

Candidate 6 evidence

ENTER NUMBER OF QUESTION	DO NOT WRITE IN THIS MARGIN
1.a)	Stainless steel has been chosen because
	it is a non-ferrous metal so it won't
	rust. meaning when the digger is left
	outside it won't be damaged by rain.
	- Textured ABS is suitable for the seat of
	the playground digger because it is
	a very hard plastic and is unlikely
	to break easily.
	- Nylon bearings are suitable because
	unlike if metal bearings are used there
	is a risk factor of sharp edges
	where as if nylon is used there isn't
	because it can be sanded down
	to smooth smooth edges that won't
	hurt anyone.
	- Rubber is ^{suitable} used for the handles
	because it is an elastomer so
	it can be stretched and moved and
	has very good grip so the child's
	hands won't slip off.
	- using a tubular mild steel frame
	is suitable because it has very
	good strength to weight ratio so
	is very unlikely to break under pressure.

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	<p>- stainless steel using polypropylene for the seat of the garden digger is suitable because polypropylene can be bent and moulded into lots of shapes and can be bent without cracking, as well as having good strength to hold the child's weight.</p>	
1.b)	<p>- Extrusion would be used to make the tubular stainless steel play-ground digger frame and is suitable because it allows for the same size tube to be made exactly the same.</p>	
	<p>- vacuum forming would be used for the polypropylene seat and is suitable because polypropylene when heated up and then moulded doesn't crack, and is</p>	
	<p>- injection moulding would be used for the ABS wheels because ABS can be melted down and injected without and the cools very quickly but is also unlikely to break.</p>	

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1.c)	<p>- For the play-ground digger Anthropometrics has influenced the digger because the designer would need to think about the width of the tubular steel in proportion to a child's hands and make sure the 5th% can wrap their hands around it.</p> <p>- For the play-ground digger physiology has influenced it by making sure the chair is not too far off the ground so that the child can still reach the ground and has enough momentum to push and turn the digger around.</p> <p>- The garden digger Anthropometrics has influenced the design because they would have had to make sure the seat was big enough for the 95th%ile bum to fit.</p> <p>- Physiology would have been thought about for the garden digger as they would have had to make sure that the child could push the handles forward easy enough and not use too much effort.</p>	

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1.d)	<p>- Safety has been thought about by adding Rubber handles to the garden digger to protect the child from the sharp edges of the bare steel.</p> <p>- safety has been thought about for the play-ground digger by adding steel balls to the top of the handles so no sharp edges are exposed and this also allows for the function to be thought about as this gives the child something to grip onto.</p> <p>- function has been thought about for the garden digger because it is self assembly meaning that anyone can build it, and the safety aspect for that is that at any point when bolts get loose they can be tightened.</p>
1.e)	<p>A gantt chart could be used in the production and manufacturing stages for the play-ground digger as many will be getting made meaning this will give everyone a clear of what they are to do and how long exactly they have to do it.</p>

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2.a)	
2.b)	
2.c)	

- by using a production and planning system this allows for teams to know how long they have to do everything as well as how long they have to get parts in.

2.a) a thermo-setting plastic is suitable because it won't melt and go soft when heated up as well as they have a good strength to weight ratio so won't break when lifting up food.

2.b) compression moulding is suitable as the plastics can be heated up and moulded without cracking. compression moulding is also a very quick process and doesn't take lots of time.

2.c) sketching could be used for ideas as all that is needed is a pencil and paper and this allows for designers to come up with multiple ideas all at once.

- Brainstorming is a technique that can be used to quickly write down shapes, colours, materials they could make the product out of.

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3.a)	- one benefit is that to they can access them very easily as they are usually just stalked on the shelf for anyone to buy.
	- if the bike broke ^{was loose} most parts can be tighted tightened with spanners or screw drivers they may have insted of trying to find a specially made one.
3.b)	- adv benefits of using CAD are that materials can be added to give a life like appearance: as what it would look like in real life, as well as CAD files can be sent anywhere in the world and modified by anyone. And it also gives a life doesn't effect the environment like working on paper and then mailing it somewhere.
3.c)	- using fully automated production means that there isn't as many people employed so people loose their jobs as they aren't needed. - along with the impact if the machine broke that would mean the whole production line could essentially have to stop.

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4.a)	<p>- one advantage is that with 3D printing there is never any waste produced compared to traditional Manufacturing where multiple materials would be use resulting in waste, as well as there is no need to assemble a whole team because the computer tells the machine what to do.</p>
4.b)	<p>-The designer could do a user trip by gathering people who need prosthetic legs and get them to test out a sample and then ask them what they like and dislike and any changes they could make.</p> <p>-The designer could also simply do a questionnaire where he could ask people again who need a prosthetic leg what they their ideal ideal leg would be.</p>
4.c)	<p>i) the purpose of a production design specification is to give the designer exactly how they wish for the design to look as well as what they don't want it to look like.</p>

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ii)	<p>A technical specification is to find out how the product will be made and what it will be made of.</p>
5.a)	<p>The designers have thought about the colour of the kettle and by using the primary colour yellow this allows for it to stand out against the dark grey and contrast.</p> <p>The designer has thought about shape by using the 3 tier lid going from big to small circle this is aesthetically pleasing as each tier leads you to the top where your hand should go.</p> <p>The designer has thought about safety by making the shape of the handle bend far enough away from the hot body of the kettle.</p>
5.b)	<p>To protect the If an image of the kettle was on the internet to protect it against people who could take the image and use it as their own a watermark with the company name could go over the top so that no one can take it and use the kettle as their own.</p>

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b.	
<p>- an ergonomist is someone who when designing a product will think about the sizes of the product and whether the target consumer will be able to use it.</p>	
<p>- The market researcher is the person who will ask people from the target market of their opinions and needs and wants of the product.</p>	
<p>- The project manager is the person in charge of all the stages. Their job is to make sure everything is running smoothly, they are on schedule and also deal with any issues that come up.</p>	
7a) i)	
<p>To identify the materials used in a plastic tupperware tub on the bottom there will usually be a small triangle with a number for how recyclable it is and a letter or two. For instance if 'PP' is shown that would mean the tub is polypropylene.</p>	
<p>To identify the materials of anything metal like chair legs. A method that</p>	

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could be used is heating it, if it is a non-ferrous metal it will conduct heat and if it is a ferrous metal it will bend without cracking.

(b) (i)

7.a) ii) Manufacturing techniques features are used and accurate and efficient assembly by making sure all the materials are correct with correct sizes and also that all machinery works to prevent workers from getting hurt.

7.b) - Manufacturers could use less materials by using one type of material for more parts resulting in less waste being produced.

- They could make products using easier recyclable materials meaning more products would be made into something else and not put into landfills.

- as well as they could make the products re-usable. Like deodorant, they could make an aluminium bottle that just uses re-fillable deodorant capsules when needed.

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scale models, block models, sketch models, prototype.

8. - designers could use block models to find out sizes of things. for instance when designing a controller they would make a foam design of the product and then test if the sizes are correct for the hand or not. This ~~would be used in the~~
- They could also use scale models. so when designing a table a model could be made to the scale they desire and then tested to see if everything was the correct height.
 - Sketch models would be used in the initial ideas stage of design and used to draw an idea in 3D to get an idea of what all the angles products would look like from all angles.
 - prototyping would be used in the very final stage of design when an idea has been been developed and refined and then ~~pro~~ the product is produced using the sizes they have come up with and sometimes the materials. This could

