Unit 3 Physics – Section 3.10

What do astronomers believe is responsible for the formation of galaxies and stars?	The force of gravity
What do astronomers believe is responsible for the stars like the Sun having a long stable period?	The force of gravity pulling inwards and balancing the outward forces from fusion reactions
What solitary element did the early Universe contain?	Hydrogen
Why are there now heavier elements in the Universe?	Hydrogen nuclei fuse together to make heavier nuclei inside stars – nuclear fusion – all heavier elements are made that way!
What is a supernova?	Massive explosion of a large star at the end of its life – spreads atoms of elements throughout the Universe.
How are the heavier elements spread throughout the Universe?	These elements are distributed throughout the Universe by the explosion of a large star (supernova) at the end of its life.
How are stars are able to maintain their energy output for millions of years?	Once a fusion reaction is set up there is a steady stage in the star's life where the force of gravity pulling inwards balances the outward forces from the radiation from fusion reactions – this stage lasts for millions of years. A steady energy output is produced from the fusion reactions.
What is the name of the star our planet orbits?	Sol – the Sun
What is the name of our galaxy?	The Milky Way
How many galaxies are there in the Universe?	Billions of them.
What is a nebula?	A nebula is a collection of interstellar (in between the stars) dust and gas.
Explain how a star is formed.	A nebula gets pulled together by gravitational attraction – it spins and contracts, getting hotter and having increased pressure until the temperature and pressure is enough for fusion to begin.
What is the life cycle of a large star?	Nebula – pulled together by gravity – spins and contacts – fusion reactions occur and it shines – gravity forces in and fusion radiation forces out balance each other – it then expands into a cooler super red giant – then explodes into a supernova.
What is the life cycle of a star like the Sun?	Nebula – pulled together by gravity – spins and contacts – fusion reactions occur and it shines – gravity forces in and fusion radiation forces out balance each other – it then expands into a cooler red giant – then shrinks into a white dwarf (as it runs out of fuel and gravity wins) and then (when all the fusion stops) a black dwarf.