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| **Lesson Number: 27.4** |
| **Lesson Title: The thermal nuclear reactor** |
| **Specification Reference** | **3.8.1.7, 3.8.1.8** |
| **Learning Objectives** |
| Fission induced by thermal neutrons; possibility of a chain reaction; critical mass.The functions of the moderator, control rods, and coolant in a thermal nuclear reactor.Details of particular reactors are not required.Students should have studied a simple mechanical model of moderation by elastic collisions.Factors affecting the choice of materials for the moderator, control rods and coolant. Examples of materials used for these functions.Fuel used, remote handling of fuel, shielding, emergency shut-downProduction, remote handling, and storage of radioactive waste materialsAppreciation of balance between risk and benefits in the development of nuclear power |
| **Opportunities for Assessment** |
| Questions page 482 |
| **Starter:** | Slide #1 is an introduction to nuclear power – Do pupils know where the nearest plant to them is? |
| **Main:** | Slide #2 lists the key points and parts in a reactor and this should explainedSlide #3 is a drawing of the inside of a gas cooled plant, link slide #2 parts to thisSlides#4 and #5 cover the learning objectives associated with understanding the choices of the main materials in the construction of a power plant and the safety considerationsSlide #6 explains critical massSlides #7 and #8 go over the different aspects of waste management – All of the high level waste produced in the UK from nuclear power over 50 years will fill a single double decker bus |
| **Plenary:** | Slide #9 is a summary |

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| **Homework:** | Questions page 482, research nuclear disasters and their causes |
| **Differentiation / Extension / S&C** |
| Write a moral based literature review of the disasters that have occurring in nuclear installations |
| **Numeracy / Literacy** | **SMSC / Fundamental British Values** |
| N/A | Nuclear power and accidentsAmount of nuclear waste (All of the UK waste fits inside a single bus, from 50 years of use) |
| **RESOURCES:** |
| None |
| **Risk Assessment** e.g. CLEAPSS card reference |
| None |
| **Working Scientifically (HSW)** |
| A nuclear future page 483 |

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Slides #1, #3 and #5 – Wikipedia (Public Domain)