# Candidate 2 evidence

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| 1.a) | Medical Trolley – | |
| | •Stainless steel is suitable for the shelves as it is hygenic and easy to clean, making the trolley safe to have medicine and medical supplies on it without compromising them or dirtying them. | |
| | •Nylon is suitable for wheels as it is durable and self-lubricating, meaning the wheels can move easily on their own without the need for added oil and they won't break if they crash into something. | |
| | •Stainless steel is suitable for the frame as it is non-corrosive and has a good, smooth surface finish, meaning if water or medicine is spilt the trolley will stay intact and it can be washed without becoming damaged. The smooth surface makes it easier to wipe clean as there won't be any bumps or ridges where dirt could get trapped, making it ~~not~~ suitable to be in a sterile hospital environment. | |
| | | |
| | Tool Trolley – | |
| | • ABS is suitable for the shelves and handles as it is flexible, meaning the user can | |

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| | grip the handles without them breaking, making the trolley easier to use and move around. | |
| | • Mild steel is suitable for the side panel as it has a good strength to weight ratio, allowing multiple tools to be hung on the thin panel without it bending or breaking under the weight. | |
| | • Polypropylene is suitable for the tool hooks as it is impact resistant, allowing the user to place heavy tools on the hooks without them breaking on impact, making the user more comfortable to use the tool hooks. | |
| | | |
| b) | • Extrusion and bending has been used to produce the tubular frame of the Medical Trolley. Extrusion is suitable as it means the frame can have the same cross section along it's length as shown. Bending is suitable as it reduces the need for joins, making the frame even stronger and sturdier. | |
| | • Press forming has been used to produce the | |

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| | shelves of the Medical Trolley. Press forming is suitable as the shelves have a simple form made out of sheet metal. | |
| | • Injection moulding has been used to produce the handles of the Tool Trolley. Injection moulding is suitable as the handle is a complex form, has a textured surface finish and would have ribs and webs to provide structural support to the handle. | |
| | | |
| c) | Function | |
| | • Both traleys have wheels, making the trolleys very ~~easy~~ easy to move around. | |
| | • Function has influenced the handles on the Tool Trolley, making the trolley easier to hold onto whilst moving it around. | |
| | • Function has influenced the shelves of both trolleys, meaning the trolleys can hold objects and items with ease. | |
| | • Function has influenced the borders on the shelves on each of the trolleys, meaning items can move around without falling off the | |

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| | side of the trolley. | |
| | • Function has influenced the tool hooks on the Tool trolley, making tools easier to quickly put aware and easier to grab when needed. | |
| | | |
| d) | Benefits: | |
| | • A benefit of standard components is that it saves time for the designer as they don't have to design every component of the trolleys. | |
| | • Another benefit of standard components is that the designer can buy them in bulk, saving money during the production process of the trolleys. | |
| | Drawbacks: | |
| | • A drawback of standard components is that they limit the designers creativity of the design of the trolley as they come in particular sizes and shapes. | |
| | • Another drawback of standard components is that if they fail whilst a user is using the trolleys, the production company who made the trolleys will gain the bad | |

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| | reputation, not the company who produced the faulty standard components. | |
| | | |
| e) | • A physical model created in the design process of the trolleys could be a block model. The benefits of a block model is that it allows the designer to gain feedback on the component from users ips and user trials. For example, the handle of the Tool trolley could have been made into a block model to test the anthropometric data used to create the dimensions of the handle as well as how the user holds it compared to others taking part in the user trial. | |
| | • Another physical model created in the design process of the trolleys could be a sketch model. The benefits of a sketch models is that they allow the designer to create something they couldn't sketch on paper. A sketch model also provides the designer with a sense of scale and proportion of the ~~prod~~ trolleys. The designer could also | |

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| | perform small tests on a sketch model such as a stability test to see if the trolley would remain upright. | |
| 2.a) | Polypropylene is suitable for the safety helmet as it is impact resistant, meaning the helmet could get knocked and bashed into without breaking and would keep the user's head safe whilst wearing it. | |
| | Polypropylene is suitable as it is flexible, meaning the helmet can bend and flex slightly around the user's head to accomodate their head shape without cracking. | |
| | Polypropylene is suitable as it is durable, meaning the helmet could be bashed and knocked multiple times without the helmet becoming damaged or broken. | |
| b) | ~~The~~ A need of the target market is to remain safe whilst using the safety helmet, which has influenced the strap | |

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| | on the helmet, making sure the helmet will stay secure on the child's head. * | |
| | -Another need of the target market is to be comfortable whilst wearing the safety helmet, which has influenced the padding on the inside of helmet, allowing the ~~user~~ child to be comfortable whilst using the safety helmet as their head won't be pressed against hard plastic. | |
| | *-The need for safety has also influenced the hard shell of the helmet, allowing a child to feel secure and safe when bumping into things or falling off a bike. | |
| | Another need of the target market is to be able to wear the helmet for long lengths of time which has influenced the mesh air pockets allowing for breathability and a steady airflow through the helmet to the child's head. | |
| | | |
| c) | The helmet could be put through a simulation which would test the strength of the hard outer shell of the | |
| | safety helmet. The helmet would be | |

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| | thrown around and thrown into walls and towards the floor to ensure it would break and hurt the user whilst wearing it. | |
| 3a) | Advantage of an open brief is that it provides the designer with free creative choice, improving the creativity and uniqueness of the designs. Adisadvantage of an open brief is that the designer could design a product that isn't what the client wanted due to the limited rules of design. | |
| b) | The purpose of the product design ~~brief~~ specification is to provide ~~a~~ beginning a list of rules and regulations to the designer to ensure the initial ideas meet the client's needs. A product design brief could include the quantity of the product required, the price of ~~each~~ the product. | |

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c) A morphological analysis could be used to help designers generate ideas. The key stages of a morphological analysis are:

① Create a table with the product split into its components.

② Give the components attributes.

③ Randomly select an attribute for each component and draw it

④ Repeat the process until you have lots of ideas generated.

E.g.

| | ~ | ~ | ~ | ~ |
|---|---|---|---|---|
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| ~ | □ | 3 | △ | 6 |
| ~ | ○ | 5 | □ | 2 |

d) - Rough sketches are used to create quick ideas and to speed up the idea generation process by not having a lot of detail in each sketch.

- Hidden detail drawings are used to show the inside of a design and how parts may fit together in the design.

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| | - Exploded views are used to show how many of each component part is required as well as the order of assembly. | |
| | - A section view is used to show the inside of particular components to help visualise where holes will be drilled and parts will attatch. | |
| | | |
| 4.a) | - A celebrity endorsement could be used to help launch a new product successfully, by having a celebrity within the field of the product to promote it. | |
| | - the company could use billboards to promote the product where the product would be used, ensuring potential users will see it and want to buy it. | |
| | - using social media and influencers to promote the product before it launches, meaning more people will be aware of the product, potentially worldwide. | |
| | - a questionnaire could be sent out to potential | |

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| | buyers to gain their opinion on price and aesthetics before the launch, allowing the company to fit the product directly to the buyer's needs and wants. | |
| | | |
| b) | The company could produce variants of the product. For example, different sizes and colours, making the product more attractive to those who haven't purchased it already as it will now be in the colour they want. The company could reduce the price which would encourage those who weren't willing to pay the initial price to buy the product. | |
| | | |
| 5.a) | Anthropometrics: | |
| | - Grip diameter has influenced the diameter of the handle of the airfryer, making sure the user can comfortably grip the handle to be able to open the door. | |
| | - Hand width has influenced the length of the handle of the airfryer, making sure the user can fit their hand into the: | |

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| | handle in order to open the door. | |
| | Physiology: | |
| | ~~Physiology can have~~ | |
| | -Arm strength will have influenced how hard the door of the airfryer would be to open, making sure adults can do so easily but young children cannot due to the hot oven behind the door. | |
| | -Hand strength will have influenced how easy the dial on the top of the airfryer would be to turn, allowing the user to easily change the settings of the airfryer. | |
| | Psychology: | |
| | -Psychology has influenced the green and red of the buttons on top of the airfryer. The colours automatically tell the user what the buttons do (stop and start the airfryer) as they are universally known as such, putting the user at ease. | |
| | -Psychology has influenced the see-through door of the airfryer, allowing | |

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| | the user to view their food as it cooks so they can see if anything goes wrong, putting the user at ease | |
| b) | The size of the smartphone has been influenced by market pull as it has lots of technology and power but can still fit into our hands comfortably, making them ~~easy~~ easy to use. | |
| c) | - Ensures no one else can produce an idea/ design you came up with, only your company can<br>- Ensures designers can be paid to sell their intellectual property at a high price so a company can produce it. | |

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| 6a) | -A float test could be carried out to test and identify different plastics. for example, if it sinks it could be ABS but if it floats it could be polypropylene. | |
| | -A spark test could be carried out to test and identify different metals. For example, if it does spark it could be steel. | |
| | -A magnet test could be carried out to test and identify different metals. For example, if it sticks it could be steel and if it doesn't it could be aluminium. | |
| | -A burn test could be carried out to test and identify plastics and metals. For example, if the burnt plastic smells of celery, then it is nylon. If the flame turns green, then the metal is copper. | |
| b) | - Flashing lines | |
| | - Simple, symmetrical form | |
| c) | Gantt charts: | |
| | -Gantt charts allow a hierarchyct tasks | |

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| | to be created, allow the company to see what projects are more of a priority than others and to create an effective timeline of the production process. | |
| | Gantt charts<br>- allows the company to save money on wage bills as people will only be employed when they need them according to the Gantt chart. | |
| | | |
| | Just-in-time Production:<br>- Just-in-time production allows the company to save money on storage as there won't be materials or unsold products to store as they will be made for each incoming order instead and shipped as soon as they are finished.<br>- Just-in-time production saves the company money from wage bills as it is mostly automated which also reduces human error and speeds up the production process. | |

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| 7. | - Consideration for the environment influences the size of the product, so as not to waste materials and energy needed to produce the product. | |
| | - Consideration for the environment influences the choice of materials, ensuring they can be recycled instead of going to landfill. | |
| | - Consideration for the environment influences the choice of materials, choosing ones that have already been recycled rather than taking raw material from the ground. | |
| | - Consideration for the environment influences the use of the same material instead of lots of different materials in a product, which makes it easier to seperate and recycle. | |
| | - Consideration for the environment influences a products ability to be upcycled and used to create an entirely new design without changing the original product, which improves the use of the product as it lasts longer. | |
| | - Consideration for the environment influences how a product is assembled, as screwing | |

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| | a product together makes it easier to take apart and seperate to recycle rather than gluing the product together. - Consideration for the environment has influenced the fixability of a product, allowing a product to be easily fixed after it breaks instead of purchasing a new one and throwing out the old one, improving the products like longevity and reducing the need for a throw away society. - Consideration for the environment has influenced how much energy the product requires to function, reducing the levels to ensure less carbon emission. | |