**ATAR HUMAN BIOLOGY UNIT 2**

**TASK 9 – Effect of Lifestyle Choices Extended Response**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 5%**

**DUE DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MARK:**

The following assessment is comprised of two parts.

* Part 1 – one-week take home research (25%)
* Part 2 – in-class scientific article analysis and presentation (75%)

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| **Take-home research notes** | 25% |  |
| **Peer-marked Presentation** | 10% |  |
| **Annotated Article** | 65% |  |
| **TOTAL** | |  |

**PART 1 25%**

When a woman becomes pregnant, she may need to make some changes to her normal lifestyle. This is because certain lifestyle factors can negatively affect the development of her baby.

**Your task is to create a set of research notes about how alcohol, smoking (the chemicals in cigarettes and their impact), diet (looking at the importance of different nutrients), codeine and exercise can impact foetal development.**

Remember, research notes are NOT detailed paragraphs about the content. Your research should be presented as concise, summarised dot points on each topic and include the sources used to obtain your information.

**PART 2 75%**

One of the most important skills you learn in science is the ability to critically analyse information. You do this by analysing sources of information and evaluating how valid and reliable investigations are. Critical analysis should be done with information from magazine articles and peer-reviewed journal articles alike.

**You will be presented with an article about how a lifestyle factor affects foetal development. Your task is to read through and critically analyse the article. You will then present a brief (3-minute) oral presentation to some of your peers, during which you will present an argument about whether the article is a useful source of information.**

Your peers will then give you a grade for your presentation (10%), and you will submit your annotated article to your teacher for further assessment (65%).

**PART 2 BREAK DOWN**

**5 minutes**

1. Read through your article. Highlight any key information about the experiment and its findings.

**15 minutes**

1. Write a brief summary of the experiment, with the aim of explaining all relevant details to somebody else. (one paragraph)

**5 minutes**

1. Go back through the article, this time critically thinking about the validity, reliability and ethics of the experiment. Highlight, in a different colour, any key information about the validity, reliability and ethics. Remember to not just look at the nature of the experiment, but how closely the findings relate to your own research from Part 1.

**25 minutes**

1. Annotate each point you’ve highlighted on the sheet about the validity, reliability or ethics of the experiment. Next to each point, write a brief explanation about why this point made, or did not make, your article valid, reliable or ethical. You should aim to have at least 10 points explained.
2. Where relevant under each point, **add** a suggestion for a way to improve this aspect of the experiment.
3. Add your annotations to the article neatly, ready to submit to your teacher as these will be marked.

**20 minutes**

1. You are now going to prepare a 2-3 minute presentation to your peers. Your presentation should include the following:
   * A summary of what the experiment was, and the results found.
   * An argument as to whether the experiment is a useful/reliable source of information for expectant mothers; this should discuss how the experimental findings relate to the information you researched in Part 1 as well as the quality of the experiment.
   * A brief conclusion.

Your peers will then mark you according to how well you spoke, how organised your presentation was and how strong your argument was. This will contribute only a small portion of your grade, as most of your grade will come from your teacher’s assessment of your annotated article.

**HOW TO ASSESS YOUR PEERS**

In this assessment you are presented with the opportunity to assess your peers. You need to write a compliment and a point for improvement. In doing this, there are a couple of important things to keep in mind.

1. Read the rubric carefully and mark you peer according to the standard they most closely achieved.
2. Do not mark based on anything other than the presentation you observed.
3. You do not know everything yourself. Be mindful of how you word your feedback as to not sound condescending or cruel.
4. This is an opportunity to support your peer. Give them some feedback that will genuinely help them to improve their presentation and argumentation skills.

This is an opportunity for you to step into the teacher’s shoes and learn how we assess your work normally. It is also a chance for you to practise a skill you will likely use at university – peer assessment.

*Be respectful, be objective and be constructive – we are all here to learn.*

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| **PEER MARKING RUBRIC FOR PRESENTATION Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | | | |
| **Description** | **A - 4** | **B - 3** | **C - 2** | **D - 1** |
| **Argument Strength** | Analyses issues and presents well-developed arguments which are supported by evidence. | Presents well‐developed arguments which are supported by evidence. | Presents arguments or statements supported by some evidence. | Presents statements of ideas with little development of an argument. |
| **Organisation** | Communicates detailed information and concepts logically using correct terminology. | Communicates some information and concepts logically, using correct terminology. | Communicates information and concepts, without detail, using some correct terminology. | Communicates little information and uses everyday language. |
| **Communication** | Speaks clearly, at a good pace and maintains eye contact. | Sometimes speaks clearly, at a good pace and sometimes maintains eye contact. | There were a few moments when they spoke clearly, at a good pace and maintained eye contact. | Does not maintain eye contact, speaking is difficult to follow. |

**Feedback (compliment and constructive criticism). /12**

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**Marking Guide**

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| **SMOKING Description** | **Marks** |
| Mentions toxins - the nicotine, [carbon monoxide](https://www.webmd.com/webmd/consumer_assets/controlled_content/healthwise/medicaltest/carbon_monoxide_co_medicaltest_hw3942.xml), and numerous other poisons found in cigarette | **1** |
| Mentions how toxins are transported - carried through your bloodstream and go directly to your baby. | **1** |
| Four ways smoking affects the foetus that are described:  [Smoking while pregnant](https://www.webmd.com/baby/smoking-during-pregnancy) will:   * Lower the amount of oxygen available your growing baby * Increase your baby's [heart rate](https://www.webmd.com/webmd/consumer_assets/controlled_content/healthwise/medicaltest/pulse_measurement_medicaltest_hw233473.xml) * Increase the chances of miscarriage and stillbirth * Increase the risk that your baby is born prematurely and/or born with low birth [weight](https://www.webmd.com/webmd/consumer_assets/controlled_content/healthwise/special/weight_management-are_you_at_a_healthy_weight_special_aa126305.xml) * Increases risks of [birth defects](https://www.webmd.com/webmd/consumer_assets/controlled_content/healthwise/special/birth_defects_testing-topic_overview_special_uf6261.xml) eg cleft lip or palate, damage to lungs, brain and blood * Increases risk of [Sudden Infant Death Syndrome](https://www.webmd.com/webmd/consumer_assets/controlled_content/healthwise/special/sudden_infant_death_syndrome_sids-topic_overview_special_hw266674.xml) - affect the baby's central nervous system and impair the baby's cardiorespiratory responses to stressful environments – damage receptors in womb | **1-4** |
| **Total** | **6** |

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| **ALCOHOL Description** | **Marks** |
| Alcohol easily travels in blood stream and crosses the placenta – small amount in Mum – huge amount in baby. | **1** |
| Alcohol is a teratogen | **1** |
| Ethanol effects:   * Increased oxidative stress – damage to lipids, DNA and proteins * Prevent differentiation during organ development * Disturbed glucose, protein, lipid and DNA metabolism; * Impaired neurogenesis and increased cellular apoptosis, especially of neural crest cells; * Endocrine effect – effects cortisol levels * Effects on gene expression. * Early pregnancy when brain and spinal cord develops – * alcohol inhibits development. Inhibits organ development as well | **1-2** |
| 2 marks for two symptoms of FASD   * abnormal features * small head * poor brain function (coordination, poor memory, learning difficulties, vision and hearing problems * problems of heart, kidney and bones. | **1-2** |
| **Total** | **6** |

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| **CODEINE Description** | **Marks** |
| Slight increased risk of Caesarean delivery and post-partum | **1** |
| Links cannot be made as reasons why mother would take codeine may be underlying reason for complications not the codeine. | **1** |
| **Total** | **2** |

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| **EXERCISE Description** | **Marks** |
| 2 points about how exercising can affect the foetus:   * When exercising reduced blood supply to placenta as nutrition and oxygen going to exercising muscles in mother * Use of glucose during exercise – less for the baby * Overheating main issue – high temperatures affect differentiation of cells and growth. Harder to cool down when pregnant * Exercise relative to what did before – more benefits as ensures good blood flow and metabolism of mother – ensures good blood flow to placenta for baby. | **1-2** |
| Indicates that it has to be strenuous exercise that can have a negative affect:  *Extreme strenuous exercise in first trimester can increase risk of miscarriage eg weight lifting. Extreme exercise and lack of nutrition will affect development as not receiving the nutrition it need* | **1** |
| Links benefits outway the negatives | **1** |
| **Total** | **4** |

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| **DIET Description** | **Marks** |
| 4 marks for four factors that can affect the foetus and what they effect.   * Folate – lack of causes neural tube defects, spinal cord and vertebrae defects eg spina bifida, helps cell division * Calcium – lack of can cause poor cartilage and subsequent bone development * Protein – lack of = poor blood vessel development in brain * Vitamin B12 – needed for cell division, comes from animal products * Low vitamin C = abnormal heart development * Low D = poor development of growth and bones * Iron for Red Blood Cell development/haemoglobin * Low K = poor development of face and teeth * Avoidance of foods that can contain harmful bacteria eg soft cheeses as bacteria makes toxins that can kill cells/interfere with growth. Can contain listeria, cause toxoplasmosis – can be life threatening/cause birth defects | **1-4** |
| Comment about specific diets and how they may affect the foetus   * *Vegan diets lack animal products and can severely affect health of foetus – need a very careful diet* | **1** |
| **Total** | **5** |

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| **PART TWO – IN-CLASS ARTICLE ANALYSIS** | **Mark** |
| **Experiment Summary**   1. Summary includes some relevant details, possibly includes irrelevant or inaccurate information too. 2. Summary includes most relevant details, some points missing. 3. Summary is comprehensive and includes all relevant details. | **/3** |
| **Research not matching scientific consensus:**   1. States that the research article does not match general scientific consensus about the impact of alcohol on foetal development 2. States that the research article does not match general scientific consensus about the impact of alcohol on foetal development, and briefly describes why 3. States that the research article does not match general scientific consensus about the impact of alcohol on foetal development and comprehensively explains why | **/3** |
| **Any 8 of the following** | |
| **VALIDITY. Hypothesis not testable**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **VALIDITY. Method not matching aim (length of exposure to substance):**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **VALIDITY. Method not matching aim (exposure to different wines):**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **RELIABILITY. Lack of repeat trials**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **RELIABILITY. Participants sample size:**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **RELIABILITY. Not including a control:**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **ETHICS. Too young an age of participants**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **ETHICS. Too young an age of participants**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **Reliability. Does not mention when babies were born.**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **ETHICS. Alcohol during first trimester.**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **RELIABILITY. Alcohol can affect beyond birth – not tested though.**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **RELIABILITY. Data Presented in wrong graph:**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **VALIDITY. Healthiness Scale is a poor measure.**   * Identifies problem * Explains why it is poor science * Describes an improvement |  |
| **RELIABILITY. Conclusion does not match what data states:**   * Identifies problem * Explains why it is poor science * Describes an improvement | **/3** |
| **TOTAL** | **/30** |

**Curriculum Points**

Extended response

Tasks requiring an extended response can involve selecting and integrating appropriate science concepts, models and theories to explain and predict phenomena, and applying those concepts, models and theories to new situations; interpreting scientific and/or media texts and evaluating processes, claims and conclusions by considering the quality of available evidence; and using reasoning to construct scientific arguments.

Assessment can take the form of answers to specific questions based on individual research; exercises requiring analysis; and interpretation and evaluation of information in scientific journals, media texts and/or advertising.

* for the establishment of a pregnancy, conception requires the union of viable sperm and ovum at the optimal time in the ovarian cycle
* epigenetics is the study of phenotypic expression of genes, which depends on the factors controlling transcription and translation during protein synthesis, the products of other genes, and the environment
* lifestyle choices, including diet, illicit drugs, alcohol and nicotine, may affect foetal development
* communicate to specific audiences, and for specific purposes, using appropriate language, nomenclature, genres and modes, including scientific reports
* interpret a range of scientific and media texts, and evaluate processes, claims and conclusions by considering the quality of available evidence; and use reasoning to construct scientific arguments

Ethical understanding

Students evaluate the ethics of experimental science, codes of practice, and the use of scientific information and science applications. They explore what integrity means in science, and they understand, critically analyse and apply ethical guidelines in their investigations. They use scientific information to evaluate the claims and actions of others and to inform ethical decisions about a range of social, environmental and personal issues and applications of science.

**Personal and social capability**

Personal and social capability is integral to a wide range of activities in human biology. Students develop and practise skills of communication, teamwork, decision-making, initiative-taking and self-discipline with increasing confidence and sophistication. In particular, students develop skills in both independent and collaborative investigation; they employ self-management skills to plan effectively, follow procedures efficiently and work safely; and they use collaboration skills to conduct investigations, share research and discuss ideas.

Critical and creative thinking

Students interpret and evaluate data; interrogate, select and cross-reference evidence; and analyse processes, interpretations, conclusions and claims for validity and reliability, including reflecting on their own processes and conclusions.

Information and communication technology capability

Students use a range of strategies to locate, access and evaluate information from multiple digital sources; to collect, analyse and represent data; to model and interpret concepts and relationships; and to communicate and share science ideas, processes and information.