

# Year 10 Physics Checklist

## P2 Space

---

### Our Magnetic Field

- Earth has an iron core and a magnetic field;
- Cosmic rays are charged particles (ionising) which spiral around the Earth's poles causing Aurora Borealis (Northern Lights).

### Electromagnetism

- Know that electric current and moving charged particles create a magnetic field;
- Know the direction of magnetic field around a current-carrying coil;

### Earth-Moon Formation:

Two planets collided. Their iron cores combined to form the Earth leaving the remnants to form the Moon. Evidence from surveys of Moon's geology by satellites and Moon rock brought back by Apollo astronauts.

### Solar Flares:

Sun emits clouds of charged particles at high speed. They produce strong disturbed magnetic fields. These can cause disturbances to satellite communications and electricity distribution.

### Solar System and beyond:

- Know the order of the planets.
- Know the Dwarf Planets (Ceres, Pluto & Eris)
- Planets, Comets and Asteroids orbit the Sun.
- Satellites/Moons orbit planets.
- Milky Way (galaxy) contains billions of stars.
- The Universe consists of billions of galaxies.
- Black holes at the centre of every galaxy.
- Planets orbit the Sun.
- Circular motion requires centripetal force.
- Gravity supplies centripetal force.

### Manned Space Exploration:

- Know a brief history of the Apollo missions to

the Moon.

- Dangers from cosmic radiation and meteors
- Long journey times require supplies of oxygen, food and water on board.
- Low gravity can weaken bones.
- Need warmth as space is very cold.

### Unmanned Space Exploration

- Satellites safer to send to space.
- Satellites can send back radio signals.

### Threats to the Earth:

- Asteroid belt - remnants from early Solar System.
- Jupiter's gravity stops planet formation.
- Large asteroid impact 65 million years ago wiped out the dinosaurs.
- Evidence from craters - e.g. the Moon.
- Comets made of ice and dust orbit the Sun from farthest reaches of the Solar System.
- Comets speed up as they approach the Sun.
- Near Earth Objects (NEOs).

### Life Cycle of a Star:

- Interstellar dust cloud / hydrogen.
- Gravity collapses matter.
- Thermonuclear fusion ignites star.
- "Burns" for billions of years.
- Once hydrogen used up becomes Red Giant.
- Heavy star dies as supernova followed by neutron star or black hole.
- Smaller star (Sun) forms a planetary nebular followed by a white dwarf.

### Big Bang

- All galaxies moving away from us.
- Light from galaxies is red-shifted.
- Further away the greater the red shift.
- Suggests the universe is 14 billion years old.
- Evidence microwave background radiation.

---

Do not keep saying to yourself, if you can possibly avoid it, 'But how can it be like that?' because you will get 'down the drain' into a blind alley from which nobody has yet escaped. Nobody knows how it can be like that.

Richard Feynman

