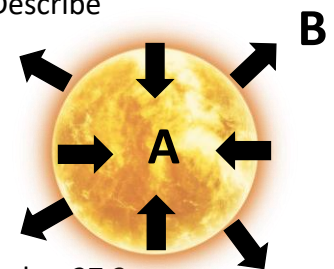


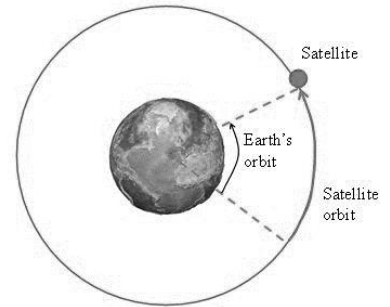
A. Solar system: stability of orbital motions; satellites (physics only)

1. Name the star in our solar system.
2. How many planets in our solar system?
3. What is the difference between a moon and a dwarf planet?
4. What do we call the natural satellites in the solar system?
5. Name the galaxy our solar system is part of.
6. How was the sun formed, and what caused this to happen?
7. List the major bodies found in the solar system.
8. What is a nebula?
9. What determines the life cycle a star will take?
10. Describe the lifecycle of a star the size of the sun.
11. Describe the lifecycle of a star more massive than the sun.
12. What processes produce all of the naturally occurring elements?
13. Where are elements heavier than iron produced?
14. How are these elements distributed throughout the universe?
15. What force enables planets and satellites to maintain their circular orbits?
16. Main sequence stars are stable despite opposing forces acting on the star. Describe forces A and B.

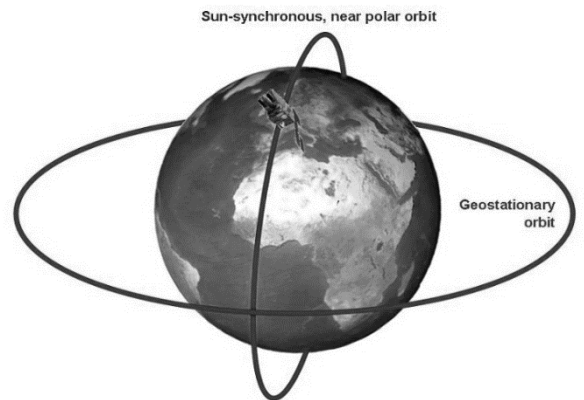


17. The international space station takes 92 mins to orbit the Earth. The moon takes 27.3 days to orbit the Earth. Explain why these orbital times are different.

18. The diagram shows a satellite orbiting the Earth. Explain how the Earth’s gravity can result in the satellites velocity changing but not its speed.

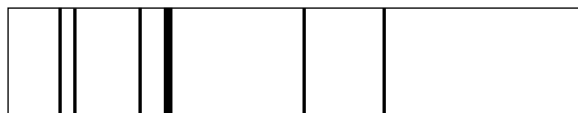


19. Explain why satellites in a polar orbit must travel at much higher speeds than a satellite in a geostationary orbit.



B. Red shift (physics only)

1. Which colour light has the longest wavelength?
2. The diagram shows the spectrum of light from a star in our galaxy.



Blue Red



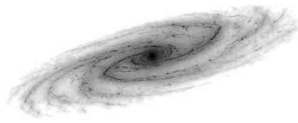
Blue Red

Complete the second box by adding the spectra you would expect from a star in a distant galaxy.

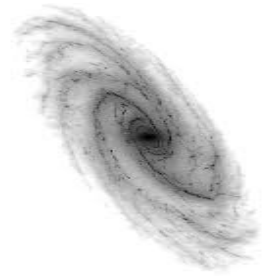
3. The light reaching Earth from distant galaxies exhibits red shift. Explain how red shift occurs.

4.

Galaxy A



Galaxy B



If galaxy A has a much bigger red shift than galaxy B, what does this tell you about galaxy A?

5. Which theory about the origin of the Universe does the red shift of galaxies support?

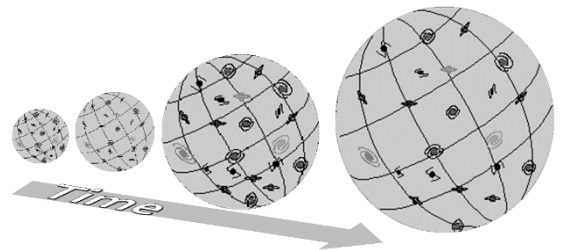
6. Approximately how many years ago did the Universe begin? (Circle the correct answer)

14 million

14 billion

14 trillion

7. What does the diagram suggest is happening to the Universe over time?



8. Describe the current theory of how the Universe began.

9. Atoms are only thought to make up about 5% of the known Universe. What do scientists think the remaining 95% is made up of?

10. The most distant galaxies in the Universe are thought to be: (tick the correct box)

The biggest galaxies

Accelerating

Slowing down

The coldest