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An 8 year old boy of a smaller build needs a cushioned lounge chair with back support because all the lounge chairs he currently uses at home are too big and don't support his back in the right places, which causes him to change his sitting position and gives him back pain . Through my user interview I have learned that my client is in the second grade and plays video games or watches TV regularly throughout the day. He weighs 59.5 pounds which is low for his height and age. My client also sits for an average of 10 hours and 15 minutes a day. Of those 10 hours he spends 2 hours watching TV and playing video games, which is how much time he expects to be using this chair a day.

Due to his smaller build and his age, the current chairs in his house don't fit him properly and do not have cushions in the proper places to support him. This seems to have caused him pain in his lumbar region and in an attempt to deal with this pain he was forced to change his natural sitting position to one where his other muscles are being strained. While playing video games and watching TV he wants to be able to sit in a position where his muscles aren't tense and to have an adequate cushion that provides quality back support (back support that does not cause him to feel back pain when sitting for the full 2 hrs a day) , but due to the sizing issues of the chairs in his house he is unable to do this. The current chairs he is using to play video games and watch TV are located in the game room, a room that's open with no doors and a big window. The chairs he is currently using make him feel like they are hugging him and he has specified that requires this feature to be included as it helps untense his muscles when playing video games or watching TV. The location of his previous chair is in the center of the game room in front of the TV.

By solving this problem my client will be able to enjoy playing video games and watching tv without back pain and sitting in a position where his muscles can relax. On the broader scale by solving this problem kids who are in a height range around 4ft 4in, a weight range around 59.5 pounds, and a sitting height of around 2 ft and 5in can have access to a more inclusive chair that provides the back support they need to do their intended task while sitting the chair well. According to Marilyn from BackTPack, children who do not sit in a proper sitting position can be prone to health issues (Back health and School Chairs). . Many school chairs, where 8 year old kids mostly sit, do not have proper back support and enforce the slouching sitting position on the kids sitting in these chairs, which can cause health issues as a result. Wenqi Shen, Chantal Parenteau, Raj Roychoudhury, and Jeffrey Robbins stated in a report that adults sitting various positions had 55% of their body weight load on the cushion and back of the chair, while in the same experiment children had 94% of their body weight load on the cushion and back (Seated Weight Distribution of Adults and Children in Normal and Non-Normal Positions). This data mathematically exemplifies that children and adults have different sitting patterns and their body reacts differently when sitting, which is why children need their own chairs made to accommodate the way their body sits in a chair. Proper back support on children's chairs also needs to be included as it has been stated that without proper back support, children sit in improper positions which can cause health issues later on. Both of these articles further prove the point that children need a chair that is made to their size and includes lumbar support as they have a different sitting pattern than adults and need the back support to enforce a proper sitting position.

My company's mission is to put out products of high quality by thoroughly meeting client needs and expectations. Our mission statement "Quality begins with the customer" ensures that the client's opinion will be highly valued and is a key component of what will make the product a success. Our mission for this project specifically is to create a product that meets all the clients requirements with the utmost quality.

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Aii

My research plan was constructed by analyzing the client's requirements, the goal for the project, and what the client needs from the product and creating questions based on what I know and don't know about each requirement or need and how to achieve the intended goal . The needed data was determined by evaluating what I knew about manufacturing each need and how to make each feature. Anything I didn't have the answer to was made into a research question. For example, I knew that I was making a tiny chair model for my client but I didn't know what scale I could use to make that would easily present all the clients requirements to the naked eye. From my understanding of what I knew and needed to know about the tiny chairs scaling, I formed the question " What scale is best for making a functionable tiny chair model ?" My research is important because it will gather all the information I need to know to meet my clients requirements and successfully make the tiny chair model. On top of that all sources from my research will be deemed appropriate by using specific parts of ACCESS FM and the CRAPP tes (ex. Materials, Aesthetics, Purpose, Currency, and Authority). My primary research was relevant because it gathered my clients' opinions on specific features of the tiny chair and what they wanted each feature to look like and do. My secondary research is relevant because it gathers factual information that will help me make the product functionable in the real market and help me provide my client with the best quality for their chair requirements and needs. The questions and research were prioritized by clients' needs and requests, what information I needed the most or first, then aesthetics, and other information needed to build the client's desired chair.

Relevancy and Question	Where might I find primary information and how will I ensure it is appropriate? (Why is it relevant to your product research and how will you evaluate)	Where might I find secondary Information and how will I ensure it is appropriate? (Why is it relevant to your product research and how will you evaluate)	Priority # and Reasons	Source	Answer
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What chair features make a functionable ergonomic chair?	I can conduct a follow up interview and ask my client what they think makes a chair functionable, so that I can ensure to make a chair that is functionable to my client.	I can use credible sources that are made by people in the furniture industry who have experience making and designing chairs to research online about what makes a chair functionable to furniture makers and furniture producers, so that my product meets the design standards in the chair market and furniture producing world.	1 because I need to know this information for my product to be successful and meet professional and my client standards.	<p>“The Ergonomics of a Chair Explained.”</p> <p><i>Full Range Furniture Ltd T/a ChairOffice,</i></p> <p>www.chairoffice.co.uk/blog/the-ergonomics-of-a-chair-explained/.</p>	<ol style="list-style-type: none"> 1. Seat height 2. Seat width and depth 3. Seat tilt 4. Backrest Lumbar support 5. Backrest recline 6. Swivel 7. Armrests 8. Headrest 9. Materials 10. Wheels
What type of chair backrests provides the most support for the lumbar region in	I can conduct a follow up review and ask my client about what type of backrest provides the support for them, so that I can	I can use credible sources that are current and written by credible authors so that my chair can have the most recent and effective backrest.	4 because my client has specifically stated that they have back problems. They have specified that they need a	<p>“Types of Lumbar Support for Office Chairs (and What to Choose).”</p> <p><i>Ergonomic Trends</i>, 11 June 2019,</p> <p>ergonomictrends.com/types-of-lum</p>	Backrests that include dynamic, lumbar support, adjustable lumbar support (height adjustable, depth adjustable, and firmness adjustable), fixed lumbar support, As well as curvature.

children?	make my chair more suitable for my client and make the chair perfectly accustomed for them.		chair that will not give them back pain after sitting in it.	bar-support-for-office-chairs/. Accessed 8 Sept. 2022.	
What features need to be included for a chair to be a gaming chair?		I can use a credible source where the author of the source has experience producing gaming chairs so that I can ensure that my chair will have appropriate chair features for gaming.	8 because although my client stated they plan to use this chair when gaming, they did not ask for a gaming chair specifically	Nieman, Craig. "A Guide to Gaming Chairs: The Best Options for Every Gamer." <i>Newegg Insider</i> , 14 May 2019, www.newegg.com/insider/gaming-chairs-buying-guide/#:~:text=Most%20gaming%20chairs%20pack%20in . Accessed 8 Sept. 2022.	adjustable armrests lumbar support pads and headrests Features that allow for long stretches of sitting
What are the best areas on a gaming chair for cushions ?		I can use a credible source where the author of the source has experience producing gaming chairs so that I can ensure that my	9 Considering that the chair might not be a traditional gaming chair, this question doesn't seem as	"How to Use a Gaming Chair Lumbar Support." <i>Wwww.youtube.com</i> , 24 Aug. 2021,	-Lumbar region where the lower back curve is - lumbar curve can be different for people so making and adjustable one would be best - thick cushion in the seat




		chair will have appropriate chair features for gaming.	relevant and important as the others. However it is a question that should be answered because my client plans to use this chair for gaming	youtu.be/EE-kqejBHSQ. Accessed 8 Sept. 2022.	is ideal -neck cushion is also seen
What is the best shape for a headrest on a lounge chair?	I can conduct a secondary interview and ask my client what shape of headrest they feel is most ergonomic. This can ensure that the headrest will meet my clients standards.		6 because my client stated that because they are smaller in size the headrest in the chairs at their homes are ergonomic for them. So by getting answers to this question I can make sure that my chair solves this problem for my client.	“How an Adjustable Headrest Works (+ Why It’s Important).” <i>Living Spaces</i> , www.livingspaces.com/inspiration/ideas-advice/guides/how-an-adjustable-headrest-works-why-its-important. Accessed 8 Sept. 2022.	Adjustable headrests are the best lounge chair head rest because they allow for the user to keep their head up and supported at all times even when reclined, this can help support the neck when watching tv.
How to make an adjustable headrest on a chair?		I can watch videos that show the process of making adjustable headrests for chairs	5 because I don’t know how to make this feature on my mini chair and my client	“Tesla Model 3 Headrest Removal and Modification.” <i>Wwww.youtube.com</i> ,	Create the frame first then the cloth or other material that goes over it, then the cushion stuffing, finally sew it shut. When making the

		so I can see the process and make sure I am doing it right.	specifically asked for this feature.	18 June 2018, youtu.be/J4vIBNx0rBQ. Accessed 8 Sept. 2022.	frame use malleable material to bend the head rest and make engravings to mark how forward or back the headrest will move.
What materials are typically used for gaming chairs and why?			7 because my client has already said they prefer a velvet chair but for the other features of the chair I need to know what materials are best.	Nieman, Craig. "A Guide to Gaming Chairs: The Best Options for Every Gamer." <i>Newegg Insider</i> , 14 May 2019, www.newegg.com/insider/gaming-chairs-buying-guide/#:~:text=Most%20gaming%20chairs%20pack%20in. Accessed 8 Sept. 2022.	PVC Leather- it is stain,water, and fire resistant and it is a fake leather which reduces the cost but also gives the aesthetic feel of real leather Mesh- its a breathable material that offers cooling Fabric- more cooling than leather , creates less sweat and retains less heat
In a tiny chair model, what materials are typically used and why?		I can use credible sources that are current and written by credible authors so that my chair will include materials that are relevant and easy to access	2 because the materials I will be using will be applicable to the entire chair and will affect the aesthetics and even the function	"What Should You Use to Build a Dollhouse or Model Building?" <i>The Spruce Crafts</i> , 2019, www.thesprucecrafts.com/building-	-Baltic Birch Versus Medium Density Fiberboard because it is lightweight and can used for products that need to be dismantled -Gatorfoam because water resistant and is a great

		i n the current time.	of certain features of the tiny chair.	materials-for-scale-models-236608 9.	building material that can be used indoors and outdoors -Craft Stripwood or Scale Lumber because it is very accessible and is a great building material for miniature projects - paperboard because it is inexpensive and accessible
What scale is best when making a functionable tiny chair model?		I can use a credible source where the author of the source has experience making tiny chairs so that I can ensure that my chair is to the appropriate scale and will still be functionable in the real market. I will also be ensured that this scale can be applicable and will not take away from the function of the tiny chair.	3 because the scale the chair is made will determine how all the other features are made and even the materials used because the size of the feature can affect what material can be used to correctly demonstrate the feature.	“How to Make a Miniature Chair.” <i>W</i> www.youtube.com , 15 Apr. 2018, youtu.be/zV7Twn6NQDU . Accessed 8 Sept. 2022.	1:5 as it allows for the chair to qualify as tiny but it is also big enough to clearly see the parts of the chair.

Aiii

Existing Product Analysis SWOT Table

Product Image	 <p>75119 Lounge Chair-No Ottoman-White-1</p>		
Product Citation	<p>“75136 DSW Dining Chair-White-1.” <i>BCmini</i>, bcmini.com/products/75136-dsw-dinning-chair-white-1. Accessed 30 Aug. 2022.</p>	<p>https://tinyurl.com/5x34dejh</p>	<p>“Amazon.com: PatioMage Gaming Chair with Footrest Ergonomic Office Chair Headrest Lumbar Support Comfortable Large</p>

			<p>Size High Back</p> <p>Adjustable Reclining</p> <p>Computer Desk Chair</p> <p>PU Leather Swivel</p> <p>Chair : Home & Kitchen.”</p> <p><i>W</i>ww.amazon.com, www.amazon.com/PatioMage-Ergonomic-Comfortable-Adjustable-Reclining/dp/B08LMYC4BK. Accessed 8 Sept. 2022.</p>
Strengths	<ul style="list-style-type: none"> • Functionable tiny chair made to the ½ scale • Has plenty of cushion • Has a headrest, backrest, and armrests 	<ul style="list-style-type: none"> • Has lumbar support • Can be used for gaming • Lots of cushion • Room to stretch and sit comfortably 	<ul style="list-style-type: none"> • Has leg rest • Has lumbar support pillow • Leather • Red

	<ul style="list-style-type: none"> • Shape gives user plenty of room • Minimalist design 	<ul style="list-style-type: none"> • Can be used to play video games • Can adjust height • Wheels 	<ul style="list-style-type: none"> • Has a frame that hugs the user • Has arm rests • Is well cushion all over the chair • Has wheels • Headrest • Is a gaming chair
Weaknesses	<ul style="list-style-type: none"> • Not prosthetic (chair doesn't allow for people to adjust the backrest to fit them better) 	<ul style="list-style-type: none"> • Not comfortable for watching tv (not good for lounging) 	<ul style="list-style-type: none"> • Lumbar support pillow is not adjustable
Opportunities	Back rest could be adjusted so that the client can sit in a more comfortable position that supports their back better and solves the client's problem with back pain while sitting.	This chair would be a perfect gaming chair and it would help my client with their back problems. Since my client is of a smaller build this chair would be good because you can adjust the height.	This chair has almost everything my client asked for. It has plenty of lumbar support, cushion, and body support. It also serves the clients purpose if sitting in the chair because it is a gaming chair and you can also lounge and watch TV in it. This chair also has extra features to make the chair more ergonomic for the client like a leg rest that can be pulled out and wheels so the chair can move easily. The led rest is also easy to use for children, which is the intended secondary audience.
Threats	The chair shape does not support the positions the client wants to sit in.	The chair does not have an adjustable neck rest and is not suitable to watch MV and lounge	The chair does not include an adjustable lumbar support pillow, which will be a problem

		in.	because based on my research table if the lumbar support is too high or low for the user it changes their sitting position.
Inspiration For My Product	From this chair I will be using the cushion placement because this chair has a cushion all through the chair with extra cushion in the back and seat of the chair. In my model I will inspire from this chair and place the cushion all throughout the chair and extra on the seat and the backrest.	I will be inspired from the sitting position this chair supports. My client stated that they sit in a more upright position with their feet dangling off the chair and arms to the side. The shape of the backrest helps support my clients sitting position. So, in my chair I will make my back rest in this shape so that it will support my clients while they are sitting.	As this chair includes all the features my client asked for, I will make sure my chair is organized like this chair so that all the required features will fit in the chair and will function without disturbing another feature on the chair. I will apply this in the framing of my chair.

Aiv

Aiv

Design Brief

PROJECT TITLE

Tiny Chair

OUR GOAL

To make a functional tiny chair that meets our clients needs.

TARGET AUDIENCE

Primary Target Audience Age, Abilities, and Interests	Primary Target Audience: 8 year old 2nd Grade Boy Age: 8 years old Abilities: 2nd grade student Interests: watching tv and playing video games
Secondary Target Audience, Age, Abilities, and	Secondary Target Audience: Kids around the age of 8, who are 60lbs and 4ft 3" tall that need a back supporting chair to

Interests	lounge in while playing video games or watching tv.
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PROJECT PARAMETERS

SCOPE

1)	Objective Overview: In this project I will be making a functionable tiny chair model for my client, who is of smaller build and is facing back problems because their current chair isn't built for their size, that will provide lumbar support through cushion and can be used for gaming and watching tv.
2)	Company will provide a high quality tiny gaming/ lounge chair model that will include an adjustable backrest and headrest as well as plenty of lumbar support as per client requests. The chair will be built to the 1/3 scale and will mainly be made out of cardboard, paperboard, and wood. The chair will provide support for the proper sitting position of my client.
3)	An 8 year old boy of a smaller build needs a velvet arm chair because all his chairs are too big and don't support his back in the right places, which causes him discomfort and even back pain.
4)	As the chair designer I will submit my designs in a PDF for through the platform Managebac. I will be submitting my progress during the weekly check in due dates on managebac. I will be documenting each step of the process in google docs and will be using these documentation to show my progress in the weekly check-ins. I will also be meeting with the client regularly to make sure I am meeting the requirements of the client, that the end product is successful, and to get updates on what they like and what they don't to help reflect on my product and make changes to improve it.

RESEARCH ANALYSIS

Client Interview and Exploratory Research Summary	<p>Through my user interview I have learned that my client is in the second grade and plays video games or watches TV regularly throughout the day. He weighs 59.5 pounds which is low for his height and age. My client also sits for an average of 10 hours and 15 minutes a day. Of those 10 hours he spends 2 hours watching TV and playing video games, which is how much time he expects to be using this chair a day. I also learned that due to his smaller build and his age, the current chairs in his house don't fit him properly and do not have cushions in the proper places to support him. This seems to have caused him pain in his lumbar region and in an attempt to deal with this pain he was forced to change his natural sitting position to one where his other muscles are being strained. While playing video games and watching TV he wants to be able to sit in a position where his muscles aren't tense and to have an adequate cushion that provides quality back support (back support that does not cause him to feel back pain when sitting for the full 2 hrs a day) , but due to the sizing issues of the chairs in his house he is unable to do this.</p>
Research Plan Summary	<p>My research is important because it gathers all the information I need to know to meet my clients requirements and successfully make the tiny chair model. Since I have no experience making tiny chair models there was a lot of unknown information I needed to know in order to make the chair. From my research I learned what scale to use, how to make an adjustable headrest, what materials to use when making the model, what backrest should be used to give quality lumbar support, and what features the chair needs to include to be a gaming chair. While researching I learned that I also needed to know what an adjustable back rest looked like, what a lumbar pillow was, and what makes a chair ergonomic. This information will be used to create each</p>

	<p>of the clients requirements to support the back and neck and have the best quality but also be easy to use, since the chair is for kids.</p>
<p>Research Plan Critical Insights - insight relevance</p>	<ul style="list-style-type: none"> • The chair needs to support the proper sitting position in order to avoid health issues for the client later on • Tiny chair model can be to the scale $\frac{1}{6}$ or $\frac{1}{2}$ in order to meet the size requirement and demonstrate all features and client requirements • Adjustable back rest pillow should be included so the client can adjust it to fit in their lower lumbar curve and prevent lumbar pain. • Adjustable headrest allows for the client to watch TV while reclining and my client has specified that will use the chair to watch TV
<p>Existing Product Analysis Summary</p>	<p>From the product analysis, I learned how to organize my features on the chair, where to put the cushion in a way that maintains aesthetics and it is ergonomic, as well as the shape of the chair (especially the back rest) to support my clients sitting position. From the first product analysis chair I learned to include the cushion placement of this chair because this chair has a cushion all through the chair with extra cushion in the back and seat of the chair. From the second product analysis I learned to include the sitting position this chair supports through its backrest shape. My client stated that they sit in a more upright position with their feet dangling off the chair and arms to the side. The shape of the backrest helps support my clients sitting position. From the third product analysis I learned to make sure my chair is organized like this chair so that all the required features will fit in the chair and will function without disturbing another feature on the chair. When making my chair I will take inspiration from the first chair and place the cushion all throughout the chair and extra on the seat and the backrest. And from the second chair I will make my back rest the same shape as the backrest in this chair so that it</p>

	will support my clients while they are sitting. The organization from the third chair will be used in the framing of my chair.
Existing Product Analysis Critical Insights - insight relevance	<ul style="list-style-type: none"> - The shape of the back rest needs to be upright so the chair can be ergonomic and properly support the clients body while sitting. - The width of the chair needs to be greater than the clients width horizontally so that they can have room to move around in the chair. - The chair needs to be big enough to include all the features so the client and production company can see all the features and how they work

STYLE PREFERENCES

Functional Requirements	The chair must have an adjustable headrest, must support the lower back when watching Tv and gaming, and must allow the client to stretch and move while sitting in the chair.
Style	The client prefers a sport aesthetic with one bright pigmented color. He does not like oversized furniture and prefers a more sleek and modern look. He wants the chair to look like a quality chair with straight lines, aesthetic material, and geometric shapes.
Color	The client prefers the colors red balck and grey
Materials	The client prefers leather as it is easy to clean and velvet

	because it is soft and looks like a quality fabric.
Design References (images and in-text style citations)	

CONSTRAINTS

- Scaled Model due to client by October 27th/28th
- Must be made to his size
- Must have lumbar support
- Must have adjustable headrest, a backrest, and armrests
- Must have cushion throughout the chair
- The chair model needs to be tiny

DELIVERABLES

- Design Brief
- Presentation of Feasible Ideas
- Blueprints
- Scaled Prototype

ASSUMPTIONS

- **A full scale chair is not included in this design stage. Instead, the final product will be handled by the Production Department.**
- **Chair will be sold in the real market after client is satisfied and the chair meets its requirements**

- **Chair is made for this specific client as well as a general client of kids who are in a height range around 4ft 4in, a weight range around 59.5 pounds, and a sitting height of around 2 ft and 5in can have access to a more inclusive chair that provides the back support they need to do their intended task while sitting the chair well**

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