

# Einstein's curved space

Middle school

**Opening statement:** In our Universe, the geometry of space is curved. Straight lines made in space by photons of light, or metal, or wood do not obey the rules of geometry that we have on Earth. In this activity, you will be using exhibits that:

- Illustrate the elastic nature of space
- Show how matter tells space to curve
- Show light being distorted by the curvature of space
- Show how space tells matter how to move

**Focus questions:**

*What do we mean by space is curved? What are the implications? How does this alter your perception of the universe? What is a black hole and how does it affect the universe around it?*

**Exhibits:**

Rubber black hole, black lycra sheet, spherical whiteboard (exhibit 10), gravitational lens (18), posters, Einstein's space (22), Newton's space (24), Einstein's equation of gravity and space (19)

**Outline of activity:**

**Newton's and Einstein's space (exhibits 22 and 24)**

Compare the exhibits of Newton's and Einstein's space.

*What is the difference between Newton's and Einstein's theories? What can you say about curved space at this stage?*

**Black lycra sheet**

Observe the interaction between bodies using the black lycra sheet

**Spherical whiteboard**

Draw triangles and circles on the spherical whiteboard

Test the geometric formulas that you have been taught in school for angles in a triangle, pythagoras'theorem, area of circle and perimeter of circle

Watch the short movie about curved space and view the poster.

