



What do the past and present of the universe look like?

01 Complete the graphic organizer about the Big Bang Theory. Then, compare your notes with a classmate.

What I know

What I think I know

What I want to know

02 Read “Ignite a Spark” and update your organizer.

03 Read the text again and complete the sentences about the astronomers.

1. Georges Lemaître _____

2. Vesto Slipher _____

3. Edwin Hubble _____

4. A group of three astronomers _____

Ignite a Spark

No light, no sound, only nothingness, when suddenly there was a **spark**, and everything started. Welcome to the City Planetarium’s History of the Universe—the **Big Bang** and Beyond.

In millions of times less than a second, that spark ignited, rapidly growing in brilliance and **accelerating** in speed. The temperature soared, and from that moment, colors exploded into existence, and space started its **expansion** in all directions.

In addition, there were atoms for the first time, and, to be clear, time began. This is our best theory on what happened at the birth, so to speak, of the universe.

Scientists have created more advanced technology to test and retested the theory, and these analyses support it. Before that astronomers made discoveries; such as Georges Lemaître, who first **conceived** of the Big Bang theory; Vesto Slipher and others who first proposed the concept of an ever-expanding universe; and Edwin Hubble, who proved galaxies farthest away were moving faster than the closer ones, hence, if things were moving away from each other, they must have been close together in the past. More recently, in 1998, three astronomers won the Nobel Prize in physics for discovering that this expansion is accelerating.

So, what happened next? The conditions were perfect for tiny particles to mix to allow for the **development** of stars, galaxies, black holes, and all the other elements we know of. Billions of years later, a tiny planet off to the side in a galaxy far, far away became hospitable for carbon-based life, and a group of people sat in a room contemplating how it all started. I get chills!

And now? Here we sit in an ever-expanding universe that started with a bang 13.8 billion years ago.

04 Draw a picture of the Big Bang and the expanding universe. Then, take turns showing and describing your drawings with a classmate.



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05 Choose the correct homophone of the words in the word bank to complete the sentences.

herd
peaked

no
threw

its
there

1. Astronomers _____ through powerful telescopes to see that galaxies were moving away from each other.
2. The Big Bang marked the birth of the universe; its echo can still be _____ in cosmic background radiation.
3. The rate of expansion affects the universe's future, but we still don't _____ all the answers.
4. Some galaxies are so far away that _____ light takes billions of years to reach us.
5. The theory predicts that space will continue to expand until _____ too cold to support life.
6. The stars we see today formed from matter that spread _____ the universe over billions of years.

07 Imagine you are to interview the winners of the Nobel Prize in 2011 for discovering that the universe's expansion is accelerating. Write three questions you'd like to ask them about their research.

06 Write the meanings of the homophones in Exercise 5.

1. peaked - _____
peeked - _____
2. herd - _____
heard - _____
3. know - _____
no - _____
4. their - _____
there - _____
they're - _____
5. it's - _____
its - _____
6. through - _____
threw - _____

08 Imagine you are one of the astronomers who won the Nobel Prize in 2011. Write the answers to the questions of the interview. Use three homophones.