Rollers

Make a roller and investigate how to make it go faster and further.

YOU WILL NEED:

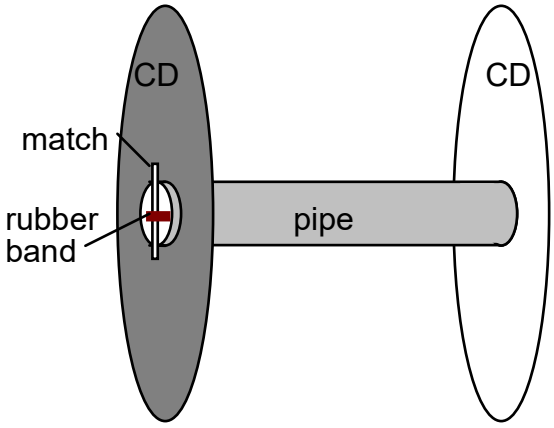
2 × old CDs or cardboard/wooden discs	1 × 9cm long, 15mm diameter pipe
1 × M8 washer	1+ × 10cm elastic bands
1 × Matchstick	Small pieces of sticky tape
1 × thin stick, 20-30cm long	Use of a wire hook

INSTRUCTIONS

1). Decorate/colour the CDs/discs as required.

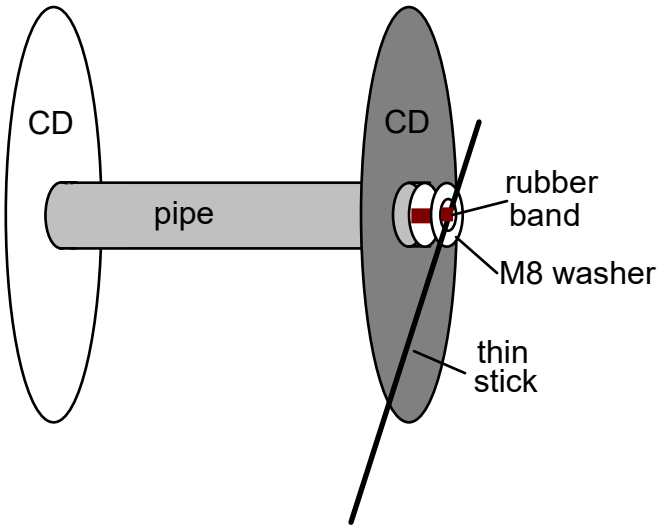
2). Put the pipe with the grooved end into the hole in a CD.
If it is not a tight fit then remove, the CD, put a small piece of sticky tape along the end of the pipe and try the CD again.
Repeat with more small pieces of sticky tape until the CD fits tight.
Put the same amount of sticky tape onto the other end of the pipe and fit the other CD.

3). Put the match stick through one end of the rubber band and thread the other end through the pipe.
The wire hook will help with this.
Adjust the match stick so that it fits in the groove in the pipe.



4). Pass this end of the rubber band through the washer and put the thin stick through the end of the rubber band.

5). Put a smear of candle wax or grease onto the side of the washer next to the kebab stick.



6). Wind up the rubber band in your roller using the thin stick.
Place the roller on the table/floor and see if it moves.
If it does not move, then wind it up more and try again.

INVESTIGATIONS

How can the distance your roller travels be increased?
How can the speed of your roller be increased?

Things you might try:-

Winding your roller up more.
Add another rubber band to your roller.
Use a longer or shorter stick.

Measure the speed of your roller.

Measure a distance on the floor along which to send your roller.
Use a stop watch/mobile phone to time how long it takes your roller to travel along your measured distance
Calculate the speed:-

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

E.g. If the distance is 4 metres and the time taken is 2 seconds, then

$$\text{speed} = \frac{4}{2} = 2\text{m/s}$$