Imagine that an asteroid crashed into Earth near Mount Prospect. It caused earthquakes under the skyscrapers in downtown Chicago.

DESIGN PROBLEM

Your job is to...

- Design and create a structure that can withstand an earthquake.

CRITERIA

To be considered earthquake-proof, your building must...

- Stay fully standing after 3 tests.
- Should be at least 2 stories and 12" tall.

CONSTRAINTS

You must follow these rules:

- Must be able to stand on its own.
- Base should be 5"x5" or smaller

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Earthquake Challenge

What to Do

Test early and often!

1. **Gather** your materials.
2. **Design and build** a little at a time.
3. Then go to the shake table to **test your creation.**
4. Tape the base to the top of the shake table, then **pull the ruler to create a mini earthquake.**
5. **Watch** what happens to help you **learn** how to improve your building.
6. Take it back to your station and **try again** or keep building.

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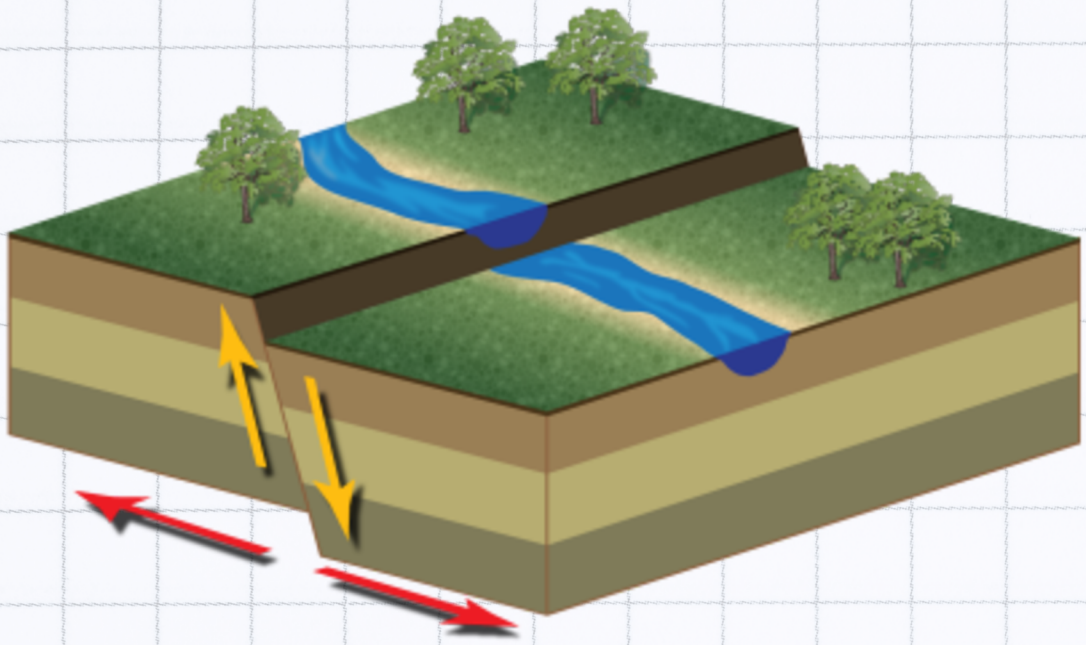
Earthquake Challenge

Things to think & chat about



- What do you know about what causes earthquakes?
- When two tectonic (underground) plates slip and release energy, this causes an earthquake.
- Scientists are still trying to figure out how to predict earthquakes.
- We can prepare for earthquakes by trying to reduce the possibility of building damage and collapse.
- How would you build a stable structure?
- What kinds of shapes do you see in structures? (buildings, bridges, playgrounds, scaffolding)?
- What worked? What didn't?

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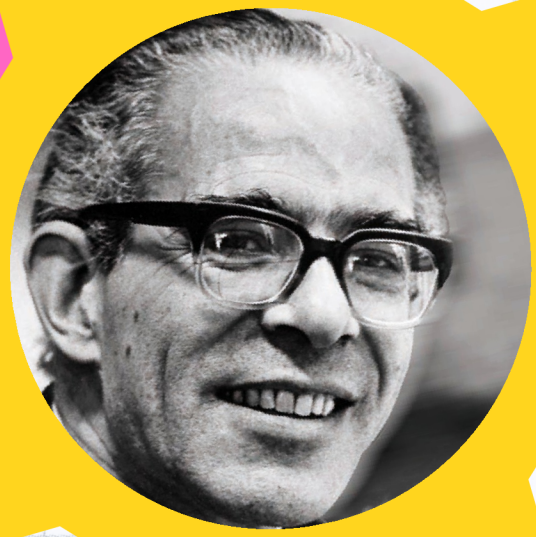
MEET AN ENGINEERING SUPERHERO!

Arturo Arias Suárez



Arturo did lots of engineering stuff.

Mechanical Engineering
Seismic Engineering
Civic & Structural Engineering
Nuclear Engineering

His formula helps measure how strong earthquake shaking is.

One of his most helpful inventions was a math formula that has helped save lives!

$$I_A = \frac{\pi}{2g} \int_0^{T_d} a(t)^2 dt \text{ (m/s)}$$

He was a professor and researcher at the University of Chile and Massachusetts Institute of Technology (MIT), & the University of Mexico.

Then other engineers used his formula to make buildings stronger and safer when earthquakes happen.

Chile

Thank you, Dr. Suárez!

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