

## Resonance

Objects have a natural frequency. **Natural frequency** is the frequency at which an object can vibrate at under certain circumstances.

ie: a clothes dryer has a natural frequency. If the clothes are not properly balanced, the dryer will vibrate and we hear it. Usually we run to stop the vibration by balancing the load as the vibration can damage the dryer.

**Resonance:** The transfer of energy from one vibrating object to another object that has the same natural frequency.

ie: in class I could start one tuning fork singing and it would get the other tuning fork (of same 440 Hz frequency) to sing without me touching it.

Other examples:

Opera singer sings at the same frequency as the natural frequency of a crystal goblet, causing it to vibrate and eventually shatter.

Tacoma Bridge Collapse (1940) – winds gusted at the same natural frequency of the bridge which caused it to twist (torsional wave). It continued to do so and increased in amplitude until it complete collapsed. Wind took down a concrete and steel bridge by resonance.