***Thor: Ragnarok***

(2017, Rated PG-13)

EQ: How do balanced and unbalanced forces differ? How do each affect the movement of objects?

[Thor Meets a Friend from Work](https://www.youtube.com/watch?v=BqA3GIeSw7o)

Synopsis: Imprisoned on the other side of the universe, the mighty Thor (Chris Hemsworth) finds himself in a deadly gladiatorial contest that pits him against the Hulk (Mark Ruffalo), his former ally and fellow Avenger. Thor's quest for survival leads him in a race against time to prevent the all-powerful Hela from destroying his home world and the Asgardian civilization.

Cinema Science Focus: Thor and Hulk have “worked” together previously in *Marvel’s Avengers* (2012). In this movie, they are pitted against each other as combatants in fight-to-the-death arena for the amusement of the audience and the Grandmaster. Both Avengers are strong and contain a great amount of mass. In the iconic scene at the very end of your clip, they are shown running and then leaping toward each other, presumably about to exert opposing forces on each other. Develop a lesson, investigation, or demonstration that models the effects when opposing forces meet. Make an argument that either Thor or Hulk would be moved more by this oppositional force.

Concepts to Master:

* Balanced Forces
* Unbalanced Forces
* Combining Forces
* Forces in the Same Direction
* Forces in the Opposite Direction

Vocabulary: force, balanced force, unbalanced force, opposing force, net force

Possible Resources:

* Ted Ed “If Superpowers Were Real: Super Strength” (Joy Lin)
* CK-12.org, “The Incredible Hulk” (Real World Application)
* CK-12.org, “Tug of War” (Real World Application)
* The Fuse School, “Balanced and Unbalanced Forces” (2:34)
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