Edexcel IGCSE Physics

8 - Astronomy

Flashcards

Why does your weight vary across planets?

Why does your weight vary across planets?

- Your weight is dependant on g, since weight = mass x g
- The gravitational field strength (g) of a planet varies depending on the radius and mass of the planet
- This means that your weight will also vary

What does our solar system consist of?

What does our solar system consist of?

- The sun (our star)
- 8 Planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune)
- The planet's natural satellites (ie. the moon)
- Dwarf planets
- Comets and asteroids

Describe the orbits of moons, planets, comets and artificial satellites.

Describe the orbits of moons, planets, comets and artificial satellites.

·Planets follow a (approximately) circular orbit around the Sun.

·Satellites including moons follow a (approximately) circular orbit around planets.

·Comets follow elliptical orbits around the Sun.

Which force is makes astronomical objects follow orbits?

Which force is makes astronomical objects follow orbits?

Gravitational force pulls the objects causing them to follow orbits around massive objects.

Which astronomical object forms from the collection of billions of stars?

Which astronomical object forms from the collection of billions of stars?

A Galaxy

What is the name of the galaxy that contains our solar system?

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Milky Way galaxy

What is the large collection of billions of galaxies called?

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The Universe

State an equation linking orbital speed, orbital radius and time period.

State an equation linking orbital speed, orbital radius and time period.

$$Orbital\ Speed = \frac{2 \times \pi \times Radius}{Time\ Period}$$

$$v = \frac{2 \times \pi \times r}{T}$$

Stars can be classified according to colour.
Order the given colours of stars from coldest to hottest

- Yellow
- Blue
- Red
- White
- Orange

Stars can be classified according to colour.
Order the given colours of stars from coldest to hottest

Red → Orange → Yellow → White → Blue

Cold ⟶ Hot

*think frequencies of EM waves. Blue has higher frequency that red so blue is more energetic

Name each stage the sun has gone/ will go through in its lifetime in order.

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1. Nebula
2. Main sequence star
3. Red giant
4. White dwarf

Which stage is the Sun currently in?

Which stage is the Sun currently in?

Main sequence

What is a nebula?

What is a nebula?

A cloud of gas and dust.

Describe the transition of the star from the nebula stage to the main sequence.

Describe the transition of the star from the nebula stage to the main sequence.

- The nebula increases in size until it is pulled in due to its gravity,causing GPE to turn into KE of molecules
- As it gets smaller, particles move faster and collide harder so temperature increases.
- Eventually the nebula will become dense and hot enough to begin fusion

What occurs in the stage when a star is a main sequence star?

What occurs in the stage when a star is a main sequence star?

- The fusion in the star releases energy
- During fusion, main sequence stars mostly turn hydrogen into helium.
- Thermal energy released from fusion causes an outward pressure which balances the inward pressure caused by gravity
- The star is in equilibrium so will not collapse due to gravity or expand due to fusion. It is stable.

What happens when a star transitions to the red giant stage?

What happens when a star transitions to the red giant stage?

- Once all of the hydrogen fuel has been used up, the star begins to fuse helium and other larger nuclei
- This causes the star to expand and become a red giant

How does a star become a white dwarf from a red giant?

How does a star become a white dwarf from a red giant?

- Once all reactions have taken place, the star's gravity pulls in all of its mass, making a small, dense white dwarf
- This will cool down to form a black dwarf

What stages occur for the evolution of stars that have a mass which is larger than the sun?

What stages occur for the evolution of stars that have a mass which is larger than the sun?

- Nebula
- Main sequence star
- Red supergiant star
- Supernova
- Black hole/ neutron star

What is supernova?

What is supernova?

After the red supergiant stage the star will expand and get hotter, eventually it will explode as a supernova. What is left turns into a neutron star (or a black hole if it is very large).