# 11.2 Looking at vibrations

Amplitude and frequency of vibrations- Далайц ба хэлбэлзлийн давтамж

When you pluck a guitar string, it vibrates very rapidly. It may vibrate hundreds or thousands of times each second. This is too fast to see clearly.

- The picture shows one way to observe slow vibrations. A metre rule is clamped to the bench. A weight is taped to the free end.
- When you pull the end downwards and let it go, the weight vibrates up and down. If you do this with a short ruler, you can make a 'twanging' sound.
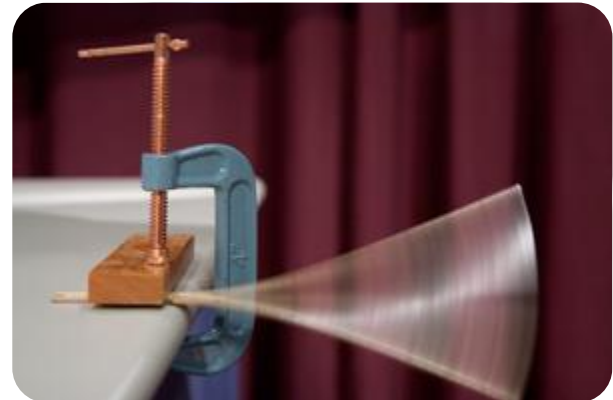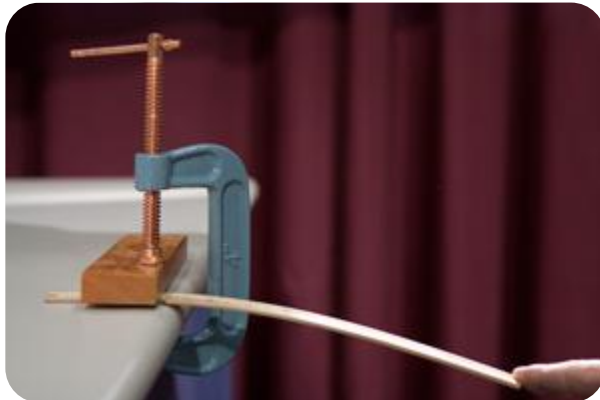
- The picture shows the amplitude of the vibration. It tells you the maximum distance the vibrating object moves from its rest position before it started vibrating.
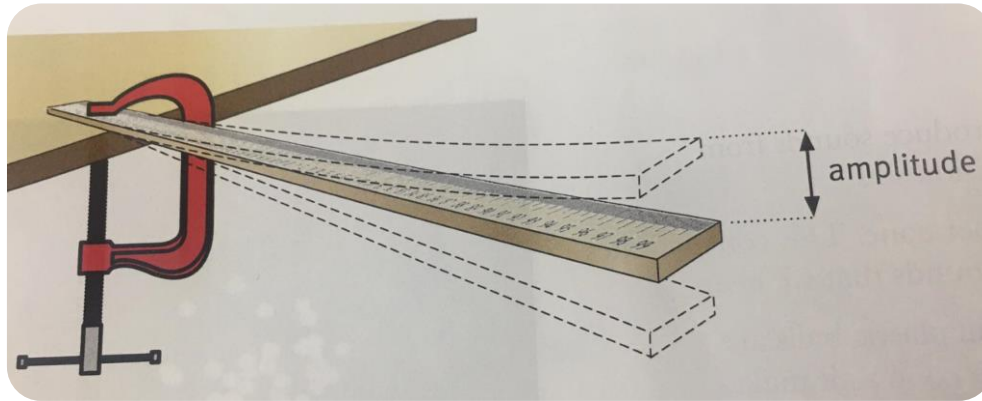
Frequency - Давтамж

- The number of vibrations per second is called the frequency of vibration. If an object vibrates 20 times each second, we say that its frequency is 20Hz. The symbol Hz stand for hertz, the unit of frequency.

1 hertz= 1 Hz = 1 vibration per second

- Formula : $$\text{frequency} = \frac{number\ of\ complete\ vibration}{time}$$

- Unit: $$1Hz = \frac{1}{second}$$

Worked examples

1. **If a guitar string vibrates 200 times each second, what is its frequency?**

      Step1   What we know: Number of complete vibration=250

                                           Time=1s

      and what we want to know: frequency=?

      Step2   The equation we need is equation 1:

$$frequency = \frac{number\ of\ complete\ vibration}{time}$$

      Step3   Calculation then gives:

$$frequency = \frac{250}{1s} = 250Hz$$

Summary

➢ The amplitude of a vibration is the greatest distance the object moves from its rest position.

➢ Frequency is the number of vibrations per second

➢ Frequency is measured in hertz (Hz).