

Youtube demonstrations for Unit 4

Waves and Light

Mechanical waves

- https://www.youtube.com/watch?v=VE520z_ugcU 4:10 min. Wave machine demonstration (DIY) from UK's National STEM Centre
- <https://www.youtube.com/playlist?list=PLPyapQSxH6mYMBRUP5tBI83vpXbwyDyAu> Mechanical waves and Sound, AP Physics. A playlist of a several videos covering many aspects. From Flipping Physics.
- <https://www.youtube.com/playlist?list=PLPyapQSxH6mYMBRUP5tBI83vpXbwyDyAu> 3:40 m. Interference of sound waves. See variation in dB reading and hear changes in loudness as the microphone is moved across in front of two speakers.
- <https://www.youtube.com/watch?v=kPe1z4GC1uU> 0:31 m. Interference of water waves, extract from by Veritasium video on double slit experiment.
- <https://www.youtube.com/watch?v=hnZ1FKVWN4k> 3:24 m. Uses a bead model to show superposition of waves producing constructive and destructive interference.
- <https://www.youtube.com/watch?v=-gr7KmTOrx0> 4:37 m. Standing waves in a stretched string, different harmonics.
- <https://www.youtube.com/watch?v=BH0NfVUTWG4> 2:38 m. Diffraction of waves. Open University

Light as a wave

- https://www.youtube.com/watch?v=FWCN_uI5ygY 7:28 m. Understanding electromagnetic radiation. Shows how accelerating charges produce em fields. Effective graphics, but does go beyond our course to antennas, etc.
- <https://www.youtube.com/watch?v=nuaHY5lj2AA> 7:57 m. Young's double slit demo with laser.
- <https://www.youtube.com/watch?v=PVyJFzx7zig> 2:16 m. Young's double slit demo with laser.
- <https://www.youtube.com/watch?v=Iuv6hY6zsd0> 7:39 m The 'original double slit experiment' by Veritasium . A must show.

Light and matter

Photoelectric Effect

- <https://www.youtube.com/watch?v=v-1zjdUTu0o> 3 min. Uploaded by UK National Stem Centre. Shines visible and UV light on a negatively charged electroscope. Electroscope is charged by induction. Highly rated.
- <https://www.youtube.com/watch?v=z-3XaXCvjZw> 5.3 min. US. Electroscope charged negatively by contact and discharged by UVC. Also used a positively charged electroscope with no effect.
- <https://www.youtube.com/watch?v=jjdWzIcHQc4> 3 min. US. Slow delivery.
- <https://www.youtube.com/watch?v=l-gwAs2ApPw> 6 min. A longer video by the same guy who used the UVC lamp above, but there are extra graphics and he shines blue light on a 70 V neon globe set at 65 V and makes the globe glow.

Energy in LEDS

- <https://www.youtube.com/watch?v=Q-rfjUQdboc> 9 min. Effective, but long video showing Photovoltaic Effect with red and green LEDs. Uses good analogies.

Diffraction of Light

- <https://www.youtube.com/watch?v=71Rp-jG6Eek> 4.5 min IOP for teachers. Uses a green laser, effective explanations
- <https://www.youtube.com/watch?v=AXaZc-VQzWk> 4:39 min. Open University. Uses both red and green lasers with three different widths. Clear explanation.

Resolution

- <https://www.youtube.com/watch?v=McJjWkTSYrg> 2:29 min US Effective demonstration show that close dark lines can't be distinguished with red light, but can with green light. Don't miss the display at the top of the screen showing the amount of diffraction. The text will need some explanatory support.

Hydrogen Spectrum

- <https://www.youtube.com/watch?v=nM5Kg7RUoTE> 3:44 min US. The first minute is relevant as it shows how a spectrum is produced in a spectroscope and shows for of the lines on the scale which students can read off. The remainder of the video is about the Bohr model.

Single photon / electron double slit experiment

- <https://www.youtube.com/watch?v=GzbKb59my3U> 5:59 min. A Veritasium video
- <https://www.youtube.com/watch?v=MbLzh1Y9POQ> 1:12 min. Interference pattern built up photon by photon from Leiden University
- <https://www.youtube.com/watch?v=I9Ab8BLW3kA> 10:44 min. Hamamatsu. Young's experiment with single photons. The first time captured on film
- <https://www.youtube.com/watch?v=ZJ-0PBRuthc> 1.08 min. Hitachi Young's experiment with single photons
- <https://www.youtube.com/watch?v=ZqS8Jjkk1HI> 1:32 min Physics Footnotes. Young's experiment with single photons