

Activity 9.8

Slinky standing wave speeds

WORKSPACE

Slinky standing wave speeds

SCI09SIWR00237

The aim of this activity is to find out how fast a slinky standing wave wiggles.

Materials

- slinky (able to be stretched to 4m)
- measuring tape
- timer or stopwatch
- calculator or spreadsheet program
- safety glasses

Method

Two people hold the slinky at either end. A long area is needed for this activity. The slinky works best on a smooth floor surface.

Part A

- 1 Stretch the slinky to a length of 2 m.
- 2 Predict the time it will take for a 'big arc' wave to travel along the slinky.
- 3 Measure the time for 10 cycles of a big arc wave. You will need to practise shaking the slinky so there is one peak only. Move your hand quickly to get one peak.

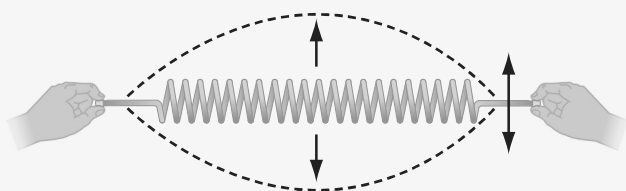


Figure 9.7 Big arc wave and wavelength

- 4 Record this time in your data table.
- 5 Repeat steps 1–4 five times.
- 6 How close was your prediction?

Part B

- 7 Stretch the slinky to a length of 3 m.
- 8 Predict the time it will take for a big arc wave to travel along the slinky.
- 9 Measure the time for 10 cycles of a big arc wave.
- 10 Record this time in a data table.
- 11 Repeat steps 7–10 five times.
- 12 How close was your prediction?

Part C

- 13 Stretch the slinky to a length of 4 m.
- 14 Predict the time for one cycle of a 'big arc' on a 4 m slinky.
- 15 Measure the time for 10 cycles.
- 16 Record this time in a data table.
- 17 Repeat steps 13–15 five times.
- 18 How close was your prediction?

Results

- 1 Construct a data table. Calculate the average time for one cycle for each slinky length.
- 2 Make a graph of slinky length against time.
- 3 What happens to the cycle time as the slinky is stretched? Predict the expected cycle time for the slinky if it were stretched to 6 m long (do not do this).

Conclusion

How does the length of the slinky change the time for one cycle?

ACTIVITY SHEET

Extension

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