

WAVES, SOUND & PHYSICAL OPTICS DAY 8: OPEN LAB: WHAT SETS WAVE SPEED ON A STRING?

CED 14.6 · Skill 3.A · FRQ: Experimental Design

PLAN

List variables that might affect string-wave speed: tension, linear density, total length, and pulse amplitude. Circle one your team can vary safely and measurably.

OPEN-INVESTIGATION WORKFLOW**QUESTION**

Write: How does _____ affect wave speed when _____ are held constant?

DESIGN FOR APPROVAL

Role	Your decision
independent variable and range	
dependent variable: how v is measured	
three or more controls	
repeats and averaging	
safety step	

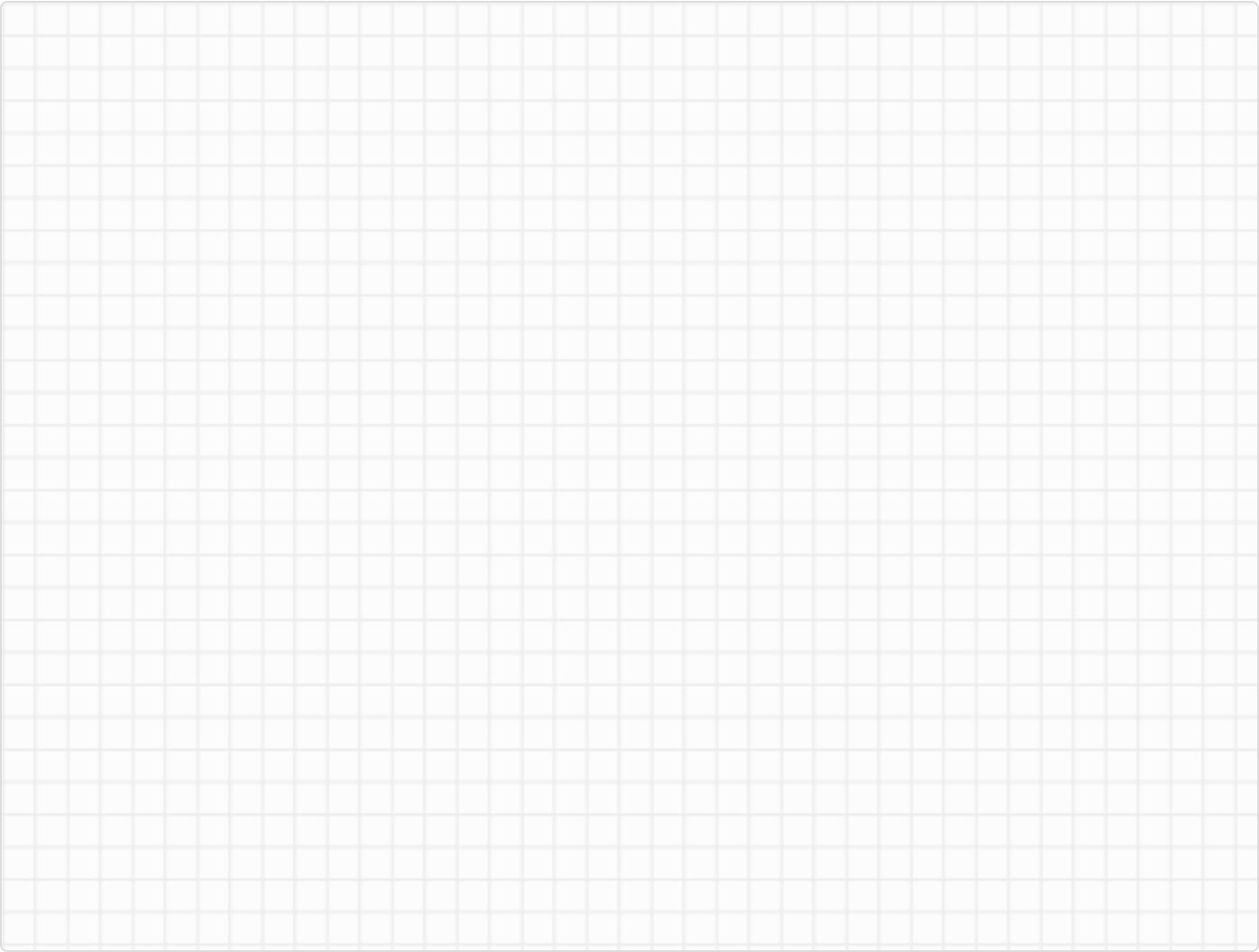
Predicted graph: sketch axes and expected trend. State the model behind it.

Approval gate: collect data only after the teacher confirms that one variable changes at a time.

DATA RECORD

trial	independent variable + unit	raw measurement(s)	v (m/s)	uncertainty
1				
2				
3				
4				
5				
6				

Graph wave speed vertically against the transformed or untransformed independent variable your model predicts. Include a fit.



CLAIM, EVIDENCE, AND EVALUATION

1. Claim: state how the selected variable affects wave speed.

2. Evidence: cite the graph trend, fit, and at least two values with uncertainty.

3. Reasoning: compare with $v = \sqrt{T/\mu}$ or another stated model.

4. Evaluation: identify a limitation, its directional effect, and one improvement.