

Quaking in boots

Eduardo measures a 2.5-magnitude earthquake in Baltimore, while Suchi measures a 8-magnitude earthquake in New Haven. **(a)** How many times larger was Suchi's earthquake than Eduardo's?

(b) What does "larger" mean in this sense?

(c) Earthquake energy is proportional to $10^{1.5M}$, with M being the magnitude of the earthquake. How many times more energetic is Suchi's earthquake than Eduardo's?

(d) What does "energetic" mean in this sense?

(e) Eduardo reported a good amount of vertical motion during his earthquake. What waves was he probably referring to? Do these waves usually arrive at the beginning or end of an earthquake?

Meteoric rise

(a) Why do meteor showers appear to come from one point in the sky? What is that point in the sky called?

Differentiation

(a) Why are there different layers in the Earth?

(b) How does your above answer relate to planet formation?

Challenge questions

- (a) How might we detect “exoquakes” on planets orbiting other stars?

- (b) Could Saturn have quakes? What about Mars? How might these these quakes differ from those that we experience on the Earth?

- (c) Does it make sense for an earthquake to have a negative magnitude?