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| **Paragraph** | **Main idea** |
| **1** | Earth’s climate is changing, and that this global warming may be caused by the combustion of fossil fuels and the subsequent release of carbon dioxideand other gases into the atmosphere. |
| **2** | We are now burning fossil fuels at an increasing rate and returning this carbon dioxideto the atmosphere. |
| **3** | Some scientists are proposing geo-engineering projects – large-scale technology designed to change the earth’s climate. |
| **4** | Whatever processes are used, there is no doubt that reducing carbon dioxidelevels will increase the cost of energy in the future, but the price of allowing climate change to continue would be even higher. |
| **5** | The Earth’s temperature is steadily rising, so there is a huge task for engineers to develop energy conservation, energy efficient generation and use, and economic and safe methods of removing carbon dioxidefrom the atmosphere. |

**ANSWER KEY: READING FOR MAIN IDEAS**

*A) Read the paragraphs below and identify the main point in each paragraph. The paragraphs are part of a longer article entitled* ***Helping to save the planet****.*

*B) Read the article below and write out the main point of paragraphs which are italicised.*

**Microprocessors**

*Computer chips generate heat because electrical resistance in their circuits. In fact, it’s this heat problem rather than microprocessor size that currently limits the speed of CPUs. A safe operating temperature is in the range of 50 - 70 ºC. Computer design engineers keep computes cool by installing fans that increase air circulation, heat sinks (solid materials that transfer heat away from hot spots), and by trying to reduce the amount of waste heat that is generated by making CPUs as efficient as possible.*

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| ***Computer chips generate heat because electrical resistance in their circuits.*** |

**Motorcycle brakes**

*When brakes are applied, the friction of the brake pads on the brake disc creates heat. When brakes become very hot – around 400 ºC – friction is reduced. This means that the brakes are less effective, which is dangerous. Engineers design brake discs with holes in them. The holes allow the air to circulate more freely around the disc to dissipate the heat. They also help remove rain water.*

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| ***When brakes are applied, the friction of the brake pads on the brake disc creates heat.*** |

**Gas-fired boilers**

*Gas-fired boilers are used in homes and industry for space heating and hot water. Chemical heat is generated by burning gases such as propane or butane. The temperature of a gas flame burning in air is almost 2000 ºC. At this high temperature, heat is easily transferred to heat exchangers and water pipes to heat air and water between 20 and 60 ºC. Heat transfer is aided by convection; as air or water is heated from bottom, it rises, and the colder fluid sinks. This forms a circulating flow so that the cooler fluid is constantly heated.*

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| ***Gas-fired boilers are used in homes and industry for space heating and hot water.*** |

**Nuclear reactors**

*Heat is generated in the reactor core when uranium-235 is split into lighter elements. The heat turns water into steam, which turns the turbines. The turbines turn generators and make electricity. Most reactors operate with a water temperature of around 315 ºC and pressure around 155 bar. In these extreme conditions, engineering design is critical particularly of safety and shutdown systems. The 2011 Fukushima plant disaster in Japan made worse by the failure of water pumps that were needed to cool the reactor core.*

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| ***Heat is generated in the reactor core when uranium-235 is split into lighter elements.*** |

*C) Read the article below and state the main point of each paragraph.*

**CAD (computer-aided design)**

CAD is used to produce drawings and design documentation. The drawings are detailed pictures that explain a design. They can be two-dimensional, like a plan showing the arrangement of a room, or three-dimensional, like the picture on the left showing pipes and structural details. Documentation includes lists of structural drawings, materials, etc. CAD checks for design clashes- for example, places where parts don’t fit together – and produces walk-through videos to check ergonomic features such as access for maintenance.

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| ***CAD is used to produce drawings and design documentation.*** |

**FEA (finite element analysis)**

Today’s oil platforms are designed for difficult environments with natural forces such as seismic activity (earthquakes), waves, wind, and ice. FES is an essential tool in making the design work. FEA divides the structure into a network of elements and solves many complicated equations. It shows hoe the whole structure will work together to stand against high winds, strong waves or big earthquakes.

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| ***FES is an essential tool in making the design work.*** |

**CFD (computational fluid dynamics)**

CFD uses complex equations to model the interaction of fluids (liquids and gases) with surfaces. In oil platform design, engineers need to know the effect the wind has on the structure, including the parts such as cranes and helicopter decks. This helps engineers to create a safe design. In the past, engineers used wind tunnel tests on a physical model, but now CFD allows engineers to try different designs to get the best result.

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| ***CFD uses complex equations to model the interaction of fluids (liquids and gases)***  ***with surfaces.*** |

*D) Read the text below and identify the main ideas for paragraphs 3-8.*

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| Paragraph | Main ideas |
| 2 | The internet made possible a relatively free culture |
| 3 | People are free to be what they want in the virtual world |
| 4 | There are many familiar constraints in cyberculture |
| 5 | The inequalities found in society at large are present in the world of internet too |
| 6 | A ‘technopower spiral’ has brought about control by a technical elite |
| 7 | Cyberculture is not free of commercial and political pressures either |
| 8 | Cyberculture is different from other cultural media to some degree is undeniable |