

GRAVITY CHIMES

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PURPOSE: To show how the length of an object affects its natural frequency.

MATERIALS: Safety glasses, 1/8-inch diameter aluminum welding rods, wire cutters (the screw cutters or wire crimpers works the best), and paint.

ASSEMBLY: Cut the number of rods in column three to the lengths in column two of the table below. Paint each rod a different color for easy resorting.

ROD NO.	NOTE	LENGTH (cm)	NUMBER OF RODS	COLOR
1	Do	19.4	1	Red
2	Re	18.3	2	Orange
3	Mi	17.3	5	Yellow
4	Fa	16.7	6	Green
5	So	15.8	8	Blue
6	La	15.0	2	Violet
7	Ti	14.2	0	Magenta
8	Do	13.6	0	Black

The aluminum welding rods are normally 91.4cm (36") when purchased. Using the following cutting procedure can results in enough small rods for the music below plus optional "Ti" and "Do" rods from the table above.

Long Rod #1: 19.4cm + 18.3cm + 18.3cm + 17.3cm + 17.3cm = 90.6cm

Long Rod #2: 17.3cm + 17.3cm + 17.3cm + 16.7cm + 16.7cm = 85.3cm

Long Rod #3: 16.7cm + 16.7cm + 16.7cm + 16.7cm + 15.8cm = 82.6cm

Long Rod #4: 15.8cm + 15.8cm + 15.8cm + 15.8cm + 15.8cm = 79.0cm

Long Rod #5: 15.8cm + 15.8cm + 15.0cm + 15.0cm + 14.2cm + 13.6cm = 89.4cm

HOW TO USE: Drop the rods, with appropriate timing, in the order given in the following "score".

LONDON BRIDGE IS FALLING DOWN

5 6 5 4 3 4 5 2 3 4
Lon-don Bridge is fall-ing down, fall-ing down,

3 4 5 5 6 5 4 3 4 5
fall-ing down. Lon-don Bridge is fall-ing down,

2 5 3 1
My fair la-dy

London Bridge

Attach this paper to cardboard to help keep your rods in order.
Add pauses for line breaks.

5 Blue
6 Violet
5 Blue
4 Green
3 Yellow
4 Green
5 Blue

2 Orange
3 Yellow
4 Green

3 Yellow
4 Green
5 Blue

5 Blue
6 Violet
5 Blue
4 Green
3 Yellow
4 Green
5 Blue

2 Orange
5 Blue
3 Yellow
1 Red