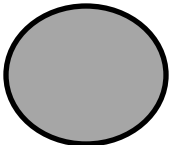
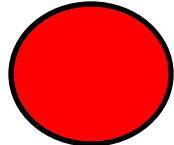
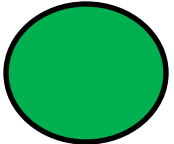
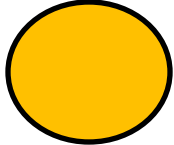


Monday, 25 September 2023

Space

Revision Session

-  or  Content you will **NOT** be assessed on
-  Content you **WILL** be assessed on
-  Content you **COULD** be assessed on that may get a mark or two

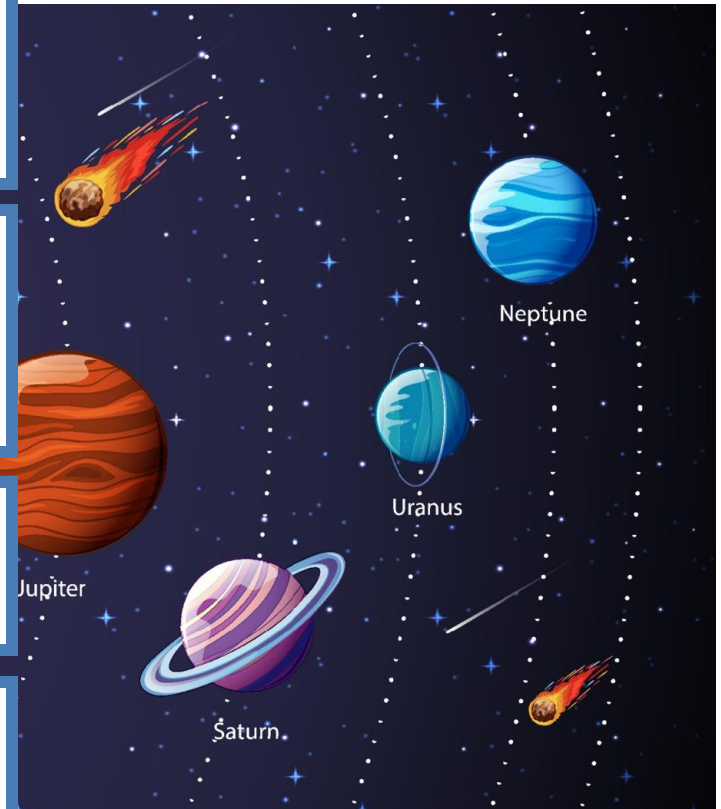
8.1.1 Our Solar System

Within our solar system there is one star, the Sun, plus the eight planets and the dwarf planets that orbit around the Sun.

Natural satellites, the moons that orbit planets, are also part of the solar system.

Our solar system is a small part of the Milky Way galaxy.

The Sun was formed from a cloud of dust and gas (nebula) pulled together by gravitational attraction.



CS/F

CS/H

SS/F

SS/H

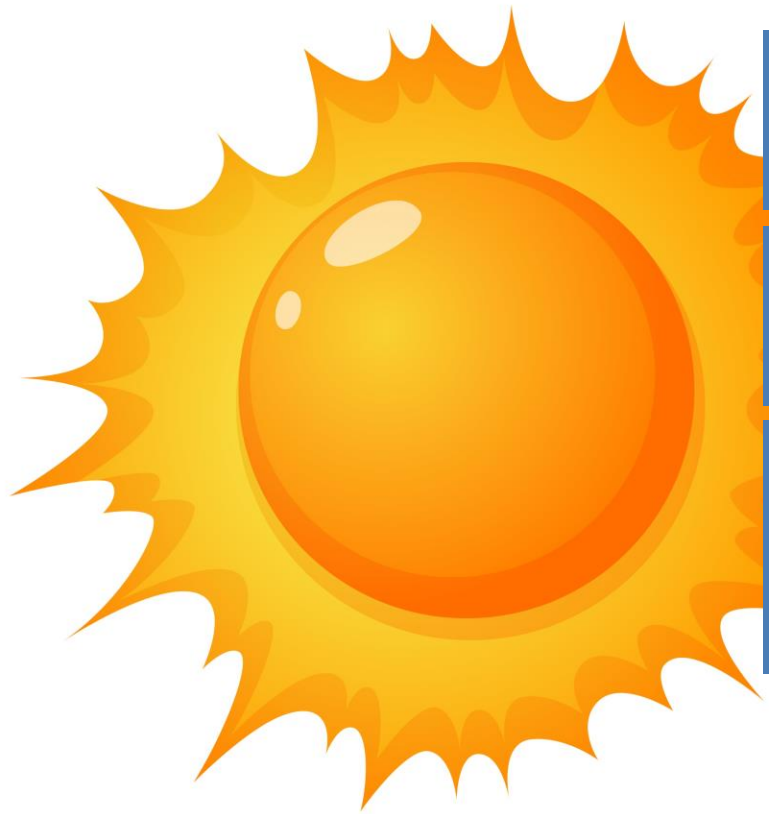
8.1.1 Our Solar System

Think

Pair

Share

How does a star remain stable?



There are two forces which are in equilibrium.

Gravity makes the sun contract inwards.

There is also a force due to radiation pressure which making the sun expand.

CS/F

CS/H

SS/F

SS/H

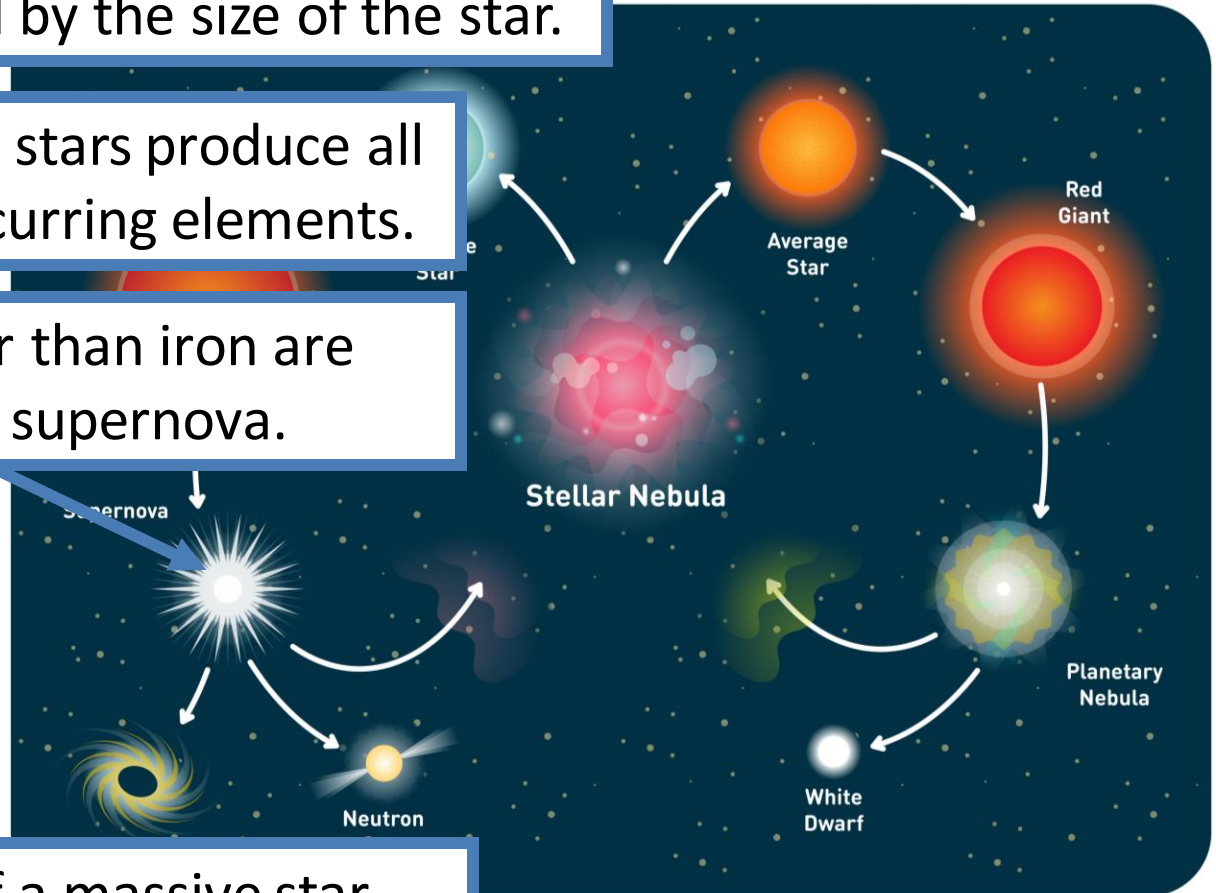
8.1.2 Life Cycle of a Star

A star goes through a life cycle. The life cycle is determined by the size of the star.

Fusion processes in stars produce all of the naturally occurring elements.

Elements heavier than iron are produced in a supernova.

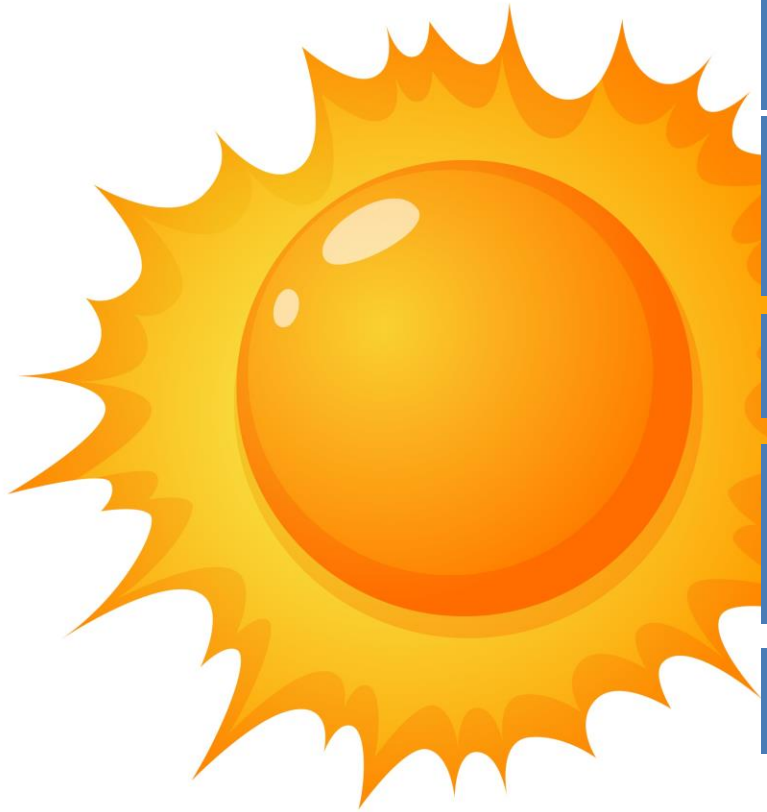
The explosion of a massive star (supernova) distributes the elements throughout the universe.



8.1.2 Life Cycle of a Star

Think
Pair
Share

What will happen to our Sun once its stable period has ended?



The hydrogen fuel has been used up.

Its temperature will decrease while its luminosity increases.

It will change to a red giant.

Its temperature will increase and its luminosity will decrease.

It will become a white dwarf.

CS/F

CS/H

SS/F

SS/H

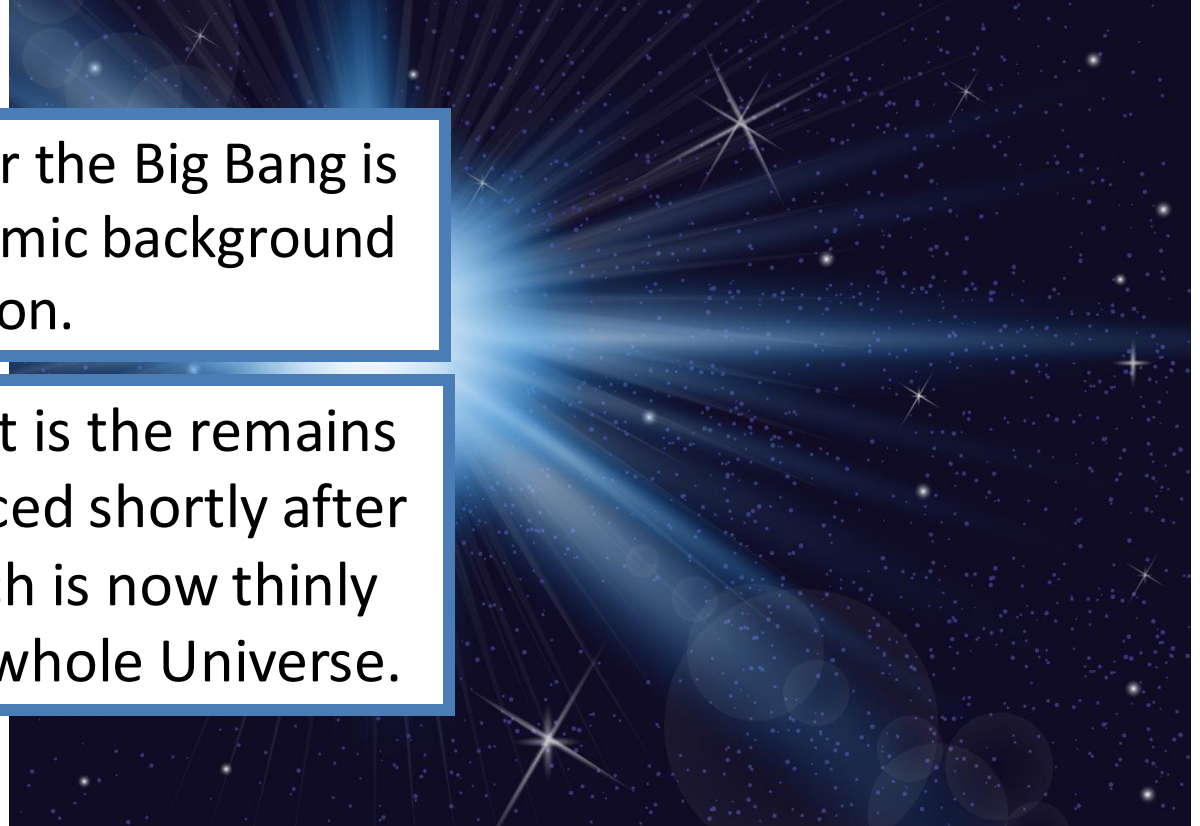
8.2 Red Shift

Think
Pair
Share

What is our evidence for the Big Bang theory?

Further evidence for the Big Bang is the presence of cosmic background radiation.

It is believed that it is the remains of radiation produced shortly after the Big Bang which is now thinly spread across the whole Universe.



8.1.3 Orbital Motion

Think

Pair

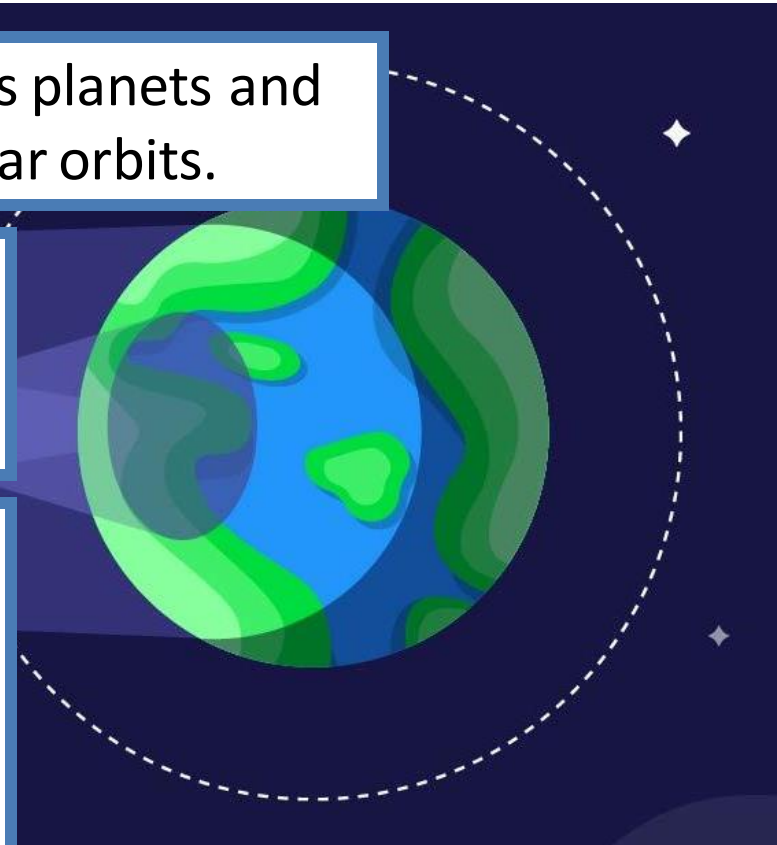
Share

How do objects maintain circular orbits?

Gravity provides the force that allows planets and satellites to maintain their circular orbits.

For an object to remain in a steady circular orbit around an object it needs to be going at the right speed.

This is because an object orbiting another maintains its orbit if there is a balance between its velocity and the gravitational pull of the object it is orbiting.



CS/F

CS/H

SS/F

SS/H

8.1.3 Orbital Motion

Key Term	Definition
Planet	
Moon	
Artificial Satellites	



8.1.3 Orbital Motion

Think

Pair

Share

What happens during a circular orbit?

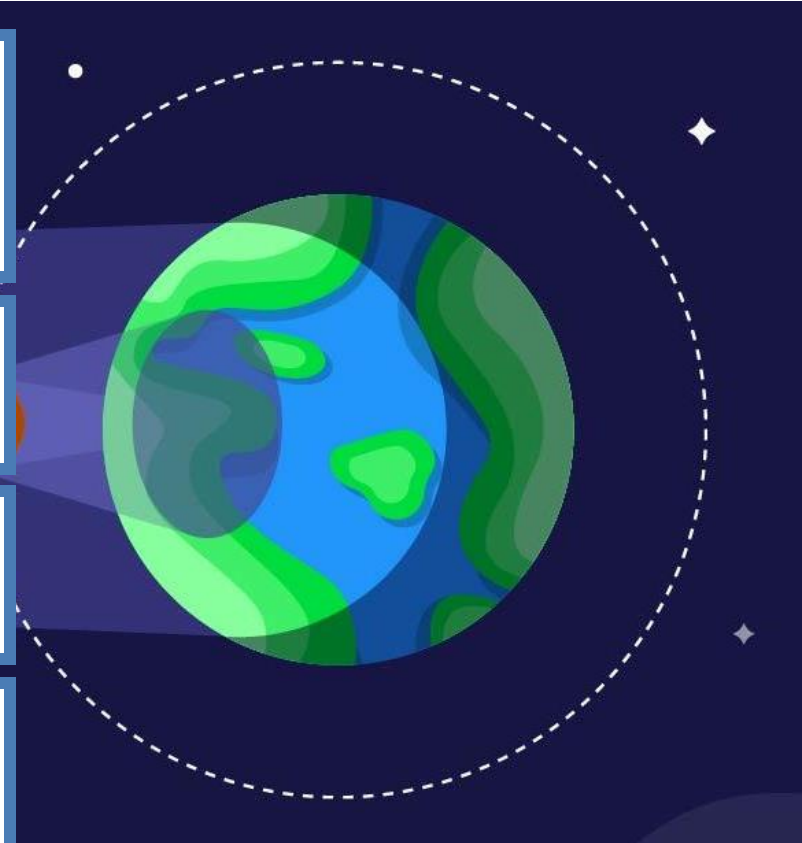
For circular orbits the force of gravity can lead to changing velocity, but unchanged speed.

The force of gravity causes the satellite to accelerate.

The acceleration causes a change in direction.

The velocity changes because direction changes.

The speed does not change.



CS/F

CS/H

SS/F

SS/H

8.1.3 Orbital Motion

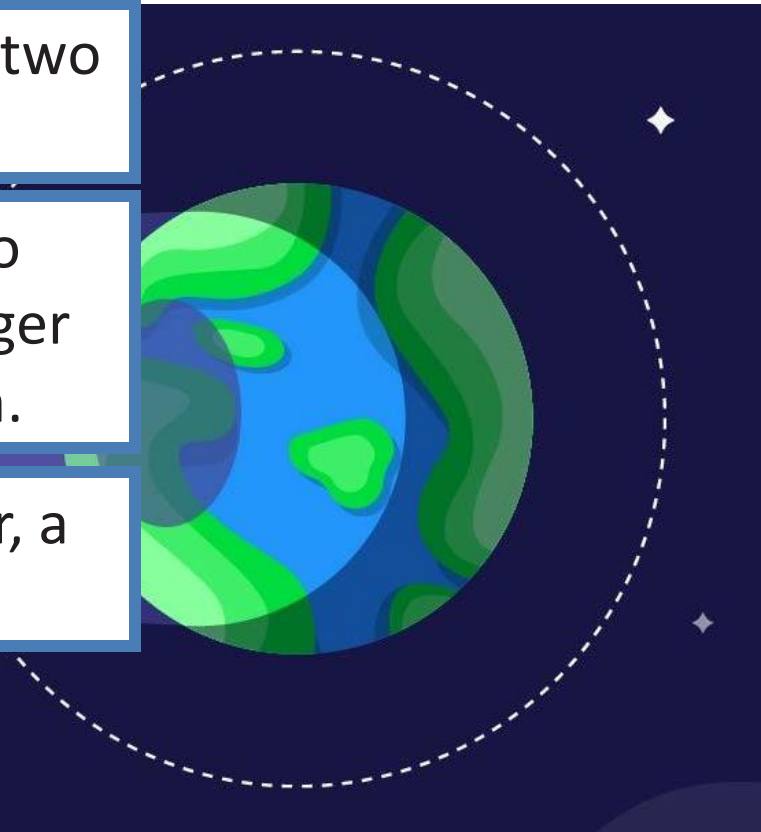
For a stable orbit, the radius must change if the speed changes.

The gravitational attraction between two objects decreases with distance.

This means that the closer the two objects are to each other, the stronger the force of gravity between them.

If the force between them is greater, a greater acceleration will occur.

The greater the acceleration, the greater the change in velocity - this causes the object to move faster.

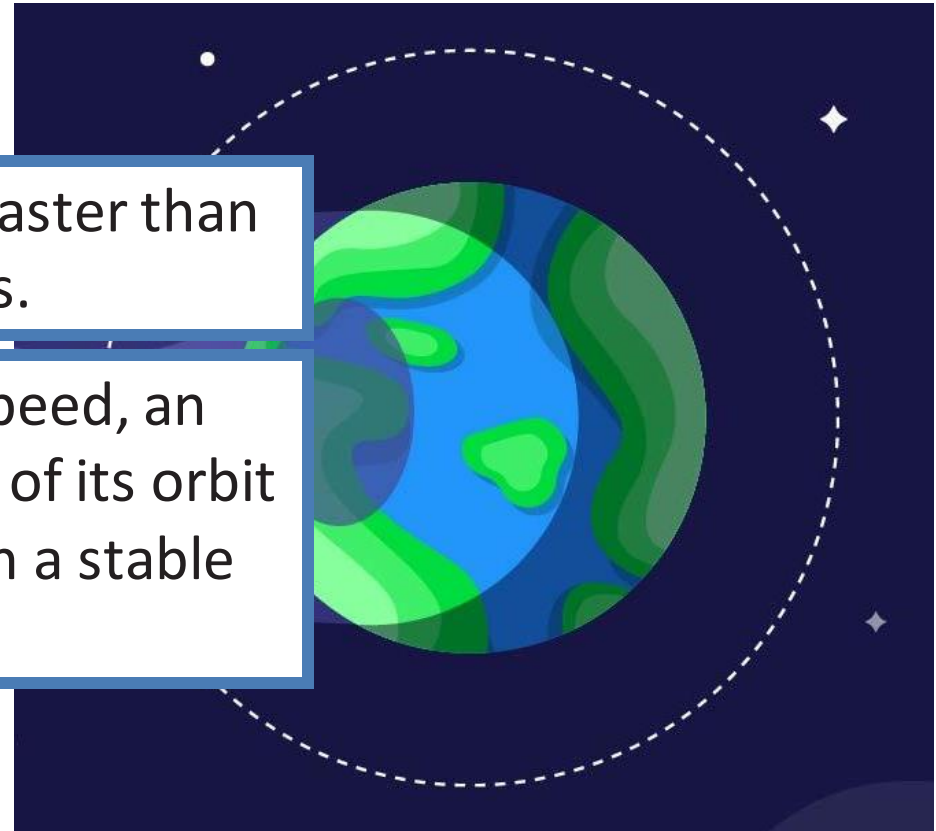


8.1.3 Orbital Motion

For a stable orbit, the radius must change if the speed changes.

Objects in small orbits travel faster than objects in large orbits.

In order to change orbital speed, an object must change the radius of its orbit at the same time, to maintain a stable orbit.



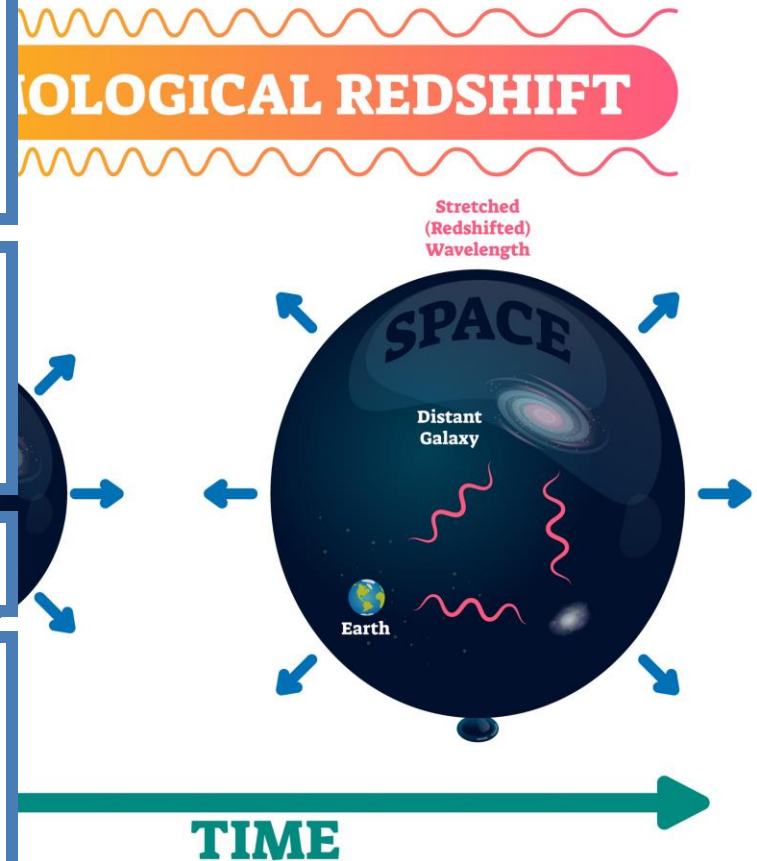
8.2 Red Shift

There is an observed increase in the wavelength of light from most distant galaxies.

The further away the galaxies, the faster they are moving and the bigger the observed increase in wavelength.

This effect is called red-shift.

The observed red-shift provides evidence that space itself (the universe) is expanding and supports the Big Bang theory.



8.2 Red Shift

Think
Pair
Share

What is our evidence for the Big Bang theory?

Galaxies show a red-shift

But more distant galaxies show bigger red-shift.

Galaxies moving away suggest the Universe is expanding

More distant galaxies are moving away faster.

The Universe therefore was once all in one place.



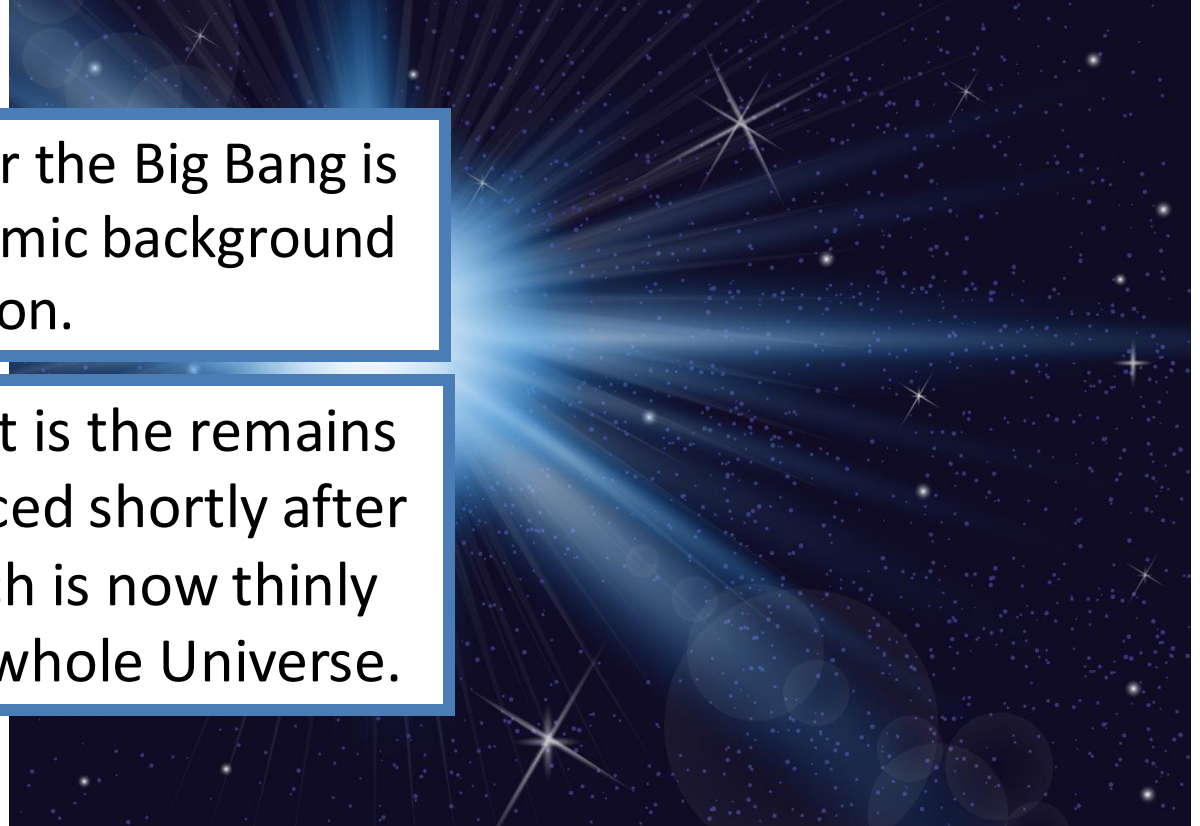
8.2 Red Shift

Think
Pair
Share

What is our evidence for the Big Bang theory?

Further evidence for the Big Bang is the presence of cosmic background radiation.

It is believed that it is the remains of radiation produced shortly after the Big Bang which is now thinly spread across the whole Universe.



8.2 Red Shift

There is still a lot about the universe that is not fully understood. For examples dark mass and dark energy.

Key Term	Definition
Dark Energy	
Dark Matter	

