

cymbox

a modular toy block set, game, and lighting feature made to grow with and be a part of every home





**3 billion toys sold annually in the U.S.
generate approximately \$40 billion**



PLASTIC MAKES UP 90%
OF THE TOY INDUSTRY

Yale Environment Review

plastics in toys

Some of the most common safe plastics used in toy manufacturing are Polyethylene Terephthalate, Polypropylene, Polyvinyl Chloride, Acrylonitrile Butadiene Styrene, and Polyurethane Foam, which all have various types and grades used in production. These materials are used for a wide ranges of toys including soft toys, board games, figurines, outdoor toys and more. Due to the many variations of plastics being used, the time it takes for each type of plastic and product to break down varies greatly.

Plastivision.org

“Plastic waste can take anywhere from 20 to 500 years to decompose, and even then, it never fully disappears”

United Nations



polyethylene (PE)



polypropylene (PP)



80% of all toys end their life cycles in landfills, incinerators, or the ocean

ScienceDirect.com

traditional toys



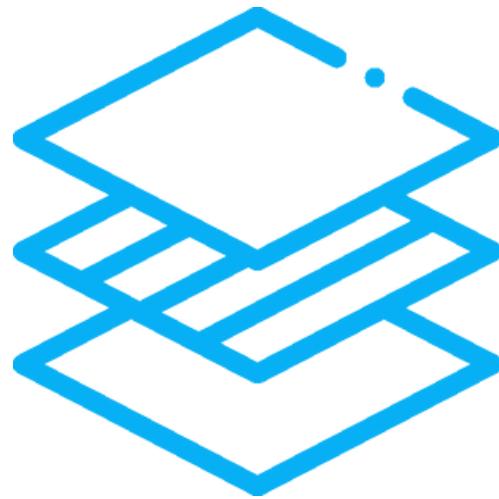
The Forbes article *Connected Toys Need to Learn Longevity from Traditional Toy Makers* emphasizes how older traditional toys have had analog toys or stuffed animals that also include interactive elements like books or stories that children have enjoyed throughout the years and still enjoy today.

“But more than that, I’m looking forward to this space maturing and **learning from what traditional toy makers have done through the ages: make beautiful objects that mean something**”

This line of thought reminded me of the longevity and durable quality that many traditional toys have. This is in part due to them being constructed from quality materials and simple designs that were easier for younger children to interact with and understand.

I began to think of the growing necessity for modern and technological toys and gadgets to remain sustainable, durable, and relevant throughout the years after their release to avoid discardment. This became a leading idea for my research, ideation, and development.

why are toys being discarded?



low quality
materials + design



made for specific
age ranges



visually unappealing
for the home

*This results in a **low emotional connection from users**, in which then the **toys end of life is not valued or considered***

research insights



When toys are made from low-quality materials, the user experience can be negatively affected by the products breaking, malfunctioning, or deteriorating quickly. ***When products are not made to last, they simply will not.*** In addition, many toys and games are appropriately designed and created for specific age groups and developmental levels which children grow out of quickly. In turn, many families often rotate various toys in and out of their homes to keep up with their children's needs and abilities. Finally, many toys and games are marketed toward children and heavily involve bold, saturated, and bright patterns, colors, and designs. Most games spend the majority of their lives in game closets or playrooms as they aren't appealing visually to display as a part of the home and appeal to multiple decoration styles. *Is it possible to design a toy that is attractive to both adults and children?*



**How can toys be designed in a sustainable
way that centers:
durability,
multi-generational engagement,
and an emotional connection with the user?**

A close-up photograph of a person's hand reaching towards a collection of colorful wooden blocks (cubes, rectangles, and cylinders) scattered on a light-colored wooden surface. The blocks are painted in various colors including green, blue, yellow, and purple. The lighting is warm and focused on the hand and the blocks.

multi-generational

organic material

longevity

sustainable

strong emotional connection

ages with users

durability

engaging

developmentally appropriate

entertaining

home decor

repairability

nesting

home decor

compact storage

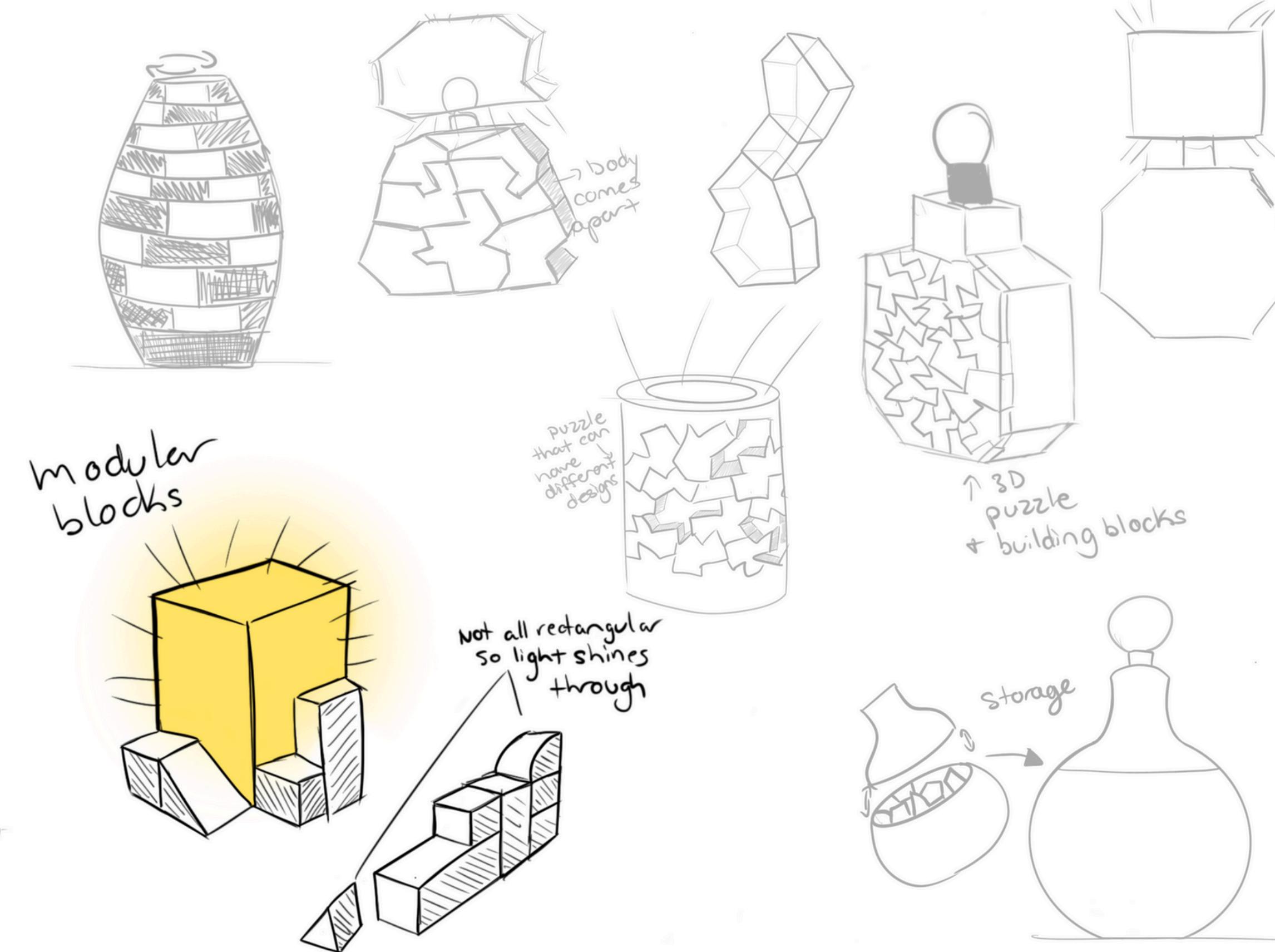
These toys are examples of play that can be adaptable and appealing to multiple generations because they act as home decor and beautiful pieces for the home.

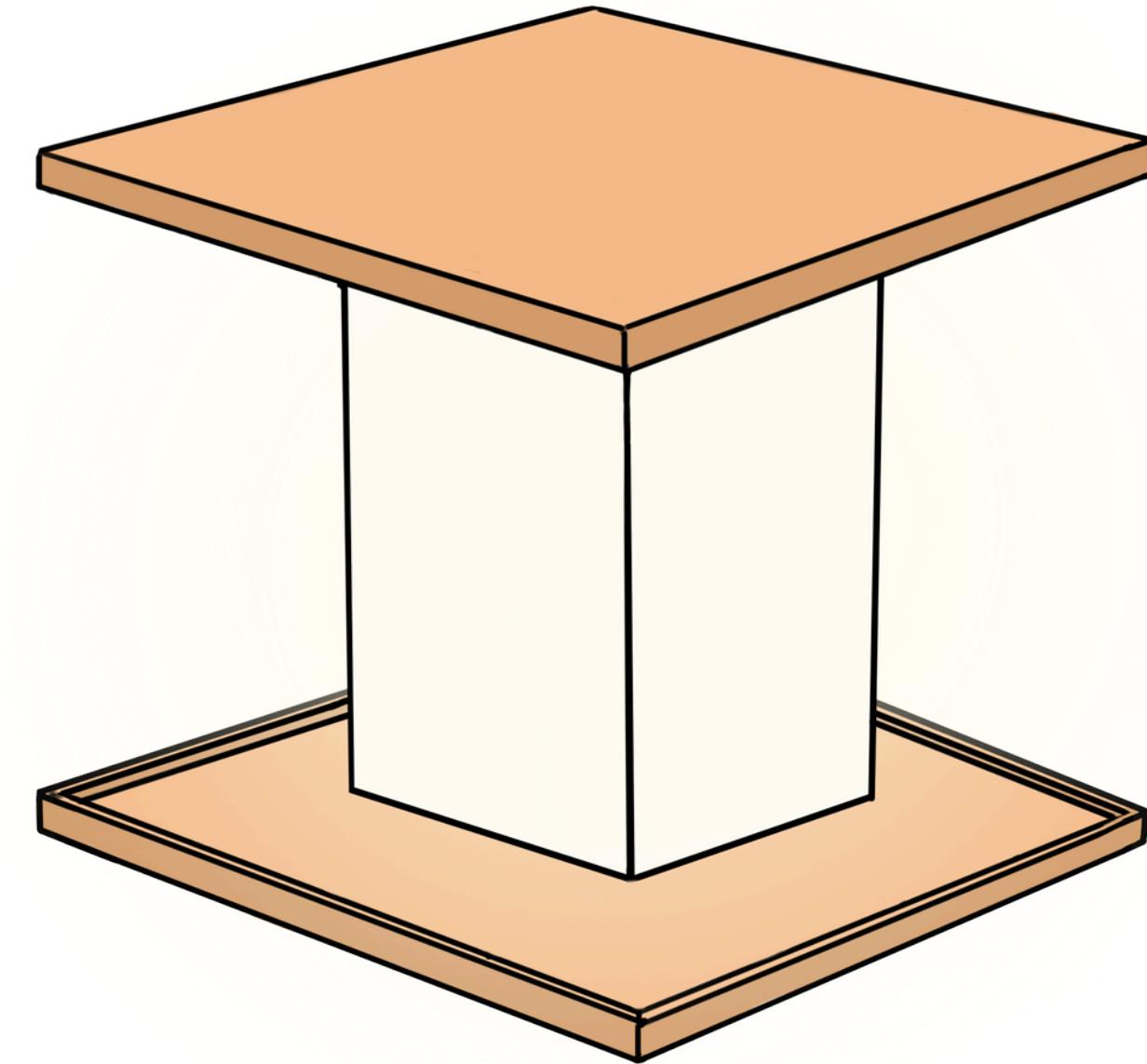
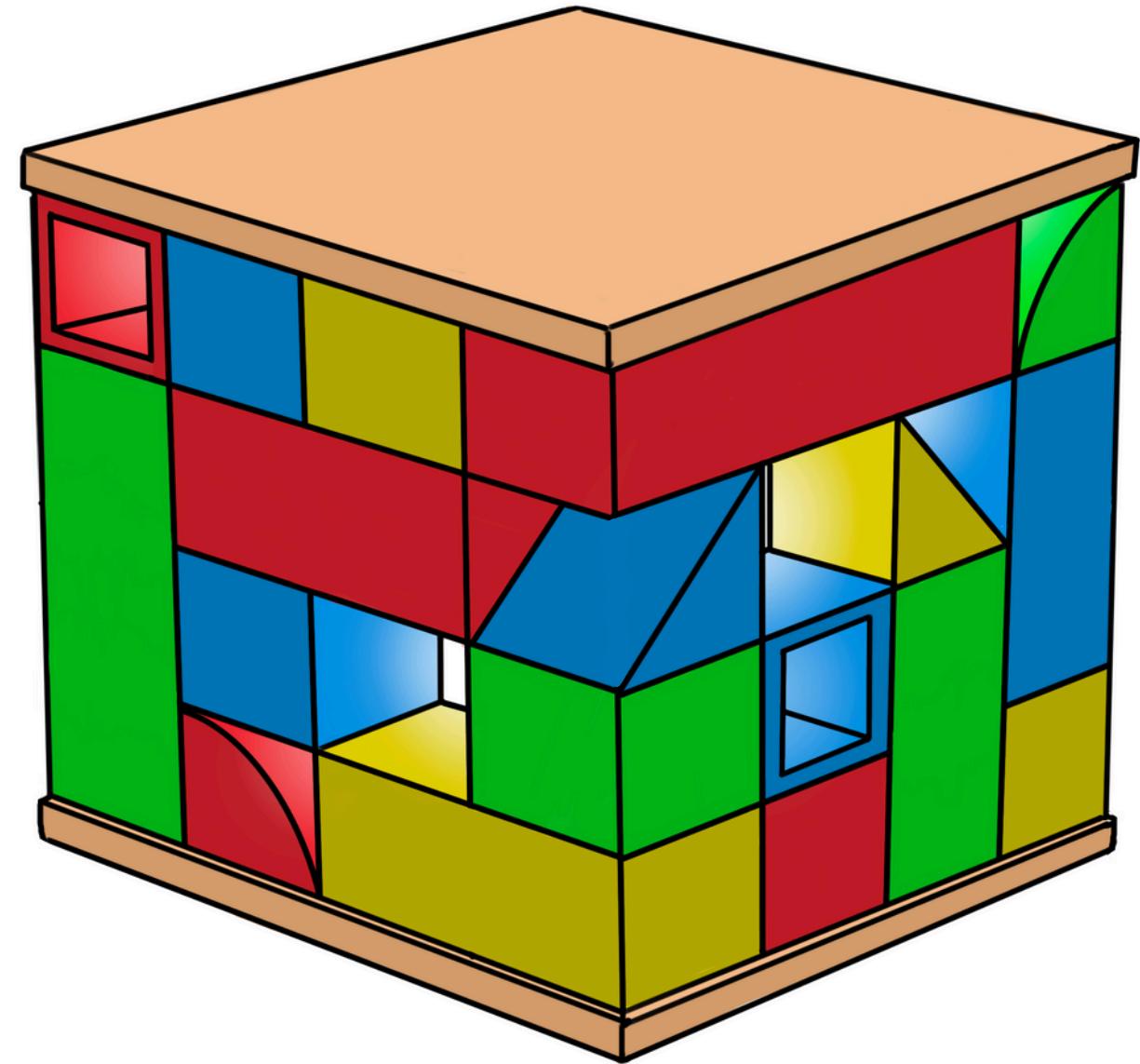


lighting + modular blocks

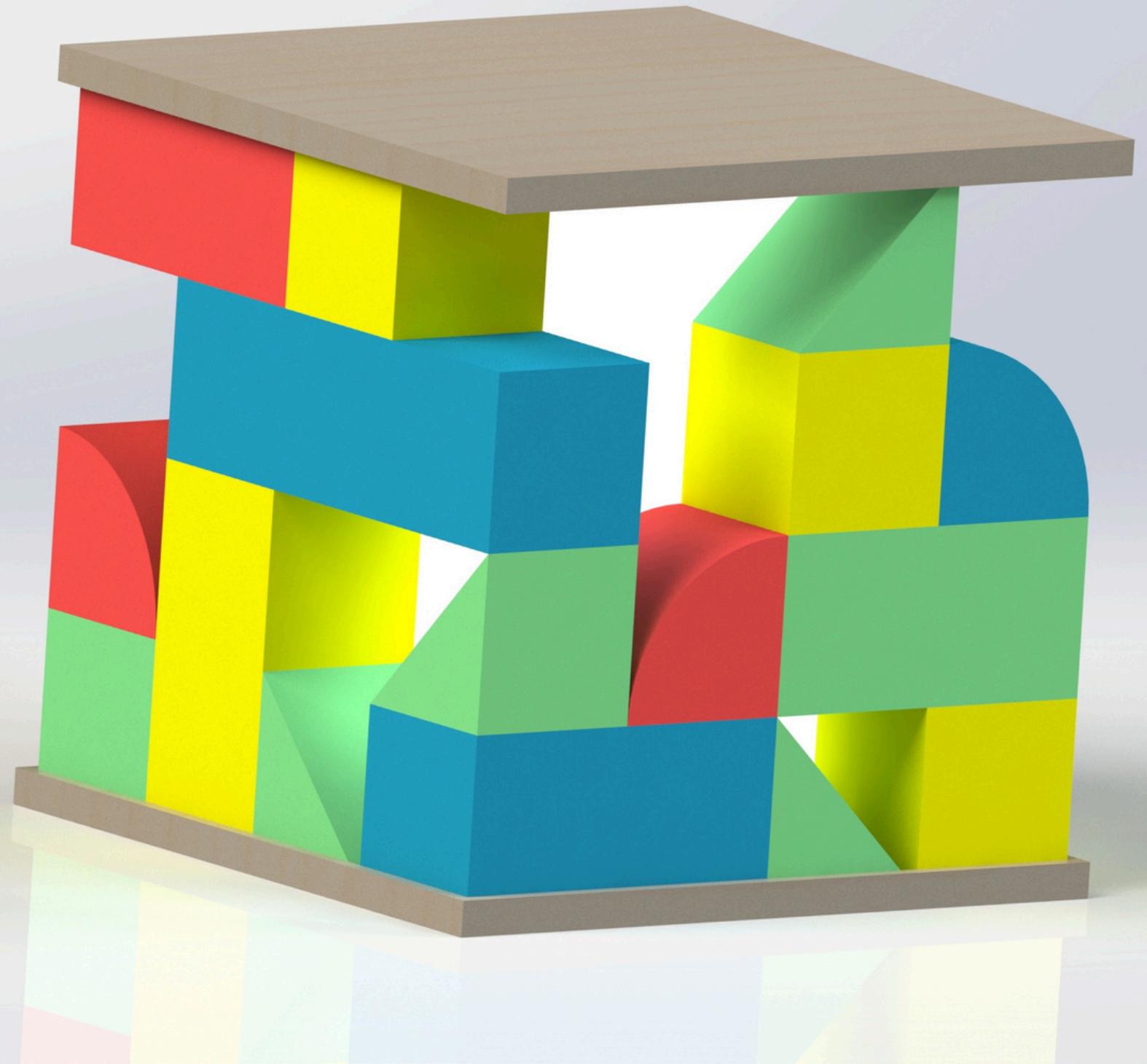
I decided to combine an interactive element with lighting because of how common lighting is in every home, and every age interacts with or needs light. This was a great opportunity to have the piece become suitable for every age seeing as this light fixture could act as mood lighting, functional lighting, part of daily routines, or even a nightlight.

The decision to create a modular block set was intentional in order to allow for younger children to be able to engage with the product and play with the blocks freely. The other designs I sketched required higher dexterity and fine motor skills such as careful placement, and puzzle pieces that have an exact fit. Per my research, emphasizing inter-generational satisfaction was an important factor and having a modular and open design with simple stacking would achieve that. The simple stacking mechanic allowed me to create a game that could have simple and added complexity for more challenging gameplay.





concept ideation



initial concept modeling

physical prototyping



9.5"

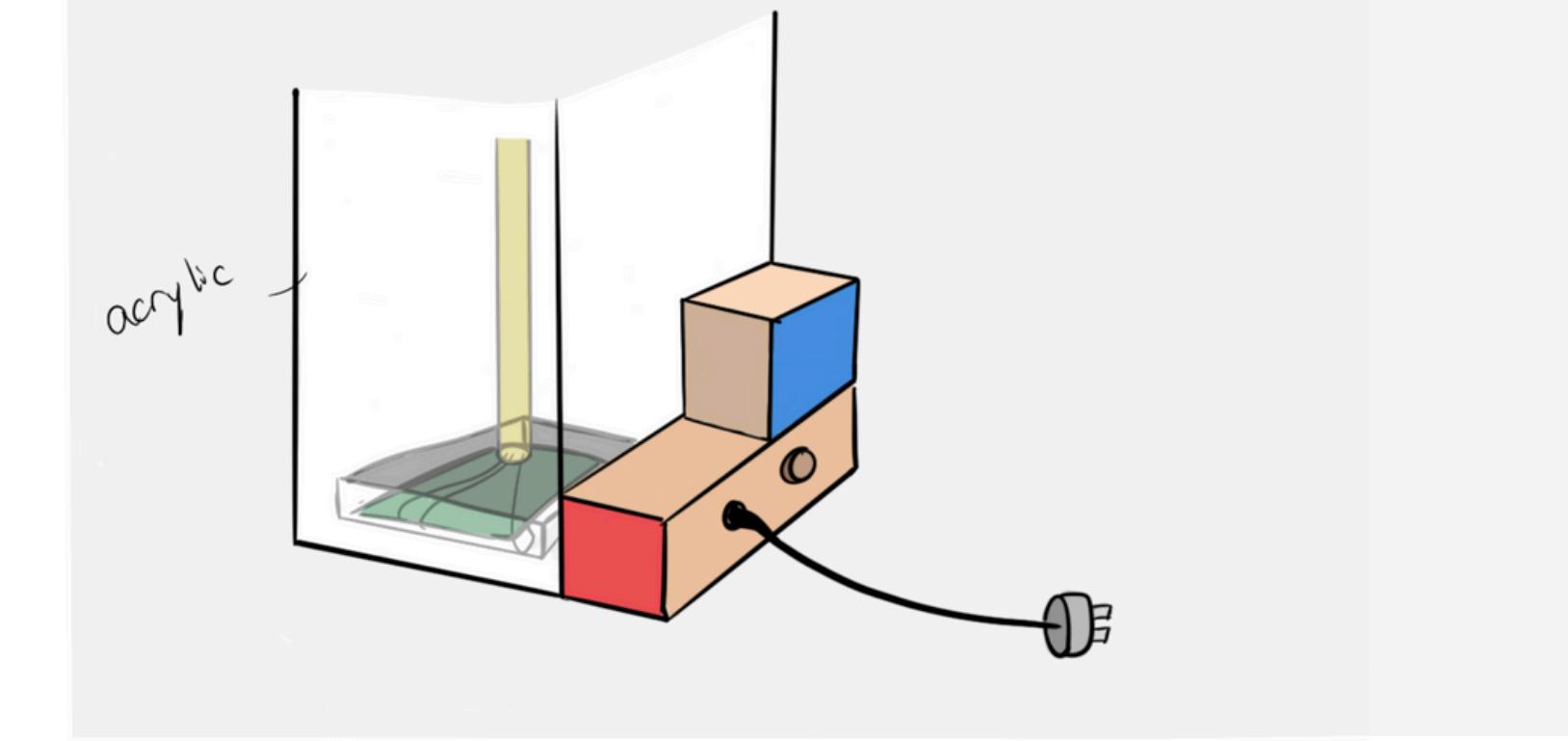
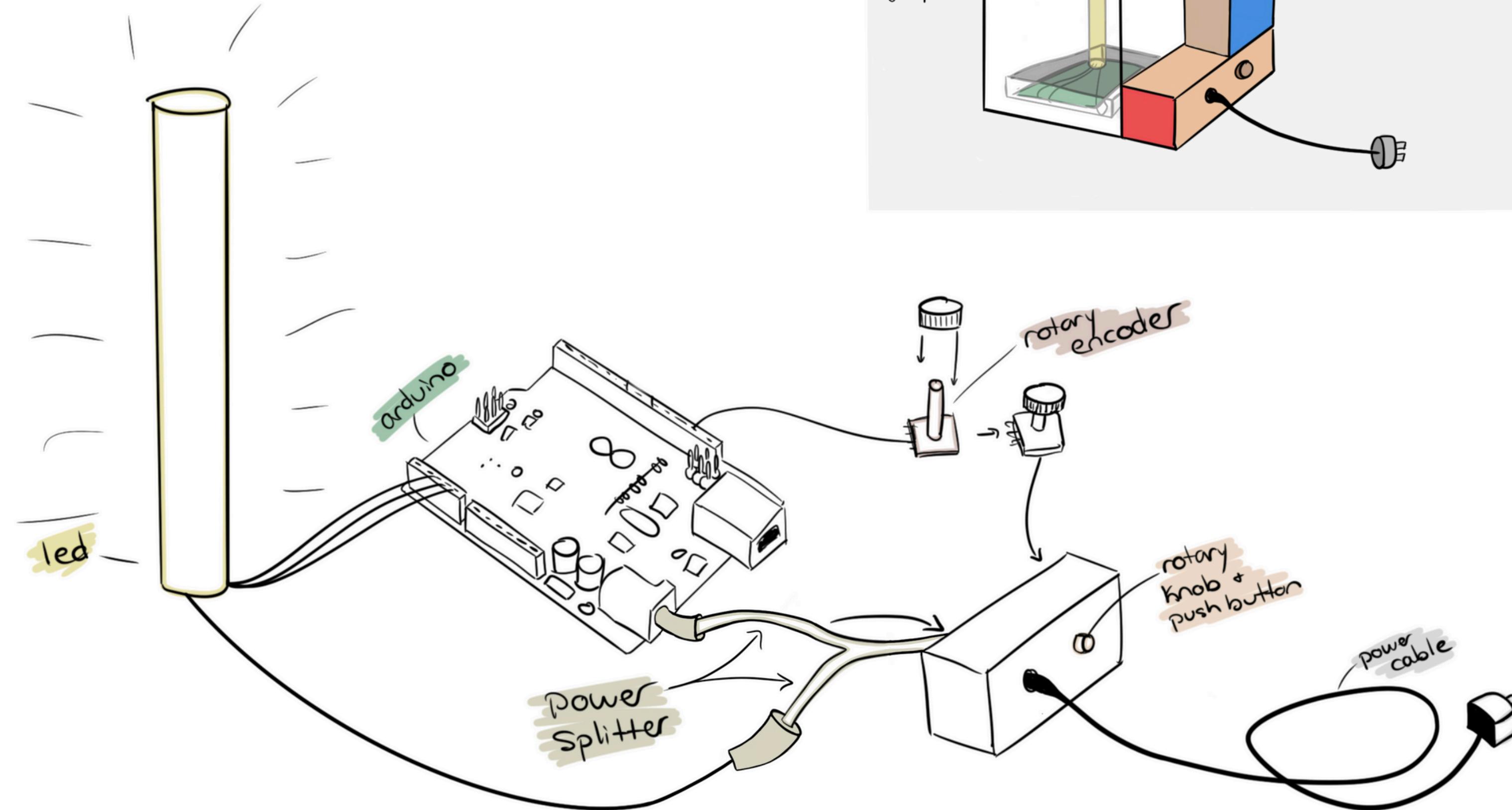
scale: too large
uncomfortable to hold



8.375"

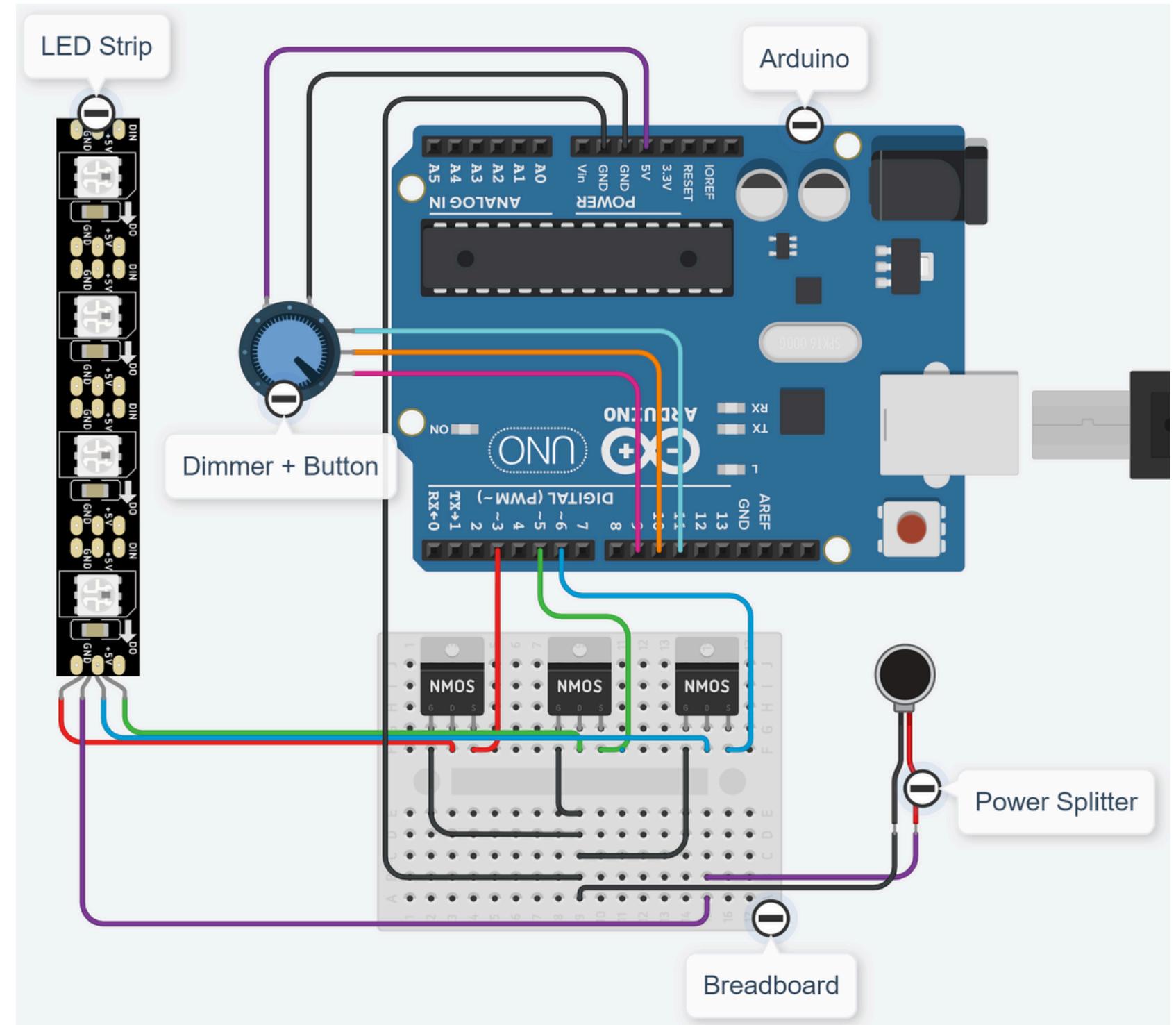
scaled down
initial light testing

initial electrical plan



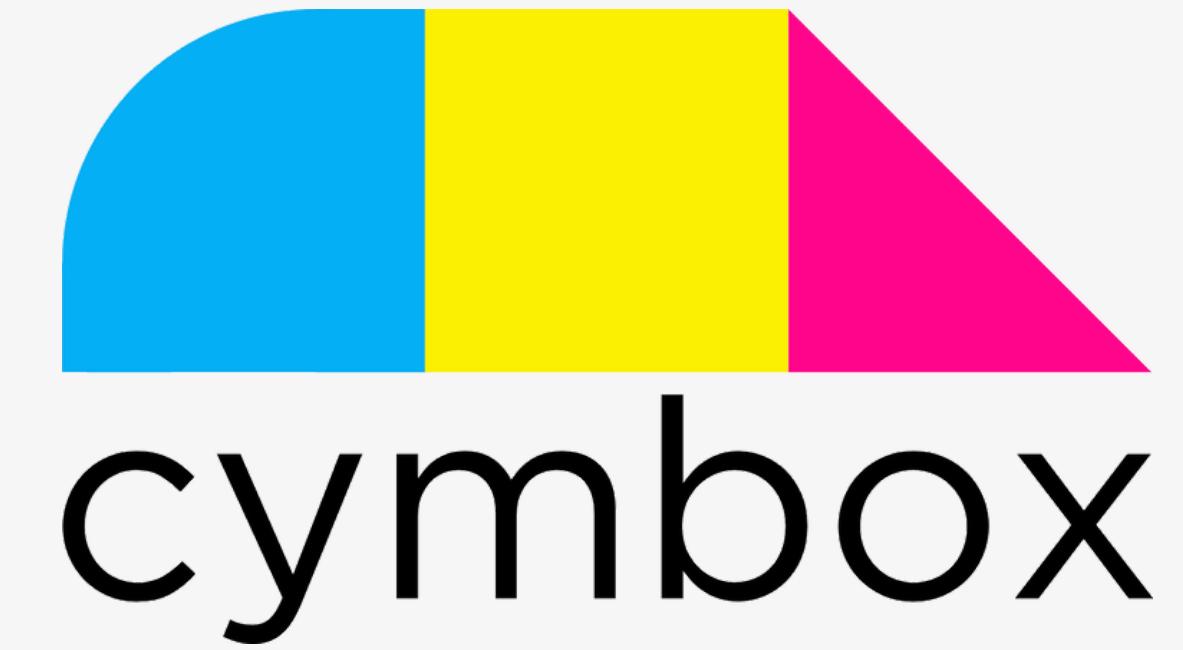
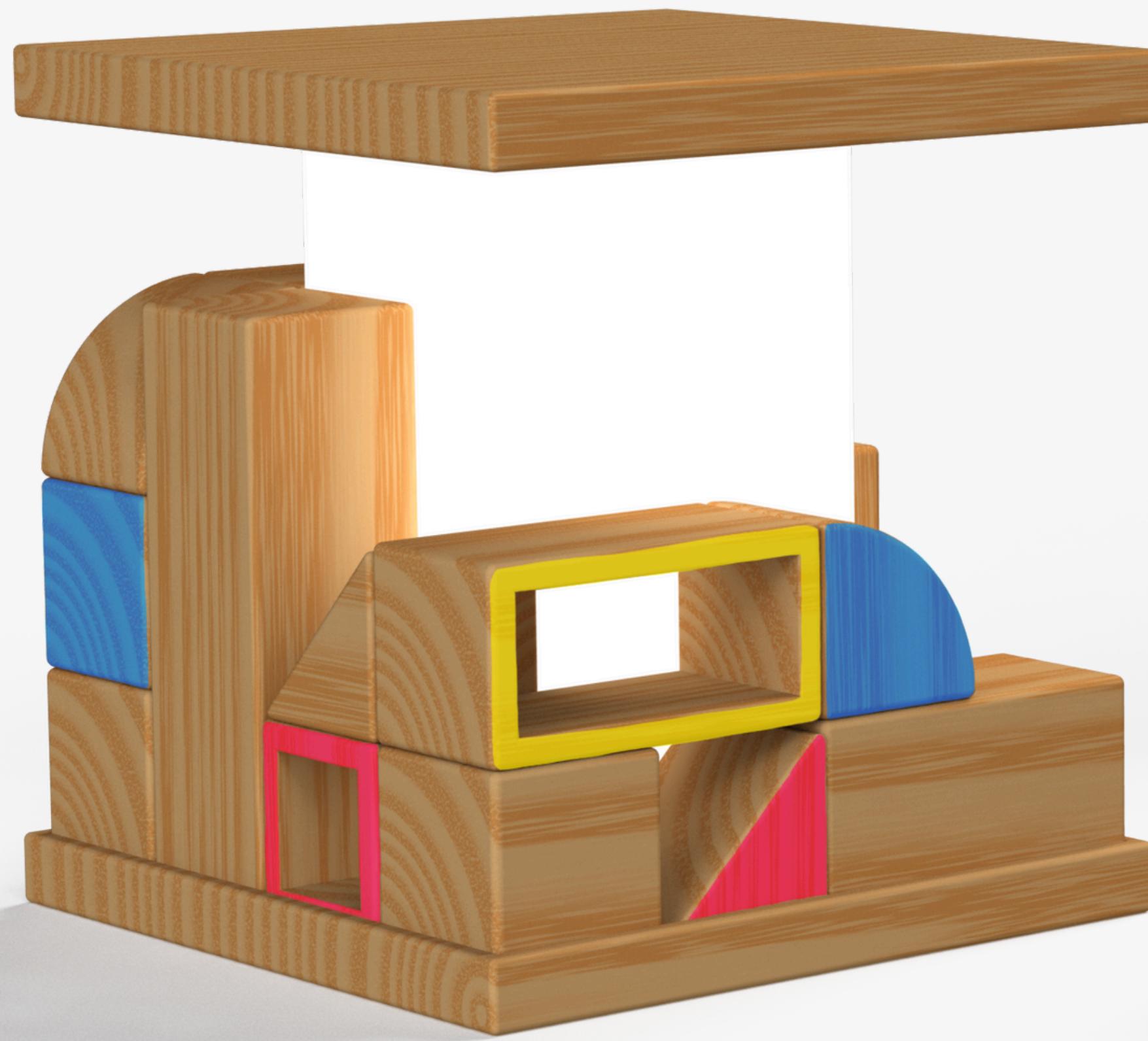
prototype schematic

Although the final product would be made from replaceable LED rods/bulbs, the final physical prototype was made from an arduino, dimmer button, and an led strip. I chose the arduino in order to create an accurate representation and works like model with the function of turning on, switching through color modes, and brightening and dimming the light. To the right is my final schematic of the wiring process.



final prototype





features



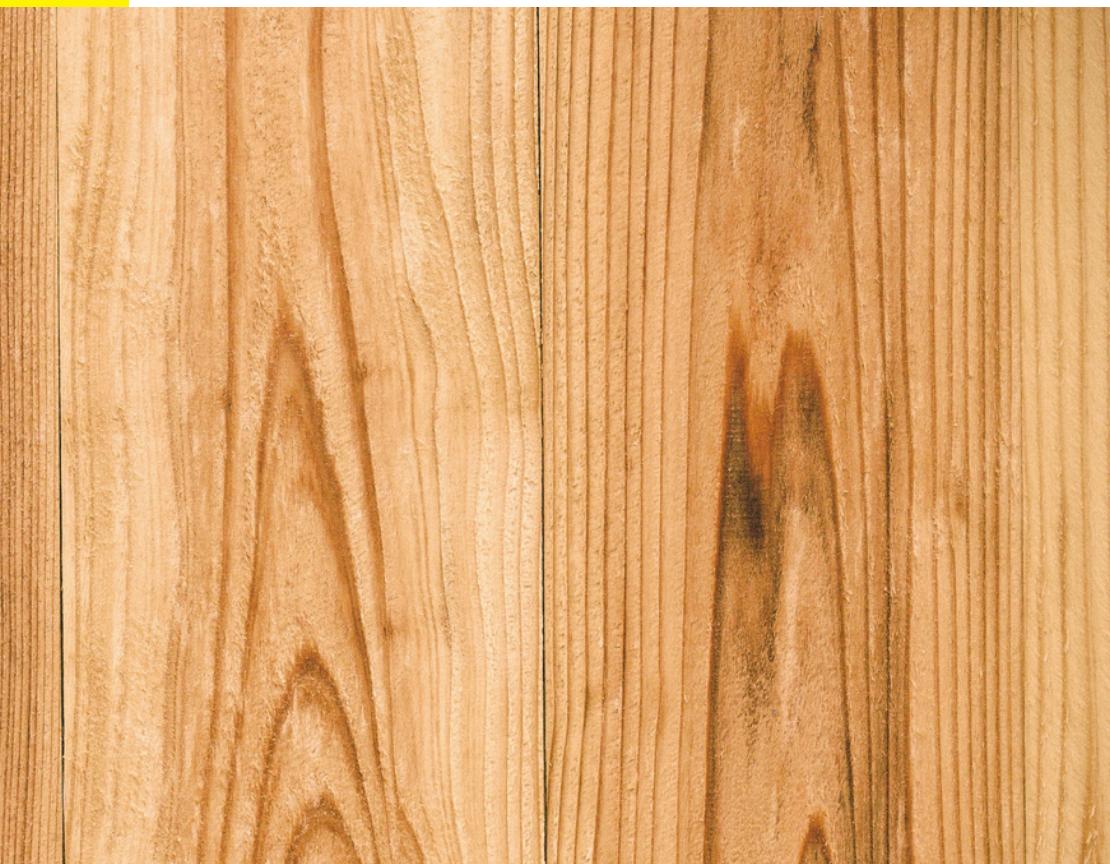
25 building blocks

stacking game

light feature

instruction booklet

materiality

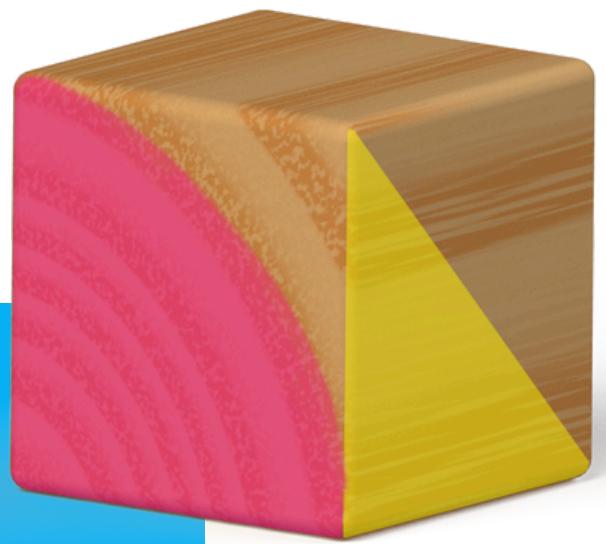


hardwoods, like oak, maple, birch, walnut, and poplar for the blocks and base build

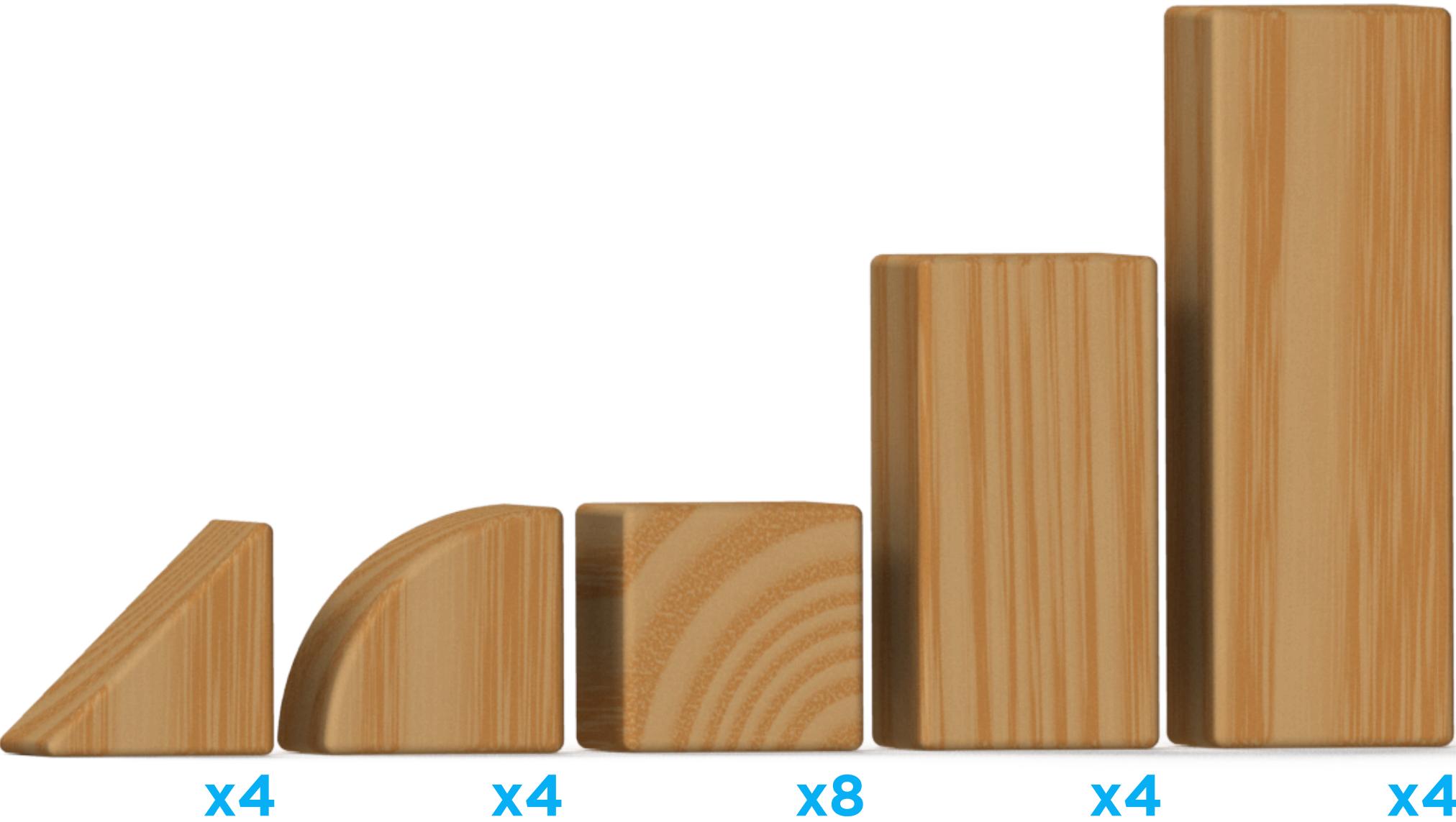


translucent sheets of acrylic to diffuse the light emitting from the LED light

25 block set



+1 die block



cymstack!

stacking game

2 modes of play

Basic Rule Set For Both Versions...

2x1 block starts as base

roll die which tells the player which block to place

must place blocks at the same level or higher than the previous block



cooperative ruleset

work together, one tower
more freedom with blocks

circle face tells players to choose any block

goal: stack and balance all the blocks on one tower

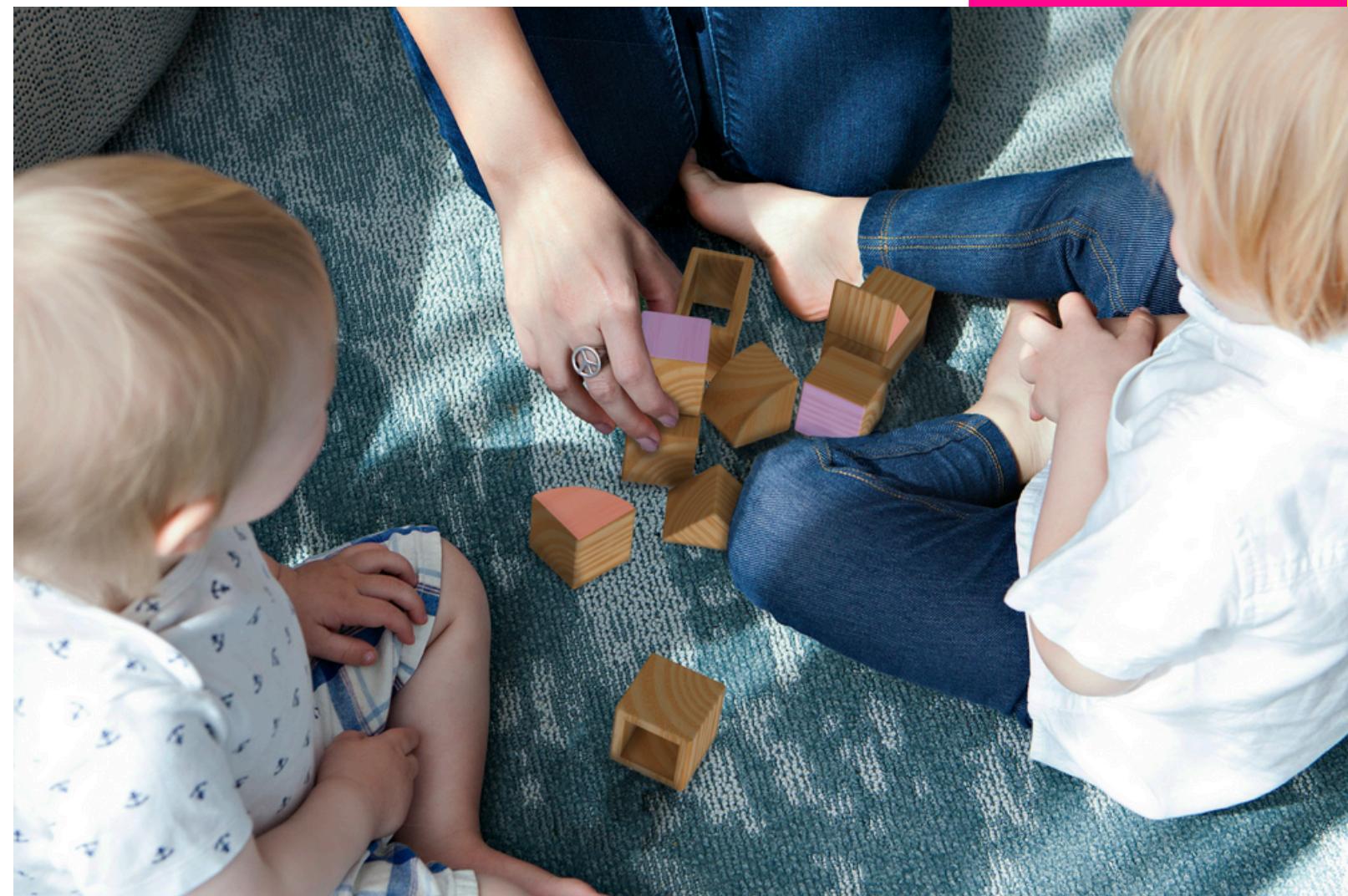
competitive ruleset

working in 2 teams or 1v1, two towers

more rules + risk involved in the gameplay

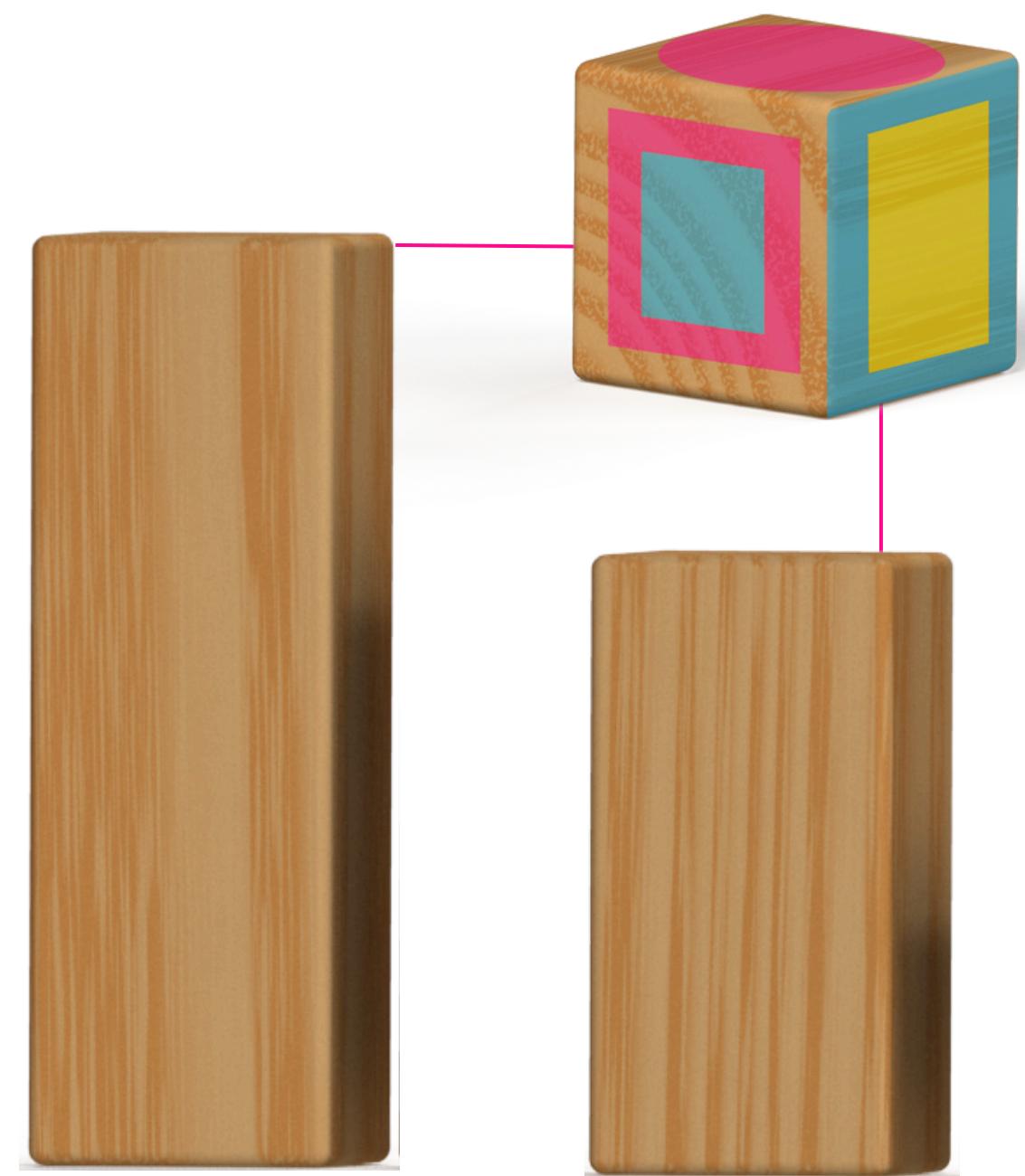
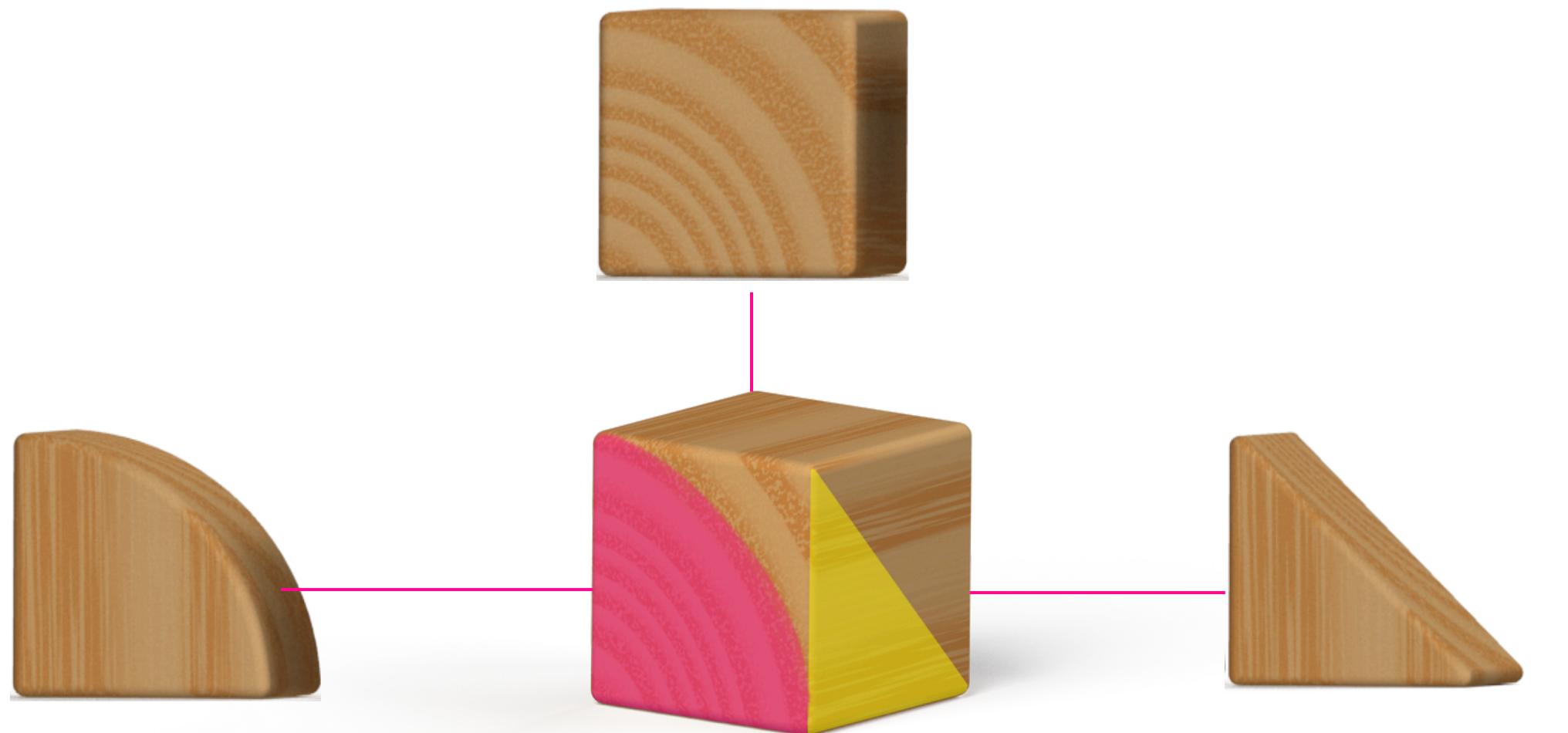
the circle face will skip the player's turn + give
an advantage to the other team

goal: have one tower survive!



die graphics

For the die faces I decided to create custom graphics. The rounded corner block, right triangle block, and square block are all represented by its same shape. The 2x1 and 3x1 blocks correspond to the amount of colors or rectangles on the face. The circle face, in the cooperative mode, is a free block which signifies that when players roll the circle, they can choose any block of their choosing to place. In the competitive mode, the circle face represents a skip turn, where instead of placing a block, the team must remove a block from their tower and give it to the other team to place on their tower that same turn. They may not roll again after.



lighting

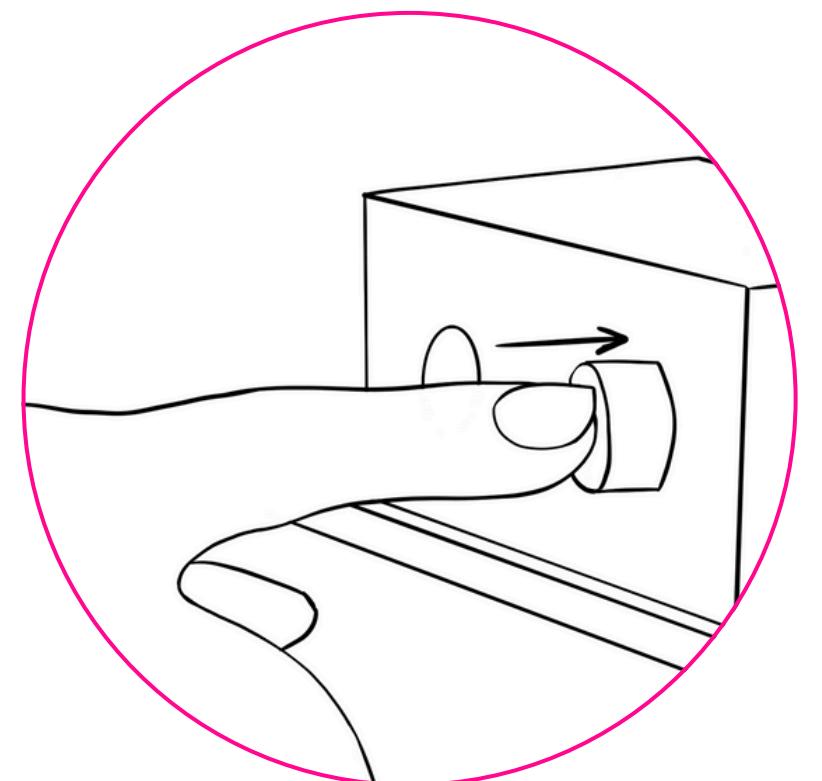
5 color modes:

white
warm white
rainbow gradient
warm gradient
cool gradient

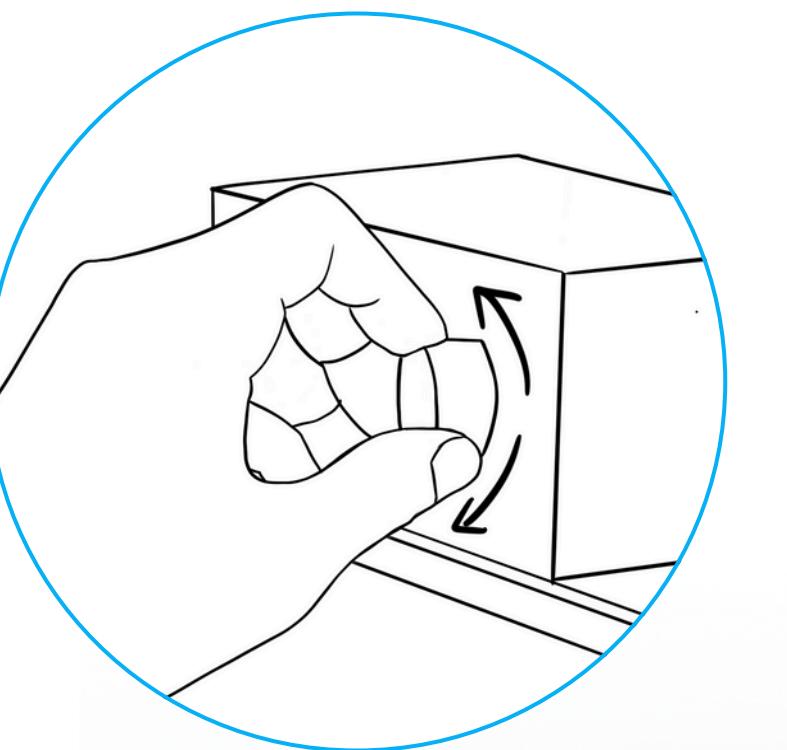
Adjustable brightness







push to turn on and switch through color modes



rotate left and right to brighten and dim lighting

charging port —————

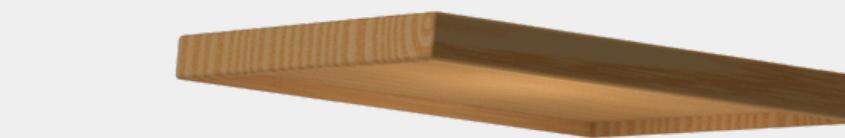
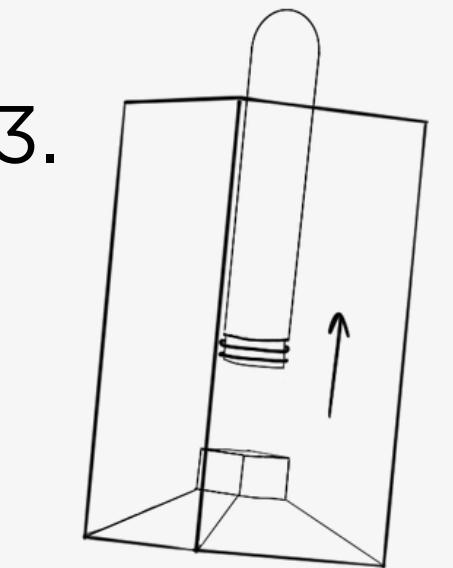
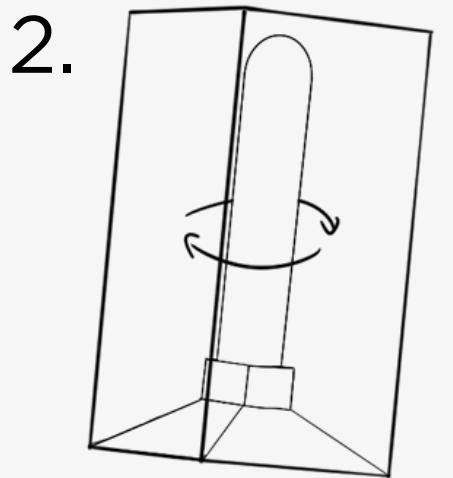
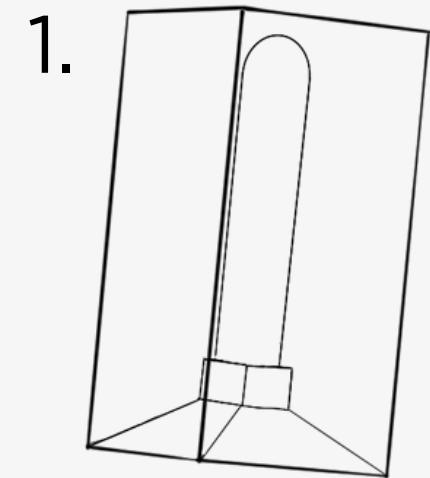
lighting controls —————

booklet slot —————



repairability

Twist to remove and change LED bulb

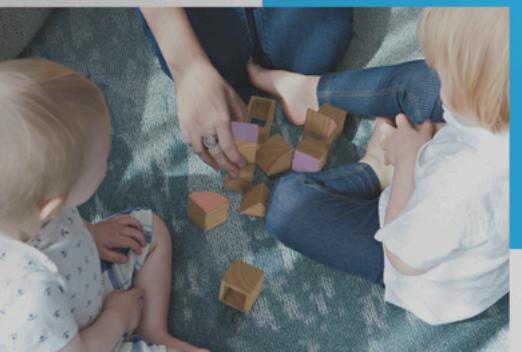


USER MANUAL

USER MANUAL



This manual covers the basic use, functions, and features of the cymbox block set and lighting feature. For more information of the customization program, example how to videos for the cymstack! game, and customer service help or concerns, please visit www.cymbox.com.



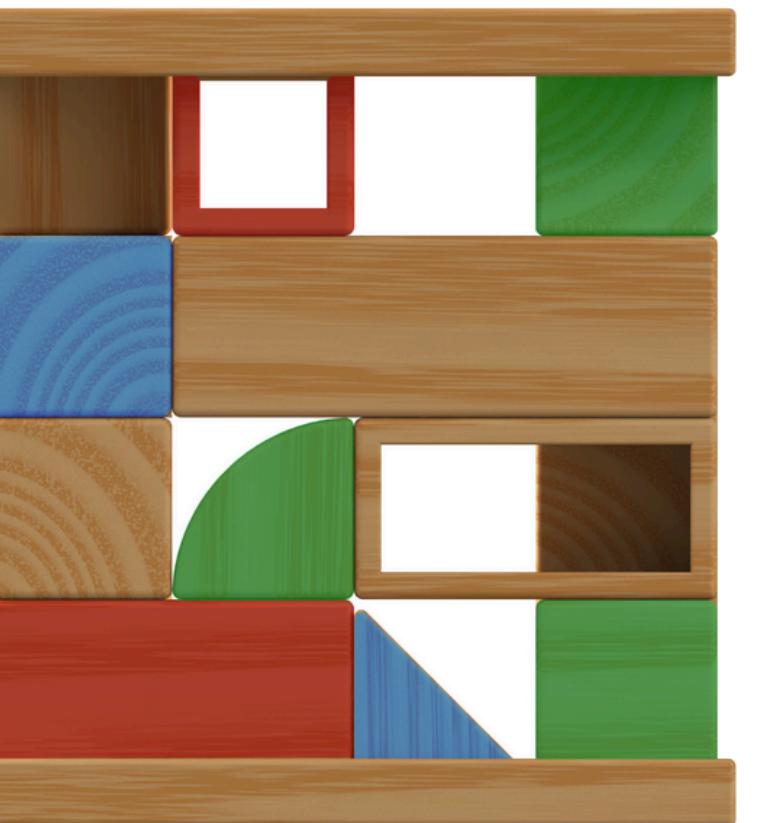
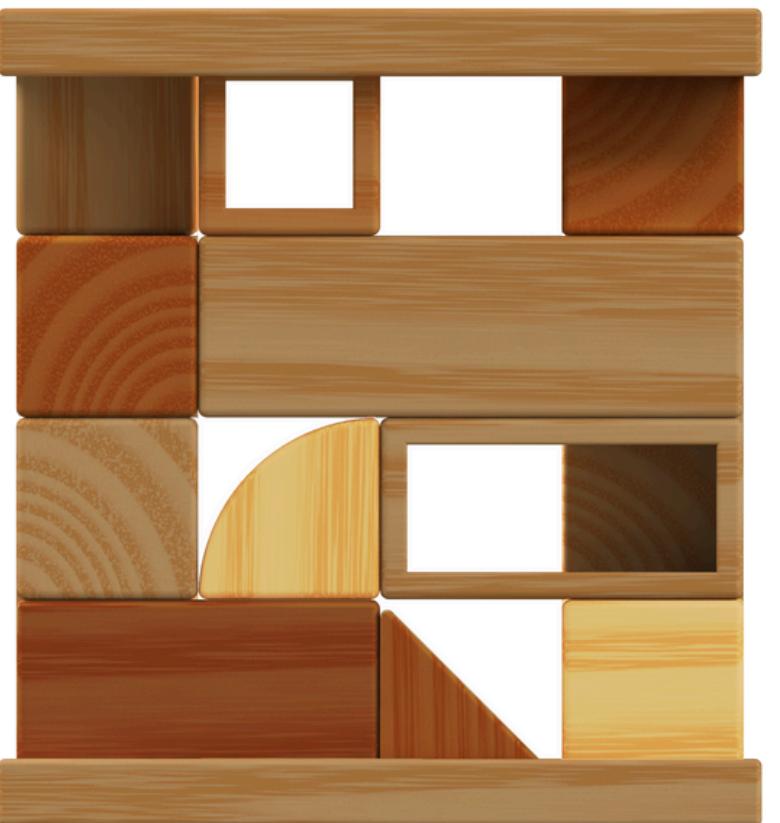
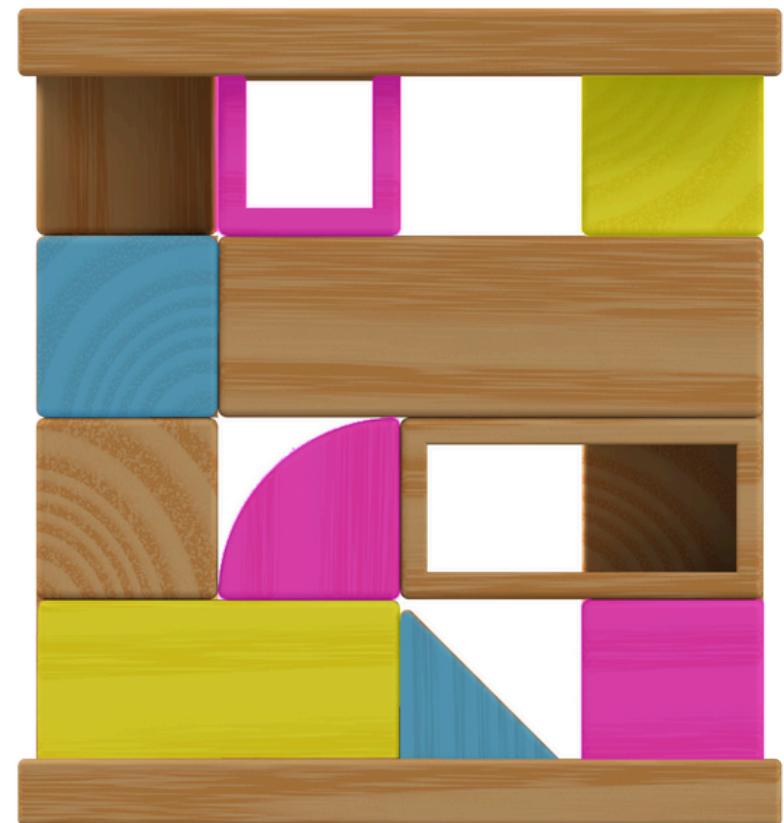
The **cymbox** block set is best suited for users ages 2+. Adult supervision is recommended for children younger than 5 years old.

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cymstack Game	04
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colorways

cymbox allows users to customize their block set's colors for them to have their perfect set that fits their home as they see fit.





cymbox can be integrated
into user's daily routines



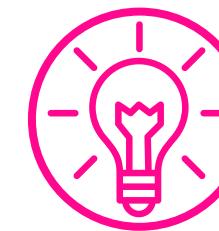
sustainability considerations



majority organic material choice



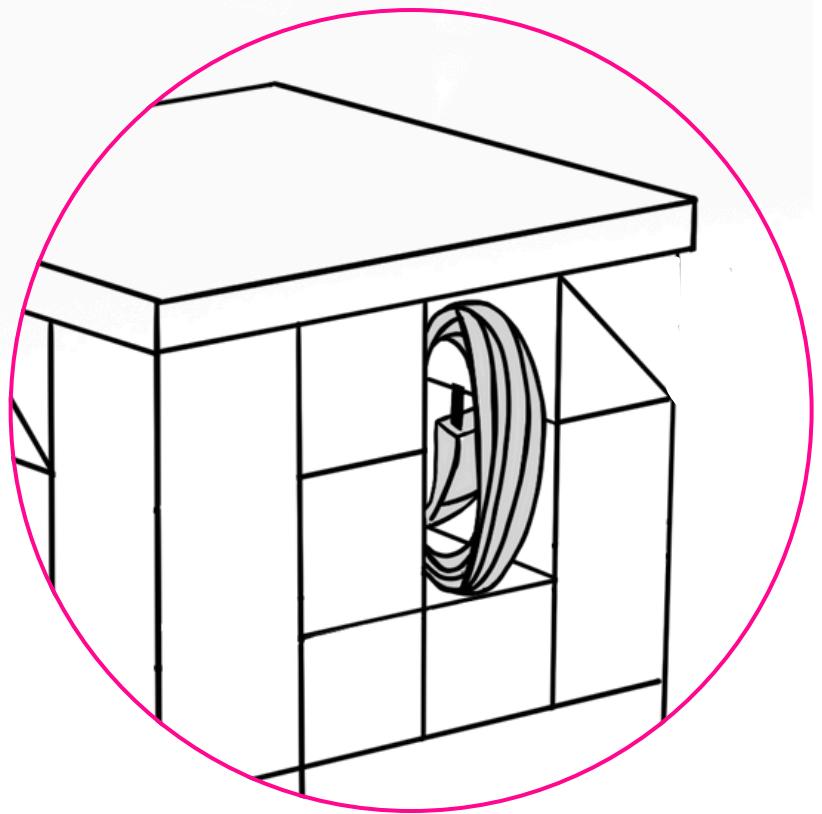
longevity from multi-faceted design



replaceable LED bulb

packaging

charging cable placed in gap in
between blocks



resources

[Toy Association- Economic Impact Data](#)

[Yale Environment Review](#)

[Plastivision-Understanding The Materials That Are Used To Build Plastic Toys](#)

[AAA Polymer-Polypropelyne Recycling](#)

[United Nations-Plastic Is Forever](#)

[Science Direct-A Life Cycle Assessment Of The Environmental Impact Of Children's Toys](#)

[National Library of Medicine-Degradation Of Polyethylene Plastic In Soil And Effects On Microbial Community Composition](#)

[Forbes-Connected Toys Need To Learn Longevity From Traditional Toy Makers](#)

[Time Magazine-My Kids Want Plastic Toys. I Want to Go Green. Here's the Middle Ground](#)

[Science Buddies- Analog RGB LED Strip Control With Arduino](#)

[BBC News-Plastic toys: Is It Time We Cut Back?](#)

[CNBC News-Adults Are Buying Toys For Themselves, And Tt's The Biggest Source Of Growth For The Industry](#)

[DePaul University-Researchers Reveal Environmental Impact of Children's Toys](#)

[International Toy Research Association](#)

[National Association for the Education of Young Children-Good Toys for Young Children by Age and Stage](#)

[Hospital for Special Surgery-Child Development Toys by Age: Choosing the Best Toys for Your Child](#)

[Emma Hubbard Pediatric Occupational Therapist-23 Developmentally Beneficial Toys](#)

[Play And Playground Encyclopedia-Games With Rules](#)

[The Consumer Product Safety Improvement Act \(CPSIA\)](#)

[Naef Spiele AG](#)

[Areaware Wooden Toys](#)

[Odin Parker Heirloom Wooden Toys](#)

[ZooModern Toys- Safe Wood](#)

[YOTTOY Productions](#)

[Freepik Booklet Mockuo](#)

[Unsplash-Vanessa Bucceri](#)

[Unsplash-Michał Bożek](#)

[Unsplash-Ryan Fields](#)

[Unsplash-Luis Arias](#)

[Unsplash-Nareeta Martin](#)

[Unsplash-Thomas Buchholz](#)

[Unsplash-Stephanie Moody](#)

[Unsplash-Nat](#)

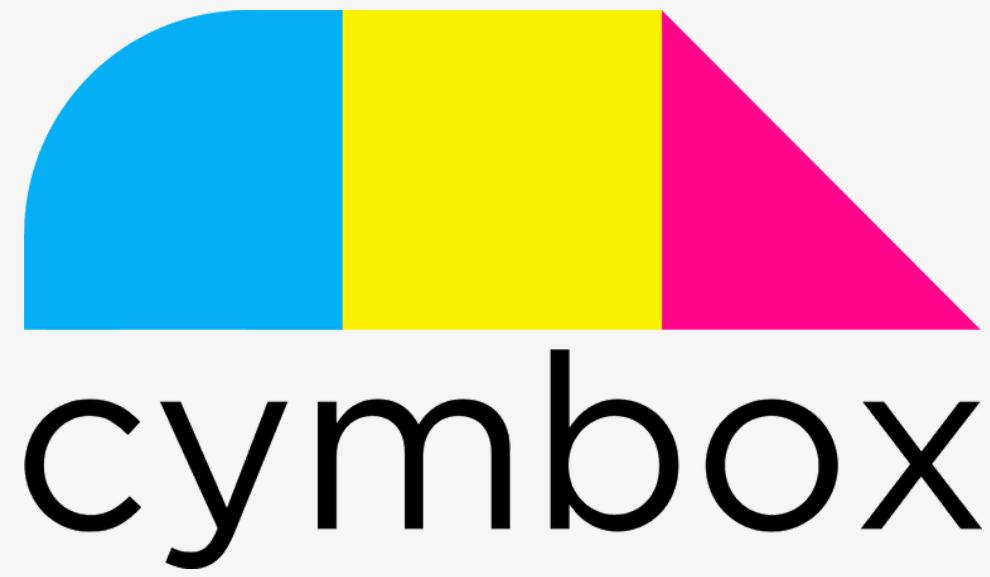
[Unsplash-Samantha Gades](#)

[Unsplash-Marisa Howenstine](#)

[Unsplash-Geon George](#)

[Pexels-Cottonbro Studio](#)

[Pexels-Jan van der Wolf](#)



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