The Ogden Trust

making physics matter

Age 7-11 years

Scientific ideas over time

Significant events in the history of the universe

Till roll timeline

Introduction

Creating a till roll timeline of the history of the universe can be a useful activity for discussing time and the bigger picture of our ideas about the universe. The activity links very well with KS2 learning about Earth & space and evolution. Although cosmology is not on the National Curriculum for KS2, it is a topic that pupils are often inquisitive about – this timeline can support discussions and capture the curiosity. Working in groups, students can begin to get an idea of the cosmic scale of the universe starting at the Big Bang and moving on to the earliest origins of our solar system and the beginnings of life on Earth. This activity can help students to develop their 'working scientifically' skills and can be used as a hook to link science to other subject areas such as history and English. This resource has been developed from the Introduction to Cosmology given as part of the CERN 'Playing with Protons' primary CPD programme.

Materials per pair

- Till roll
- Scissors
- Tape measure/metre stick
- Pencil
- Ruler
- List of significant events in the history of the universe

Instructions

1. Teams work collaboratively to carefully measure out a 13.8 metre length of till roll. This represents a timeline of the history of the universe and each mm is 1 million years.

2. Ask the pupils to mark one end of the till roll (left) 'THE START OF TIME'. This represents the Big Bang which took place 13.8 billion year ago. Mark the other end of the till roll (on the right) 'NOW!'

3. Give the teams the list of key events and ask them to decide where they think they should fit in on the timeline – the children can mark their predictions on the till roll lightly in pencil.

Eight key events in the history of the universe

- First human civilisation
- The first humans
- The first dinosaurs to walk the planet
- The last dinosaurs to walk the planet before mass extinction
- The first stars are formed
- The first galaxies are formed
- The first life on Earth
- Formation of planet Earth

4. Groups share their ideas with the class – looking for similarities and differences between when they think events took place. It would be interesting to discuss what sort of evidence they think humans have found that allow them to say when these things happened (this will generate a lot of questions).

5. Share the positions that the event should be placed with the class – the children can then finish creating their own timeline of the history of the universe, adding pictures and colours to their creation.

6. This is a great resource to take out on the playground on a dry day with no wind – perhaps when it is complete the children could explain what they have created to a younger class of children in the school to share the awe and wonder.

The solution

Event	Position on timeline	Time
• First stars formed	10cm from the left end	13.7 billion years ago
• First galaxies formed	20cm from the left end	13.6 billion years ago
• Formation of planet Earth	4.6m from the right end	4.6 billion years ago
• First life on Earth	4m from the right end	4 billion years ago
• The first dinosaurs walk on planet Earth	24cm from the right end	240 million years ago
• The last dinosaurs walk on planet Earth	6.5cm from the right end	65.5 million years ago
• The first human	0.2mm from the right hand end	200 thousand years ago
• The first human civilisation on Earth	0.0122mm from the right hand end	12,200 years ago

Other useful links

- **The Big History Project**

https://school.bighistoryproject.com/bhplive

Designed for middle and high school pupils – has some great resources, particularly the interactive timeline of the universe PDF.

- **TED Talk animation – introduction to cosmology and the Big Bang**

https://vimeo.com/71852454

Short and not too complicated and a fantastic introduction to cosmology and the work of particle physicists.

- **Cosmic Times newspaper, posters and resources**

https://cosmictimes.gsfc.nasa.gov/online_edition/1919Cosmic/index.html

A fantastic resource from NASA that has posters from different times in history that help understand how ideas have formed over time. Great for research focused enquiry.