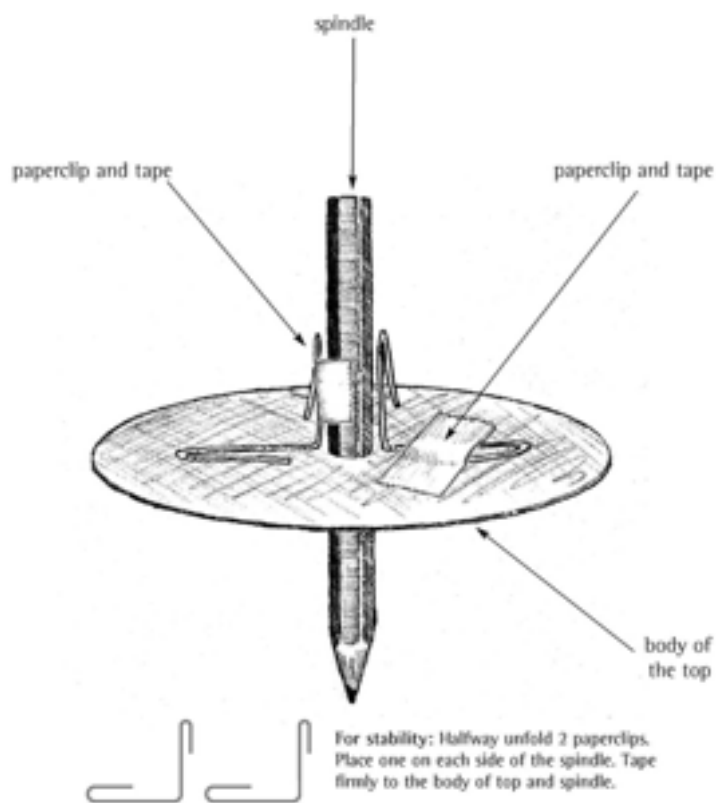


Challenge: Spinning top



Autor: José Viñas
21 de septiembre de 2015
Curso: 1º ESO
Nº de práctica. 2
Aula 2020

GUIDE FOR STUDENTS

Group A instructions

1. Using a compass and posterboard, draw a 10-cm circle. Cut it out.
2. Insert a small scoring pencil through the center of the circle so that the pointed end extends about $\frac{3}{4}$ cm through the circle.
3. Push a twisted rubber band up tight against each side of the circle to stabilize the pencil so it is perpendicular to the circle.
4. Practice spinning the top a few times to make sure the pencil stays firmly attached and perpendicular to the circle.
5. Using masking tape, attach four evenly spaced cents on the top surface of the top with each penny touching the pencil.
6. Take a few practice spins, and then time three spins. Record the times.

(Note: A spin is considered ended when the top stops moving.)

cents in: Spin 1 Spin 2 Spin 3

7. Now, move the four cents to the outside edge of the top surface and attach them evenly. Retest your top.

cents out: Spin 1 Spin 2 Spin 3

A. What were your best times:

cents in cents out

B. What did you notice?

C. Based on your results, if you move the weight farther out from the axis of a top, do you expect it to spin:

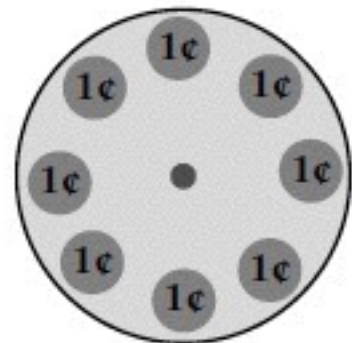
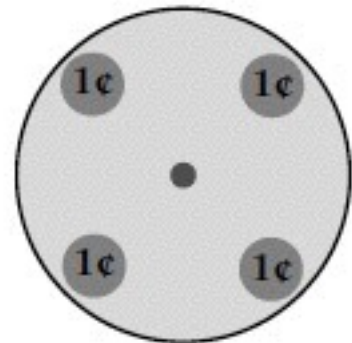
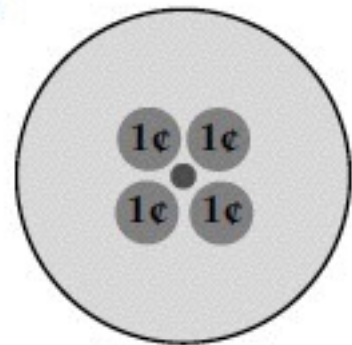
shorter longer the same

8. **(If you finish early)** Now add four more evenly spaced cents. Retest your top.

8 cents out: Spin 1 Spin 2 Spin 3

How does this affect our times? _____

12



Group B instructions

Challenge

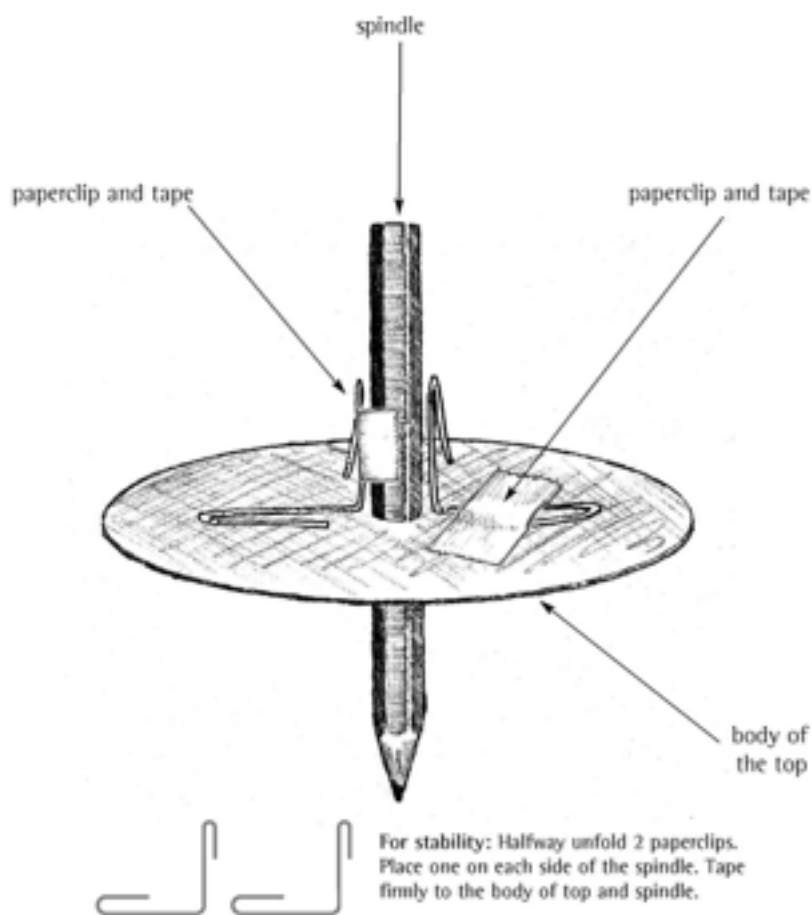
Make a top with the spindle extending (4 cm) below the body of the top that can spin for 10 seconds. Work with a partner. Keep track of what factors help your top spin longer.

Super challenge

Make a top with the spindle extending (8 cm) below the body of the top that can spin for 10 seconds.

Beyond the super challenge

Make a top with the spindle extending (8 cm) below the body of the top that can spin as long as possible.



Report-Resume

The Challenge

What data will you collect?

How will you collect your data?

How will you analyze your data?

Talk about the changes in your design according with your results

