Reforming IKEA: Do-it-Yourself Projects and Everyday Objects in Disposable Culture

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Abstract

This project aims to gain an understanding of the relationships people have with everyday, domestic objects inside their urban living spaces using Do-it-Yourself (DIY) furniture making projects. Throughout the project, new knowledge is generated using hands-on making activities as a form of Research through Design (RtD). The primary objectives of this research are to open up and encourage these kinds of Do-it-Yourself, experiential learning activities as resources for people to draw on in their everyday lives. By innovating design interventions related to personal well-being and satisfaction with our objects, this project has led to the development of concrete design research exemplars demonstrating how DIY projects can operate as creative resources for everyday design. Through the design, implementation, and study of the artifacts created for DIY home customization, this research aims to support people in experiencing increased levels of self-satisfaction, well-being, and sense of value with their belongings. This investigation focuses on aspects of a domestic object's importance, becoming an 'Everyday Designer,' customization, personalization and their respective relationships to consumption and material culture. As a result of this research, multiple DIY furniture projects and instructional booklets have been created to provide opportunities for everyone from non-designers to experienced makers to conduct a personal material exploration. Together with this creative act of hands-on making, everyday design practices allow people to reflect on the objects they own and why, while also achieving an increased sense of well-being and agency towards their domestic objects.

Keywords

Everyday objects, making, Research through Design, Do-it-Yourself projects, experiential learning, design research, customization, Everyday Designers, personalization, consumption, material culture, IKEA, furniture.

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List of Abbreviations and Definitions

Do-it-Yourself (DIY)
A Do-It-Yourself activity is defined as anything that is constructed or assembled from parts after being purchased from a manufacturer. Examples of this include putting together a piece of furniture from a kit, building a children's toy or renovating an entire house (Ho & Huang, 2009).

Research through Design (RtD)
Research through Design is a design research methodology that uses the act of physically making something to generate new knowledge by physicalizing ideas to help inform future design decisions (Zimmerman, J., Stolterman, E., & Forlizzi, J., 2010).

Everyday Designers
Everyday Designers are individuals that use the simplest of acts to discover and exploit affordances between situations and their physical environment (Wakkary & Maestri, 2007).

IKEA™ (IKEA)
Founded by Ingvar Kamprad in 1943, IKEA is a Swedish, multinational furniture company that sells 'ready-to-assemble' home furnishings (Kamprad & Torekull, 1999).

Maker
Within this project, a Maker can be anyone who physically builds things inside or out of their domestic space. This could include any and all forms of DIY projects such as IKEA furniture building or large-scale home improvements.

Non-Maker
A Non-maker is someone with a propensity to think that creating, building, or physically making things is something that should be done only by someone with specific training.

Canadian Mortgage and Housing Corporation (CMHC)
"As Canada's authority on housing, we contribute to the stability of the housing market and financial system, provide support for Canadians in housing need, and offer objective housing research and advice to Canadian governments, consumers and the housing industry"
(Canada Mortgage and Housing Corporation, 2015).

Medium Density Fiberboard (MDF)
A type of building material made of wood particles glued together under intense heat and pressure
("Medium Density Fiberboard," n.d.).

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Introduction

It's time for a new generation of products that can age slowly and in a dignified way, become our partners in life and support our memories.

Ezio Manzini
For Eternally Yours: Visions on Product Endurance
1995

As a designer, I have always been fascinated with individual's relationships with their objects. This interest relates to how people create a sense of home in domestic space and, how "design for sustainability can embrace not only social and environmental considerations but also deeper notions of human meaning and purpose" (Walker & Giard, 2013, p.1). Not only does this quote from *The Handbook of Design for Sustainability* by Stuart Walker and Jacques Giard (2013) align with my personal design philosophy, but it also stands as the inspiration for much of this project.

In addition to that, I also believe that everyday individuals possess an innate ability to design, and create and that this capacity should not be considered a rare skill. Therefore, through the process of making, it is my hope that people will establish a greater sense of agency and ownership with their everyday objects. Consequently, these ideas support longer lasting relationships with them, regardless of skill or experience. An underlying theme in this project is that designing and creating can be done by anyone. Additionally, individuals can experience increased levels of self-satisfaction, personal empowerment, and sense of value with their belongings and their home even if they initially feel as if designing and creating should be left to a professional. Therefore, anyone can become an 'Everyday Designer' by exploiting minor affordances with objects to better enable specific needs within their environment (Wakkary & Maestri, 2007). Through the creation of the objects they keep within their domestic space, individuals can experience these and similar phenomena attributing to an increase in their overall well-being.

Several topics are part of this exploration, including an inquiry into Vancouver's unsustainable urban development. As half of the world's population currently live in cities, this number is expected to concomitantly increase with the growth of the global population (Bettencourt, L. M. A., Lobo, J., Helbing, D., Kühnert, C., & West, G. B., 2007). Thus, cities such as Vancouver, Toronto, New

York, Paris, and Shanghai are facing a growing number of challenges in areas such as affordable housing, urban organization, and sustainable development (Bettencourt et al., 2007; Performance Urban Planning, 2015). As a result of this, having enough space for people to engage in meaningful Do-It-Yourself practices are difficult. Particularly for those who cannot afford large enough living spaces that would allow them to both live and comfortably build or modify their belongings in. Although many cities worldwide are facing these issues, the scope of this investigation is limited to Vancouver, British Columbia, to investigate the design opportunities related to this problem space efficiently.

Material culture and consumption form another facet of my core argument. These problems with Material Culture and consumption are mainly due to corporations viewing consumers as only the passive buyer of what others produce and not as an active producer themselves (Xie, C., Bagozzi, R.P. & Troye, 2008). Furthermore, the number of objects that have been mass-produced since the 1950's currently exceeds the combined amount of people that have ever lived on this planet (Schor & Holt, 2011). The problem with the massive number of objects created is that it supports consumers in their decision to purchase a new object when the one they own becomes unfashionable or needs repair (Schrader & Thøgersen, 2011). Ultimately, this provides a design opportunity to try to reinvigorate and rethink our relationships with ordinary, everyday, consumer objects before so quickly and vacuously discarding them.

Aside from a lack of space and our tendency to abandon perfectly adequate objects, other circumstances are antecedent to a would-be Everyday Designer. These factors are motivation and preconceived notions of skill or experience (Wolf & McQuitty, 2011). Negative feelings such as these can significantly impact an individual's willingness to create or customize their domestic objects and in turn, affect the formation of an emotionally long-lasting relationship with their objects (Marathe & Sundar, 2011). Beginning with my proposed DIY projects, an accessible entry point for an Everyday Designer provides a way to combat these and similar feelings. By doing so, the potential for an increased sense of empowerment an individual could feel by having customized one of their belongings can become a reality.

All of these concerns are mitigated in this project using a three-part approach with each aimed at a particular outcome. Part one is composed of a comprehensive literature review, part two makes up the primary research activities, and part three is the ongoing Research through Design occurring throughout the project.

Part one begins by asking: What roles could DIY projects play in helping people who see themselves as "non-makers" to construct a sense of home? How could these activities open new ways that people can creatively design, develop, curate, and live with the objects and furniture they produce for their home? How can the act of DIY making bring awareness to, and affect a person's consumption habits? The design research within part one begins as a search for a broad base of contextual evidence taking form as a literature review.

Part two aims to design and undertake the primary research activities to gain specific insights into the problem space surrounding this investigation. Part two works to develop and create an online survey, as well as to conduct and code several interviews with participants relevant to the scope of the project.

Part three happens concurrently throughout this project and makes up the ongoing Research through Design activities. These occur alongside each part of this project and involve the physical making and material exploration happening through model making, prototyping, and the creation of the final design artifacts themselves. As part of the RtD process, this project explores the use of readily accessible materials, in this case, IKEA furniture fixtures, which are repurposed to serve as concrete casting molds. The resulting material explorations are analyzed and made into familiar instructional booklets that contain simple, Do-it-Yourself projects designed to support everyday people in their personal creation of a piece of furniture for their small domestic space.

Literature Review

Housing Affordability and Urban Densification

If the city is for the rich and for luxury, and the rest of the population has the role of living outside the city and commuting in to service the rich, then we are looking at a world that is very different than the one we grew up in.

The Canadian Mortgage and Housing Corporation
2015

Vancouver, British Columbia ranks significantly high in overall quality of life for several reasons. In comparison to other Canadian cities, it has a temperate year-round climate, is in proximity to both the Pacific Ocean and the North Shore mountains. As it is such a desirable place to live, the demand for affordable housing is in short supply, and thus, it becomes an expensive city to live in for someone who is not yet financially established. In other words, people who must rent a place to live, mainly young adults, university students, or individuals living on their own away from their parents for the first time. Thus, Vancouver works as an ideal problem space for this design research investigation.

An important source for information and statistics regarding Vancouver's housing situation is the Canadian Mortgage and Housing Corporation (CMHC). The CMHC (2015) estimates that the demand for affordable housing among Vancouver's growing population will continue to remain high for the foreseeable future (Housing Market Outlook, 2015; Willa, R., Jennifer, Y., & Engeland, J., 2008). When comparing the monthly rental prices for a small, studio apartment in the Metro Vancouver area with other Canadian cities, this problem becomes apparent. In 2016 the monthly rental price was anywhere from $950.00 to $1,760.00 in Vancouver, whereas, in Calgary or Montreal, a one-bedroom apartment averaged $896.00 and $868.00 per month respectively (Rent Seeker, 2015; Housing Market Outlook, 2015).

Being extremely sought after, Vancouver also suffers from complications related to the urban densification that has been occurring for decades. Despite Vancouver building developers trying to alleviate problems associated with this, they are unable to keep up with the number of people currently migrating to Vancouver. This disconnect becomes apparent when looking at the significant amount of condominiums now being built throughout Vancouver

(about 51,600 units last year), yet despite not even being finished, have already been purchased (CMHC, 2015, p. 4). Additionally, these new developments are for sale only and are not available to rent, another factor decreasing the total number of rental units available (CMHC, 2015, p. 5).

When considering Vancouver's housing affordability and urban densification problems, a solution for prospective tenants could be to relegate themselves to increasingly smaller and smaller dwellings due to the shrinking affordability of larger ones (Danziger, S., & Rouse, C. E., 2008). However, fitting everyday items such as furniture, domestic objects, and electronics from a previously larger living space into a smaller one proves difficult and introduces a range of consequences. For example, imagine you are moving to Vancouver in your first apartment away from home. At your current residence, your desk and chair, as well as other belongings fit comfortably. However, in your newly-rented Vancouver apartment, the only space for these is a corner with a windowsill that awkwardly come together making it a difficult area to use. You try to orientate the desk, but it does not fit. Also, while maneuvering it, you notice that the legs have been damaged slightly from the move. Ultimately, you decide to discard the desk and purchase a new one that will fit the space better. This scenario describes a major challenge that comes with living in a small domestic space. However, it also highlights the correlations between material culture, consumerism, and the way we create our identities and spaces we live in using objects.

An urban planning survey conducted in 2015 stated that "home prices have risen ahead of economic fundamentals such as personal disposable income and population growth, resulting in overvaluation in many Canadian housing markets" (Performance Urban Planning, 2015, p. 20). If these expensive housing trends continue, it will be almost impossible for young adults trying to establish themselves financially to be able to afford to rent a modest-sized apartment in Vancouver. As this problem intensifies, residents that occupy smaller, cramped living spaces face elevated levels of stress and altogether, a lowered sense of well-being (Campagna, 2016). Therefore, there is a critical need to develop novel ways that enable people to enhance smaller living spaces through their domestic objects in the service of positively shaping the mental health of residents dwelling inside them.

Consumption and Material Culture

Consumption is about far more than simply the mindless purchasing of newer, shinier stuff - it is a journey toward an improved and evolved self.

Jonathan Chapman
2005, p. 31

The seemingly infinite number of objects that surround us in our everyday lives is incomprehensible. These objects include "cameras, cars, lamps, solar panels, dishwashers, telephones, chairs, Prozac, computer games, bread, […] and far more clocks than we can possibly watch" (van Hinte, 1997). These objects make up what is known as 'Material Culture,' and the amount of mass-production and waste generated from our inconsequential relationships with these objects has become a problem (Schrader &Thøgersen, 2011). Klaus Krippendorff (2008), a researcher of cybernetics, epistemology, design, and culture describes how objects have been typically created in the past, specifically before and after the Industrial Revolution by saying:

> Before the industrial era, there were millions of craftsmen, artists, poets, and thinkers who invented new technologies, created new visions, and experimented with new practices of living. The industrial era eradicated most of this creative activity by enforcing the distinction between creative designers and uncreative consumers who had to be told how to live and what to do in the service of mass production.
> (Krippendorff, K. 2008, p. 14)

The manufacturing processes for these kinds of inexpensive, domestic objects have made our lives incontrovertibly easier. However, our separation from notions of repair as well as our love for purchasing new material goods has since become an easier option for many consumers. As a result of this, we tend to discard things quickly, often well before the object can be considered no longer usable (van Hinte, 1997). An example of this commonly occurring problem of Material Culture can be found by merely looking down one of Vancouver's alleys. Although missing part of its back panel, this bookcase left in the alley could be argued as still a viable and useful domestic object (see Figure 1).

Fig. 1. Bookshelf Found in the Alley
(Photograph by M. Harkness, 2016)

Many of the objects created within the sphere of Material Culture make up a critical part of who we are and how we identify ourselves to one another (Csikszentmihalyi & Rochberg-Halton, 1981). A major proponent of this idea of 'objects and the self' comes from a study conducted in 1981 by behavioral scientist, Mihaly Csikszentmihalyi and sociologist Eugene Rochberg-Halton (1981). Their study in the *Meaning of Things: Domestic Symbols and The Self* looks at "the significance of material possessions in contemporary urban life and the way people carve meaning out of their domestic environment" (Csikszentmihalyi & Rochberg-Halton, 1981). Csikszentmihalyi & Halton (1981) summarize our relationships with objects and why they play such a vital role in human progress by stating that:

> The evolution of humankind thus tends to be measured not by gains in intellect, morality, and wisdom, the benchmarks of progress have to do with our ability to fashion things of ever greater complexity in increasing numbers. [...] The fact remains that the transactions between people and the things they create constitute a central aspect of the human condition (Preface. ix).

Unfortunately, this materialistic way that we have come to individualize ourselves is something that has been occurring throughout much of history, even more so in the last hundred years (Ingold, 2013; Krippendorff, K. 2008; van Hinte, 1997). The countless number of objects that are being endlessly designed, manufactured, partially consumed, then discarded make up this temporal, ego-centric manifestation of ourselves. The resulting level of consumption and waste that comes with it ultimately suggests that this an unsustainable way forward.

The amount of waste made up of our previously viable, working objects happens due to our shallow relationships with objects and our constant upgrading and need for the newest thing (Suzuki, 2007). Therefore, this project advocates that this eagerly disposable behavior may be discouraged through the strengthening of our relationships with our objects using making and physical engagement with them. However, shifting this mentality may be easier said than done, as sustainability researcher Anne Marchand (2011) asks:

> What can possibly motivate someone to not only opt for products or product-service systems that are greener, but also to voluntarily renounce the pleasure accompanying the acquisition of new objects (a nice pen, a new kitchen in which to welcome friends and family, a trendy handbag) while having the purchasing power to do so? (Marchand, 2011, p. 1).

Marchand (2011) raises a good point. It may not be possible to totally shift consumer's mindsets from the pleasure they get from purchasing new things. Although creating a more meaningful and engaging experience with the objects individuals purchase, may result in more substantial relationships with their objects and hopefully more time in between consumption cycles.

Reflecting on Everyday Objects

Stress on function results in a loss of attachment with products. When artifacts are designed mainly to fulfill a function, their individual characteristics become less important.

Peter Paul Verbeek, & Petran Kockelkoren
1998, p. 33

An idea synonymous with our relationships with objects is what these objects mean to us and the contextual meanings surrounding them. Donald Norman (2007), a researcher in the field of cognitive psychology describes meaning as something shown in many ways, yet always maintains an aspect of 'reflection' (p. 8). Applying this idea to design, Norman (2007) discusses reflective design as something that "makes you think about both past and future experiences. It's about long term relations with objects" (Norman, 2007, p. 38). To understand this point further and how it relates to everyday objects, a surface level breakdown of an object's meaning is discussed in the first chapter of his book *Everyday Objects: Why We Love (or Hate) Everyday Things*. It begins by describing how an object's meaning to us is based on visceral, behavioral, and reflective levels of cognition (Norman,

2007, p. 5). An example of this is then provided using a description of three different teapots that Norman (2007) owns and displays on his kitchen windowsill.

> I have a collection of teapots. One of them is completely unusable […] It was invented by the French artist Jacques Carelman […] The second item in my collection is the teapot called Nanna whose unique squat and chubby nature is surprisingly appealing. The third is a complicated but practical "tilting" pot made by the German firm Ronnefeldt. The Carelman pot is, by intent, impossible to use. The Nanna teapot […] looks clumsy but works rather well. The tilting pot […] was designed with the different stages of tea brewing in mind (Norman, 2007, p. 3, 4).

The individual characteristics of each teapot and the fact that they possess reflective qualities despite being ordinary, everyday objects, makes them important to Norman (2007) and demonstrates an important part of this project's argument. Not only is each teapot inherently meaningful, and not because of its practical value, each one maintains an aspect of reflection.

Writing by the French sociologist, philosopher, and cultural theorist Jean Baudrillard (2008) elaborates on reflection, and the meanings objects can have as significance combined with our own personal, emotional investment (Baudrillard, 2008). However, as individuals could potentially be passionate about anything they own, that is too broad for the scope of this project. Therefore, this project focuses on more mundane, everyday, domestic objects including furniture, beds, kitchen appliances and electronics as opposed to antiques, wedding rings, collectibles, or overtly sentimental objects. Although antiques are often thought of as objects people take pride in collecting and maintain the aspect of reflection I have been investigating, without this distinction, this discussion would become convoluted by trying to resolve what does or does not count as a meaningful object (Busch, 2005). By considering aspects of meaning and reflection from a design perspective, ideas such as sentimentality and the ability objects have to connect us with memories and experiences can then be positively exploited. The investment of time and creative energy needed to create something for one's space could imbue an object with some of these previously discussed aspects of reflection, meaning, and importance to create a longer lasting relationship with it.

Learning through Making and Everyday Designers

Handmade is a mark of distinction. It connotes a kind of authenticity and devotion that people, increasingly cast as passive consumers rather than active citizens, feel is otherwise missing from their lives.

Tim Ingold
2013, p. 122

British anthropologist Tim Ingold (2013) was reviewed to gain an anthropological perspective of the physical making aspects of this inquiry. In additiona, Ingold's (2013) ideas relate to experiential learning aspects of this project bolster this project's RtD approach. In Ingold's (2013) book *Making: Anthropology, Archaeology, Art and Architecture*, he states that to make is to "learn by doing" and to "give form to supposedly inchoate material of sensory experience" (p. 13). This kind of preliminary relationship that making has concerning experiential learning is a major outcome of the created DIY projects. Throughout the learning process, the user's physical engagement with materials and the limited number of tools make up the primary means for learning to take place.

As learning through experience transforms our reflections, observations, and experiments into actual knowledge, users can, therefore, rely on this newly formed knowledge of making in future problem solving and DIY activities (Kolb, 2005). Additionally, this notion will also aid in quelling thoughts of inexperience or uncertainty with these kinds of activities through the establishment of knowledge with hands-on making and building materials. As a result of these simple and approachable entry-level DIY projects, users will gain essential experience and may feel more inclined to undertake future repair or maintenance activities involving their everyday, domestic objects (Wolf & McQuitty, 2011).

These aspects of Experiential Learning were pivotal for this project and its trajectory towards the creation of hands-on, DIY design research activities and how they might be used to enact a change in consumer behavior. However, a critique of the effectiveness of this model (See Figure 2) comes from the journal article *Cognitive Styles and Multicultural Populations*. The problem with this model, Anderson (1988) states, is that it "takes very little account of different cultural experiences and conditions and has "been used within a fairly limited range of

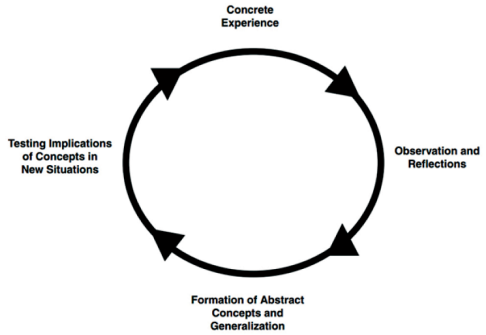


Fig. 2. *Experiential Learning Cycle and Basic Learning Styles* (Perspectives on Thinking, Learning, and Cognitive Styles by Taylor and Francis. Reproduced with permission of Taylor and Francis in the format Thesis/Dissertation via Copyright Clearance Center)

cultures" (p. 3). To disarm concerns that the proposed DIY projects may be limited to only a Western, English-speaking audience, the design decision was made to use universal, 'Pictographic' instructions (See Figures 17-22 and Appendices 8 and 9). This decision was due to Pictographic style instructions being proven to be useful in describing manufacturing processes and various contexts universally (Yamazaki, Goto, Taki, & Hori, 2008).

As the target audience for these DIY activities ranges from inexperienced 'Non-makers' to significantly skilled 'Makers,' it is important to note the distinction between the two. Furthermore, this differentiation as to why making plays a critical role in our relationships with objects as well as to individuals living in small spaces is also important. Therefore, a Non-maker is a person with a propensity to think that creating, building, or making things is something that should be done only by someone with specific training. Whereas being a Maker means simply being somewhat creative, resourceful, and self-determined. In this case, a Maker or Non-maker can become an Everyday Designer merely by using the simplest of acts to discover and exploit affordances between situations and their physical environment (Wakkary & Maestri, 2007). An example of an exploited affordance shown in the study titled The *Resourcefulness of Everyday Design* by Wakkary & Maestri (2007), has a participant using a measuring cup as an impromptu vessel to hold glass marbles. Directly related to exploited affordances and augmentation of material attributes is this project's use of IKEA furniture fixtures. A user's initial familiarity with IKEA fixtures was something this project aims to capitalize on in a further attempt at making these proposed DIY projects relatable.

Each proposed DIY project also requires a very limited number of tools to complete. By limiting the necessary tools needed to things user's may already have around the house, items such as a knife, a bucket or a roll of tape, the hope was to make these projects less intimidating while decreasing any notions of a required DIY skillset.

IKEA Heirlooms: Personalization, Customization, and Agency

The mental state in which an individual claims an object as theirs is called psychological ownership. Psychological ownership is associated with motives, routes, affordances, and outcomes directly linked to attachment.

Weston L. Baxter, Marco Aurisicchio, & Peter R.N. Childs 2015, p. 1

Enabling a user by providing opportunities for personalization and augmentation of their everyday, domestic objects is also central to this project's argument as these customization activities often result in stronger feelings of agency between user and object (Baxter et al., 2015). The significance of this idea comes from the previously mentioned roles that objects play in supporting people's everyday practices of self-exploration, self-expression, and the social presentation of self to others (Odom, Pierce, Erik, & Eli Blevis, 2009). However, agency is a major psychological factor when it comes to having a longer, more durable relationship with our objects. As agency contributes to a would-be Everyday Designer's motivation and the resulting empowerment that comes with the completion of a personal DIY project (Baxter et al., 2015; Sundar & Marathe, 2010; Williams, 2004). By becoming intrinsically familiar with an object, its components and how to physically construct it, feelings of ownership and attachment to that object can develop more quickly (Pierce, Kostova, and Dirks, 2003). Finally, the physical act of hands on making then concretizes the entire experience and resulting memories of when the user took the time to create something unique for their personal space.

As this project revolves around IKEA furniture and the creation and customization of personal objects, the phenomenon known as 'IKEA Hacking' needs to be addressed. An accurate description of an 'IKEA Hacker' comes from the article *Learning from IKEA Hacking: "I'm Not One to Decoupage a Tabletop and Call It a Day* by Rosner & Bean (2009). This article describes these individuals by saying "whether they were making a self-conscious artistic statement or simply modifying a towel rack to fit in a small bathroom, IKEA hackers illuminate an emergent practice that provides insights into contemporary changes in creativity" (p. 1). In support of a fledgling Everyday Designer's initial foray into this realm of personalization

and customization, several considerations have been taken into account within each of the proposed DIY projects. Many of them because of dissatisfaction with aspects of IKEA Hacking. Many websites claiming to highlight IKEA Hacks are often only showing projects consisting of superficial changes that require a very low level of augmentation of the existing IKEA fixtures (Rosner & Bean, 2009). These incredibly cosmetic enhancement techniques often include painting, staining, adding wheels or casters to the bottom of the object, or a very basic recombination of individual fixtures. Furthermore, once finished with their IKEA Hack, these people are left with an artifact that has mainly the same physical and material lifespan due to the original low quality of the IKEA fixtures themselves.

However, it is important to note that as I am advocating for individuals bringing out their innate ability to design and create, I do not aim to discount even these depthless creative explorations. The goal of this project is to amplify these activities to empower and increase the user's well-being and sense of agency with their objects to hopefully result in stronger relationships and a longer life for their domestic objects.

A fundamental difference to my approach as opposed to merely being an IKEA Hack is the fact that my proposed DIY projects take the low, almost disposable material quality of IKEA fixtures, and makes them significantly more durable. The familiar activity of building IKEA furniture is supplemented and amplified through the introduction of a new, material exploration process leading to the transformation of inferior IKEA parts into long-lasting concrete ones. By doing so, the intention is for the user to feel enabled and more involved in the making process, mainly feeling a much higher level of satisfaction and attachment to the object they have created. In contrast to a simple box of IKEA furniture, they will now have created an 'IKEA heirloom.' In this way, the user's resulting everyday object has been adapted to both redefine and relate the artifact to their sense of self in a much more enduring and almost permanent way (Akah & Bardzell, 2010).

Furthermore, in the study conducted for their paper, *What Drives Customization? Control or Identity?*, Marathe and Sundar (2011) state that "psychologically, customization can imbue a strong sense of personal agency by letting users specify their preferences and modify the product" (p. 782). As the making of home life is done through the

related acts of customizing, curating, and organizing one's domestic objects, having the ability to augment these kinds of spaces with specific and personalized furniture can enable a greater sense of ownership over one's objects (Odom, et al. 2009). This idea of co-production […] allows users to participate "through shared inventiveness and co-design" and users are engaged as active participants (Wolf & McQuitty, 2011; Lusch, R. F., Vargo, S. L., & O'Brien, M. 2007, p. 11). By physically interacting with both familiar and foreign materials on a much deeper, more engaging level than in a basic IKEA furniture kit, my proposed DIY projects aim to support these kinds of customization and personalization activities. By doing so, individuals will become Everyday Designers through the augmentation of their mass-produced IKEA furniture fixtures. Although this will involve a much deeper level of engagement, it will result in an increased sense of agency, ownership, and a strengthened relationship as opposed to a surface level, IKEA Hack.

Primary Research and Research Through Design

Survey and Interviews

A significant portion of the primary research for this project takes direction from the study conducted in *The Meaning of Things: Domestic Symbols and the Self* by Csikszentmihalyi & Rochberg-Halton (1981). It consists of data obtained from interviews with over 300 people living in a major metropolitan area with interviews having been conducted in the respondents' homes, to view and discuss the things that were part of their everyday lives (Csikszentmihalyi & Rochberg-Halton, 1981, preface. x). This study provided a useful coding manual and object inventory for ordinary domestic objects found within participant's homes and described how to classify and exclude certain objects from this inquiry.

Within my project, the young adult participants were asked questions regarding the amount and kinds of furniture they own, the amount of time they spend at home and what objects they find most useful in their current domestic space. However, unlike Csikszentmihalyi & Rochberg-Halton's (1981) study, this project is not only concerned with the everyday objects that participants chose to live with inside their domestic space, but also how easily discarded these belongings were. For example, would participants discard a piece of furniture if it became damaged or if they had to physically move it from one place of residence to another? By conducting both an online survey as well as in-person interviews with people living in Vancouver and various other areas during the Summer of 2016, insights surrounding this topic became apparent. Furthermore, the selection criteria for both the survey and interviews were individuals aged 19-30 years old and the participants interviewed at various locations around Vancouver. Several Vancouver residents, including students from Emily Carr University of Art + Design and the University of British Columbia, were interviewed to gain insights into topics such as consumer behavior, tendency to discard objects and confidence with DIY activities.

- Over half of the participants interviewed claimed to currently own or have at least built one piece of IKEA furniture in their lifetime

- Participants expressed confidence in undertaking this level of DIY project either on their own or with another person helping them

- Specifically, IKEA furniture was almost unconsciously discarded if it had suffered any moderate form of damage due to its relatively small purchase price

- Whether participants had or would ever try to repair their domestic objects resulted in the response that they were mostly unwilling to undertake these kinds of activities

- Concerning repairing their IKEA furniture, it was because of both its low cost and respondents low level of attachment to it; they felt this action was beyond their skill level and not worth the time

Artifact Analysis

To help further ground this investigation, one of the primary research methodologies was an analysis of the kinds of objects individuals discarded in their alley. This method of qualitative data collecting involved visiting various alleys over the course of several weeks and documenting the objects found through photographs. Multiple alleys in different Vancouver neighborhoods were scoured, and of the hundreds of objects found, domestic objects such as furniture (chairs, tables, bookshelves, lamps), mattresses, small appliances (microwaves, kettles), and books were found most often. Care, in the form of neatly wrapped appliance cords, the stacking of books, and 'Free' signs, were used with some objects to infer that they may still work or to enhance their appeal to a passerby. An example of this is a stainless-steel kettle that had been wrapped in a red plastic grocery bag to protect it from rain possibly (see Figure 3). Described as 'Alley Shopping,' this activity often involves the reuse, repair or recombination of second-hand objects and has been linked with a perceived increase in quality of life during a study conducted within the *Handbook of Design for Sustainability* (Marchand,

Fig. 3. Plastic Wrapped Kettle
(Photograph by M. Harkness, 2017)

2011; Walker & Giard, 2013). As a result of these activities, this increased sense of agency can strengthen our relationship with an object because of the many levels of physical engagement that occur as an attempt to service a particular need we may have within our domestic space (Baxter et al., 2015).

During an observational outing for this project, two discarded microwaves had been discovered. Although incredibly dirty, they were tested and confirmed to be perfectly viable, and working appliances yet were discarded before being rendered entirely inoperable. The *Eternally Yours Foundation* (1997) elaborates on why objects similar to these microwaves become abandoned despite still working by stating:

> 25 Per cent of vacuum cleaners, 60 per cent of stereos and even 90 per cent of computers still function when people get rid of them. [...] They may either be bored or annoyed by the way these products look and feel, or development of new technologies has made the 'old' ones obsolete. If on the other hand products are discarded because of malfunction, it is because consumers are left out in the cold when it comes to repairability of products (p. 19).

Evidence of these unfashionable, obsolete, or irreparable domestic objects are common problems associated with modern day Material Culture and our affinity for consumption. These symptoms reflect a lack of consumer confidence in these agency-related areas and suggest a much-needed development in regards to the way we engage and live with the objects we own.

Research Through Design

Research through Design was selected as the primary design research methodology to support this research project for several reasons. RtD uses the act of making to create artifacts that generate new knowledge (Zimmerman, et. al, 2010). These artifacts can then be used as design research exemplars to aid in the transfer of this knowledge to Everyday Designers and design research communities (Koskinen, Zimmerman, Binder, Redstrom & Wensveen, 2011). Furthermore, RtD also broadens the understanding of the problem space surrounding this project while uncovering questions for further inquiry. As Walker and Giard (2013) state "the activity of designing should be regarded less as a problem-solving activity and more as a question-asking activity" (p. 6).

Using these extensive material-based explorations occurring throughout this project, an ongoing cycle of creation, reflection, and synthesis of ideas often supported this process of continuous making. Not only does this time creating design artifacts allow for the physicalization of ideas but it also allows for critical moments of contemplation that can be synthesized to help inform further design decisions.

IKEA as Pattern and Material Choices

During the Fall of 2016, a series of domestic furniture-objects were developed using IKEA furniture fixtures as materials that could be used to employ aspects of simple, experiential learning-based, DIY projects. Initially, insights from the online survey and interviews led to the decision to use IKEA furniture fixtures as a familiar, ubiquitous, and standardized material element that many young adults were comfortable using. Another reason for this decision to use IKEA furniture fixtures within my proposed DIY projects stems from IKEA's history as a purposefully cost-effective, yet aesthetically pleasing alternative to other furniture brands (Bengtsson, 2010). Therefore, it was fitting for use in this project similarly aimed at young adults.

Ideation began by obtaining an IKEA catalog and using white correction fluid to hide parts of the images of furniture to imagine the individual parts that might be effectively repurposed or recombined with other pieces. These activities developed into a smaller-scale artifact analysis and the eventual manual dissection of the different components. Ultimately, the analysis of various IKEA

Fig. 4. IKEA LACK Dissection
(Photograph by M. Harkness, 2016)

furniture kits determined what kinds of physical, material properties each piece had and informed how it might be useful moving forward.

These examinations shifted this exploration from repurposing and recombining to viewing each fixture as a negative space and its potential to become a mold. Therefore, beginning with previously accrued IKEA furniture, an inventory of all the available parts in each furniture kit allowed for manipulation of these components. This kind of component inventory also confirmed whether or not a piece could work as a casting mold.

As familiarity and ubiquity were other majors factor during my consideration of material choices, all the materials within my proposed DIY projects are approachable, generally cost-effective, and readily available. Using these types of materials, I began specifically developing a series of design artifacts featuring creative exploitations, affordances, and happenstance (See Appendices 2-7). In a similar attempt to bridge and modify an individual's viewpoint towards DIY, making and appropriation, these standardized components were deliberately manipulated, exploited, and explored in such a way as to remain understandable and familiar to them. Examples of this include the decision to severely limit the use of tools needed to construct these artifacts while keeping the skills and techniques required to create them at a very basic level.

The potential negative spaces afforded by IKEA fixtures and my desire to create longer lasting, emotionally durable objects led to the implementation of high-strength concrete as the void-filling material. Often described as an unsustainable material choice, further research into durable, long-lasting building materials determined that a sustainable material of this kind is difficult to find (Mehta P., 2002). Additionally, evidence suggest that regardless what material is used for purposes within this project, it will have both positive and negative effects on the environment (St. Pierre, 2016). However, in support of concrete and its use within this project, many harmful industrial by-products are recycled during the production of concrete (Mehta P., 2002; Van Vliet, K., Pellenq, R., Buehler, M., Grossman, J., Jennings, H., Ulm, F., & Yip, S., 2012). By adding these often toxic by-products into the mix during manufacturing, it can give concrete both desirable material properties and strengthen it as well

(Van Vliet, et. al, 2012). Concrete has also been labeled as an 'infinitely recyclable' material because old hardened concrete can always be ground down into small pieces and reused as aggregate in a new mix (Mehta P., 2002). Between the demolition of an old building and the construction of a new one, it often makes more sense to grind up the old building's foundation as aggregate for the new one, than it does to remove the rubble from the construction site altogether (Mehta P., 2002).

Initially selected for its durability and association with the idea of permanence, the many brands of concrete tested during this material exploration led to the discovery of a high-strength mix that would be able to exist far beyond the lifespan of a typical piece of IKEA furniture. Concrete is also an excellent material choice because of its indelible quality and its ability to patina over time. Like wood and leather, van Hinte (1997) states that "wear should never be a surprising gimmick. It is a slow process that needs a certain gradualness in its appearance" (p. 130). Again, it is these one-of-a-kind marks and signs of use that add to the personalization factor and perceived lifespan of our objects that can make them more emotionally durable. The final reason for choosing concrete was it's easy to use, forgiving nature and its aptitude towards aspects of experiential learning. This blending of familiar IKEA fixtures while introducing foreign material elements in the form of concrete aimed at giving the user an increased feeling of empowerment and accomplishment as opposed to merely just putting together a box of IKEA furniture. An example of this experience design scenario comes from 'Betty Crocker' cake mixes:

> While they sought to promote a quick and easy product that still retained a fresh, 'home-made' quality, […] the problem, according to psychologists, was eggs. Powdered eggs, often used in cake mixes, should be left out, so women could add a few fresh eggs into the batter, giving them a sense of creative contribution (Marks, 2007, p. 136).

Measuring the water, mixing, and pouring the concrete are synonymous with the cake making example above because of three important concepts needed to develop an emotionally long-lasting relationship with an object. These concepts are engagement, history, and augmentation (Odom, et al., 2009).

> Engagement — the extent to which an object invites and promotes physical engagement with its owner during use; histories—the extent to which the materials of an object preserve personal histories or other memories, either by explicitly showing physical signs of use or implicitly by virtue of its persistence over time; augmentation—the extent to which an object has been reused, renewed, modified, altered or otherwise made to be a part of something [...] and as such has become a symbol of the resourcefulness and/or creative expression of its owner (Odom, et al., 2009, p. 4).

Engagement allows the user and object to interact, and makes up the creation and hands-on part of my proposed DIY projects. History might allow for any previous DIY experience that the user may have to come forward, but more so, is viewed as the unique conception of the object itself. Although following instructions, what is meant by this, is that each object will be inherently bespoke. For example, the ratio of water to the concrete mix may not be the same, and fewer air bubbles may be visible on the surface resulting in a slightly different end product, again, these imperfections will add to the object's character throughout its lifespan. Finally, the addition of concrete to the IKEA furniture kits demonstrates this idea of augmentation. As it elevates the identical mass-produced, IKEA furniture fixtures, to an improved, personalized, and otherwise enhanced object through a Do-it-Yourself project.

DIY Projects: The FORMÅ, KRÄFTIG, and STÖN

After several months of ongoing material explorations using IKEA furniture fixtures, concrete, and a limited number of tools, I created several prototypical design artifacts. Initially, ten distinct concepts were developed and iterated upon, however, from these initial explorations, three of the most successful of these explorations became realized as working prototypes (See Figures 5-13 and Appendices 2 and 3).These included the FORMÅ (see Figure 13), an elevated surface made using a LACK side table, the STÖN (see Figure 14), a larger table also made using a LACK and the KRÄFTIG (see Figure 15), a small stool made using a FNISS garbage can. The making process for many of these explorations is similar in that it involved the exploitation of the IKEA fixtures to create a mold cavity, then preparing the mold, mixing the concrete and pouring it into the mold. Disassembly of the mold takes place after the concrete has become dry, and, in many cases, the mold becomes a future component in the rest of the design. Then, through cutting, taping or use of the IKEA fasteners in the original furniture kit, a recombination of the pieces, plus the newly created concrete one, is put together to make the final design artifact.

The making process is quite similar for each the FORMÅ, KRÄFTIG, and STÖN, however, it is demonstrated below using images for the FORMÅ project (See Figures 6-14). The making process for the KRÄFTIG is detailed using its instruction manual in the following section titled *Making Instructions* and images from both the KRÄFTIG and STÖN's making processes can be found in Appendix 2 and Appendix 3 respectively.

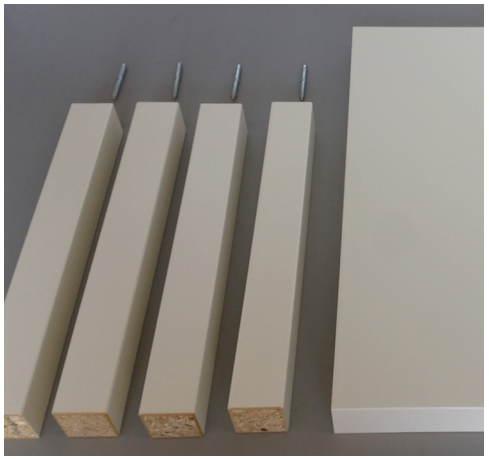


Fig. 5. LACK Components. *An inventory of the LACK table's components. One medium density fiber board (MDF) table top, four MDF legs and four double-sided steel leg screws.* (Photograph by M. Harkness, 2016).

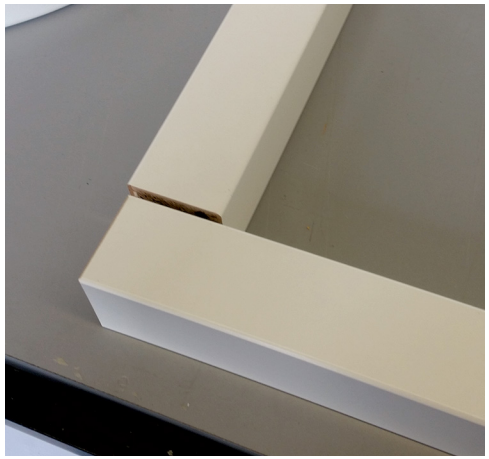


Fig. 6. Creating the Mold 1. *Butting the legs up against one another at 90 degrees to form the mold cavity.* (Photograph by M. Harkness, 2016)

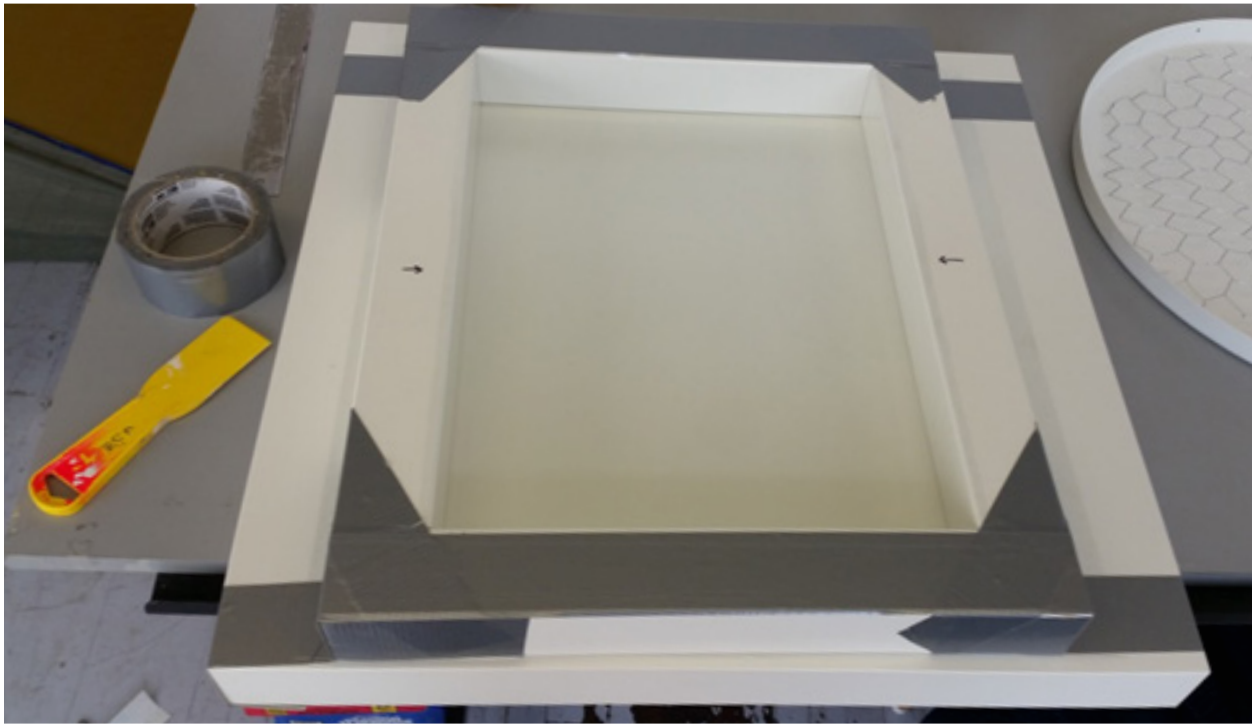


Fig. 7. Creating the Mold 2. *The LACK legs form the mold cavity, and the LACK tabletop creates the base. Tape secures them together.* (Photograph by M. Harkness, 2016)

Fig. 8. Preparing to Mix the Concrete. *Concrete mixing tools: A level work surface, a bag of concrete mix, a bucket to mix the concrete and water in, a few liters of water and a sturdy mixing stick.* (Photograph by M. Harkness, 2016)

Fig. 9. Freshly Mixed and Poured Concrete. *Once thoroughly mixed and poured into the mold, the concrete can be aerated by repeatedly tapping the edge of the mold with mixing stick to release any trapped air bubbles.* (Photograph by M. Harkness, 2016)

Fig. 10. Concrete Component Released from the Mold. *Although not required, a rubber mallet helps release the concrete from the mold. Any concrete that seeped out from the bottom edge of the mold is fragile and is easily cleaned off.* (Photograph by M. Harkness, 2016)

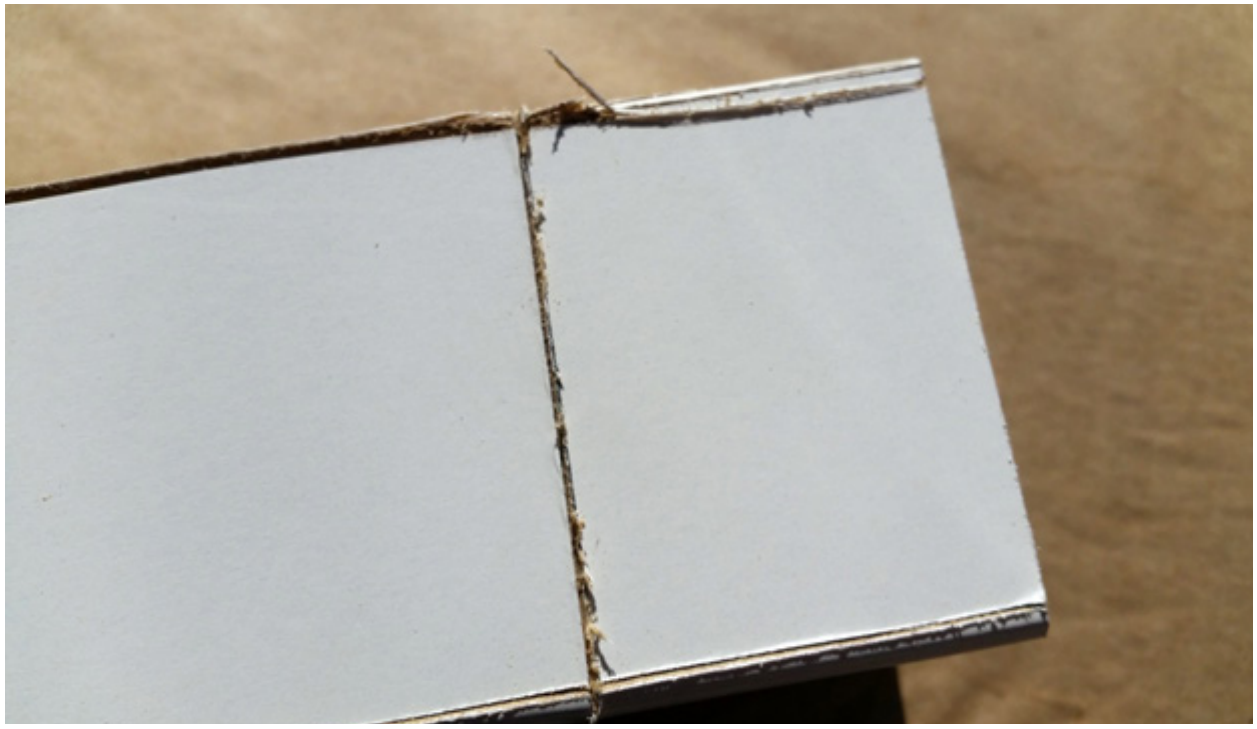


Fig. 11. Cutting Legs for the FORMÅ. *The IKEA LACK legs consist of MDF. Therefore, they can be cut to size using a sharp knife.* (Photograph by M. Harkness, 2016)

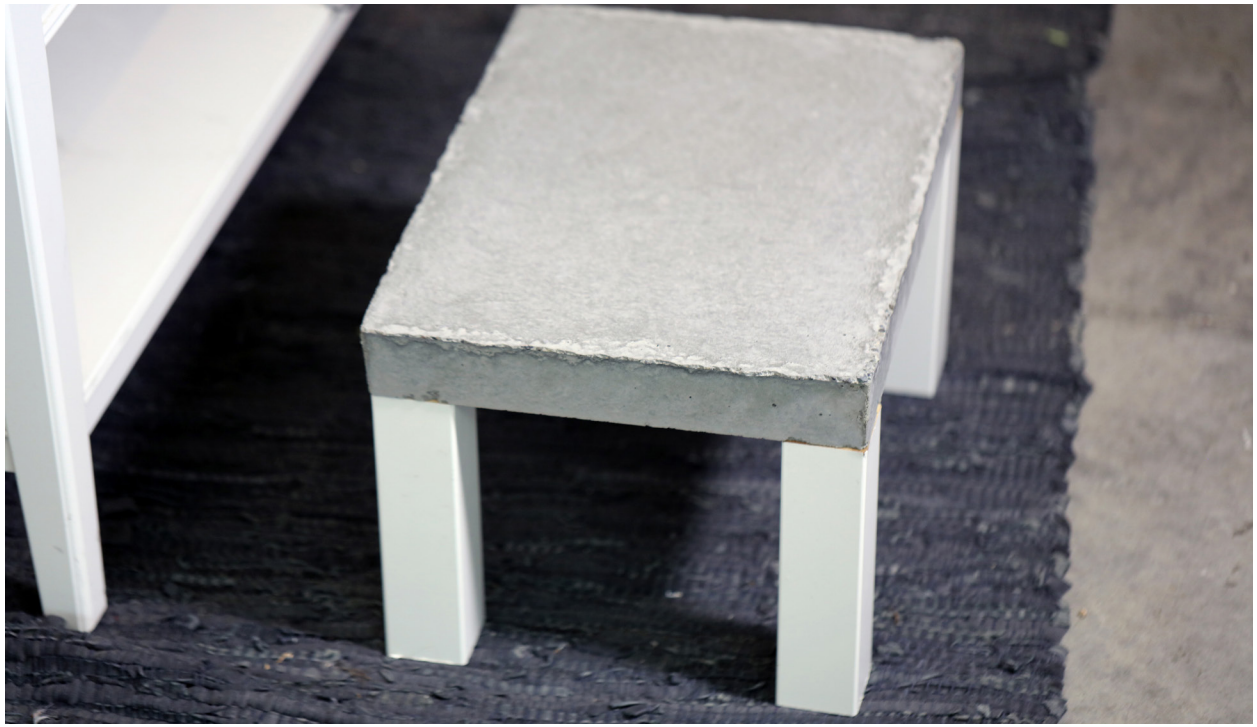


Fig. 12. FORMÅ Elevated Surface
(Concrete and IKEA Fixtures, M. Harkness, 2016)

Fig. 13. STÖN Table
(Concrete and IKEA Fixtures, M. Harkness, 2017)

Fig. 14. KRÄFTIG Stool
(Concrete and IKEA Fixtures, M. Harkness, 2016)

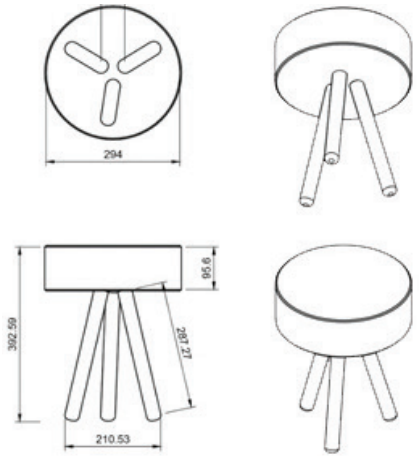


Fig. 15. KRÄFTIG Stool Blueprints
(Digital Image, M. Harkness, 2016)

Instruction Manuals

The inspiration for this kind of open-source, DIY instruction manual comes from books such as *Nomadic Furniture*, by UNESCO International Design Expert Victor Papanek (1973) and industrial designer James Hennessy (1973), and *Build More Buy Less!* by German architect Van Bo Le-Mentzel (2012). Beginning with ideas from these texts and my initial sketches, measurements, and using the FORMÅ, STÖN and KRÄFTIG artifacts themselves, I created a computer modeled version of each using Autodesk Fusion360. Then, working between Autodesk and Adobe Illustrator, manipulated the 3D models to create a Do-it-Yourself project manual for each of these three artifacts.

An investigation of Pictographic instructions, the kinds of symbols and their uses within IKEA instruction books, mainly their semiotic structure, informed my DIY instruction manuals. IKEA's well-known Pictographic instructions are co-opted as templates for their use of only imagery, symbols, and numbers to support future dissemination of these manuals to a broader range of Everyday Designers (Yamazaki et al., 2008). This application of a somewhat universal and familiar semiotic structure suggests a more approachable method of transmitting the steps needed to complete these design artifacts to both Makers and Non-makers. Ultimately, the artifacts and their instruction manuals came to be in an attempt to create understandable, relatable design exemplars that enable previously unwilling people to weave design and making activities into their everyday lives.

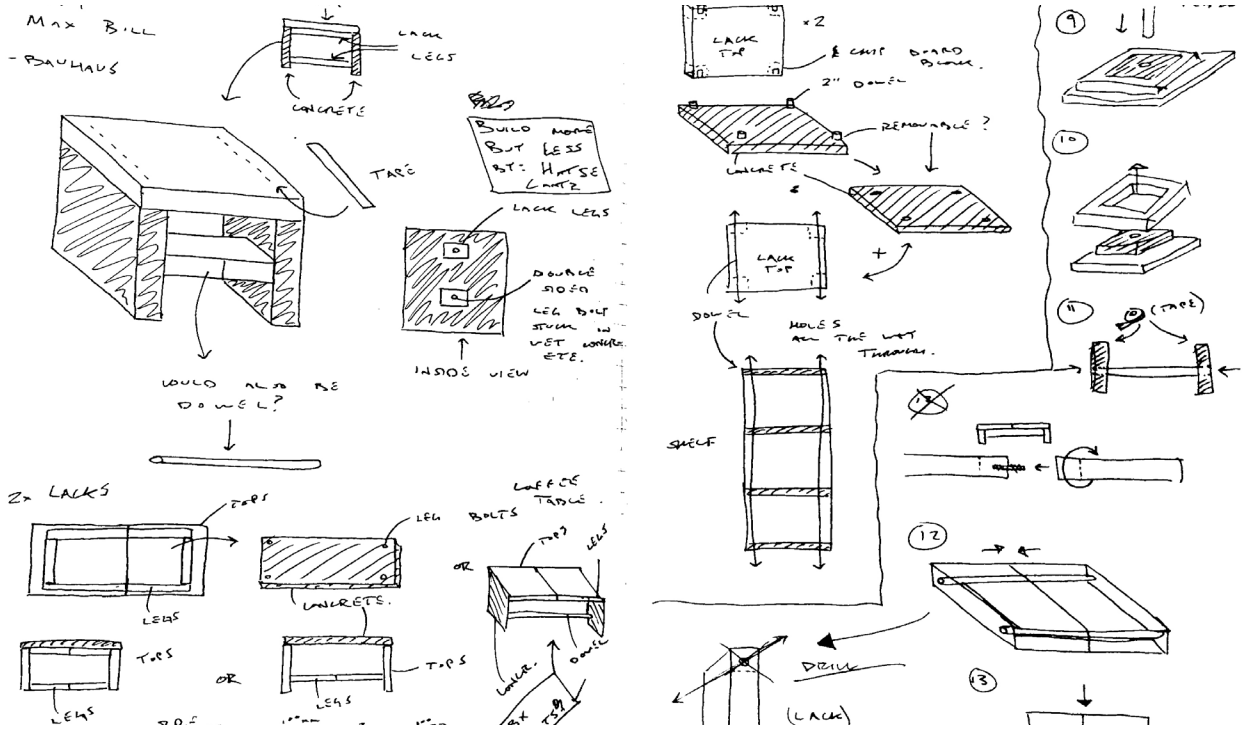


Fig. 16. Sketching Instructions
(Ink on Paper, M. Harkness, 2016)

Fig. 17. KRÄFTIG Instructions Page 1
(Digital Image, M. Harkness, 2016)

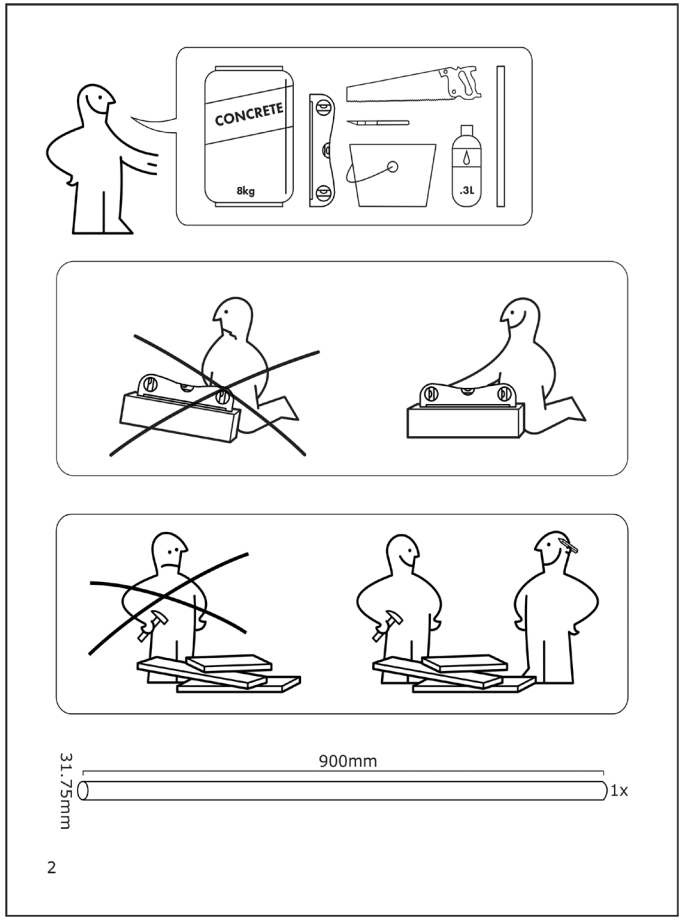
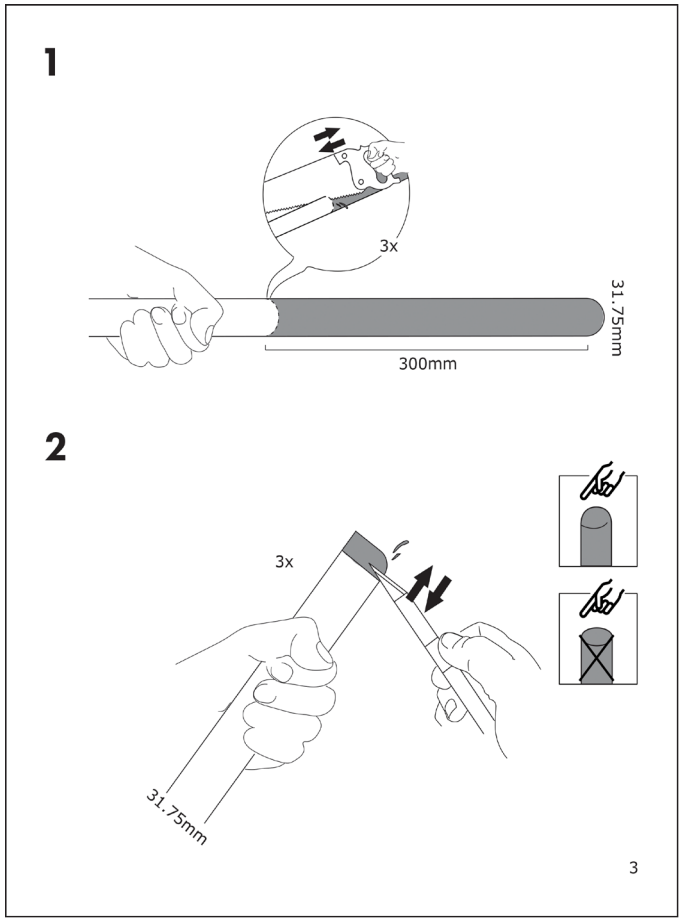


Fig. 18. KRÄFTIG Instructions Page 2
(Digital Image, M. Harkness, 2016)



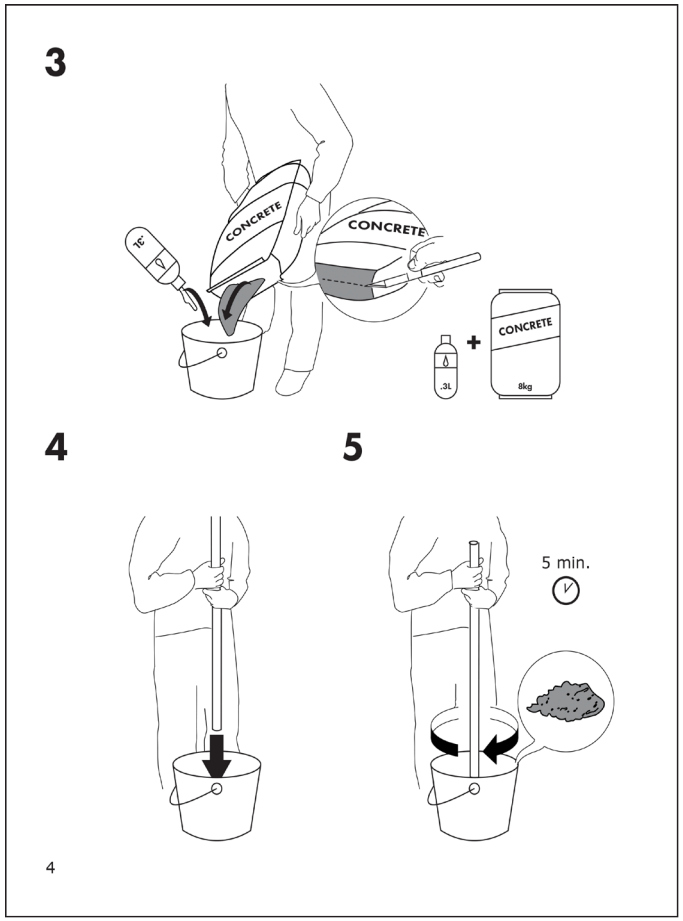


Fig. 19. KRÄFTIG Instructions Page 3
(Digital Image, M. Harkness, 2016)

Fig. 20. KRÄFTIG Instructions Page 4
(Digital Image, M. Harkness, 2016)

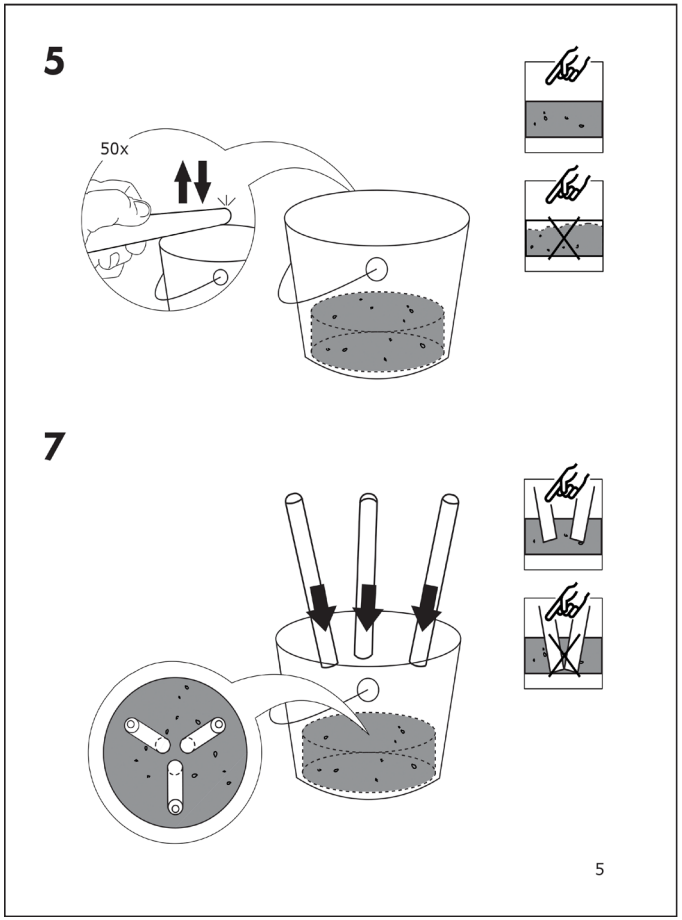
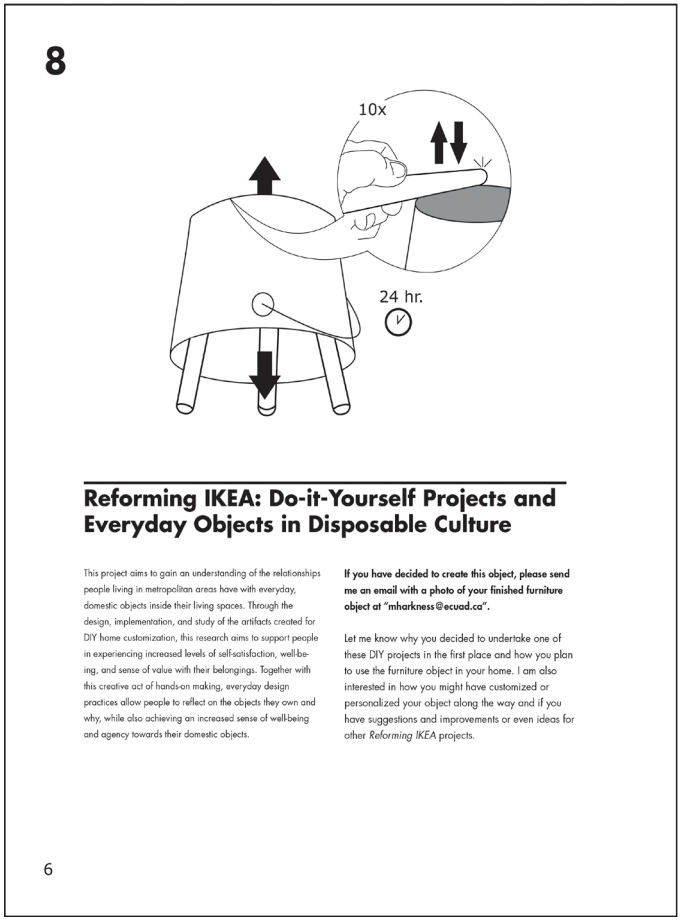


Fig. 21. KRÄFTIG Instructions Page 5
(Digital Image, M. Harkness, 2016)

Fig. 22. KRÄFTIG Instructions Page 6
(Digital Image, M. Harkness, 2016)



Conclusion

By bringing together a variety of ideas and, through creative practice, translating them into tangible form, questions can be raised about the nature of material culture.

Stuart Walker & Jacques Giard
2013, p. 6

Implications for Design

Ultimately, the importance of this project stems from problems related to the ever-increasing cost of housing and the fact that major urban centers are constantly densifying and will continue to do so into the future (Housing Market Outlook, 2015; Willa, R., et al., 2008). By looking at broader, global housing issues, then focusing on local ones, Vancouver has been specifically chosen as a case study within this project. This investigation uncovered many problems with urban densification and resulted in the discovery of quantitative data from various sources to support and further grounding this inquiry (Bettencourt et. al, 2009; CMHC, 2105). Unaffordable housing and urban densification were among the issues uncovered, and their effects will not only reach young adults currently living in Vancouver but prospective future residents as well (Danziger & Rouse, 2008).

More specifically, individuals earning an average income in Vancouver will not be able to afford the high cost of housing in the Metro Vancouver area shortly (CMHC, 2015; Danziger & Rouse, 2008). Even now, young adults are feeling this pressure and moving to cities that are more affordable (Performance Urban Planning, 2015). Alternatively, young adults who are not leaving Vancouver may choose to move and downsize both their rented living space as well as the number of possessions they keep to maximize their livable space. However, this suggests an increased level of stress and a decreased sense of well-being because of their dissatisfaction with their now smaller living spaces and the objects within them (Campagna, 2016; Csikszentmihalyi & Rochberg-Halton, 1981). By attempting to uncover notions of importance, meaning and reflection concerning our everyday, domestic objects, this project aimed to benefit individuals by using DIY projects as a source of agency and empowerment in regards to their material possessions we construct our identities with (Akah & Bardzell, 2010; Baxter et al., 2015).

The city of Vancouver again works well as a case study for this project, as it demonstrates aspects of our con-

sumer tendency toward seemingly disposable objects, Material Culture, and our love of purchasing new things. Further research led to the discovery of the way we create our identities using material objects (Csikszentmihalyi & Rochberg-Halton, 1981). Although, these identities that are created using objects were quickly found to be somewhat inconsequential because of certain aspects of Material Culture and our relationships to those objects (Chapman, 2005; Csikszentmihalyi & Rochberg-Halton, 1981; Walker & Giard, 2013).

Besides theoretical evidence, this project seeks precedence focused on the importance of everyday objects and reasons why people keep certain things rather than others. Cognitive psychology, anthropology, engagement with objects and objects and the self, all revolved around everyday, domestic objects and informed ongoing Research through Design activities. Furthermore, the artifacts produced through RtD and the resulting evaluations were attempted to provide concrete ways of advancing new knowledge on how these consequences of urban density and the lack of personalized objects and furniture for smaller dwellings can be re-framed and productively approached. This objective was geared towards broadening previous research beyond the role of making and prototype creation by professional designers towards more emergent ideas of how people can draw on these DIY activities as design resources to improve their everyday dwellings (Campagna, 2016; Koskinen et al., 2011; Odom et. al, 2009). Furthermore, primary research was conducted through survey and interview questionnaires as well as multiple artifact analyses. These provided more insights into both the problem space and the theory-based pillars of this project. With hopes to reframe our currently shallow relationships with our everyday, domestic objects, engagement, personalization, and customization were also considered as possible sources to support these changes (Akah & Bardzell, 2010; Marathe & Sundar, 2011; Sundar and Marathe, 2010). These considerations suggest a need for accessible, and nearly tool-free projects to support and engender more positive relationships between us and our objects. In particular, for individuals affected by shrinking living spaces who are currently living modestly in the cities like Vancouver.

Future Directions

Implications for these design artifacts and the resulting steps for this project revolve around the dissemination of these instruction manuals. Essentially, taking these instruction manuals and distributing them to individuals living in small metropolitan living spaces. Currently, these manuals are available to download from my portfolio website www.mharknessdesign.com. However, the number of downloads remains in the single digits.

Another option currently being explored is called 'Droplifting.' This activity involves physical copies of these instruction manuals being left at IKEA store locations near the required fixtures for each project (see Figure 23). Droplifting or 'Shopdropping' is the opposite of shoplifting and is a form of culture-jamming where someone leaves something behind in a store rather than steals something (Watkins-Hughes, 2004). In this way, consumers could find their IKEA product as well as one of these instruction manuals. They may then decide to augment and enhance their new object to the level of an IKEA heirloom, and, by doing so, increase the emotional durability of their newly acquired domestic object. For example, while shopping at IKEA, an individual might come across one of these manuals and look through it. They may become inspired to create one of these projects and decide to improve and reinvigorate the LACK table they came to replace rather than buying a new one. Subsequently, the individual will have effectively reduced their consumption and increased their agency and lifespan of their IKEA object. However, as the consumer is already at an IKEA store about to purchase a new piece of furniture, this method may not be the most effective in changing ingrained consumption habits.

Another problem with both these methods is the lack of feedback gained from having someone complete one of these DIY projects. A viable solution to this issue takes inspiration from Le-Mentzel's (2012) open-source DIY projects. Like Le-Mentzel's (2012) designs, my proposed DIY projects are also available both in a physical form and online. To increase feedback on his projects, Le-Mentzel (2012) asks individuals to email him, send a photo of the completed furniture object and also to explain why they are undertaking these DIY projects (Bo Le-Mentzel, 2012) all while welcoming augmentation and improvements to any of the designs.

Fig. 23. Droplifting Instruction Manuals at an IKEA Location
(Photograph by Z. Camozzi, 2016)

A possibly even more fruitful implication with regards to obtaining feedback for these projects would be to recruit participants to complete them and use them within their homes as a cultural probe. A cultural probe can be an object or set of objects aimed at creative reflections regarding personal circumstances and context. Particularly useful when looking at individual's specific problems with small living spaces and how customization could improve certain areas, cultural probes serve to "begin a conversation about possibilities that might exist by design, in tandem with other informative research methods" (Martin & Hanington, 2015, p. 24). As a type of cultural probe, these DIY activities could be attempted by participants who would then be involved in further stages of iteration and investigation to improve these artifacts and strengthen the suggested outcomes. Additionally, important questions could then be asked of future participants regarding how these DIY activities are being received and conducted. Questions such as how the resulting artifacts are in use in a participant's small space and for how long, and how might this kind of experiential learning and engagement with materials impact their consumption habits. Specific questions revolving around the creation and dissemination of the instruction manuals for these DIY activities could then be asked. How well participants are responding to the instructions and in what ways if any, are they altering the objects for an even greater level of personalization and customization as opposed to merely following the instructions? Mostly these cultural probes would serve as "provocative instruments given to participants that will inspire new forms of self-understanding and communication about their lives, environments, thoughts, and interactions" (Martin & Hanington, 2015, p. 24).

Other avenues of consideration regarding concrete and IKEA as construction materials have also been uncovered. Many of the material explorations conducted were relatively small in scale, further investigation into what the scalability of these kinds of concrete IKEA projects might look like may also be a viable avenue for future research. In addition to that, considerations were made to increase longevity and physical durability of these artifacts to promote increased reflection on an object's perceived life. However, this neglects aspects of design for ephemerality or design for flexibility. Perhaps extremely durable, heirloom IKEA furniture and domestic objects are not a viable suggestion for dealing with this kind of 'throwaway' ma-

terial culture? Further exploration into purposefully single use objects could be undertaken to gain a more holistic view of this problem space as well as areas for possible mitigation.

Further user testing scenarios could integrate with other aspects of DIY culture for use within these projects. Initial speculation of this implication for this project could be a demonstration day or a face-to-face tutorial of these introductory DIY projects with various participants. This type of event could aim to highlight the benefits and empowerment that results from taking part in these activities. A prominent and far-reaching platform for these could be an online YouTube tutorial video. This video would demonstrate these projects and allow users to follow along systematically at home. Additionally, the comments section could allow for further discussion, iteration, and perspective on the making process of these design artifacts from both Makers and Non-makers and on a much larger scale.

Therefore, through the research, design, and study of these innovative DIY home customization activities and, by developing new ways these activities can be resourcefully drawn on by people in their everyday lives, this research aims to contribute to the fields of Research through Design, Material Culture, and Sustainability. This project also concerns individual's overall well-being and sense of empowerment with their domestic objects they keep in their small living spaces in the service of extending these objects lifespans. Through the creation of these DIY projects, "the resulting artefacts, which are effectively questions-in-form," exist to illuminate issues surrounding our domestic objects and their importance to us (Koskinen et al., 2011). Moreover, these objects and the relationships they have with the act of making, and our consumption habits all aim to propose new directions for design as it sits within the realm of material culture (Walker & Giard, 2013).

References

1. Akah, B., & Bardzell, S. (April 10-15). Empowering products: personal identity through the act of appropriation. Presented at the CHI 2010, Atlanta, Georgia, USA: ACM.
2. Anderson, J. A. (1988). Cognitive Styles and Multicultural Populations. Journal of Teacher Education, 39(1), 2–9. https://doi.org/10.1177/002248718803900102
3. Baudrillard, J. (2008). The System of Objects. Navayana.
4. Baxter, W. L., Aurisicchio, M., & Childs, P. R. N. (2015). A psychological ownership approach to designing object attachment. Journal of Engineering Design, 26(4–6), 140–156 https://doi.org/10.1080/09544828.2015.1030371
5. Bengtsson, S. (2010). IKEA, the Book: Designers, Products and Other Stuff - Staffan Bengtsson. Arvinius.
6. Bettencourt, L. M. A., Lobo, J., Helbing, D., Kühnert, C., & West, G. B. (2007). Growth, innovation, scaling, and the pace of life in cities. Proceedings of the National Academy of Sciences, 104(17), 7301–7306. https://doi.org/10.1073/pnas.0610172104
7. Bo Le-Mentzel, V. (2012). Build More Buy Less! Konstruieren statt konsumieren. Art Pub Incorporated.
8. Busch, A. (2005). The Uncommon Life of Common Objects: Essays on Design and the Everyday. Metropolis Books.
9. Campagna, G. (2016). Linking crowding, housing inadequacy, and perceived housing stress. Journal of Environmental Psychology, 45, 252–266. https://doi.org/10.1016/j.jenvp.2016.01.002
10. Canada Mortgage and Housing Corporation. (2015). Publications and Reports | CMHC. Retrieved May 14, 2016, from https://www03.cmhc-schl.gc.ca/catalog/productDetail.cfm?lang=en&cat=114&itm=3&fr=1448322517427
11. Chapman, J. (2005). Emotionally Durable Design: Objects, Experiences and Empathy. Routledge.
12. Collins, H. (2010). Creative Research: The Theory and Practice of Research for the Creative Industries. AVA Publishing.
13. Csikszentmihalyi, M., & Rochberg-Halton, E. (1981). The Meaning of Things : Domestic Symbols and the Self. New York : Cambridge University Press.
14. Danziger, S., & Elena Rouse, C. (2008). The Price of Independence: The Economics of Early Adulthood. Russell Sage Foundation.
15. Hennessey, J., & Papanek, V. (1973). Nomadic Furniture. New York: Pantheon Books.
16. Hinte, E. V. (1997). Eternally yours: Visions on product endurance. Rotterdam: 010.
17. Ho, J.-W., & Huang, Y.-S. (2009). A study on customer involvement in final assembly for DIY products. Computers & Industrial Engineering, 56, 19–27.
18. Housing Market Outlook — Vancouver and Abbotsford. (2015, October 1). Retrieved November 22, 2015
19. Ingold, T. (2013). Making: Anthropology, Archaeology, Art and Architecture. Abingdon, England: Routledge.
20. Kamprad, I., & Torekull, B. (1999). Leading by Design: The IKEA Story. Collins.
21. Kolb, A. Y. (2005). The Kolb learning style inventory-version 3.1 2005 technical specifications. Boston, MA: Hay Resource Direct, 200, 72.
22. Koskinen, I., Zimmerman, J., Binder, T., Redstrom, J., & Wensveen, S. (2011). Design research through practice: From the lab, field, and showroom. Elsevier.
23. Krippendorff, K. (2008, November). The diversity of meanings of everyday artifacts and human-centered design. Paper presented at DeSForM: Meaning, Matter, Making. http://www.northumbria.ac.uk/static/5007/despdf/designres/2008proceedings.pdf.

24. Lusch, R. F., Vargo, S. L., & O'Brien, M. (2007). Comparing through service: insights from the service-dominant logic. Journal of Retailing, 83(1), 5–18.

25. Marathe, S., & Sundar, S. S. (2011). What drives customization?: control or identity? (pp. 781–790). Presented at the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, ACM. https://doi.org/10.1145/1978942.1979056

26. Marchand, A. (2011). WHY SUSTAINABLE CONSUMERS DON'T CARE THAT MUCH ABOUT GREEN PRODUCTS. In The Handbook of Design for Sustainability. Bloomsbury Publishing.

27. Marks, S. (2007). Finding Betty Crocker. Retrieved from https://www.upress.umn.edu/book-division/books/finding-betty-crocker

28. Martin, B., & Hanington, B. (2012). Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas and Design Effective Solutions. Beverley, Massachusetts: Rockport Publishing.

29. Mehta P., K. (2002). Greening of the Concrete Industry for Sustainable Development. Concrete International, 23–28.

30. Norman, D. A. (2007). Emotional Design: Why We Love (or Hate) Everyday Things. Basic Books.

31. Odom, W., Pierce, J., Erik, S., & Eli Blevis. (2009). Understanding Why We Preserve Some Things and Discard Others in the Context of Interaction Design (p. 11). Presented at the CHI 2009, Boston, MA USA: ACM.

32. Performance Urban Planning. (2015). 12th Annual Demographia International Housing Affordability Survey: 2016 Rating Middle-Income Housing Affordability. Retrieved from http://www.demographia.com/dhi.pdf

33. Pierce, J. L., T. Kostova, and K. T. Dirks. 2003. "The State of Psychological Ownership: Integrating and Extending a Century of Research." Review of General Psychology 7: 84–107.

34. Prown, J. D. (1993). The Truth of Material Culture: History or Fiction? In S. Lubar & D. Kingery, History from Things: Essays on Material Culture (p. 19). Smithsonian Institution.

35. Rent Seeker. (2015, November 5). Canada's Most Expensive And Least Expensive Cities To Rent Apartments. Retrieved May 14, 2016, from http://www.rentseeker.ca/blog/index.php/canadas-priciest-rental-markets/2319

36. Rosner, D., & Bean, J. (2009). Learning from IKEA hacking: I'm not one to decoupage a tabletop and call it a day. Paper presented at the Proceedings of the 27th International Conference on Human Factors in Computing Systems, Boston, MA, USA. 419-422.

37. Schor, J., & Holt, D. B. (2011). The Consumer Society Reader. The New Press.

38. Schrader, U., & Thøgersen, J. (2011). Putting Sustainable Consumption into Practice. Journal of Consumer Policy, 34(1), 3–8. https://doi.org/10.1007/s10603-011-9154-9

39. Sternberg, R. J., & Zhang, L. (2014). Perspectives on Thinking, Learning, and Cognitive Styles. Routledge.

40. St. Pierre, L. (2016). Open Studio Day [In-person].

41. Sundar, S. S. and Marathe, S. S. (2010), Personalization versus Customization: The Importance of Agency, Privacy, and Power Usage. Human Communication Research, 36: 298-322. doi: 10.1111/j.1468-2958.2010.01377.x

42. Suzuki, D. (2007). The Sacred Balance: Rediscovering Our Place in Nature. Greystone Books Ltd.

43. Tonkinwise, C. (2014, September 1). The Practically Living Weight of Convenient Things by Cameron Tonkinwise.

44. van Hinte, E. (1997). Eternally Yours: Visions on Product Endurance. 010 Publishers.

45. Van Vliet, K., Pellenq, R., Buehler, M., Grossman, J., Jennings, H., Ulm, F., & Yip, S. (2012). Set in stone? A perspective on the concrete sustainability challenge. MRS Bulletin, 37(4), 395-402. doi:10.1557/mrs.2012.55

46. Verbeek, P. P., & Kockelkoren, P. (1998). The things that matter. Design Issues, 14(3), 28-42.

47. Wakkary, R., & Maestri, L. (2007). The Resourcefulness of Everyday Design (p. 10). Presented at the C&C'07, Washington, DC, USA: ACM.

48. Walker, S., & Giard, J. (2013). The Handbook of Design for Sustainability. Bloomsbury Publishing.

49. Watkins-Hughes, R. (2004). Shopdropping.net. Retrieved February 21, 2017, from www.shopdropping.net

50. Willa, R., Jennifer, Y., & Engeland, J. (2008, November 25). The Dynamics of Housing Affordability.

51. Williams, C. C. (2004). A lifestyle choice? Evaluating the motives of do-it-yourself (DIY) consumers. International Journal of Retail & Distribution Management, 32(5), 270–278.

52. Wolf, M., & McQuitty, S. (2011). Understanding the do-it-yourself consumer: DIY motivations and outcomes. Academy of Marketing Sciences. https://doi.org/10.1007/s13162-011-0021-2

53. Xie, C., Bagozzi, R. P., & Troye, S. V. (2008). Trying to prosume: toward a theory of consumers as co-creators of value. Journal of the Academy of Marketing Science, 36(1), 109–122. https://doi.org/10.1007/s11747-007-0060-2

54. Yamazaki, A. K., Goto, K., Taki, H., & Hori, S. (2008). An Effectiveness Study of Pictogram Elements for Steps in Manufacturing Procedures (pp. 680–686). Presented at the International Conference on Knowledge-Based and Intelligent Information and Engineering Systems, Springer Berlin Heidelberg.

55. Zimmerman, J., Stolterman, E., & Forlizzi, J. (2010, August). An analysis and critique of Research through Design: towards a formalization of a research approach. In Proceedings of the 8th ACM Conference on Designing Interactive Systems (pp. 310-319). ACM.

Appendices

Appendix 1. Visual Essay: IKEA Fixtures and Negative Spaces

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Appendix 1.

Visual Essay: IKEA Fixtures and Negative Spaces

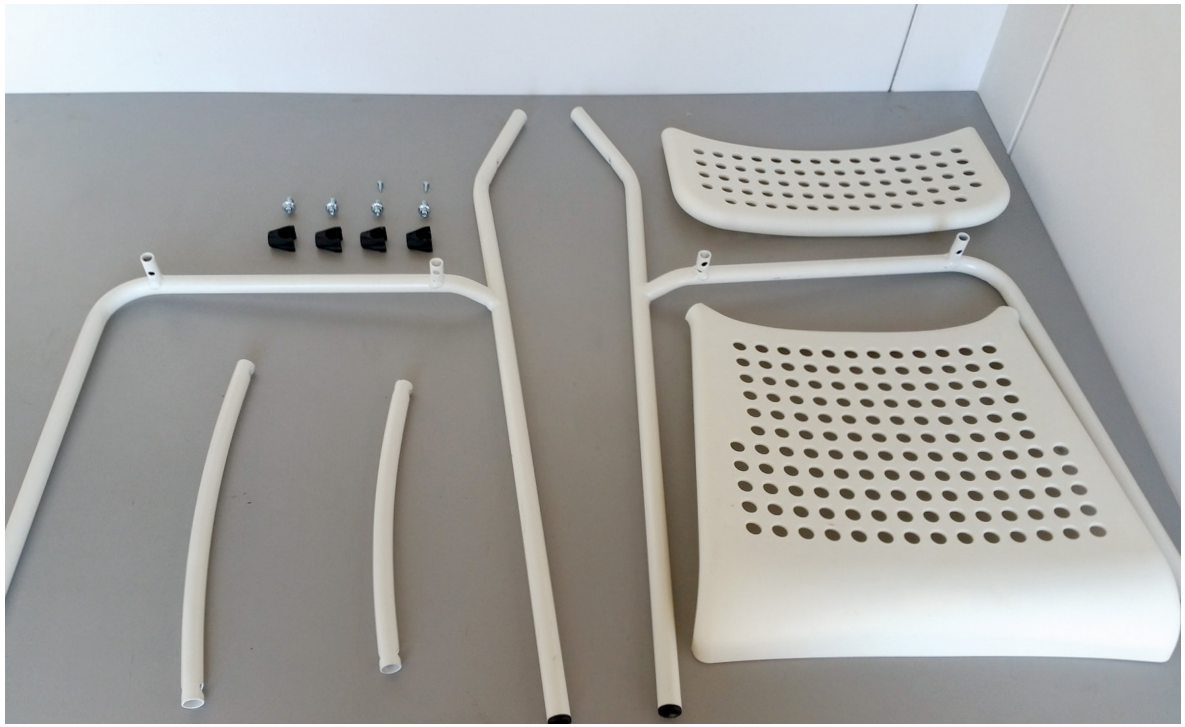

Fig. 24. ADDE Dining Chair
(Photograph by M. Harkness, 2016)

Fig. 25. MAMMUT Children's Stool
(Photograph by M. Harkness, 2016)

Fig. 26. PS VÅGÖ Chair
(Photograph by M. Harkness, 2016)

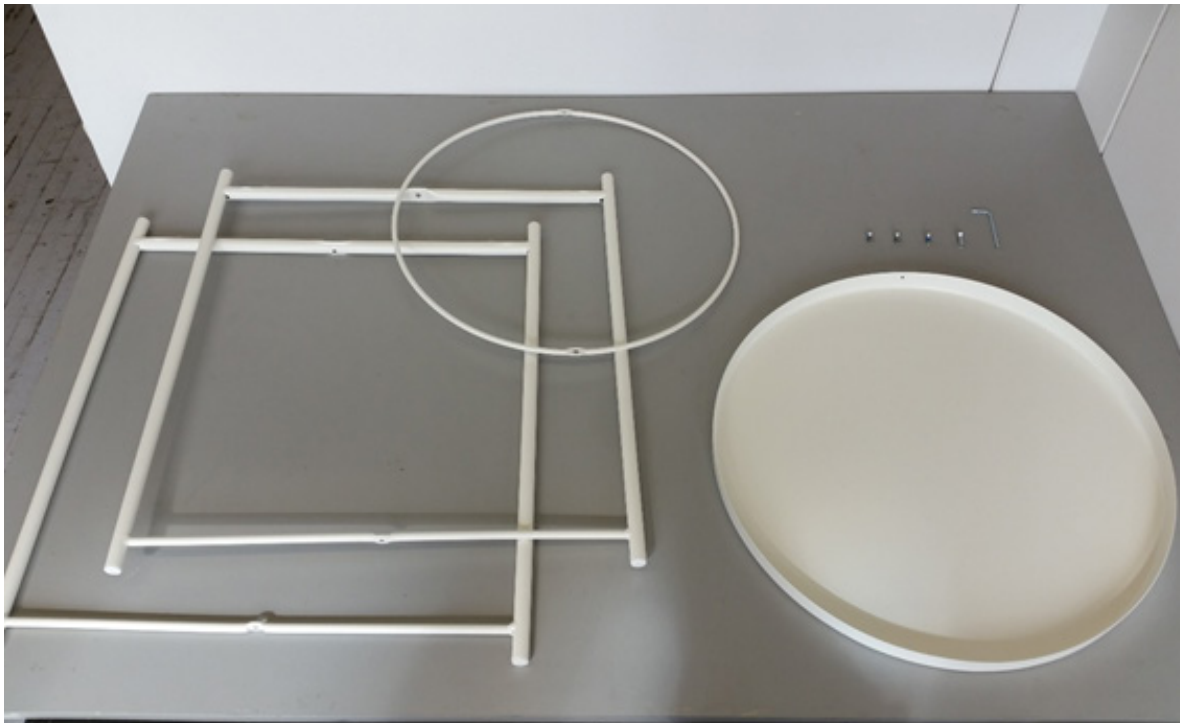

Fig. 27. GLADOM Side Table
(Photograph by M. Harkness, 2016)

Fig. 28. PELLO Armchair
(Photograph by M. Harkness, 2016)

Appendix 2.
KRÄFTIG Process Documentation

Fig. 29. KRÄFTIG Process 1. *A 5-gallon bucket works in place of a FNISS Garbage can.*
(Photograph by M. Harkness, 2016)

Fig. 30. KRÄFTIG Process 2. *Detail of the rounded over leg-ends.*
(Photograph by M. Harkness, 2016)

Fig. 31. KRÄFTIG Process 3. *Zach is seen locating the KRÄFTIG's legs in the freshly poured concrete.*
(Photograph by M. Harkness, 2016)

Fig. 32. A Finished KRÄFTIG Stool
Concrete and IKEA Fixtures, M. Harkness, 2016)

Fig. 33. One of Many Failed KRÄFTIG Stools. *This image shows a KRÄFTIG that broke as it released from the mold. If the KRÄFTIG's legs are positioned too close together when stuck into the concrete, the stool can become weakened.* (Photograph by M. Harkness, 2016)

Appendix 3.
STÖN Process Documentation

Fig. 34. STÖN Process 1. *Measuring out 9mm from each edge of the LACK table top.*
(Photograph by M. Harkness, 2017)

Fig. 35. STÖN Process 2. *Detail of the LACK table top surface partially removed.*
(Photograph by M. Harkness, 2017)

Fig. 36. STÖN Process 3. *Another detail of the LACK table top surface with even more removed.* (Photograph by M. Harkness, 2017)

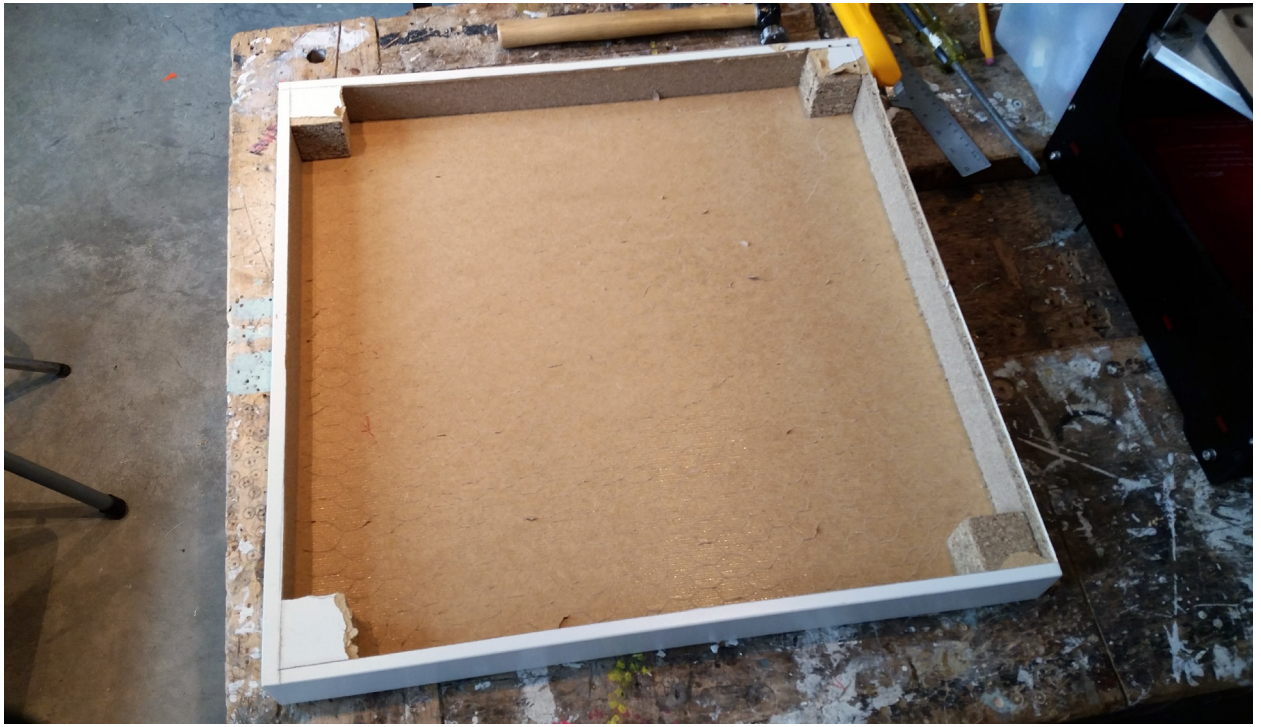

Fig. 37. STÖN Process 4. *The LACK table top entirely removed with only the particle board blocks in the corner remaining.* (Photograph by M. Harkness, 2017)

Fig. 38. STÖN Process 5. *Once the waste has been drilled out of the corner block, the rest can be chiseled away.*
(Photograph by M. Harkness, 2017)

Fig. 39. STÖN Process 6. *Detail of the corner block being chiseled away.*
(Photograph by M. Harkness, 2017)

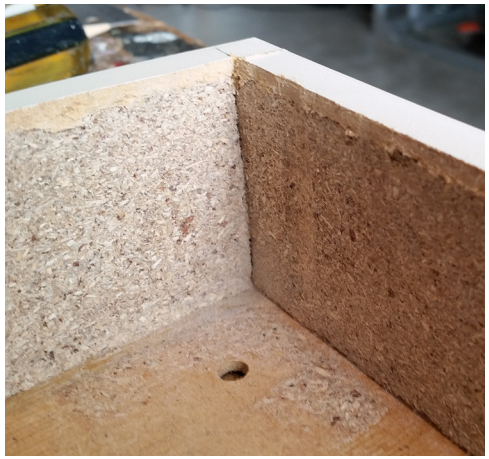

Fig. 40. STÖN Process 7. *Detail of the corner with the block removed and waste cleaned out.*
(Photograph by M. Harkness, 2017)

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Fig. 41. STÖN Process 8. *The completely hollowed out LACK table top can now be used as a mold.*
(Photograph by M. Harkness, 2017)

Fig. 42. STÖN Process 9. *Drilling through the dowel to create the STÖN frame.*
(Photograph by M. Harkness, 2017)

Fig. 43. STÖN Process 10. *Detail of the perpendicular holes for the STÖN's dowel frame.*
(Photograph by M. Harkness, 2017)

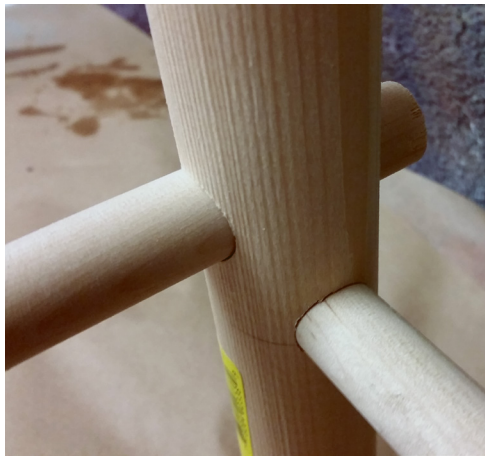

Fig. 44. STÖN Process 11. *Detail of the STÖN's frame with perpendicular through dowel joinery.* (Photograph by M. Harkness, 2017)

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Fig. 45. STÖN Process 12. *The STÖN's frame.* (Photograph by M. Harkness, 2017)

Fig. 46. STÖN Process 13. *The LACK table top mold is filled with concrete.*
(Photograph by M. Harkness, 2017)

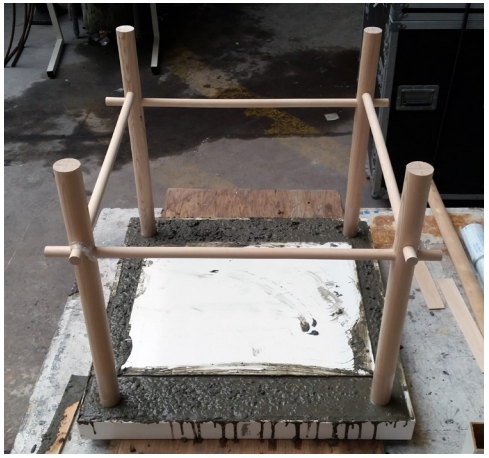

Fig. 47. STÖN Process 14. *In an effort to make the concrete component of the STÖN lighter, a 20mm Melamine panel was used to create a void in the underside of the table's surface.*
(Photograph by M. Harkness, 2017)

Fig. 48. STÖN Process 15. *Once the STÖN's frame is stuck into the wet concrete a spirit level ensures the furniture object will be level once the concrete has dried.*
(Photograph by M. Harkness, 2017)

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Fig. 49. STÖN Process 16. *The thin, particle board edges of the LACK mold are easily peeled away from the concrete top of the STÖN table.*
(Photograph by M. Harkness, 2017)

Appendix 4.
Material Exploration: Lamp

Fig. 50. Lamp Process 1. *A failed lampshade beside its NEJKON plant pot mold.*
(Photograph by M. Harkness, 2016)

Appendix 5.
Material Exploration: Wall Hanger

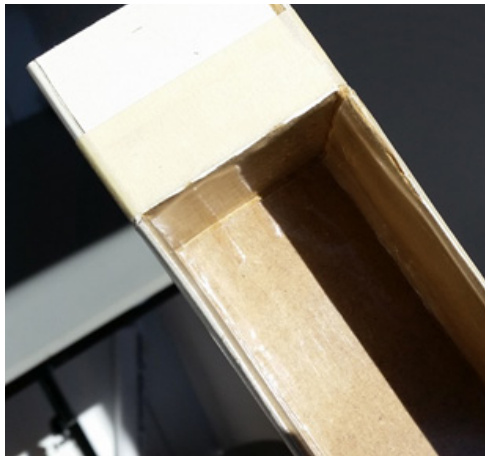

Fig. 51. Wall Hanger Process 1. *A hollow LACK table leg became the mold for the Wall Hanger.* (Photograph by M. Harkness, 2016)

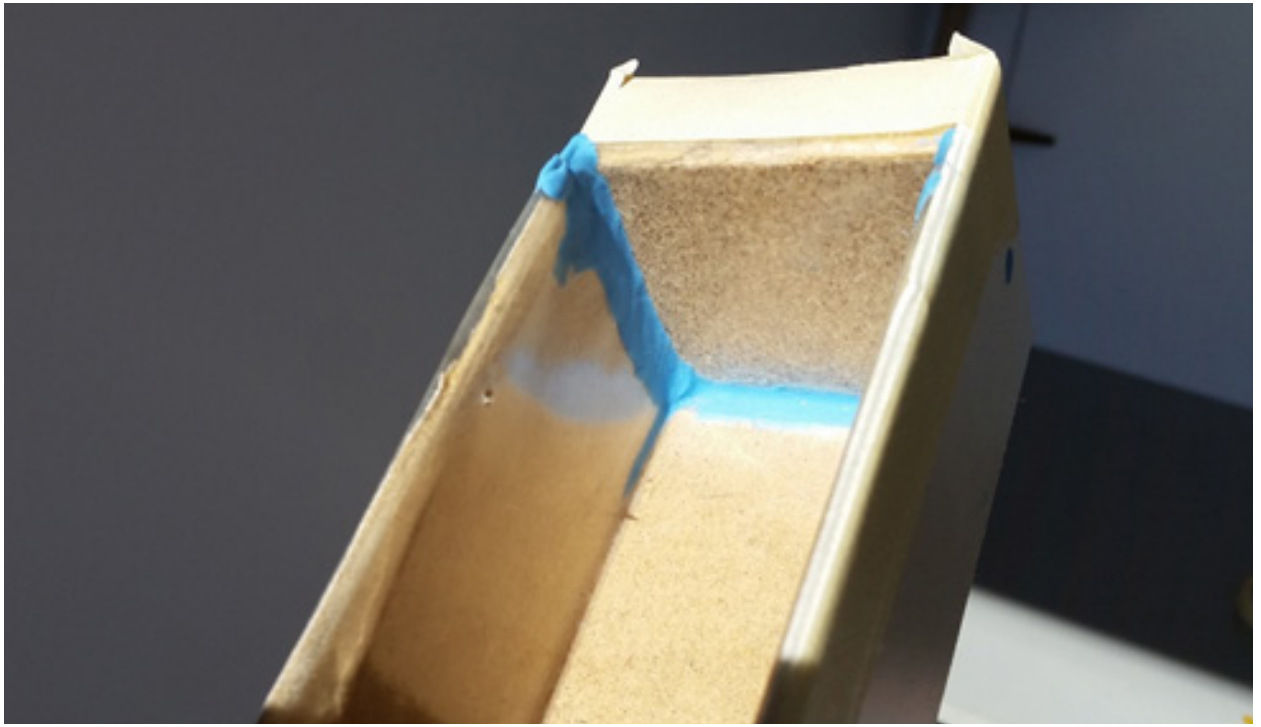

Fig. 52. Wall Hanger Process 2. *The corners of the mold can be smoothed and sealed using plasticine.* (Photograph by M. Harkness, 2016)

Fig. 53. Wall Hanger Process 3. *The LACK's thin MDF walls are rein forced using G-Clamps and wood cauls. This clamp pressure prevents the wet and heavy concrete from bowing out the sides of the mold.*
(Photograph by M. Harkness, 2016)

Fig. 54. Wall Hanger Process 4. *The coat pegs are fixed in place within the dried concrete.*
(Photograph by M. Harkness, 2016)

Fig. 55. Wall Hanger Process 5. *Detail of the failed Wall Hanger.*
(Photograph by M. Harkness, 2016)

Fig. 56. Wall Hanger Process 6. *The distance from the wooden coat peg to the edge of the LACK mold was too small. Presumably, this made the Wall Hanger fail as it was removed from the mold.*
(Photograph by M. Harkness, 2016)

Appendix 6.
Material Exploration: Chair-Table

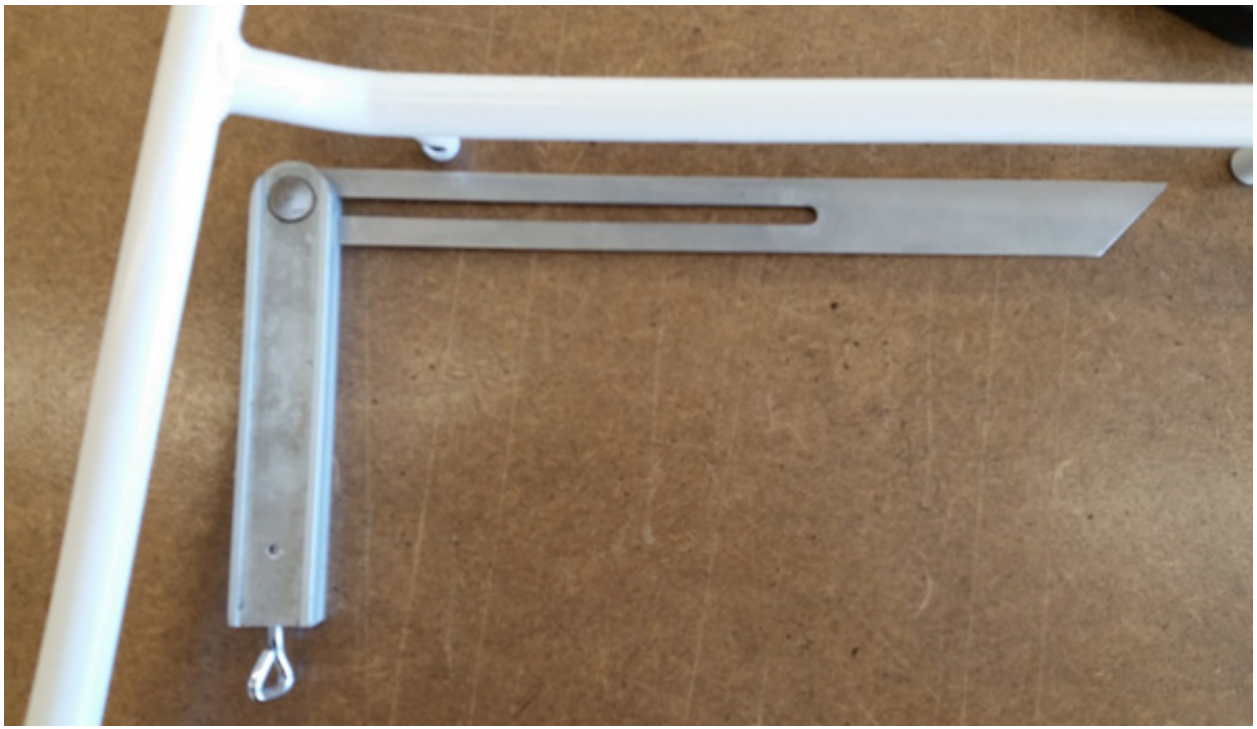

Fig. 57. Chair-Table Process 1. *The back leg of the ADDE Chair can be bent by hand to 90°.*
(Photograph by M. Harkness, 2016)

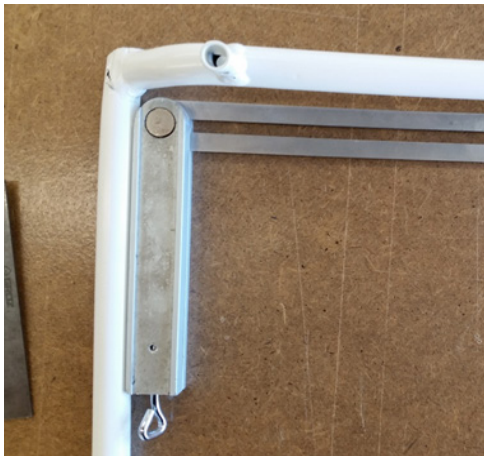

Fig. 58. Chair-Table Process 2. *The ADDE Chair leg now bent to 90°.*
(Photograph by M. Harkness, 2016)

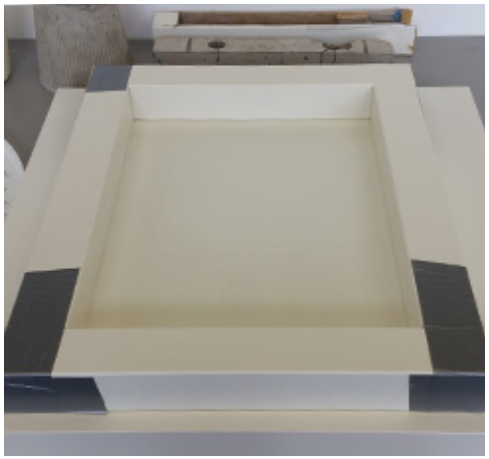

Fig. 59. Chair-Table Process 3. *Using a LACK Table to create a mold the same way a FORMÅ is made, the top of the Chair-Table can also be made.* (Photograph by M. Harkness, 2016)

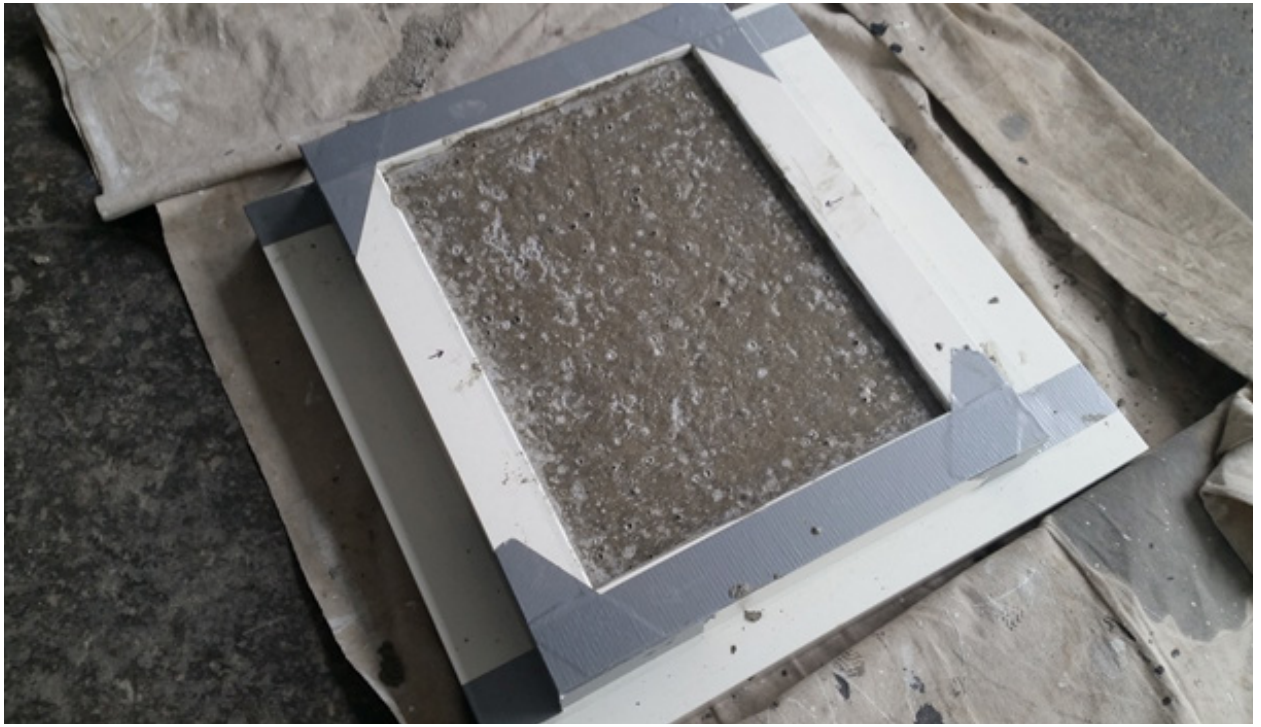

Fig. 60. Chair-Table Process 4. *A recently dried concrete Chair-Table top from a FORMÅ mold.* (Photograph by M. Harkness, 2016)

Fig. 61. Chair-Table Process 5. *Using a hacksaw, the ADDE Chair Rails can be cut shorter to fit the newly formed concrete top.*
(Photograph by M. Harkness, 2016)

Fig. 62. Chair-Table Process 6. *The ADDE Chair frame is then put back together using the existing IKEA fasteners, and rubber clips hold the concrete top in place.*
(Photograph by M. Harkness, 2016)

Fig. 63. Chair-Table Detail
(Concrete and IKEA Fixtures, M. Harkness, 2016)

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Fig. 64. Chair-Table
(Concrete and IKEA Fixtures, M. Harkness, 2016)

Fig. 65. Coffee Table Process 1. *Choosing a smooth, level and, plastic-coated concrete pouring surface will significantly affect the finished table's top surface.*
(Photograph by M. Harkness, 2016)

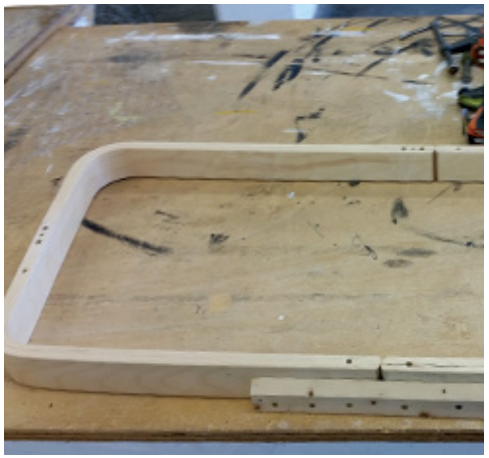


Fig. 66. Coffee Table Process 2. *The curved legs of a PELLO armchair create the mold for the table. A piece of scrap wood can be nailed or screwed into the PELLO frame to connect each leg-end and complete the mold.*
(Photograph by M. Harkness, 2016)

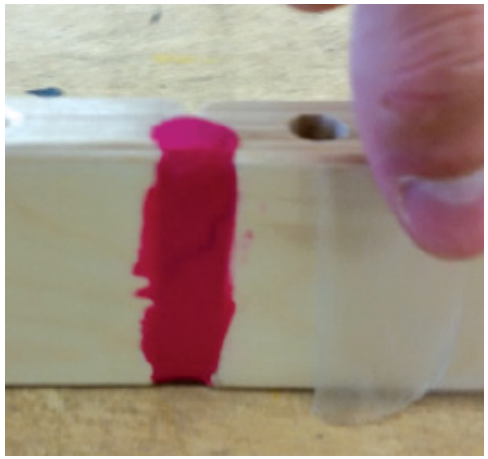


Fig. 67. Coffee Table Process 3. *The gap between ends of the PELLO legs is smoothed over using plasticine and translucent packing tape.*
(Photograph by M. Harkness, 2016)

Fig. 68. Coffee Table Process 4. *With the PELLO frame clamped down to the work surface, the concrete is poured.*
(Photograph by M. Harkness, 2016)

Fig. 69. Coffee Table Process 5. *Disassembling the mold after the concrete has dried.*
(Photograph by M. Harkness, 2016)

Fig. 70. Coffee Table Process 6. *With half of the PELLO mold removed, the corners of the concrete top can begin to be gently pried up.*
(Photograph by M. Harkness, 2016)

Fig. 71. Coffee Table Process *7. The top surface of the table after it has been pried up and flipped over.* (Photograph by M. Harkness, 2016)

Fig. 72. Coffee Table Process 8. *The wooden base of the table is then created using the PELLO Armchair's pre-drilled holes and fastener's. All that is left to do is to trim the two long sides of the legs using a hand saw.*
(Photograph by M. Harkness 2016)

Fig. 73. Coffee Table Process 9
(Photograph by M. Harkness, 2016)

Appendix 8.
FORMÅ Instruction Manual

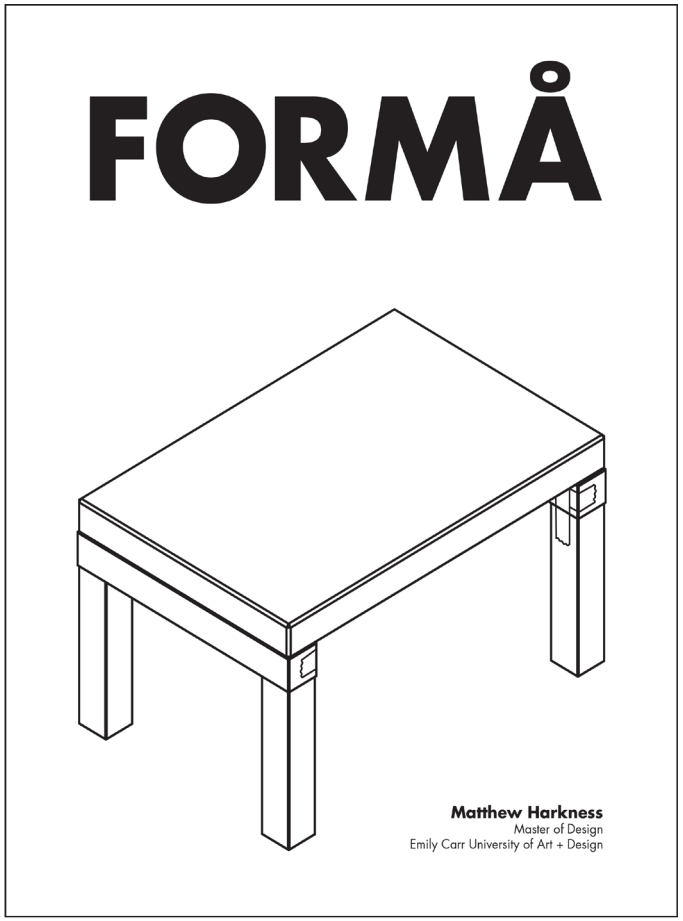


Fig. 74. FORMÅ Instructions Page 1
(Digital Image, M. Harkness, 2016)

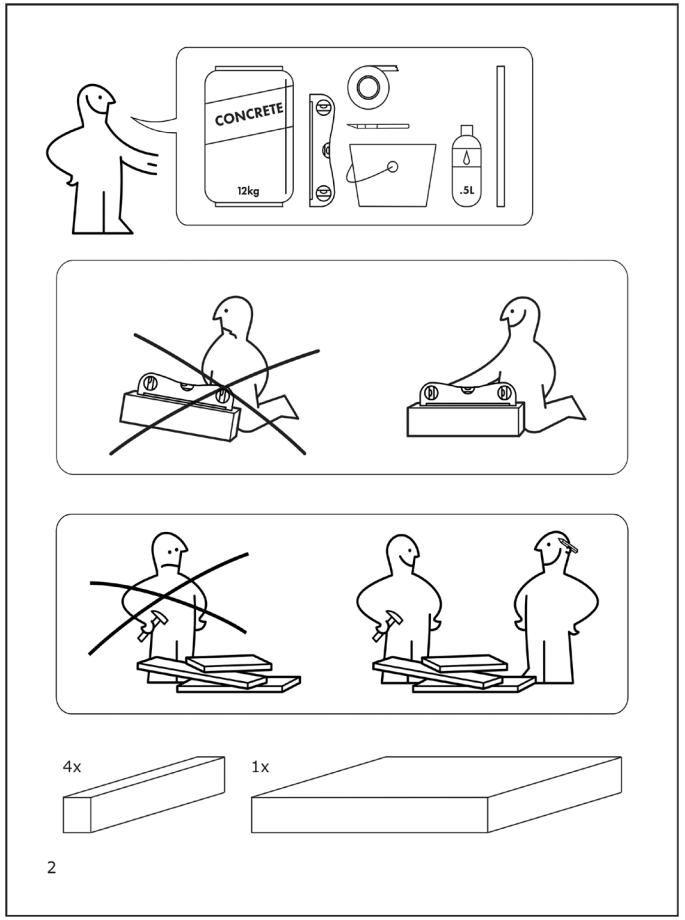
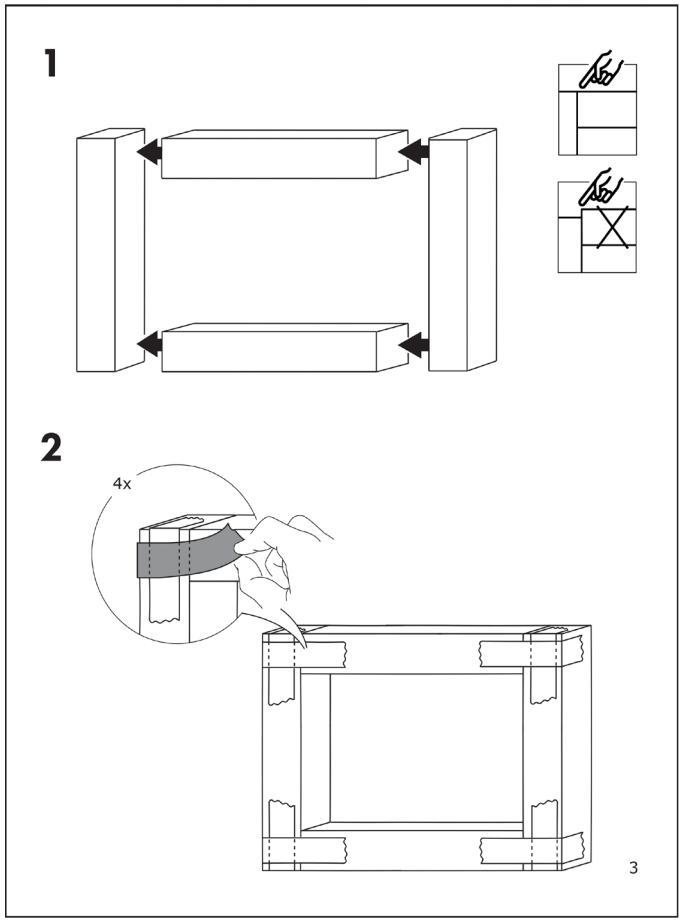


Fig. 75. FORMÅ Instructions Page 2
(Digital Image, M. Harkness, 2016)



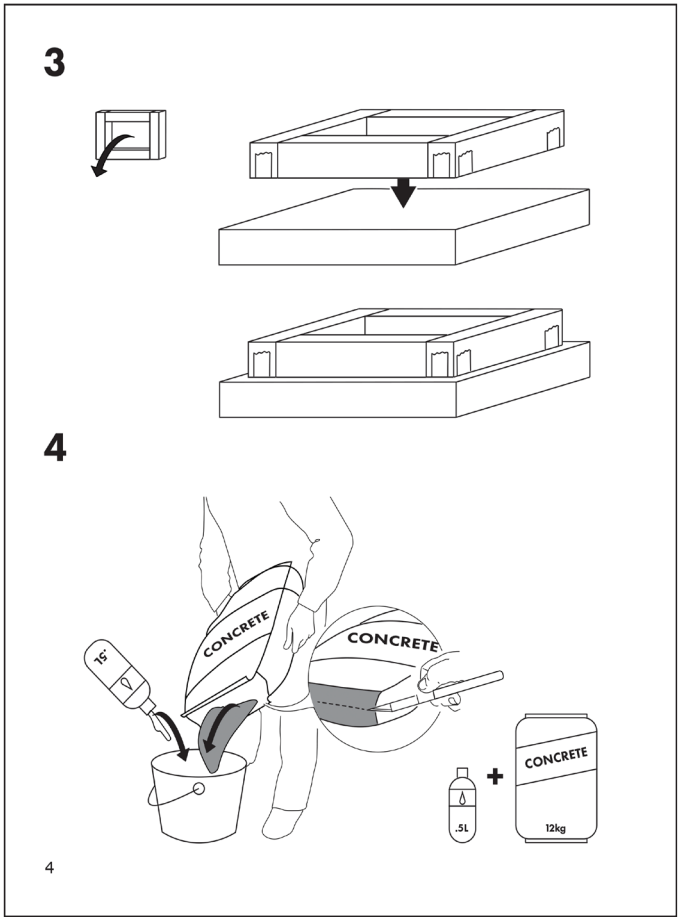


Fig. 76. FORMÅ Instructions Page 3
(Digital Image, M. Harkness, 2016)

Fig. 77. FORMÅ Instructions Page 4
(Digital Image, M. Harkness, 2016)

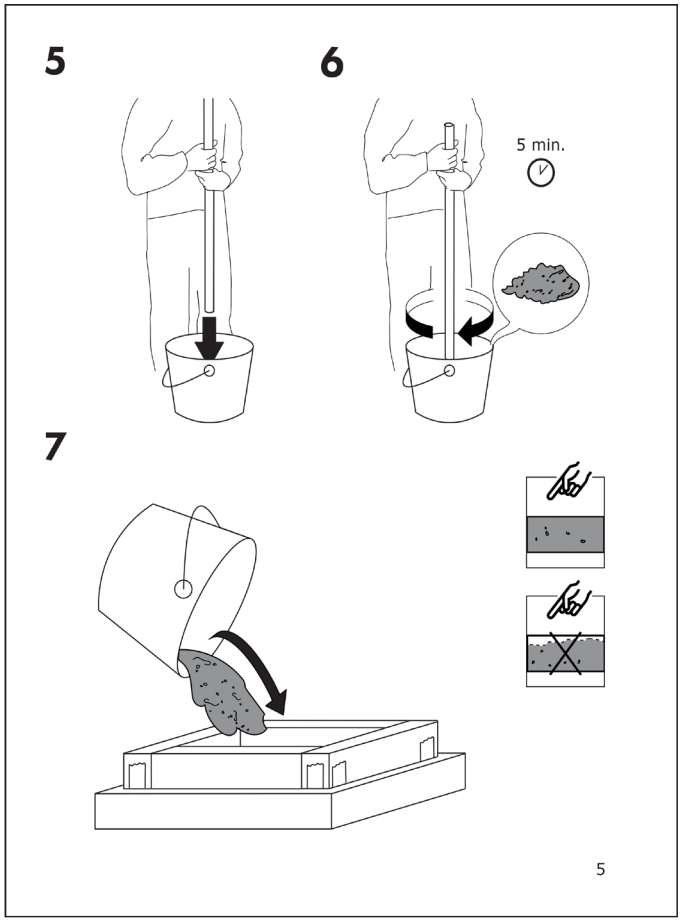


Fig. 78. FORMÅ Instructions Page 5
(Digital Image, M. Harkness, 2016)

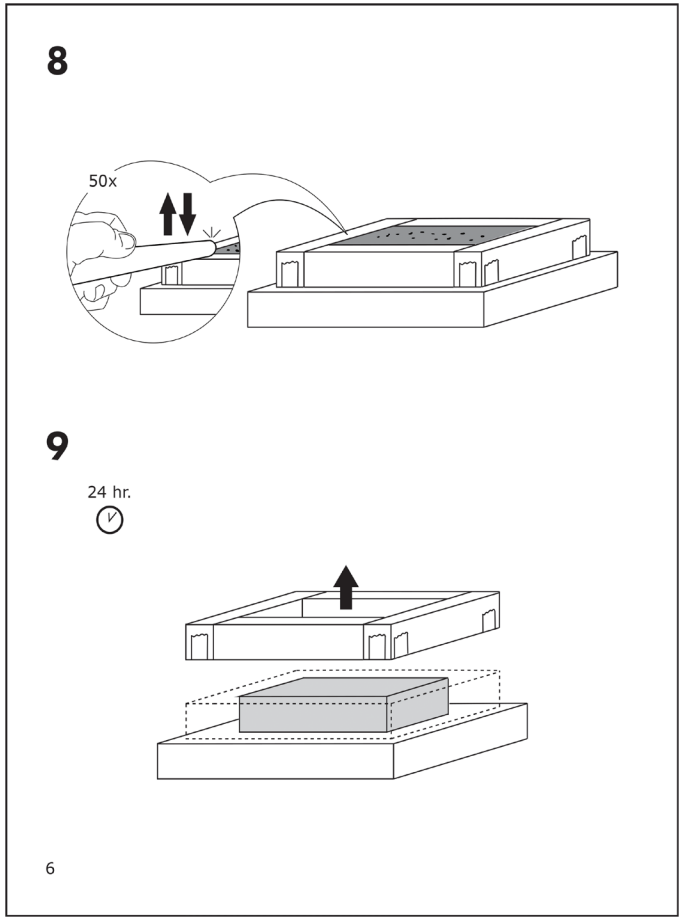


Fig. 79. FORMÅ Instructions Page 6
(Digital Image, M. Harkness, 2016)

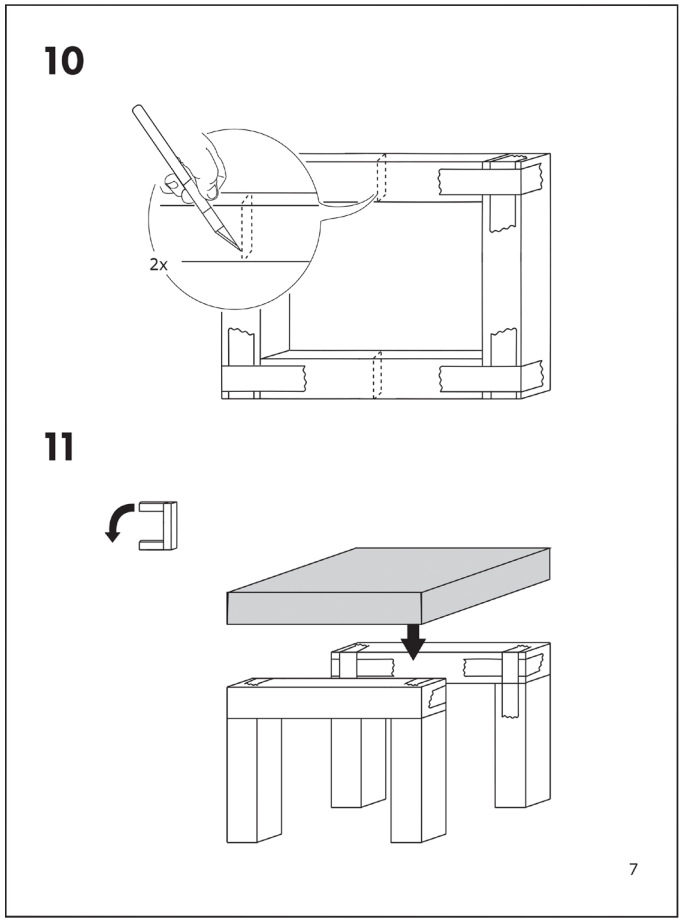


Fig. 80. FORMÅ Instructions Page 7
(Digital Image, M. Harkness, 2016)

Fig. 81. FORMÅ Instructions Page 8
(Digital Image, M. Harkness, 2016)

Appendix 9.
STÖN Instruction Manual

Fig. 82. STÖN Instructions Page 1
(Digital Image, M. Harkness, 2017)

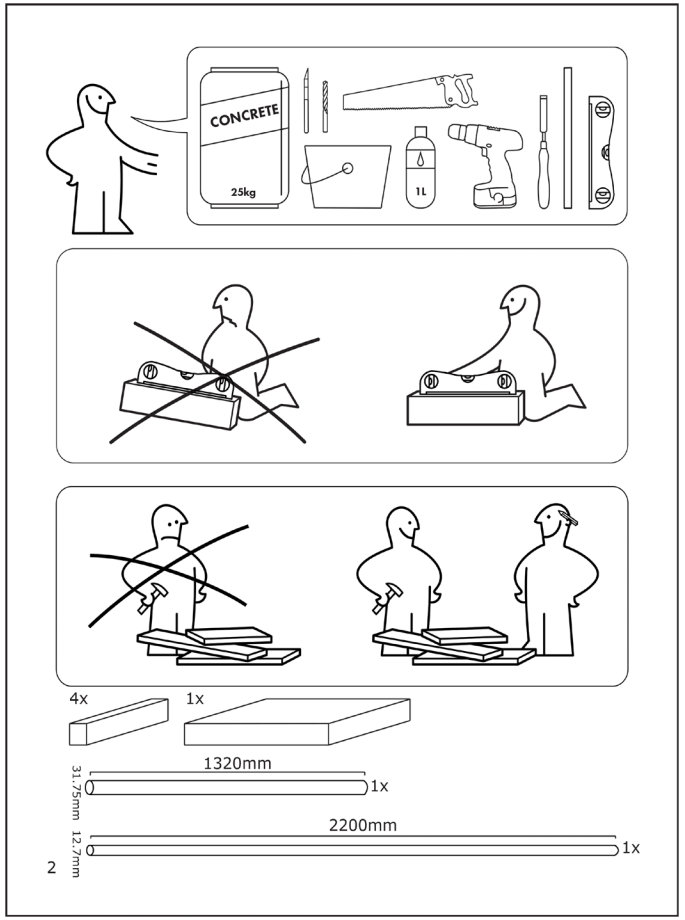


Fig. 83. STÖN Instructions Page 2
(Digital Image, M. Harkness, 2017)

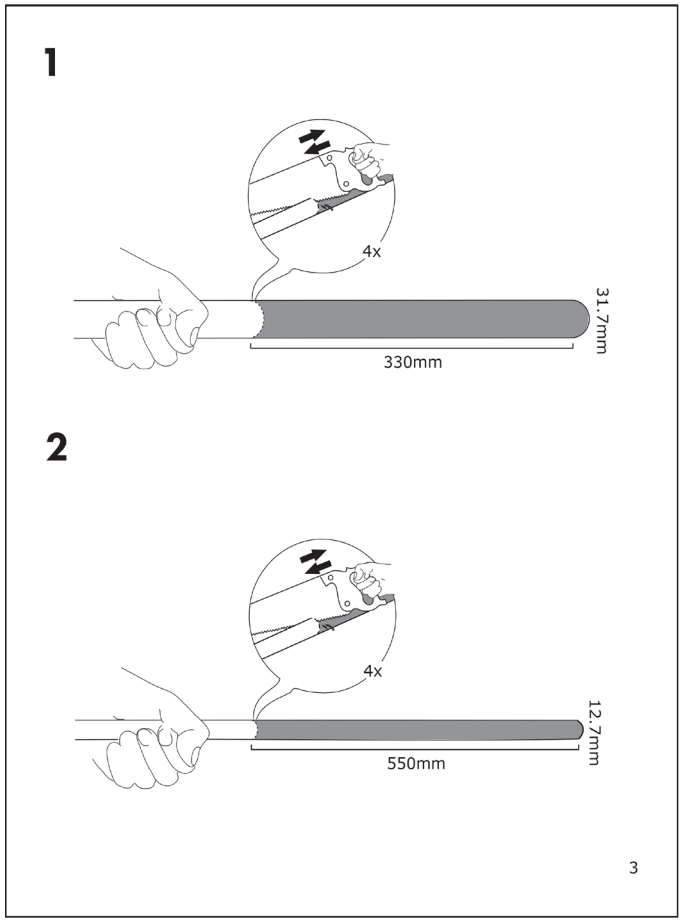


Fig. 84. STÖN Instructions Page 3
(Digital Image, M. Harkness, 2017)

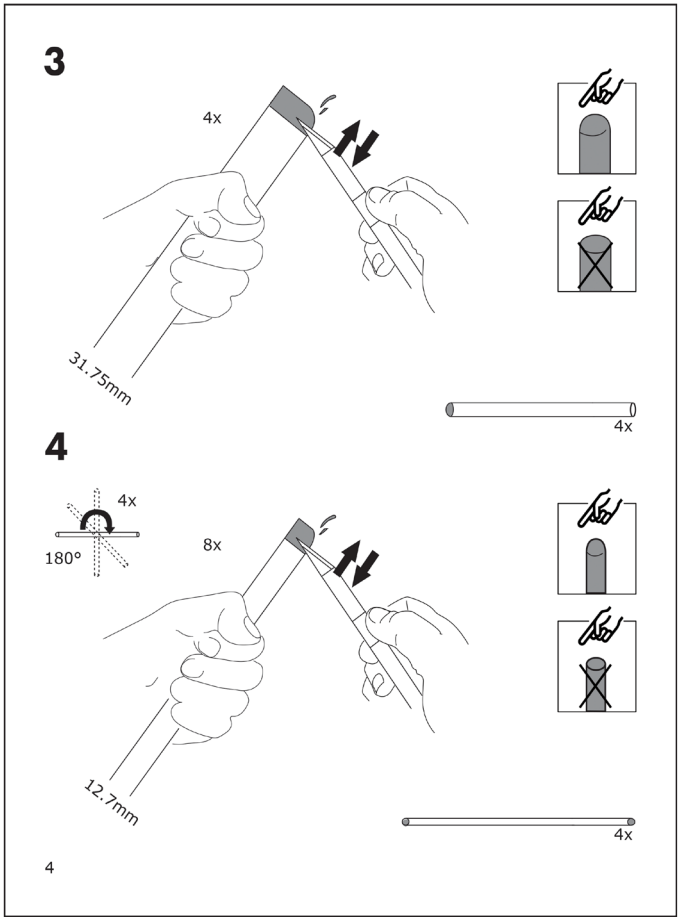


Fig. 85. STÖN Instructions Page 4
(Digital Image, M. Harkness, 2017)

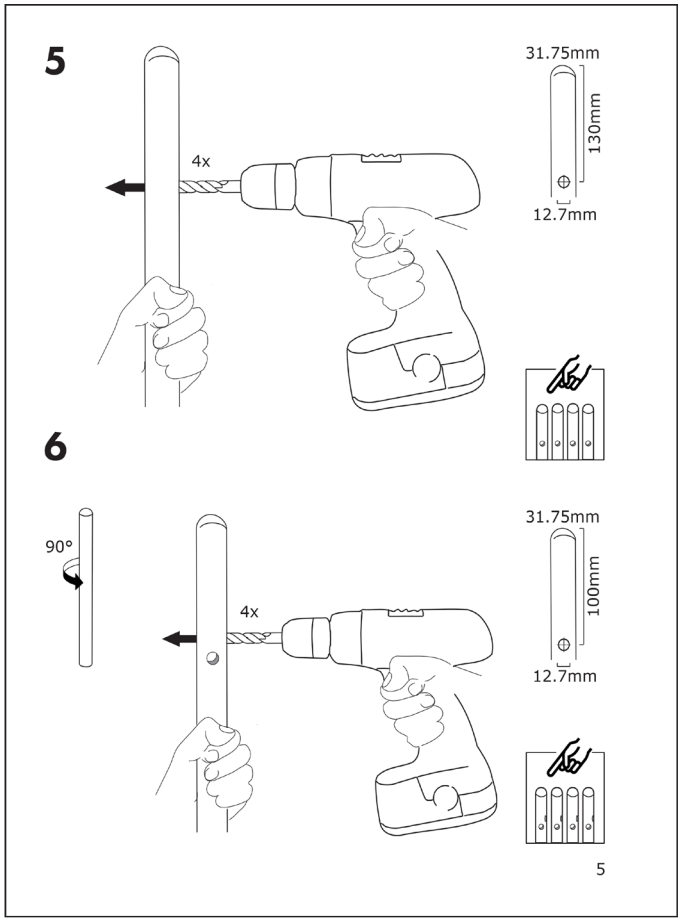


Fig. 86. STÖN Instructions Page 5
(Digital Image, M. Harkness, 2017)

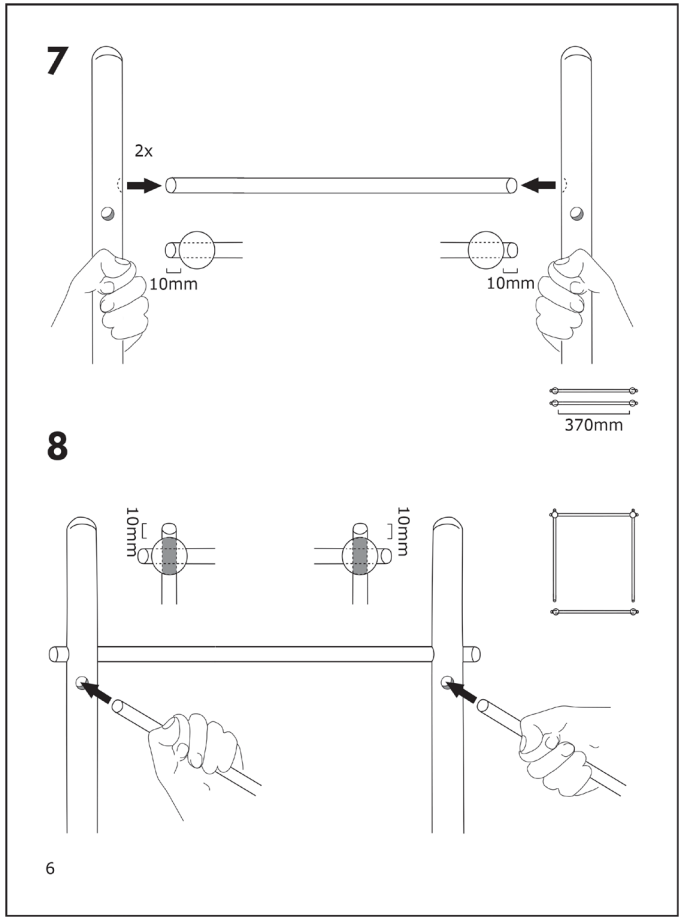


Fig. 87. STÖN Instructions Page 6
(Digital Image, M. Harkness, 2017)

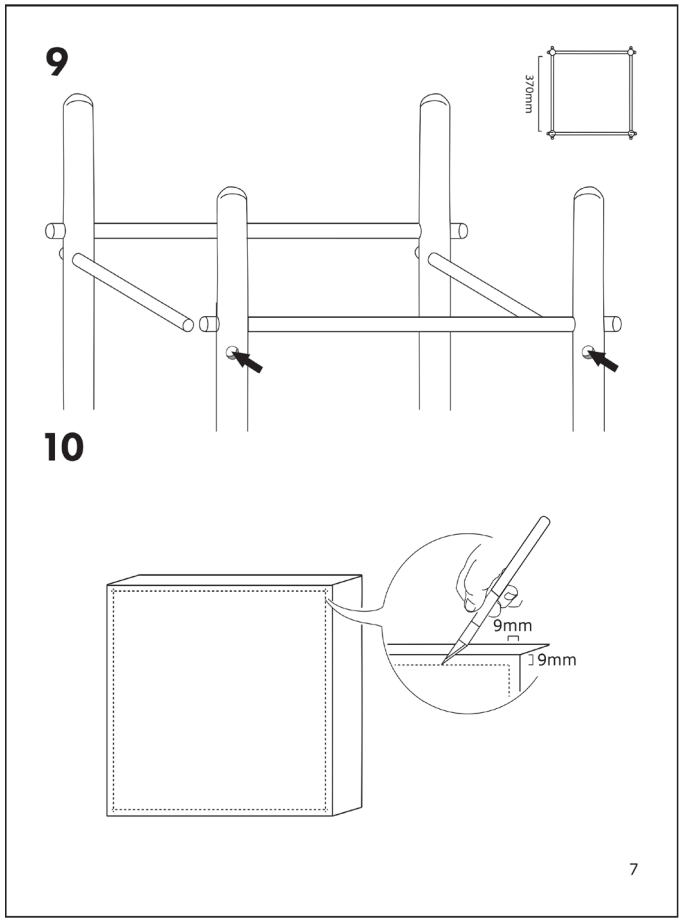


Fig. 88. STÖN Instructions Page 7
(Digital Image, M. Harkness, 2017)

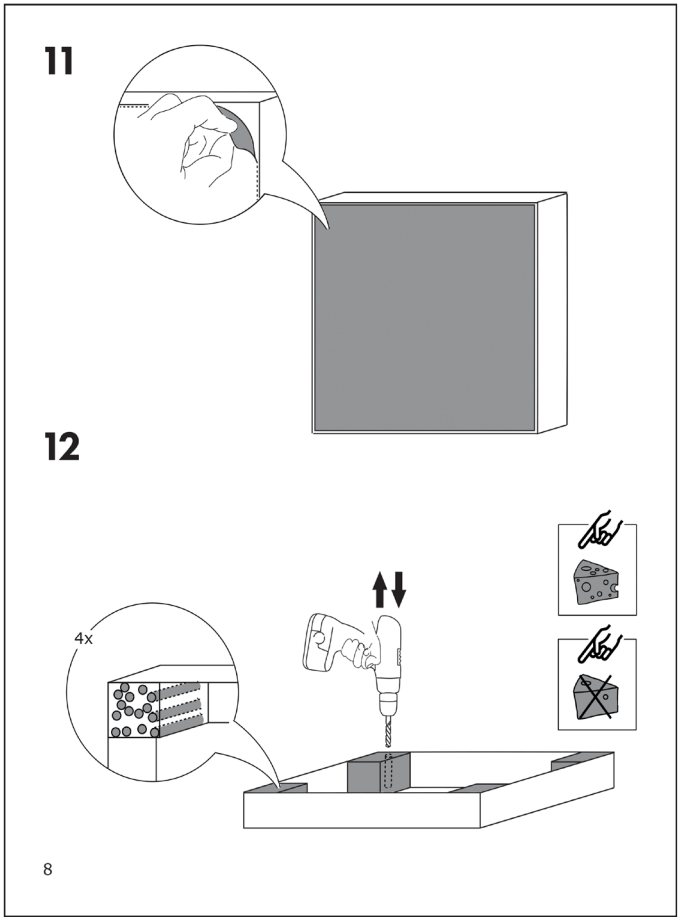


Fig. 89. STÖN Instructions Page 8
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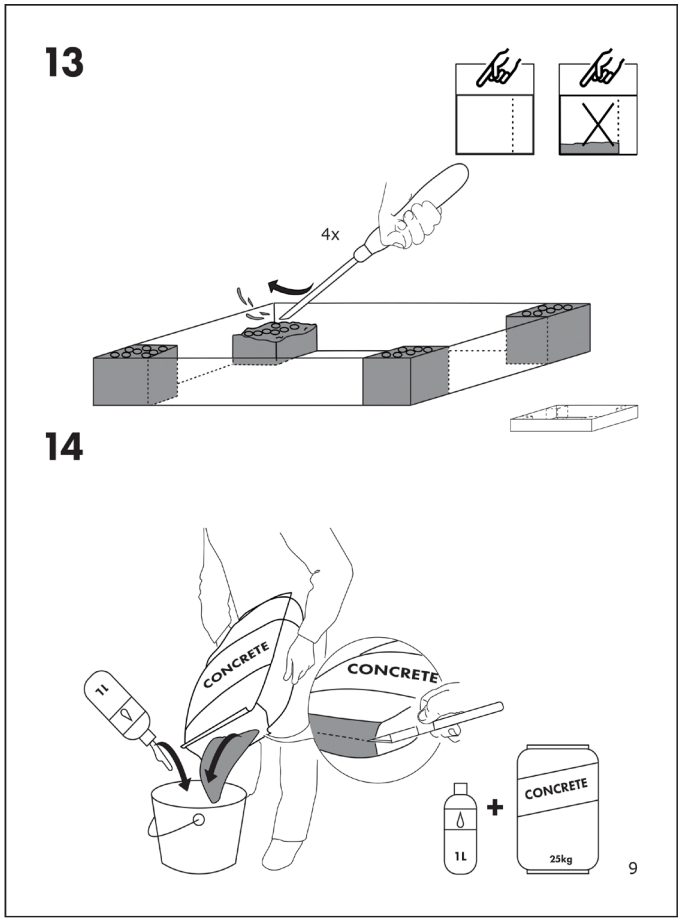

Fig. 90. STÖN Instructions Page 9
(Digital Image, M. Harkness, 2017)

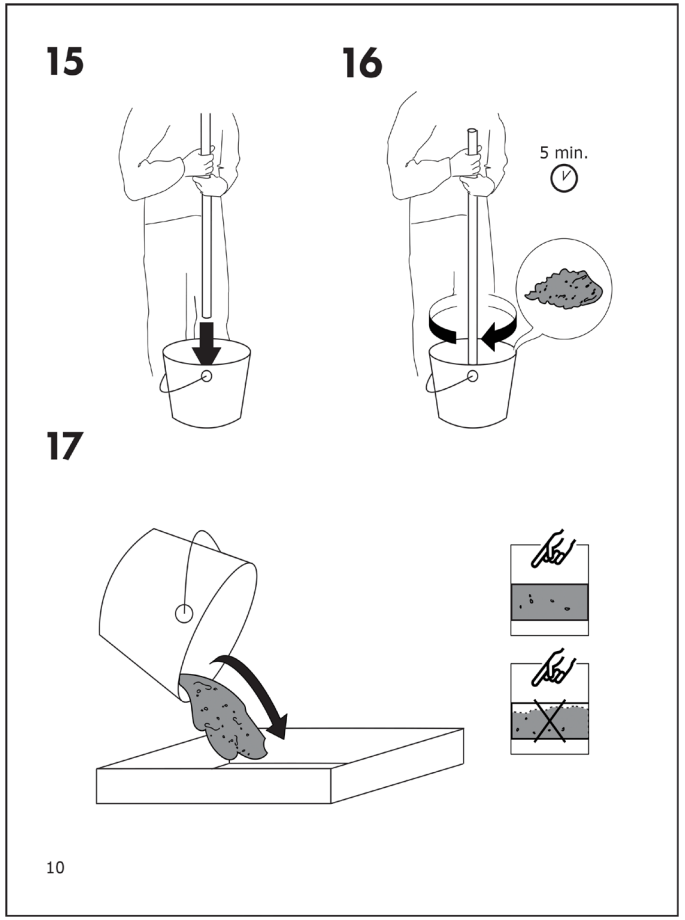

Fig. 91. STÖN Instructions Page 10
(Digital Image, M. Harkness, 2017)

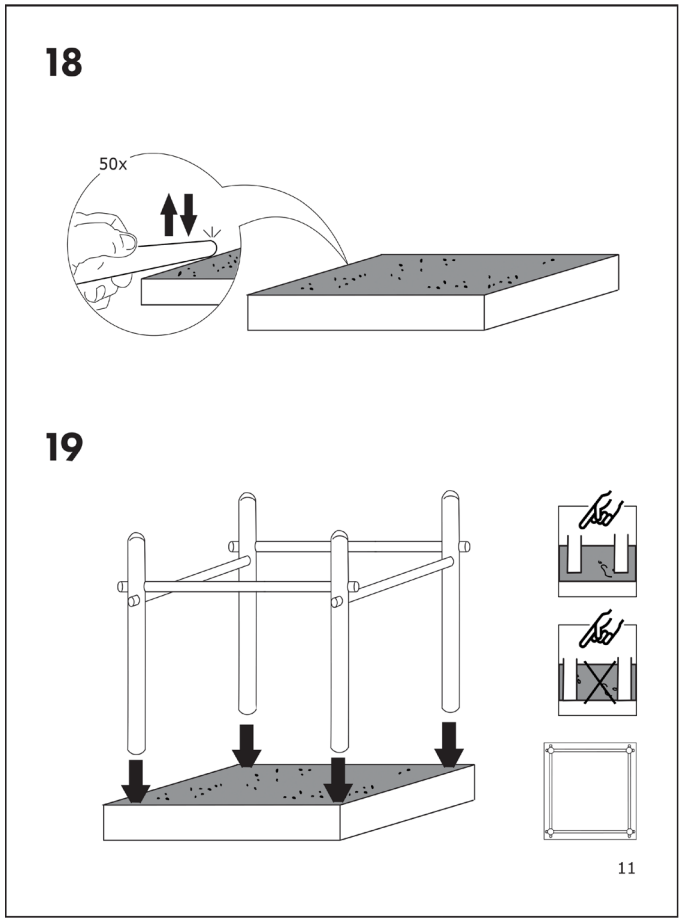

Fig. 92. STÖN Instructions Page 11
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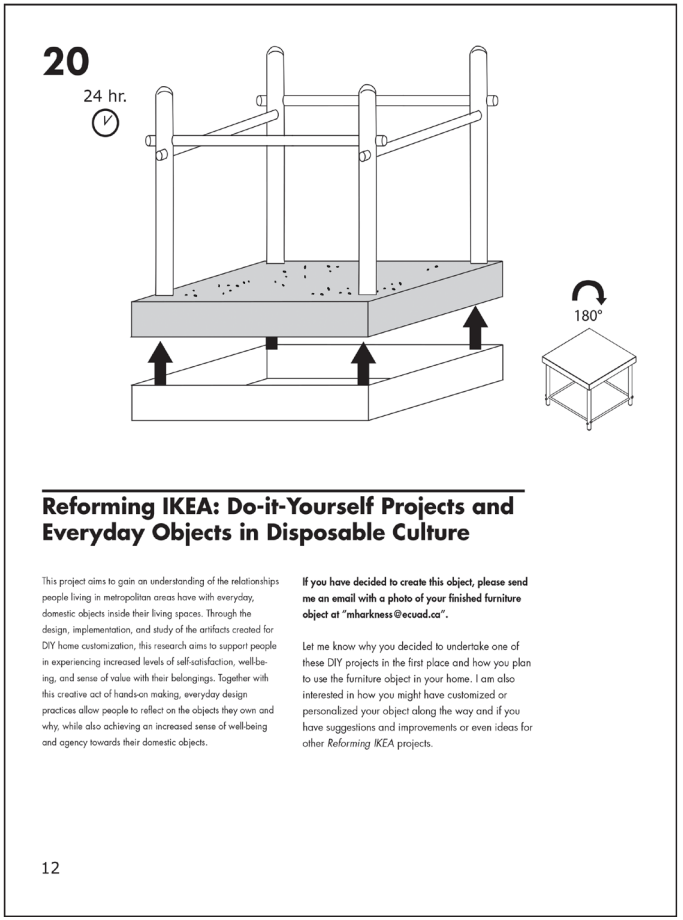

Fig. 93. STÖN Instructions Page 12
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Appendix 12.

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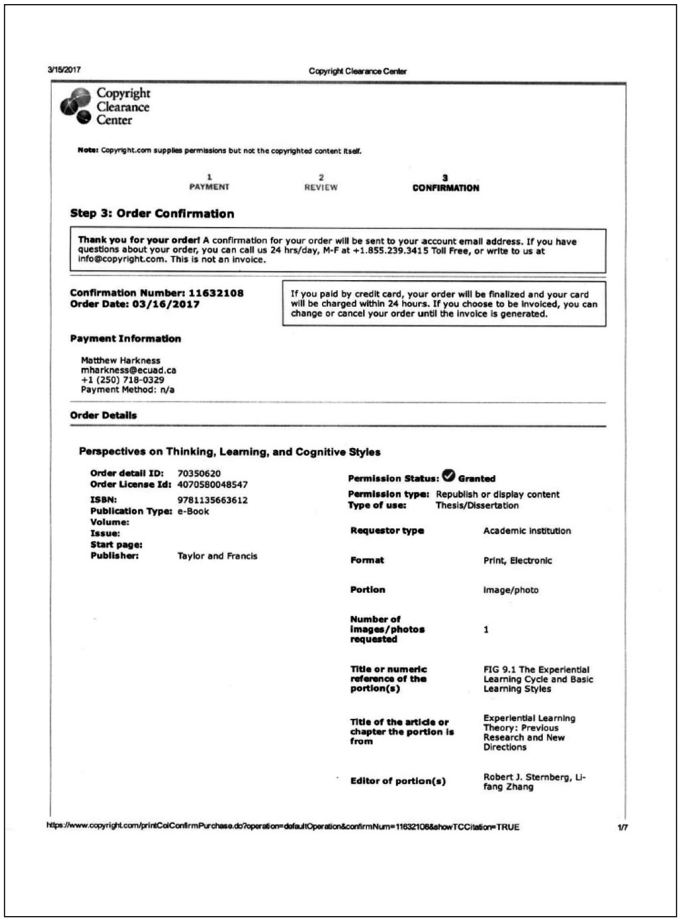

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