceleration. Then press the play button to start the recordings for your measurements (ask your teacher if you need help using the phyphox app).
- Shake the cardboard base back and forth using a ruler and stopwatch to measure your shaking.
- Stop recording and make sure to save your data.
- Review your graph and record the maximum accelerations in the table. With the pick data tool in the app you can select individual data points in your graph to view their values.



Test #	Maximum acceleration (m/s ²)
1	
2	
3	
4	
5	

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Directions: After everyone in your class has finished testing, answer the questions below.

4. Reflect

a. How well did your design work relative to other groups?

b. What parts of your design worked well?

c. What parts of your design could you improve?