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| **Qualification** | | Pearson BTEC Level 3 National Extended Certificate in Applied Science |
| **Unit number and title** | | Starter Assignment |
| **Assignment title** | | Investigating the spread of pathogens via droplet transmission and steps that can be taken to minimise the spread. |
| **Assessor** | | Mr. S Vale |
| **Vocational Scenario or Context** | | Pathogens can spread through a wide range of methods, however the novel coronavirus Bob 79 seems to mainly be spread via droplets transferred from person to person.  You have been asked to provide a summary for your school of how droplets are transmitted and various methods people can use to minimise that transmission. You also need to include a method about making hand sanitiser and how the % of alcohol in them kills the virus.  **Remember it is not recommended to make your own hand sanitiser at home.** |
| **Task 1** | | Your task is to write a brief report on how pathogens can spread and investigate the different ranges that droplets can be transferred from a whisper, shouting, a cough and a sneeze, then discuss different methods that can be used to minimise the spread of the virus.  The first section should be an introduction to the different types of pathogen, and how they can be spread.  The second section should look at the different methods droplets can be transferred, their range of travel and how droplets can infect people. It would good to include any diagrams that you thing are relevant. Just remember if you get a diagram from the internet or any other source you must reference where it came from.  The next section is to look at 3 different methods of reducing how droplets can be transferred.  Think about any advice that has already been published on this topic and create a summary of each method that is recommended, and how effective it is at helping to reduce the transfer of droplets from person to person.  This section can also make use of any other methods you come across in your research but every method must have a reference to where you found the information.  Finally, you must include a full reference list of where you found your information and any diagrams. An explanation of how to reference will be available to help. |
| **Task 2** | | The WHO has released guideline for small businesses to be able to make hand sanitiser to supplement a shortage that has occurred. The list of chemicals and the basic method is provided in the attached WHO guidance.  Schools have been looking at if it is possible to make it themselves and have been provided with sterile equipment and the required chemical to make it.  Your task is to write a step by step method to make the hand sanitiser.  **you must include**   * A list of any laboratory equipment that would be available in any school. * A risk assessment of each chemical and how to handle them safely.      * A clear method that would successfully make the sanitiser      * A method for testing the alcohol concentration of the sanitiser to check that it is above the 60% by volume, amount of alcohol required to kill the virus. * You are given a range of different concentration alcohols. Calculate which alcohols can be used to make the sanitiser and which, if they were used, would not be effective. * A reference section for any sources of information you have used. |
| **Checklist of evidence required** | | **TASK 1**  The report should contain:   * A section on the different types of pathogens and how they can be transferred. * A section on the different range and methods of droplet transfer and how those droplets can infect people (and any diagrams). * A section on at least 3 different methods of reducing the rate of transmission from droplets, each method should have an explanation of how it works and how effective it is at stopping the disease being spread. * A references section at the end detailing where you found your information.   **TASK 2**  The report should contain:  An introduction on how alcohol gel kills bacteria and the minimum % of alcohol per 100mL (%volume) is needed for it to be effective  An equipment list.    A step by step method to make the hand sanitiser  A method for testing the alcohol concentration of the hand sanitiser.  Clearly laid out calculations.  A reference section. |
| **Criteria covered by this task:** | | |
| Unit/Criteria reference | To achieve the criteria you must show that you are able to: | |
| A.D1 | Two fully referenced reports detailing how droplet borne diseases spread and clearly explained methods of the reduction of the spread, with appropriate diagram. A valid method for making hand sanitiser in schools with a risk assessment, testing methods and clearly laid out calculations. | |
| A.M1 | Detailed explanations of droplet transfer by different methods and how to reduce the spread with 3 methods. Referencing is clearly laid out.  A valid method and testing of alcohol concentrations, with correct calculations, and risk assessments. References where required. | |
| A.P1 | A report that explains briefly, how diseases transfer via droplets and limited explanations of how to reduce the spread using 1 different method  A clear method for making hand sanitiser and brief explanation of testing. There is some references. | |
| **Sources of information to support you with this Assignment** | | <https://www.who.int/gpsc/5may/Guide_to_Local_Production.pdf>  <https://www.bangor.ac.uk/studyskills/plagiarism-tutorials/tutorials/v4/GENERIC_EN/story_content/external_files/Harvard_Referencing_Guide.pdf>  <https://www.bbc.co.uk/bitesize/guides/zxr7ng8/revision/1>  <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>  <https://www.livescience.com/are-face-masks-effective-reducing-coronavirus-spread.html>  <https://www.health.harvard.edu/diseases-and-conditions/preventing-the-spread-of-the-coronavirus>  <https://www.gov.uk/coronavirus> |
| **Other assessment materials attached to this Assignment Brief** | | *Appendix A: Required calculations*  *Appendix B: WHO guidance for Handrub formulation* |

**Appendix A: Calculation Sheet for Task 2**

You have been provided with the following alcohols:

1. 98% Isopropyl Alcohol
2. 80% Ethanol
3. 75% Ethanol
4. 72.55% Isopropyl Alcohol
5. 60% Isopropyl Alchohol

Show, by calculation, which alcohols would be suitable to use in the following formulation to make a hand sanitiser that is above 60% alcohol, by volume.

**Basic formulation recipe**

83.33 cm3 Alcohol

4.17cm3 3% Hydrogen Peroxide

1.45cm3 Glycerol

11.05cm3 Water

**Appendix B: WHO – recommended Handrub Formulations.**

*Adapted from* [*https://www.who.int/gpsc/5may/Guide\_to\_Local\_Production.pdf*](https://www.who.int/gpsc/5may/Guide_to_Local_Production.pdf)















