

**HEIDI HOOPS**

**FORCE YOUR HOOP TO STAY UP**

**FUN FACTS:**

* The current world record is 200 hula hoops at once by Marawa The Amazing.
* Hula Hoops were around in Egypt 5000 years ago.
* The hula hoop fad started in the 50’s in America, was inspired by the cane hoops Australian kids used, and named after the Hawaiian Hula dance.
* Hula hoops stay on the waist because of a clever manipulation of forces. Push (forward), centipedal force, friction/air resistance (backwards), weight/gravity (down), acceleration (up).

You will need:

A hula hoop (that stands as high as your hip)

Lots of energy and determination.

1. Make your body stiff and straight (vertical) with feet wide.
2. Position the hula hoop horizontally around your waist so it is touching your back.
3. Use your hand to push (force) it across your body so it is parallel to the ground.
4. If it is perfectly horizontal it will travel fast and have the best momentum and centrifugal force.
5. Friction from clothes, air resistance, and the pull of gravity, will oppose the momentum of the hoop and slow it down. You will need to counteract these forces to keep it up by moving.
6. Use a fast backward and forward movement in the middle of your body (oscillation).
7. Your hips will rock forward and back for every single rotation. Good timing is essential. Don’t miss a beat.
8. Remember to breath so your muscles can maintain energy.

Advanced tricks: To make the hoop travel on different parts of your body, you need to rock (oscillate) that part of your body. If you want to hoop to go down just slow down. If you want the hoop to go up just speed it up (accelerate).

Super advanced tricks: Try vertical body hooping, then try 2, then 3, then 4! Keep going and soon you might break the world record!

**What is Velocity?**

In physics scientists use the term velocity rather than speed. It is a vector quality. It has both speed and direction. Acceleration is getting faster, but it is also a change in direction. Acceleration is a really important factor in keeping a hoop up. You could theorise that a hoop stays up and resists the force of gravity because of velocity, but how could you prove it?

**Experiment with weight**

Weight is a measure of the force of gravity.

Experiment with different size and weight hoops. Which is easier? Ca you explain why?

Is it easier to hula hoop with 2 same size hoops of just one? Try it then try to explain why.

Further internet research:

Why It's Almost Impossible to Spin 300 Hula Hoops At Once

<https://www.youtube.com/watch?v=0lvwIW6Fvec>

Swivelling Science Applying Physics to HulaHooping

<https://www.scientificamerican.com/article/bring-science-home-hula-hoop-physics/>