

MASTER THESIS
INDUSTRIAL ENGINEERING

Design of a toy which helps children who suffer ADHD to develop their skills

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Annex

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A.1. Principal users' needs

Name of the program: 30 minuts – un toc d'atenció [1]

Fundació ADANA is a foundation where the parents, with children suffering ADHD, can find information and support. One of the services that they offer is a class where they teach how to behave to the children.

One of the parents says in the video:

- He (referring to his son) realizes that he does not quite fit (he is different from others)
- *Need of having a place in society.*

The point that makes one of the teachers is:

- Children (with ADHD) who are not diagnosed receive more negative messages.
- *Need of feeling that being different is not bad if you respect other people.*

The following images are extracted from the video and show the children in Fundació ADANA.



FigA.1.1. Capture of the video [1] showing a boy diagnosed with ADHD in classroom.

What Looking something different from what he is doing in that moment.

How Staring at the other thing and keep what is he doing out of his vision field.

Why He is more interested in the other thing.

Need of doing things that really interest you.



FigA.1.2. Capture of the video [1] showing two boys diagnosed with ADHD running.

What Both kids wanted to play with the same toy (the bike).

How They run to have the toy.

Why The first who arrives gets the toy.

Need of learning how to share toys and knowing the correct way of purchasing things.

Need of experience healthy competitiveness.



FigA.1.3. Capture of the video [1] showing a boy diagnosed with ADHD playing in the playground.

What He is having fun with the bike.

How He is running up and down with it.

Why He feels a lot of energy.

Need of having fun with toys.

Ismael has a higher IQ than normal but is also diagnosed with ADHD. Although, he was more intelligent than his classmates, his marks did not reflect his skills. Now, with the treatment, which includes medication, he has improved his results.



FigA.1.4. Capture of the video [1] showing Ismael paying attention in classroom.

What Paying attention to the lecture.

How Staring to the teacher and trying to understand what is she saying.

Why He knows he has the obligation of paying attention in class.

Need of appreciation from the others because making the effort of paying attention is hard.



FigA.1.5. Capture of the video [1] showing Ismael in classroom.

What Looking around while he is doing school work.

How Watching what his classmate is doing.

Why He wants to know what is happening around him.

Need of analyzing the situation and the setting around you (maybe he need a break to do things in a better way later).

One of the situations we can see in the video is when he raises his hand to speak but when is his turn he cannot remember what he wanted to say.



FigA.1.6. Capture of the video [1] showing Ismael talking with the teacher.

What Don't remember one thing you wanted to say.

How He has to wait his turn to talk and he forgot what he wanted to say while he was waiting.

Why He was too much time waiting and he started to think in another thing.

Need of instant response in the games.

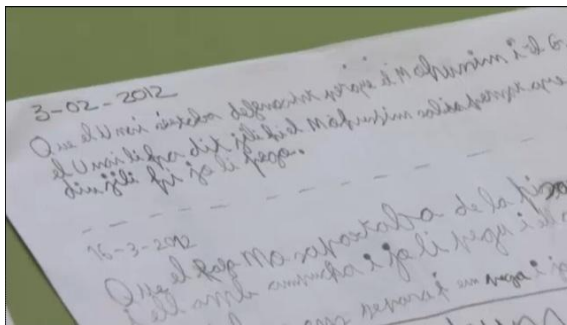
His teachers explain how he was casted out of the basketball team because he couldn't stop throwing balls to his teammates and not following the orders of the teacher. But in one of the images we can see Ismael playing football without causing any problem.



FigA.1.7. Capture of the video [1] showing Ismael playing football.

What Playing football with classmates
How Moving his body with the target of being in the winning team.
Why He wants to channel his energy showing how he can play in a team.
Need of moving with a purpose and learning how to be respectful with others.

In some texts he wrote about his behavior we can see that he knows why his behavior is wrong but he cannot explain why he did it.



FigA.1.8. Capture of the video [1] showing an Ismael's drafting.

What Self evaluation of his behavior.
How Writing about it.
Why Expressing what he thinks can help him to reflex about it.
Need of distinguishing between impulsive and reflexive thinking. Need of learning when impulsivity can be used in profit and detect when it is necessary to be reflexive.

In the video, we can also see how he plays the violin very concentrated and these images make us think he really like playing that instrument.



FigA.1.9. Capture of the video [1] showing Ismael playing the violin.

What Playing violin.
How Being very concentrated.
Why He likes to play the violin.
Need of realizing that sometimes making the effort of learning things that you do not want to learn could give you a tool to be creative. Need of appreciating that a lot of times creativity needs some impulsivity.



FigA.1.10. Capture of the video [1] showing Ismael doing homework.

What Doing homework.
How Writing in the paper at home.
Why His mother order him to do it.
Need of explanations from people who give you an order (the only reason cannot be "you have to do it").



FigA.1.11. Capture of the video [1] showing Ismael doing homework (2).

What Being beaten by the obligations
How Stopping writing and resting his head on the table.
Why He wants to show his disagreement with the obligation of doing homework.
Need of having liberty to decide when, where and how we want to do something.

Samuel is a boy who was diagnosed with ADHD late. We can see he is a bit flirtatious when he spends a lot of time brushing his hair and when his father asked him if he had brought his books and he realizes he only had brought the hair-dryer.



FigA.1.12. Capture of the video [1] showing Samuel drying his hair.

What Drying his hair.
How Being so careful and spending a lot of time.
Why He wants to look handsome.
Need of being conscious of the external image and relate that to good habits.



FigA.1.13. Capture of the video [1] showing Samuel and his father playing Scrabble.

What Looking how his father plays to Scrabble.
How He is behind his father watching.
Why He wants to see how his father plays and learn the way of playing.
Need of having examples of behavior.

When the reporter asked him how he can describe what happens in his head when he is in class he responds:

- All the information is entering into my brain but I do not have filter to choose on what I have to be paying attention. I am not ashamed of having ADHD. Sometimes I am proud because I think I am more empathic than the others.
- *Need of being conscious of you strengths and weakness.*



FigA.1.14. Capture of the video [1] showing Samuel and his mother playing Scrabble.

What Trying to help his mother when she is playing Scrabble.

How Sitting at her side and thinking.

Why He wants to be part of a team and share knowledge.

Need of doing teamwork and having more examples of behavior when you are in a team.



FigA.1.15. Capture of the video [1] showing Samuel and his father.

What He pretends he is not listening.

How He is playing with the phone while his father is asking him for the books.

Why He does not want to answer a question that he knows is going to upset his father.

Need of learning how to face problems. Need of not holding up behind the excuse "I cannot do this because I have ADHD."



FigA.1.16. Capture of the video [1] showing Samuel and his friends.

What He is talking with his friends.

How He is surrounded by them and showing an agreement with one of them.

Why He wants to share experiences with people.

Need of being with people who try to understand you and have the same opinions than you in some matters.



FigA.1.17. Capture of the video [1] showing Samuel playing with a swing.

What Playing with a swing.

How Pushing other people.

Why Playing with others can be funnier than playing alone.

Need of having time and space to have fun with others

Luís Rojas is a doctor who suffers ADHD. In his childhood he was sent to a special school where only were problematic children. The headmaster realized that he has something “salvageable” and help him. Dr. Rojas says in the video:

- We have an average intelligence but we have the advantage of having energy. If you channel this energy in something constructive it could be very positive.
- *Need of being conscious that success does not mean the same for everybody.*



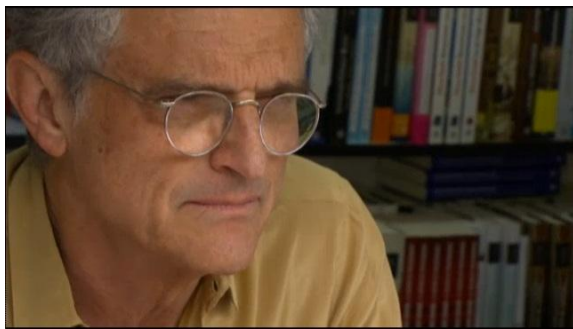
FigA.1.18. Capture of the video [1] showing an old picture of Luís at school.

What Posing for a group picture from the special school with problematic children.

How Smiling.

Why You are conscious of being part of a group.

Need of feeling you are not alone.



FigA.1.19. Capture of the video [1] showing Luís in the presentation of his book about ADHD.

What Remembering his childhood in front of children who suffer ADHD

How Telling how happy he was.

Why He wants to tell the good things you can live when you are different.

Need of giving hope and an example to other people who have the same problems that you.

Another testimony is David. David was diagnosed of ADHD when he was in the school and now he is studying the first course of chemistry degree. He upholds the use of medication saying the next statement:

- Although many people don't understand it, with medication I'm a better person.
- *Need of perseverating in what you believe but listen carefully other opinions.*



FigA.1.20. Capture of the video [1] showing David in the classroom.

What He is taking notes in class.

How He is writing very concentrated.

Why He is interested in what is he listening and he has learned how to study using his own notes.

Need of knowing how to adapt yourself to the way that other people work.



FigA.1.21. Capture of the video [1] showing David having lunch with friends.

What Having lunch with friends.

How Seating in the table and talking with his friends.

Why In a lot of cultures the lunch time is used to socialize with the others.

Need of talking and sharing experiences with people who do not suffer ADHD.

Daniela is in school and she also suffers ADHD with predominance in hyperactivity. She says to the reporter:

- Sometimes I have to say to my teacher that I am nervous and she let me go out of the classroom. Then I start to walk up and down on the corridor until I calm down.
- *Need of expressing yourself. Need of doing exercises in class that involve movement to not be a lot of hours seating in the chair.*



FigA.1.22. Capture of the video [1] showing Daniela talking to the camera.

What She is explaining what happens to her when she is in the classroom.

How Looking at camera very serious.

Why People told her that why she is different from the others.

Need of showing maturity because you have to make the others understand why you do some things.

Sergi is a boy who suffers ADHD but he also has sleeping disorders and speech difficulties. His father explains to the reporter how Sergi says many times “You don’t understand me”. Sergi is not using the pharmacological treatment, his parents prefer to try alternative treatments like the Tomatis method. This method seeks to stimulate the active listening of the individual alternating the voice of the mother with classic music.



FigA.1.23. Capture of the video [1] showing Sergi playing video games.

What Playing videogames.

How Watching the screen and pushing buttons.

Why He does not need to speak with the machine.

Need of communicating without speaking.

Need of working all types of expression.



FigA.1.24. Capture of the video [1] showing Sergi doing test exercise.

What Doing exercises to test his psychomotor skills.

How Moving along the room doing coordinated movements.

Why He wants to control his movements.

Need of focusing in coordination of your movements. Need of channeling your energy to make what you want to do.



FigA.1.25. Capture of the video [1] showing Sergi while his doing the Tomatis method.

What Doing the Tomatis method

How Listening with headphones and being guided by an adult.

Why His parents want to develop his active listening.

Need of having experiences with sounds and music to learn how to pay attention when people are talking to you.



FigA.1.26. Capture of the video [1] showing Sergi with his parents.

What Explaining to his parents something in which he is interested.

How Talking and showing them pictures.

Why He has the need of expressing himself.

Need of feeling listened and supported. Need of using the way of expression that you feel more comfortable with.

Joel has an inattentive predominant ADHD which is the more difficult to diagnose subtype of the disorder. He explains that before knowing he has ADHD he sometimes felt suffocated and that he did not have liberty. Teachers considered him a lazybones and his parents an unmotivated.

- *Need of being conscious that achieving academic goals is important but is not the most important thing in life.*

Name of the program: Quequicom – nen para quiet [2]

Aitor is in the school with the reporter. He has been diagnosed with ADHD. When the reporter asked him if he like puzzles he said no. He does not like puzzles nor studying Mathematics nor reading and writing. He likes playing videogames and in the video we can see how he started playing with a toy truck.



FigA.1.27. Capture of the video [2] showing Aitor talking with the reporter.

What He is saying he does not want to play with puzzles.

How He is trying to put distance between the puzzle and him.

Why He wants to express his dislike.

Need of showing your dislikes openly. Need of playing with games which do not require patience.



FigA.1.28. Capture of the video [2] showing Aitor playing with a toy truck.

What He choose playing with a toy truck.

How He takes a toy from the box.

Why He feels motivated playing with the truck.

Need of choosing with what you want to play. Need of playing with toys that have mobile parts and maybe with which you can invent a story.



FigA.1.29. Capture of the video [2] showing Aitor playing football.

What Playing football in the sand.

How Showing a lot of energy while he is shooting the ball.

Why He wants to shoot with all the strength he is able to do.

Need of showing that you are full of energy and enthusiasm.

Later Aitor went to a Hospital to make some tests. The test consisted in pressing a bottom when he saw a particular picture. They explain this test to Aitor like it was a game and when they ask if he likes the game he say no. While he is in the MRI machine he couldn't stop moving and questioning everything he saw.



FigA.1.30. Capture of the video [2] showing Aitor during a medical test.

What He is inside of the MRI machine in the hospital.

How He cannot be without moving himself.

Why He does not like to be there.

Need of knowing more about these children and try to explain them why.

Ainhoa also has been diagnosed with ADHD. When the reporter let her to make the video and explain to the audience how her life is, she started introducing the animals of the house. After that she ask to her father what is he cooking.

- *Need of giving and receiving affection.*



FigA.1.31. Capture of the video [2] showing Ainhoa talking to the camera.

What Talking to the camera introducing herself.

How Looking to the camera and smiling.

Why She likes to have attention.

Need of being listened and also of being able to explain why you do things in one way and not other. Need of giving her the liberty of talking about what she wants to talk.

She explains us the problems she has in the following way:

- When I want to obey my mum orders I can't because my brain starts to hurt.
- *Need of receiving orders with a justification and with the correct tone.*

Parents and teachers describe her behavior like "she daydreams all the time and she has difficulties to express herself". On the other hand they say:

- She never complains and she always asks for help when she needs it. Since she knows that she suffers ADHD is happier and feel more self-confidence when she goes to school.
- *Need of recognizing what are your weakness and try to improve with the support of people surrounding you.*



FigA.1.32. Capture of the video [2] showing Ainhoa doing work at class.

What Doing school work in class.

How She looks very serious and concerned.

Why She wants to do it well.

Need of being conscious that everybody feel pressure when is being evaluated.

In one part of the video she says that she concentrated seeing how the snow is falling. After that when the reporter asks her what things she does not like, she responds:

- I don't like when people shout at me nor people take the things when I'm using them.
- *Need of learning to be patient and try to understand that, like you, other people are not always acting well.*

Name of the program: Quequicom – TDAH: transtorn d'oportunitats [3]

Fina is Ainhoa's mother. She was diagnosed with ADHD when her daughter was because she felt reflected in her. She explains how she remembers her childhood:

- I didn't understand anything. I was always in my inner world. It was like I had two different lives. When I wrote something in my agenda because I didn't want to forget it, then I forgot to look the agenda. You suffer because you don't get where the other people. Everybody say that you are dumb, a lazybones or a absentminded. You have the feeling that you have failed.
- *Need of not being afraid to say what you are feeling. Need of interacting with people and find a solution different from hiding yourself in an inner world.*



What Putting a paper in her ring to remind she has something in the oven.

How Using a permanent visible reminder of a task she has to do.

Why She has the purpose of cooking the food in a proper way.

Need of finding new and simple methods in our daily life to improve it.

FigA.1.33. Capture of the video [3] showing Fina's hands.

Xavier was diagnosed when he was a child. Now he is an elite athlete and he is also studying physiotherapy. Like David he upholds the use of medication:

- If I don't take the pill I feel like I'm aware of everything but not of what I'm trying to do. I notice that people don't understand that if I don't take the pill I can't do the same things than others. It's like you don't allow an asthmatic to take the medication, he will feel suffocated. There's nothing free in this life but if you fight for what you want at the end you can have your recompense.
- *Need of finding a vocation and fight to achieve the goals that you have decided.*



What Explaining one anecdote of his childhood.

How Laughing with his brother.

Why They think the situation was funny although they were not obedient.

Need of being children who are sometimes playful, it doesn't matter if you have ADHD or not, sometimes you're not obedient.

FigA.1.34. Capture of the video [3] showing Xavier and his brother.



FigA.1.35. Capture of the video [3] showing Xavier while he is rowing.

What He is rowing very concentrated.

How Closing his eyes.

Why He really likes rowing and he feels pleasure while he is training.

Need of finding an activity which can be your refuge, your stimuli to strive and makes you to set your goals at the same time.

There is an important school of thought that says the problem is not ADHD, it is the obligation of being “standard”. In other words all these children have the need of changing their minds and start thinking that the problem is caused by the society that stipulates how a person has to behave and think. If we can make society realizes that other ways of thinking are not a bad thing, we are going to do a big step to solve this children problems. Another big problem is the debate about if pharmaceutical industry is taking advantage of this situation.

We are going to do the same exercise than with the last 3 videos, but now with a video which shows a clearly position against considering ADHD a disorder and against using a pharmacological treatment. Once again we are going to make the effort of extracting neutral information.

Name of the program: Merrow Report. Attention deficit disorder: a dubious diagnose? [4]

4 children are interviewed in this program. All of them have been diagnosed with ADHD when they were younger and have been taking Ritalin for treatment. They show themselves openly against this medication.

Andrew seems indignant with his situation.

- When we go dinner and my mum tell me to take Ritalin I say no, I can be ok. Then my mum says, while we are eating: you need Ritalin, you’re so active. No, I wanna eat.
- *Need of making understand that they don’t need help for do everything, sometimes they only just want to do things on their own way.*



FigA.1.36. Capture of the video [4] showing Andrew talking to the camera.

What Explaining that he disagrees with her mother.

How Showing with his words and his facial expression that he is angry with her.

Why He thinks her mother has not reason.

Need of being patience with them and not expect they always will behave as you want.

David seems very concerned about the medication side effects.

- My father is a doctor and tries to convince me that there are no side effects and then I read on the box that it can cause somnolence, depression or loss of appetite.
- *Need of make understand that there are things more important than good grades like correct growth and health.*



What Talking about the side effects of Ritalin.
How Showing a face of resignation.
Why He feels like he cannot decide taking Ritalin or not.
Need of being listened and taking account their views.

FigA.1.37. Capture of the video [4] showing David talking to the camera.

Andrew continues talking, now about how he feels in school.

- My teachers always bring it out. Like I were hyperactive for a week or something. One of my teachers doesn't let me enter the class if I don't have a sign note from the nurse of the school, saying that I take my Ritalin.
- *Need of helping them without putting them in evidence in front of other people. Need of make an effort on part of teachers to integrate all the students in the class.*

The following interviewed explains the differences he feels when he take Ritalin and when he does not.

- When you're not in Ritalin you catch much more information, life is so much greater and interesting. When you take it, you focus all in a small point. Nothing's fun anymore and you're not the same person you were.
- *Need of making understand that they see things in another way that it is not worse than another, it is only different.*



What Explaining how wonderful is life when he is not in Ritalin.
How Using words like funny and interesting.
Why He feels happy when he is not in Ritalin.
Need of choosing a lifestyle.

FigA.1.38. Capture of the video [4] showing a boy diagnosed with ADHD talking to the camera.

When the reporter asks if they like themselves when they are in Ritalin they answer that they do not and they argue it saying next things.

David:

- No, because it's not real, it's not you.
- *Need of letting them being themselves.*

Andrew:

- Medicine is creating a fake person.
- *Need of not feeling pressure to be like the others because is supposed to be the correct thing.*

Andrew also explains what he thinks about the results that he achieves in school.

- When people say: Oh, you need more Ritalin, you have ADHD, it makes you feel stupid. My parents make me take it since I was in 1st grade and it makes me feel bad. My mum always makes a big deal and I don't think it's a big deal. She tells all her friends: Oh, he has ADHD, he has a bad behavior. They think that you're stupid because they think Ritalin makes you smart, but this is not you, they don't let you try it yourself, they want to the Ritalin to work for you.
- *Need of making understand that you are not less intelligent than the others. Intelligence is not memorizing or using only the methods that teachers use.*
- I don't get better grades since 5th grade, it's not Ritalin, it's just I'm not organized.
- *Need of asking for help in things that you think you have to improve.*

After Andrew said that he is not organized, one of the kids says:

- Ritalin cannot help you in everything, I mean if you're not an organized person it won't makes you an organized person. They think it's a kind of miracle drug.
- *Need of taking all time they need to help them and not try to use the "fast track".*

Darren:

- It makes me be awake all night so then I have somnolence. I think it makes you retard your growth. Every day I say that I don't want to take Ritalin. I just have to take it to get well in school.
- *Need of resting properly. Need of explaining them why do you think it is important to get good marks in school. Need of guiding them on their way to be independents.*



What Saying "I have to take Ritalin to get well in school"

How Showing a sad face.

Why He prefers not taking Ritalin although it means getting bad in school.

Need of helping them to choose their future, always considering their preferences.

FigA.1.39. Capture of the video [4] showing Darren talking to the camera.

After doing the exercise of analyzing the children testimonies in some documentaries, using the What, How, Why method [5], the needs found were divided in 6 different groups. Maybe some needs could be classified in more than one group but with the aim of doing a more simple analysis they are filed only in the one where it has more relevance. Below it is showed this classification.

Need of having fun

Need of having fun with toys.

Need of having time and space to have fun with others

Need of being children who are sometimes playful, it doesn't matter if you have ADHD or not, sometimes you're not obedient.

Need of being patience with them and not expect they always will behave as you want.

Need of resting properly.

Need of having a good self-confidence:

Need of having a place in society.

Need of feeling that being different is not bad if you respect other people.

Need of appreciation from the others because making the effort of paying attention is hard.

Need of being conscious of you strengths and weakness.

Need of being with people who try to understand you and have the same opinions than you in some matters.

Need of being conscious that success does not mean the same for everybody.

Need of feeling you are not alone.

Need of giving hope and an example to other people who have the same problems that you.

Need of feeling listened and supported.

Need of being conscious that achieving academic goals is important but is not the most important thing in life.

Need of knowing more about these children and try to explain them why

Need of giving and receiving affection.

Need of recognizing what are your weakness and try to improve with the support of people surrounding you.

Need of being conscious that everybody feel pressure when is being evaluated.

Need of making understand that they don't need help for do everything, sometimes they only just want to do things on their own way.

Need of helping them without putting them in evidence in front of other people.

Need of make an effort on part of teachers to integrate all the students in the class.

Need of making understand that they see things in another way that it is not worse than another, it is only different.

Need of letting them being themselves.

Need of not feeling pressure to be like the others because is supposed to be the correct thing.

Need of expressing yourself:

- Need of talking and sharing experiences with people who do not suffer ADHD.
- Need of showing maturity because your way of doing things is different from the others' and you have to make the others understand why you do some things without forgetting that you are a child not an adult.
- Need of working all types of expression.
- Need of using the way of expression that you feel more comfortable with.
- Need of showing your dislikes openly.
- Need of showing that you are full of energy and enthusiasm
- Need of being listened and also of being able to explain why do you do things in one way and not other.
- Need of giving her the liberty of talking about what they want to talk
- Need of not being afraid to say what you are feeling.
- Need of interacting with people and find a solution different from hiding yourself in an inner world.
- Need of making understand that it is more important to have a good relation with your sons than their grades in school.
- Need of making understand that there are things more important than good grades like correct growth and health.
- Need of being listened and taking account their views.
- Need of asking for help in things that they think they have to improve.

Need of playing in a different way:

- Need of instant response in the games.
- Need of moving with a purpose.
- Need of channeling your energy to make what you want to do.
- Need of playing with games which do not require patience.
- Need of choosing with what you want to play.
- Need of playing with toys that have mobile parts and maybe with which you can invent a story.

Need of learning in a different way:

- Need of doing things that really interest you.
- Need of analyzing the situation and the setting around you (maybe you need a break to do things in a better way later).
- Need of distinguishing between impulsive and reflexive way of thinking.
- Need of learning when you can use impulsivity in profit and detect when it is necessary to be reflexive.
- Need of realizing that sometimes making the effort of learning some things that in the first time you do not want to learn could give you a tool to be creative, like learning to play a musical instrument.
- Need of appreciating that a lot of times creativity needs some impulsivity.
- Need of explanations from people who give you an order (the only reason cannot be "you have to do it").
- Need of having liberty to decide when, where and how we want to do something.
- Need of knowing how to adapt yourself to the way that other people work.

Need of doing exercises in class that involve movement to not be a lot of hours seating in the chair.
Need of communicating without speaking.
Need of focusing in coordination of your movements.
Need of having experiences with sounds and music to learn how to pay attention when people are talking to you.
Need of receiving orders with a justification and with the correct tone
Need of finding new and simple methods in our daily life to improve it.
Need of making understand that you are not less intelligent than the others, intelligence is not memorizing data or using only the methods that teachers use.
Need of taking all time they need to help them and not try to use the “fast track”.
Need of guiding them on their way to be independents.
Need of explaining them why do you think it is important to get good marks in school.

Need of being conscious of the consequences of your acts:

Need of learning how to share toys and knowing the correct way of purchasing things.
Need of experience healthy competitiveness.
Need of learning how to be respectful with others.
Need of being conscious of the external image and relate that to good habits.
Need of having examples of behavior.
Need of doing teamwork and having more examples of behavior when you are in a team.
Need of learning how to face problems and recognizing your mistakes to not search a refugee when you don't like the situation.
Need of not holing up behind the excuse “I cannot do this because I have ADHD”.
Need of perseverating in what you believe but listen carefully other opinions.
Need of learning to be patient and try to understand that, like you, other people are not always acting well.
Need of finding an activity which can be your refugee, your stimuli to strive and makes you to set your goals at the same time.
Need of finding a vocation and fight to achieve the goals that you have decided.
Need of choosing a lifestyle.
Need of letting them being themselves.
Need of helping them to choose their future always considering their preferences.

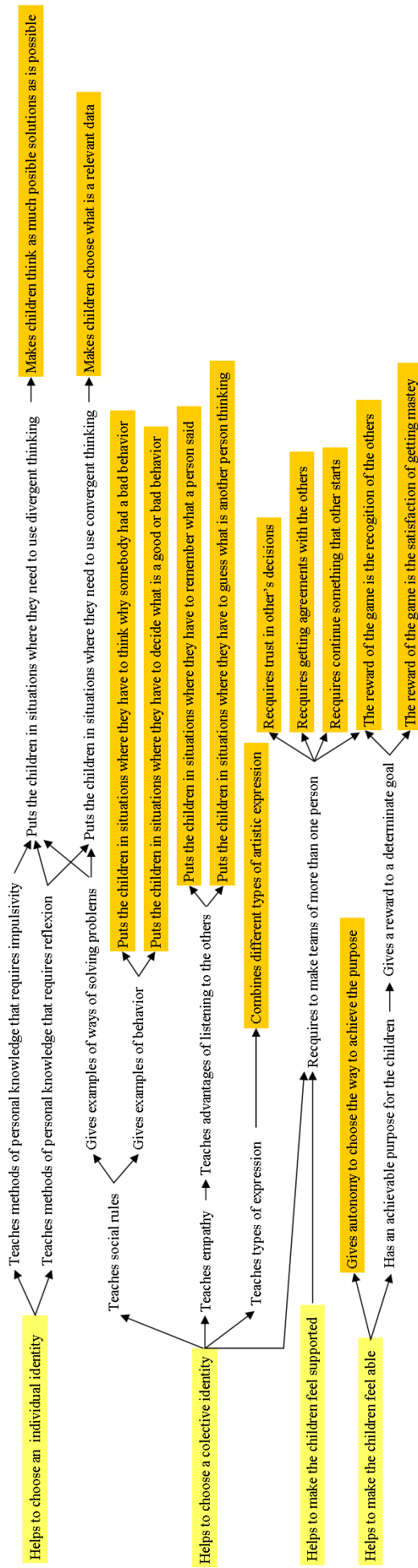
A.2. Pondered weight matrix

The next figure sets out the importance of every need studied and how the requirements satisfy each need. This way it could be possible to choose the requirements that best fit according with the objectives of the project.

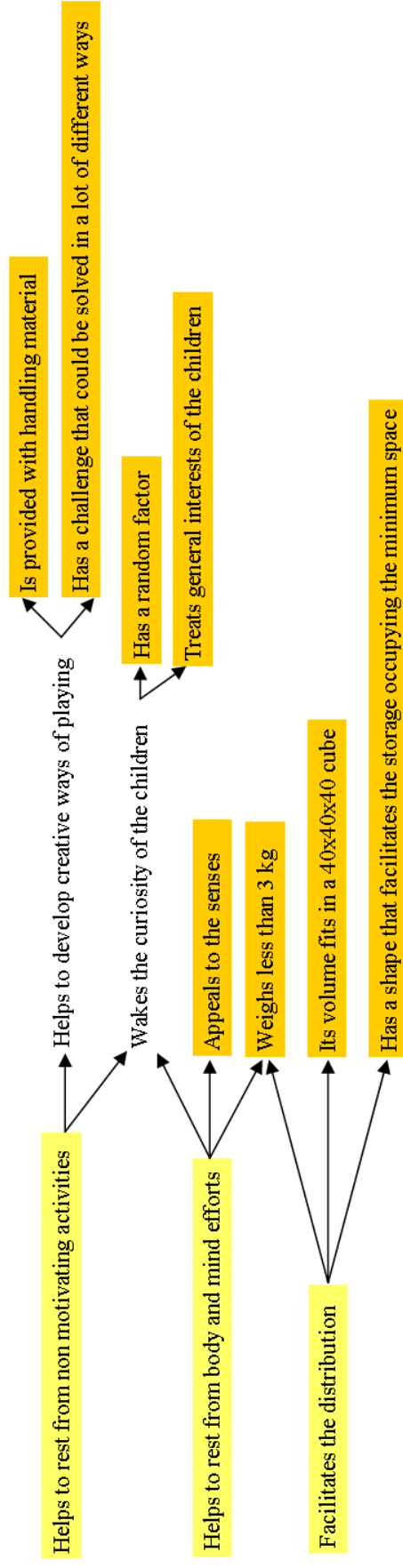
	1	2	3	4	5	6	7	8	9
priority									
puzzles/games									
dolls									
vehicles									
arts and crafts									
plush									
action figures									
visualization of letters									
selection of relevant data									
mark the rhythm for reading									
spelling with the finger									
practicing only errors									
exercise review									
handling material for representing data									
graphic representation of data									
visual reinforcement for vocabulary									
data relation with colours									
examples of behavior									
team games									
musical instrument									
graphic arts material									
sculpture material									
theatre material									
writing stories material									
dance material									
cinema/photography material									
non toxic									
non flammable									
mechanical stress minimum									
liquids and gases contained in it not danger									
non volatile									
washable									
eco-friendly									
material reward									
social reward									
achievable purpose									
give autonomy									
reward mastery (progress)									
stimuli produce emotional reaction									
stimuli stands out visually									
stimuli wakes curiosity									
possibility of interacting with the stimuli									
product volume									
product weight									
product height-width									
packaging height-width									
packaging weight									
packaging volume									
EU market									
X benefits in X time									
type of distribution									
type of communication channels									
1,6									
manufacturer, distributor and commercial needs									
having a business plan									
establishing the vision and mission of the company									
2									
establishing an economic and temporal target									
1									
dimensioning to facilitate the transport									
2									
establishing the sellable value									
2									
having commercial resources									
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A.3. Functional tree analysis

The next analysis breakdowns the main functions found previously in sub-functions with the aim of describing the functions of the product more specifically. This analysis also will help to focus the search of the state of the art in the proper direction.



FigA.3.1. Functions tree (1).



FigA.3.2. Functions tree (2).

A.4. Failure tree analysis

The reliability of the alternative chosen has been analyzed through the elaboration of the next failure tree. This way it is possible to find the cause of the most several failures and the relationship between the different failures.

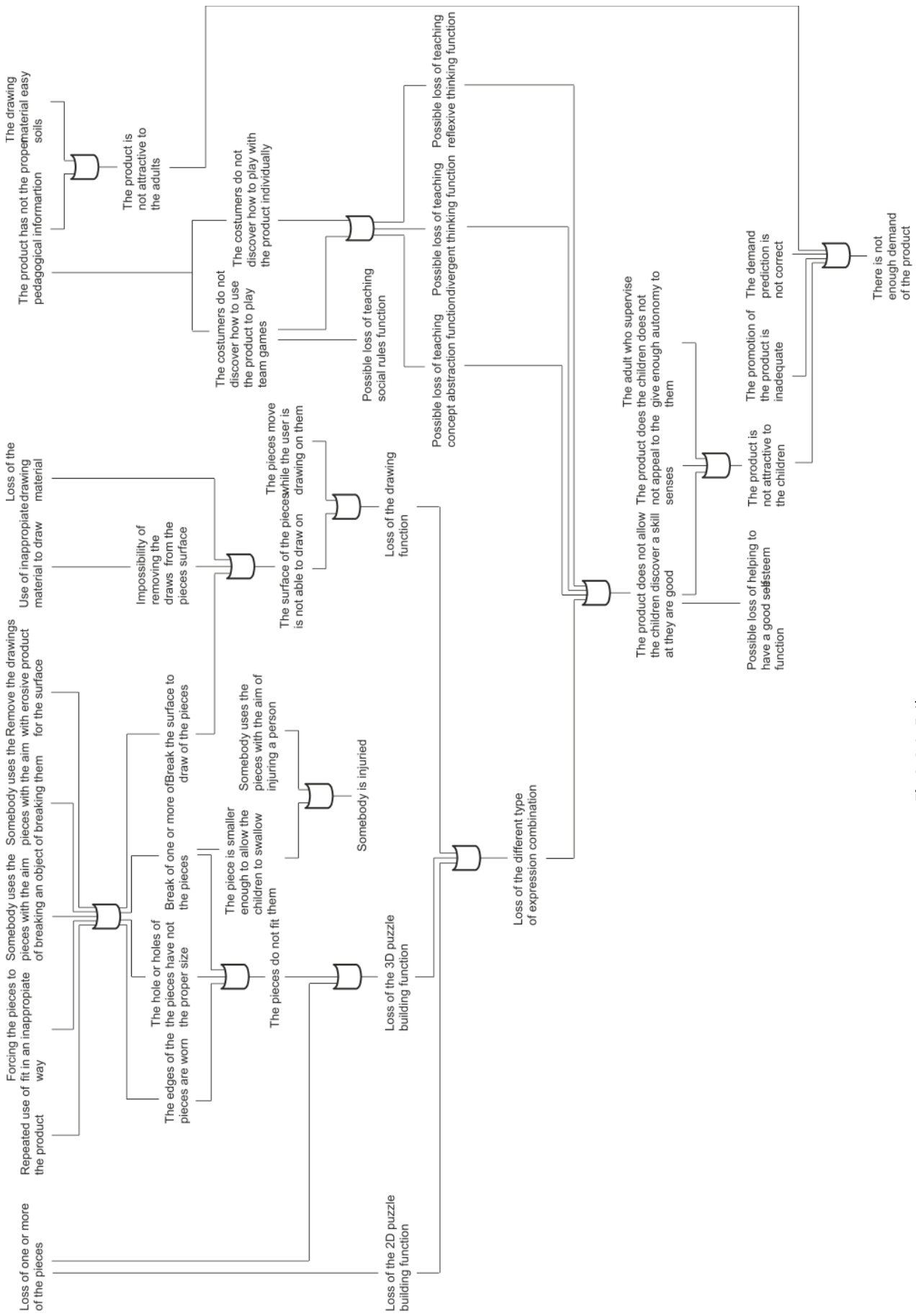


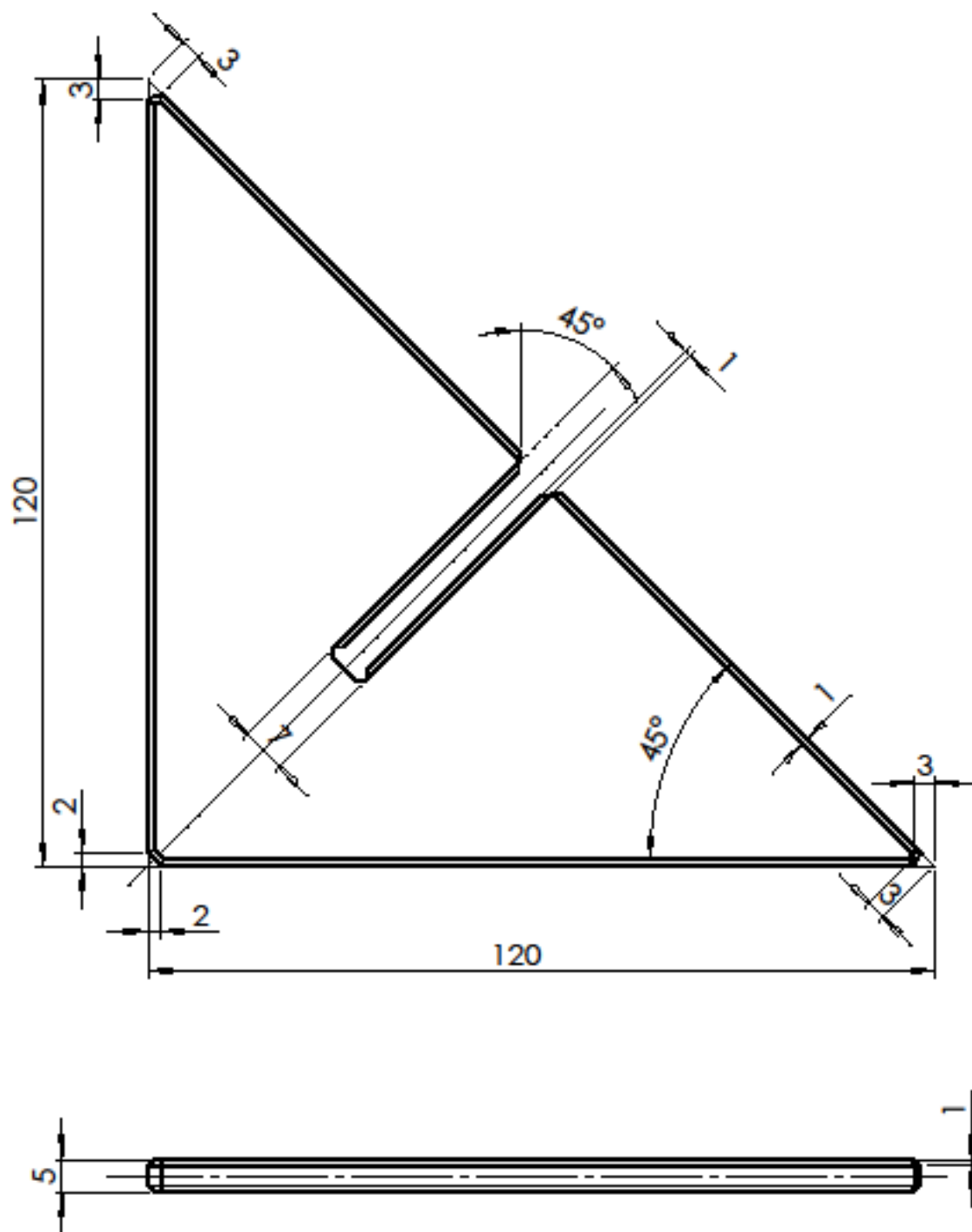
Fig.A.4.1. Failure tree.

A.5. Drawings

To describe properly the design proposed in the basic design process, the next drawings have been elaborated. The shape and dimensions of every piece can be extracted from these drawings.

Drawing contents

Big triangle 1	1/23
Big triangle 2	2/23
Big triangle 3	3/23
Big triangle 4	4/23
Small triangle 1.....	5/23
Small triangle 2.....	6/23
Small triangle 3.....	7/23
Small triangle 4.....	8/23
Square 1	9/23
Square 2	10/23
Square 3	11/23
Square 4	12/23
Trapezoid 1.....	13/23
Trapezoid 2.....	14/23
Trapezoid 3.....	15/23
Quarter circle 1.....	16/23
Quarter circle 2.....	17/23
Quarter circle 3.....	18/23
Quarter circle 3.....	19/23
Semicircle 1	20/23
Semicircle 2	21/23
Semicircle 3	22/23
Semicircle 4	23/23



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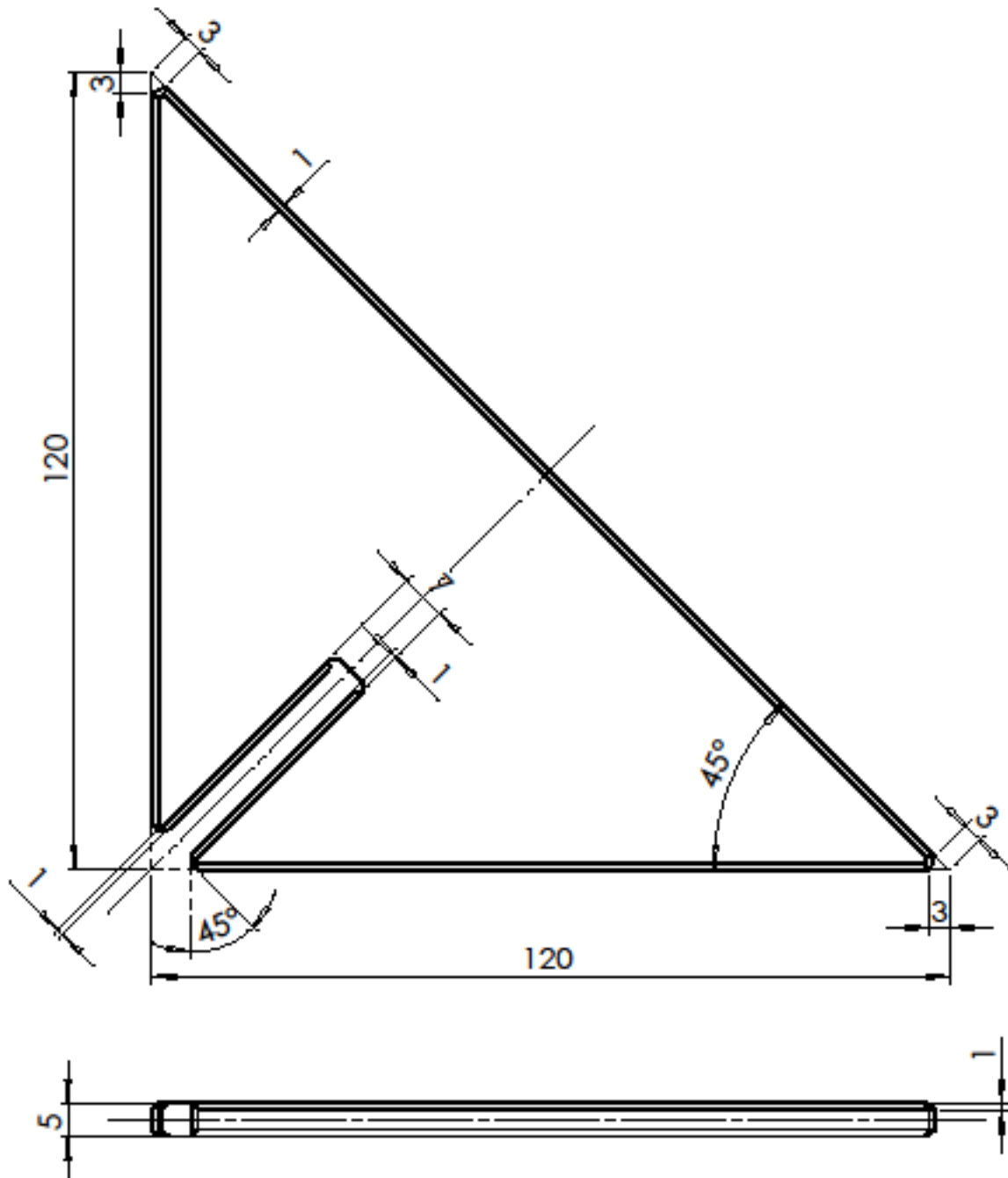
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
BIG TRIANGLE 1

Plan no.
1/23



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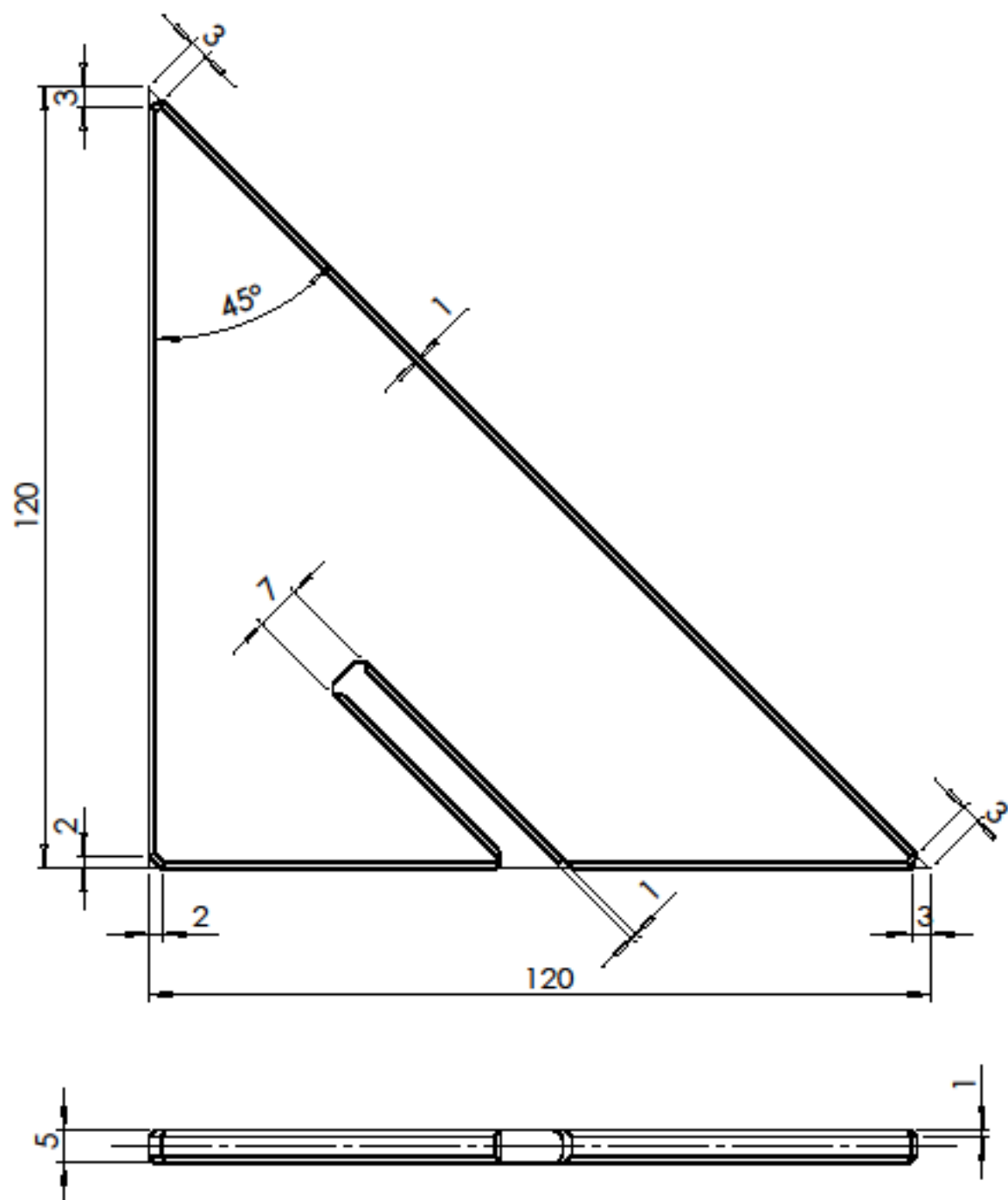
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
BIG TRIANGLE 2

Plan no.
2/23



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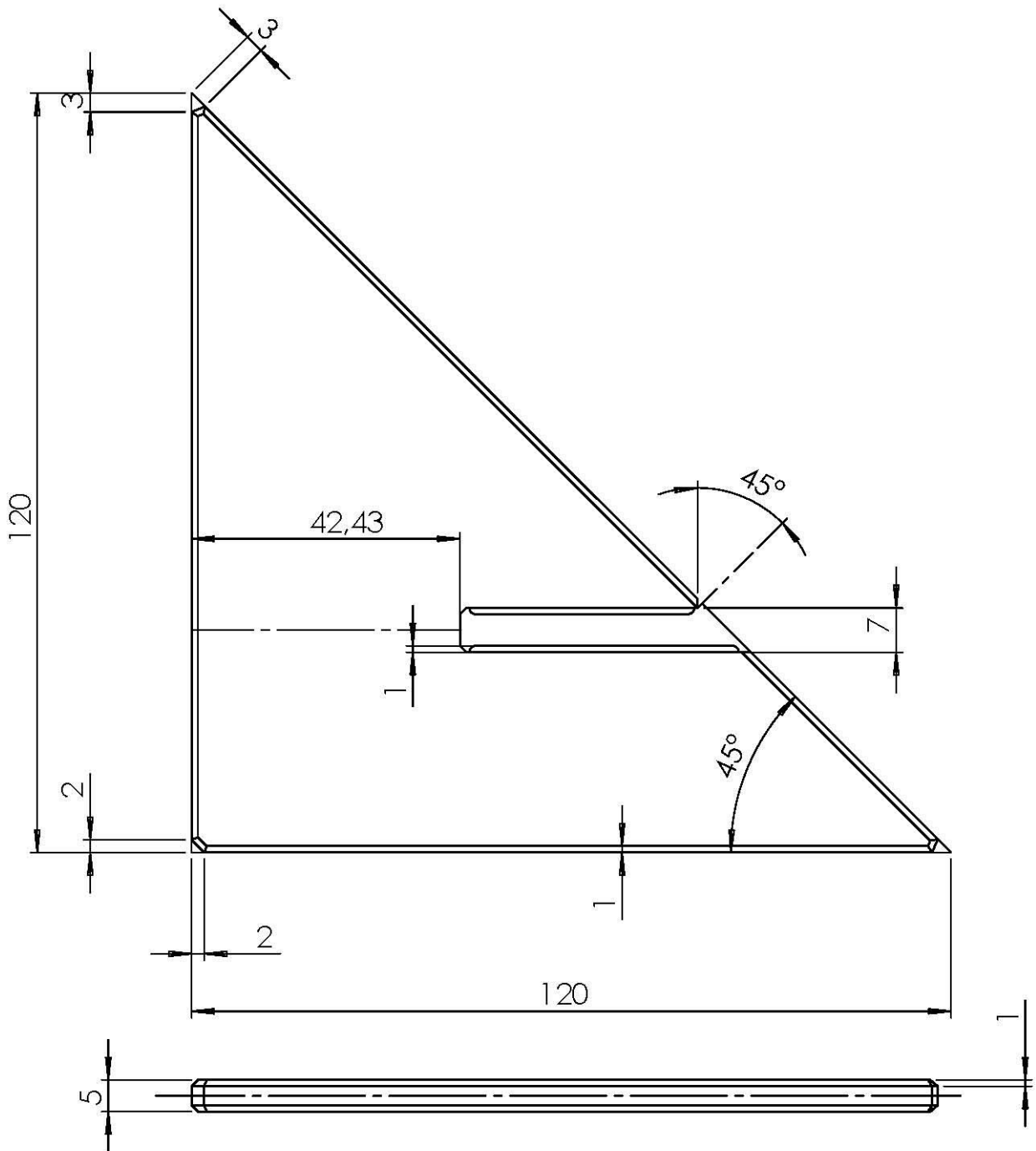
Author:
LAURA RODRÍGUEZ

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Scale:
1:1

Plan title:
BIG TRIANGLE 3

Plan no.
3/23



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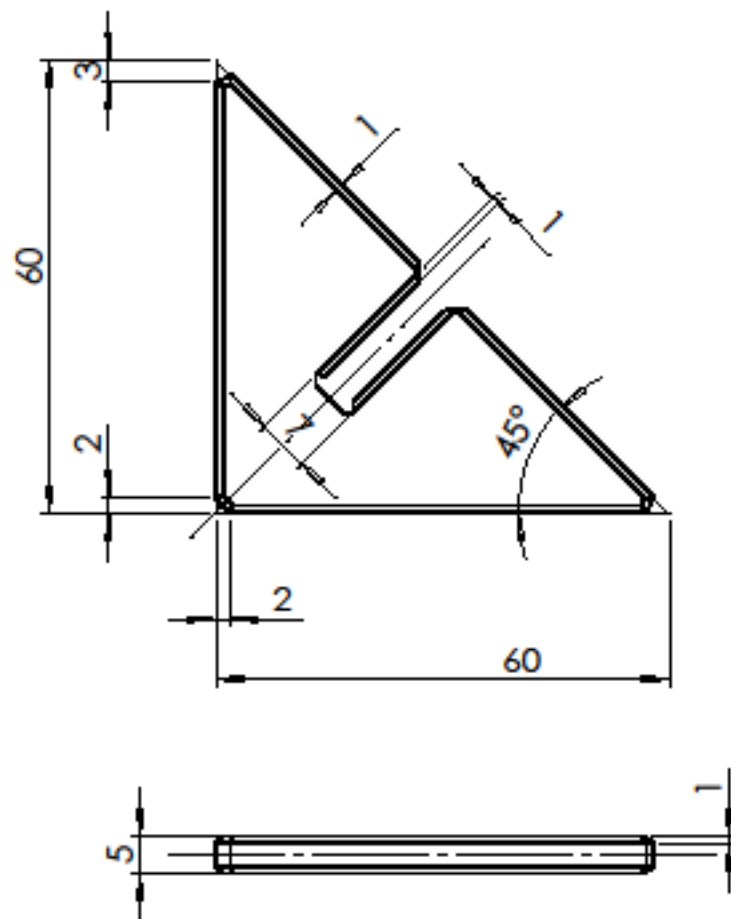
Author:
LAURA RODRÍGUEZ

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Scale:
1:1

Plan title:
BIG TRIANGLE 4

Plan no.
4/23



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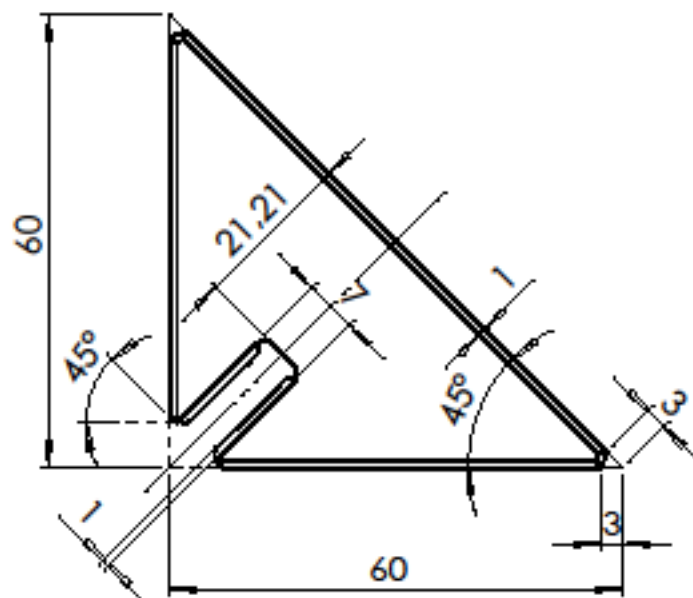
Author:
LAURA RODRÍGUEZ

Project title:
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SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SMALL TRIANGLE 1

Plan no.
5/23



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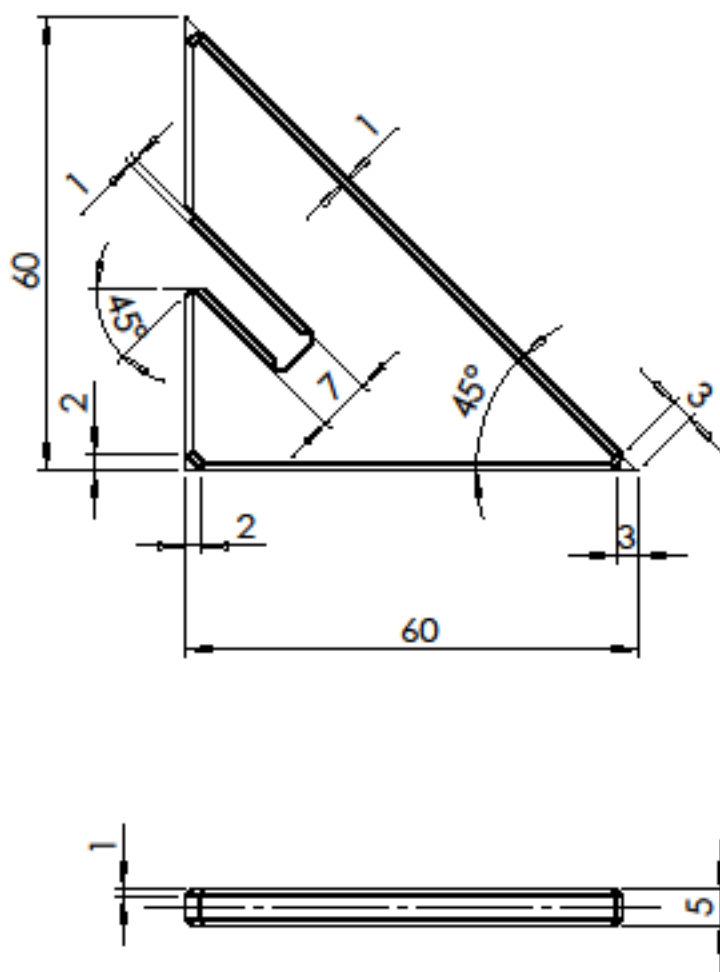
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SMALL TRIANGLE 2

Plan no.
6/23



Date:
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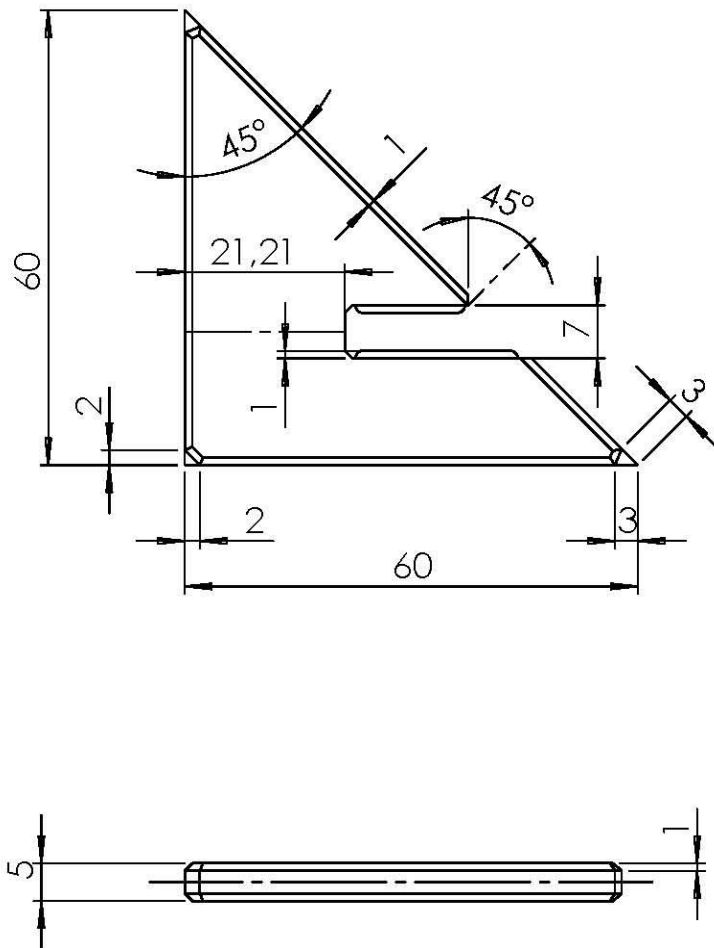
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SMALL TRIANGLE 3

Plan no.
7/23



Date:
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Institution:
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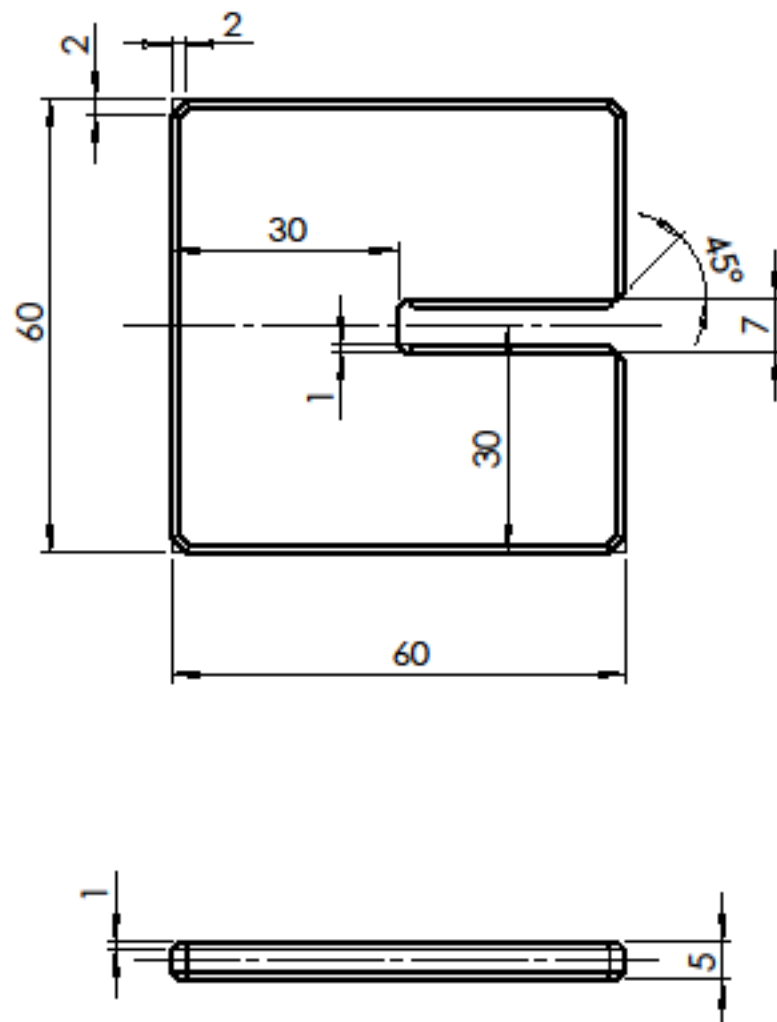
Author:
LAURA RODRÍGUEZ

Project title:
DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SMALL TRIANGLE 4

Plan no.
8/23



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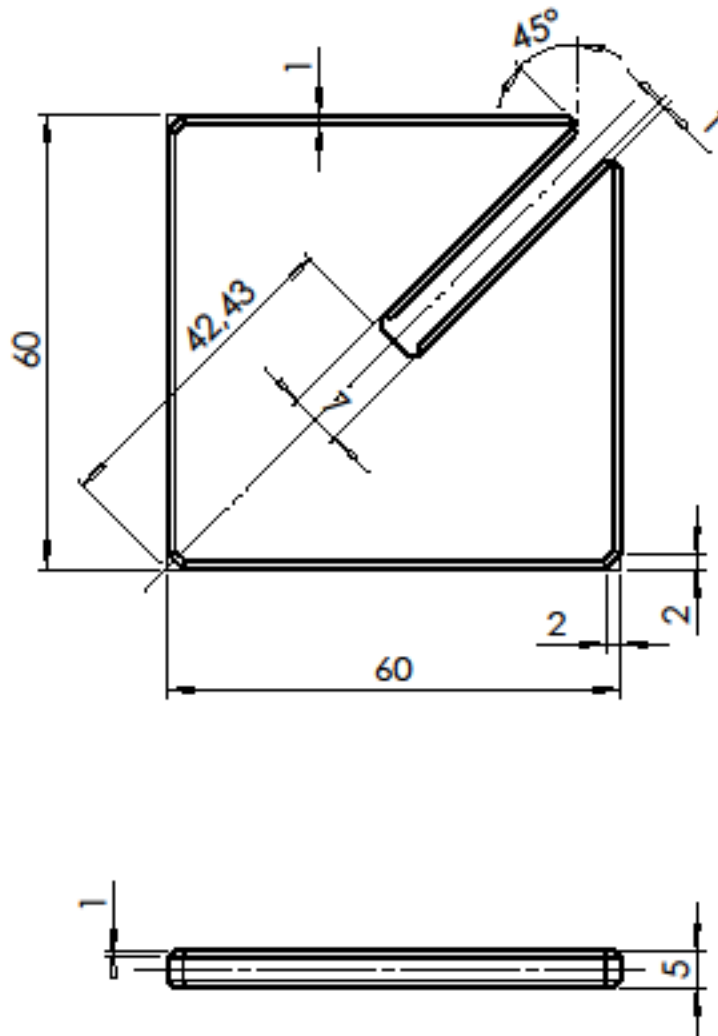
Author:
LAURA RODRÍGUEZ

Project title:
DESIGN OF A TOY WHICH HELPS CHILDREN WHO
SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SQUARE 1

Plan no.
9/23



Date:
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Institution:
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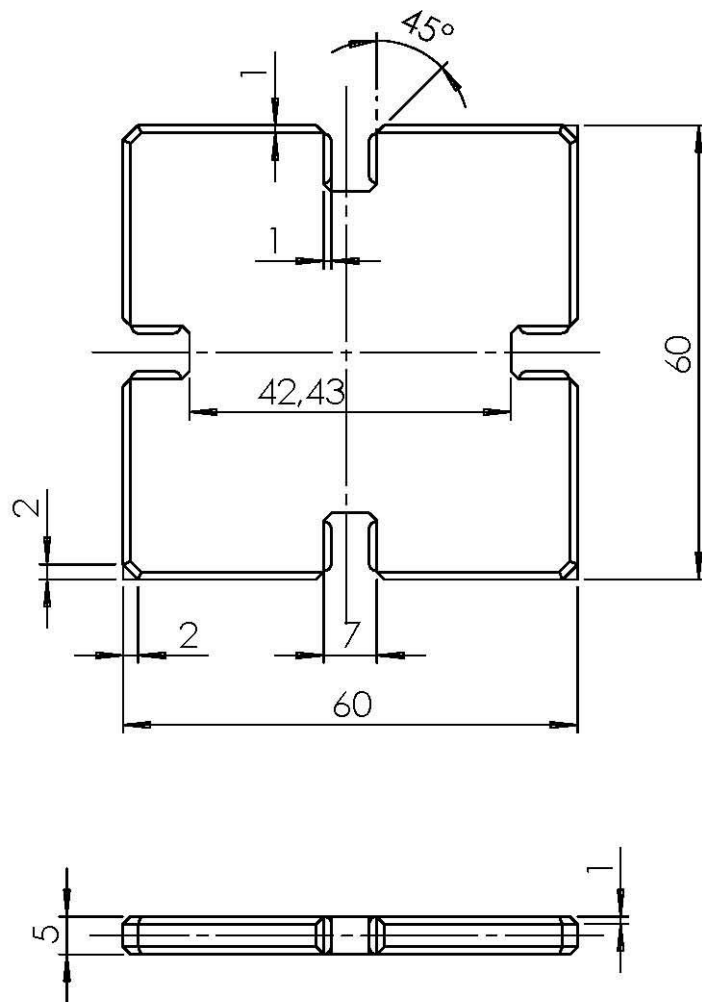
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SQUARE 2

Plan no.
10/23



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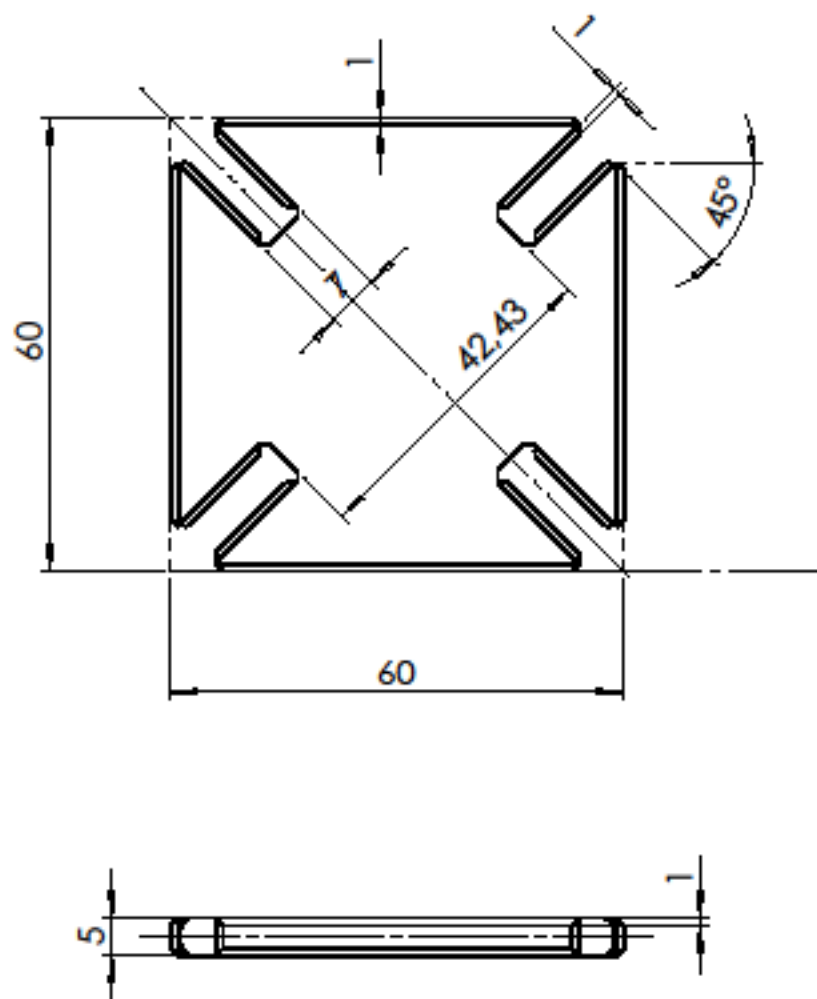
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SQUARE 3

Plan no.
11/23



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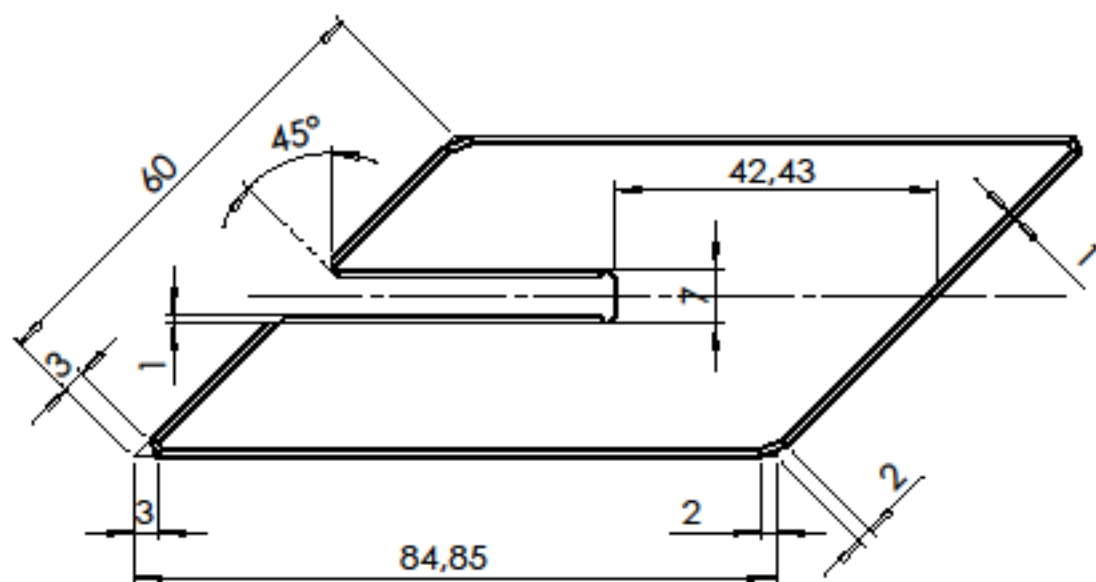
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SQUARE 4

Plan no.
12/23



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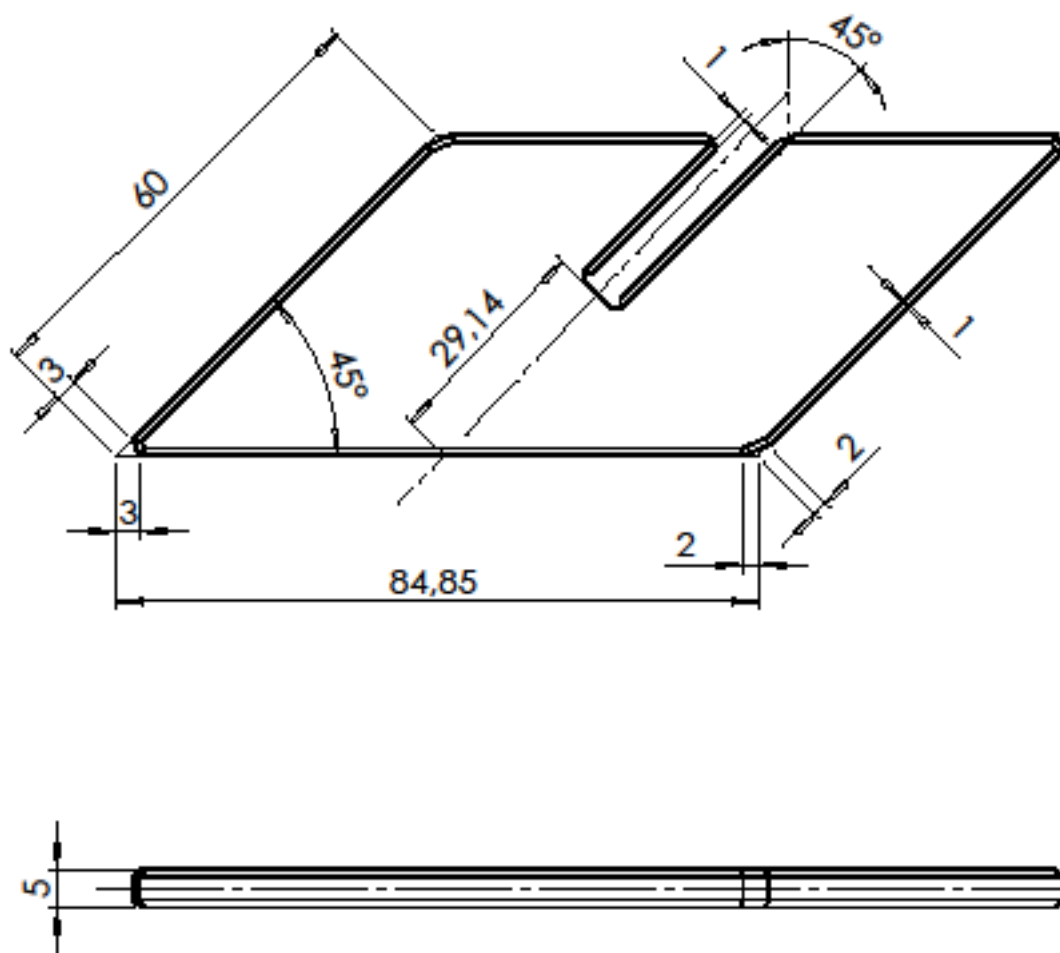
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
TRAPEZOID 1

Plan no.
13/23



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Institution:
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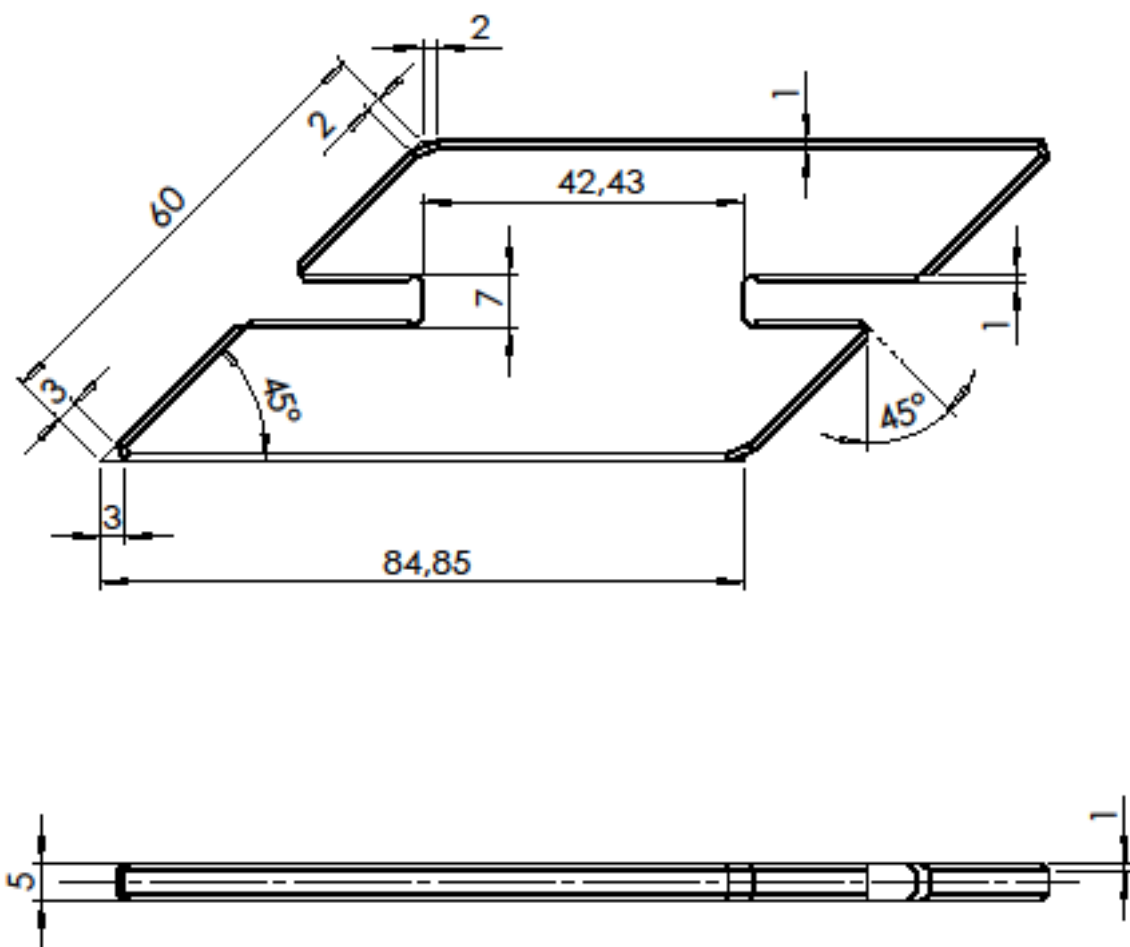
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
TRAPEZOID 2

Plan no.
14/23



Date:
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Institution:
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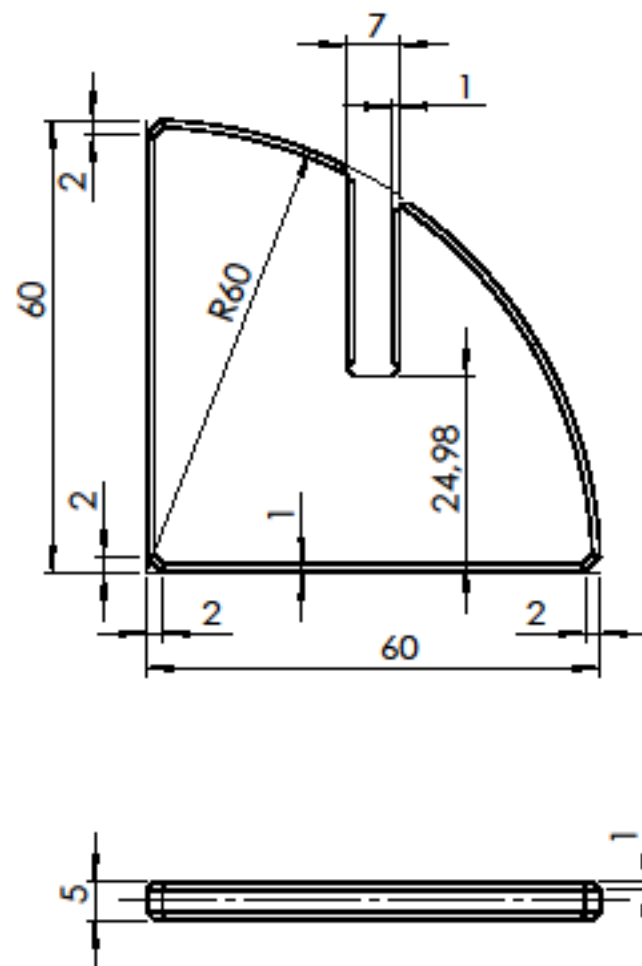
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
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Plan title:
TRAPEZOID 3

Plan no.
15/23



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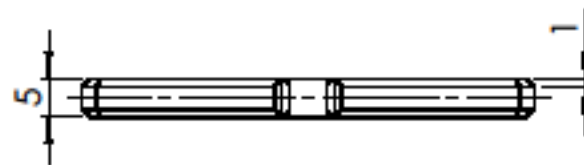
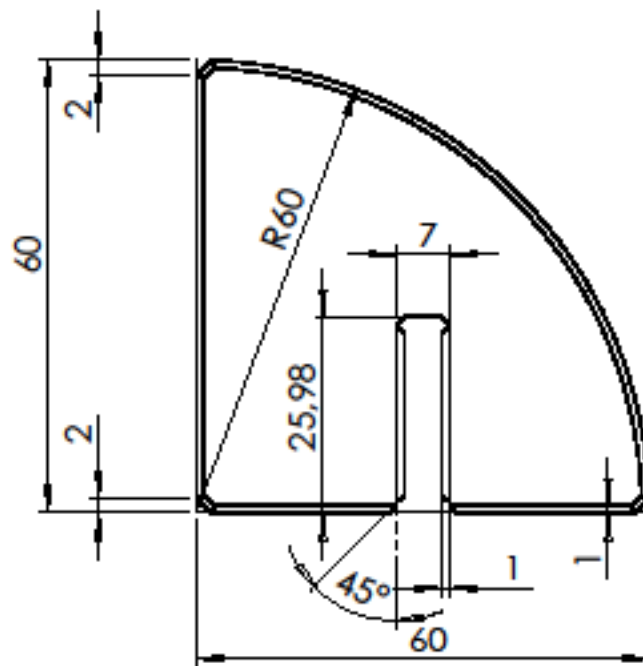
Author:
LAURA RODRÍGUEZ

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Scale:
1:1

Plan title:
QUARTER CIRCLE 1

Plan no.
16/23



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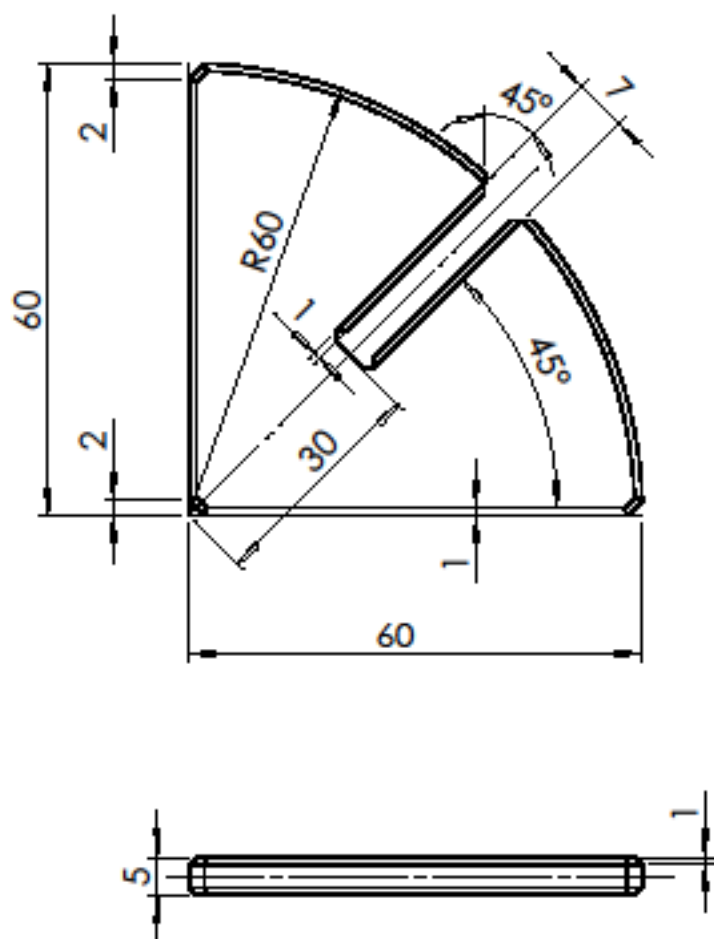
Author:
LAURA RODRÍGUEZ

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Scale:
1:1

Plan title:
QUARTER CIRCLE 2

Plan no.
17/23



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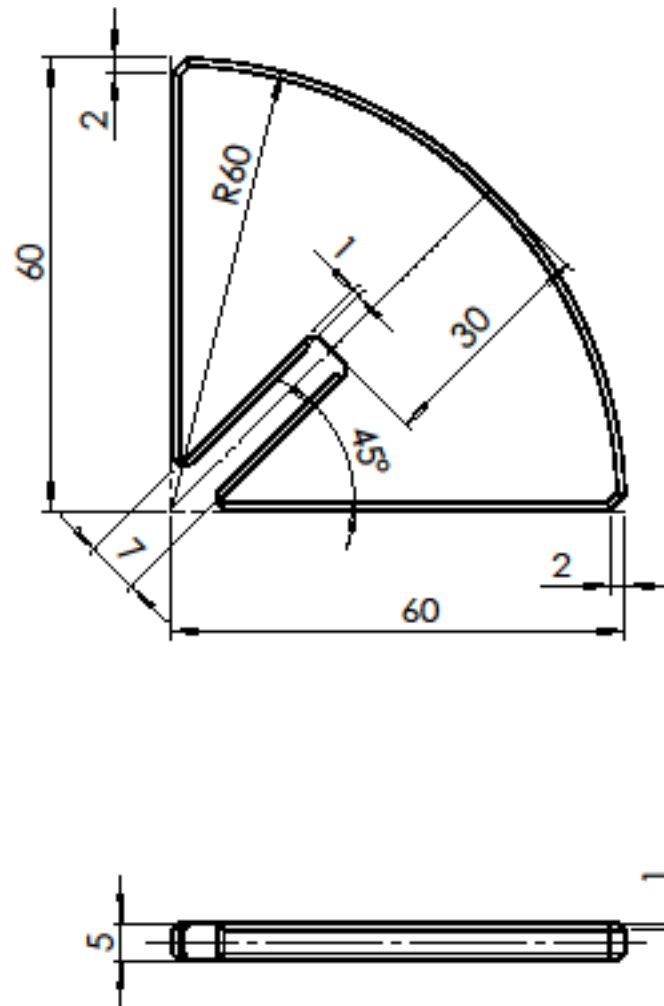
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LAURA RODRÍGUEZ

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1:1

Plan title:
QUARTER CIRCLE 3

Plan no.
18/23



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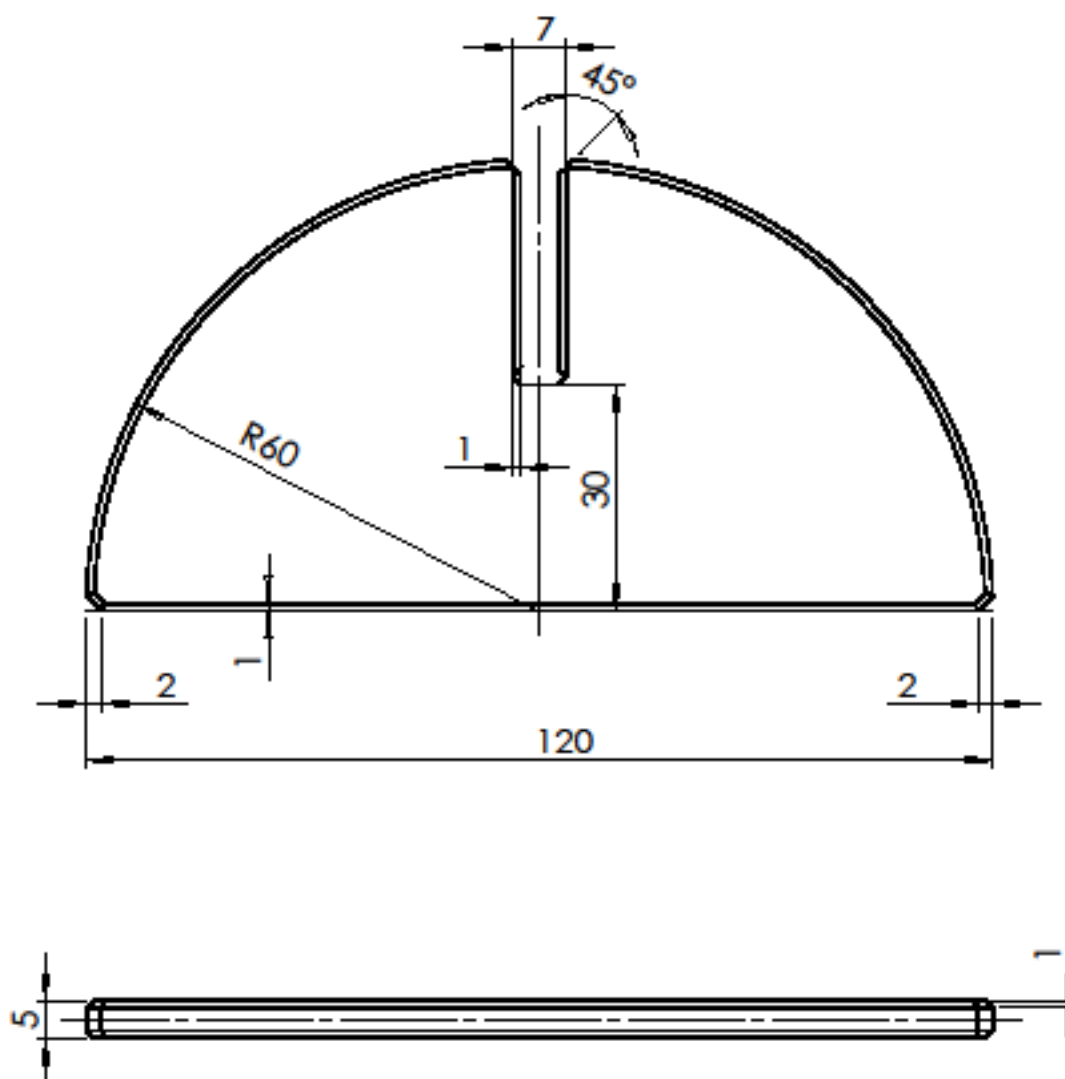
Author:
LAURA RODRÍGUEZ

Project title:
DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

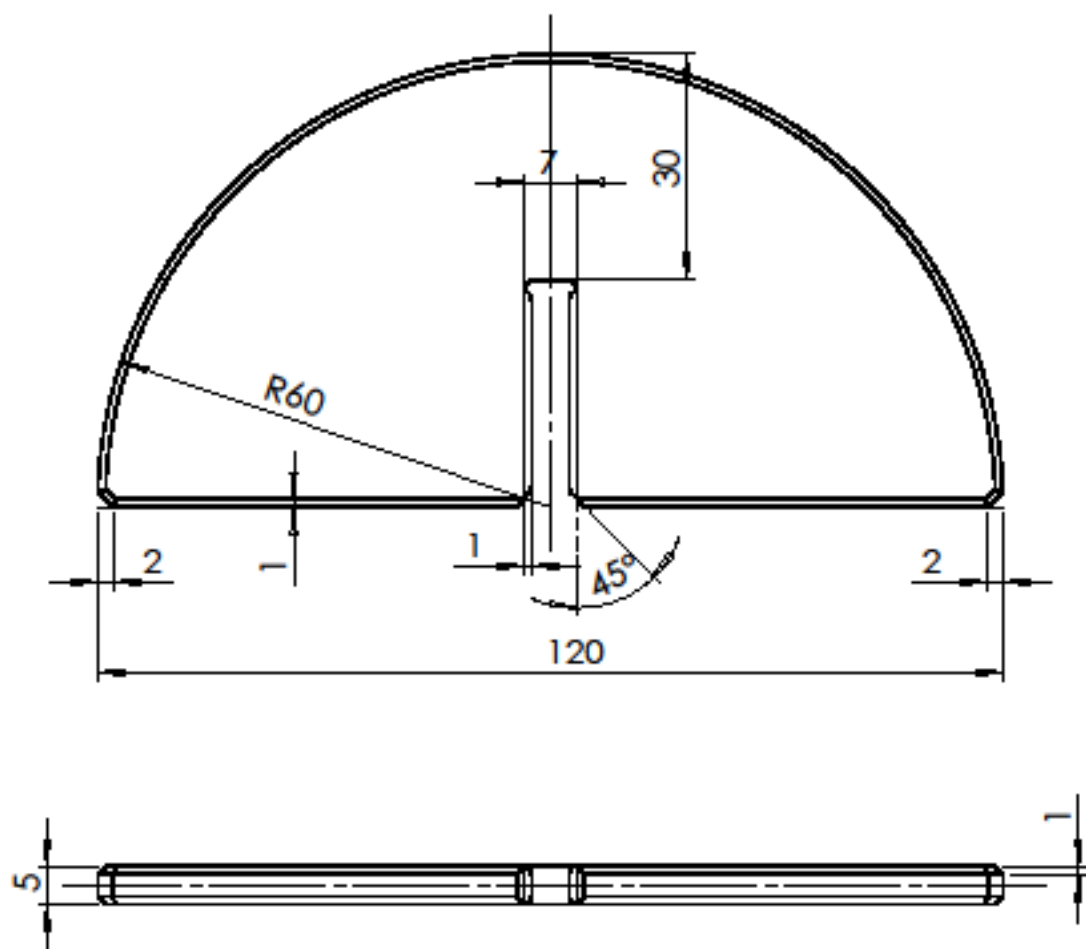
Scale:
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Plan title:
QUARTER CIRCLE 4

Plan no.
19/23



Date: 25.01.2013	Institution: UNIVERZA V MARIBORU	Author: LAURA RODRÍGUEZ
Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS		
Scale: 1:1	Plan title: SEMICIRCLE 1	Plan no. 20/23



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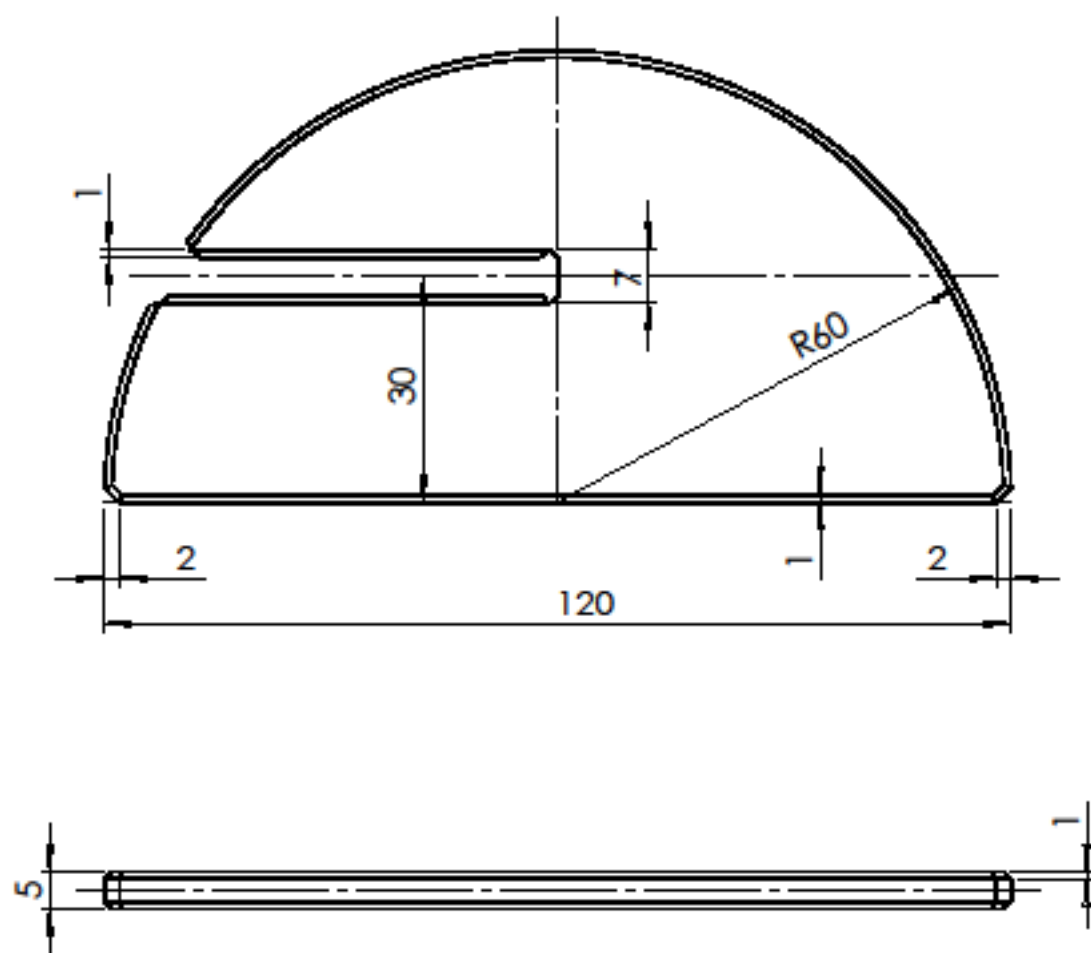
Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SEMICIRCLE 2

Plan no.
21/23



Date:
25.01.2013

Institution:
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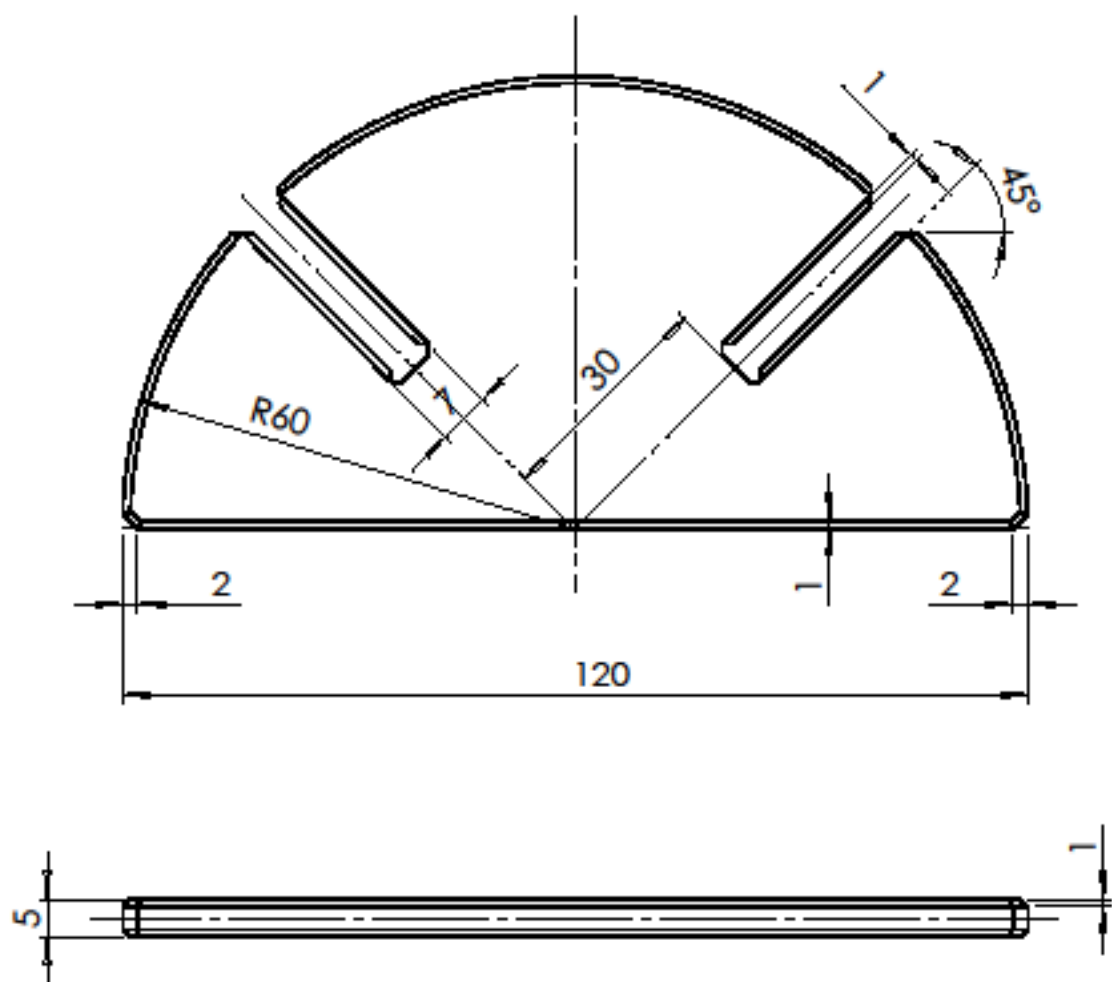
Author:
LAURA RODRÍGUEZ

Project title:
DESIGN OF A TOY WHICH HELPS CHILDREN WHO
SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SEMICIRCLE 3

Plan no.
22/23



Date:
25.01.2013

Institution:
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Author:
LAURA RODRÍGUEZ

Project title: DESIGN OF A TOY WHICH HELPS CHILDREN WHO SUFFER ADHD TO DEVELOP THEIR SKILLS

Scale:
1:1

Plan title:
SEMICIRCLE 4

Plan no.
23/23

A.6. Gantt chart

The next Gantt chart specifies the steps done in the first steps of the design and shows the brief prediction of the schedule for the next steps to do until the commercialization of the product.

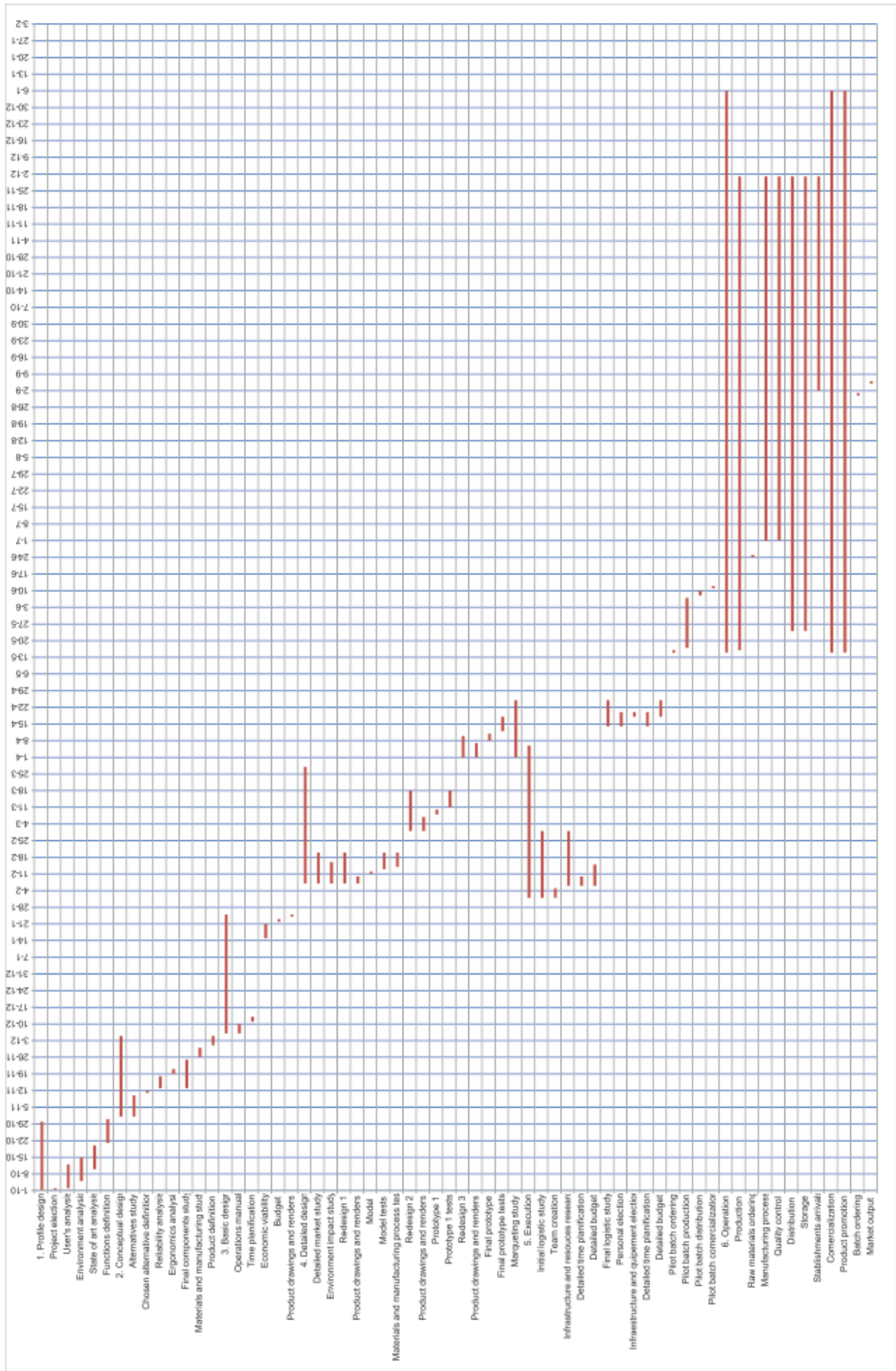


Fig.A.6.1. Gantt chart.

A.7. Sources

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