

L3 Lead Examiner Report 2001

January 2020

**L3 Qualification in Applied
Science**

**Unit 7 Contemporary Issues in
Science (31629H)**

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A grade boundary is where we set the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade, at Distinction, Merit and Pass.

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the external assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries – this means that they decide what the lowest possible mark is for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each external assessment we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries for each assessment, because then it would not take accessibility into account.

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Unit 7: Contemporary Issues in Science

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	8	16	26	36

Introduction

31629_H0, Unit 7, Contemporary Issues in Science, transcends the three science disciplines within Applied Science.

This unit is designed to enable learners to develop their skills and understanding in evaluating the impact of contemporary science issues in our society and how they are discussed in publications.

The assessment outcomes are

AO1 Demonstrate knowledge and understanding of the issue

AO2 Apply knowledge and understanding of the issue to real life scientific scenarios

AO3 Make valid judgements based on interpretation, analysis and evaluation of scientific information and their sources

AO4 Apply and synthesise scientific ideas from several sources

This was the fourth series of the new specification. Previous issues have included antibiotic resistance, nanotechnology in space travel, genetically modified crops and for the 2001 exam the issue was the health effects of diesel.

The question paper followed the same format as for the previous papers and for the sample assessment material. It consisted of five questions, three of which require longer responses (two carrying 12 marks and one carrying 15 marks) and the other two require shorter responses (carrying 5 or 6 marks).

Learners are given access to the stimulus material before the examination and are expected to spend six hours of study time in analysing the content of the articles and carrying out any further research that they deem appropriate.

As detailed in the specification, learners should be looking at the environmental, ethical and moral, social, political and/or financial impacts of the issue, as well as potential benefits, disadvantages and risks associated with the issue.

Learners should develop critical thinking skills and be able to assess the reliability and validity of conclusions reached in one of the articles, sometimes by also assessing the reliability of the source. Learners should also be able to evaluate qualitative and quantitative evidence in the article, to justify their judgments.

The source material for the 2001 Unit 7 paper were three edited articles; one from The Guardian, one from Imperial College and one from the Centre for Genomics and Health, Queen Mary University of London, published in British Medical Journal.

All five questions in this paper are marked using a levels-based markscheme.

The indicative content in the markscheme is for general guidance; learners are not expected to cover all of that content in their responses and learners are also credited for other valid responses that they include.

Introduction to the Overall Performance of the Unit

Many learners were well prepared for the examination; this was particularly true for questions 1, 2 and 5 and, in some cases, less so for questions 3 and 4.

Some learners obviously use their preparation time very well.

Most responses were clear and coherent and the learners' lines of argument able to be followed.

More details about learners' performances of answering the specific questions follows below.

- You can access the specification and/or sample assessment materials (SAMs) located on the BTEC First qualification webpage located [here](#).

Individual Questions

Question 1 12 marks

In this question learners are asked to discuss the implications of the scientific issue: – the health effects of diesel.

As indicated in the specifications learners should discuss the ethical/moral, social, financial/economic and environmental implications of the effects of the nitrogen oxides and small particles emitted by diesel engines.

Overall this was the best answered question of the paper.

Good responses demonstrated that those learners could select relevant information from all three articles and synthesise it into their own accounts, discussing the ethical/moral, social, financial/economic and environmental implications of the issue. Good responses were well structured and gave clear, coherent and logical accounts, demonstrating comprehensive knowledge and understanding of the implications of the issue by identifying and selecting relevant information from all three articles and drawing a wide range of links to and between the different types of implications.

Some learners approached to question using an article by article approach, or an implication by implication approach, thus missing the opportunity to clearly demonstrate the AO3 and AO4 assessment outcomes.

Some learners misinterpreted the references, in the articles, to diesel cars and carbon dioxide emissions and, having incorrectly interpreted these references as saying that diesel cars produced more carbon dioxide than their petrol-powered counterparts, went off on a tangent and wrote far too much about climate change. The inclusion of irrelevant content, as well as demonstrating that the learner has not selected relevant information, also wastes time and reduces the time available for learners to allocate to a more worthy response.

Some learners offered little more than a rant about diesel, often including incorrect deductions for example that diesel produced a lot of carbon dioxide or that the public had been lied to and cheated into buying diesel cars. These

responses were also polarised and indicated a lack of appreciation on the part of some learners that both sides of the argument need to be considered in a discussion.

This response achieved band 4 with 12 marks.

1 Discuss the implications of the scientific issue identified in the articles.

(12)

~~The~~ This article discusses the implications of diesel. Diesel affects the environment in many ways for example health in humans and animals. This ~~leads~~ affects ~~the~~ population as it can lead to many deaths. Diesel also makes cars noisy. There are lots of implications mentioned in the articles.

The first article is a newspaper 'the Guardian'. It ~~talks~~ mentions social impacts that diesel has. ~~on the~~ One impact mentioned is how ~~at~~ air pollution kills 3.3 million people prematurely every year. This negative implication tells us that air pollution (which is caused by diesel) is ~~one of~~ a big killer and it ruins people's health. In article 2 ~~it has~~ a negative social ^{and ethical} impact ~~has been~~ mentions how ~~the~~ a study shows the link between the levels of diesel particles and reduced lung function. ~~At~~ The study showed ^{that people in} higher levels of air pollution had worse lung function than people in lower polluted areas.

A positive economical impact ^{mentioned} ~~shown~~ in article 1 is that ~~the~~ diesel is cheaper than ~~petrol~~ petrol. This leads to more people wanting to use diesel as they will save money. However, this leads to ^{several} ~~a~~ negative

environmental and social impacts such as this leads to a rise in diesel the amount of diesel in the air which then leads to air pollution which damages the environment and climate change then occurs. Article 1 mentions a joint investigation that was done by the guardians and of Greenpeace showing how hundreds and thousands of schoolchildren are being exposed to ~~air~~ illegal air toxicity levels. This environmental impact has led to a social impact as it affects ~~that the illegal air toxicity levels exposes~~ young school children to are exposed to the illegal air toxicity levels which ruins their health at a very young age so they are more likely to get worse respiratory diseases and asthma. The pollution also ~~not~~ affects their learning which ~~can~~ affects them as they get older and they could end up with jobs that they didn't want. ~~this has also~~ Article 3 has mentioned that there ~~are~~ is emerging evidence on how air pollution affects the development in children and their neurological systems and how increased air pollution leads to reduced IQ. Articles ~~2 and 3~~ ~~both~~ mention that over 2000 education or childcare providers are near busy roads with Nitrogen oxides that are higher than the legal limit. This is a negative social implication.

~~However~~

However, there are also a few positive implications mentioned in the articles.

A positive social impact from article 1 talks about in 2012 there was the first major evidence of the health impacts of diesel ~~were~~ was identified and shared ~~the~~ ~~rapidly~~ across the media. This led to more studies into diesel and the affect ~~of~~ on health. This is positive as it shows how it made everyone aware and they all started helping each other. Another positive social impact came from this as mayors of many cities worldwide decided to completely outlaw diesel by 2025. This global implication has linked to a positive ~~to~~ environmental impact as it will make a huge difference in air pollution levels causing them to drop and there will be less ^{change of} climate change. Political leaders are also working on "cracking down diesel" which can help reduce smog (environmental impact). Article 2 can also link to this as it states that Dr Carlsten is encouraging citizens to voice concern about traffic pollution. This has led to the government taking action which is both a ^{positive} social impact as it spreads more awareness and a positive environmental impact as it reduces air pollution.

Article 3 have written about research from the institute for public policy research who ~~estime~~ made an estimation that if all diesel vehicles were phased out, there would be large reductions in NO_x and NO_2 which means 1.4 million life years would be gained and £800 million would be saved as they wouldn't need to fund for health-care. This is a positive economical impact if it could happen.

However, a negative economical impact from article 1 is that not everyone can afford to buy cleaner cars as they are more expensive. This means that they have no choice and they have to use diesel cars. For the drivers who don't want to switch ~~there has~~ their motorbikes, they will be given pollution charges. This is both a positive impact for the environment as it ~~per~~ makes them drive less and a positive ~~social~~ economical impact for the government as they will get money.

Research from article 3 shows that UK traffic is a big part of air pollution and it has risen over 60 years. This negative environmental impact shows how the ban of diesel can reduce air pollution.

(Total for Question 1 = 12 marks)

The learner has started with a general introduction. The implications are discussed with reference to relevant content from all three articles and the

reference to climate change here is not wrong as the oxides of nitrogen produced by burning diesel fuel do contribute to climate change. The three articles are mentioned throughout but this is not an article by article approach but a clear example of linking the selected relevant information to the three articles. The response links well to and between all of the implications of the issue.

This response achieved band 3 with 8 marks

1 Discuss the implications of the scientific issue identified in the articles.

(12)

The scientific issue in all the articles is the effect of diesel to us humans. In article 1 it was explained that diesel fumes is very dangerous to us comparable to mustard gas. The ethical issue in article 1 is the safety of humans who are in the ~~per~~ area of the diesel fumes. By having a lot of diesel cars, we increase the number of premature deaths and this is ethically wrong. A social impact in article 1 is that the government first thought diesel was harmless and therefore advertised it, but after few years the problems were revealed. People who invested into buying diesel cars are now stuck with a car that they can only use limitedly. This can cause people to lose their trust in the government and not follow what they say. An economical impact is people who relied on their diesel cars to make a living are now losing money since they can't use the car in certain areas and they need to pay to travel to

some cities. People who can't afford a new car are now left with nothing, losing their job and source of income. An environmental impact

is the effect of diesel fumes on animals. It's not only humans that are affected but animal as well. ~~The~~ A sudden decrease in a number of animals can cause a ~~disruption~~ disruption in the ecosystem. For example if the number of deers is reduce, the number of mountain lions can also reduce because they ~~feed~~ feed on deers.

In article 2 it was suggested that people with respiratory system diseases are more likely to suffer to diesel fumes than normal people. The ~~ethical~~ ethical impact of this issue is the further suffering of people with respiratory diseases. By having diesel fumes around we put people who suffers from ~~no~~ respiratory diseases at a greater risk. The chances of them getting a sudden ~~attack~~ attack of their condition is increase making it harder for them to live a normal life. A social impact of this issue is people with respiratory diseases will less likely to go out because of the risk of being around diesel fumes. This will

limit them from ~~see~~ meeting up with friends and family. An economical impact is that ~~that~~ people with respiratory diseases will only work indoors, they cannot work outside because of diesel fumes. A person who cannot find a job indoors will have no option. This means ~~the~~ the number of

people who work outdoors will be ~~and~~ reduce. An environmental impact is the air pollution. The air around ~~us~~ us can get so polluted people who suffer from any respiratory disease will not be able to breathe it in safely.

Article 3 ~~also~~ also suggest that diesel fumes affect people who suffer from respiratory system, but they also greatly explain the effects it has on children. A ethical ~~imp~~ impact of this issue is the safety of children and unborn babies. It was explained that unborn babies are also affected when their mother breathes in diesel fumes. This increases the chance of a ~~health~~ ~~health~~ problem during birth. A economical impact in this issue is people who takes medicine for their respiratory condition will likely need more causing more money to be spent on the effect of diesel fumes. A social impact is that women will be

more hesitant to have babies because of the risk of it ~~get~~ getting affected by the diesel fumes. This can lower the population in the area. An environmental impact is diesel fumes can also cause acid rain that can make soil infertile meaning it ~~can~~ cannot grow trees or plant. This will reduce the amount of trees.

people who work outdoor will be ~~red~~ reduce. An environmental impact is the air pollution. The air around ~~us~~ us can get so polluted people who suffer from any respiratory disease will not be able to breath it in safely.

This response shows good knowledge and understanding of the scientific issues and has identified and selected relevant implications from the three articles. There are some links to and between the implications but the account is not well enough synthesised to be in band 4. The structure has some coherence and is mostly logical and able to be followed. The learner has given some thought to the implications of the issue and not just extracted information from the articles.

This response achieved band 2 with 5 marks

1 Discuss the implications of the scientific issue identified in the articles.

(12)

its causing health implications, meaning everyone in highly polluted areas are at risk of dying prematurely. Another health issue caused by diesel ~~emissions~~ ^{emissions} is the flare up of underlying problems such as ~~asthma~~ asthma.

Diesel fumes are also causing air pollution so badly in some areas elderly people and young children are advised to stay inside.

Each article identified air pollution as the scientific issue. Each article highlights that the air pollution is primarily coming from diesel cars. As well as each article agrees with the dangers of diesel cars they all state that it's dangerous gases such as Nitrogen oxides (NO_x). These gases harm the air quality for people as well as for animals. Another implication is people socially being affected. In article 1 people are not going out so they can avoid the air pollution. Where as in article 2 people are effected socially by facing hospitalisation these effects people as they are unable to leave. However article 3 enters the idea that air pollution causes neurological development issues such as ASD (Autism Spectrum disorder). For the economical effects article 1 raises the issue of car manufactory of diesel cars will decrease where as the tax for these cars will increase. In

Article 2 the economical issue is that due to hospitalisation more people are out of work but more NHS staff would be needed. in Article 3 People who have faced neurological development issues may be unable to work and Article 3 mentions that the cost for air purifiers are high. and the final implication is that it may be unethical to harm others with pollution, as air pollution causes direct harm to peoples health and risk shortening Peoples life and damaging the quality of life for others.

The response takes an article by article approach and the learner has selected some salient points but failed to synthesise their account. Many of the links are in isolation but adequate knowledge is demonstrated. There are attempts to link to the relevant implications and there is some structure to the account.

This response achieved band 1 with 3 marks

1 Discuss the implications of the scientific issue identified in the articles.

(12)

The implications of diesel include Air pollution, health problems, diesel also causes deaths.

Air pollution kills around 3.3 million people every year. The NO_2 from diesel fumes has caused 71000 premature deaths across the continent.

* The health problems caused by diesel fumes include respiratory symptoms such as coughing, wheezing and shortness of breath. These symptoms are caused by the by-products from burning diesel fuel, called polycyclic aromatic hydrocarbons. These stimulate the nerves in the lungs.

The advantages of Diesel include:

- Fuel efficiency as it made the running cost cheaper than petrol.

- Diesel cars were thought to emit less CO_2 so they would help cut the CO_2 emissions.

10/10/19

- The pollutants also affect neurological systems
 - There are also links to pollution and an increased mean Pulmonary arterial pressure.
 - The pollutants from diesel engines can cause onset cardiovascular ~~disea~~ disease.
- The disadvantages of diesel fuel heavily outweigh the advantages of diesel fuel. Diesel exhaust ~~to~~ leads to 11940 premature deaths in the UK every year, it is the second highest in the EU.

This response demonstrates limited knowledge and understanding of the issues and does little more than précis some of the content from the articles. There is no attempt to draw links to the ethical, social, financial or environmental implications but there is some structure to the response, hence this was placed at the top of band 1.

Question 2 6 marks

This question asked learners to identify some of the different organisations or individuals mentioned in the articles and to suggest how these may have an influence on the scientific issue.

There was, in these articles, a large range of both individuals and organisations that learners could choose from. Many learners limited themselves to two or three and then suggested how these individuals or organisations exerted an influence. For example they may suggest that an organisation was high profile and what they said would be listened to by many people, or that researchers at a prestigious university would have credibility and will carry out research to generate empirical data that can be used to advise government ministers and influence policy making.

Some learners gave a list of individuals and/or organisations but failed to suggest how they might influence the issue or they gave vague responses, such as 'they have a great influence.'

This response achieved band 3 with 6 marks

- 2 Identify the different organisations/individuals mentioned in the articles and suggest how they may have an influence on the scientific issue.

(6)

An organisation mentioned in articles 1 and 3 may have influence the scientific issue is the World Health Organisation (WHO). The World Health Organisation is a leading international organisation in collecting, sharing and researching health and ~~thing~~ scientific issues that may effect health such as diesel fuel. WHO may influence the scientific issue because it they research diesel and find all the disadvantages of using diesel fuel and broadcast this information. They may influence other scientists and specialist to appose ~~the~~ the use of diesel leading to a decrease of the use of diesel fuel and eradicating it in the future.

An individual mentioned in article 2 that could influence the scientific issue is professor Maria Belusi. The professor is the head of respiratory pharmacology at ^{The} heart and lung Institute at Imperial collage which is a highly ~~re~~ credited school. Maria Belusi is an internationally recognised expert in her field and mainly focusses on research ~~to~~ on people with ~~asthma~~ asthma, which is ~~a major~~ ^{one} of the main people affected.

by air pollution. She would have an influence on the scientific issue because with her research of the effects air pollution has ~~on people~~ ^{on people with} asthma, she could share this information to other specialist that could do further ~~research~~ research on how to lower the effects of air pollution and help ~~stop the use of~~ influence the ~~govt~~ people to stop using diesel in transport.

Another ~~an~~ organisation mentioned in articles 1 and 3 ^{are} ~~is~~ the European union. The European Union is a political and economical union with 28 different ~~states~~ in ~~the~~ Europe. The EU could influence the scientific issue because they ~~could~~ ^{would} be able to influence head governmental bodies and ~~persuade~~ persuade them to oppose the idea of using diesel fuel. This could lead to a butterfly effect of leading countries such as Russia or the US to decrease their use of diesel fuel which could decrease the amounts of air pollution globally.

The learner has selected two organisations and one individual and shown comprehensively and clearly how they can influence the scientific issue.

This response achieved band 2 with 4 marks

- 2** Identify the different organisations/individuals mentioned in the articles and suggest how they may have an influence on the scientific issue.

(6)

International Council for clean transportation (ICCT) is an independent ~~technical~~ ^{nonprofit} organization founded to provide first-rate, unbiased research & technical and scientific analysis to environmental regulators. Their missions to improve the environmental performance & energy efficiency of road, marine, and air transportation, in order to benefit public health & mitigate climate change.

World health organisation (WHO) focuses to promote good health amongst people prone to illnesses world wide wherever they have access to sufficient healthcare. WHO works with government, thousands of experts, and scientific professionals to conduct researches in improving health care and raise awareness of problems caused by air pollution from diesel engines. They done many

presentation in different countries and released articles ~~only~~ online to make people aware the issues. ~~The~~ if government provides ICCT & WHO enough funds they can collaborate and carry out

a big project in solving, preventing and/or the risk factors occurring from the air pollution. They are big organisations & many qualified people work for them with some people will ~~understand~~ believe them & be aware.

Professor Terry Terry PhD, FRS, Professor of Lung Cell Biology ~~has~~ is conducting a research into cellular and molecular mechanism of pulmonary illnesses related to inhaled toxic ambient particulate air pollution. Her area focus is related to the impacts of toxic gases many it be from diesel engines. Effecting health can be used to make people aware of the issue. It can also be shared with the car and ^{diesel} engine making industries & government so laws and guidelines are put in place to reduce the emissions ^{air} pollution from diesel. Professor Belwin from Imperial College, London, also specialises air way diseases. She found air pollution from exhaust is affecting everyone, especially those with respiratory problems. She's highly qualified person so findings will be great importance and there are many/will consider her work.

(Total for Question 2 = 6 marks)

The learner has sensibly restricted their choice to two key organisations and two individuals and they have implied but not always clearly and overtly stated how they may influence the issue but they have demonstrated good knowledge and understanding of the roles of the organisations and individuals.

This response achieved band 1 with 2 marks

The World Health Organisation (WHO), did their own research and declared ~~diesel~~ diesel exhaust a carcinogen which is a cause of lung cancer.

Professor Maria Belvisi, head of the Respiratory Pharmacology Group at Imperial's National Heart and Lung Institute, who led the research: pollution will affect everyone, but it affects people with underlying conditions, such as asthma, and even more.

International Council on Clean Transportation (ICCT), did their latest study show that the latest diesel cars produced 10 times the NO_x of heavy trucks or buses which are more strictly regulated than cars.

The European Environment Agency found that nitrogen dioxide ~~and other~~ from diesel fumes had caused around 71,000 premature deaths across the continent in a single year.

Researchers at Imperial College studied that high levels of air pollution on London's busy Oxford Street had a measurable effects on the lungs of people with asthma.

Dr Ian Mudway, from the Environmental Research Group at King's College London did research and stated " This study further highlights the adverse impacts diesel exhaust emissions can have on sensitive individuals and strengthens the scientific evidence base supporting moves to improve air quality in the UK.

This response is a list including 3 or 4 organisations and one individual but there is little attempt to suggest how these influence the scientific issue. This response demonstrates adequate knowledge and understanding.

Question 3 12 marks

This question asks learners to discuss whether article 3 has made valid judgements about the scientific issue.

This is the question that was the least well answered. Many learners restricted their answers to general comments about references, peer review, reliability of the source(s) of the article and the authenticity of the data. Some learners consider all three articles and try to relate what they are saying to the economic, social and ethical implications, which is not relevant in this question, although it is relevant to cite evidence in the other articles that supports or does not support the conclusions made in article 3. Some responses appeared not to be planned and, in some cases, the poor synthesis and use of language made it difficult to follow the lines of argument.

A key failing is that many learners do not identify exactly what conclusions and judgements have been drawn. Some learners correctly identify some of the judgements and conclusions and then address them in terms of quality of data to support them. The learners comment on the research carried out and whether other studies support or refute the conclusions. Learners may evaluate the conclusion that diesel should be phased out by pointing out that although diesel emissions contribute to over 50% of air pollution, there are other sources of damaging particles, such as wood burning stoves. They may then go on to discuss that if diesel cars are phased out more research and development will need to be carried out in order for us to produce enough electricity, by green

energy generation, to meet the demand to power many more electric cars, and pose the question as to whether governments have the resources to do this.

Other conclusions that can be discussed are that children are exposed to these pollutants on the way to and from school and that the particles can interfere with children's lung and neurological development. There is also evidence in the article that fetal development can be impaired due to maternal exposure to the pollutants but that in all of the studies there are confounding variable such as that in areas of social deprivation children are also more likely to be exposed to cigarette smoke, another source of harmful particles; in such areas this may also be coupled with poorer health care due in part to the austerity measures in operation over the past ten years. Some learners also identified that the research proposes a physiological mechanism for how particles cause lung damage and this physiological evidence supports the epidemiological evidence cited in the article.

The validity and reliability of these conclusions can be assessed in the light of the fact that the article reviews a lot of research by various organisations and research teams and many studies have reached the same conclusions. However the main focus is on the UK which is heavily dieselised but globally only about 20% of the oxides of nitrogen originate from diesel fuel. Other conclusions that can be discussed are that the WHO has classified diesel particles as carcinogenic, but that does not necessarily mean that exposure to them will always lead to cancer. Some learners, when considering references and peer review correctly pointed out that the peer review process is not always infallible.

This response achieved band 4 with 10 marks.

3 Discuss whether Article 3 has made valid judgements.

In your answer you should consider:

- how the article has interpreted and analysed the scientific information to support the conclusions/judgements being made
- the validity and reliability of data
- references to other sources of information.

(12)

Article 3 is an article published by the British Medical Journal. Journals are often quite reliable as they are peer-reviewed before they are published.

Answer It is said that approximately 40,000 excess deaths a year are attributable to air pollution and that this has increased health service and social costs by £20 billion a year.

This can be supported by a parliament publication stating that poor air quality is now found to be shortening the lives of up to 200,000 people. The NHS also states that ~~around~~ the treatment for lungs itself has increased up by £11 billion.

Jonathan Gripp has been one of the writers of this article and he is a very reliable source.

He is a former research leader of the British

~~Paediatric~~ Paediatric Respiratory Society and was a Vice Chair of the Royal College of Physicians.

It has been found that 37 out of 43

reporting zones across the UK had maximum annual mean NO_2 concentrations over the EU legal limit. This information can be traced back from other sources, making this a valid point in the article. International Council for Clean Transportation states that the latest diesel cars, which are at high on the roads in the UK, produce $10\times$ the NO_x ; this is on average, seven times higher than safety limits allow.

A pollutants table comparing EU legal limits of different pollutants to WHO guidelines, provides clear evidence that the EU are going over the ~~required~~ accepted emissions. WHO, world health organisation is a very trustworthy organisation aiming to educate others on environmental issues.

~~An summary information point was~~
stated that there is a strong correlation
between exposure to traffic-derived air
pollutants of pregnant women and their children,
can be confirmed by a study in Beijing. After
doing a bit of research I found out
it was the world's worst city for air
pollution. A study made strides in connecting
air pollution to low birth weight. Studies were

made on women in 2008 during the Olympics during a 2 month span when the city was mandated to lower emissions to improve air quality.

The study found out that women who were in their 8 month pregnancy during the Olympics, delivered babies ~~which~~ who were 0.8 ounces heavier. This proves that there is a strong ~~now~~ correlation between exposure to traffic-derived air pollutants of pregnant women and their children, validating this point in the article. As the city was forced to low emissions during the Olympics, babies were born much healthier to those born during high emissions.

A meta-analysis has been mentioned in Article 3. This is a very reliable source as more than one study has been looked at to make a stable conclusion.

Article 3 gives many good ~~other~~ ~~ideas~~ ideas, which are often mentioned online and in the news, ~~about~~ regarding what we can do on both a national level and an international level. The article has over 66 references, allowing its making to be

composed of many sources, which after
going through them I was able to trace back.

The learner has referred to peer review, references, a meta-analysis and the credibility of the author.

They have stated some of the conclusions and, in each case, offered supporting evidence, either from the article or from their own research, to support the conclusion.

The structure is well organised, clear coherent and logical. It is perhaps a little unbalanced and a comment, for example that peer review is not always infallible, or that because the article is edited we do not know if any conflicting evidence has been omitted, could also have been included and would have taken the response to the top of band 3.

This response achieved band 2 with 6 marks

3 Discuss whether Article 3 has made valid judgements.

In your answer you should consider:

- how the article has interpreted and analysed the scientific information to support the conclusions/judgements being made
- the validity and reliability of data
- references to other sources of information.

(12)

In Article three, they have used established organisations research^(ICCT) and have incorporated it amongst other investigations to give a rounded interpretation of the scientific issue at hand.

The validity in this article can be assumed due to the people ^{involved} ~~investigating~~ and where the article was published. This article was published in the British medical journal which is recognised by established scientist and it is where new found research is ~~is~~ logged for other individuals in this sector. This journal is reliable and would not print false or not widely-accepted articles of information because it would affect its integrity therefore, it can be assumed the judgements made have validity.

Furthermore, the use of research from organisations such as ~~the~~ Department of transport and Department of environment, food and rural affairs, increases the reliability because the issue at hand is about diesel emissions from cars and both organisation will have had to investig-

ate this issue because cars are a common form of transport and, in general, have been known for their environmental impacts:

Another organisation mentioned and used to show evidence is WHO, who have said that diesel is a health hazard therefore, in article three, the use of their (WHO) data supports the author(s) judgement of diesel because in cross reference to the EU's legal limits of pollutants, WHO have shown that the UK have exceeded this therefore, the author(s) stand point that diesel is affecting the health of people could be reliable.

In article three, there is a graph that highlights diesel soot throughout the day which can potentially be reliable, however it does depend on location. It is known as 'figure one' in the article and the graph shows diesel soot throughout the day to prove it is damaging to school children. It shows that some of the main peaks of diesel soot is around the times that children are outside of class and can be affected. Although this is evidence to show that it could be a reason for increase in bad health in children, it is not the most reliable source of evidence due to if it was repeated,

it could vary widely.

The discussion shows some structure and coherence. There is some discourse about the validity of the conclusions made and this is partly supported by links to the article. The main focus is on the reliability of the information sources.

This response achieved band 1 with 3 marks

Artical 3 has made a range of judgements however I g questioned these judgements as the artical had been edited, this means that the artical may of been edited for the writer to make there their ideas to be backed by the evidence and not Contradicted by by the supporting evidence. this then questioned the reriability of the data they had given.

Artical 3 states that 40,000 deaths are caused by air pollution but after researching I found this to be from £ 3.45 million from fr Refronce (4) to upto 7 million in refonce (6) this suggests that the number of deaths are decreased for the artical and makes the data about the deaths no longer reliable.

In the introduction article 3 states air pollution has health effects on the respiratory system, Cardiovascular and neurological system. After conducting my own research I found that article 1 and 2 backed the claim about how the respiratory system is effected due to air pollution. After researching into Artherosclerosis the claim of air pollution is backed and reliable as air pollution can cause artherosclerosis.

~~Article~~ article 3 is once again backed by article 1 and 2 in the fact of the main component of air pollution being ~~air~~ nitrogen oxides (NO_x) and nitrogen dioxides (NO_2).

Also article 3 mentions that diesel cars produce nitrogen oxides is backed from article 1 and 2 along side of research of how to reduce air pollution, (to use public transport and to use alternative fuels)

Within article 3 one the writer credits

World health organisation (who) multiple times (See article 3 references 12, 19)
WHO are a highly trusted organisation that are often cited or credited for their work within health matters around the world. This makes the information from WHO to be highly reliable source of data.

Overall i beleve Article 3 to have some areas of highly reliable data and other areas to be edited or changed to back the writer. Some areas have to be researched ~~there~~ further.

The critique here largely focuses on the editing of the article. A comment about the WHO is relevant and there is some structure and coherence in the account but the response is rather basic.

Question 4 5 marks

This question asks learners to suggest any potential areas for further development and/or research of the issue.

As this question carries only 5 marks, learners are wise not to spend too long answering it. A vague long list of areas for development and research will not score highly but a shorter list integrating relevant knowledge and ideas of how this further development would be of use will obtain a higher score.

Some learners still entirely misinterpret the focus of this question and talk about how the presentation of the articles could be improved by, for example,

including more graphs and tables of data or using more paragraphs. This approach is irrelevant and not answering the question.

Many learners made vague recommendations for areas of further research and development but did not elaborate on them. For example, many said plant more trees around schools, but a better response would have been to say that research to find out which types of trees would be more effective at absorbing pollution should be carried out first. Other ideas offered were 'ban diesel cars' but no discourse as to the research and development needed to provide ecologically sound alternatives – such as electric vehicles that could be powered by electricity not produced by fossil fuels or research to find out if countries can produce enough electricity to run all of these vehicles. Some responses alluded to more research being needed to find the effects of diesel pollutants on fetuses but some learners did not seem to realise that their suggestion of exposing pregnant women to diesel fumes and see what happens, is not ethically sound. There were several areas in the article from which learners could choose, such as the costs and practicalities of having more charging points for electric cars, the development of transporting goods (by diesel powered vehicles) at night but that there would first need to be research into the harmful effects, on the drivers, of such shift work. Some learners produced very good responses and demonstrated that they had done some research to find out about mitigation measures in place in other countries and suggested that these could be adopted here. Such measures included better urban and industrial planning and more strictly enforced air quality monitoring and regulations. Some learners cited the Xian tower experiment in China – a seven metre tall tower that sucks up polluted air and cleans it at the nano level and turns the carbon from particles into diamonds. These responses demonstrated that the learners had used their preparation time well. Other responses that indicated research by learners referred to building materials that absorb and break down pollution, as found in Mexico city and Milan. Cement containing a catalyst, titanium dioxide, when exposed to UV light, breaks down air pollutants to harmless compounds. This material can be shaped and used on the exteriors of large urban buildings. Some learners were a little confused and thought the material was limestone but they had apparently researched some of the more innovative solutions to the problem.

This response achieved top of band 3 with 5 marks

- 4 Suggest potential areas for further development and/or research of the scientific issue from the three articles.

(5)

There are many implications that are associated with using diesel in order to fuel cars. However across all three articles there is evidence that suggest that there are potential areas for development and research in order to reduce the negative impact.

Firstly, using ~~the~~ diesel requires fossil fuels to be burnt which can have a negative environmental impact as CO_2 is a product of fossil fuels burning this will eventually lead to an increase in global warming which will in turn have a negative impact on future generations quality of life as well as wildlife and their habitat. However if research is put into how we can efficiently use and extract fossil fuels as well as alternatives for fossil fuels and how fossil fuels are stored then there can be further development into using diesel to fuel cars without it having a negative impact.

Also the government can put in funds to research how the air pollution caused by diesel emission can be reduced ~~by~~ for example investing funds into buildings like the "Grand air tower China" which can be put in other major populated areas to reduce air pollution.

In areas that are over populated or busy laws can be introduced such as the hours in which vehicles are permitted to operate in certain areas like schools and build more places where bikes can be stored in order to encourage people to ride bikes or walk to their destination.

This will in turn encourage people to not drive unnecessary as well as being harmful to the health of people as less cars mean less CO₂ emissions leading to cleaner air so less cases reported that is a result of air pollution also educating people on the benefits that walking or cycling instead of driving will have on their overall health.

Using reward schemes for example discount given for those that swap their diesel car for an electric car as well as giving those that transport without a vehicle motor free bus or train ticket for every 10 000 steps. These will encourage people to reduce the use of their car meaning less CO₂ emissions and less air pollution as well as reducing idle time especially in public areas to reduce the level of polluted air.

The government as well as ^{private investors} ~~research scientists~~ can invest money in order to increase the development of electric cars by allowing scientists to carry out research into how cars can be fuelled by other things like water and how to make it more durable. Also by developing electric cars more areas for charge while parking or portable form of energy should be introduced. Therefore it will be convenient and accessible to everyone making them want to purchase these cars. The energy used to charge cars are sourced by renewable form of energy is another potential area for development.

For introducing stricter laws for car maintenance will ensure that there is less emission of toxic gases into the air.

For the residence to wear masks to reduce the effect of developing health problems like asthma from polluted air.

(Total for Question 4 = 5 marks)

The response is well structured and developed. It is in clear sections, selecting areas of interest that are discussed coherently. Each section takes a relevant

point and identifies how it could be further researched and developed, with clear suggestions as to how or why this should be done. Despite being a little too fixated on carbon dioxide emissions rather than particulates, there is evidence of other research and reading to exemplify the points made, for example reference to the giant tower in China, and exploration of potential benefits beyond what is established in the three articles.

This response achieved band 2 with 3 marks

- 4 Suggest potential areas for further development and/or research of the scientific issue from the three articles.

(5)

In the three articles there are ideas mentioned to help improve the air quality and air pollution, however, there are areas for development and research to help see if the ideas suggested actually work.

In article 3, the idea was suggested to plant more trees. It is known that trees are able to reduce air pollution. The idea of planting more trees is cost effective to tackle ~~an~~ urban air pollution. ~~It can~~ Trees also shade buildings, therefore, reduce the need for air conditioning which reduces fossil fuels ~~consum~~ consumption, reduces heart attacks, strokes, asthma, and therefore help to make people healthier and improves ~~neighbour~~ neighbourhood air quality. Trees may take up space, however, can increase wildlife and are positive for the environment.

Another area for development is the idea of electric cars. Plug in vehicles help to keep the town and world clean and produce fewer emissions that contribute to climate change. The only issue is economically, the electric cars are expensive to make, however, will eventually be a money saver and help to the environment.

In article 3, air cleaning systems are also mentioned to reduce indoor pollution. ~~The~~ Much more research would need to be made to ensure the system actually works and doesn't use a lot of energy, therefore, it's good for the environment.

In article one, Sadiq Khan is suggesting a sum of up to £3,500 per ~~car~~ car and van ~~to be taken off the road~~. Government should come up with schemes and new ways to public transport to help lower air pollution, plus benefit the people.

The response has good structure and provides a coherent discussion around each point. Although the areas are relevant there is little additional development of the points beyond what is mentioned in the articles.

This response achieved band 1 with 1 mark

- 4 Suggest potential areas for further development and/or research of the scientific issue from the three articles.

(5)

Article 1
~~Article 1~~ Improve

Article 1 can be improve by adding real life studies to support the issue. The studies should explain how the chemical in ~~diesel~~ diesel fumes affect us. They can also compare their finding to another to ~~check~~ check the validity of their results.

Article 2 can improve by using statistics and table to ~~re~~represent the data. They can also explain the effect of diesel fumes on normal people then compare that to people with respiratory diseases to highlight that the effects is worst in people with respiratory ~~syst~~ diseases. They can also search ~~at~~ which areas ~~are~~ are affected greatly and how and why the areas ~~are~~ are affected.

Article 3 can improve by exploring the possible alternative to diesel fuel. By exploring other sources, people can be encouraged to switch from diesel to for example electric cars. Also explain why is the other

source better than diesel. Show and explain the benefits of the other sources. Some sources they can research are electric, gasoline and other ways of transport like a bicycle.

The learner has written about improvement of the articles instead of areas of development and research with the issue. However, there are comments that suggest some relevant developments such as comparing the effects of diesel between people with and without respiratory problems and between people in different areas of the country.

Question 5 15 marks

In this question learners were asked to imagine that they were journalists for a local newspaper and were writing an article about the advantages and disadvantages of a proposed ban of diesel cars, in the year 2025, from the city centre.

Learners were told to use information from all three articles and to consider the audience, what they want readers to learn from the article and whether diesel cars should be banned – in other words, to reach a conclusion.

As this article is for a local newspaper it should neither be too scientific nor too sensationalised and lacking content. Ideally it should have an attention-grabbing heading and explain the pros and cons of banning diesel cars. In the pros (of banning) section should be information as to why diesel poses a threat to health, together with supporting evidence, so that the article is not just opinion-based.

The article should be coherent and logical and structured so that some advantages and disadvantages of banning diesel cars are discussed and a conclusion reached. Scientific evidence should inform the article and any terminology used should be explained as many in the audience will not be very scientifically literate but neither should they be patronised.

Unfortunately a significant number of learners misinterpreted the question and wrote instead about the pros and cons of diesel as a fuel for vehicles, rather than the pros and cons of banning diesel cars. Many responses discussed the health impacts of diesel pollution and discussed at length the advantages, therefore, of banning diesel but failed to address any potential drawback of banning diesel cars such as possible loss of trade as owners of diesel-powered car owners take their custom to another town, or the cost of having to provide better public transport or of financing a diesel scrappage scheme, the investment for developing more efficient electric cars, increasing the generation of electricity to meet the increased demands, including making sure that the national grid can cope, and increasing the number of electric charging points; there would also be a cost of replacing trams, taxis and buses and in investing in increased production of green energy. Advantages of banning diesel-powered vehicles include reducing exposure to harmful and carcinogenic pollutants, reducing exacerbation of respiratory problems already suffered by many members of the population, reducing harmful effects upon the fetus when pregnant women are exposed to diesel pollution, reducing the effect on children, whose brains and lungs are still developing, when walking to and from school or playing outside and therefore reducing health costs for treatments; some increase in job opportunities as more electric vehicles will need to be manufactured, although fewer diesel cars will be manufactured. Any other valid responses made by learners were also credited. Not all of the indicative content in the mark scheme has to be covered.

This response achieved top of band 4 with 15 marks

5 You are a journalist working for your local newspaper.

Your local council wishes to ban diesel cars from your city centre next year.

Your task is to write a newspaper article about the advantages and disadvantages of banning diesel cars from your city centre.

Your article will be read by your local community. Many of your readers will not be scientists.

Use information from the three articles to write your newspaper article.

When writing your newspaper article, you should consider:

- who is likely to read the article
- what you would like the readers to learn from the article
- whether diesel cars should be banned nationwide by 2025.

(15)

Putting a Stop to diesel!

Currently we are in the 21st century and all the road rage is about diesel. It started off as a blessing but is now causing a major threat on a global scale. There are people who may not be familiar with the diesel ^{catastrophes} ~~catastrophes~~, so this news article is to familiarise the issue and explain the advantages & disadvantages of banning diesel powered cars. As 5.3 million deaths occur each year

What is ~~diesel air pollution?~~ diesel air pollution?

As the name suggests, diesel air pollution is your car causing harm to the environment and to man kind. This is specifically due to ^{the amount of} diesel powered cars ~~drastically~~ rising. It was initially thought to be the best thing road users would come across as it was a much more cheaper alternative to the classic, more expensive, petrol.

Once car manufacturers saw diesel as an opportunity to increase their revenue, they began to hatch schemes to make their money ~~while~~ ^{whilst} knowing the risks. The most famous of these is the Volkswagen scandal.

Diesel air pollution contributes to over 50% of the global warming that the earth faces. Did you know that it has a negative impact on the people as well?

This is because diesel ~~emissions~~ ^{emissions} causes ~~an~~ ^{all} harmful nitrogen gases to be produced, called NO_x , and the people who are most at risk are the elderly and the young. To begin with elderly aged people already suffer from diseases such as asthma and severe chest infections, just add poisonous gases to the air and the ^{potent smell} ~~spread~~ of fast deaths will begin to spread. Secondly, we say children because of the fact that between ages 0-5 children are still ^{very} ~~premat~~ and need to develop properly, this causes them to develop major respiratory problems and suffer from a young age.

Thankfully the local council and the rest of the world are willing to help ban diesel vehicles by next year and have a diesel free future by 2025. This brings us on to the advantages and disadvantages of banning the vehicles.

Advantages of banning diesel powered cars.

The future of flying cars that we all imagine isn't here yet however hybrid and electric cars are the next best thing on the way. Banning diesel cars is not new as we have learned from Paris, it's just a matter of time until it happens globally. For the people, the best idea would be to sell diesel cars rather than ~~scrap~~ ^{scrap} them and lose out on money. Well the biggest advantage out here is that companies are being set up so that ~~the~~ people can turn their cars in and get paid large amounts for the vehicles, even though they will be depreciating due to their age. ~~source~~ ^{should} This ~~will~~ cause most of society to start changing their vehicles and ~~bring~~ ^{have} a great spin off to a brighter future. Electric cars are the best alternative as they can be charged anywhere from the airport up your ~~house~~ ^{house} at low prices. Some fuel stations even ~~offer~~ ^{offer} renewals, such as free charging for not charging your vehicle with them. Petrol vehicles will still be kept as well, for most of the

A Society that use petrol engines, this is a good thing because petrol emits less gases. These should theoretically cause global warming to decrease by around 50% and families will be able to live in peace.

Disadvantages of banning diesel!

Along with the good there are also bad things that follow.

To begin with the main concern is that if society will not want to adapt to this change, this could result in temporary riots and street rage outside of the authorities head quarters. Also, another disadvantage is that car manufacturers will lose out on lots of money so they will increase the price for the permitted vehicles, causing people to pay more on a car that uses petrol as a more expensive fuel source. Finally, the last disadvantage is that petrol is a non-renewable ^{fuel} and with so much people going to switch, it will run out over 2x faster than it is estimated to. This will ~~lead~~ lead to another future switch to a completely ~~electric~~ ^{electric} future.

To conclude diesel cars should be completely banned by the world as they are causing a major threat to humanity ~~humanity~~ and the planet. If it is not stopped now then it will only take longer to ~~stop~~ ^{put} an end to it. I hope this news article was good advice and will help you to make the best overall decision.

The learner has provided a response that is appropriate for a local newspaper.

There is a relevant attention-grabbing title, an introduction that is engaging and with sub-sections that address questions or issues that would be relevant to a general reader. Some advantages and disadvantages are discussed, in detail, with coherence and logic. The article reads as being well informed and uses key examples from the three articles. It synthesises relevant facts, scientific information and opinion and reaches a conclusion.

This response achieved lower end of band 3 with 10 marks

~~Exhaust fumes can be a silent killer. They~~
exhaust fumes can be a silent killer. They
can cause diseases such as ~~asthma~~ asthma
and other lung diseases. ~~Our~~ Our local
city is planning to ban ~~the~~ diesel cars
from our city centre next year.

An advantage of banning diesel cars
is that the local council can save
money on treatment for lung diseases.
It is estimated that there are 11,940 early
deaths each year^{due to diesel pollution}. This is because diesel
cars release greenhouse and other toxic gases
into the environment. these gases can
get into the lungs and cause tissue
damage. They can also trigger asthma in
people who are sensitive to lung problems.
This ~~can~~ ^{ban} could save the council money because
there will be less people needing treatment
for lung problems so the money can
go into medicine for other diseases.

A disadvantage is that a diesel ban
could cause more people to buy electric cars
which although ~~are~~ are more environmentally
friendly require charging points which can

be expensive ~~*~~ for the council. This means that more people might need to buy home chargers which could be expensive for the local public.

An advantage for banning cars in the city centre is that shopping will be more enjoyable. We can have more open stalls and local produce available at the market because there will be less pollutants. This ~~to~~ makes the outdoors a more enjoyable place because we are able to breath better increasing the time we spend outdoors. This is also great for children as pollutants have links to athsma in children this means that they can enjoy themselves exploring the world instead of stuck in doors playing computer games helping there developement.

A disadvantage is that if cars are banned other methods of reducing pollution such as planting trees could be given up on as the council might feel that they have done their part.

This would mean that the pollution won't be reduced because the other ways of reducing pollution will be gone

~~In conclusion planting & banning trees has many environmental advantages~~

The government is also debating whether diesel cars should be banned nationwide by 2025. An advantage is that this would significantly reduce the countrys carbon footprint. However this could cost customers alot of money as they will have to buy new cars. However Sadiq Khan has proposed to offer £3,500 ~~to~~ for diesel cars which will reduce the cost

In conclusion banning diesel engines has many environmental advantages and can also give people a better quality of life free from illness. However thought on the consumer needs to be taken into account.

The article has amplified some relevant points and there is a good summary of the main points with supporting and conflicting statements. Whilst the structure is not really that of a newspaper article, there is a good structure and a clear conclusion.

There are attempts to synthesise information but little audience awareness. The response is mostly clear, coherent and logical.

This response achieved lower end of band 2 with 6 marks

The Ban of diesel CARS

Shattered Dreams

Diesel was the dream fuel, promoted by governments and the car industry as a cheaper way to save the planet. It was believed that diesel was a more sufficient fuel than petrol or any other fuel. However, it wasn't long before the cracks started to appear!

Diesel: not only killing our planet but also killing ~~as children~~ US!

~~It has been stated~~ Diesel is the worst culprit amongst the fuels as it's ^{emissions has} ~~has~~ killed 3.3 million people ~~prem~~ 'prematurely' every year. This is more than HIV, malaria, & and influenza combined. Before we know it there

will be ~~no~~ no one left on the planet...

It's coming after our CHILDREN .

~~We have been~~ Research shows children suffering from ~~the diseases~~ such as fetal growth due to the exposure to the air pollution. The death of infants increasing and it's currently really high. If the children to survive they will later have to battle Cardiovascular diseases.

What will happen to our future.

The planet will become polluted with ^{more} toxic air ~~then~~ increasing death rates and causing more illnesses. It eventually get to our food when the animals eat the plants that have absorbed the rainwater which has been mixed with the toxic gases. When the plants ~~or~~ animals be consumed it will cause more illnesses.

The youth will no longer be able to provide for the family in future.

Not only this the health care will become almost impossible afford or access.

~~The~~ Though diesel~~s~~ has improved our economy ~~as~~ due to its cost efficiency price meaning that everyone can afford it. It has made a huge difference in buying fuel as petrols prices are sky ~~rocketing~~ rocketing. However, this is not enough to keep the diesel~~s~~★

Overall, diesel should be banned by 2025 if ~~we~~ want to watch our kids live a complete and a good quality of life. For ~~too~~ cheap fuel we ~~shouldn't~~ risk many lives especially of those very dear to us. Further, we must think about home the EARTH we are killing our only home to save a few dollars and make profit. Therefore, we should try and opt for more friendly options such as taking the public transport or riding ~~on~~ a bike or walking when ~~also~~ making shorter trips. It's good for the environment as well if our health! →

* Since 2011 the ~~the~~ exhaust emissions from the diesel engines is higher than the ~~required~~ ^{required} amount which means ~~people~~ ^{companies} have been coning the system to make profit. One of these ~~car~~ ^{cars} is Volkswagen who admitted they cheated on the emissions test. This company still running till date. it cannot said what action as been taken but David King the UK government's former Chief Scientific adviser on climate change has admitted the ministers made a mistake in trusting the car company. ~~Prime Minister, Theresa May~~ ^{the government} is aware of the hypocrisy and intends to resolve this matter however, Prime minister, Theresa May is ~~of~~ conscious about the public that has been encouraged to buy diesel powered cars which may be difficult to eradicate from their minds that diesel is not the fuel.

The response starts with a snappy title but there is considerable verbatim copying from the articles and a lot of hyperbole. The account lacks balance and does not reach a sound conclusion.

This response achieved band 1 with 3 marks

Diesel cars which were to be said to reduce carbon dioxide emissions actually ended up increasing the amount of emissions, therefore greenhouse gases have increased and the global warming has gotten worse. However there is a solution to stop this from affecting future generations.

Banning diesel cars will reduce CO₂ emissions however the climate will still continue to change and temperatures will remain high for many centuries as cutting CO₂ will not immedi immediately stop the planet from warming up. 1 reason for this is that 90% of the warming has gone into the ocean in the last 50 years. It takes many many years for the ocean to heat up but if you stopped adding heat, it will still give off heat which was previously added then the ocean will continue to expand ~~causing~~ resulting in higher sea levels. This will then lead to natural disasters such as flooding.

Another reason why the earth will still stay warm is because CO_2 molecules stay in the atmosphere for a very long time creating 80% of the global warming. By using renewable energy (which doesn't consist of CO_2 particles) such as, solar power and wind power then this could benefit our health as many people, especially children, are inhaling polluted air resulting in ~~to~~ lung cancer or heart disease. These deaths have occurred more in developed countries such as the UK and USA as they produce lots of CO_2 from ^{factories in} industry, therefore ^{they have} ~~there is~~ more polluted air.

The ecosystem and the environment will also benefit from using renewable energy as less fossil fuels are being burnt which means that less construction will take place. However a disadvantage of using renewable energy such as wind turbines means that ~~the scenery~~ some land may need to be used up so some plants are affected and the scenery is disturbed as well. (<https://youtu.be/A4KX9XKGeEw>)

By switching to electric cars from diesel cars the emissions will reduce. If people use electric cars, the parking will be cheaper and they will also be able to drive in the bus lane. An advantage of using an electric car

Instead of a petrol car is that electric cars have a rechargeable battery which stores energy when charged. They can be charged by ^{renewable} electricity such as solar power. This electricity will help to rotate the wheels and will be more efficient than driving a petrol / Diesel car. However a disadvantage of charging the car with solar power is that sometimes it may not be sunny so less electricity might be produced so they must use other way by which people can charge their cars: (<https://www.google.co.uk/amp/s/www.bbc.co.uk/newsround/amp/50135750>).

Although the response is clearly communicated it is not really addressing the issue.

It has included incorrect information about carbon dioxide emissions and irrelevant information about global warming. Had the account focussed on NO_x gases as being greenhouse gases the inclusion of that would have had some relevance.

Summary

Based on their performance on this paper, learners should:

- Use their preparation time well to familiarise themselves with the content of the three articles and also do some research into potential areas for further research and development and possibly find out if any other investigations support the conclusions made in article 3
- Always read the question carefully and make sure they are including material that is relevant and that addresses the question. This is always important but particularly so for question 5 where the scenario/type of article required will change from session to session.
- Not spend so much time on one question that they are short of time for the other questions.
- Always try to synthesise the information they wish to include into a logical, coherent and clear response that is easy to follow. Try to avoid an article by article or implication by implication approach for question 1.
- For question 2 they need to suggest *how* the organisations and individuals they have selected may influence the issue.
- For question 3, learners should not limit their account to generalised comments about references, peer review, and authenticity of sources and data; they need to relate all of these to the conclusions drawn in article 3, about the issue.
- For question 5 learners should read the question very carefully and make sure they know what is being asked so they can decide on the focus of their response and tailor their article to the type of audience cited in the question stem.
- Use appropriate scientific terminology throughout as appropriate.

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