

Interactive physics and maths instruments that take you to space

Every lesson pairs a live simulator and 3-round step-by-step quiz with the exact Department for Education curriculum statements for England ([KS2](#), [KS3](#), [GCSE](#) and [A-level](#)), connected into five space missions so pupils see *why* each formula matters.

1 Build your toolkit

Size & fuel the rocket

Find tank volume, fuel-to-mass fractions, propellant mix ratios, sub-zero countdowns and metric unit conversions before ignition.

11 lessons · [KS2–KS3](#) →

2 Get to orbit

Leave the ground & stay up

Use gears to swing nozzles, hot gas pressure ($pV = nRT$) to throw exhaust for momentum, and balance gravity in circular & transfer orbits.

6 lessons · [GCSE–A-level](#) →

3 Navigate

Steer & land on target

Resolve 2D thrust vectors with trigonometry, rotate the craft with radians & matrices, and model acceleration & drag with calculus.

6 lessons · [GCSE–A-level](#) →

4 Talk to the spacecraft

Send commands & data home

Power the transmitter circuit ($V = IR$), tune carrier waves ($v = f\lambda$), encode commands & photos as binary 1s and 0s, and calculate backup probability.

4 lessons · [KS3–GCSE](#) →

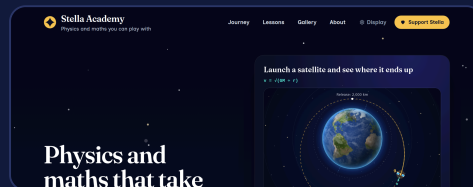
5 Read the starlight

Decode distant stars

Split starlight through a prism (Snell's law), filter sensor noise with standard deviation, induce emf (Faraday) and measure photon energy ($E = hf$).

4 lessons · [GCSE–A-level](#) →

Inside every lesson



Home orbit simulator ([live on /](#))

01 Interactive instrument

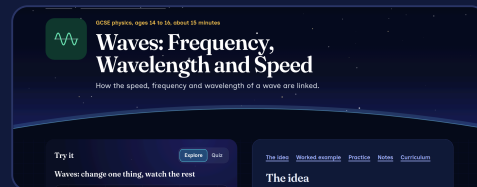
Sliders, bit switches and 3D/2D diagrams respond live + integrated mission notes.

03 3-round adaptive quiz

Fresh numbers every time, marked line by line, with missed steps brought back.

Try live: [KS2 Volume](#) [KS3 Binary](#) [GCSE Waves](#) [A-level Gravity](#) [A-level Calculus](#)

Browse all 31 at stella-academy.org/study



GCSE Waves lesson (</study/waves>)

02 Formula & worked example

Every symbol defined with its unit, plus one example solved step by step.

04 Verified maths & DfE quotes

Automated scripts verify every answer and match every DfE statement word for word.

1. Review a mission (teacher credit)

[Volunteer to review](#) →

Teach physics or maths, or work in science or engineering? Try a mission of five or six short lessons, tell us what is wrong or missing, and receive named credit on the lessons you review plus every classroom pack free.

2. Request a classroom pack or topic

[Request a pack or topic](#) →

Run a class, STEM club or home-education group? Tell us which mission or key stage you want slides, lesson plans and printable worksheets for, or suggest a new curriculum topic or interactive simulator.

3. Help Stella pay for itself

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Stella's core lessons are free to use, but not free to run. Chip in towards cloud hosting and new models on Ko-fi, or partner with us as a school or university host on a public-engagement grant (hello@pixjobs.com).