

The nature of dark matter

By NASA.gov, adapted by Newsela staff on 12.02.16

Word Count **446**



TOP: The Bullet Cluster of galaxies. Photo: NASA.

The universe is made up of all of outer space and everything in it. Every planet and star is part of the universe. So is Earth. In general, scientists learn about the universe by studying light. Planets and stars give off light. Some light people can see with their eyes. Other light, like infrared light and radio waves, is invisible. Scientists need special tools to see this invisible light.

But what if there is material in the universe that gives off no light? How will scientists ever know it is there? How will they tell what it is?

Too Dark For Scientists To See

Such material is called "dark matter." Scientists now think most of the material in the universe is made of this stuff. Dark matter is a special kind of material. It does not give off enough light for scientists to see it. However, there are still some ways for them to find it. One way has to do with gravity. This is a mysterious force that shapes the universe. It keeps the planets and moons in their orbits. On Earth, gravity makes apples fall from trees. It keeps humans stuck to the ground.

Dark matter has its own gravity. It shapes the light that scientists can see. Scientists can study the effects of this "extra" gravity. It helps them make smart guesses about how much dark matter there is.

The picture at right shows one way this is done. It is a picture of a large group of stars. The red areas show X-ray light. The blue is regular light that people can see with their eyes. The picture helps scientists learn how much gravity and matter are in one place. Surprisingly, scientists cannot find enough matter in the picture to explain the amount of gravity. There is some "missing" matter. What could this "missing" matter be?

What Is Dark Matter Made Of?

The kind of matter people see every day is regular matter. It is made of tiny particles called atoms. These are the building blocks of matter. Is the dark matter in the universe also made of regular matter? Or is it something strange ... some kind of new matter never seen before?

So far, it looks like there are two different types of dark matter. One type is made of regular matter. The other type of dark matter is different. It is made of something other than regular matter. Scientists still do not know much about it. But it may make up a large part of the dark matter in the universe. In that case, it is possible that most of the matter in the universe is still a mystery.

Quiz

1 Read the section "Too Dark For Scientists To See."

Which paragraph explains what gravity is?

2 Read the section "What Is Dark Matter Made Of?"

Which sentence from the section explains what regular matter is made of?

(A) It is made of tiny particles called atoms.

(B) So far, it looks like there are two different types of dark matter.

(C) One type is made of regular matter.

(D) In that case, it is possible that most of the matter in the universe is still a mystery.

3 Read the introduction [paragraphs 1-2].

What is the BEST definition of "universe" based on the information in this section?

(A) everything that is in in outer space

(B) planets and stars that give off light

(C) things in space that scientists can see

(D) invisible infrared light and radio waves

4 Read the sentence from the section "Too Dark For Scientists To See."

Such material is called "dark matter."

Fill in the blank. "Dark matter" is...

(A) a force that keeps planets and moons in the right place.

(B) a material that does not give off enough light to be seen.

(C) a special kind of light that scientists can see.

(D) a material that all of outer space is made up of.

Answer Key

- 1 Read the section "Too Dark For Scientists To See."

Which paragraph explains what gravity is?

Paragraph 2:

Such material is called "dark matter." Scientists now think most of the material in the universe is made of this stuff. Dark matter is a special kind of material. It does not give off enough light for scientists to see it. However, there are still some ways for them to find it. One way has to do with gravity. This is a mysterious force that shapes the universe. It keeps the planets and moons in their orbits. On Earth, gravity makes apples fall from trees. It keeps humans stuck to the ground.

- 2 Read the section "What Is Dark Matter Made Of?"

Which sentence from the section explains what regular matter is made of?

(A) It is made of tiny particles called atoms.

(B) So far, it looks like there are two different types of dark matter.

(C) One type is made of regular matter.

(D) In that case, it is possible that most of the matter in the universe is still a mystery.

- 3 Read the introduction [paragraphs 1-2].

What is the BEST definition of "universe" based on the information in this section?

(A) everything that is in in outer space

(B) planets and stars that give off light

(C) things in space that scientists can see

(D) invisible infrared light and radio waves

- 4 Read the sentence from the section "Too Dark For Scientists To See."

Such material is called "dark matter."

Fill in the blank. "Dark matter" is...

- (A) a force that keeps planets and moons in the right place.
- (B) a material that does not give off enough light to be seen.**
- (C) a special kind of light that scientists can see.
- (D) a material that all of outer space is made up of.