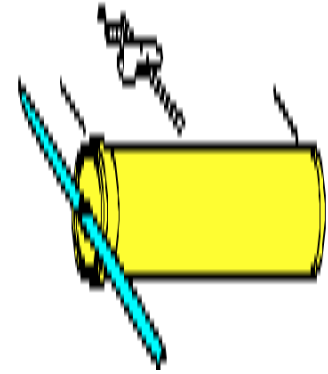


## What this is about

When you wind up a cotton-reel roller you store energy in the elastic band. When you let go this energy is released and the roller moves forward. In this activity the children investigate cotton reel rollers. They use a spreadsheet to record their results and draw a graph. The spreadsheet also calculates an average - you could do this for them. The children use IT here to 'sort information and present their findings'. They learn too about 'elastic bands exerting forces'.



## Starting points

How far would a cotton-reel roller travel on a level surface? Can the children make one go further? Does winding the elastic band more make a lot of difference?

Do you think that if you turned the band twice as far, the roller will go twice as far? Is there a pattern between the times you turn the band and how far it travels?

## You will need

A spreadsheet, elastic bands, cotton reels, orange sticks.

## What to do

Make a cotton reel roller. Wind up the roller different numbers of turns and measure how far it travels. Do this three times for each number of turns.

Make a spreadsheet and enter your results as shown below. The spreadsheet will calculate the average of three 'goes' with the roller.

You can plot a scattergraph of your results. Or you can use a bar graph instead - but make sure the 'number of turns' increases as you go down the spreadsh

	A	B	C	D	E
1	Cotton reel rollers				
2	Number of turns	Distance 1	Distance 2	Distance 3	Average distance
3		cm	cm	cm	cm
4	10	3	2	1	xx
5	20				xx
6	30				xx
7	40				xx
8	50				xx
9	60				xx
10	How to plot a graph 1. Highlight cells A4 to A9. 2. Hold down the CTRL key. 3. Highlight cells E4 to E9 4. Get the program to plot a bar or scattergraph.				
11					
12					
13					
14					

et.

## Questions to ask

Does turning the band more change how far it travels? Does it make a lot of difference?

Write about what you did for next year's class.

## Extra

Would other elastic band powered toys show the same pattern?

	A	B	C	D	E	F	G	H	I
1	Cotton reel rollers								
2	Number of turns	Distance 1	Distance 2	Distance 3	Average distance				
3		cm	cm	cm	cm				
4	10	3	2	1	2				
5	20								
6	30								
7	40								
8	50								
9	60								
10	How to set up your spreadsheet 1. Enter the headings in rows 1, 2 and 3. 2. Enter the number of turns of the elastic band in column A. 3. Measure how far the roller goes and record your reading in column B. 4. Do this for different numbers of turns. 5. Repeat this twice more. Enter your readings in column C and D. 6. Move to cell E4 and enter the formula =AVERAGE (B4:D4). This works out the average of your three results. 7. Copy cell E4. Paste it into cells E5 to E9								
11									
12									
13									
14									