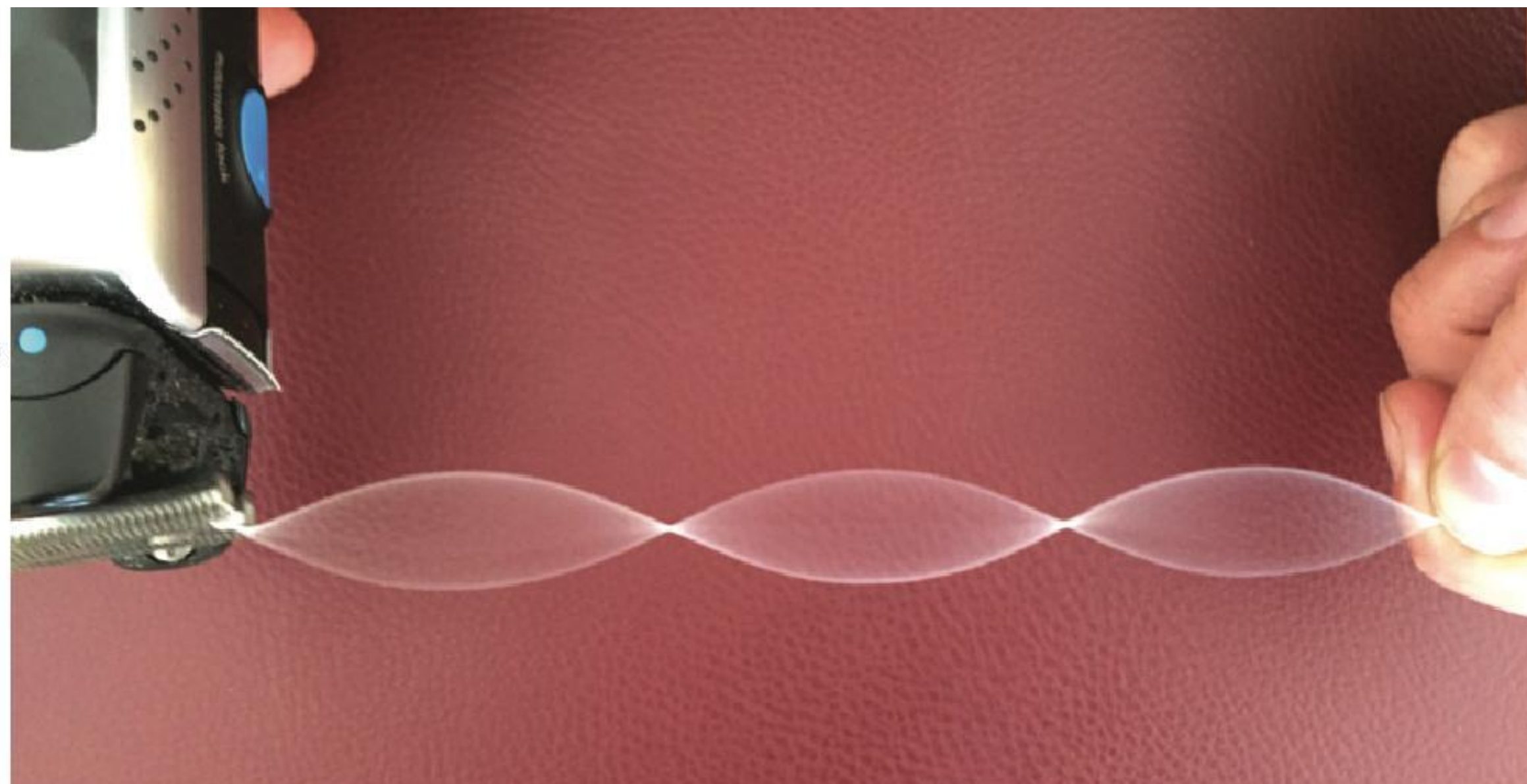




PHYSICS 121

الموجات Waves-I



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Semester 453

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Principles of Physics

Tenth Edition



Contents:

- 16.1 Transverse Waves: Types of waves, Transverse and Longitudinal Waves, Wavelength and Frequency, The Speed of a Traveling Waves
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- 16.5 Interference of Waves: The Principle of Superposition of Waves
- 16.7 Standing waves and Resonance: Standing Waves

Particles versus Waves

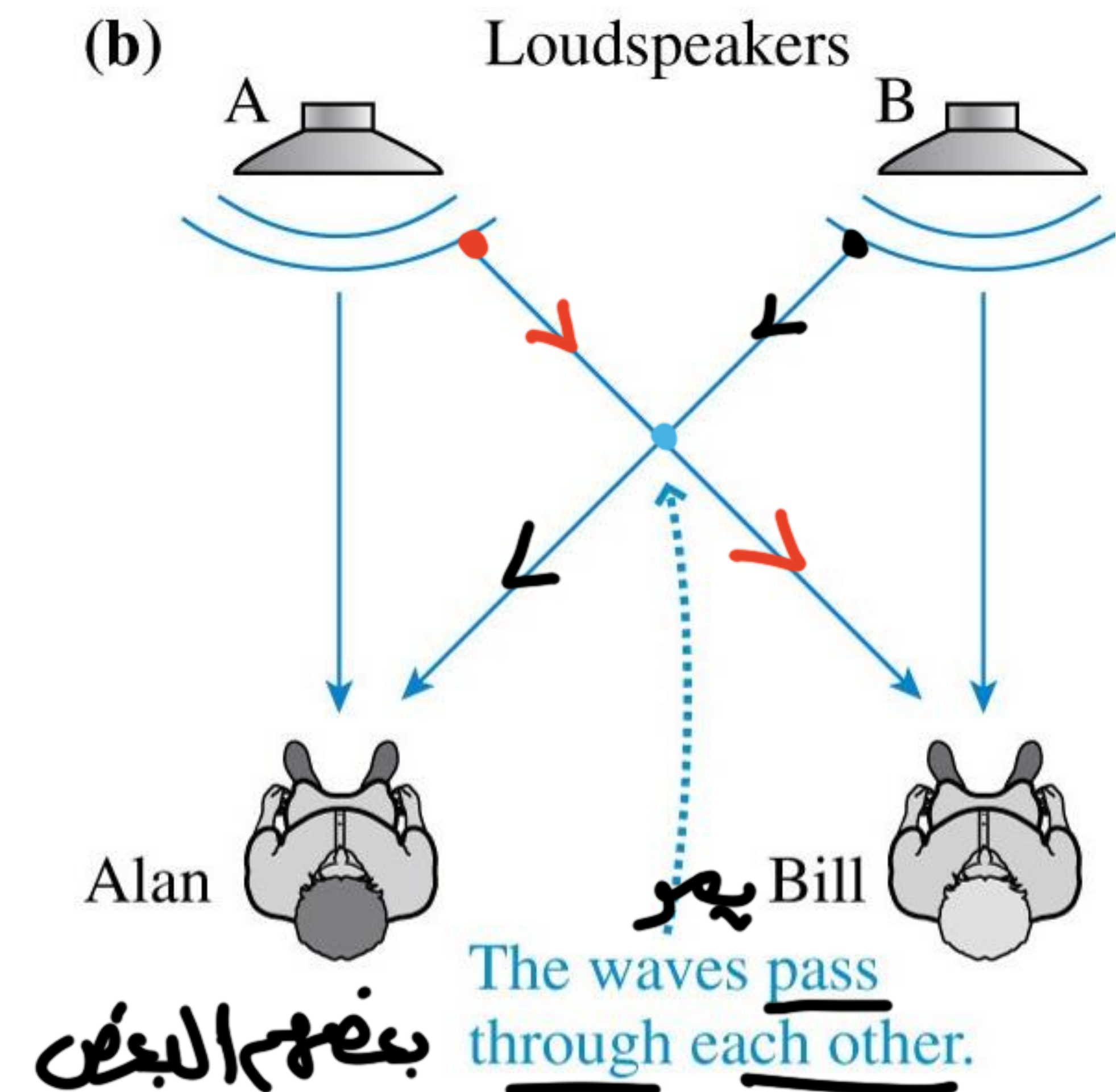
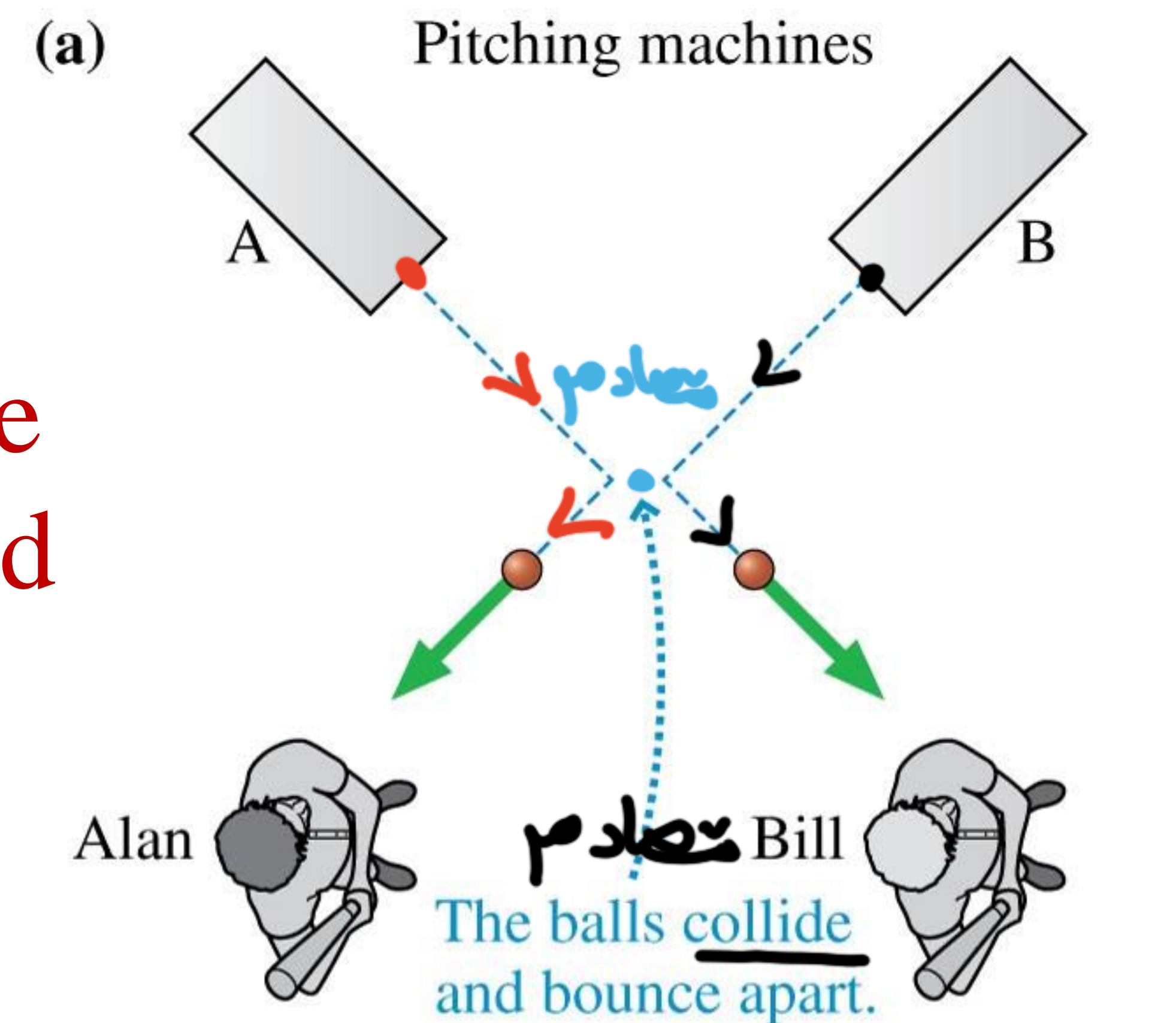
جسيمات الموجهات

- Two particles flying through the same point at the same time will collide and bounce apart, as in Figure (a).

يقتباعد
عن
بعضهما
← تصادم (جسيمات)

عكس الجسيمات
الموجهات

- But waves, unlike particles, can pass directly through each other.



Types of waves

ما هي أنواع الموجات

تذبذب ينتقل
خلال وسط

What is a wave? ماذا تكون الموجة

A wave is a disturbance traveling through a medium.

Types of Waves

الميكانيكية

1 Mechanical Waves

* Require a material medium.
* تحتاج لوسط للانتقال

* Examples:

- 1 - water waves
- 2 - sound waves
- 3 - waves on a string
- 4 - seismic waves

كهرومغناطيسية

2 Electromagnetic Waves

* They do not require medium.
* لا تحتاج لوسط للانتقال

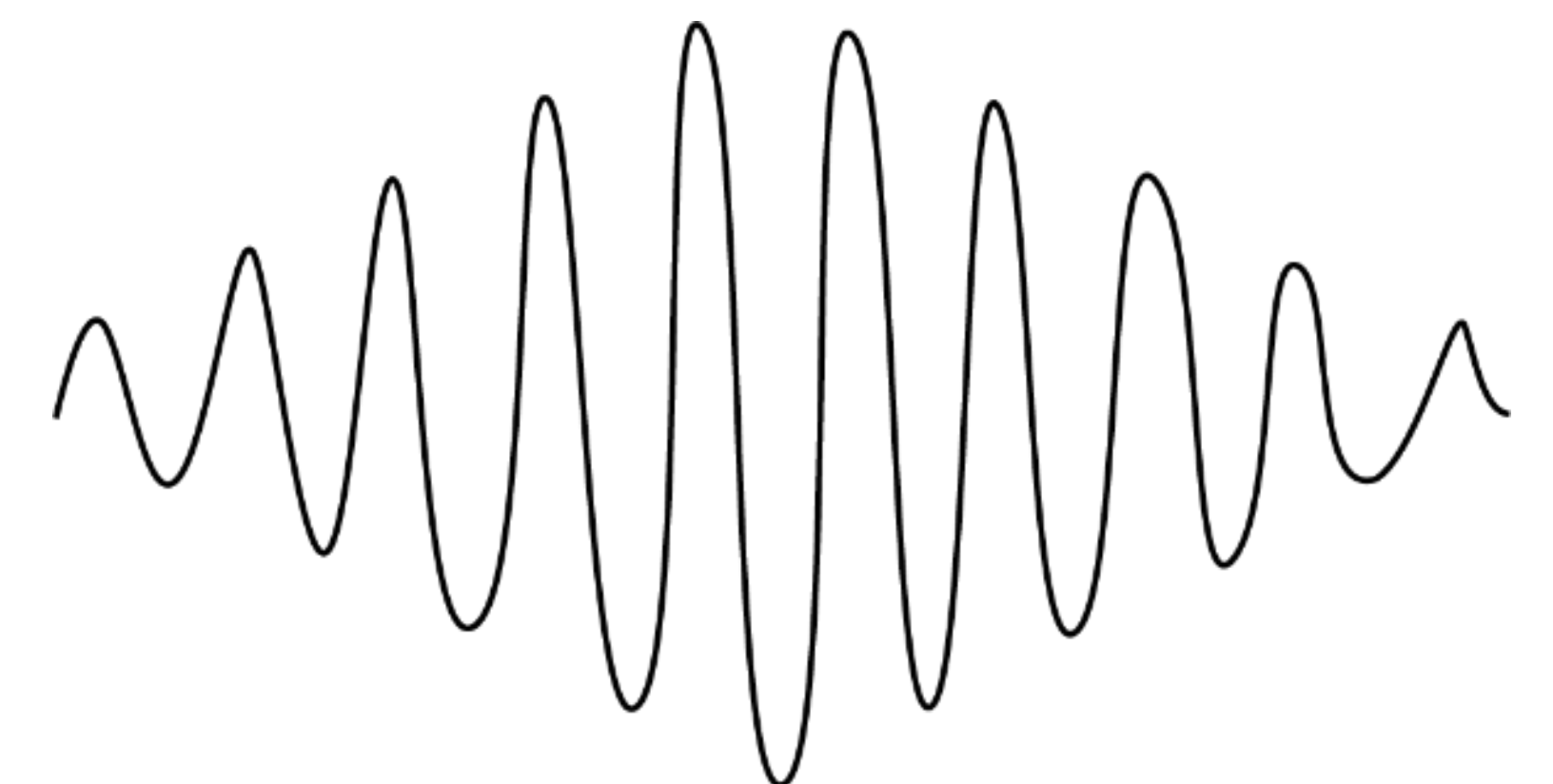
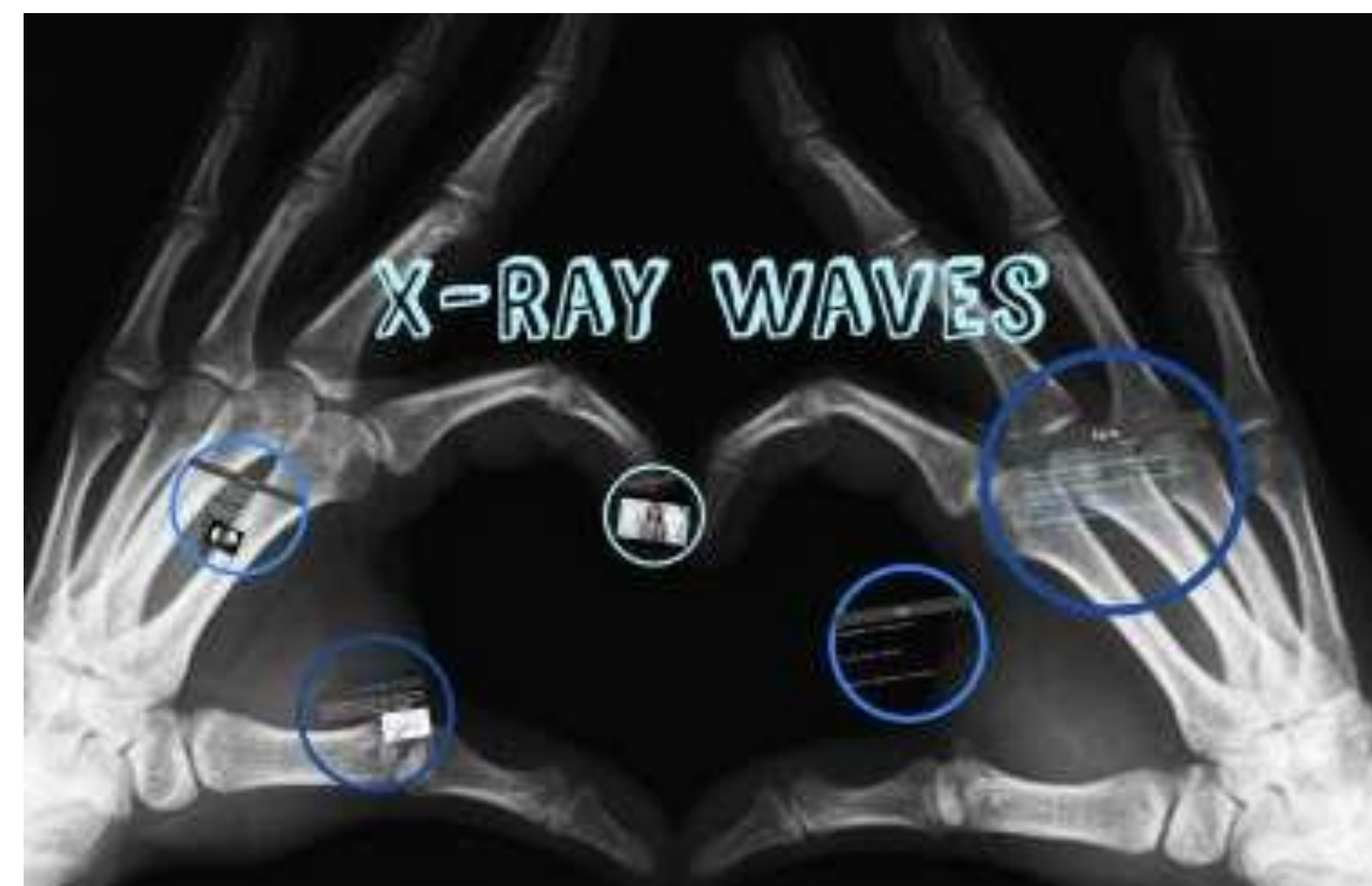
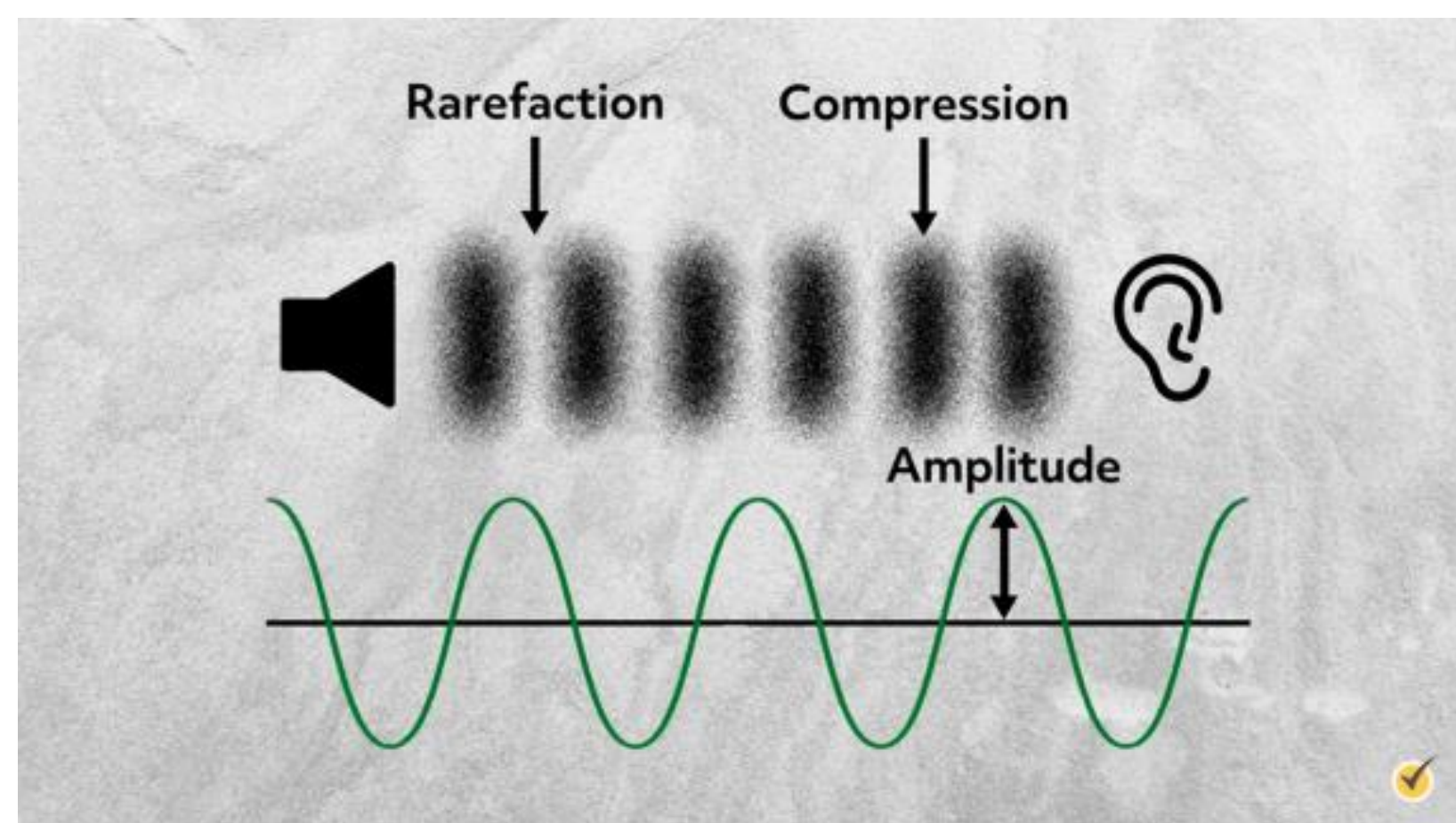
* Examples:

- 1 - visible light
- 2 - radio waves
- 3 - x rays.

المادة

3 Matter Waves

* associated with electrons, protons, and other fundamental particles.
* موجات تنشأ من الإلكترونات والبروتونات والجسيمات الأولية الأساسية



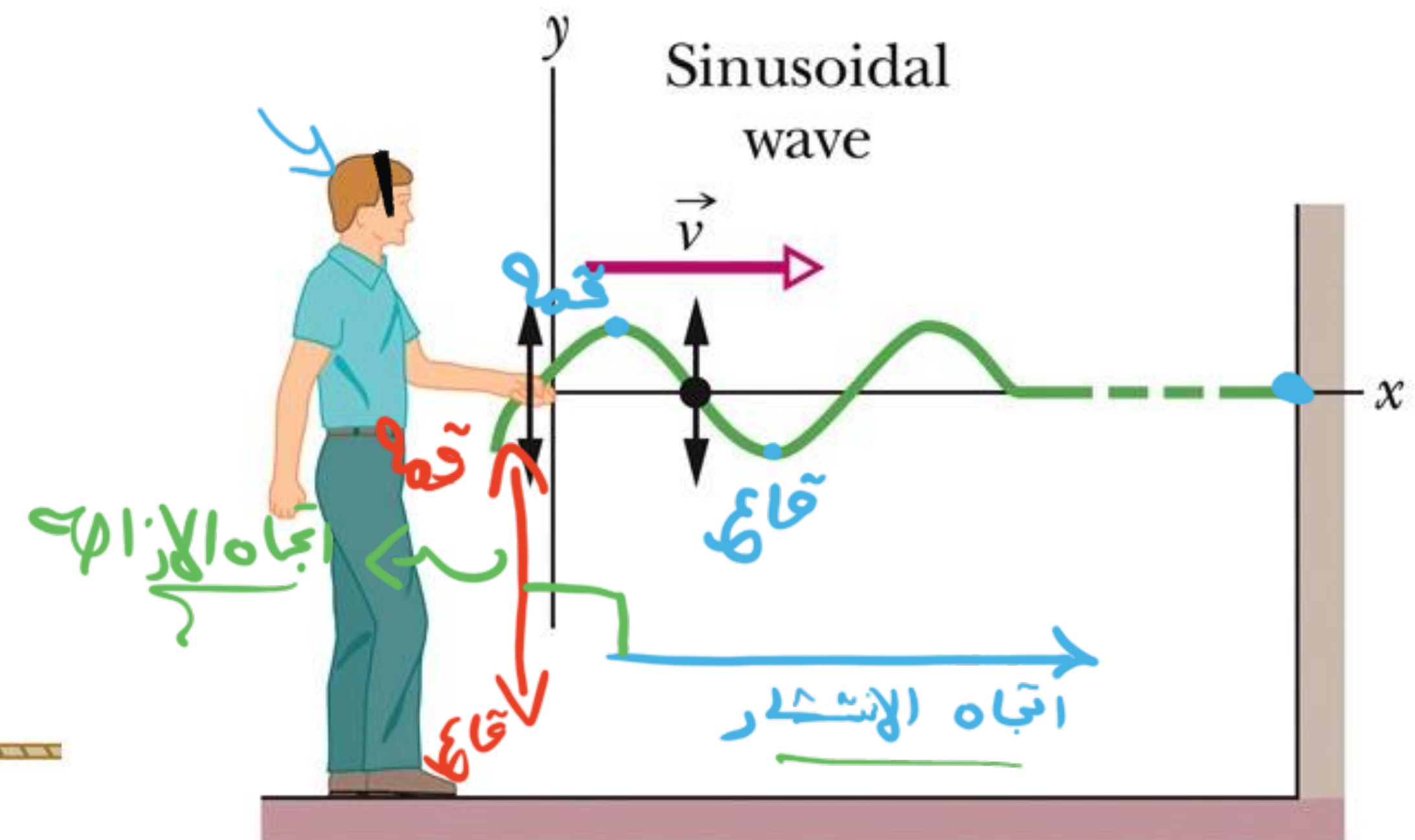
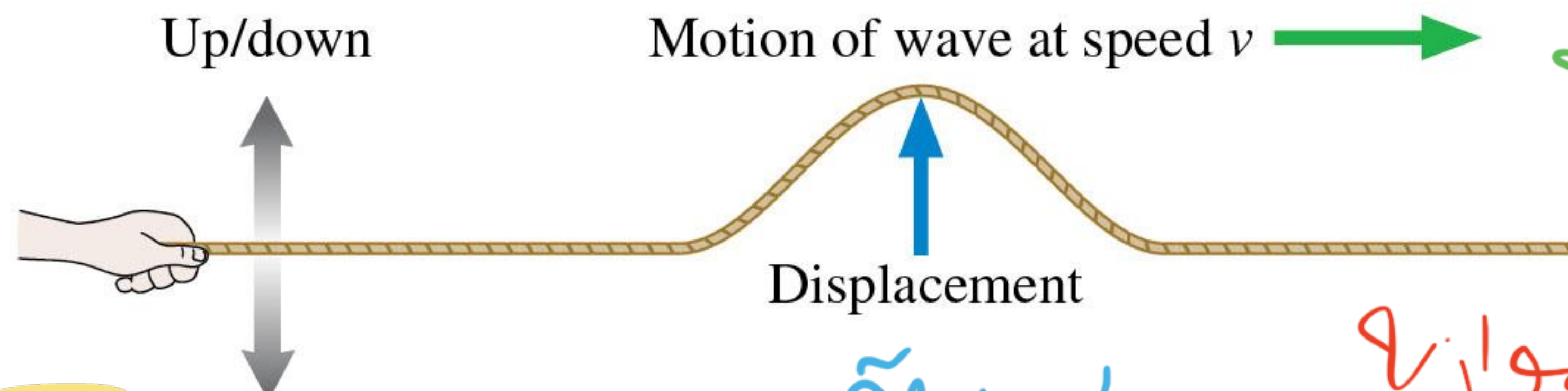
Types of waves

Most waves can also be classified into:

Transverse Waves

مستعرضة
الازاحة

- In a **transverse wave**, the displacement is **perpendicular** to the direction of travel.
- Examples : waves on A string



Longitudinal Waves

طولية

موازيا

- In a **longitudinal wave**, the displacement is **parallel** to the direction of travel.
- Examples : a chain of masses connected by springs

