**Y12 Recommended Further Reading – 2024-25**

Remember this is a general guide only. Feel free to explore further. Links valid as of 16/07/24

**Autumn 1 – Topics**

**Fundamentals**

1. Easy to Understand:

 [Introduction to Physics](https://www.khanacademy.org/science/physics/one-dimensional-motion) – Khan Academy

2. In the News:

 [Gravitational Waves Detected, Confirming Einstein’s Theory](https://www.nytimes.com/2016/02/12/science/ligo-gravitational-waves-black-holes-einstein.html)  - The New York Times

3. Going further:

 [Evolution may explain values of the fundamental constants – Physics World](https://physicsworld.com/a/evolution-may-explain-values-of-the-fundamental-constants/)

**Basics of Electricity**

1. Recap:

[Electricity Basics](https://www.explainthatstuff.com/electricity.html) - Explain That Stuff

2. In the News:

[The Future of Renewable Energy](https://www.bbc.com/news/science-environment-54074792) - BBC News

3. Going further:

 [Kirschoff Laws](https://phys.libretexts.org/Bookshelves/University_Physics/University_Physics_%28OpenStax%29/University_Physics_II_-_Thermodynamics_Electricity_and_Magnetism_%28OpenStax%29/10%3A_Direct-Current_Circuits/10.04%3A_Kirchhoff%27s_Rules) – LibreText Physics

**Kinematics**

1. Recap:

 [Understanding Kinematics](https://www.khanacademy.org/science/physics/one-dimensional-motion) - Khan Academy

2. In the news:

 [The Physics of Johnny Knoxville, Human Cannonball | WIRED](https://www.wired.com/story/the-physics-of-johnny-knoxville-human-cannonball/)

3. Going further:

 [How rockets work: A complete guide | Space](https://www.space.com/how-rockets-work)

**Autumn 2 – Topics**

**Internal Resistance and Potential Dividers**

1. Recap:

 [Potential Divider Circuits](https://www.electronics-tutorials.ws/resistor/res_3.html) by Electronics Tutorials

2. In the news:

[Flow batteries for grid-scale energy storage | MIT News | Massachusetts Institute of Technology](https://news.mit.edu/2023/flow-batteries-grid-scale-energy-storage-0407)

3. Going further:

[BU-902: How to Measure Internal Resistance - Battery University](https://batteryuniversity.com/article/bu-902-how-to-measure-internal-resistance)

**Dynamics and Projectile Motion**

1. Recap:

[Two-dimensional motion | Physics archive | Science | Khan Academy](https://www.khanacademy.org/science/physics/two-dimensional-motion)

2. In the news:

[The physics of football – Physics World](https://physicsworld.com/a/the-physics-of-football/)

[Physics of Free Kicks - Stem Fellowship](https://live.stemfellowship.org/physics-of-free-kicks/)

3. Going further:

[Projectile Motion (real-world-physics-problems.com)](https://www.real-world-physics-problems.com/projectile-motion.html)

**Waves Basics**

1. Recap:

[Oscillations and mechanical waves | Physics archive | Khan Academy](https://www.khanacademy.org/science/physics/mechanical-waves-and-sound)

2. In the news:

[Sound Waves Power Advances in Smart Materials - Tech Briefs](https://www.techbriefs.com/component/content/article/39612-sound-waves-power-advances-in-smart-materials)

3. Going further:

[Physics Tutorial: Vibrations and Waves (physicsclassroom.com)](https://www.physicsclassroom.com/class/waves)

**Spring 1 – Topics**

Waves – Superposition, Diffraction, and Harmonics

1. Recap:

[Oscillations and mechanical waves | Physics archive | Khan Academy](https://www.khanacademy.org/science/physics/mechanical-waves-and-sound)

2. In the news:

[How lasers and 2D materials could solve the world's plastic problem (phys.org)](https://phys.org/news/2024-07-lasers-2d-materials-world-plastic.html)

[Securely propagating entanglement at the push of a button (phys.org)](https://phys.org/news/2024-07-propagating-entanglement-button.html)

3. Going further:

[Superposition of Waves (psu.edu)](https://www.acs.psu.edu/drussell/Demos/superposition/superposition.html)

**Work, Energy, and Power**

1. Recap:

[Work and energy | Physics archive | Science | Khan Academy](https://www.khanacademy.org/science/physics/work-and-energy)

2. In the news:

[Renewable energy, facts and information (nationalgeographic.com)](https://www.nationalgeographic.com/environment/article/renewable-energy)

3. Going further:

[Work, Energy, and Power (physicsclassroom.com)](https://www.physicsclassroom.com/class/energy)

**Materials Basics**

1. Recap:

[AQA 3.4 Mechanics and Materials - A Level Physics Online](https://www.alevelphysicsonline.com/aqa-3-4)

2. In the news:

[What is graphene? All about its properties and applications | Repsol](https://www.repsol.com/en/energy-and-the-future/technology-and-innovation/graphene/index.cshtml#:~:text=Graphene%20in%20electronics,components%20that%20are%20used%20today.)

3. Going further:

[Materials science - A simple introduction - Explain that Stuff](https://www.explainthatstuff.com/materials-science.html)

**Spring 2 – Topics**

**Materials – Young Modulus**

1. Recap:

[Notes - Topic 3.4 Materials - OCR (A) Physics A-level (physicsandmathstutor.com)](https://pmt.physicsandmathstutor.com/download/Physics/A-level/Notes/OCR-A/3-Forces-and-Motion/Detailed/3.4.%20Materials.pdf)

2. In the news:

[Materials Science News -- ScienceDaily](https://www.sciencedaily.com/news/matter_energy/materials_science/)

3. Going further:

[Nondestructive Evaluation Physics : Materials (nde-ed.org)](https://www.nde-ed.org/Physics/Materials/Mechanical/Mechanical.xhtml)

**Newton's Laws and Collisions**

1. Recap:

[Forces and Newton's laws of motion | Physics archive | Khan Academy](https://www.khanacademy.org/science/physics/forces-newtons-laws)

2. In the news:

[The Physics of a Car Collision (thoughtco.com)](https://www.thoughtco.com/what-is-the-physics-of-a-car-collision-2698920)

3. Going further:

[Elastic Collision (real-world-physics-problems.com)](https://www.real-world-physics-problems.com/elastic-collision.html)

**Quantum Physics – Planck's Constant and Particle-Wave Duality**

1. Recap:

[Photon energy (video) | Modern physics | Khan Academy](https://www.khanacademy.org/science/ap-physics-2/ap-quantum-physics/x0e2f5a2c%3Awave-particle-duality/v/photon-energy)

2. In the news:

[quantum physics | Quanta Magazine](https://www.quantamagazine.org/tag/quantum-physics)

3. Going further:

[Wave-Particle Duality: Explanation, History, Compton Effect (studysmarter.co.uk)](https://www.studysmarter.co.uk/explanations/physics/radiation/wave-particle-duality/)

**Summer 1 – Topics**

**Materials Research PAG**

1. Recap:

[Materials Science News -- ScienceDaily](https://www.sciencedaily.com/news/matter_energy/materials_science/)

2. In the news:

[Materials Science | Science News](https://www.sciencenews.org/topic/materials-science)

3. Going further:

[Materials science - Latest research and news | Nature](https://www.nature.com/subjects/materials-science)

**Capacitors and Electric Fields**

1. Recap:

[Introduction to Capacitors, Capacitance and Charge (electronics-tutorials.ws)](https://www.electronics-tutorials.ws/capacitor/cap_1.html)

2. In the news:

[capacitors - IEEE Spectrum](https://spectrum.ieee.org/tag/capacitors)

3. Going further:

[hyperphysics.phy-astr.gsu.edu/hbase/electric/capcon.html](http://hyperphysics.phy-astr.gsu.edu/hbase/electric/capcon.html)

**Summer 2 – Topics**

**Electric and Magnetic Fields**

1. Recap:

[Electric force, field, and potential | Khan Academy](https://www.khanacademy.org/science/ap-physics-2/ap-2-electric-charge-electric-force-and-voltage)

2. In the news:

[MRI Scans: Definition, uses, and procedure (medicalnewstoday.com)](https://www.medicalnewstoday.com/articles/146309#what-is-an-mri-scan)

3. Going further:

[Physics Tutorial: Static Electricity (physicsclassroom.com)](https://www.physicsclassroom.com/class/estatics)

**Circular Motion**

1. Recap:

[Circular motion and gravitation | AP®︎/College Physics 1 | Khan Academy](https://www.khanacademy.org/science/ap-college-physics-1/xf557a762645cccc5%3Acircular-motion-and-gravitation)

2. In the news:

[How Roller Coasters Work | HowStuffWorks](https://science.howstuffworks.com/engineering/structural/roller-coaster.htm)

3. Going further:

[Circular Motion (real-world-physics-problems.com)](https://www.real-world-physics-problems.com/circular-motion.html)