Time machines

SCRIPT:

Imagine that you could look through a magic telescope, and see the Earth with dinosaurs, the Earth as it was millions of years ago.

Well, now imagine that it's possible – if the telescope was powerful enough, and you had a place to stand that was far enough from the Earth. That's because it takes so long for light to travel across outer space.

For instance, light from the closest star takes four years to get here. So if something were to happen – let's say the closest star turned into a pumpkin – we wouldn't know about it for four years…because the light from that pumpkin would take four years to get here. And then one night four years later, we'd see what happened four years ago.

Now imagine other stars and galaxies are much farther away. We see them as they looked millions of years ago. In fact, we're looking so far back in time, some of these stars and galaxies may no longer exist. They might have burned out a long time ago.

And it works both ways. If anybody out there is looking back at us, they're not looking at the Earth as it is, but the Earth as it was…perhaps in the time of dinosaurs…or even before the time of dinosaurs. Because – strange as it seems – you cannot look across the far reaches of space without looking backward in time.

Relevant NSES Standards

NSES Content Standard A: Understanding about scientific inquiry.
- (Grades K-4) Using tools to extend our senses.
- (Grades 5-8) Types of investigations; observing and describing objects.
- (Grades 9-12) Scientists rely on technology to gather information.

NSES Content Standard B: Physical science.
- (Grades K-4) The positions of objects are described in relation to other objects.
- (Grades 9-12) Electromagnetic waves (as data).

NSES Content Standard D: Earth and space science.
- (Grades K-4) Objects in the sky. Stars.
- (Grades 9-12) Origin and evolution of the universe (observing early universe).

NSES Content Standard E: Understanding about science and technology.
- (Grades K-8) Using technology to extend our senses.
- (Grades 9-12) Using technology to extend our level of understanding.

NSES Content Standard F: Science in social perspectives.
- (Grades 5-8) Science influences how we see the world (age of universe).

NSES Content Standard G: History and nature of science.
- (Grades 9-12) Major developments in science have major impacts (age of universe).

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