



## The Cosmos Lesson Plan

**Time:** 40 minutes

**Goals:** To gain an understanding of the content and structure of the cosmos and the distances to the outer most reaches of space and time.

**Objectives:** Students will:

- Watch the “Cosmos” segment of the “How far away is it” video book
- Take a short quiz

**Materials:**

- Internet connection with a computer for viewing [“The Cosmos” segment on YouTube](#)

**Directions:**

- Introduce the ‘Cosmos’ segment as the final step in our journey from our back yards to the edge of the known Universe. We’ll pass through the fabric of the cosmos and introduce Dark Energy. We’ll end with Edwin Hubble’s own words on the subject.
- Show the video.
- Review what they saw:
  - The largest galaxy ever seen.
  - The evidence for Dark Matter.
  - A simulated trip through the cosmos.
  - The evidence for Dark Energy and the Big Bang.
  - The next generation space telescope.

**Assessment:**

Take a simple quiz. Print and distribute the quiz on page 2. Here are the answers:

- When galaxies clusters collide, does the dark matter pass through undisturbed except for the effects of gravity?  
**Answer:** Yes. (Dark matter doesn’t interact with regular matter or with other dark matter.)
- How far back in time does Hubble’s Ultra Deep Field view of the Universe take us?  
**Answer:** b) Around 13 billion years.
- Are there more stars in the Univers than there are grains of sand on all the beaches of Earth?  
**Answer:** Yes.



## Colliding Galaxies quiz

- When galaxies clusters collide, does the dark matter pass through undisturbed except for the effects of gravity?
- Approximately how far back in time does Hubble's Ultra Deep Field view of the Universe take us?
  - a) 3 billion years
  - b) 13 billion years
  - c) 130 billion years
  - d) 1.3 trillion years
- Are there more stars in the Univers than there are grains of sand on all the beaches of Earth?

