

Activity: Keep satellites in orbit



TIME NEEDED **45** minutes

This activity can be done to introduce the topic of satellites for requirements 2, 3 or 5

Instructions

1. Ask your Scouts to stretch a piece of cloth, plastic, or rubber sheet over a circular frame like a hula hoop or embroidery hoop and secure the material to the frame using bulldog clips
2. Put a weight in the centre of the sheet-covered hoop so that it weighs down into the centre.
3. Now if you roll the marbles onto the sheet, they should move in circles and ellipses as though they are in orbit around the central weight.



You will need:

- Hula hoop or embroidery hoop
- Rubber or plastic sheet
- Large bulldog clips
- Weights to place at centre of 'gravity well'
- Marbles to orbit the gravity well

HOW DOES IT WORK

When two objects are in close proximity to each other, an attractive force acts to pull them towards each other. This force is gravity.

The weight in the middle of the sheet is Earth, the marble is a satellite (e.g. the International Space Station) orbiting the Earth. Newton's first law of motion is that an object will stay in motion unless something pushes or pulls on it. Without gravity, an Earth-orbiting satellite would travel in a straight line. Gravity pulls it back towards Earth. The speed and course of the satellite is adjusted so it continues to orbit the Earth, without falling back to Earth. Try changing the size and weight of the object in the middle ('Earth') and adjust the speed of the marbles around it ('the satellite') to see what happens.

