

Suitable for
3-7 years

- ✓ Solo
- ✓ Pairs
- ✓ Groups

Circus activity

Scarf throwing and plate spinning

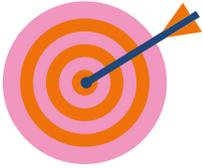
How to guide

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Circus activity

Scarf throwing and plate spinning



Aim

The aim of this activity is to use circus skills to explore the effect of the wind through throwing scarves and how things like wind turbines turn through trying plate spinning.

This guide is split into three parts: first is the plate building guide followed by a guide to the scarf throwing activity and then the plate spinning activity.



Timings

~10 minutes per activity.



Materials and equipment

→ Our instructional videos on You Tube can be found [here](#). You will find there are step by step guides to what the children can do as well as some demos of advanced skills by circus professionals.

→ Scarves

For the plate

→ 2 paper plates (diameter approx. 22cm)

→ One 200ml paper cup OR a strip of thin cardboard (e.g. from a box of biscuits)

→ 1 sharp pencil (for piercing a hole in the plate)

→ Craft glue

→ Sellotape

→ Scissors

For the spinning stick

→ 60cm length of thin wooden dowel (6mm wide);

→ A small handsaw and a bench hook to cut dowel to required length (60cm);

→ A metal pencil sharpener;

Or

→ A 30cm ruler, a sharp pencil and sellotape

PART 1

Plate Building Activity

Before the activity starts, the teacher may wish to prepare a few templates to help the children draw a pencil dot on the centre of their plates. Using a template will help to guarantee the success of the spinning plate.

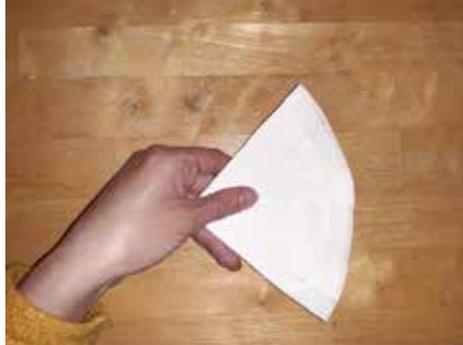




Instructions

Making the template

1. To make the template, fold a paper plate into quarters.



2. Next, snip off a tiny bit of the centre corner to make a small hole in the centre of the plate.
3. Unfold the plate and place it upside down. You should see a small hole in the centre of the plate. This is your template. You can write instructions for the children on the bottom of the plate as required.



If the children are using the template, when they get to Step 2 they should follow the Step 2a instructions.

If they are not using a template, they should follow the Step 2b instructions.

Step 1 – Making the plate

1. Glue one plate on top of the other with the craft glue.



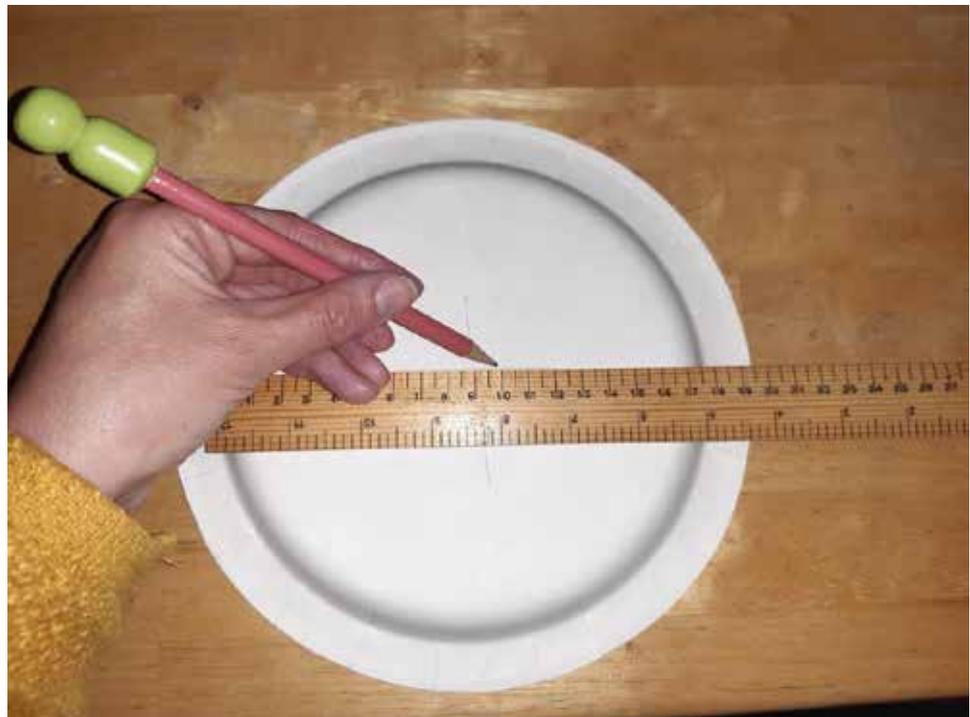
Step 2A – Using the template, finding the centre of the plate

1. Turn the glued plates over.
2. Place the template on top of the glued plates and mark the centre of the plates with a pencil.
3. Go to Step 3.



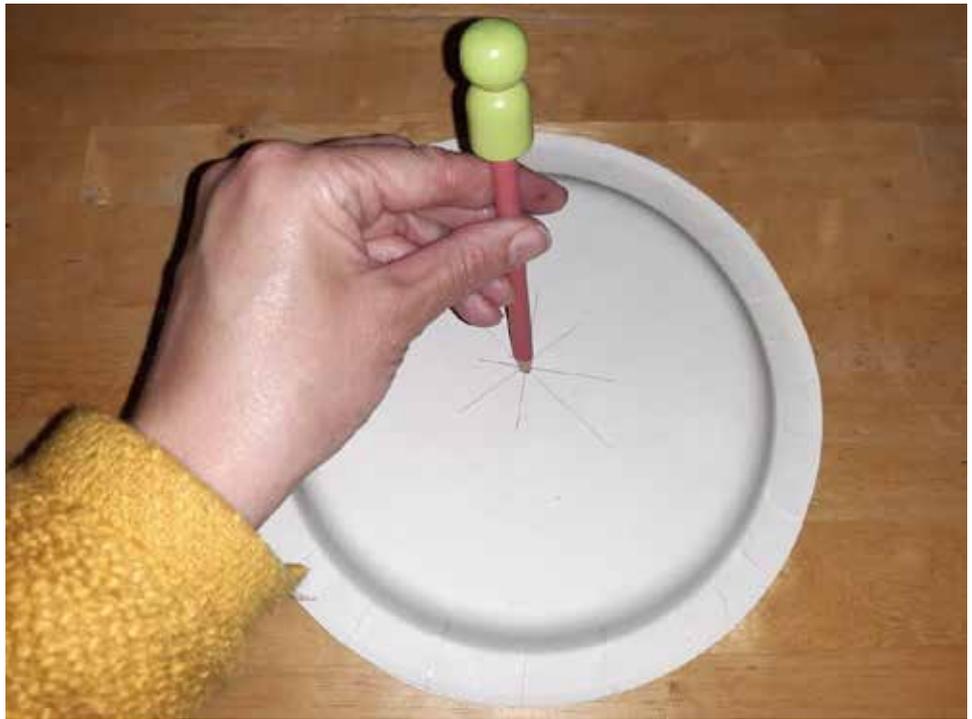
Step 2B – Without using a template, finding the centre of the plate using a ruler

1. Turn the glued plates over. Find the middle of the plate using a ruler.
2. To do this, measure across the plate with the ruler and find the widest point. Draw a line along the middle of the plate with a pencil. Turn the plate a quarter turn and do this again. You can draw several more lines across the middle of the plate to get the best idea of where the middle of the plate is. The middle of the plate is where the pencil lines cross.
3. Take your time to do this, as the closer your hole is to the centre of the plate, the better it will spin.



Step 3 – Piercing the centre of the plate

1. Using the sharp pencil, carefully pierce a hole in the centre of the plate, from the bottom to the top.
2. A sponge placed under the plate can help to prevent damage or injury from the pencil going through the plate. The teacher may wish to supervise this step at a designated workstation.
3. Try spinning your plate on your pencil by pushing the side of the plate round gently. If your plate can spin and it's not too wobbly, you've found the middle of your plate successfully.



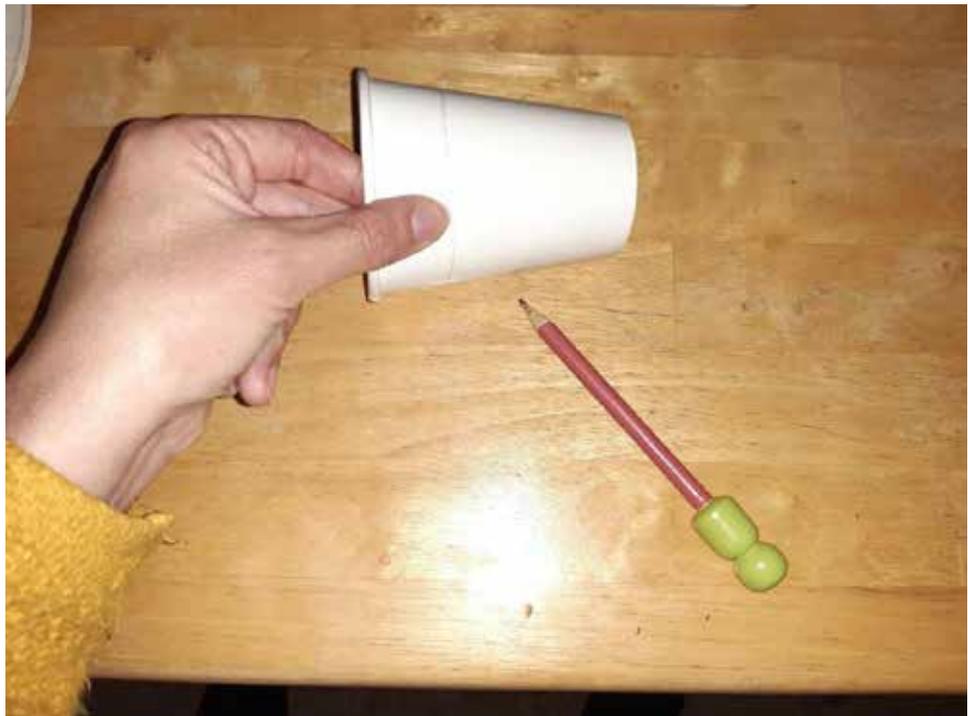
Step 4 – Putting sellotape over the hole

1. Loosely cover the hole on the top of the plate with sellotape so that the sellotape makes a small dome shape over the hole.



Step 5 – Making the rim

1. Get the paper cup. Draw a line around the outside of the paper cup about 2cm down from the rim of the cup. This is about the same distance as the length of the top of your thumb.
2. (If you don't have a paper cup, you can use a strip of thin cardboard about 2cm wide and approx. 30cm long.)
3. Using this line as a guide, cut off the top of the cup so that you have a circle of cup material.

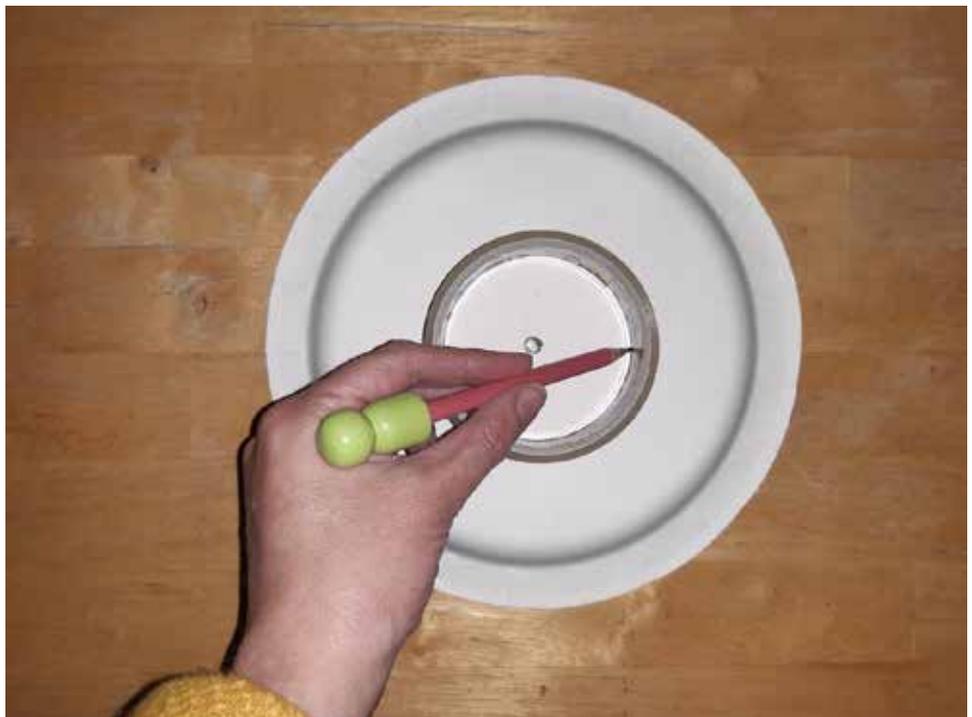


4. Sellotape this circle back together to be one continuous piece again.



Step 6 – Preparing to attach the rim

1. Place a roll of sellotape on the underside of your plate. Try to get it exactly in the middle.
2. Draw around the inside of the sellotape roll with a pencil.



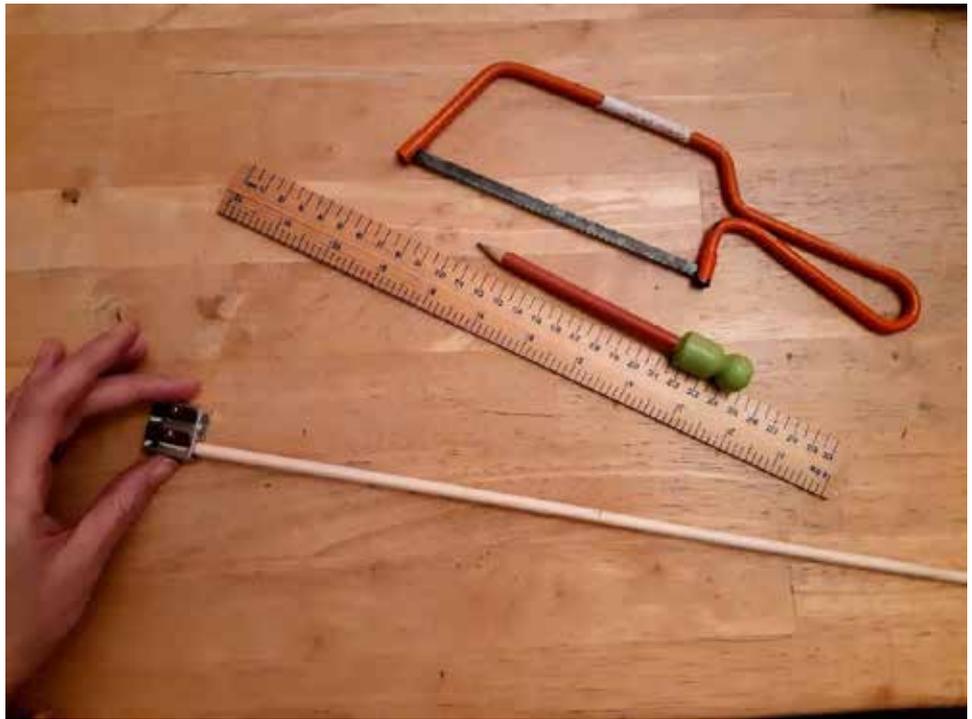
Step 7 – Attaching the rim to the plate

1. Using the circle you have just drawn as a guide, stick the cup rim (or a strip of cardboard) onto the underside of the plate using 4 pieces of sellotape.
2. The sellotape must be flush against the cup and have no gaps underneath it.
3. Your plate is now finished! Now you can make the spinning stick.



Step 8 – Making the spinning stick

1. Measure the dowel to 60cm and mark it with a pencil.
2. Saw the dowel to the correct length using a handsaw and a bench hook.
3. Sharpen the dowel to a dull point using the metal pencil sharpener.
4. If you don't have any dowel, you can make a spinning stick by sellotaping a pencil onto a 30cm ruler.



Step 9 – Let's Practise!

Practise spinning your plate. Push it gently round at first, then push it a bit faster as the plate starts to balance.



PART 2

Scarf Juggling and Spinning Activities



1. Scarf Throw and Catch

Concepts and vocabulary

- **Push**
- **Parabola (a symmetrical curve)**
- **Air resistance**

How to perform 'Scarf Throw and Catch'.

1. Hold the scarf by its top corners so that it is hanging as a flat square.
2. Throw it up and catch it in its middle, keeping your palms down.
3. Then, practise throwing the scarf from one hand to another. Throw it as high as you can to give yourself time to catch it.

Extra challenge / Variations

Can you catch the scarf without using your hands? You could catch it on another part of your body, like the back of your arm, your leg, or even your head!

Questions

- What shape does the scarf follow when you throw it through the air? Does it make a straight line? A curve? The scarf follows a curve through the air. The curve is symmetrical. A symmetrical curve is called a parabola.
- If you performed this trick with balls, do you think it would be easier or harder? Why? The scarves have a larger area. The balls have a smaller area. The air pushes against the scarves more and the balls less. Because the air pushes more on the scarves, the scarves fall more slowly through the air and are easier to catch. Because the air pushes less on the balls, the balls fall more quickly and so are more difficult to catch.



2. Scarf Throw, Clap and Catch

Concepts and vocabulary

- **Push**
- **Parabola a (symmetrical curve)**
- **Air resistance**

How to perform 'Scarf Throw, Clap and Catch'

1. With palms facing down, throw the scarf into the air. Keep watching the scarf while it is in the air.
2. Clap your hands. Catch the scarf in the other hand.

Extra challenge

Set yourself a target. Can you do 3 claps while the scarf is in the air? 5 claps?

Question

- If you performed this trick with balls, do you think it would be easier or harder? Why? The scarves have a larger area. The balls have a smaller area. The air pushes against the scarves more and the balls less. Because the air pushes more on the scarves, the scarves fall more slowly through the air and are easier to catch. Because the air pushes less on the balls, the balls fall more quickly and so are more difficult to catch.



3. Scarf Throw, Spin and Catch

Concepts and vocabulary

- **Push**
- **Parabola a (symmetrical curve)**
- **Air resistance**

How to perform 'Scarf Throw, Spin and Catch'

With palms facing down, throw the scarf high into the air. Turn around and catch the scarf again.

Extra challenge

Set yourself a target. Can you do 2 turns while the scarf is in the air?

Variation:

Can you throw the scarf behind you, perform a half turn and catch it while you are facing towards the back of the room?

Questions

- How can you increase the amount of time the scarf is in the air for? Throw the scarf higher in the air. It will take more time to come down.
- If you performed this trick with balls, do you think it would be easier or harder? Why? The scarves have a larger area. The balls have a smaller area. The air pushes against the scarves more and the balls less. Because the air pushes more on the scarves, the scarves fall more slowly through the air and are easier to catch. Because the air pushes less on the balls, the balls fall more quickly and so are more difficult to catch.



4. Throw, Swap and Catch

Concepts and vocabulary

- Push
- Parabola a (symmetrical curve)
- Air resistance
- Downwards
- Upwards

How to perform 'Throw, Swap and Catch'

1. Hold one scarf in each hand. Swing your hands in circles in front of you, starting by pushing downwards towards the floor.
2. When your hands are at their highest point, let go and watch as the scarves swap places in the air.
3. Grab the scarves out of the air as they fall.

Variation

Try to reverse this move by swinging your hands up the way to start with, instead of down the way.

Does the move still work?

Questions

- How can you increase the amount of time the scarf is in the air for? Throw the scarf higher in the air. It will take more time to come down.
- If you performed this trick with balls, do you think it would be easier or harder? Why? The scarves have a larger area. The balls have a smaller area. The air pushes against the scarves more and the balls less. Because the air pushes more on the scarves, the scarves fall more slowly through the air and are easier to catch. Because the air pushes less on the balls, the balls fall more quickly and so are more difficult to catch.



5. Scarf Two-beat weave

Concepts and vocabulary

- Push
- Air resistance
- Cross over

How to perform 'Scarf Two-beat weave'

1. Hold one scarf in each hand. Swing your hands forwards in circles. The circles should be beside your body, not in front of it.
2. Draw one circle with one hand, then the other, so that your hands are swinging in a 1,2, rhythm, like you are doing the Front-Crawl swimming stroke.
3. Cross one hand over your body to draw a circle on the opposite side of your body, and then bring it back again. The 2nd hand follows the 1st hand.

Note: One hand is always slightly higher than the other one when crossing over.

Extra support

Instead of trying to swing your arms at different times, you can try to swing them at the same time.

So rather than trying to do the Front-Crawl movement with your arms, it's more like you are doing the Butterfly swimming stroke.

Questions

- Is it easy to pull the scarves through the air? Can you feel the air pushing on them? The air pushing on them creates air resistance and slows them down.
- How could you make your scarves easier to pull through the air? Make them smaller, so that they would have less air resistance. You could compare scarves with ribbons and see how they feel different.
- If you had ribbons instead of scarves, would they feel easier to pull through the air? Why? They would feel easier to pull through the air because they have less air resistance.
- Can you think of an example in real life where air resistance is used to slow something down? A parachute.



1. Plate Spinning Methods 1 & 2

Concepts and vocabulary

- **Push**
- **Air resistance**
- **Friction**
- **Stable**
- **Balanced**
- **Unbalanced**

How to perform 'Plate Spinning Methods 1 & 2'

Place your hand on top of the plate like a spider.
Push the plate around with your fingers.

Start with your hand close to your face. Your hand is flat and stiff. Move your hand away from you to push the side of your plate very gently. As the plate increases in speed you will be able to push it more firmly.

The plate spins around an invisible line called an axis. The stick shows where the axis is.

Extra Support

Rather than having your plate balanced on a spinning stick, you can have the plate balanced on an upwards-pointing finger of your other hand.

Variation

Make sure that you practise this trick on both sides. So, make sure that you practise pushing the plate around with both your right and your left hands. This will improve your coordination on both sides of your body.

Questions

- **What makes the plate spin faster?**
The pushing force from your hand.
- **What slows the plate down?**
Friction between the plate and the stick; air resistance.
- **Which is more wobbly, a still plate or a spinning plate?**
The spinning plate is more stable, which can be shown by trying to perform tricks with a still plate vs a spinning plate. The faster an object spins, the more stable it becomes.
- **Do you think the plate would spin if it wasn't a circle? Why / Why not?** If it wasn't a circle, one part of the plate might be heavier than the other. Gravity would pull on the sides of the plate differently, causing it to become unbalanced.
- **Can you think of any other spinning objects in real life?**
They too will spin around an axis. Wheels. Wheels are joined together by an axle which shows the direction of the axis.
- Wind turbines - where is their axis?



2. Plate Isolation

Concepts and vocabulary

- Push
- Air resistance
- Friction
- Stable
- Length

How to perform 'Plate Isolation'

1. Get the plate spinning using Methods 1 and / or 2.
2. While your plate is spinning, move the bottom of the stick from side to side, while trying to keep the top of the stick still.

Variation

Does this trick work if the plate is spinning on your finger, rather than your hand?

Can you try this trick with a longer stick? Does it affect how far you can move the stick?

Questions

- What makes the plate spin faster?
The pushing force from your hand.
- What slows the plate down?
Friction between the plate and the stick; air resistance.
- How far can you move the bottom of the stick away from the top?
- If the stick was longer, would you be able to move it further?
If the stick was longer, you would be able to move it further away from the top of the stick due to the increased length.



3. Plate to finger

Concepts and vocabulary

- **Push**
- **Air resistance**
- **Friction**
- **Stable**

How to perform 'Plate to finger'

Get the plate spinning using Methods 1 and / or 2.

While your plate is spinning, slide your finger up the stick until your finger reaches the top of the stick. Lift the plate off the top of the stick with your finger.

Variation

You could try performing this trick with different fingers having the job of sliding up the stick to test your coordination.

Questions

- **What makes the plate spin faster?**
The pushing force from your hand.
- **What slows the plate down?**
Friction between the plate and the stick; air resistance.



4. Passing plate behind back

Concepts and vocabulary

- **Push**
- **Air resistance**
- **Friction**
- **Stable**

How to perform 'Passing plate behind back'

1. Get the plate spinning using Methods 1 and / or 2.

2. While your plate is spinning, turn one hand upside down to hold the stick in one hand with a thumbs-down grip.
3. With this hand, pass the plate behind your back. Again, using a thumbs-down grip, reach around with your other hand to grasp it.

Variation

Can you hold a spinning plate on your fingertip, and then pass it under your armpit on that same side?

Questions

- What makes the plate spin faster?
The pushing force from your hand.
- What slows the plate down?
Friction between the plate and the stick; air resistance.
- If the plate falls, what causes it to fall?



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5. Plate Spinning Method 3

Concepts and vocabulary

- Push
- Air resistance
- Friction
- Stable
- Horizontal
- Lever

How to perform 'Plate Spinning Method 3'

1. Hang the plate on its rim on the top of the stick.
2. Start twirling the plate round the stick, slowly at first. This will feel like you are drawing a circle in the air.
3. Gradually get faster and faster until the movement is coming from your elbow and the plate is spinning flat (horizontally).

4. Stop spinning and the plate will pop into place.

Extra Support

This move can be challenging to learn and can take 20 minutes or more of practice time to get the hang of.

Please do not worry if you need to practise it a lot before it works!

Questions

- What makes the plate spin faster?
The pushing force from your hand.
- What slows the plate down?
- (Friction between the plate and the stick; air resistance.)
- Which is more wobbly, a still plate or a spinning plate?
The spinning plate is more stable, which can be shown by trying to perform tricks with a still plate vs a spinning plate. The faster an object spins on its axis, the more stable it becomes.
- If you can, try spinning the plate with a few different lengths of stick (sharpened lengths of 6mm width dowel can be used).
- For example, how does a 50cm dowel feel compared to a 1-metre long one? A longer dowel will need less movement from the arm to spin the plate more, due to its increased length. This is a concept from levers.