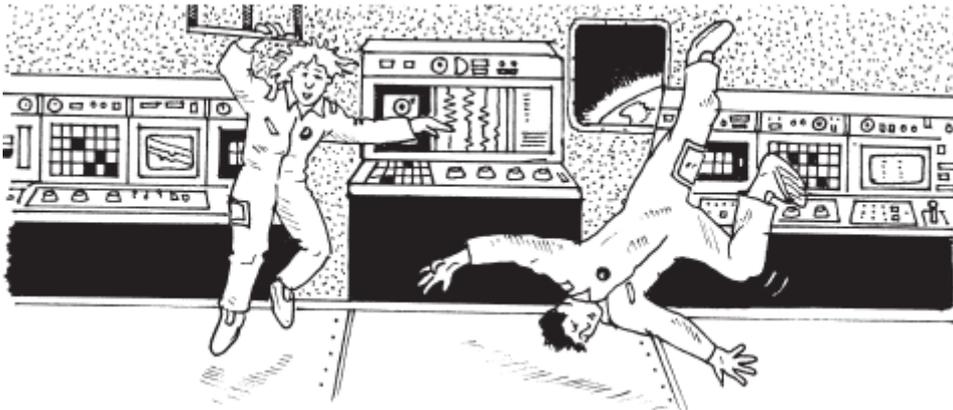


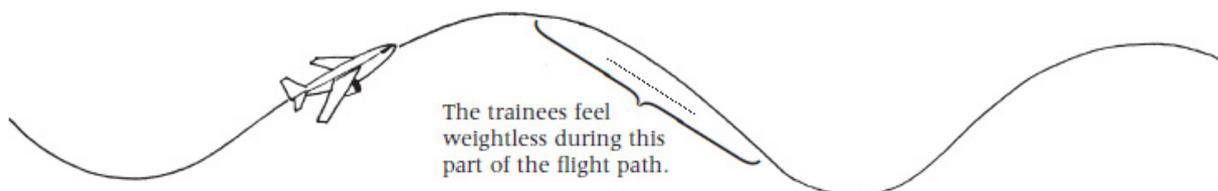
# The Vomit Comet - literacy task



You have probably seen pictures of astronauts floating around in the Space Shuttle. When astronauts are floating around like this, people often refer to them as being 'weightless', or being in 'zero gravity', but this is not correct.

At the altitude that the Space Shuttle orbits, gravity is pulling on every kilogram of mass with over 9N of force. Gravity is still pulling on the astronauts, so they still have weight. So why do they feel weightless?

When you are standing on the ground, gravity is trying to pull you downwards. You can't go down, because the ground is in the way. If you went into orbit around the Earth, your spacecraft would be 'falling' around the Earth, and you would be falling with it. The spacecraft is not pushing up on your feet, so you feel as if you do not have any weight. It is a bit like the feeling you get in a lift when it suddenly starts going down. American astronauts used to be trained to cope with this weightless feeling in an aeroplane. The aeroplane would fly up and down, and during parts of the flight the trainee astronauts would feel weightless.



When the aircraft is pushing over the top of each curve, it is falling at the same speed as the people in it. They feel weightless.

## Questions

- ① Why do people refer to astronauts being in 'zero gravity'?
- ② An astronaut has a mass of 70 kg.
  - a) What would her weight be on Earth?
  - b) What would be the force of gravity on her when she is in orbit?
- ③ Why do astronauts feel weightless when they are in orbit?
- ④ How are astronauts trained to cope with the feeling of weightlessness?
- ⑤ Find out:
  - a) why the training aircraft was called the 'Vomit Comet'
  - b) how 'zero gravity' affects the way astronauts live in space. What special arrangements have to be made for sleeping, eating and drinking, and going to the toilet?