

CURVED SPACE

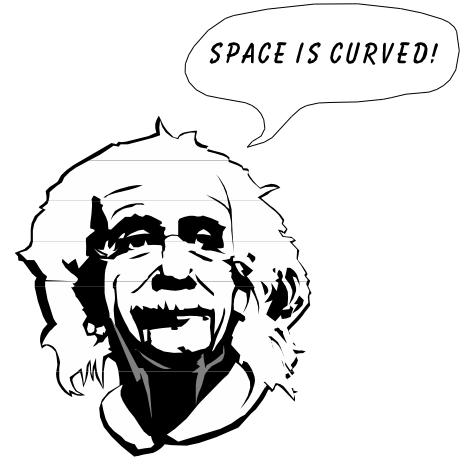
- a mind-bending lesson -

Why do planets such as our Earth orbit around the sun? The famous astronomer Galileo said that objects prefer to move in a straight line. So why don't the planets move in a straight line and leave the sun behind, never to return?

Here's a weird idea

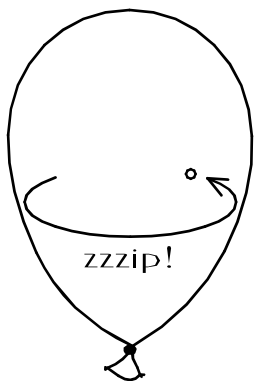
Albert Einstein said the planets are trying to move in a straight line. It's just that the space they're traveling in is curved.

Imagine that you try to walk in a straight line. You could walk and walk until you came to a mountain or body of water. So let's imagine that you can magically walk on water and through mountains. Now there's nothing to stop you from walking in a straight line. You walk and walk, and after several years you are surprised to find that you ended up where you started. Can you think why?



Your space is curved!

The Earth is round, so when you tried to walk in a straight line you ended up going around the Earth.

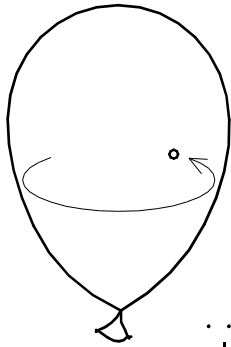


WHAT YOU NEED: A BB and a large balloon

WHAT TO DO: Drop the BB into the balloon. Blow up the balloon. Be careful to point the balloon **DOWN** so there is no chance of swallowing the BB. Tie off the balloon. Please keep it away from any young children.

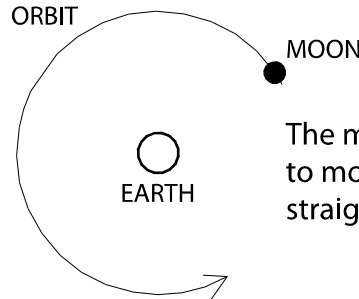
If you give the balloon a shake, you can make the BB zing around the inside of the balloon, resisting gravity's efforts to pull it to the bottom. (It makes a neat sound, too!)

BALLOONS AND CURVED SPACE



The BB tries to move in a straight line . . .

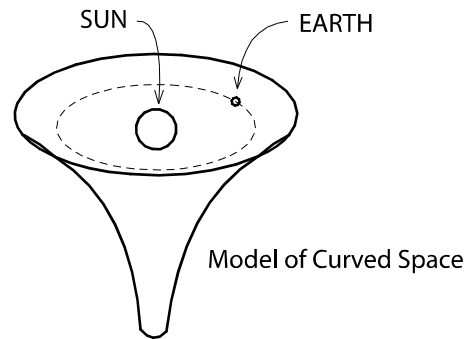
. . . and ends up moving along the curve of the balloon.



The moon tries to move in a straight line . . .

. . . and ends up moving along the curves of space.

As long as the BB is moving, it can resist falling to the bottom of the balloon. If you can explain why, you can understand why the moon doesn't fall to Earth. You can understand why planets don't fall into the Sun. You can unlock the mysteries of how the solar system works. . . and the universe beyond. . .



Model of Curved Space

