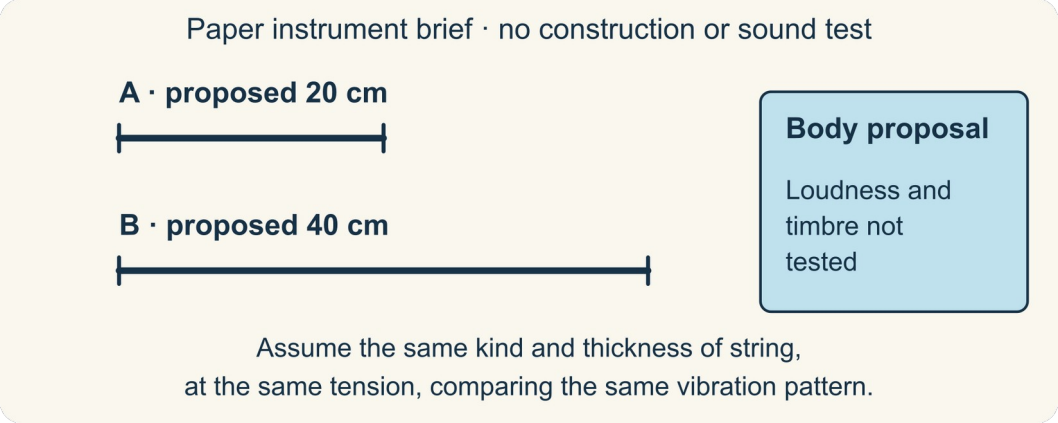
An imagined instrument on paper

Which design choices would need checking before claiming a particular sound?

Sketch a possible string instrument and label an aim, a prediction and the evidence still missing. The entire investigation stays on paper.

Explore | 15-25 minutes, or one comparison | Paper and a pen or pencil, The supplied sketch; no string, tool, instrument or sound needed

Start here Draw two imaginary strings: A has a 20 cm vibrating length and B a 40 cm vibrating length. Label them as the same kind and thickness of string, at the same tension, comparing the same vibration pattern.



Length is one variable, not a sound recording

1 Label the proposal

Sketch the strings beside a possible resonating body. State an aim, such as making two contrasting pitches. The 20 cm and 40 cm are proposed dimensions, not a measuring or building instruction.

2 Make a conditional prediction

For a simple comparison, assume the same kind and thickness of string, at the same tension, comparing the same vibration pattern. With only vibrating length different, expect the longer string to give a lower pitch. Keep the phrase “if the other conditions stay the same”.

3 Separate three sound questions

Pitch concerns how high or low a sound seems. Loudness and timbre are different questions. A longer string or bigger drawn box does not by itself prove a louder or particular-coloured sound.

4 Write a checking plan

List what an actual controlled comparison would have to hold fixed: string kind, thickness, tension and vibration pattern. Plan to change only vibrating length and observe the resulting pitch. You can finish with this paper plan; do not build or tension strings for this activity.

An instrument brief not an invented test result

Two proposed lengths differ by a factor of 2: 40 / 20 = 2. No instrument was constructed.

• Aim: two contrasting pitches. Assume uniform strings of the same kind and thickness, giving the same mass per centimetre, at the same tension and with the same vibration pattern. With only vibrating length different, B would have the lower pitch.

• A body might couple string vibration into surrounding air, but this drawing supplies no loudness measurement. “Twice as long” does not mean “twice as loud”.

• Next evidence needed: a controlled record of vibrating length, string kind and thickness, tension, vibration pattern and resulting sound. The exact pitch and timbre remain unknown.

What this example can show Real strings, bodies and playing methods interact. The sketch is not a guarantee that a proposed instrument will work.

A different way

Annotate the supplied drawing with “aim”, “prediction” and “not yet known”, or ask someone to scribe those labels. No sound or instrument is required.

If you want to go further

Propose changing one body feature while leaving the strings unchanged. Identify which new comparison would be needed before attributing a difference to that feature.

Something to notice

Have I described a design intention as though it were something I actually heard or tested?

Read or explore more

Horizon topic Instrument Design

https://launchhorizonhq.com/learn/instrument-design/

Horizon topic Instruments Acoustics

https://launchhorizonhq.com/learn/instruments-acoustics/

Horizon topic Musical Texture

https://launchhorizonhq.com/learn/musical-texture/

UNSW Sydney, Music Acoustics How does a guitar work?

https://newt.phys.unsw.edu.au/music/guitar/guitarintro.html

UNSW Sydney, Physclips Pitch, loudness and timbre

https://www.animations.physics.unsw.edu.au/jw/sound-pitch-loudness-timbre.htm