

Candidate 4 evidence

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| 1a | |
| | Stainless steel is a suitable |
| | material for the playground |
| | digger as it is non-ferrous |
| | so does not rust as the digger |
| | is outside. |
| | ABS is a suitable material |
| | for the playground digger seat |
| | as it is water-proof and |
| | easy to clean so dirt could |
| | be removed by rain. |
| | Rubber is a suitable |
| | material for the garden digger |
| | handles as they are grippy |
| | and durable. |
| | Mild steel is a suitable for |
| | the garden digger scoop as it |
| | is durable so will not be |
| | worn overly-worn down by |
| | digging into hard materials |
| | ABS is suitable for the |
| | garden digger seat as seat |
| | as it is relatively lightweight |
| | so makes movement easier |

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nylon is suitable for the bearings as it is durable so
~~can~~ can survive ~~and~~ constant use and battering from children.

rotational moulding is an appropriate manufacturing technique for the garden digger wheels as the wheels are made of ABS which can be used in this process and are hollow.

injection moulding is suitable for the textured ABS seat as it is entirely one material and curved so could be easily removed from mould.

extrusion is appropriate for the playground sand digger frame as many components are a continuous ~~size~~ width/diameter/

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| C | |
| physiology has effected | |
| influenced the ^{sand-} diggers | |
| with the weight of the | |
| bucket ^{as it has} to be to be | |
| lifted with with levers by a child. | |
| anthropometrics has influenced | |
| the garden digger with | |
| the size of the seat | |
| having to fit the the behind | |
| of the target demographic, | |
| physiology has influenced | |
| the overall weight of the | |
| garden digger as it must be | |
| pushed along by a child. | |
| anthropometrics has influenced | |
| the size of the garden digger | |
| handles as they must fit the | |
| hands of a child. | |
| anthropometric influenced the | |
| ease at which the sand digger | |
| rotates. | |
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| the playground sand-digger | |
| was influenced by safety | |
| as it is posted into the | |
| ground this means it | |
| cannot topple over and | |
| injure a child. | |
| the sand digger was influenced | |
| by safety by using vandal | |
| proof nuts and bolts so | |
| the digger cannot be tampered | |
| with in such a way that | |
| makes it dangerous. | |
| the garden digger has been | |
| influenced by function as | |
| the wheels are textured | |
| so it can be used outdoors. | |
| the garden digger has been | |
| influenced by safety with the | |
| wideness of the wheels which | |
| makes the digger more stable and | |
| less likely to topple and hurt | |
| someone. | |

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| garden digger was influenced by function safety by using rubber handles which is soft so unlikely to hurt a child's hands. | |
| e Gantt charts could be used in the garden digger to allow multiple parts to be made at once. | |
| mass production could be used with the sand digger to make many identical diggers so the product stays the same quality. | |
| flow charts could be used to streamline manufacture by setting an ideal order to make parts. | |
| mass production could be used to create parts cheaper due to economy of scale and make many. | |

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batch production could be used to create products when a certain amount is wanted so material or storage is not wasted while still benefitting from economies of scale.

2a thermosetting plastic is suitable as the utensils will be used in high temperature environments but would not melt or become misshapen due to the heat.

b compression moulding is suitable because the utensils are all one material and also have curved edges to be easier removed from a mould.

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| C | |
| <p>morphological analysis could have been used which is created creating a table of factors such as shapes or patterns and picking sets of them randomly, combining them into an idea.</p> | |
| <p><u>Brainstorming</u> could have been used which is sitting down - usually with people - and bouncing ideas off each other until it becomes fully-fledged.</p> | |
| 3a | |
| <p>one benefit to the consumer of using standard components is it lets the consumer easily replace parts or mend the product.</p> <p>Another benefit is that it is cheaper for the manufacturer to use standard components</p> | |

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So would likely bring product price down for consumers.

b one benefit of using cad software in the design of such products is to check how parts and components fit together.

Another benefit is it allows for easy communication between designers/design teams as they can be in different places and emailed cad models to view.

Another benefit is that it reduces the cost of design as cad is relatively inexpensive compared to ~~an~~ other design techniques.

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| c | |
| <p>fully automated production methods create redundancies ^{for many} in lower skilled, ^{lower paid} job areas but creates jobs for less higher skilled, higher paid workers.</p> | |
| 4a | |
| <p>One advantage of 3D printing over traditional manufacturing is that 3D printing can be done unmanned or with minimal supervision which makes it much cheaper. ^{which is good for prosthetics as they are needed}</p> <p>Another advantage of 3D printing over traditional manufacturing is that it is very accurate which is good for products such as prosthetic legs as they are very specific for every individual's needs and sizes.</p> | |
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| b | <p>One appropriate method of researching the needs of an end user is survey, this could collect users age, sex, height, weight, etc by asking specific questions.</p> <p>Another appropriate method is</p> | |
| c | <p>i) product design specifications are for laying an outline for the wanted product. It may include maximum sizes, intended costs and usecase functions.</p> <p>technical specifications the are what the manufacturer uses and includes specific sizes and how the product operates</p> | |

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The Kettle is yellow which causes it to stand out and catch the eye.

The kettle is largely curved which makes it appear more sleek and modern.

The kettle has a metal rim around the base which indicates separation of the components.

The kettle has a grey switch that juts out in a unique shape that indicates ~~it is a~~ its use.

another method of protecting IPR is copyright which can be used to protect books and music.

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| 6 | <p>ergonomists research sizes of people and provide the best sizes for products to use that to the designer. market researchers look at market trends to gauge popularity of certain products and gaps in the market and give suggestions to the team on what is popular and what needs of the market ^{are} is not being met.</p> <p>project managers create the team and manage all aspects and communication between groups.</p> |
| 7a | <p>one material identification that could be used is the flame ^{test}. When set alight a certain material may burn a certain way with a certain colour of flame, for example</p> |

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a bic pen would burn very poorly with a dull flame.

Another method that could be used is a float test by placing an object in water. for example if an ^{Ikea table top} chair leg were to ~~float~~ ^{float} it may be made of a metal ~~such as~~ wood, for example beech or pine.

ii basses are used in ^{Samsung} TV remotes to aid efficiency by being clear screw points. ridges are used in games controllers ~~to~~ for easy routing of interior electronics.

b One step manufacturers can take to reduce environment impact is to use lighter materials as this would use less fuel in transport, making a smaller carbon footprint

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| 876 | Another step manufacturers | |
| | can take is to create | |
| | more portable products or | |
| | packaging such as stacked | |
| | chairs allow more products | |
| | to be transported at once | |
| | meaning less vehicles and | |
| | therefore fuel is used. | |
| | Another step manufactures | |
| | can take is using recyclable | |
| | materials that can be disposed | |
| | of environmentally. | |
| | Another step manufactures can | |
| | take is providing replacable | |
| | parts so products can be | |
| | fixed instead of replaced and | |
| | disposed of. | |
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| 8 | |
| Sketch models may be | |
| used early in the design process | |
| to explore shape of a product to | |
| get response opinion of client. | |
| Block models may be | |
| used to in later stages | |
| of the design process to | |
| explore ergonomics and provide | |
| data on how a product interacts | |
| with a person such as hands | |
| with handles. | |
| Block models may also be | |
| used in much later stages of | |
| the design process to explore | |
| aesthetics and gain information | |
| on the se visual appeal of | |
| a products. | |
| Sketch models could be | |
| used to test mechanisms and | |
| provide data on | |
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