

Suitable for  
3-7 years

- ✓ Solo
- ✓ Pairs
- ✓ Groups

Circus activity

# Hula hooping

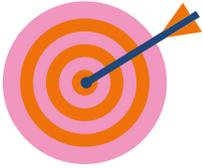
How to guide

Created and written by Think Circus in collaboration  
with Mechanical Engineer, Jinglang Feng and Aerospace  
Engineer, Adah Tole



# Circus activity

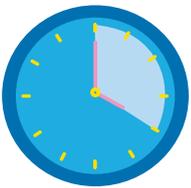
## Hula hooping



---

### Aim

The aim of this activity is to use circus skills to explore how satellites stay in orbit through practising trying to get a hula hoop to stay in motion.



---

### Timings

~15 minutes.



---

### Materials and equipment

- Our instructional videos on YouTube can be found [here](#). There you will find step by step guides to what the children can do as well as some demos of advanced skills by circus professionals.
- Hula hoops



---

## Instructions

Work through the below step by step guide building up hula hooping skills

.....

### 1. Hula hooping on waist

#### Concepts & vocabulary

- **Force**
- **Movement Energy**
- **Momentum**
- **Pushing force**
- **Horizontal plane**
- **Friction**

#### How to perform hula hooping on waist

1. First see if you can get the hula hoop to spin on your waist six times without you moving your waist/hips. Push the hula hoop across your midriff instead of twisting the hoop, and throw it faster than you think. Keep the hoop horizontal - if it's on an angle, it will go up or down your body very quickly!
2. Then pretend you are on an imaginary surfboard, with one leg in front. You are going to use a push from your knees to go forwards and backwards, and keep your hips in the same place the whole time. Your hips don't need to go in circles for you to hula hoop - this is an unhelpful myth! You can also do the backwards/forwards movement as side to side, by turning 90 degrees - this is essentially the same movement as you are using your knees to power it.
3. Then add the hoop spin and the surf-board movement together! Throw the hoop towards the leg that is in front (i.e. right leg in front, clockwise circle), then immediately start moving forwards and backwards. Top tip - don't forget to breathe in/out of your belly when you do this! It's easy to forget to breathe properly and get light-headed. If you can keep your hoop going for more than six spins, you can officially hula hoop.

## Variations

### Hula hooping with a friend - two people in one hoop!

1. Try standing one person in front of the other, standing very close to each other. Try to hula hoop with one hoop spinning around the both of you.
2. Before you start, predict what will happen. Do you think it will work better than with one person?

## Questions

- What happens when you push the hoop across the body with more energy? It will spin faster and for longer as it has more movement energy.
- What happens when you push the hoop across your body with less energy? It will spin slower and for less time as it has less movement energy.
- Can you feel the hula hoop pushing on your body? Where do you feel it? The hoop is pushing against you anywhere that it touches you. You are also pushing against the hoop to make it spin.
- What happens when you stop pushing the hoop with your body and just stand still? Why? The hoop will lose movement energy and slow down because of the friction against your body, air resistance and gravity pulling it to the ground.
- Can you think of anything else in the world that orbits (spins around) something else? What forces keeps those objects spinning? All the planets in our Solar System orbit the sun. They have movement energy from when the Universe was formed. There is no air resistance in Space to slow them down. Gravity from the sun pulls on them to keep them in orbit.
- Can you try hooping with a smaller hoop? A bigger hoop? Does it feel different? Why? A smaller hoop has a shorter distance to travel so you will need to push against it more often, so it will spin faster. A larger hoop has a longer distance to travel so you will need to push against the hoop less often, so it will spin slower.

.....

## 2. Spinning with the hoop

### Concepts & vocabulary

- Force
- Movement energy
- Momentum
- Pushing force
- Horizontal plane

### How to perform spinning with the hoop

1. Throw the hoop and yourself in the same direction, using any footwork you like to turn yourself around. You'll find that the hoop seems to be going slower, because relative to you, it is! The hoop is now turning around you less times than when you stand still which gives you more time to react.
2. See if you can throw the hoop and turn at the same speed - the hoop will seem to stick to your body in the same place. The hoop is powered by the amount of energy we transfer from our bodies through the throw, so we can change how fast it goes by using more/less energy.

### Variations

**Try turning in the opposite direction to the way the hoop is spinning. You will have to work harder to keep the hoop level.**

- Why do you think this is?
- You'll find that the hoop seems to be going faster, because relative to you, it is! The hoop is now turning around you more times than when you stand still which gives you less time to react.

### Questions

- Can you feel the hula hoop pushing against your body? *Where do you feel it?* The hoop is pushing against you anywhere that it touches you. You are also pushing against the hoop to make it spin.

.....

## 3. Hula hooping on your hands

### How to perform Hula Hooping on your hands

1. The motion for getting a hula hoop going on your hands/ arms is in three parts: swing your hoop from side to side so it makes a smile shape, then when it's got a little momentum, do one big circle with your arm. Then stop in one place and bounce your hand up and doing as if you are shaking someone's hand. The hoop should keep spinning.
2. Try moving the hoop up and down your arm, by having your hand either below shoulder height (hoop goes towards hand), at shoulder height (hoop stays in the same place), or above shoulder height (hoop goes towards shoulder). Be patient and keep doing short regular bounces with your arm, as the hoop will take a little time to respond to the change in angle.
3. Swap hands by slowly putting your second hand next to the one already in the hoop. You can take your time, sliding your arm next to the one that's in the hoop. Then bounce with both hands together until you are ready to take out the original hand. You have now swapped hands! See if you can swap back to the other hand.

### Variations

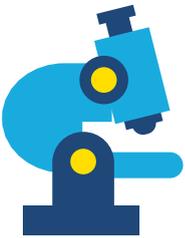
#### Hula Hooping with a Friend

1. Hula Hooping Handshake - put the hoop onto your wrist, then hold hands with a friend. You are going to swing your connected arms around in a big circle, like a skipping rope. If you go slowly in a big circle, you should be able to get the hoop spinning. You can then keep doing big circles, or start doing a handshake up and down - the hoop will then spin on your arms and you can pass it from one person's arm to the other, by playing with whose hand/arm is higher up.

### Questions

- Can you feel the hula hoop pushing against your body? *Where do you feel it?* The hoop is pushing against you anywhere that it touches you. You are also pushing against the hoop to make it spin.

- What force pulls the hula hoop up your arm?
- What force pulls the hula hoop down your arm?  
When you raise your arm, gravity pulls the hoop down towards your shoulder. When you lower your arm, gravity pulls the hoop down towards the ground.
- Can you try hooping with a smaller hoop? A bigger hoop? Does it feel different? Why? A smaller hoop has a shorter distance to travel so you will need to push against it more often, so it will spin faster. A larger hoop has a longer distance to travel so you will need to push against the hoop less often, so it will spin slower.



---

## How does it work?

For a satellite to stay in orbit the orbit is achieved when the speed of the satellite balances the pull of gravity. This is the same for hula hooping



---

## Extension ideas

This circus activity links with our activities developed by Adah and Jinglang who both work on satellite orbit design. Jinglang has an another activity related to satellites and removal of space debris whereas Adah has created an activity based on rocket design (which are used to launch satellites).

Also if you enjoyed learning through circus skills try our other activities like Structures and Balances, Juggling and Computer Vision or Hula hooping with Rocket Launching or Satellite Orbits