

ADVENTURES IN MENSTRUAL WORLD

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ABSTRACT

Half the world's population experiences menstruation during their lifetime. Menstruation plays an essential role in the human life cycle. Without it, none of us would be here today. And yet, it is stigmatized all over the world. Menstruation is seen as dirty, shameful, embarrassing, something to be hidden. These attitudes are a form of sexual discrimination that serve to limit and isolate menstruating people – and non-menstruating people.

What if we lived in a world that celebrated menstruation?

A world that revered its life-giving power?
A world where periods were a source of pride, not shame?
A world that offered greater support and comfort throughout the menstrual cycle?

This thesis explores the wonderful possibilities of that world.

Using a holistic approach ranging in scale from the menstrual cup to urban infrastructure systems, this project proposes different ways of making space for menstruating bodies.

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DEFINITIONS

Sex refers to a set of biological attributes in humans, including chromosome patterns and reproductive anatomy. Sex is generally categorized as female or male, though there is variation in how sex characteristics are expressed, as in the case of intersex people (Canadian Institutes of Health Research 2020).

Gender refers to the “socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender diverse people. It influences how people perceive themselves and each other, how they act and interact, and the distribution of power and resources in society. Gender is often conceptualized as a binary (girl/ woman and boy/man) yet there is considerable diversity in how individuals and groups understand, experience, and express it” (Canadian Institutes of Health Research 2020).

Gender inequality can be defined as allowing people different opportunities due to perceived differences based on issues of gender. Similarly, **gender discrimination** is the prejudicial treatment of an individual or group due to gender. I will use these two terms somewhat interchangeably, with the understanding that gender inequality refers to the broader systems of discrimination that women and gender diverse people (trans, queer, non-binary, etc.) experience because of their gender.

Sexual inequality is essentially the same idea as gender inequality, but refers to different opportunities and discrimination based on biological sex difference, pertaining specifically to the unequal treatment of female sexed persons compared to the male sexed persons.

Menstruation is the biological process of shedding blood and other materials from the lining of the uterus and discharging it through the vagina. Menstruation is an important part of female reproductive health, and represents potential fertility. The uterine lining develops in preparation for potential pregnancy, as the nutrients in the lining would help a fertilized egg to develop into a baby. If a woman does not become pregnant, her body naturally sheds and discharges this lining through menstruation. The average discharging process (period) lasts 3-5 days and occurs on a 28-day cycle. However, these can vary greatly by person and by month – the discharge process may last anywhere between 2-7 days on a 21-35 day cycle. Menstruation usually begins at around 11-15 years of age during puberty, and stops at around 45-55 years of age in menopause. It also temporarily stops during pregnancy, and usually while a woman is breastfeeding (DaSilva 2018, 76).

Menstruator, menstruant, or menstruuous are terms that describe a **person who menstruates**. By biological necessity, this refers to a person with female sexual (reproductive) anatomy. Every single woman experiences menstruation during her lifetime, though there are exceptions (some medical conditions or interventions can prevent menstruation). It should be noted that it is also possible for intersex people, transgender men (people with female sexual anatomy but who identify as male), and other gender diverse people to menstruate.

CHAPTER 1

GENDER INEQUALITY

"Humanity is male, and man defines woman,
not in herself, but in relation to himself....
He is the Subject; he is the Absolute.
She is the Other."

- Simone de Beauvoir (1953, 26)

DESIGNING FOR THE MALE BODY

THE DEFAULT MALE

The concept of the “default male” is central to understanding gender inequality. One does not have to dig deep for evidence of the default male; just look at language, where “man” and “mankind” are used to refer to the human species in general. The male body, the male perspective, and the male experience are taken as the universal standard for humanity. The female part of humanity is seen as deviation from this ideal standard. Consequently, female needs often are not fully acknowledged.

While the following discussion focuses on the gender data gap as it relates to female bodies, it is important to note that gender diverse people and intersex people are even further dismissed from the data.

Gender Data Gap

In her book *Invisible Women: Data Bias in a World Designed for Men* (2019), Caroline Criado-Perez illustrates that a significant “gender data gap” exists. Through countless examples, she highlights the systemic exclusion of women from data gathering, and how consequently women are not fully visible subjects of design. Many of the products, places, and experiences that we all regularly engage with are based on data that disproportionately represent men, sometimes to the complete disregard of women. This causes implicit gender bias that severely disadvantages women with respect to comfort, convenience, health, safety, and more. Because female bodies and experiences are not the same as male bodies, they require their own consideration through sex-disaggregated data – in other words, data that are collected and analyzed separately on males and females.

While many problems reflecting the inequality between men and women are related to biological sex differences, Criado-Perez deliberately uses the term “gender data gap” and not “sex data gap,” because gender represents the socially constructed meanings that we impose upon biological difference; and therefore, gender is the reason women are excluded from the data we use to construct our society (Criado-Perez 2019, 10).

‘Reference Man’ Anthropometric Models

Many aspects of our world are designed for a very particular human body type: that of an able-bodied, white male, weighing about 70 kilograms, and roughly 1.8 metres tall. Anthropometric models of this “Reference Man” have served as important tools in shaping our society, especially in architecture, design, and medicine, since these disciplines pertain intimately to the physical measurements and properties of the human body (Criado-Perez 2019, 55).

Anthropometric models such as Leonardo da Vinci’s *Vitruvian Man* and Le Corbusier’s *Modulor Man* have long been used to dimension the built environment to best fit the “human” body – but they of course only refer to the Reference Man body. Similarly, the field of medicine has adopted its own practice of anthropometry, which too has historically favoured the Reference Man body.

Vitruvian Man and Modulor Man are idealizations that in all actuality represent very few people. The majority of humans do not have this normative body on the basis of sex, race, or ability, and not to mention all the natural physiological variations that can exist from person to person. Most obviously, such anthropometric models automatically dismiss the female population on the account of sex. Women and men have significant biological differences that affect body size and proportion, strength, cellular composition, metabolism, hormones, organ function, immunity – the differences are vast (Criado-Perez 2019, 90).

Today, there is certainly better consideration of differences in sex, gender, and ability. However, the improvements have been relatively recent, and there is still a long way to go. For example, it was not until 1974 when the Architectural Graphic Standards series, one of the most popular architectural manuals for dimensioning the built environment, began to take into account gender differentiation (Funambulist, n.d.). Still, Reference Man continues to represent far more than his fair share in design and medical data alike, which can pose serious risks to women’s health and safety.

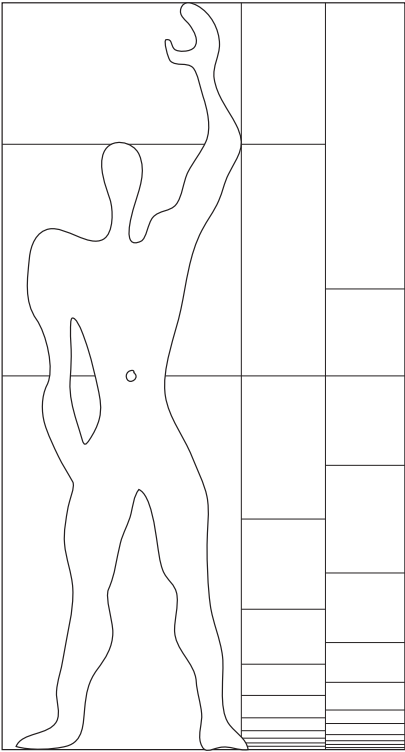


Figure 1: Le Corbusier’s ‘Modulor Man’.

MEDICINE

There are countless differences in physiology between men and women, not just in body size and reproductive anatomy, but all the way down to the cellular level. It should therefore come as no surprise that women often exhibit different symptoms and respond differently to medical treatments than men. Despite this knowledge, sex-specific data – or, to put it more accurately, data on women – is severely lacking in medical research, as women have historically been under-represented in medical studies and trials.

Women suffer twice as many adverse drug reactions, are misdiagnosed, and are improperly treated in far greater numbers than men. Some drugs do not work on women as they are intended to, or simply do not work at all. Additionally, drug dosages are supposedly gender-neutral, even though they are all based on the 70 kilogram Reference Man. This puts women at risk of overdose because they generally have smaller bodies and slower metabolisms than men (Criado-Perez 2019, 96).

The lack of consideration of female-specific data in medicine can have serious, if not fatal consequences for women. For example, cardiovascular disease is one of the leading causes of death in North American women. In spite of this, the most commonly used risk-predictions models and diagnostic tests have been developed based on data that is more than two-thirds male. The most widely recognized sign of a heart attack is pain in the chest and left arm; but women often do not exhibit these symptoms. Instead, women may experience stomach pain, breathlessness, nausea, and fatigue, all of which can easily be attributed to other health issues. Consequently, more than 50% of women's cardiovascular disease is misdiagnosed (Criado-Perez 2019, 98).

Women’s Menstrual Cycles

While most researchers acknowledge that biological sex differences do matter, many argue that they are too complicated to be accounted for in medical research. Women's bodies are seen as being more complex and variable because of their fluctuating, “atypical” hormones, which makes women more expensive and inconvenient subjects for research than men. In the cases where women are included in drug trials, generally they are not tested at different stages in their menstrual cycles. It is common for medical trials to only include women who are in the earliest phase of their menstrual cycle (when hormone levels are lowest and therefore most similar to men) – if at all (Criado-Perez, 91).

While this helps simplify studies, it deliberately avoids the consideration of women's hormones and their impact on the trial outcomes, which can be significant. Many medical treatments, including heart medications, antipsychotics, antidepressants, and antibiotics, have been found to affect women differently depending on where they are in their menstrual cycle. For example, a medication that is meant to prevent heart attacks was found to actually be more likely to trigger one in a woman at a certain point in her menstrual cycle (Criado-Perez 2019, 92).

PRODUCT DESIGN

Smartphones

One-Size-Fits-Man-Hand

Gender bias is evident in the design of smartphones in numerous ways. On average, women have smaller hands than men. However, cell phones are designed as one-size-fits-all, and unlike clothing and shoes, there are no small, medium or large options for a given phone model. The average cell phone is now 140 mm long, which fits comfortably in the average man's hand, but not so much for women, whose hands on average are only slightly bigger than the phone itself. This makes it more challenging for women to use their phone with one hand, especially when taking photos. Women are more likely to drop – and potential crack or break – their phones. To make matters even more inconvenient, most smartphones are way too big to fit into the tiny (or non-existent) pockets in women's clothing. Furthermore, handling a phone that is too large for one's hands can cause musculoskeletal stress and injury (Criado-Perez 2019, 74-75).

Menstrual Tracking in Health App

When Apple released their health-monitoring app for iPhone in 2014, they advertised it as a “comprehensive health tracker.” It could track steps taken, blood pressure, blood alcohol level, even metal micronutrient levels. It did not, however, include a period tracker, despite menstruation being medically listed as a vital sign of the body. Why was this overlooked? Perhaps there were no women on the design team to suggest that this feature should be included. Perhaps women were included, but their voices were ignored. Or, perhaps this important female-specific information was missing from the male-dominated health data that Apple was using (Criado-Perez 2019, 81).

Speech-Recognition Software

Speech-recognition software is a case in which women's voices are literally heard less than men's. It is less effective for women because the databases on which the technology is trained are dominated by male voice recordings. Google's speech-recognition software, which is currently the most advanced, was found to be 70% more likely to accurately recognize male speech than female speech. While the inaccuracy can cause much frustration for women trying to use this technology – it can get annoying when the iPhone's Siri constantly misinterprets your request – it can also have serious health and safety consequences. For example, the reason many cars have voice-command systems is to reduce distractions and make driving safer, with some even connecting to emergency response systems. But when the system does not recognize or misinterprets a woman's voice, this can result in greater distraction, and potentially fatal consequences (Criado-Perez 2019, 76).

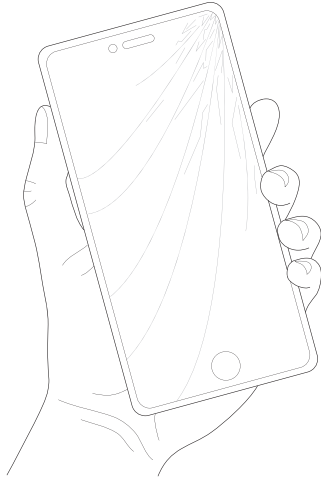


Figure 2: Cell phone that is too big to handle.

Cars

In a car crash, a woman is 47% more likely to be seriously injured, 71% more likely to be moderately injured, and 17% more likely to die than a man. This is because the “standard seating position” around which car safety features are designed is based on – you guessed it – the average male (hello again, Reference Man). Women are on average shorter, and therefore need to pull the seat up closer to reach the pedals, and sit more upright to clearly see over the dashboard. Seat belt design does not account for women’s breasts – and not to mention, a pregnant woman’s belly – so women naturally end up wearing them “improperly.” Thus, a woman’s seating position typically deviates from the standard “safe” set-up, exposing her to greater risk of injury in the event of a collision.

Crash-test dummies are also based on average male weight, height, proportions, and anatomy. It was not until 2011 when the United States started using a “female” dummy, which, to this day, is not even anthropometrically correct in representing the female body; it is just a scaled-down male dummy. Of course, we all know that women are not simply scaled-down men. Many of our sex differences significantly impact the way our bodies respond to a vehicle’s safety features in the event of a car crash.

Furthermore, the female crash-test dummy is generally only used in testing the passenger seat, with the male dummy still being the standard for testing the driver’s seat. Not only is this a reflection of the gender stereotype of man as driver and woman as passenger, it also excludes women from important car safety statistics, which tend to focus mostly on the driver’s seat. The inaccurate representation of women’s bodies in the design of car safety features essentially conveys the message that women’s lives are less important than men’s (Criado-Perez 2019, 86-87).

Construction PPE and Tools

Gender difference and discrimination is a well-known problem in the construction industry. As a traditionally male-dominated field, it was not too long ago when virtually no women at all worked in construction. During those times, it made sense that personal protective equipment (PPE), tools, and building materials were sized exclusively to suit the male body. However, today, more and more women are working in the trades, engineering, architecture, and other construction-related professions.

And yet, much of the PPE has not been adapted to the female body, with “unisex” (i.e. men’s) styles being the only option. Differences of size and proportion in chests, hips, thighs, feet, and faces between women and men should require sex-specific adaptations to PPE like harnesses, boots, and face masks. However, many of these items are only designed based on standard male proportions. Not only does ill-fitting equipment cause discomfort, it can also end up compromising the wearer’s safety, which counteracts the whole purpose of PPE (Criado-Perez 2019, 60).

For example, one-piece overalls come with a zipper at the front, allowing a man to urinate simply by opening the zipper; but for a woman wearing these same overalls, peeing is not so simple. She must remove her overalls and whatever else she is wearing – such as a harness or other PPE that is cumbersome to take on and off – and urinate completely exposed. In cold weather, this can be especially uncomfortable and compromising. A two-piece suit would easily solve this problem, but some industries continue to only supply unisex overalls (Criado-Perez 2019, 59).

Construction tools and materials also continue to come in sizes that best fit men. Standard cement bags weigh 40 kilograms, which is comfortable and safe for most men to lift, but not most women, whose average strength is less. Similarly, standard brick and hand tool sizes are sized to perfectly fit the average male hand, which makes them too large for most women to properly hold and grip. There is no reason why standard cement bags and bricks cannot be made smaller so that both men and women can comfortably and safely handle them. While some common tools are available in smaller sizes, this is not always the case, especially for more specialized equipment (Criado-Perez 2019, 58).

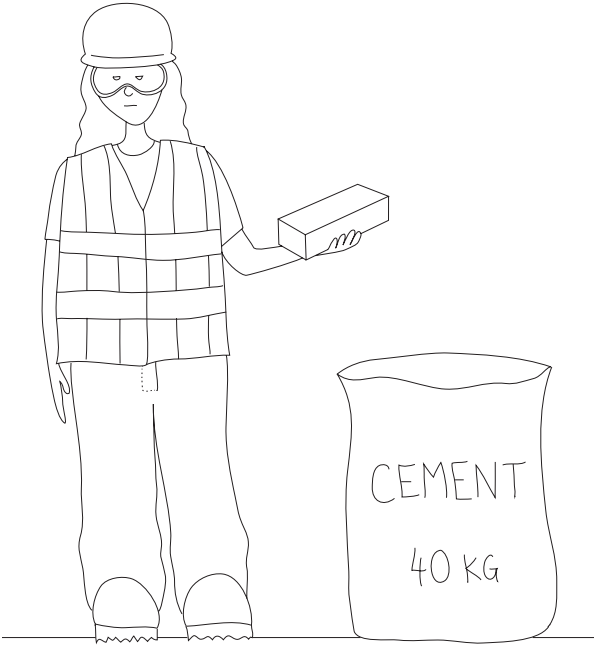


Figure 3: Construction PPE, tools and materials for the male body.

GENDER INEQUALITY IN PUBLIC SPACES

I have illustrated how the gender data gap compromises the health and safety of women in medicine and product design. While you may find this information disturbing (or at least, I hope you do), you may also be wondering: how is all of this related to architecture?

The built environment is no exception to gender inequality. In fact, it often serves to maintain it. "An analysis of gender in modern architectural criticism reveals a social system that has historically functioned to contain, control, or exclude women" (Agrest et al. 1996, 11). In this section, I will examine how men have historically dominated the built environment, particularly public spaces.

THE PUBLIC / PRIVATE DICHOTOMY

The distinction between public and private is ubiquitous in social and political life, and has real spatial consequences. This powerful binary is deeply entwined with gender and sexuality, which we also dichotomize.

The public/private dichotomy (both the political and spatial dimensions) is frequently employed to construct, control, discipline, confine, exclude and suppress gender and sexual difference preserving traditional patriarchal and heterosexist power structures (Duncan 1996, 128).

Our tendency to classify people into opposing groups – male/female, straight/gay, white/black, rich/poor, young/old – almost always serves to reinforce systems of inequality and injustice by advantaging one group over the other. Depending on which side of the binary someone is on, they are predisposed to experience inclusion or exclusion, power or powerlessness, superiority or inferiority, freedom or restriction (Weisman 1992, 10-11). Dichotomies define not only social space, but also physical space. This is especially true of the separation that has been established between the public and the private. This binary has served to reinforce the domination of men and subordination of women:

[The truth is that] man builds and woman inhabits; that man is outside and woman is inside; that man is public and woman is private; that nature, in both its kindest and its cruelest aspects, is female and culture, the ultimate triumph over nature, is male (Agrest et al. 1996, 11).

Woman and the Private Sphere

The private home has a long history of being associated with women and female sexuality. The private sphere is traditionally associated with personal life, the domestic, family, property, reproduction, sexuality, the embodied, the natural, unpaid labour – all things stereotypically feminine (Duncan 1996, 129). In most cultures, references to the home are associated with the female body: the "birthplace," a "cozy nest," a "sheltering womb." Caves, the earliest dwellings, were referred to as "nature's womb" (Weisman 1992, 17).

The institutionalization of patriarchy reinforced the identification of women as property for their sexual reproductive capacity, strengthening the link between woman and house – both of which are forms of patriarchal property. A woman's "natural" purpose was to reproduce in order to create a large family, which in turn required her to take on the role of full-time household manager to stay on top of the domestic tasks. Fast-forward to the 19th and 20th centuries, when the rise of industry and capitalism further reinforced the association of women with domesticity, and the "suburban housewife" ideal became the norm.

Man and the Public Sphere

In contrast, the public realm is traditionally associated with the polar opposite of the private sphere: the impersonal, the cultural, the marketplace, paid labour, production, the state, action – all things stereotypically masculine. Theoretically, the public sphere should be open and accessible to everyone. However, in reality, it is deceptively restrictive and has historically favoured the dominant culture – that is, white, heterosexual men (Duncan 1996, 128-130).

"Logically, those who have the power to define their society's symbolic universe have the power to create a world in which they and their priorities, beliefs, and operating procedures are not only dominant, but accepted and endorsed without question by the vast majority. In patriarchal societies where men are by definition the dominant group, social, physical, and metaphysical space are the products of male experience, male consciousness, and male control. Further, man-made space encodes and perpetuates white male power and superiority and the inferiority and subordination of women and minorities" (Weisman 1992, 10).

Like so many other aspects of society, the built environment has historically prioritized the male experience. Because the public sphere has traditionally "belonged" to men, public spaces are often less accommodating of women and people who do not fit within the dominant male culture, and are sites of overt and covert discrimination.

For example, men naturally do not have the capability to breastfeed, only women do. In many parts of the world, breastfeeding in public is considered to be socially inappropriate, and women who choose to do so are harassed and shamed. One wonders: if men could breastfeed, would breastfeeding in public be totally acceptable and normal? Would there be breastfeeding benches and nursing stations everywhere?

Public Space is Political

The public sphere is the site of the dominant male culture, as well as state politics and regulation, all of which is wrought with inequality and injustice. However, it is also the site of oppositional social and political movements. For example, in the fight against sexual orientation discrimination, "deconstructive spatial tactics [have taken] the form of marches, Gay Pride parades, public protests, performance art and street theatre as well as overtly homosexual behaviour such as kissing in public" (Duncan 1996, 138).

To take over a public space and use it to publicly display a group of people, behaviour, or activity that is normally excluded from such a place is a political act. This process of "territorializing" is a spatial ploy that all kinds of disempowered groups have used to challenge and destabilize unjust social norms (Duncan 1996, 129).

Profound social and political change cannot happen without a public platform. The public realm is inherently far more visible and accessible to far more people than the private sphere. Visibility and accessibility are essential to spreading information and awareness about any issue, whether it is gay rights or women's rights – or menstruation.

SPATIAL DOMINANCE

Boys are raised to take up more space than girls. They are encouraged to explore their surroundings, have outdoor adventures, get dirty, discover their environment. They learn to sit with their legs so wide they spill over their seat (a phenomenon commonly known today as "manspreading"). Girls, on the other hand, learn to "expect and accept spatial limitations." They are taught to occupy space, but not control it. They are encouraged to stay closer to home, to stay safe, to keep clean, to tidy up. They sit in "ladylike" positions so that they take up as little space as possible.

Social power and dominance are closely linked to spatial dominance – why else would there ever be war over territory? Because boys learn from a young age to be more spatially dominant than girls, they are better positioned to hold greater power and dominance in society. This is a man's world, indeed (Weisman 1992, 24).

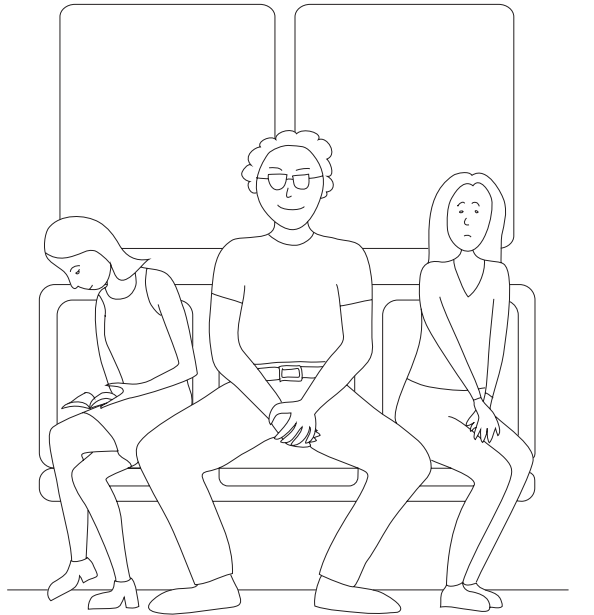


Figure 4: *Manspreading.*

THE MALE GAZE

The male gaze is the act of viewing the world from a masculine, heterosexual perspective. This is widely recognized in film and literature, where men account for the majority of writers, directors, and characters; and women have historically been cast as incomplete secondary objects – often objects of men's sexual desire – and not as fully developed human beings of their own. The male gaze is not limited to books and movies because, after all, these media are simply are a reflection of our culture. As women are perceived and judged through a framework that favours the male experience, this inevitably creates a power difference in which men are privileged and women are disadvantaged (Colomina 1992, 82-83).

I can feel myself under the gaze of someone whose eyes I do not even see, not even discern.... I feel myself becoming an object for the gaze of others. But in this position, which is a reciprocal one, others also know that I am an object who knows [her]self to be seen (Colomina 1992, 83).

It can be challenging to convey to men just how inescapable the male gaze is in the female experience. It is so pervasive that many women not only accept that they are objects (often sexual) for the male gaze, they may even see themselves through male eyes. "Men look at women. Women watch themselves being looked at" (Weisman 1992, 69). In this way, a woman becomes an object in her own life rather than an autonomous subject. This affects how a woman behaves and how she occupies space.

The male gaze serves to inequitably restrict a woman's conduct and movement within space. The constant feeling of being observed through a male perspective is not only uncomfortable, it can also feel threatening. This is especially true in public places where a woman may already be concerned about safety – for example, on the bus or in a parking garage at night (Criado-Perez 2019, 32).

DESIGN OF PUBLIC SPACES

Safety in Public Places

Many public spaces fail to take into account women's concerns over safety. Women are at far greater risk of sexual assault and harrassment than men. Surveys have shown that the majority of women feel two times more fearful than men of potential threat and violence against them in certain types of public spaces, and even more so at night. Women generally feel unsafe in public spaces with poor lighting, that are deserted, are not visible to others, and have no access to help. At the top of the list are parking garages, walking home, and waiting on train platforms and at bus stops (Criado-Perez 2019, 31). In these scenarios, there is a greater potential for a woman to be watched, followed, cornered, harassed, assaulted, raped, or even killed. Many women tend to adopt submissive behaviour patterns in an attempt to avoid potentially dangerous situations, such as avoiding eye contact, restricting their movement, and moving out of the way (Weisman 1992, 69).

The lack of sex-specific data on perceptions of public safety and danger makes women feel unsafe and uncomfortable in places that are supposed to be equally accessible to everyone (Criado-Perez 2019, 31). If women were consulted more in projects, we would probably see far more implementation of physical and geographical features that enhance safety. We already know that improved lighting standards, signage, multiple exits, no dead ends, visibility and sightlines are all design considerations that can help women – and everyone else, for that matter – feel safer in public places (Weisman 1992, 71).

Public Transportation

In many cities, women account for approximately two-thirds of public transportation users. There are several factors that cause women to use public transport more than men, starting with the fact that men are more likely to have access to a car. This is in part because women on average have less money than men – the global gender pay gap is currently 37% – and also because of the persistence of gendered patterns that developed decades ago, when men drove into the city to work while their housewives stayed in the suburbs. Public transit systems are designed primarily around the needs of people needing to get in and out of the city centre, a demographic which historically has been dominated by men. They are also largely designed by men, as transportation and urban planning are male-dominated professions (Criado-Perez 2019, 22-26).

Public transportation is much less efficient in servicing passengers with more complicated travel patterns, the majority of whom are women. This in turn is because women take on 75% of the world's unpaid care work, which generally requires numerous interconnected trips – for example, dropping the kids off at school before going to work, taking an elderly family member to a doctor's appointment, grocery shopping on the way home. This kind of “trip-chaining” travel pattern is observed much more in women than in men, and is significantly more inconvenient and inefficient without a car. Pushing a baby stroller, accompanying a person who uses a walker or wheelchair, and carrying heavy bags of groceries are all burdening and time-consuming on their own, let alone when they are combined with the additional time and effort spent walking to, waiting for, and making transfers on public transit (Criado-Perez 2019, 22-26).

Public Toilets

A widely recognized sex difference is the fact that women generally need to urinate more frequently than men (Weisman 1992, 36). This phenomenon is amplified in pregnant women because of hormonal changes and additional pressure on the bladder. Women also tend to need more time to use the toilet – more than twice as long, on average – for several reasons. For one, a woman typically needs to remove some of her clothing before sitting down to pee; whereas men usually just need to unzip and they are ready to go. Women also wipe with toilet paper after urinating; men do not. Further, when a woman is on her period, she may need extra visits to the washroom and even more extra time to change her menstrual product and freshen up; of course, men do not menstruate. Finally, women are more likely to be accompanied by children or provide care for elderly or disabled people, which can greatly increase the amount of time needed in the washroom (Criado-Perez 2019, 29).

Historically, building codes have allocated an equal amount of floor space for male and female public washrooms. While this may seem fair and equitable on the surface, it actually is not – and it is not only because of the extra time women need. Men's public washrooms have toilet cubicles and urinals, the latter being more space and time efficient. This means that men's washrooms can actually accommodate more plumbing fixtures and people per square metre of floor space (Criado-Perez 2019, 29).

It therefore makes sense to provide more toilet facilities for women. This often is now reflected in current building codes, which require a greater number of toilets to be designated for women. But current codes still may not be aggressive enough; and not to mention, they also do not change all of the pre-existing washroom facilities that have equal floor space for men and women. The queue for the women's washroom is almost always longer than the men's, especially at large gatherings like sporting events and performances, where everyone is trying to go to the washroom at the same time during intermissions.

To compound this problem, public toilets are not always available when needed – a necessity that, as I have already discussed, is more frequent for women than men. It seems logical to provide public washroom facilities at transit stations, in parks, or simply on their own. But this often is not the case, and the problem has worsened with a trend in public toilet closures over the last few decades. A lack of access to public toilets can actually cause health problems, especially in women. Women are more susceptible to urinary-tract infections and bladder problems, which can be caused or exacerbated by holding in one's urine. A menstruating woman is also at risk of toxic shock syndrome if she has nowhere to change their tampon, in addition to the potential embarrassment if her tampon (or other menstrual product) becomes so full that it leaks through her clothing (Criado-Perez 2019, 31).

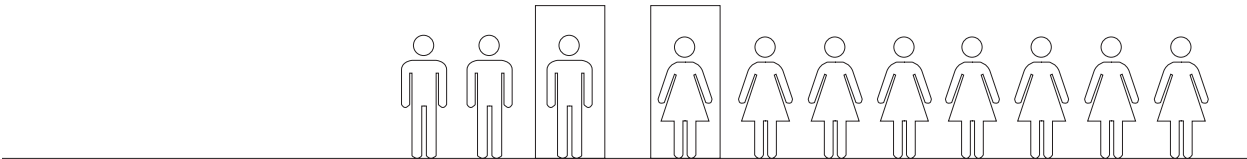


Figure 5: Unequal queues for gender-designated washrooms.

INCLUSIVITY

HOW TO REDUCE INEQUALITY

There are countless other examples that illustrate the pervasiveness of the gender data gap, gender inequality, and implicit gender discrimination in our society. The select cases I have demonstrated should hopefully make even the strongest deniers of gender inequality see that this is indeed a serious and extensive problem that our society needs to acknowledge and address. The next logical thing to discuss is: how can we reduce gender inequality?

Many of the solutions are simple and obvious. We can start by promoting greater representation of women, and letting women's voices be heard as loudly as men's are. This means gathering sex-specific data on women. This means including women in studies and seriously considering the impacts of sex differences. This means more consultation with women to better understand and accommodate their needs and preferences in design projects. This means supporting women in traditionally male-dominated professions. Or, to put it more simply: just treat women as we treat (white, able-bodied, heteronormative) men.

In this next section, I will investigate deeper into how architects and designers can help promote gender equality by designing for inclusivity.

Designing for Different Experiences

It is extremely difficult for anyone to fully understand and predict people's needs outside one's own lived experience. Just as it is unreasonable to think that the 1.8 meter tall, 70 kilogram, white, abled-bodied Reference Man accurately represents every variety of human on the planet, it is also unrealistic to expect a homogenous group of people to anticipate the needs of everyone else outside of their group. This is why it is incredibly important to be inclusive of a wide diversity of people representing different experiences and worldviews in virtually all aspects of organized society – in institutions like education, the workplace, and government, as well as in design.

This does not simply mean that male and female, black and white, with and without disability, rich and poor need a seat at the table. Within each socially identifying category – gender, race, ethnicity, ability, class, age, sexuality – there exists many more layers of diversity. One black man does not represent all people of colour. One person with a vision impairment does not speak for all people with disabilities. One woman does not automatically embody all knowledge of the female experience.

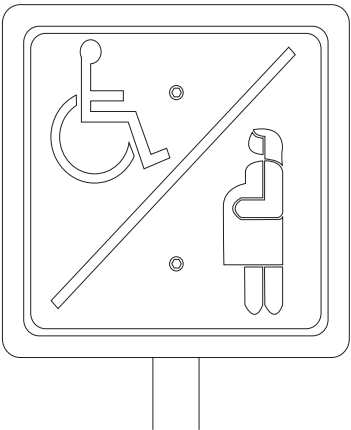


Figure 6: Signage for parking reserved for pregnant women and people with disabilities.

Sheryl Sandberg (the current COO of Facebook and author of *Lean In*, a book seeking to help women achieve their career ambitions) shared a story that effectively illustrates this. In 2014, when working in a senior management position at Google, Sheryl became pregnant. As is the case for many women during pregnancy, she experienced severe swelling in her body, especially in her feet. Suddenly, walking from her car to the office building entrance (something she used to do everyday with no problem) was now a struggle. After months of uncomfortably waddling across the large parking lot, she finally thought of suggesting to the founders – who were men – that they provide pregnancy parking spots directly in front of the building. The founders agreed immediately, noting that “they had never thought about it before.”

That last line says it all. Not only had these men never before considered that it might be beneficial to provide pregnancy parking, neither had Sheryl, even though she is a woman. This exemplifies what I said earlier: one woman does not automatically embody all knowledge of the female experience. Sheryl did not really understand what it is like to be pregnant until she herself was pregnant. She points out that she was not the first pregnant woman at this office, and surely she was not the first to recognize this problem. She further argues that Google could have proactively anticipated the need for pregnancy parking by searching out the data – they are the king of data, after all.

However, as we have previously seen with the gender data gap, solutions to these kinds of female-specific problems all too often remain under the radar. Although it really should not be this way, it usually takes a woman in a senior position for these problems to be fixed. But of course, women are a minority in senior positions, which perfectly illustrates the systemic nature of gender inequality and how effortlessly it is upheld and perpetuated in society (Criado-Perez 2019, 55).

INCLUSIVE DESIGN

Architecture is the design of the built environment; the built environment is used by people; and, people are incredibly diverse. Differences in gender, race, ability, class, age, religion, environment, and other life circumstances shape each and every one of us into a unique person with our own history, perspective, and needs. “Inclusive design” seeks to eliminate architectural discrimination by making the built environment accessible to and usable by as many people as possible, regardless of their differences. In aiming to be welcoming and accommodating of all people, inclusive design generally needs to be flexible and provide options for its users, acknowledging that it is unrealistic to think that one solution will always work for everyone (Goldsmith 2000, 1-2).

The Evolution of Inclusive Design

The origins of inclusive design are strongly rooted in designing for people with disabilities, which gained attention in the 1950s. “Accessible” or “barrier-free” design practices help make spaces more usable by those with disabilities, and are now customary in building codes and design manuals. In more recent years, this design approach is being interpreted through a broader lens so as to be inclusive of a wider range of people and needs. With the increasing trend of advocacy and awareness around issues of gender identity in our society today, gender has been a central focus in the current discourse around inclusivity.

Generally, there is greater acknowledgment of the diversity with which people may express their gender, and we have been changing the way we design the built environment to better accommodate gender diversity, most notably in the design of washrooms and change rooms. Non-binary people (those who do not identify as either woman or man) and transgender people (those whose gender identity does not align with their biological sex assigned at birth) often feel uncomfortable or unsafe in convential gender-designated (i.e. separate male and female) washrooms and change rooms. Similarly, some people feel uncomfortable sharing these facilities with members of the opposite sex or with gender non-conforming people. Not only does this pose challenges for individuals, it also makes it difficult for the elderly, people with disabilities, and children to receive assistance from caregivers or parents of a different gender (HCMA 2018, 8-13).

In efforts to better accommodate different needs with respect to ability and gender, and thereby enhancing overall user experience, “universal” washrooms and change rooms are being implemented in more and more public facilities. This is often in addition to standard gender-designated

ones, so that each person can choose the option that best suits their personal preferences. Using the term “universal” reflects the current best practice because it implies inclusivity based on both gender and ability – and potentially beyond – as opposed to “gender neutral,” “all gender,” “accessible” or “barrier free,” which each refer to just one of these categories.



Figure 7: Gender-inclusive poster at Hillcrest Aquatic Centre.

Hillcrest Aquatic Centre - Universal Change Room

Universal washrooms are now required in all recreation, wellness, and community centres in the Vancouver Parks Board system, as part of the City's larger mandate for promoting awareness around community diversity and inclusivity. For example, 75% percent of the change room area in the Hillcrest Aquatic Centre is “universal.” The universal change room, located in between the traditional male and female change rooms, is inclusive of people of all genders, providing a safe and comfortable space for families, caregivers, transgender and non-binary people – a space for everyone, if they so choose. It is also inclusive of and accessible to people with disabilities (HCMA 2018, 9-10).

Clear signage communicates the options at the change room entrances, and also inside the change rooms. The design of the universal change room promotes increased privacy and safety. Private single- and multi-user change and shower stalls are provided, with tall doors and small gaps underneath to ensure privacy. The door lock fixtures clearly indicate whether the stall is vacant or occupied, to facilitate monitoring and comfort. Users are required to wear clothing or swimsuits outside of these stalls. Sinks, communal showers, and locker areas are open and shared by all users, promoting passive observation and a feeling of community. There are two open entrances and exits to provide multiple options for entering and leaving the space (HCMA 2018, 23-26).

When I visited Hillcrest Centre, there were significantly more people using the universal change room than the women-only change room, which is likely an indicator that there is indeed demand and appreciation for these types of inclusive spaces.

Designing for Inclusivity

While washrooms and change rooms are perhaps the most obvious sites in need of gender inclusive design considerations given the intimate nature of their use, surely there are many other spaces that would benefit from such practices. What would a more inclusive restaurant look like? Classroom? Park? Grocery store?

Moreover, inclusivity does not just pertain to gender and disability. Race, ethnicity, class, age, sexuality, and other social identities resulting in systemic discrimination are just as relevant and necessary to consider when designing for inclusivity, though they may not appear as much in current discussions around this design topic.

I think that the scope of inclusive design will continue to expand, accommodating diversity and equality at a broader scale. “It is critical that we embrace the challenge to rethink even our most familiar spaces. We have a responsibility to use design to support basic rights for everyone and the evolving needs of our communities” (HCMA 2018, 4).

Equitable Does Not Mean Equal

Design that is totally inclusive of every single potential user and which eliminates all discrimination implied within it may seem like an impossibly complex task – and perhaps it is. But that does not mean we should stop striving to achieve these goals. It is helpful to note that inclusive design strategies may not necessarily accommodate all potential users *equally* – that is, to the exact same level of convenience – but rather, as *equitably* as possible – that is, as fairly as can be. Design that is inclusive of the most diversity is generally the fairest solution. Finally, it is also helpful to remember that designing for inclusivity is a continuous, incremental process. We have been working on it for many decades, and we will need to continue working on it for many more.

User Consultation

In designing for inclusivity, architects often need to consider issues that are outside of their own lived experience. No one is an expert at everything; thus, no one should expect an architect to instinctively know the best solution on their own. This is why it is important for architects to consult with potential users during the design process. User group consultations should include as much diversity as possible in order to minimize latent bias that may only appear after the project is built and being used.

Moreover, it is incredibly beneficial to seek input from users not only during the various stages of design, but also after the project has been constructed and is in use. A lot can be learned from the actual users about what worked, what did not work, and what could be improved in a building, space, or architectural feature. This gives architects the opportunity to carry forward the lessons learned and avoid making the same mistakes in future projects.

It is not simply a matter of hearing what people say they want and need, it is about responding to it. By taking into account user feedback, designers are better able to improve the collective practices of inclusive design.

CHAPTER 2

MENSTRUATION

IF MEN COULD MENSTRUATE

So what would happen if suddenly, magically, men could menstruate and women could not? Clearly, menstruation would become an enviable, worthy, masculine event:

Men would brag about how long and how much. Young boys would talk about it as the envied beginning of manhood. Gifts, religious ceremonies, family dinners, and stag parties would mark the day.

To prevent monthly work loss among the powerful, Congress would fund a National Institute of Dysmenorrhea. Doctors would research little about heart attacks, from which men would be hormonally protected, but everything about cramps.

Sanitary supplies would be federally funded and free. Of course, some men would still pay for the prestige of such commercial brands as Paul Newman Tampons, Muhammad Ali's Rope-a-Dope Pads, John Wayne Maxi Pads, and Joe Namath Jock Shields – "For Those Light Bachelor Days."

- Gloria Steinem (1986)

THE STIGMATIZATION OF MENSTRUATION

MENSTRUAL TABOO

Menstruation is stigmatized all over the world. Periods are seen as impure, gross, shameful, embarrassing, and expected to be hidden, like a dirty secret. Stigmatizing beliefs like these are pervasive, and often serve to create barriers, limitations or restrictions for menstruators:

A menstruating woman must keep herself from contact with many activities lest she spoil them: she may not brew beer nor pass by the homestead of a potter lest his pots crack during fire; she may not cook for her husband nor sleep with him lest she endanger both his virility and his general health. A menstruating woman endangers the success of rituals by her presence.... At first menstruation... she must be secluded at once from normal contacts, particularly from contact with men of the village.... During the time that she is menstruating she must not touch food with her hands; she eats with two sticks (Buckley & Gottlieb 1988, 6).

“Taboo” is defined as a prohibition against touching, saying, or doing something on the grounds of morality, taste, or fear of harm from a supernatural force. “Menstrual taboo,” therefore, is defined as distinct rules for conduct regarding menstruation.

Although the cultural presence of menstrual taboo is nearly universal, it has many different – and often ambiguous or opposing – meanings and interpretations across different

cultures (Buckley & Gottlieb 1988, 7). Some menstrual taboos are considered oppressive to women, while others are empowering. Furthermore, a taboo may be perceived by an outside observer in a certain way and judged as good or bad, but understood completely differently within its own cultural context (Buckley & Gottlieb 1988, 25).

Nonetheless, there are some common themes of menstrual taboo across cultures. Many of them:

- regard menstrual fluid as dangerous and polluting;
- require isolation of menstruating women;
- limit contact with water or other things;
- limit contact with men;
- prohibit sex during menstruation;
- prohibit menstruuous women from working; or,
- prohibit menstruuous women from cooking, especially for their husbands (Buckley & Gottlieb 1988, 11).

In all cases, it is important to recognize that menstrual taboos are a symbolic representation often founded on spirituality, religion, or mysticism, and depend heavily on their context (Buckley & Gottlieb 1988, 4). However, that does not justify discriminatory customs that may be harmful to menstruators.

Blood Rituals

Rituals around menstrual blood* have multiple different meanings and applications. In the Mae Enga tribe in Papua New Guinea, women have been known to use their menstrual blood with devious intentions. It is believed that menstrual blood, when put into a man's food, will quickly kill him – a secret weapon for women seeking revenge (Buckley & Gottlieb 1988, 34). On the other hand, many other cultures have used menstrual blood for a more positive, albeit still manipulative, objective: love. Love charms and potions containing a woman's menstrual blood are believed to make a man fall in love with her, or keep him faithful to her (Buckley & Gottlieb 1988, 35).

*Note: “Menstrual fluid” is commonly referred to inaccurately as “menstrual blood,” as only half of its contents is actually blood. While I have chosen to use the former term throughout this thesis because it is technically more accurate, I think that the connotation of the word “blood” (as opposed to “fluid”) is important in the context of menstrual taboo – “menstrual fluid ritual” just does not have the same zing to it.



Figure 8: Menstrual hut in western Nepal (Vaughn 2019).

Menstrual Huts

Menstrual huts are special shelters where women are sent to live in isolation while they menstruate. Menstrual huts have been a part of many indigenous cultures across the world, though there can be variances between them. Many cultures have abandoned this practice since contact with Western outsiders, but not all of them have (Buckley & Gottlieb 1988, 12).

In Nepal, menstruating women are believed to be unclean, and are therefore sent to live in solitary confinement in menstrual huts, a practice called chhaupadi. The huts are usually very small, basic, dilapidated, poorly ventilated, and unsanitary. Women die every year because of smoke inhalation, suffocation, snake bites, and other regrettable causes. Although chhaupadi was made illegal in 2005, many people still practice it today, and women continue to die because of it (Vaughn 2019). As an outside observer, it is difficult not to see this as blatantly oppressive and harmful to women. As for the women who respect this custom, some resent their mandatory seclusion, while others consider it a contribution to the communal welfare and find it fulfilling (Buckley & Gottlieb 1988, 12).

In contrast, on the Micronesian island of Mogmog, menstrual huts are large, communal spaces that essentially serve as community centres for women. Women live together in their seclusion, and pass the time by talking, weaving, cooking, and meditating, among other enjoyable activities. Most of these women say they appreciate their monthly break from their normal duties (Buckley & Gottlieb 1988, 12).

Hiding Menstruation

While menstrual huts and menstrual blood love potions may seem exotic and uncommon in the Western world, menstrual taboo is still ubiquitous and takes many other forms in our society. In many ways, periods are treated as something dirty and embarrassing, and the expectation of hiding menstruation is widely accepted.

Most people believe to some degree that it is socially unacceptable to talk about menstruation, and many people, especially boys and men, become visibly uncomfortable if the subject does come up. Girls are often teased by boys and other girls when they get their period.

It is a common strategy among menstruators to hide a tampon or pad up their sleeve on their way to the washroom, so that no one knows they have their period (and because public washrooms generally do not supply menstrual products – more on that later).

Furthermore, we have a tendency to think of menstruation as a negative thing, as “the curse,” as something to apprehend.

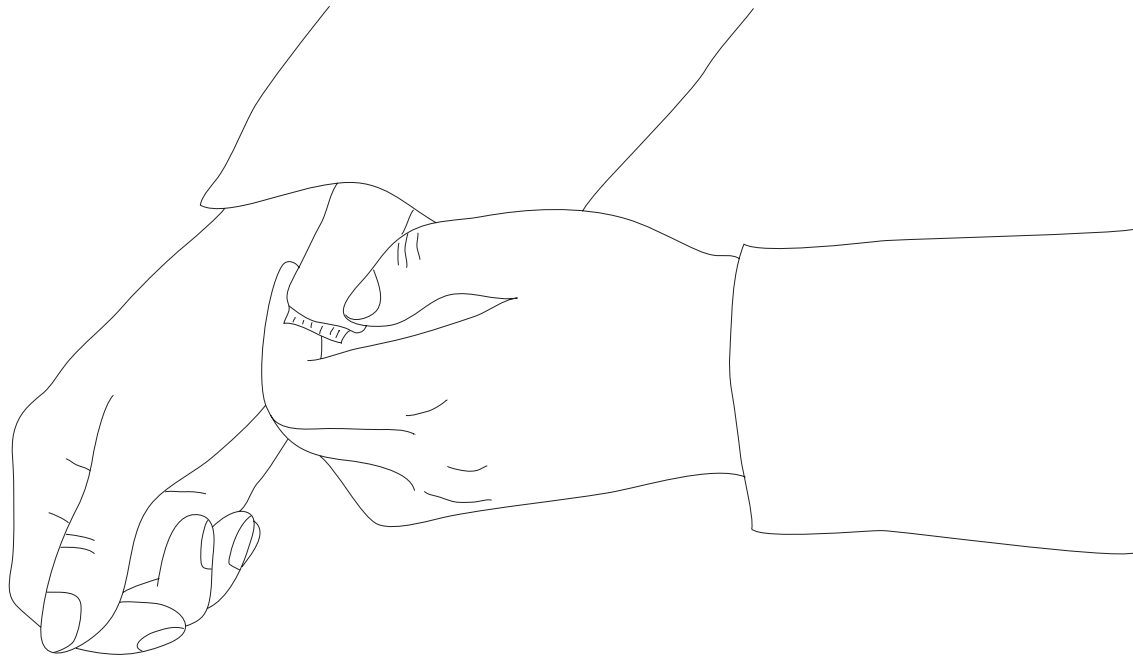


Figure 9: Tucking a tampon up your sleeve so no one sees it.

PMS

Attitudes towards premenstrual syndrome (PMS) reflect the stigmatized status of menstruation. PMS refers to the physical, emotional, psychological or energetic symptoms that 90% of women experience before and sometimes during their period. Common symptoms include abdominal cramping, bloating, sore breasts, acne, food cravings, headaches, fatigue, irritability, anxiety, depression, sadness, anger, emotional outbursts, and mood changes. Today, there is generally an understanding of and accommodation for PMS as a “hormonal onslaught” that can cause women to have mood swings and need some extra rest during that time of the month. However, like menstruation, PMS is stigmatized and shrouded by misinformation (Criado-Perez 2019, 103).

Rationale for Female Irrationality

“Are you PMSing or something?” I bet that most women have been asked this question at some point when they were expressing anger, irritability, or moodiness – whether or not they were actually on their period. PMS has in a way become a label for “irrational” behaviour in women, feeding the stereotype of angry, hormonal women. This perspective reinforces the longstanding biological deterministic view of women as inherently weak and lacking control over their bodies and emotions. Furthermore, the physical pain that women can experience during menstruation is sometimes dismissed as emotional or psychosomatic, and antidepressants are prescribed instead of painkillers or other more appropriate interventions (Buckley & Gottlieb 1988, 18).

Penises Problems over Period Pain

PMS has historically been under-studied in medical research, and this continues to be true today. Five times as many studies have been conducted on erectile dysfunction than studies on PMS – even though the number of women suffering from PMS is six times higher than the number of men with erectile dysfunction. In the early 1990s, drug researchers were conducting clinical trials for sildenafil citrate, also known as Viagra, as a heart-disease medication. All of the trial participants were men. While the drug did not have great results for its intended application, it was shown to be very effective at increasing blood flow to the pelvic region. Researchers quickly realized the drug’s potential to treat erectile dysfunction in men, and it was patented as Viagra in 1998 (Criado-Perez 2019, 103).

But, what if women had been included in the trials? A group of researchers decided to study the effectiveness of sildenafil citrate to treat dysmenorrhea (severe pain from menstrual cramps) in women, and the results were promising, with no observed negative side effects. However, the trial’s funding was stopped because the “reviewers did not see dysmenorrhea a public health priority,” even though period pain affects far more women than erectile dysfunction affects men (Criado-Perez 2019, 103).

Menstrual Suppression

As birth control options are becoming more diverse and accessible, there has been increased interest in using hormonal management to stop or reduce menstrual flow, also known as menstrual suppression. While menstrual suppression is used to manage a number of medical conditions, like severely heavy periods and period pain, it is also now being used by women who simply do not want to have their period as often – or at all. In a study conducted by the FDA on women’s attitudes towards menstrual suppression, over half of the women surveyed reported an interest in not having a period every month, and one third were interested in not having a period at all anymore (Andrist et al. 2004, 359). If menstruation were not perceived so negatively, perhaps fewer women would wish to suppress their periods – and instead, be more accepting of this biological process and appreciative of its role in the creation of life.

Representation of Menstrual Products

Despite the fact that menstrual product manufacturers are in the business of menstruation, the ways in which they represent their products often are reaffirming of menstrual taboos – that periods are dirty, embarrassing, and should be hidden. The fact that menstrual products are commonly referred to as “feminine hygiene products” or “sanitary products” implies that menstruation is dirty, and serves to perpetuate this belief in our society. For a long time, packaging of pads and tampons was non-descriptive, with only the brand name printed on the box, allowing the consumer to purchase pads or tampons with discretion and be “saved from embarrassment” (Vostral 2008, 66-67). The first time the word “period” was used on TV was in 1985, in a Tampax advertisement. Prior to that, all menstrual products ads somehow avoided using the word. Furthermore, up until just a few years ago, pad brands always used a blue liquid to show how much fluid their product could hold. It was not until 2017 when the pad company Bodyform used red liquid for the first time to represent menstrual fluid in an advertisement (Patel 2020).

PERIOD-POSITIVE ATTITUDES

Though menstrual taboo is everywhere, there are still some people who have positive beliefs around menstruation. Some see menstruation as “nature’s monthly gift” rather than “the curse” (DaSilva 2018, 79). Some believe that women are in a state of heightened spirituality during menstruation and are more energetically powerful during this time (Buckley & Gottlieb 1988, 13).

I do not necessarily expect everyone to suddenly adopt these perspectives, but I do think it is necessary for our society to break the stigma around menstruation so that half of the population is not carrying shame and embarrassment because of an important biological process they are born with. In order to get there, we need more awareness around the subject of menstruation, including better access to education, resources, and support.



Figure 10: Discreet packaging for menstrual products.

PERIOD POVERTY

Period poverty refers to the lack of access to menstrual products, menstrual hygiene education, washing facilities, and/or waste management. At first glance, many people may perceive this to be a problem that exists only in less developed countries or low-income regions, where it is more commonplace to have inadequate access to basic sanitation services such as clean running water, handwashing facilities with water and soap, toilets with water, and materials to manage menstruation. However, period poverty is a global issue that affects menstruators everywhere, from Kenya to Canada. Similarly, it does not only refer to financial poverty; it is also an issue of social poverty (UNICEF 2018).

FINANCIAL POVERTY

Managing periods hygienically and comfortably costs money. Many people do not have adequate access to menstrual products for financial reasons.

A 2017 study surveying one thousand girls and women in the United Kingdom revealed that one in ten 14- to 21-year-olds have been unable to afford menstrual products (Astrup 2018, 40). Menstrual products are not a trivial expense. A box of twenty tampons, a typical amount to go through in one period, usually costs around \$5 in Canada.

In many parts of the world, menstrual products are considered to be non-essential items, and are taxed as “luxury items” at a higher sales tax rate. In the majority of the states in the United States, this is the case – but men’s erectile dysfunction medication, on the other hand, is considered an essential item and is not taxed – and food stamps cannot be used to buy menstrual products in these states (AMWA 2019).

The financial burden of accessing menstrual products disproportionately affects people living below the poverty line, in low-income regions, or in times of emergency such as natural disasters and conflicts (UNICEF 2018).

B.Y.O.T. (Bring Your Own Tampon)

Menstrual products are an essential item for people who menstruate. They are just as necessary as toilet paper. Therefore, here in Canada, why is toilet paper always provided for free in washrooms everywhere outside the home – schools, workplaces, businesses, public spaces – but menstrual products are not? Why do we just accept that girls and women are required to supply and bring their own pads and tampons with them wherever they go? What happens when a woman is unprepared? Some washrooms have coin-operated pad and tampon dispensers, but oftentimes they are out of order or not even provided at all. Imagine if toilet paper dispensers were coin-operated, or if a “bring-your-own” policy applied to toilet paper, just as it does for menstrual products. This is why menstrual activists are fighting to have menstrual products provided for free in washrooms.

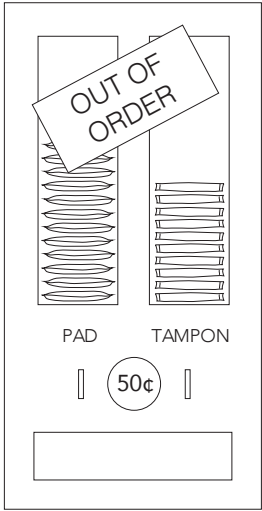


Figure 11: Out-of-order coin-operated pad and tampon dispenser.

Advocacy for Free Menstrual Products

There has been some recent progress in British Columbia. In March 2019, the United Way of the Lower Mainland launched Period Promise, a campaign that collects funds and menstrual products to help more people have access to the items they need. In April 2019, a ministerial order was passed requiring all B.C. public schools to provide free menstrual products for students in school washrooms by the end of 2019. In June 2019, the City of Victoria voted to provide free pads and tampons at community and recreation centers, public washrooms, and other civic facilities; and in March 2020, the City of Vancouver did the same (St-Denis 2020).

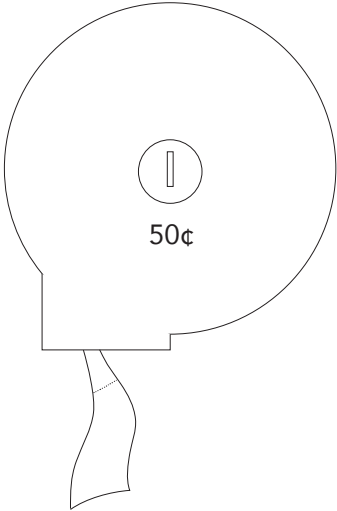


Figure 12: What if public washrooms had coin-operated toilet paper dispensers?

SOCIAL POVERTY

Inadequate access to menstrual resources is not just a financial problem, it is also a pervasive social issue. The widespread stigma that exists around menstruation and the inadequate education that children receive around the subject leaves girls inadequately informed to manage their periods comfortably and access the support they deserve. In the same U.K. study previously mentioned, more than one quarter of the girls said they did not know what to do when they got their first period, and one in seven said they did not even know what was happening. Nearly half of the girls said they were embarrassed by their periods (Astrup 2018, 41). Periods are a normal biological process. It is important that girls and boys are educated about menstruation *before* the age of menstruation, and continue to have access to information and support throughout their lifetime.

Sex Education

In Canada, the sexual education curriculum in schools varies widely across the provinces, as do people’s opinions on what topics should and should not be included and in what grade the topics should be taught. Historically, sex-ed curricula in Canada have primarily focused on the prevention of unwanted pregnancies and sexually transmitted infections. I know this was the case in my personal experience in the B.C. public school system in the 1990s and 2000s. In retrospect, there are many reasons why I think the sex education I received in school was inadequate, and I can see now that the inadequacies often were a reflection of the gender inequality that exists in our society.

For instance, in the few sex-ed classes that I had throughout elementary and high school, I can remember learning about menstruation once in Grade 7 and once in Grade 10. Both

times, the girls were separated from the boys during this part of the lesson, sending the message that menstruation is a girl’s “dirty little secret” that should be hidden from the boys, something that only girls and women should know about and need to deal with on their own. Menstruation is an integral part of sexual reproduction, so how was it justifiable to not educate boys about it?

Compare this to the fact that we (boys and girls) learned about the male orgasm, but not the female orgasm. It is likely fair to assume that the male orgasm was discussed because it is required for a pregnancy to happen – and after all, the main goal of sex-ed back then was to teach us how to prevent unwanted pregnancies – whereas the female orgasm is not required for pregnancy and was therefore excluded from the discussion. However, this reinforced the idea that female sexuality is something private and to be hidden, while male sexuality is natural and important enough for both sexes to learn about. This also sent the message that male sexual pleasure is essential and to be expected, and female pleasure is not – because it was never even acknowledged.

Although sex education curricula have certainly changed since I was in school – topics such as gender identity, sexual orientation, masturbation, personal and cultural preferences, and consent are now included in many schools across the provinces – the changes have not always been progressive. In 2018, Ontario Premier Doug Ford of the Conservative Party repealed the sex-ed curriculum that had previously been implemented by the Liberals in 2015, and replaced it with the 1998 curriculum. This was because some social conservative groups had opposed the Liberal curriculum, arguing that the classroom was not the place to learn about the aforementioned topics (Gollom 2018). This decision received enough backlash that a new version of the curriculum, similar to the 2015

version, was released one year later in 2019. However, some of the contested topics are not mandatory lessons, and there continues to be an option for parents to have their children opt out of these lessons (Jones 2019).

What has not changed is the fact that sexual education is a challenging subject in which it is difficult, if not impossible, to satisfy everyone. Globalization continues to bring people together from different parts of the world to create new, diverse communities representing many different personal and cultural values and norms. I recognize the challenge in reaching consensus on a subject like sex education when there is such a wide array of viewpoints and opinions to represent and respect.

However, no one should feel embarrassed or ashamed because they menstruate. What is embarrassing and shameful is that our society continues to treat menstruation as something embarrassing and shameful. So, what is the solution?

We must teach girls and boys, together, about the physical, personal and social aspects of menstruation... We need to encourage open discussion and better equip girls with tools and information to manage their periods effectively, without shame or embarrassment (Astrup 2017, 41).

Misinformation or a lack of information around menstruation plays a big role on perpetuating stigma and discrimination, and prevents everyone from understanding the importance of menstruation and normalizing it (UNICEF 2018).

Access to Resources and Education

Lack of access to menstrual products and menstrual education causes many girls to stay home and miss school, or use makeshift solutions like wearing a sock, toilet paper, or a scrap of fabric and hope for the best (Astrup 2017, 40). A child should never have to make that choice. Menstruation is natural and necessary, and should never get in the way of a child’s access to education. Unfortunately, it does get in the way – and this disadvantage only ever applies to girls, never boys. The impact of period poverty on access to education affects girls everywhere in the world, however it is especially pervasive in low-income regions (UNICEF 2018).

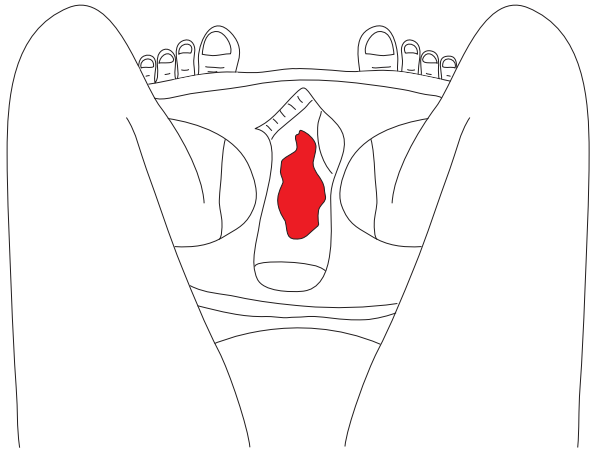


Figure 13: *Makeshift period pad.*

ARCHITECTURE?

What is the role of architecture and design in all of this?

Design can be used as a tool to challenge social norms, and make our lives a bit more comfortable. Why not use architecture to help break down the financial, social, and educational barriers that people experience because of menstruation? Why not design spaces that help make menstruation a more comfortable and positive experience?

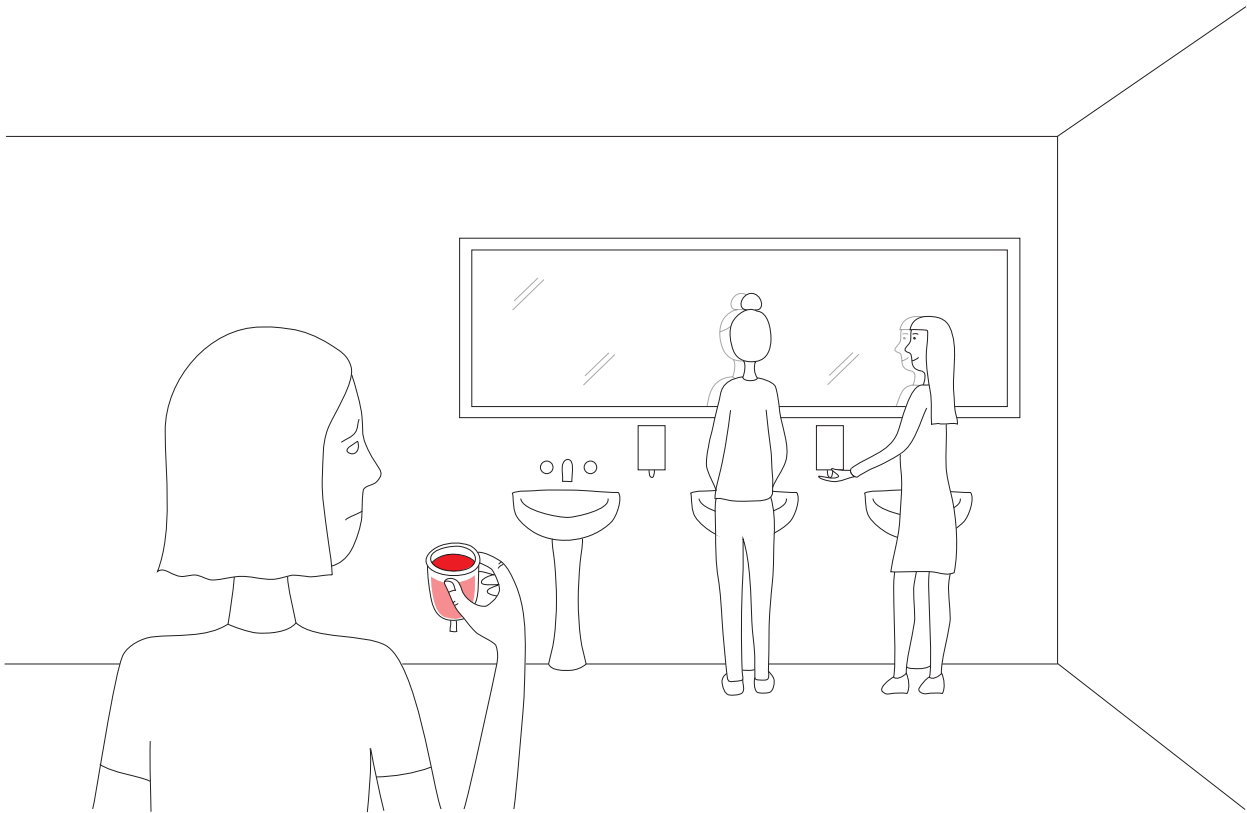


Figure 14: Cleaning a menstrual cup in a public washroom can be awkward.

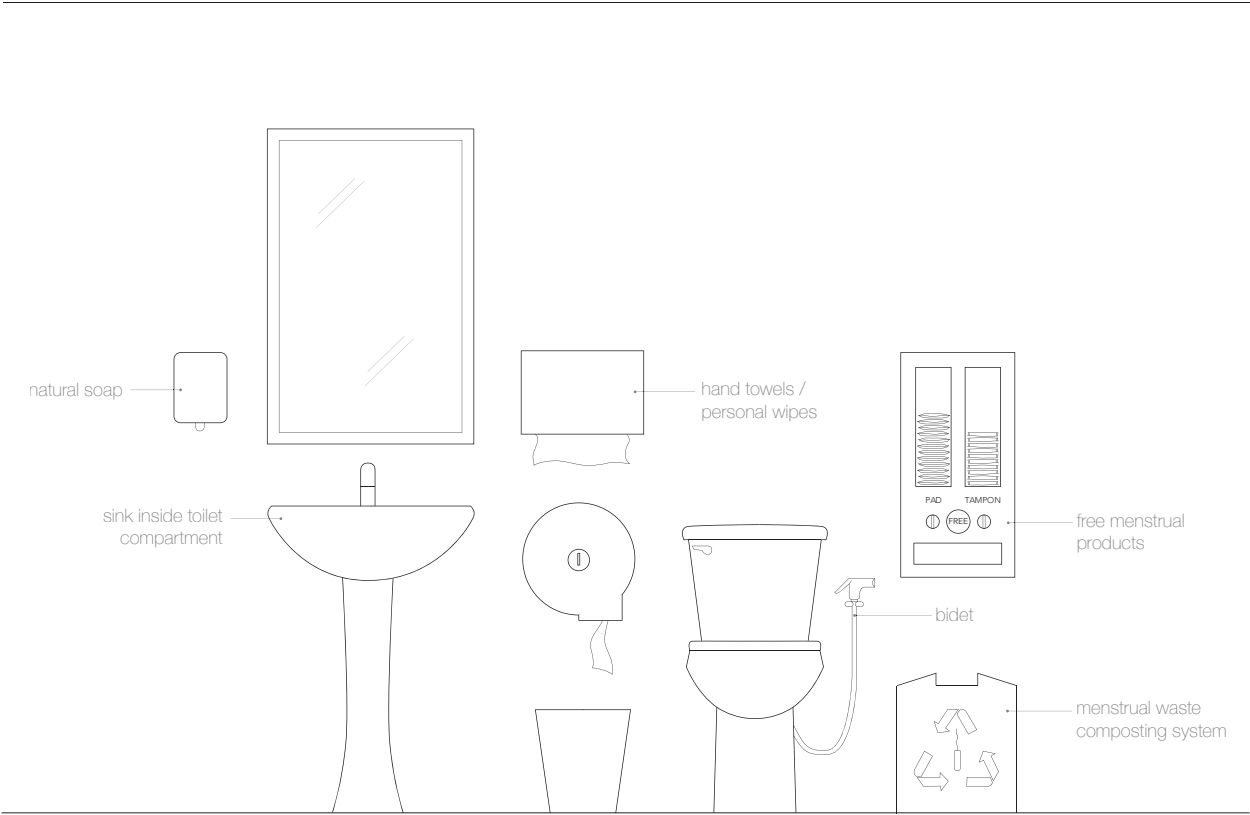


Figure 15: Period-friendly public washroom.

MENSTRUAL MANAGEMENT TECHNOLOGY

A HISTORY OF MENSTRUAL PRODUCTS

Menstrual products as we know them today have not always been around. Up until relatively recently, women were left to their own creative devices to manage their periods. Women have used a variety of absorbent materials such as moss, wool, grass, wood chips, paper, sea sponges, animal skins, and fabrics to catch their menstrual flow, depending on the materials available at a given place and time. I will limit my exploration to the menstrual hygiene technologies that have existed in North America since the 19th century.

I am including an overview of the history of menstrual technology because these products are literally and figuratively a material representation of attitudes towards menstruation and available menstrual support. I also think that architectural responses that seek to support women during menstruation could potentially draw inspiration from menstrual technologies.

Homemade Sanitary Napkins

Prior to the commercialization of menstrual products towards the end of the 19th century, women generally produced their own “sanitary napkins” by folding and sewing cotton, gauze, flannel, or rags. They pinned these homemade pads onto homemade cloth “sanitary belts” or directly onto their underwear, and washed and reused them each month. In addition to, or as an alternative to homemade napkins, some women used “sanitary aprons,” a rubber apron with a strip that ran between the legs worn underneath skirts. Not surprisingly, these were often uncomfortable and smelly. These solutions also posed issues of cleanliness and hygiene, as unwashed or improperly cleaned napkins could lead to infection (Vostral 2008, 64).

MANUFACTURED DISPOSABLE PRODUCTS

General attitudes towards menstruation in the 19th century were very undermining and limiting to women. In the 1870s and 1880s, a scientific view of menstruation took over, in which menstruation was increasingly seen as a “condition, disease, debility, ailment, disability” that incapacitated women, rendering them weak and feeble. Physicians advised women and girls to stay home to take mandatory rest from school and activities during their periods. Menstruation was seen as a vile, unsanitary excretion from an uncivilized, unhealthy body. These views framed menstruation as a problem lacking control and hygiene. However, they also helped spark the development of new menstrual management solutions (Vostral 2008, 4).

The rise of industry during the late 19th and early 20th centuries spurred the manufacturing of menstrual products. As factories and businesses increasingly relied upon women labourers, especially during wartimes, the need for women to efficiently and effectively manage their menstrual flow grew (Vostral 2008, 4). Women’s menstrual cycles were no longer just for women to deal with on their own; they were now of importance to industrial production, since women were missing work because of their periods (Vostral 2008, 100). Also, as industry was increasingly offering solutions to many of life’s daily struggles, it was just a matter of time until menstruation became the subject of technological management and mass production (Vostral 2008, 5).

Period Pads / Sanitary Napkins

Johnson & Johnson produced the first mass-produced sanitary napkins in 1896 (Vostral 2008, 64). However, manufactured, disposable, gauze-covered cotton pads did not gain traction until 1921, when Kotex sanitary napkins were first marketed and sold (Vostral 2008, 5). The mass-production of disposable pads helped change the outlook on menstruation and women’s abilities during menses. No longer were they confined to rest at home, “swaddled in rags to catch their menstrual flow.” Women now had greater control over their bodies. During their periods, they could go about their lives with more normalcy than before, and maybe even pass as not being on their period (Vostral 2008, 61).

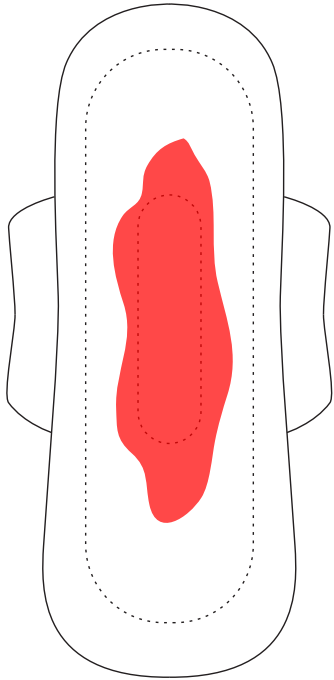


Figure 16: *Period pad.*

Tampons

Soon after, a new menstrual technology entered the scene that addressed some of the shortcomings of pads. Also known as “internal sanitary napkins,” tampons were first used to manage menstruation in 1927. Tampax, the first commercially available tampon, was patented in 1931. Based on surgical devices that originated several decades earlier to stop bleeding in large wounds, the first tampons were made very similarly to how they are today: an absorbent core made of wood fiber, cotton or wool, rolled in gauze or cellulose to contain the core, with a string to remove it (Vostral 2008, 75-76). Compared to pads, tampons allowed women to hide their periods even better since they are worn internally. Blood and scents were now contained within a woman’s body, and there were no visible outlines under clothing (Vostral 2008, 59).

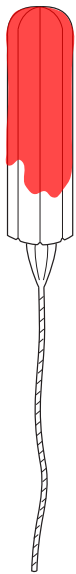


Figure 17: Tampon.

Few Improvements

Surprisingly few changes have been made to pads and tampons to improve their comfort and effectiveness, although there have been some minor improvements. Pads are now made thinner, with flattened and tapered ends, and a wing design to conform to curves better than the original rectangular shape (Vostral 2008, 79). Adhesive was added to the underside of pads to keep them in place, reducing chafing and eliminating the need for pinning to underwear (Vostral 2008, 154). Disposal telescopic applicators are often provided with each individual tampon, allowing insertion with less effort and contact with the genitals. To make removal of tampons easier, the cotton cores are now stitched in such a way to restrict their expansion width-wise. To accommodate different menstrual flow intensities, both pads and tampons come in a variety of sizes and absorbances (Vostral 2008, 77).

Health Concerns

Some changes, however, have had negative consequences. In the 1970s, tampon and pad manufacturers started using synthetic materials like foam, polyester, rayon, thickening agents, and glues, many of which have been known to contain toxins, pesticides, dyes, fragrances and bleaches (DaSilva 2018, 74; Vostral 2008, 162). The use of these materials in tampons has been linked to causing toxic shock syndrome (TSS) because they can create the perfect conditions to promote growth of staph bacteria. If a woman’s immune system is unable to thwart the bacteria, the bacteria produce toxins and release them in the body, causing flu-like symptoms, and in worst cases, death (Vostral 2008, 157). In the last couple decades, many tampon companies have made efforts to “clean up” their materials; however, many brands continue to use harmful chemicals. The use of tampons still comes with the risk of TSS, and although warnings are provided on all tampon boxes, many women accept this risk because

they do not have many other options. Similarly, testing of Always brand pads in 2014 found the presence of numerous known carcinogens and reproductive toxins, including chloroform and acetone (Criado-Perez 2019, 57).

“This market based on secrecy has created a market of users who do not know the contents of their menstrual products nor think about the possible health and environmental consequences associated with them” (DaSilva 2018, 74). While disposable menstrual products have in many ways made it easier for women to manage their periods, their success is largely based on the societal norm of hiding menstruation. This has created a multi-billion dollar market that reinforces and capitalizes on women’s insecurities around their periods.

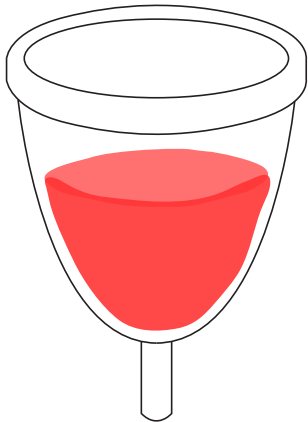


Figure 18: Menstrual cup.

REUSABLE MENSTRUAL PRODUCTS

Menstrual Cups

The menstrual cup – a bell-shaped, reusable, internally-worn device that collects menstrual flow – is becoming a popular choice among menstruators today. The first prototypes actually date back to the 1860s, although they were quite different from the designs we know today. Some were attached to a belt, and some even had valves to empty the device without having to remove it. In 1937, the first modern menstrual cups similar to the ones we know today were introduced. However, the idea of washing and reusing a product did not catch on in a time when disposable products were becoming all the rage. It was not until the 1980s when The Keeper menstrual cup, made of latex rubber, was sold with success. In the 2000s, flexible medical grade silicone changed the menstrual cup game, and many brands like Diva Cup, Mooncup, and Lunette joined in with great success (Lunette, n.d.).

Advantages

Compared to disposable single-use pads and tampons, menstrual cups collect rather than absorb menstrual fluid. They must be removed, emptied and rinsed every 12 hours, as opposed to tampons and pads, which must be changed every 4-8 hours. They are also less prone to fostering bacteria, and are reusable for many years, which reduces waste sent to the landfill and saves money.

Up until 2017, I primarily used tampons. Since switching to a menstrual cup, I have become much more aware and understanding of my menstrual flow, and I hardly ever worry about leakage or changing it throughout the day. Plus, I no longer have to spend money on buying tampons every month. I would never choose to go back to using disposable pads or tampons.

Reusable Pads

There has been a recent resurgence in the use of reusable cloth pads, both handmade and manufactured. Since the 1990s, several new companies have started up, selling reusable pads often available in fun patterns. There are also plenty of do-it-yourself tutorials online demonstrating how to make your own – similar to how it was done over a hundred years ago.

Period Underwear

Period underwear is the most recent addition to the menstrual management product options available to menstruators. Period underwear can be worn during menstruation as a substitute for or supplement to traditional menstrual products. THINX, founded in 2011, was the first brand to patent this idea. Their layered design provides absorbency as well as moisture-wicking, bacteria resistance, odour control, and leak resistance. They have a black gusset at the crotch to camouflage any staining, though their material is supposedly stain-resistant. They are also free of harmful chemicals. Depending on the style, one pair of underwear holds up to 2-4 regular tampons’ worth of fluid, yet they are thinner than most pads and look like normal underwear – not like a diaper (THINX, 2015).



Figure 19: THINX period underwear advertisement (THINX 2015).

ARCHITECTURE

Women’s Parlour Spaces

Menstruation has also been managed through architecture. As women were participating more in the workplace and public life in the late 19th century, policymakers began to support “menstrual debility” by manipulating public spaces to better accommodate women. “New architectural spaces were cordoned off for the exclusive use of women, spaces that were seen to offer protective havens in the dangerous public realm” (Kogan 2007, 27).

In accordance with medical and psychological recommendations that women rest during their periods, women-only lounge spaces were created in factories, businesses, and a range of other public spaces including railroad cars, libraries, department stores, and restaurants. Referred to as “women’s parlours,” these spaces were generally furnished in a similar manner to a private home, reflecting women’s association with domesticity and the private sphere. They often contained couches, chairs, a fireplace, and domestic-looking carpets and window treatments (Kogan 2007, 31). In these spaces, a woman could “seek comfort and rest her weak body” when she was feeling dizzy, faint, or in pain (Kogan 2007, 44). Women’s parlours in workplaces also provided cots for women to lie down, so that they might lose only a few hours of work instead of going home and taking an entire sick day. These spaces were generally adjacent to or integrated with the women’s toilet facilities, offering discreet access to the toilet (Vostral 2008, 103).

While they did offer some support for women, women’s parlours also reinforced the cultural message that women’s bodies are weaker, in need of special protection, and should remain private and discreet (Kogan 2007, 34).

Menstrual Architecture?

I have provided this summary of the history of menstrual products because I think there may be something to be learned from the materials and technologies that have been employed, and how they engage with the body. Tampons and menstrual cups are worn internally, inside the body. Pads and period underwear are worn externally, on the body. What if we were to zoom out another level and consider architectural elements – furniture, surfaces, rooms – as menstrual technology? What lessons can we learn from traditional menstrual products and apply in designing “menstrual architecture”?

An exploration of the material properties and management mechanisms of menstrual pads, tampons, cups, and underwear – absorbency, collection (of fluid), camouflage, colour, layering – could be a valuable source of inspiration for architectural solutions. Furthermore, menstrual products have not changed that much in decades, aside from relatively recent momentum towards more healthy and sustainable options. This indicates to me that there is a need for better solutions for managing menstruation, and I see this as an opportunity to implement a larger-scale support system that engages with architecture.

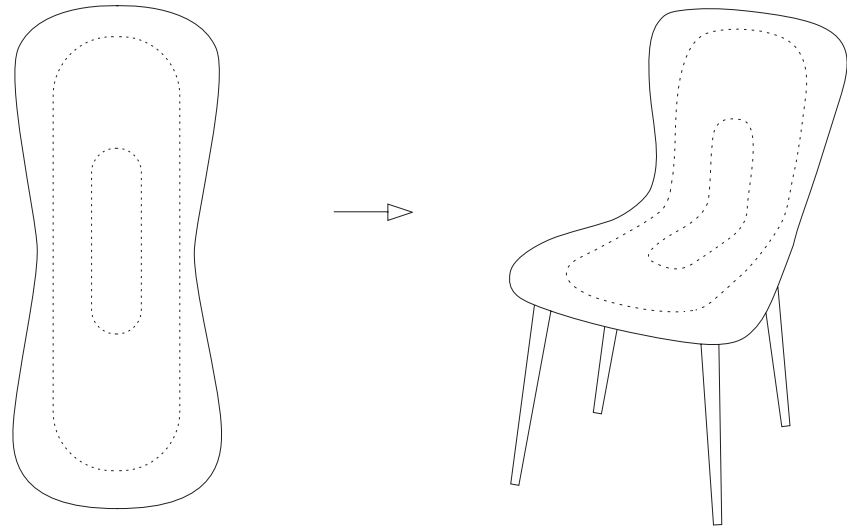


Figure 20: *Period pad inspired chair.*

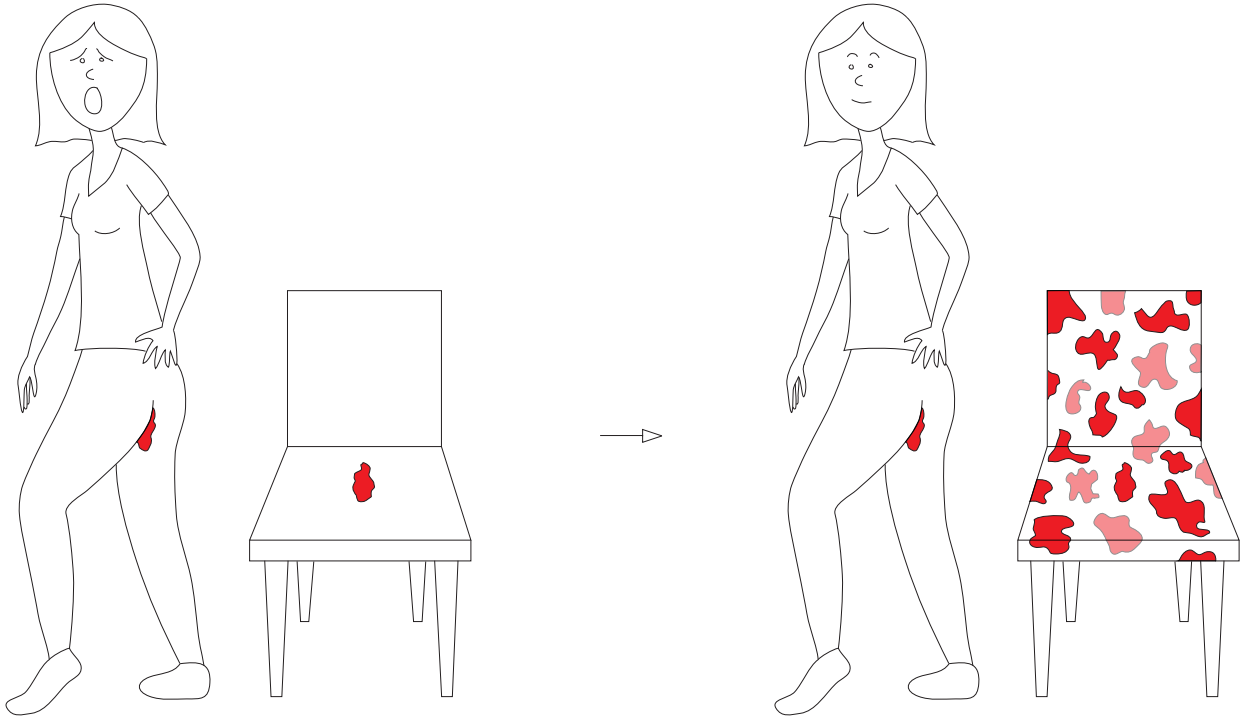


Figure 21: *Period camouflage chair.*

NATURE AND ENVIRONMENT

MENSTRUAL FLUID AS PLANT FERTILIZER

Since I started using a menstrual cup several years ago, I feel like I have a significantly more positive relationship with my period. I am much more aware of my flow intensity and patterns, and consequently feel more connected with my body. This feeling has increased exponentially since I started recycling my menstrual fluid in an unconventional yet meaningful way: as plant fertilizer.

Menstruation is the shedding of the uterine lining, which contains nutrients that would help grow a baby, if woman were to get pregnant. While it may not necessarily provide the optimal ratio of nutrients for growing plants, surely there is something in menstrual fluid that is beneficial to plant growth, too. When I need to empty my menstrual cup and I am at home, rather than discarding the fluid into the toilet, I mix it with water and feed it to my houseplants. I like to think of it as giving them a "natural multivitamin."

While I have not conducted a regimented scientific experiment to prove it, I strongly believe that this practice has promoted the growth of my plants. Whenever one of my plants is looking a bit unhealthy, I will give it some of my natural monthly fertilizer; and within a month, the plant almost always looks healthier. It seems to help yellowing leaves become a dark vibrant green and promote the growth of new leaves.

Whether this is truly happening and is a result of my menstrual fertilizer, or if it is just a psychological placebo-type effect, I do not know. Either way, personal benefits I experience are undeniable. Not only have I become more aware of my own menstrual cycle, I feel a greater sense of connection to my own body and to nature – and connection between the two. It has been quite empowering.



Figure 22: *My coffee plant, before and after receiving five cycles of menstrual fertilizer.*

Is Menstrual Fluid a Biohazard?

I realize that the practice of using menstrual fluid as plant fertilizer may seem weird or gross to many people. When I first learned about it, I too had my apprehensions, mostly around the question of whether or not it is safe and hygienic. Unfortunately, a Google search on the subject will yield strong opinions for both sides; some people swear by it, while others condemn it. The latter is an unsurprising reflection of the tabooed status of menstruation. Similarly, there has been very little scientific research done on the potential health and pathogenic concerns of menstrual fluid (DaSilva 2018, 74).

That being said, menstrual fluid is not currently classified as a regulated biohazard. Biohazardous waste is described as waste that “may be contaminated by blood, body fluids or other potentially infectious materials” and must be collected

by a licensed biohazardous waste hauler. Although menstrual fluid is commonly referred to inaccurately as “menstrual blood,” only half of its contents is actually blood. Vaginal secretions of water, electrolytes, and proteins, as well as cervical mucus and endometrial tissue make up the other half of menstrual fluid (DaSilva 2018, 74).

Current Disposal Methods for Menstrual Waste

The current standard methods for disposing menstrual waste do not treat it as a pathogenic concern. In public washrooms, “sanitary bins” are lined with plastic or wax paper bags to protect janitorial staff from coming into physical contact with the bin’s contents, which are then discarded into the regular waste management system and end up in the landfill. Menstrual waste from private homes is treated like any other non-hazardous waste. If menstrual waste were truly a health risk, there would already be special disposal practices in place for it (DaSilva 2018, 76).

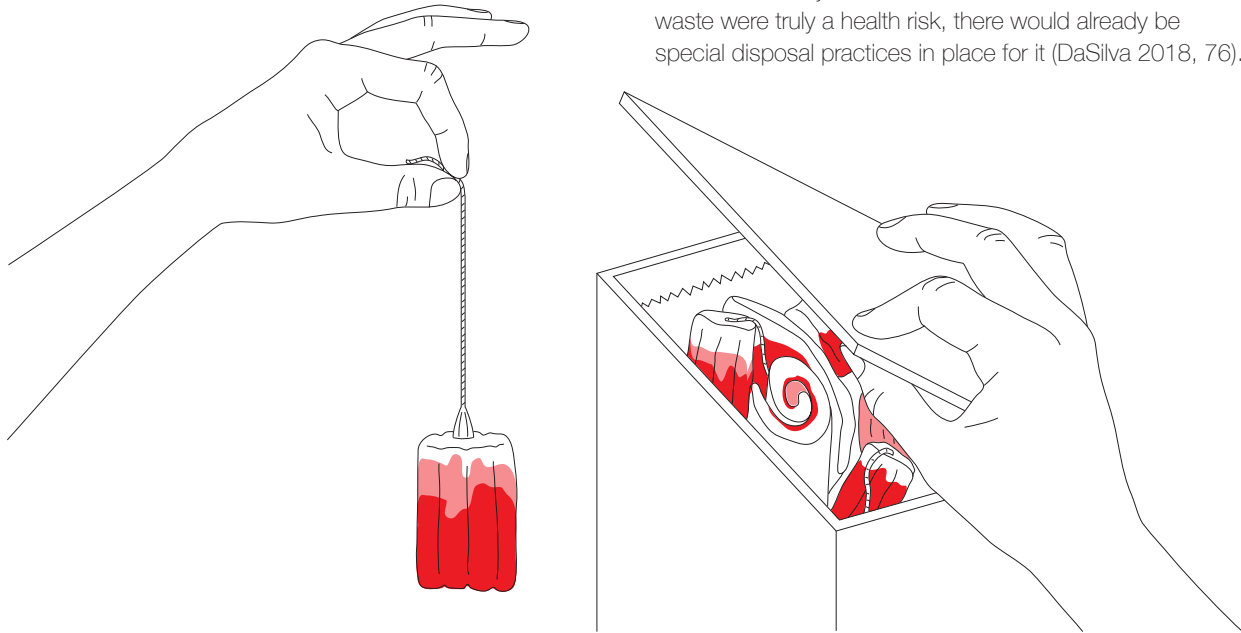


Figure 23: “Sanitary” bin.

COMPOSTING MENSTRUAL WASTE

If menstrual fluid is not considered a biohazard, and our existing methods of menstrual waste disposal are unregulated, then why should the alternative disposal solution of recycling menstrual fluid into plant fertilizer not be taken seriously? And even if menstrual fluid does potentially carry pathogens, that does not automatically exclude it from being compostable.

In fact, there are already other “unconventional” waste materials of known pathogen-carrying potential that are commonly managed through composting methods, such as animal carcasses and baby diapers. Similarly, blood meal, a powder derived from pig and cow blood, is commonly mixed into fertilizer for agricultural crops and plants for its high nitrogen content. Menstrual fluid also has a high nitrogen content, so why not use it for the same purpose (DaSilva 2018, 77-78)?

Composting Baby Diapers and Animal Carcasses

Composting is the process of recycling organic material and turning it into a rich soil to be used as plant fertilizer, by means of natural decay processes. Most people are familiar with common compost, which typically includes kitchen scraps, paper, and yard waste. Some manage their own compost pile in their backyard, while others use municipally managed composting programs. Composting animal waste and baby diapers is a similar process; it is just all the more important to maintain adequate temperatures, ventilation, and moisture distribution to ensure any potential pathogens are killed, which a simple lab test can confirm. The finished animal compost can be used on farm crops for non-public goods; and the finished diaper compost can be used for landscaping, although not for consumer or agricultural goods. Menstrual waste compost can certainly be used in these same applications (DaSilva 2018, 77-78).

Biodegradable Menstrual Products

Baby diapers are similar to menstrual pads and tampons in that the majority of brand-name products are disposable, single-use, and made with inorganic, synthetic materials that do not decompose in landfills. Of course, this also means that they are not suitable for composting. However, just as enough parents are choosing to buy more environmentally-friendly compostable diapers such that diaper composting has become a viable business, many women are doing the same with menstrual products. One hundred percent plant-based menstrual products, like organic cotton tampons, are increasing in popularity and are completely biodegradable (DaSilva 2018, 78). If there were greater awareness around the potential compostability of menstrual waste, and if regulated composting systems were in place such that potential health hazards would be properly contained, then perhaps more women would opt for compostable menstrual products.

ENVIRONMENTAL ADVANTAGES

“It is no longer an issue of *if* it is possible to compost menstrual waste, but *what* is stopping this venture from realization” (DaSilva 2018, 79). If menstruation were not so stigmatized, the idea of composting pads and tampons would probably be received with much more support and enthusiasm. If people accept that we can compost things like baby diapers and animal carcasses, then there is no reason why menstrual waste should not be the next thing to compost.

The average woman has at least 400 periods over her lifetime, during which she will use over 11,000 disposable tampons and pads. That is a lot of trash being sent to landfills. Single-use products each serve their purpose after just 4-8 hours of use, and then take hundreds of years to decompose in landfill conditions (DaSilva 2018, 74). On the other hand, composting menstrual waste would create a regenerative system – a cycle in which women give a part of themselves back to the earth.

In the meantime, until such a system is in place, I highly encourage women who are interested to practice this on a personal scale by feeding their menstrual fluid to their houseplants.

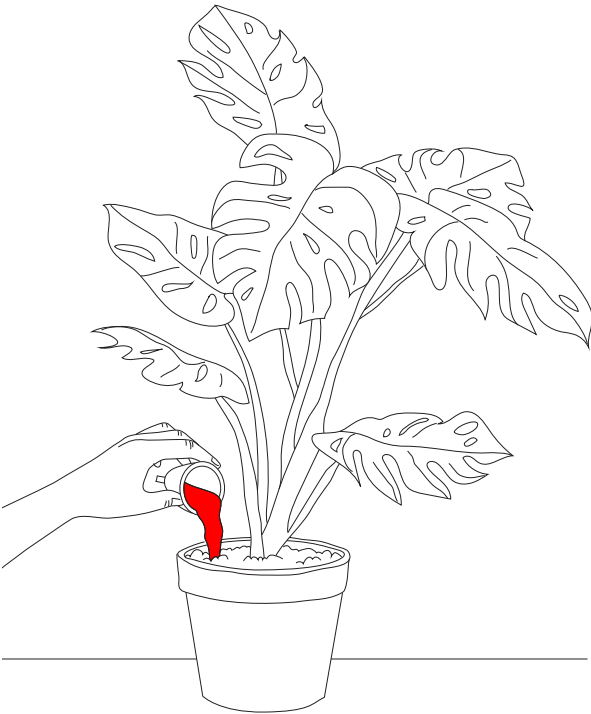


Figure 24: Menstrual fluid as plant fertilizer.

CHAPTER 3

PRECEDENTS

The following precedent studies have been influential to this thesis. I have also included two of my own studio projects from last year, when I first began exploring menstruation as a subject of design.

These projects represent a wide range of media and scales – photography, furniture, art installations, performance, spatial analysis, building design. As I completed my GP1 research, I was unsure how these bite-size pieces would come together to form a substantial and cohesive GP2 design project. But sure enough, through the design process, I was able to integrate the lessons learned from these precedent studies and create a holistic project – a whole world.

PRECEDENT STUDIES

DOING FEMINISM IN ARCHITECTURE

Olivia Daigneault Deschênes, 2018

Olivia Daigneault Deschênes's Master of Architecture thesis explores how a feminist approach to architecture might contribute towards better gender equality within the discipline of sexual healthcare, looking specifically at the gynaecological exam room.

Women, once sexually active, are recommended to visit the doctor once every year for a gynaecological check-up. This practice is broadly accepted and unquestioned, though the male equivalent is generally not required as frequently. Olivia demonstrates how the practice of gynaecology functions as a means of control over women's bodies and sexuality. She questions how architecture reinforces this, and how it can be used as a tool to change this (Daigneault Deschênes 2018, 39-41).

Her project does not seek to design a better exam room design, but rather to deepen our understanding of how implicit gendering and patriarchy manifests in the design of these spaces. Thus, she uses the experimental design methodology of *feminist critical spatial practice*, in which she explores five design experiments. Each one

explores an alternative exam room design, proposes a different argument, and applies a different methodology – for instance, materiality, exaggeration, absurdity, irony, symbolism – in representing abstractions of the social forces that operate in the space of the gynaecological exam room (Daigneault Deschênes 2018, 66-69).

Olivia's thesis has been very influential to my own work. What I find particularly effective is her use of feminist critical spatial practice. I like that her project exists somewhere in between art, architecture, and theory, and how therefore her designs are not entirely realistic but also not entirely metaphorical. I intend to employ a similar method for my design project.

I also think that her choice of the gynaecological exam room as the site was very powerful, as she clearly explains how the practice of gynaecology has historically been a form of patriarchal control over women's bodies and sexuality. This inspired me to focus on women's reproductive health, and ultimately menstruation, in my own research on issues of sexual and gender inequality.

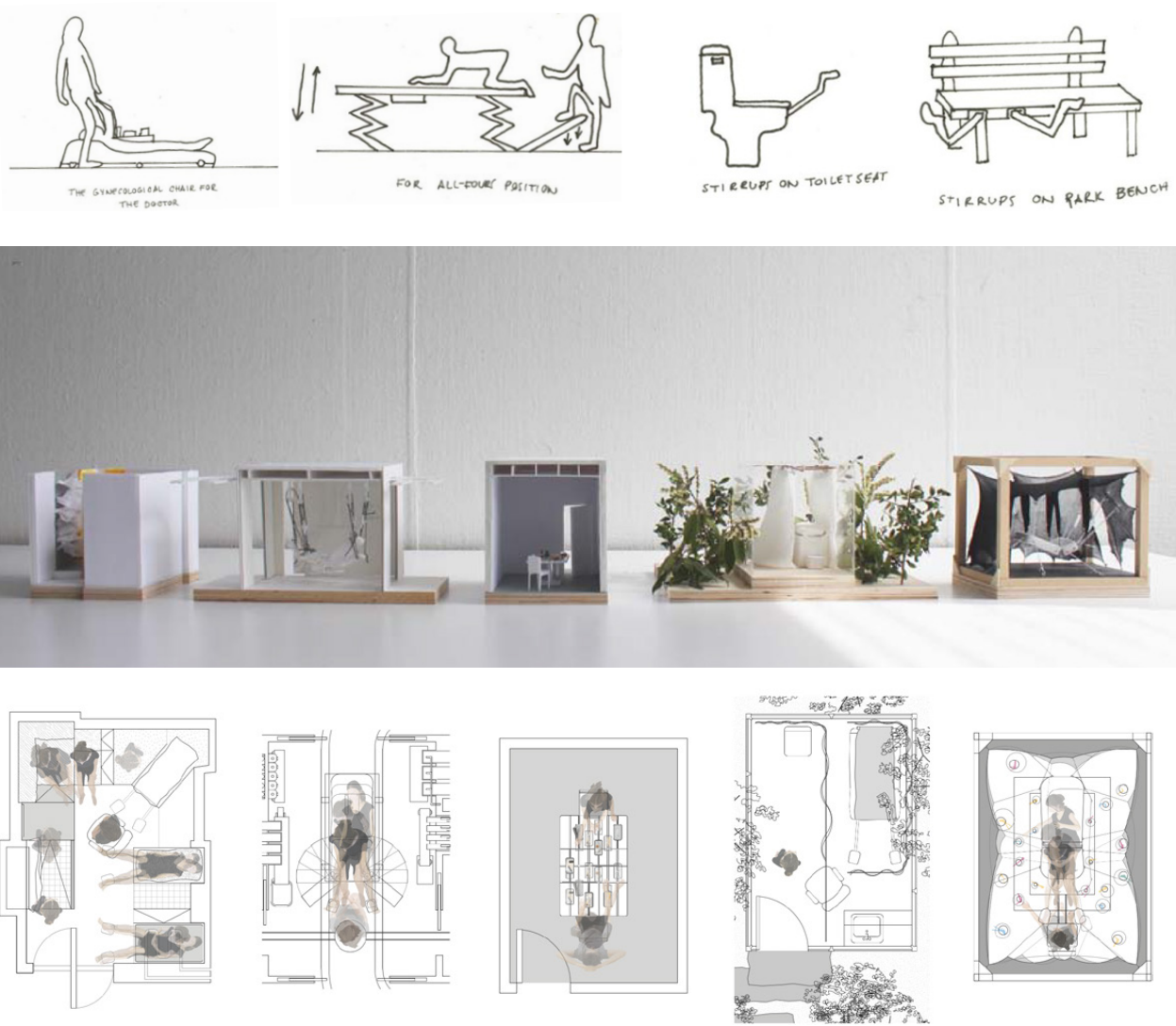


Figure 25: *Doing Feminism in Architecture* – sketches, physical models, floor plans (Daigneault Deschênes 2018, 67 & 105-107 & 147).

WARM WALL

Lauren Lee, 2017

In response to the systemic exclusion of women as subjects of design, and more specifically in response to the lack of public amenities designed to serve women during their periods, Lauren Lee designed *Warm Wall* for her industrial design master's thesis. It is a heated wall for public washrooms that provides women with "a place to lean, alleviate cramps, and commiserate with a friend, or be alone in the bathroom." Aimed at helping to break taboos around menstruation, the design is centred around the fact that menstruation is one of the few things that all women experience. Warm Wall provides space that acknowledges and supports menstruation as a common and shared experience, challenges the social norm of secrecy around periods, and provides support and relief for the physical and emotional symptoms of menstruation (Lee 2017).

I like how this project takes on the complexity of menstruation as a social, communal, and physical issue, and yet offers a highly refined solution that is distilled down to a single building element: a wall. At the same time, I do wish that it were more visible to men, since their awareness and involvement around these issues are absolutely necessary to destigmatize menstruation. I could see Warm Wall being implemented not just in women's washrooms, but in public spaces that are more accessible to everyone, like at subway stations and bus stops.



Figure 26: *Warm Wall* (Lee 2017).

HEER BREASTFEEDING BENCH

52hours, 2018

Prague-based design studio 52hours came up with the idea for *Heer* when they witnessed a woman being shamed for breastfeeding in a public space. Many people, including mothers, are uncomfortable with breastfeeding in public. Places that are considered acceptable for nursing, when they are even available, are often uncomfortable, isolating, and reinforce the idea that breastfeeding should always be done in privacy. *Heer* – the name being a combination of “her” and “here,” symbolizing “here is her space” – provides another option for nursing mothers.

The bench is ergonomically designed specifically for breastfeeding. The seat tilts and rotates, allowing the mother to choose the position that best suits her, and also soothe her baby by gently rocking. The shield offers privacy without being totally enclosed, and also prevents distractions to the baby while feeding. The long bench next to the nursing seat provides seating for others accompanying the mother, so she does not have to be isolated, if she so wishes (A'Design 2019).

Heer uses design as a tool to help combat the stigma around breastfeeding, another function of women’s reproductive capacity. I want to do the same for menstruation. What I especially like about this design is that it enables the user to control the degree of privacy they wish to have, providing options that cater to a range of preferences. It serves as a comfortable space where mothers are not forced to choose between feeling completely exposed or completely isolated in their experience of breastfeeding. I also like how the intervention is at the scale of furniture, and therefore can be situated virtually anywhere.



Figure 27: *Heer* breastfeeding bench (A'Design 2019).

WOMEN ON WAVES

Non-profit org. founded by Dr. Rebecca Gomperts;
Boat designed by Atelier Van Lieshout, 1999

Women on Waves is a mobile reproductive health clinic that takes advantage of free trade zones and international waters to provide abortion services to women who live in countries where abortion is illegal. The clinic is contained within a shipping container, which is secured onto a ship, and can sail virtually anywhere. The ship docks 12 nautical miles from the coastline, beyond a country's legal border, and people are ferried to and from the clinic-on-a-ship. In addition to abortion services, the clinic also provides sex education, contraception, ultrasounds, counselling, and workshops (Brown 2013, 80-3).

What I like most about this precedent is its mobility, which allows the clinic to access a greater range of people in need and promote awareness around women's reproductive health issues on a global scale. The concept is also easily replicable, as one can imagine the possibility of there being many ships out on the water with abortion clinics on them. The tangible and mobile nature of the shipping container unit also lends to the accessibility and replicability of the concept.



Figure 28: Women on Waves mobile abortion clinic-on-a-ship (Brown 2013, 81).

THE NEW PUBLIC CONVENIENCE:
HULL’S BATH HOUSE & LADY GARDEN

Ruth Pearn, 2018

For her Master of Architecture thesis, Ruth Pearn designed a period-positive bath house as a renovation to a historic public toilet building in Yorkshire, England. Aiming to help alleviate period poverty and fight stigma around menstruation, her design has many features tailored specifically to the needs of menstruators, while being inclusive of everyone. It provides access to public toilets, baths, and showers, acknowledging the need for greater access to such public amenities in general, but particularly for people during their periods. It also hosts laundry and clothes rental services, convenient for those times when a woman is caught off guard by her period and needs a change of underwear or clothes.

The building incorporates a tampon composting scheme, which would be used to fertilize the plants in the gardens on site. It also includes a system that extracts essential oils from the plants, to be used for making soaps that would be sold on site, from which the profits would be

reinvested in running the building. The plumbing and mechanical systems are visible, which highlights to visitors the sustainable design features of the building and how its systems are connected (Block 2018).

I enjoy how the design feels like a living organism, full of interconnected systems that each serve a purpose in contributing to the wellbeing of the whole building – a self-sufficient cycle in itself. I am particularly inspired by the tampon composting and plant fertilizing scheme. I think that enabling people to see and experience such a connection between the female body and nature could help shift society’s perspective of menstruation, to be seen as something natural, beautiful, and essential to the cycle of life. I also appreciate how unashful the design is in approaching such a tabooed issue, but still with elegance and inclusivity. The design does not conceal menstruation in any way. Rather, it celebrates and supports it in a way that remains open and inviting to everyone.



Figure 29: Ruth Pearn's period-positive bath house and lady garden (Block 2018).

EXCREMENTUS MEGALOMANUS

Atelier Van Lieshout, 2019

Excrementus Megalomanus is a functional sculpture that takes a critical view of the systemic waste that accompanies waste management systems. In Western society, clean drinking-quality water is generally used to flush our biological waste down the toilet, even though other less wasteful solutions are available – like composting toilets, which can efficiently recycle every kind of human excretion. This project speculates that our “squeamishness” around bodily functions is a major part of why we have not adopted alternative solutions at a large scale. Excrementus Megalomanus is a public tower consisting of a spiral stair and a functioning compost toilet at the top. Atelier Van Lieshout describes it as a “throne, watchtower, ... living organism, ... liberté, égalité, fraternité, ... everything your heart desires, urinal, vomitorium, ... excrementorium, toilet of toilets, compost to the people” (Busuito n.d.).

I appreciate how this project has situated itself between art and architecture. As a functional sculpture placed in an outdoor public place, it reaches a wider audience and

prompts deeper reflection than if it were simply a compost toilet that looked like a traditional toilet and located inside a washroom. I think a similar positioning for my own design project could be very effective.

I also like how it plays with privacy and exposure. While the toilet-tower is very much out in the open and visible to the public, the toilet feature is located a few metres up at the top, surrounded by an opaque, waist-height guardrail. Up there, the user is less exposed, but still visible. From the ground, it simply looks like a person is sitting and looking out onto the landscape – but they are likely doing their business on the toilet.

Lastly, I like how this project puts the spotlight on bodily functions and displays composting as an effective means of waste management. Not only does this challenge social taboos, it also shows the applicability of composting systems to manage bodily waste, both of which I am interested in doing for menstruation.



Figure 30: *Excrementus Megalomanus* composting toilet tower (Atelier Van Lieshout 2019).

PERIOD.

Rupi Kaur, 2015

period. is a series of photographs as visual poetry, with the objective of challenging menstrual taboos without using words. Although the photos speak for themselves, I feel inclined to include the written prose Rupi provided alongside this project on her website, as it reflects many of the same ideas that are central to my own work:

i bleed each month to help make humankind a possibility. my womb is home to the divine. a source of life for our species. whether i choose to create or not. but very few times it is seen that way. in older civilizations this blood was considered holy. in some it still is. but a majority of people. societies. and communities shun this natural process. some are more comfortable with the pornification of women. the sexualization of women. the violence and degradation of women than this. they cannot be bothered to express their disgust about all that. but will be angered and bothered by this. we menstruate and they see it as dirty. attention seeking. sick. a burden. as if this process is less natural than breathing. as if it is not a bridge between this universe and the last. as if this process is not love. labour. life. selfless and strikingly beautiful (Kaur 2017).

I like how the photos seek to share the common nature of the experiences they are capturing, helping women know they are not alone, that these things are normal. The photos depict moments that the majority of women can certainly relate to, but which are almost never seen outside of one's personal privacy, and are often met with embarrassment, discomfort, or discontent. I admire how the photos authentically and beautifully represent the everyday realities of periods, without trying to mask or pacify them in any way.



Figure 31: Photos from Rupi Kaur's 'period.' series (Kaur 2017).

PREVIOUS EXPLORATIONS

TAMPOON

Tampoon is one of my own studio projects from 2019. It represents the monthly voyage that a woman takes during menstruation, which can sometimes take her off guard. Just as sanitary disposal bags are used to conceal the evidence of menstruation, a woman on her period is expected to do the same. Tampoon challenges this widely accepted social norm.

At first glance, a string of twelve white paper bags floats gracefully on the water. However, with each passing moment, a cloud of red releases below the water's surface, symbolic of the monthly menstrual event that a woman is expected to manage with complete discretion.

Tampons – which were packed with red powdered dye, and wrapped in white candy coating – were attached to the underside of each wax-coated paper bag. The thickness of the candy coating varied from tampon to tampon, so they dissolved at different rates. This created a shockingly delightful exhibition of spontaneous and uncoordinated “blood” releases.

The final floating performance actually helped me see menstruation in a new light: as a beautiful spectacle. I wanted this project to visualize what menstruation can be like, especially for those people who do not menstruate, and help combat the stigma around it. Tampoon certainly opened up the discussion of menstruation among my peers in the studio. The performance was presented with humour, which I think helped make it more approachable and well-received, without taking away from the importance of the subject matter.

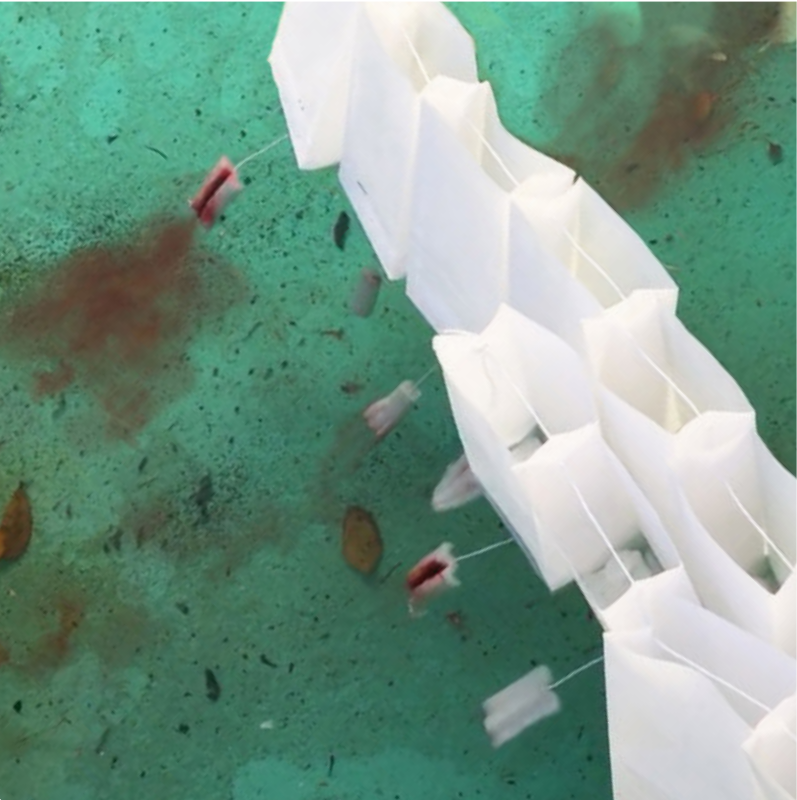


Figure 32: *Tampoon* – a floating spectacle of menstrual release.

A SPACE TO MENSTRUATE

This is another one of my studio projects from 2019. In my previous project, *Tampoon*, I discovered how the moment of release of blood into water can be really beautiful. With this next project, I wanted to design a space specifically for that one moment. *A Space to Menstruate* asks the question: What if we honoured menstruation as something beautiful, something powerful, something sacred?

You walk along the wooden dock across the water towards a long and slender wooden box floating on the water, nestled and bobbing between the piers. You enter. It is dark inside, except for the water, which is illuminated by the daylight outside. The water glows in the darkness, inviting you in. You remove your clothes, placing them on the bench. You sit here for a few moments, taking in the calm. You proceed down the steps, gradually wading into the water until it reaches your waist. You pause here. You feel the water flowing from behind you. It is quiet, except for the sound of the water. From between your legs, you release your menstrual flow, into the flow of the river.

The design of this ceremonial space marked the beginning of my inquiry into how the built environment can help better support the experience of menstruation. As I continue to explore this subject through the lens of architecture, my biggest critical takeaway from this project is the importance of designing for inclusivity and for comfort.

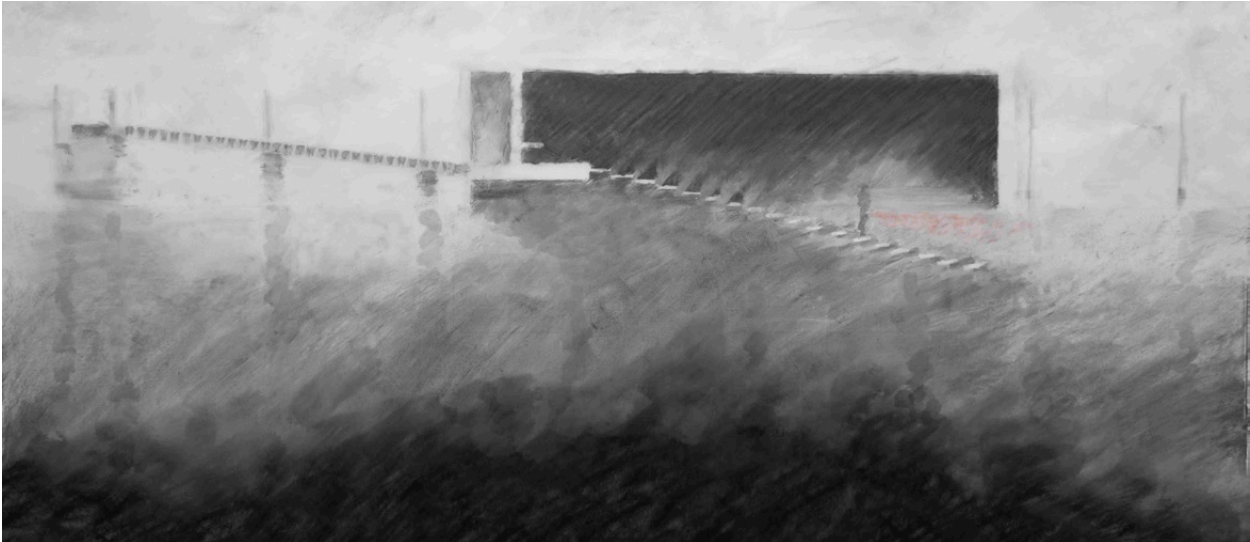
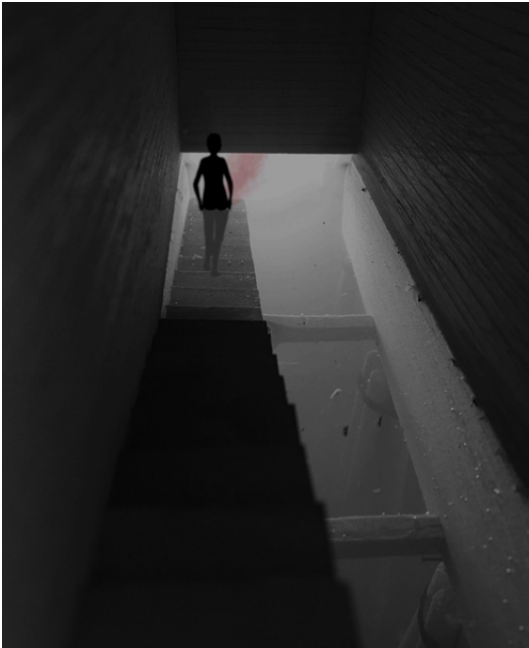


Figure 33: *A Space to Menstruate* – the moment of menstrual release, interior view, and section.

CHAPTER 4

DESIGN PROJECT

PREAMBLE

IMAGINE A MENSTRUAL UTOPIA –

*a world that celebrates the female body;
a world that reveres menstruation and its life-giving power;
a world where periods are a source of pride, not shame;
a world that offers greater support and comfort throughout
the menstrual cycle.*

The discipline of architecture has a huge tradition of designing utopias. For example, Le Corbusier conceived of Radiant City, a highly ordered and functionalist plan for a metropolis of vertical architecture and ample public space, to promote a more rational built environment and radical social reform. Frank Loyd Wright envisioned Broadacre City, a decentralized way of life based on individual property ownership, small scale farming, and modern technology.

While such utopian designs represent a wide range of social, economic and environmental ideologies, they all have one thing in common: they offer a new and improved vision of society. Even if they were never constructed, many utopian plans have produced lasting effects on how we see spaces, and how our built environment responds to social, cultural, and economic forces.

By provoking an image of a more equitable, menstruation-friendly world, I hope that the vision I am presenting in this project will make an impact, too.

I have represented this new world in the form of a graphic novel, not only because graphic novels have long been used to explore utopian and dystopian worlds. The format lends well to zooming in and out of different scales – which is necessary for this project, as it paints a holistic picture ranging from the scale of a tampon, to clothing, to furniture, to the workplace, to urban infrastructure systems. Furthermore, storytelling is a powerful tool for captivating an audience and inserting them into a different world.

And on that note, I will add one final note:

While *Adventures in Menstrual World* is a fictional story, it pulls from my personal life in many ways. The design interventions respond to my personal experiences – as a menstruator, and as a human being in general. These experiences are not unique to me; they are common to many of us. I hope that each and every person who reads this will be able to connect to this story, in one way or another.

FINAL PRESENTATION

INTRODUCTION

December 15, 2020

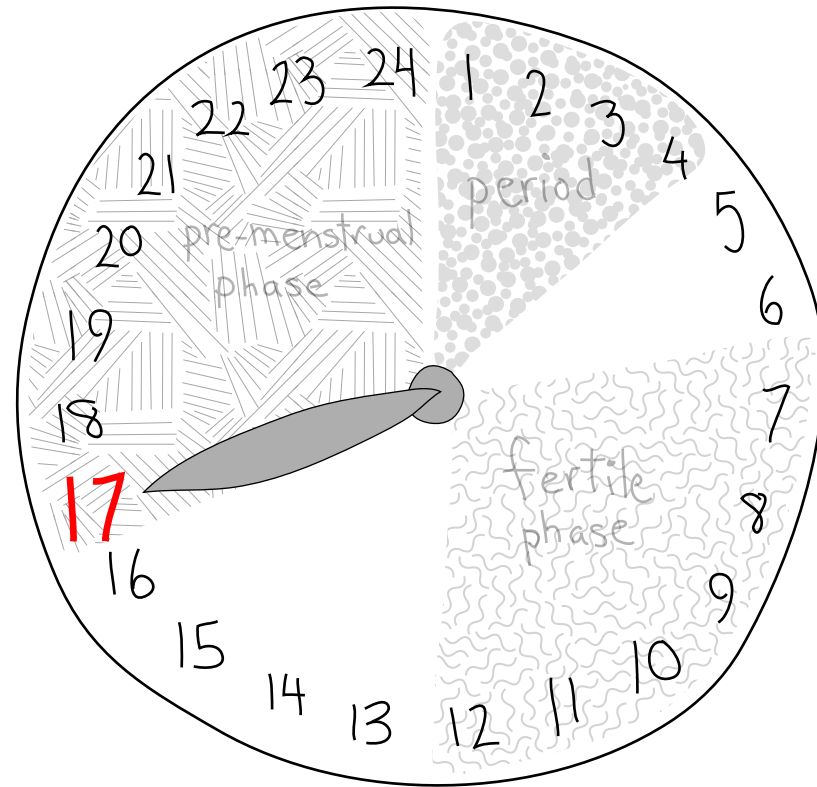


Figure 34: Menstrual cycle of Julia Booth.

Hi everyone, I'm Julia.
Today is Day 17 of my current menstrual cycle.
My cycle is usually 24 days long, give or take a day or two.

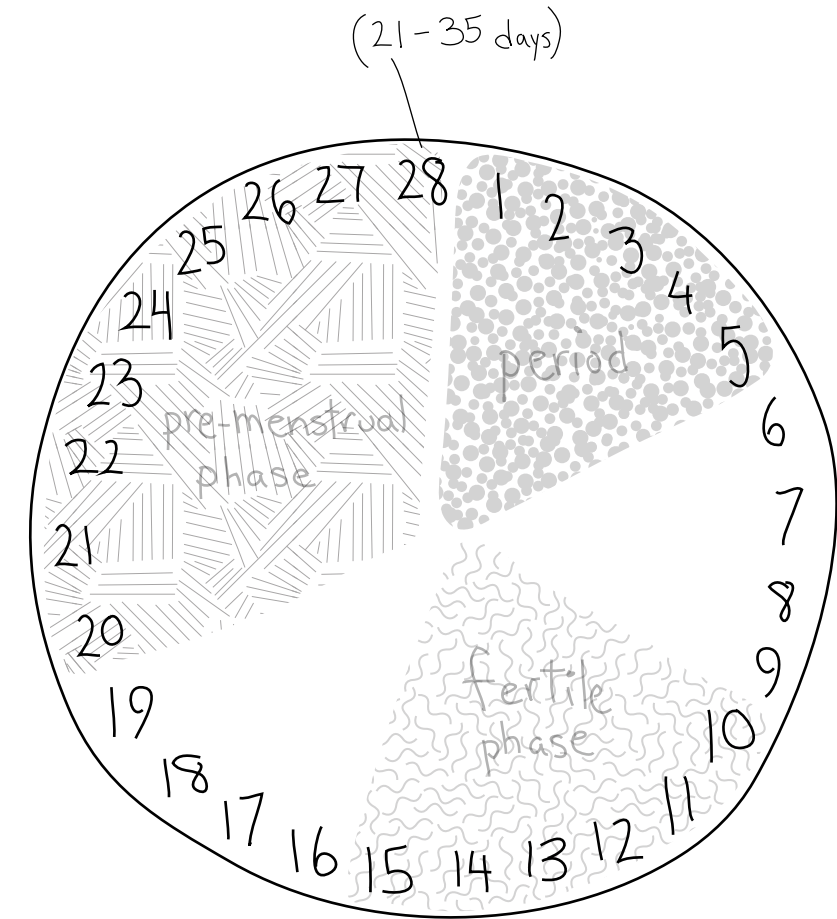


Figure 35: Global average menstrual cycle.

This is shorter than the general average of 28 days,
but it's within the "normal" range of 3-5 weeks.

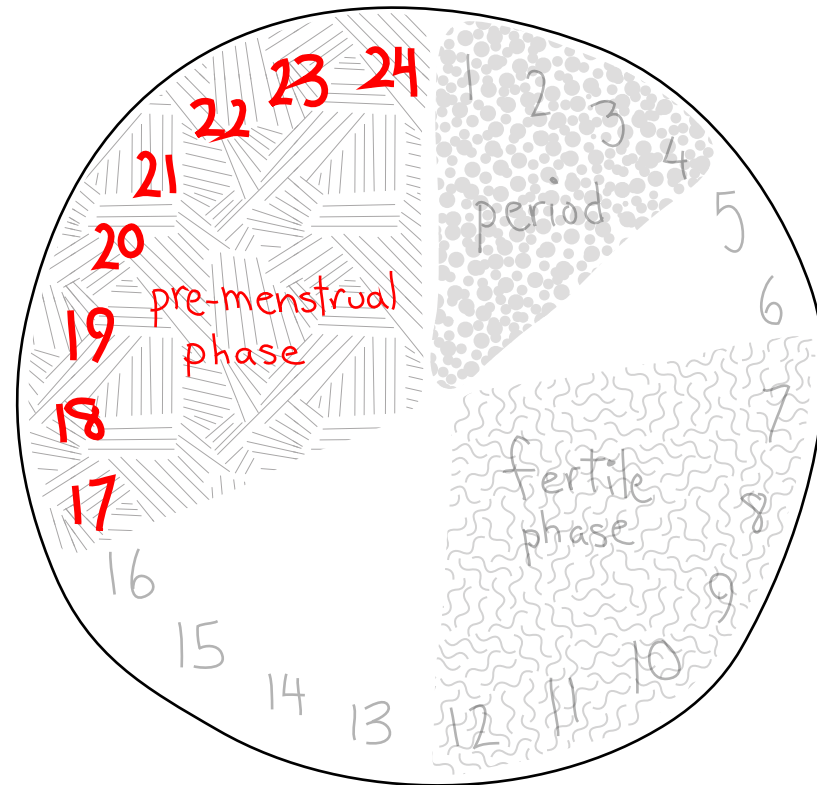


Figure 36: Pre-menstrual phase days.

I've just started my pre-menstrual phase.

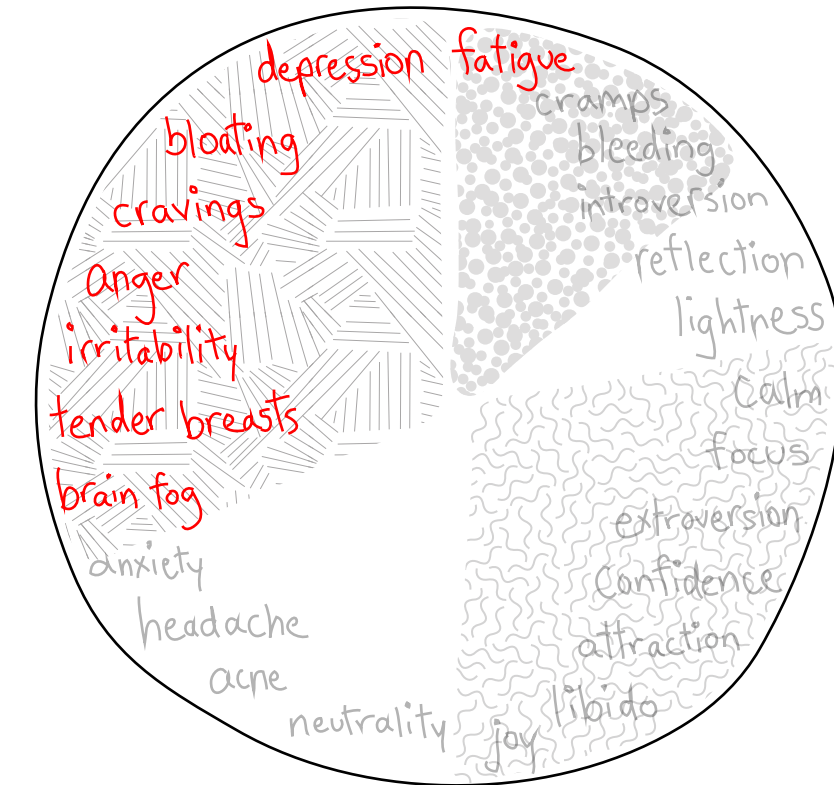


Figure 37: Pre-menstrual phase symptoms.

In these days leading up to my period, my breasts are always tender for seven days straight. I tend to experience more frequent moments of anger. I often crave simple carbs (white bread in particular). I usually feel tired and a bit depressed.

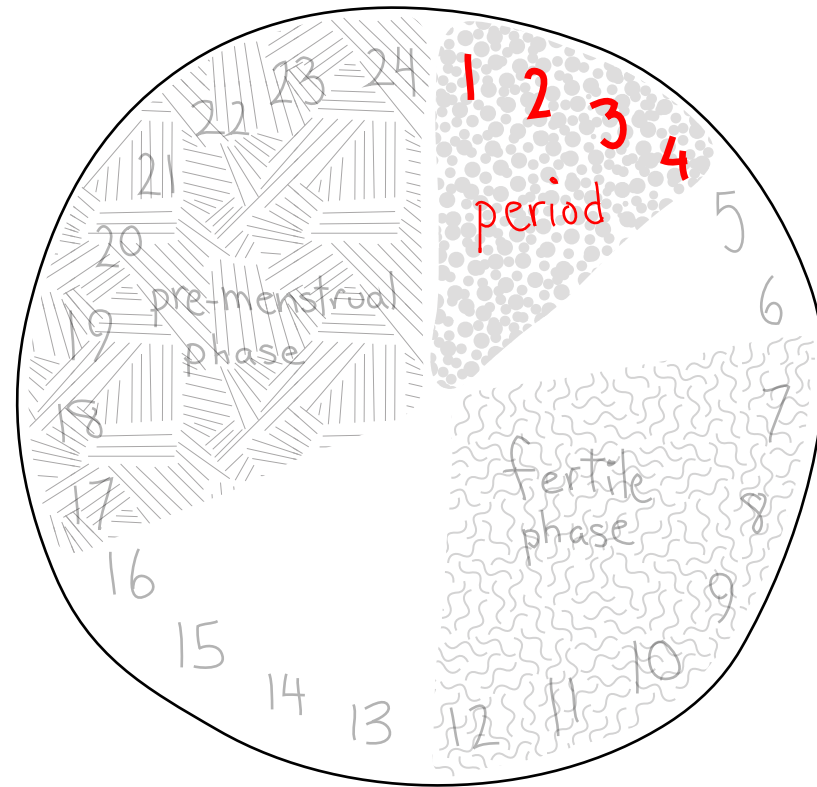


Figure 38: Period days.

In about 1 week, I will get my period, which then begins a new cycle.

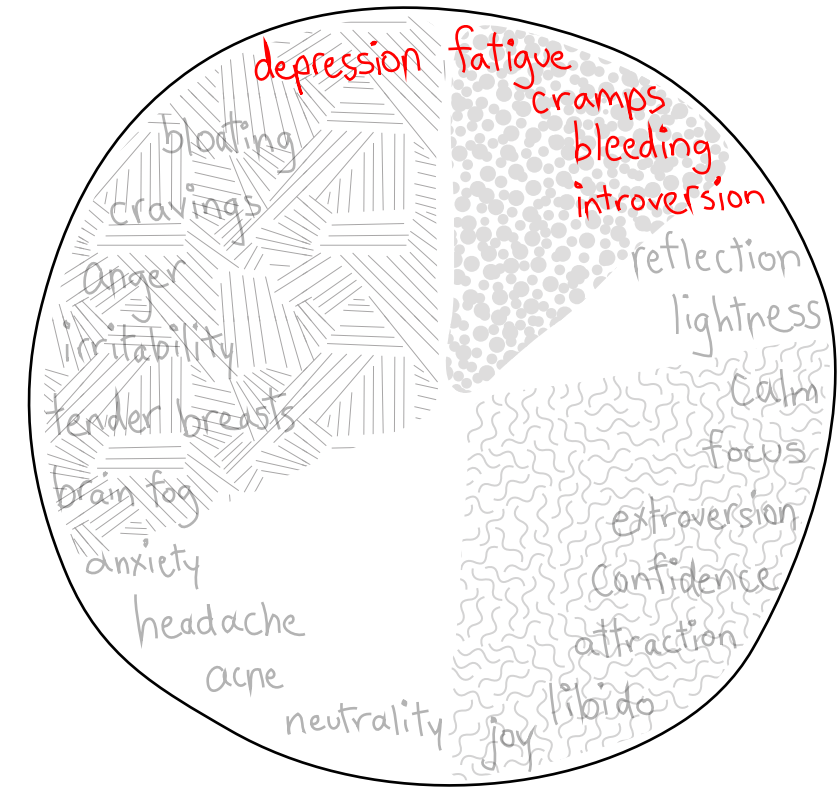
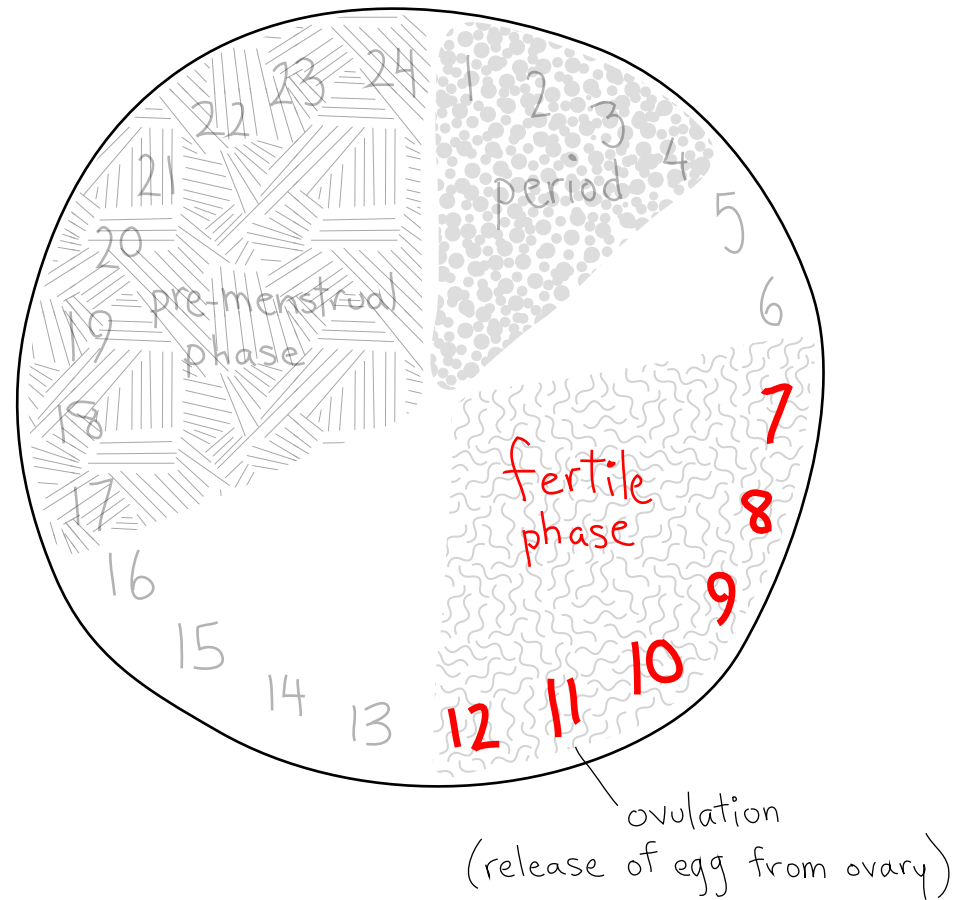
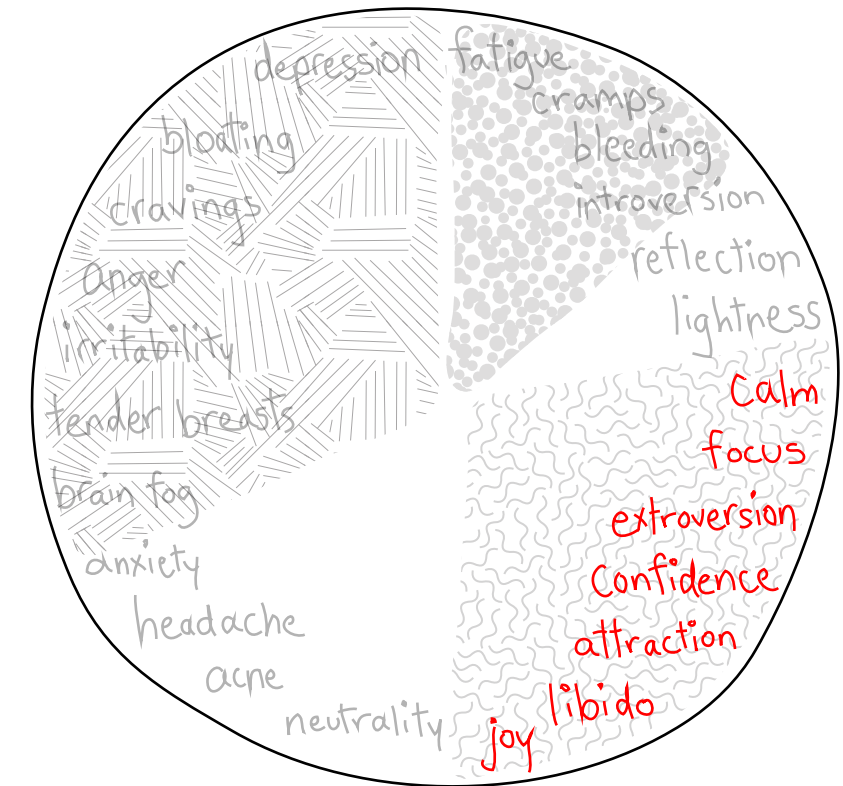


Figure 39: Period symptoms.

During my period, I still usually feel tired and depressed, and I need to rest more. I rarely get period cramps – but when I do, it feels like something is grating my insides, which is incredibly unpleasant.



Last week I was in my fertile phase, which is the six or so day window around my ovulation date. Generally, these are the only days when it's possible for me to get pregnant (if certain prerequisites are met, of course).



During my fertile phase, I typically feel happier, more confident, energetic, and productive – which biologically all makes sense, since this is the ideal time to attract a mate for baby-making purposes.

Also, as of today, I've gone swimming in the ocean every single day for exactly 9 months.

I started this ritual on March 16th, as a personal memorial to my partner, who died of brain cancer on March 16th of last year.

The shock of the cold water would snap me out of the overwhelming thoughts and emotions that were taking over me, and gave me a brief moment of reprieve from my grief.

After practicing this ritual for 275 days, I now see my daily ocean swims as a reflection of my experience as a menstruating person – and as a human being in general:

Just like the ocean, the menstrual cycle – and life – has its highs and lows;
sometimes it's calm, sometimes it's chaotic;
sometimes it's clear, sometimes it's murky;
sometimes it's inviting, sometimes it's scary.



Figure 42: Two hundred and seventy-five days of swimming in the ocean.

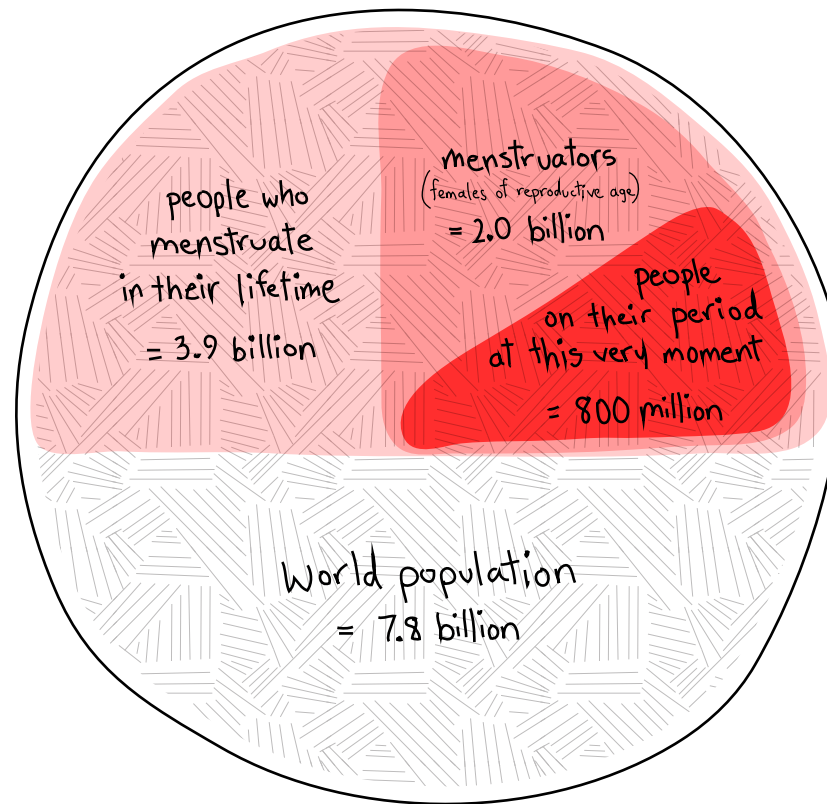


Figure 43: Menstruation population.

It has been interesting to witness how my own perceptions of menstruation have shifted since I first started exploring it as a subject of design over a year ago. I remember the fiery passion I felt back then when I talked about it with people – *why* do we stigmatize something that literally half the population naturally experiences during their lifetime, and is essential to all human life?



Figure 44: Menstrual shame and embarrassment.

As I've worked on this project, I've also worked to unlearn some of the stigmatizing attitudes towards menstruation that are deeply engrained in our society – the shaming, the secrecy, the misinformation.



Figure 45: Menstrual plant fertilizer.

My relationship to my period really started to shift two summers ago, when I began feeding my menstrual fluid to my houseplants. When I first learned about this practice, I was a bit apprehensive, as I'm sure some of you are right now.



before menstrual fertilizer



after 5 cycles of menstrual fertilizer

Figure 46: My coffee plant, before and after menstrual fertilizer.

But after doing it for only a couple months, I saw how much my plants appreciated receiving this natural fertilizer.

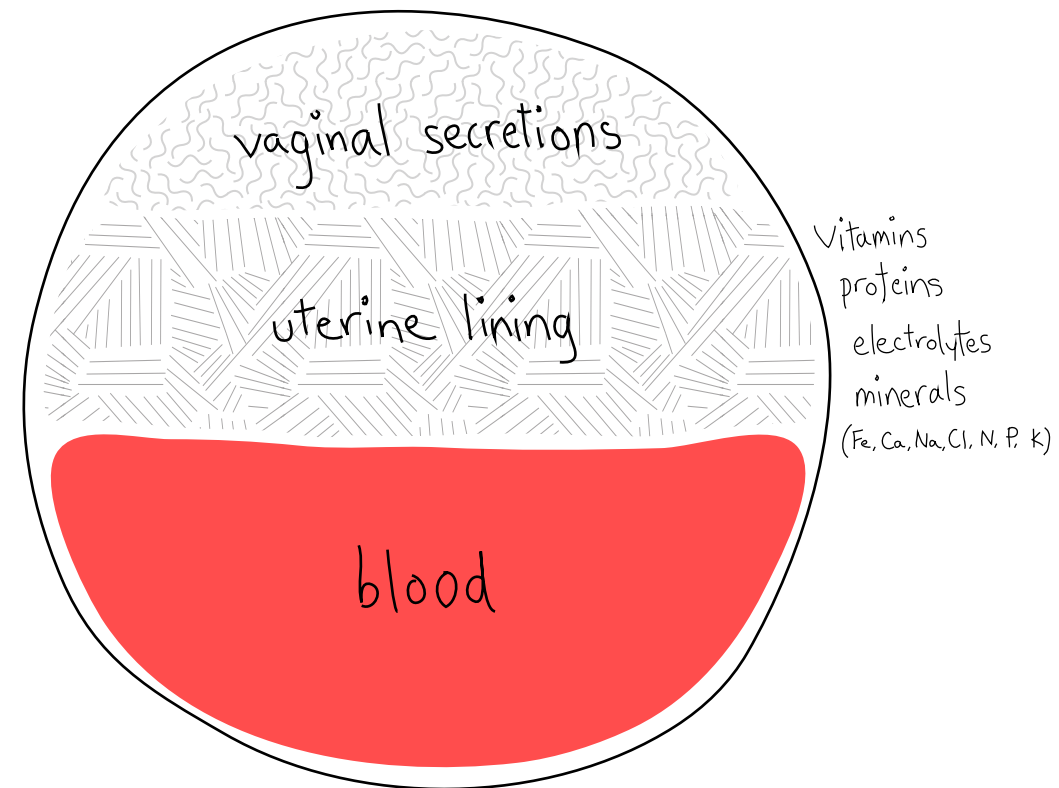


Figure 47: Menstrual fluid constituents.

Menstruation is the process of shedding the lining that builds up in the uterus, which is full of nutrients that would help grow a baby if a woman were to get pregnant. Surely some of these nutrients are beneficial to growing plant life, too.

This monthly ritual has also been nourishing to me. Not only has it increased my awareness of my own menstrual cycle, it has been empowering to form a deeper connection between my body and nature.

At one point, I started wondering: what if more people practiced this? What is the untapped potential of our global supply of menstrual fertilizer?

Well, I crunched the numbers.

average volume of menstrual fluid per person:

per cycle = 60mL
(4 Tbsp)



per year = 780mL
(3 cups)



per lifetime = 31 L
(1.5 water cooler jugs)

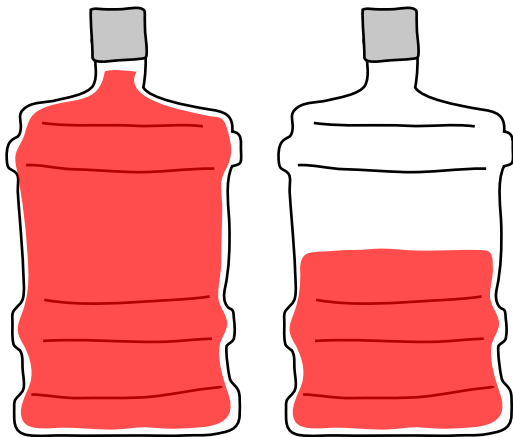


Figure 48: Menstrual fluid volumes per person.


per cycle = 60mL
(4 Tbsp)  × 2 billion menstruators

Figure 49: Menstrual fluid volume of one period.

If we were to collect one period's worth of menstrual fluid from all the 2 billion menstruating people in the world...

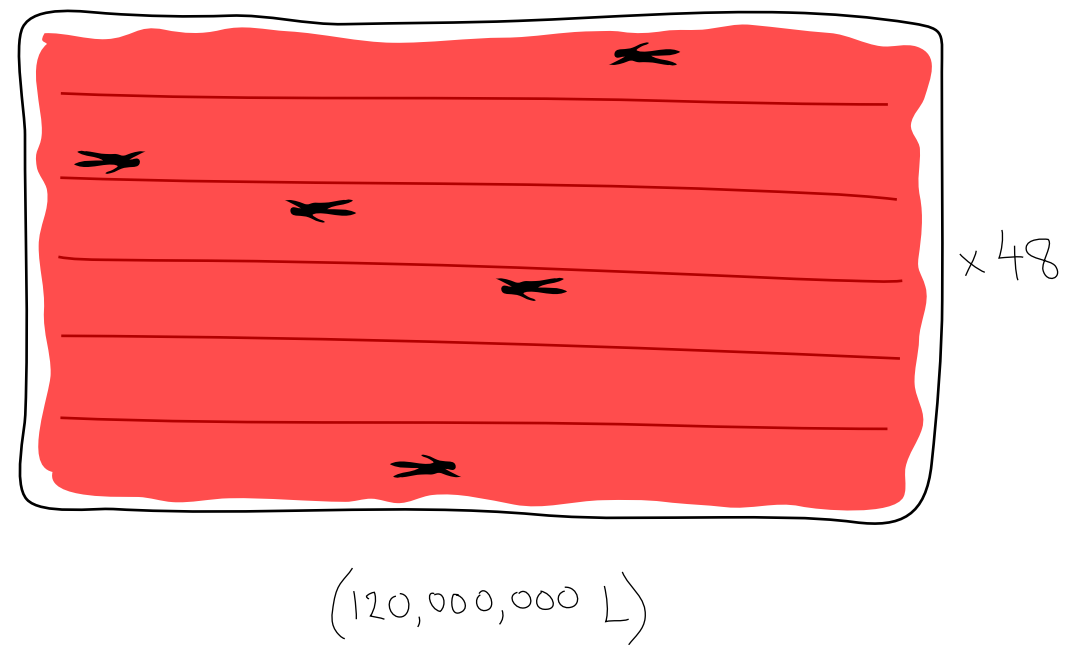


Figure 50: Menstrual fluid volume of 2 billion periods.

...It would fill 48 Olympic-size swimming pools.
That would feed a lot of happy plants.

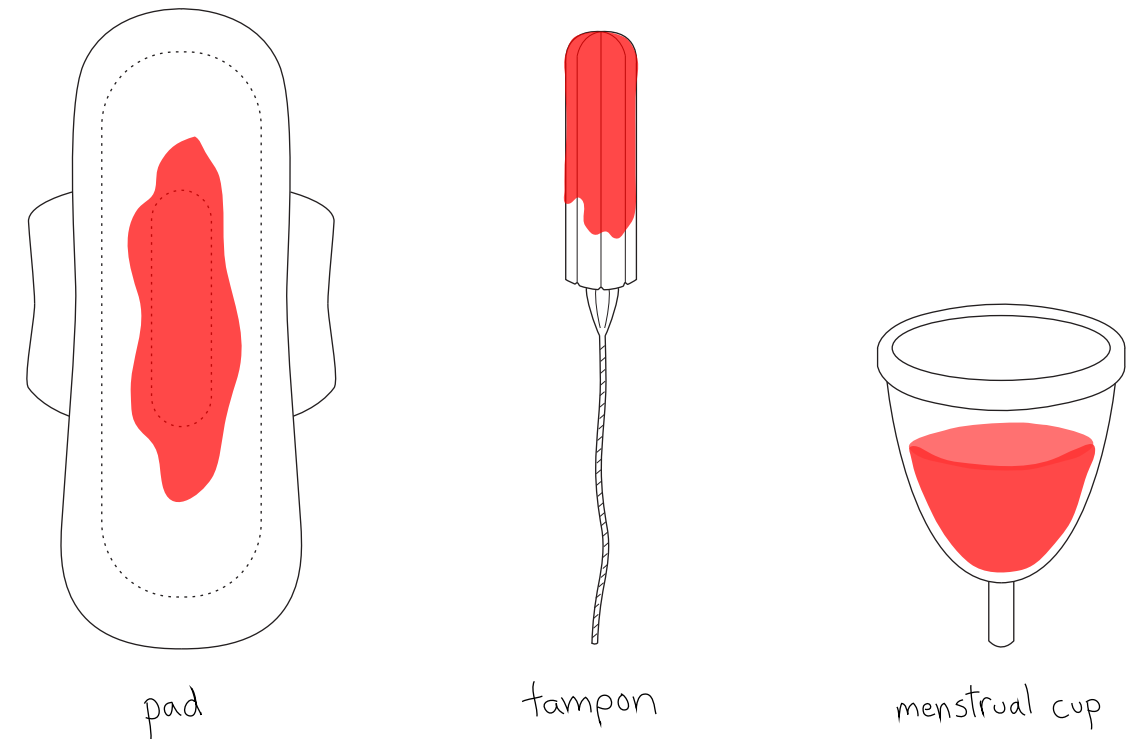


Figure 51: Menstrual products.

I recognize that my acceptance and appreciation of menstruation has largely been possible because I have a relatively high level of access to menstrual support. For example, I can afford menstrual products (though I haven't had to buy any since I started using a reusable menstrual cup four years ago). I have a reliable supply of running water. I feel safe speaking openly about menstruation. Unfortunately, this is not the reality for everyone.

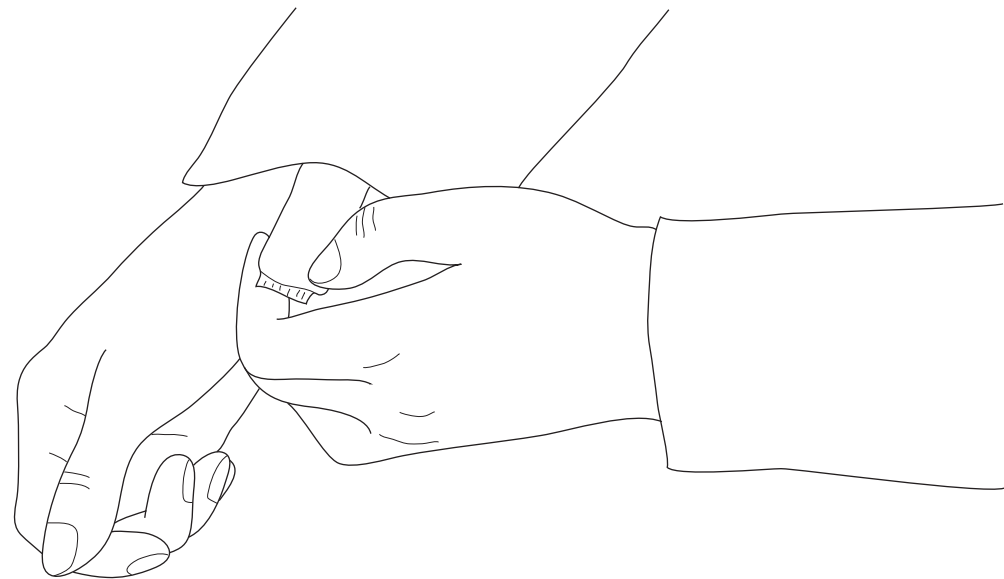


Figure 52: *Hiding menstruation.*

But what *is* a reality for everyone is that menstruation is stigmatized everywhere in the world.

From a young age, we are taught to feel shame and embarrassment around it, to hide any evidence of it, to suppress our emotions, to deal with the discomfort alone.

As I'm working to unlearn these harmful beliefs in myself, I know that this ultimately requires a major collective shift.

I am here today to explore this question:

What if we lived in a world that celebrated menstruation?

A world that revered its life-giving power?

A world where periods were a source of pride, not shame?

A world that offered greater support and comfort throughout the menstrual cycle?

I will now give you a glimpse into this world.

Those of you who don't menstruate may be wondering: what's in this world for you?

I invite you to connect beyond the physical experience of menstruation, and ask yourself:

What would it be like to live in a world where it's normal to express the emotions you've been taught to suppress?

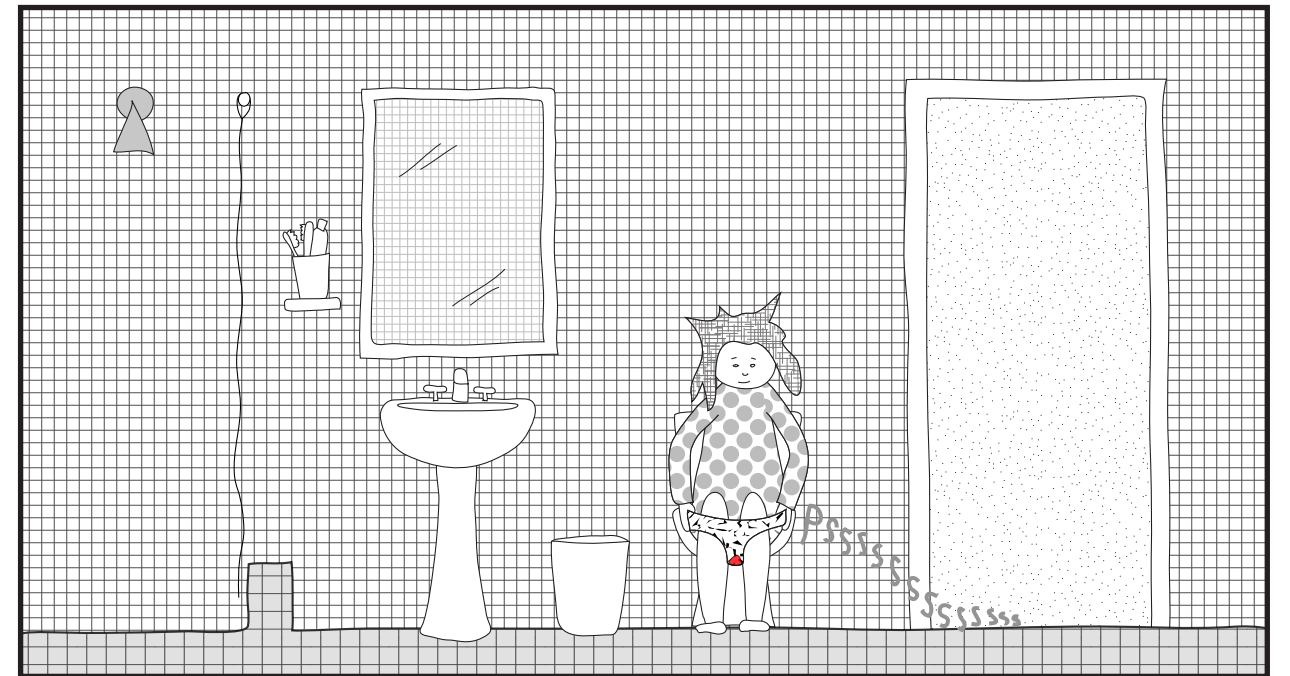
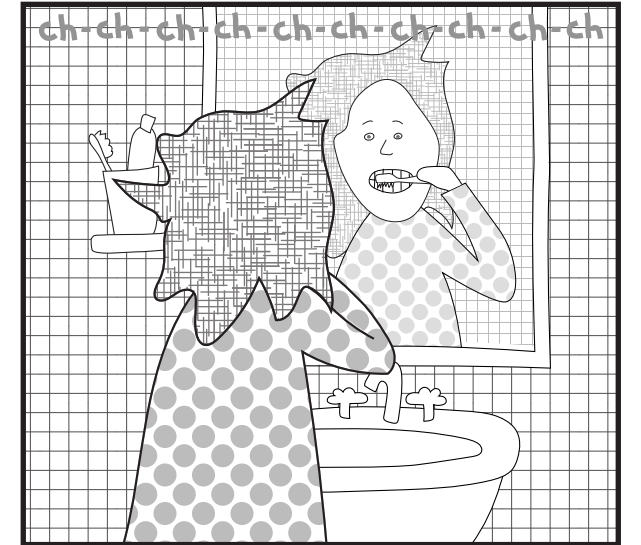
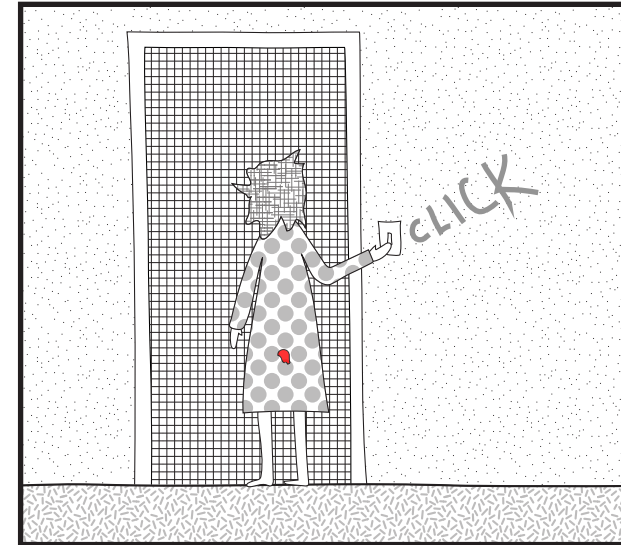
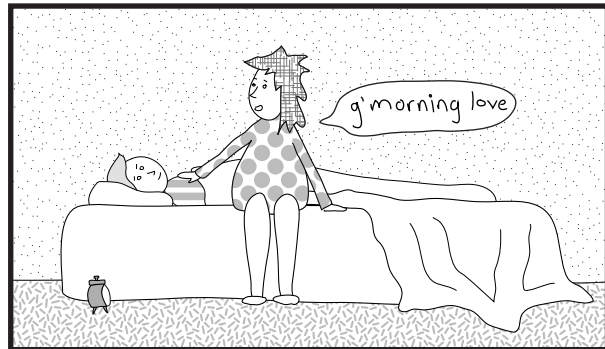
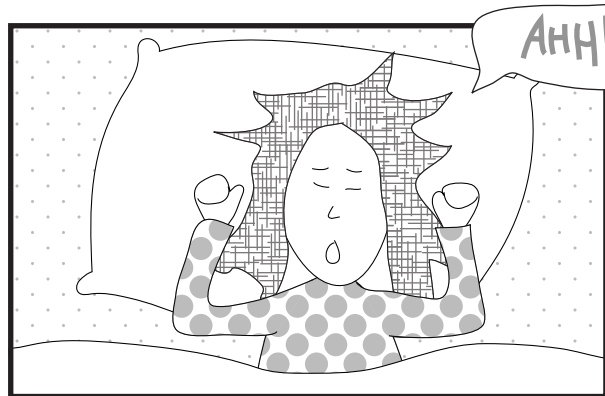
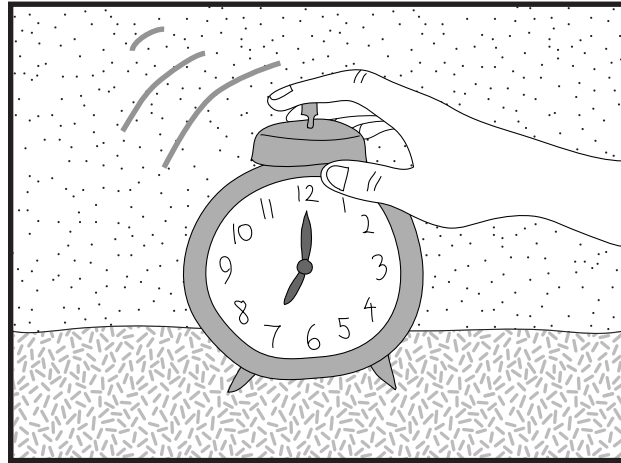
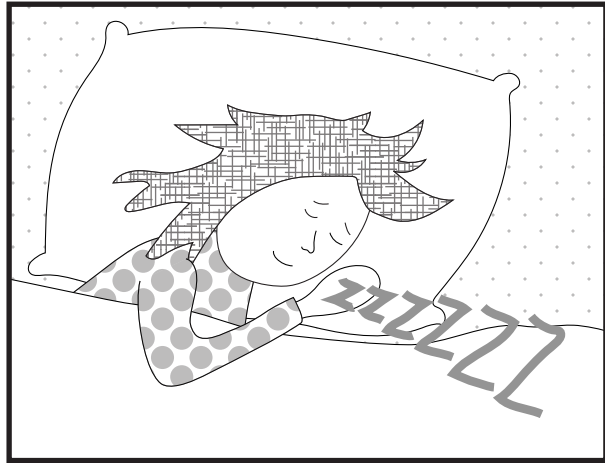
A world that doesn't expect you to live up to standards that truly serve very few of us?

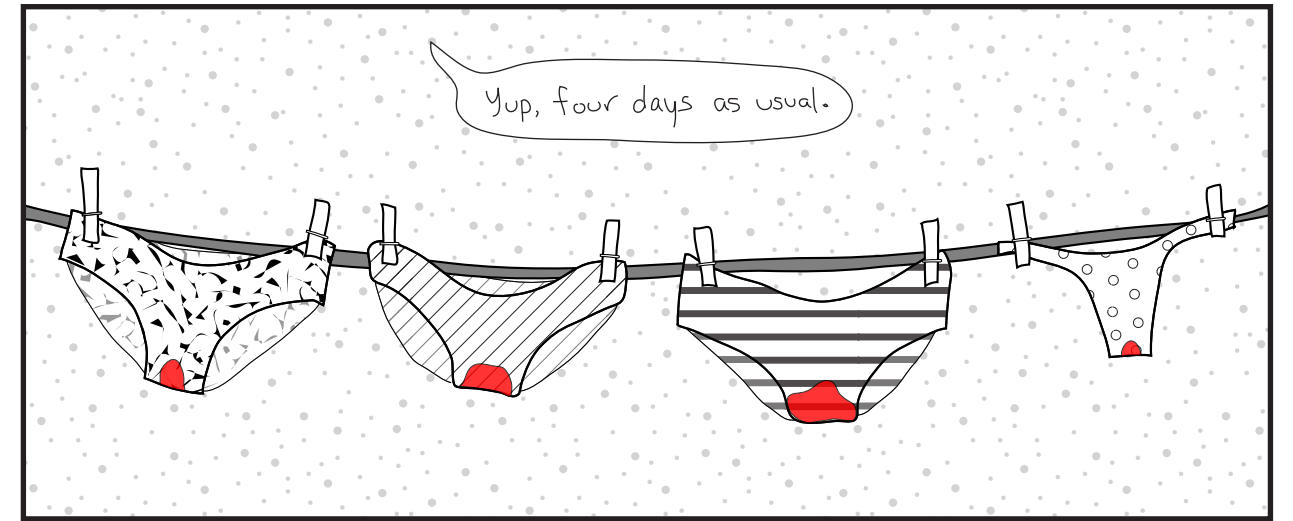
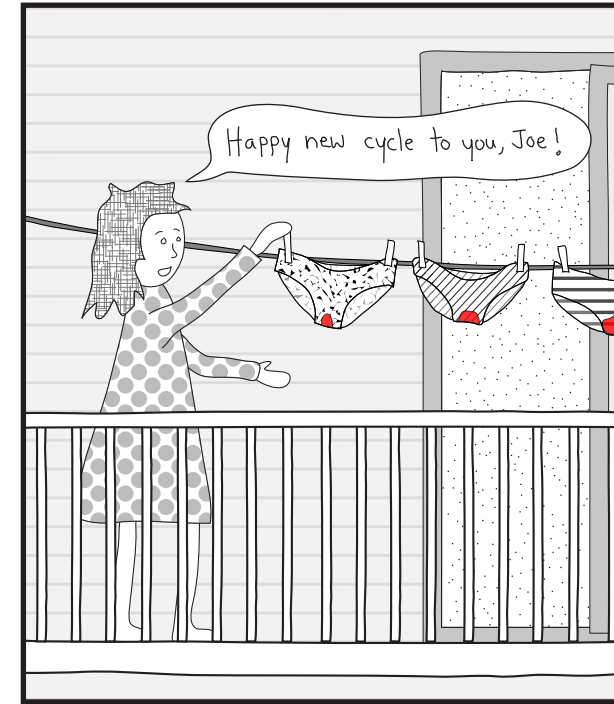
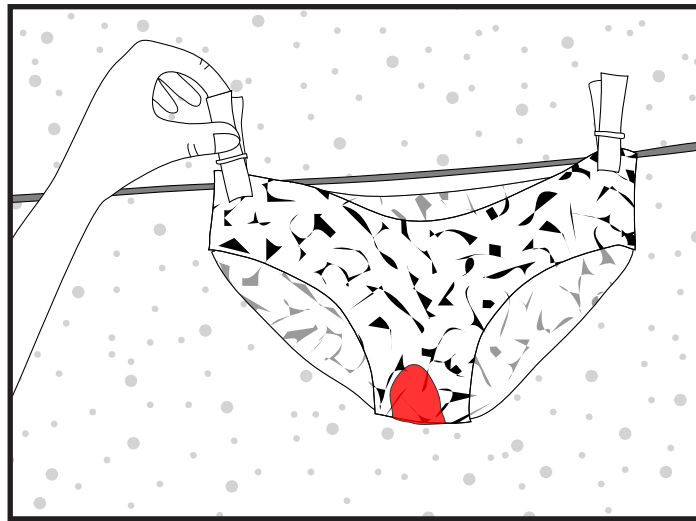
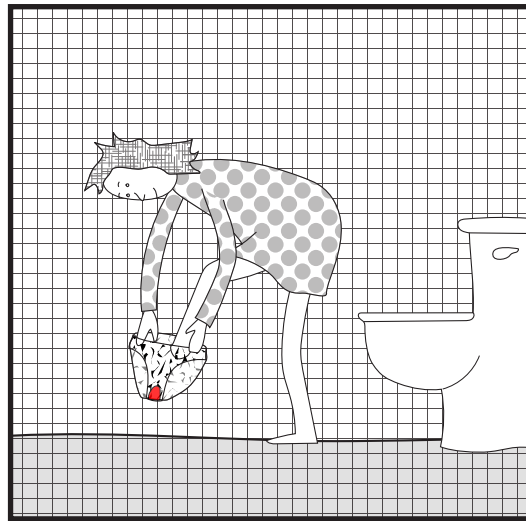
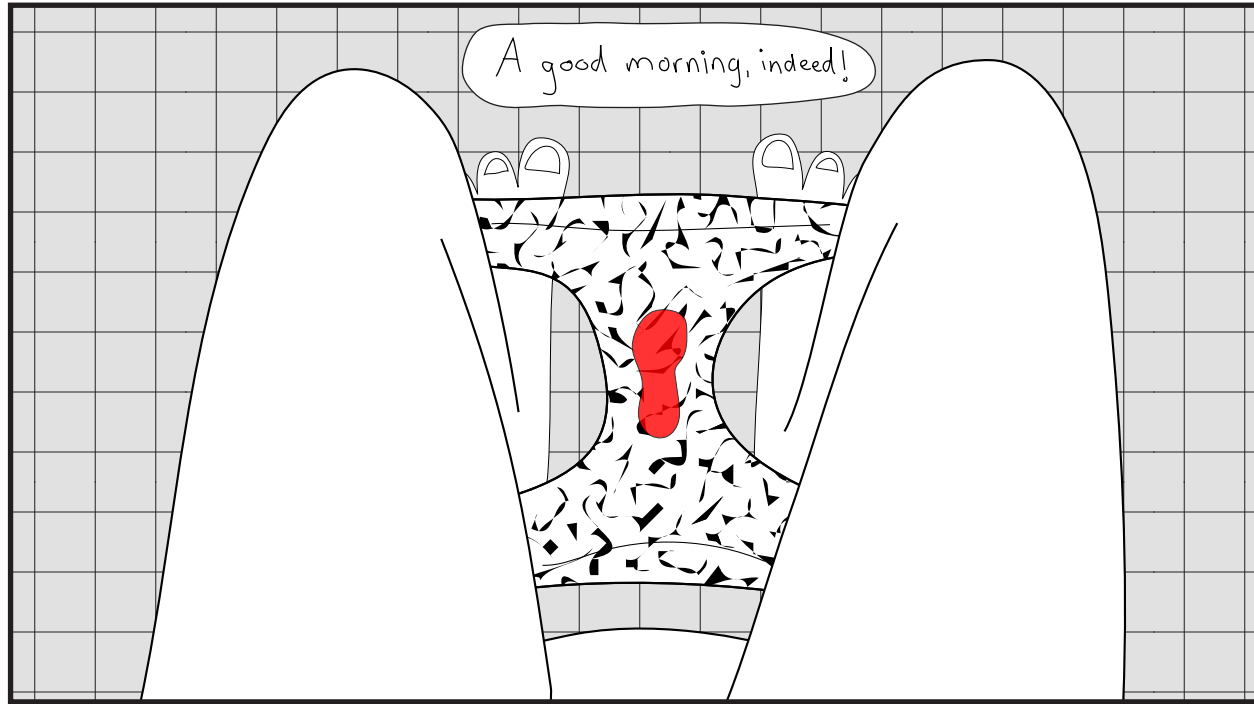
A world that supports a deeper connection with yourself, with others, and with nature?

Basically: a kinder, softer world.

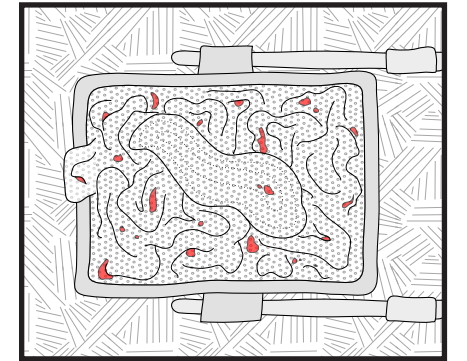
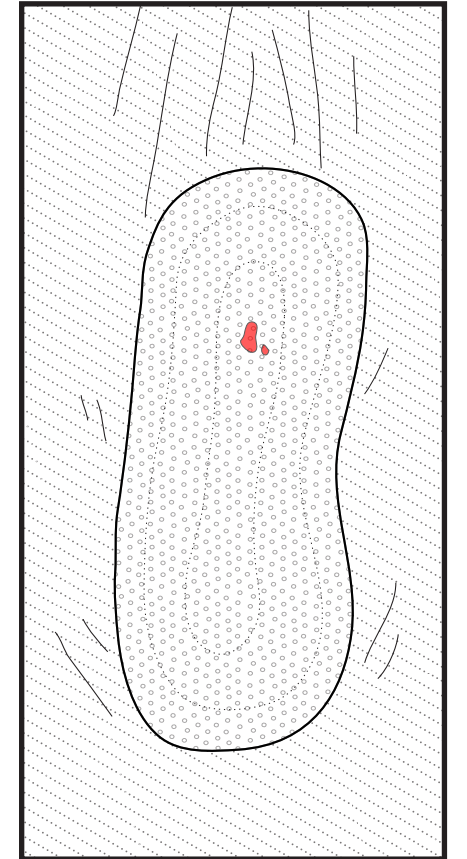
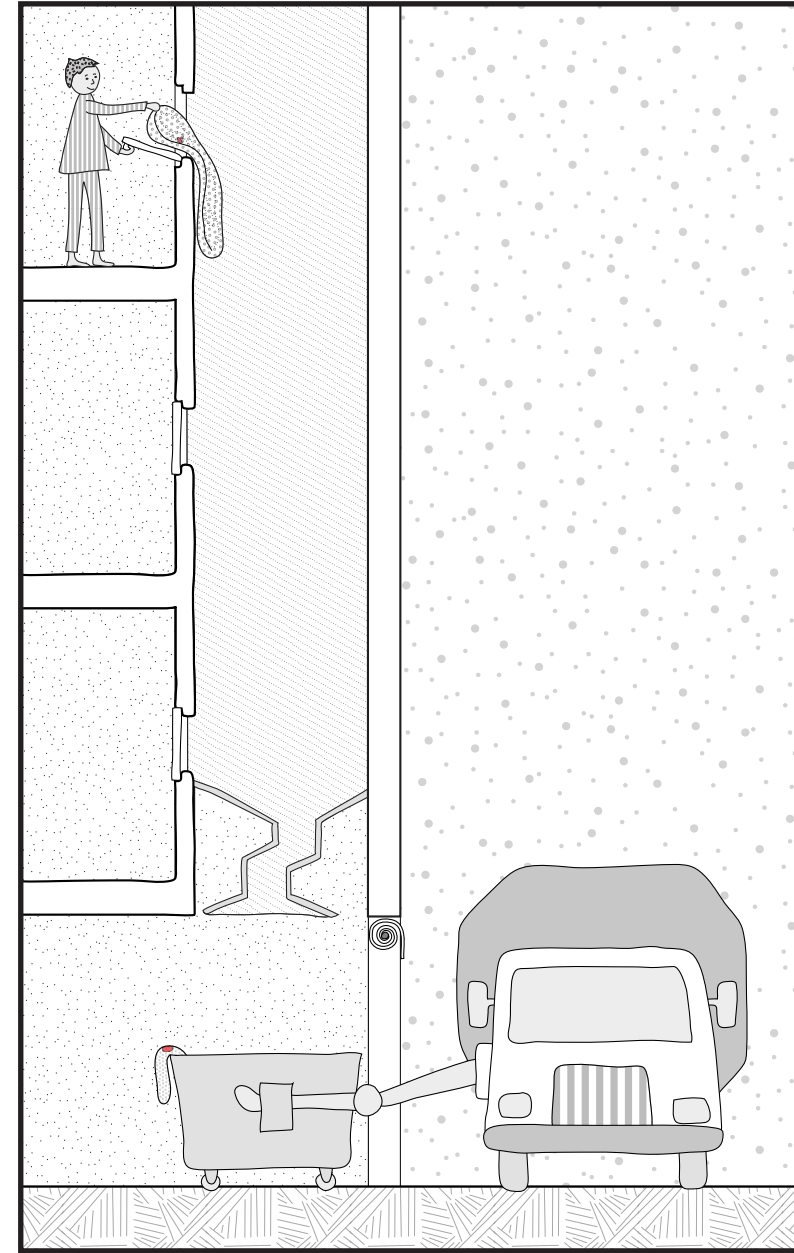
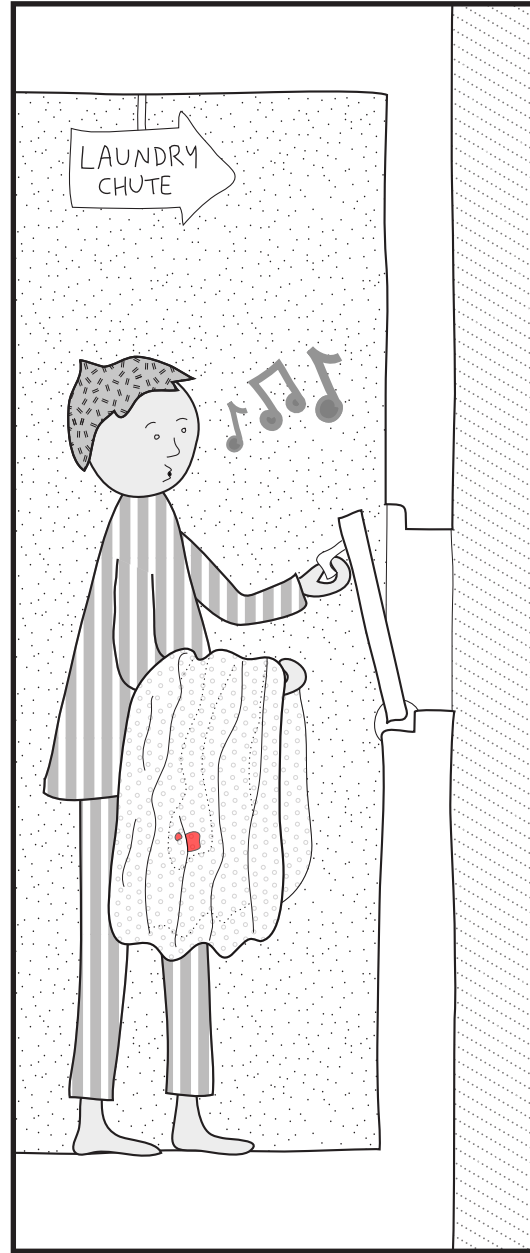
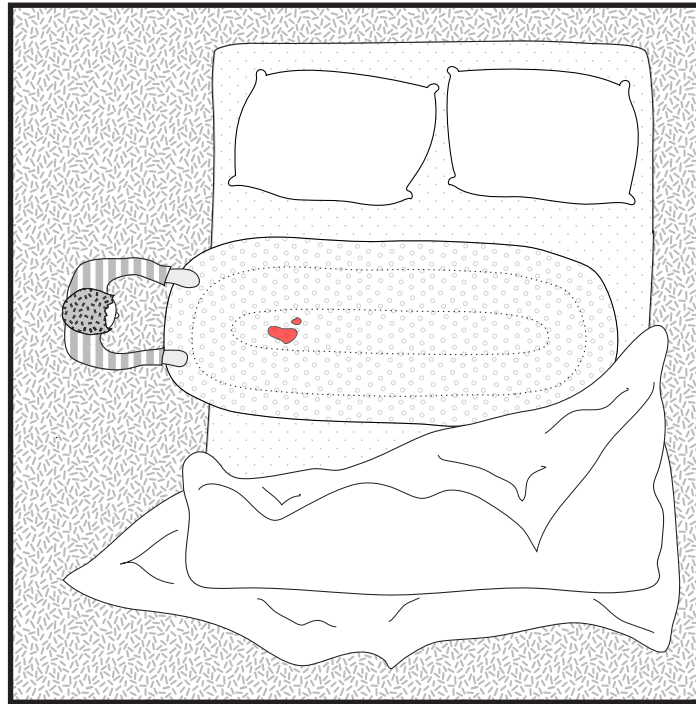
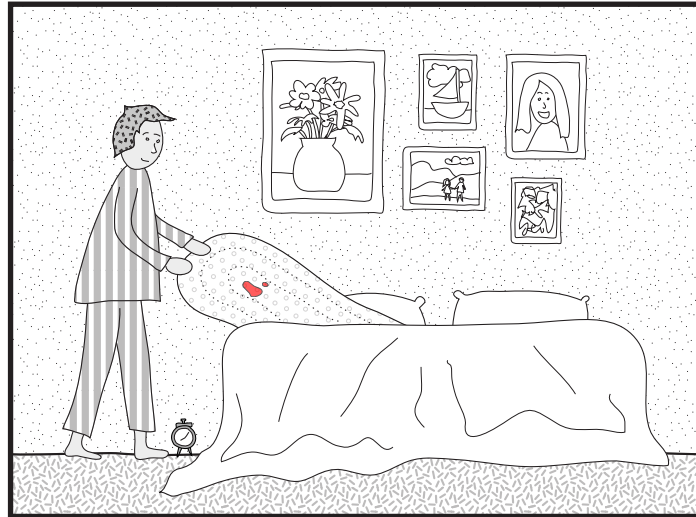
ADVENTURES
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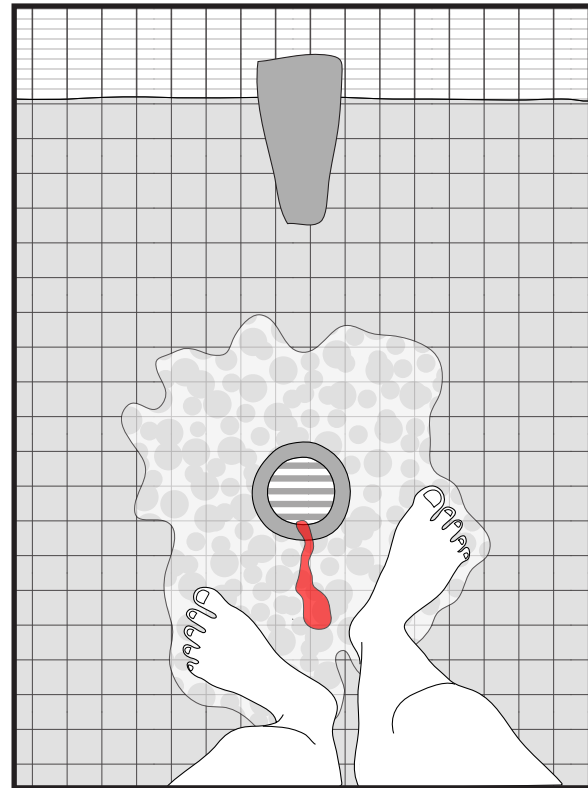
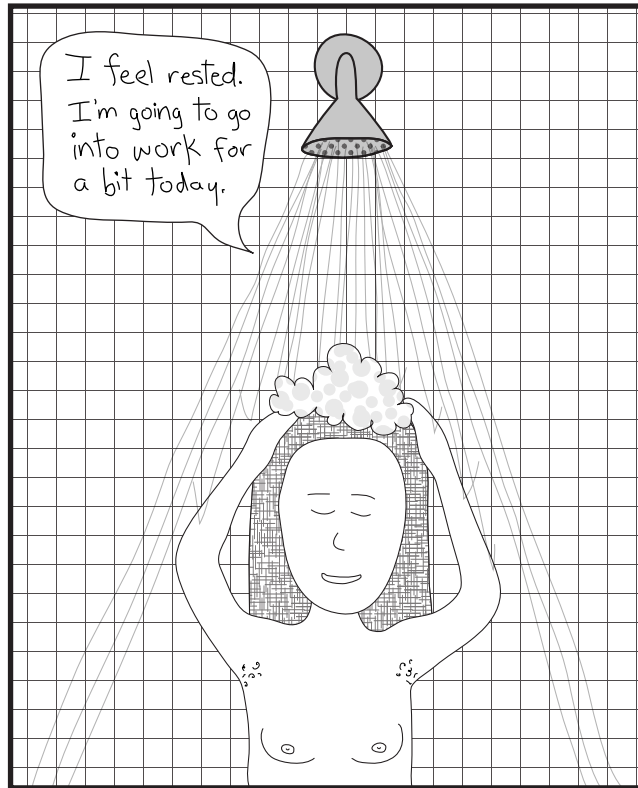
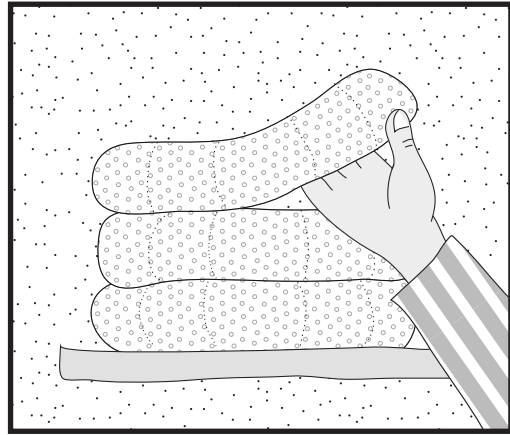
A GRAPHIC NOVEL

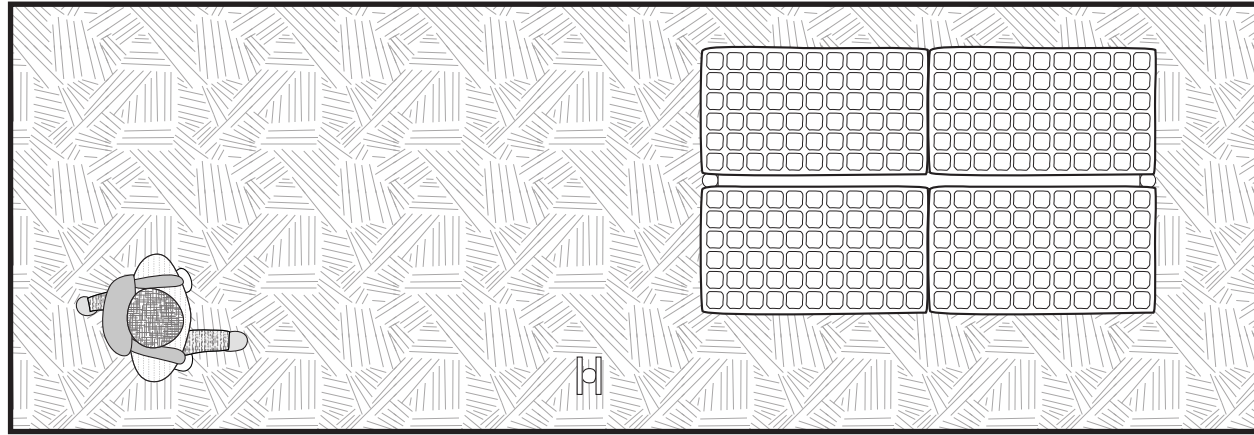


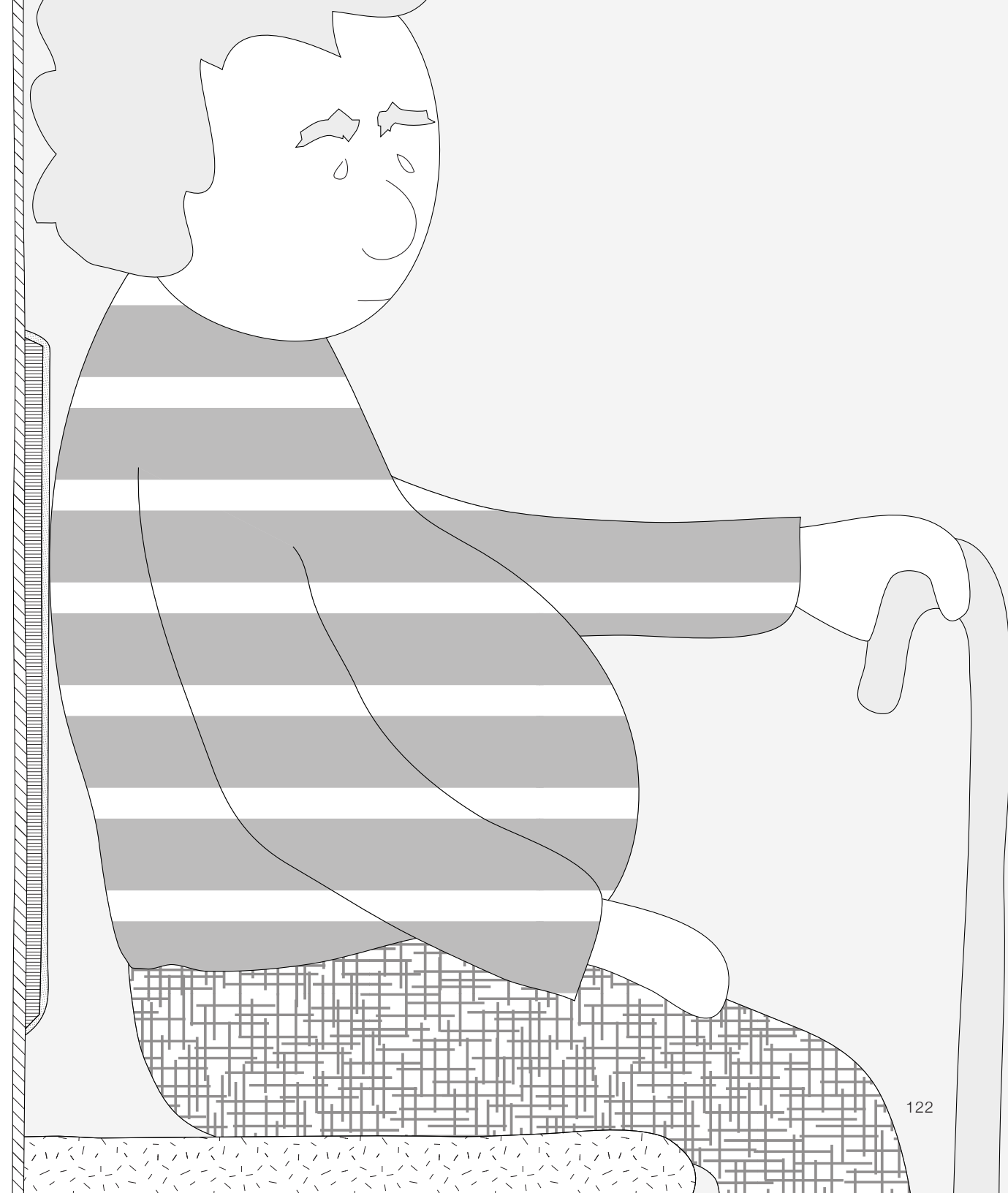
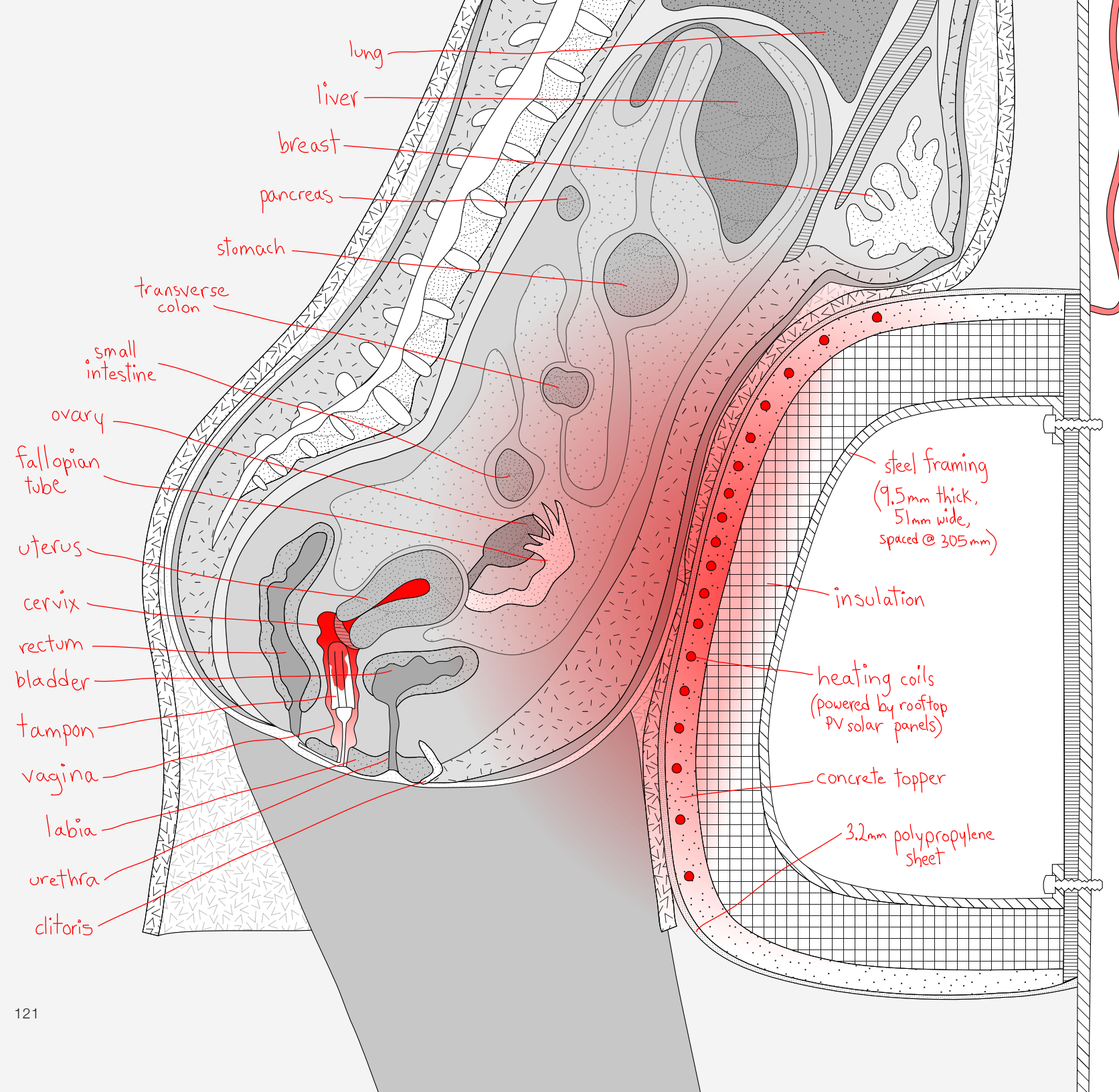


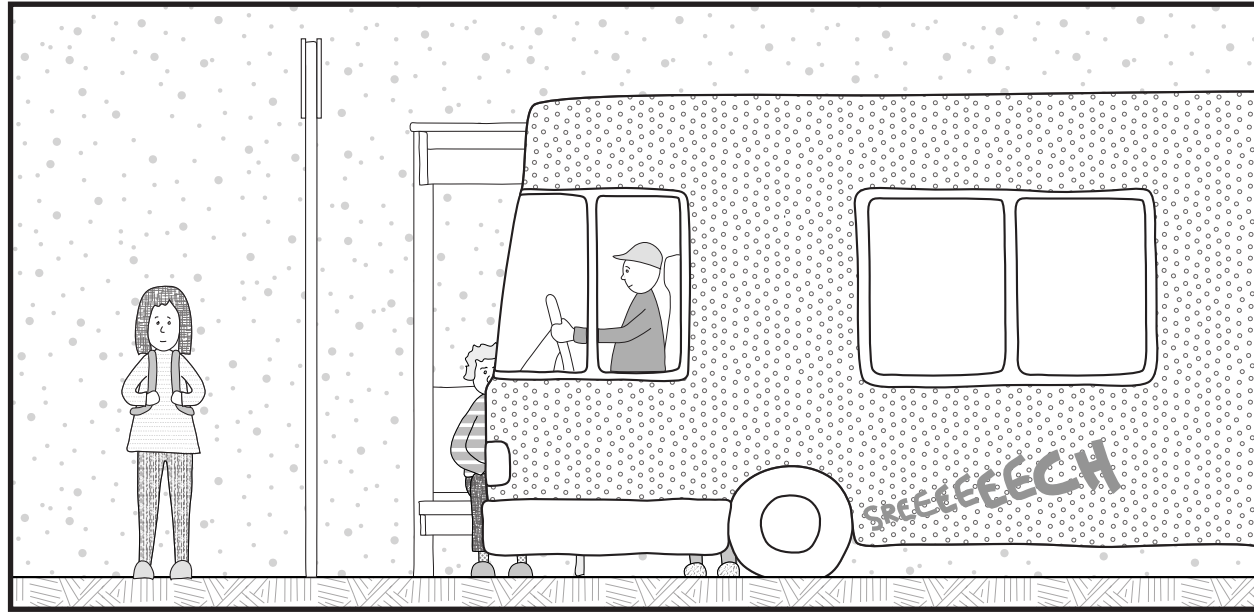




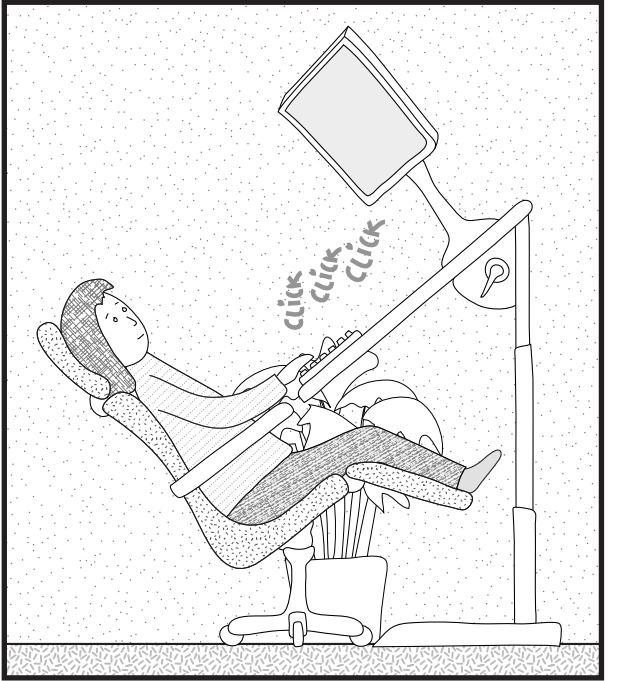
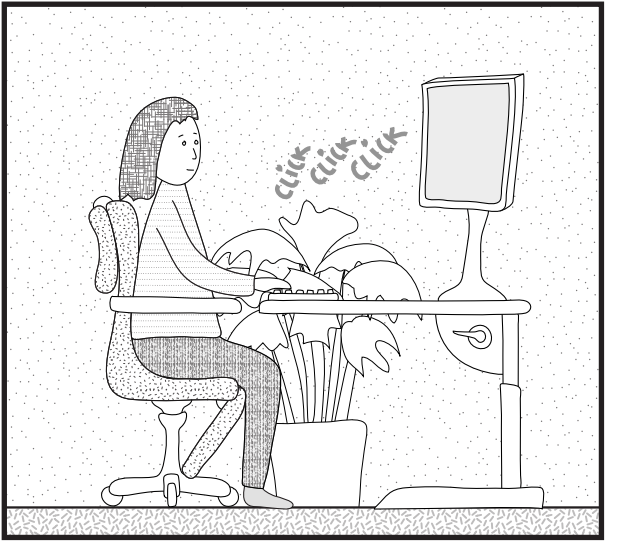
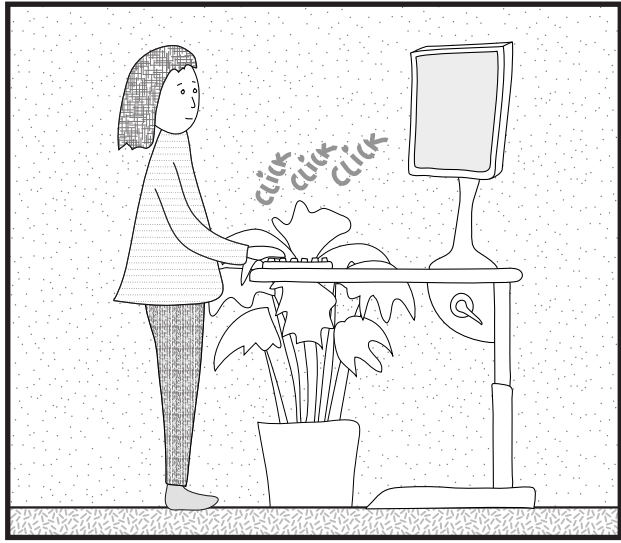
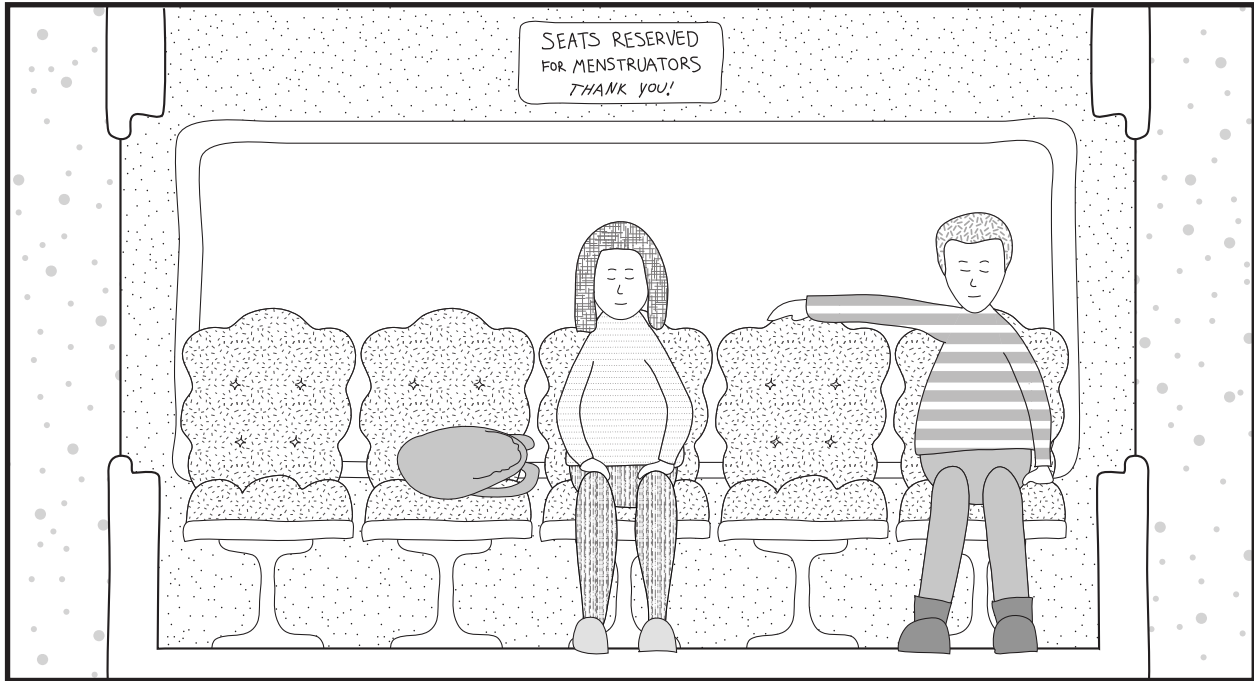
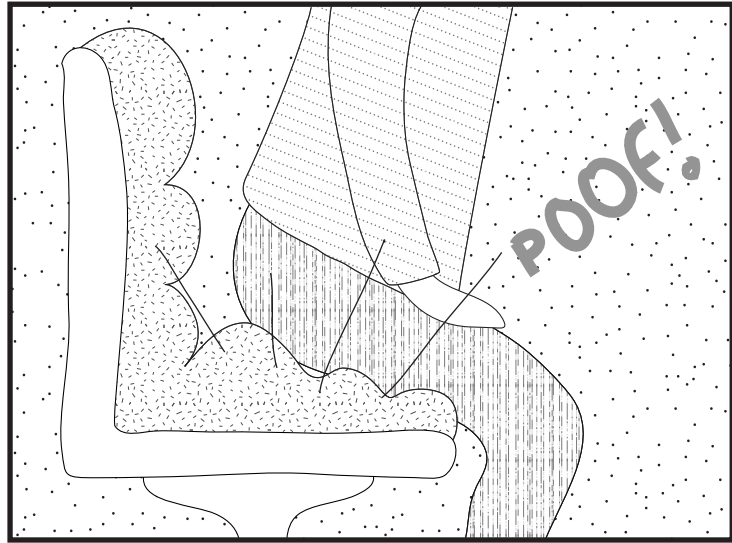
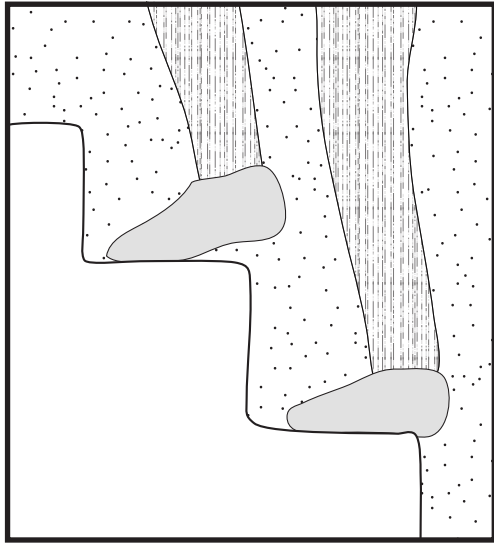


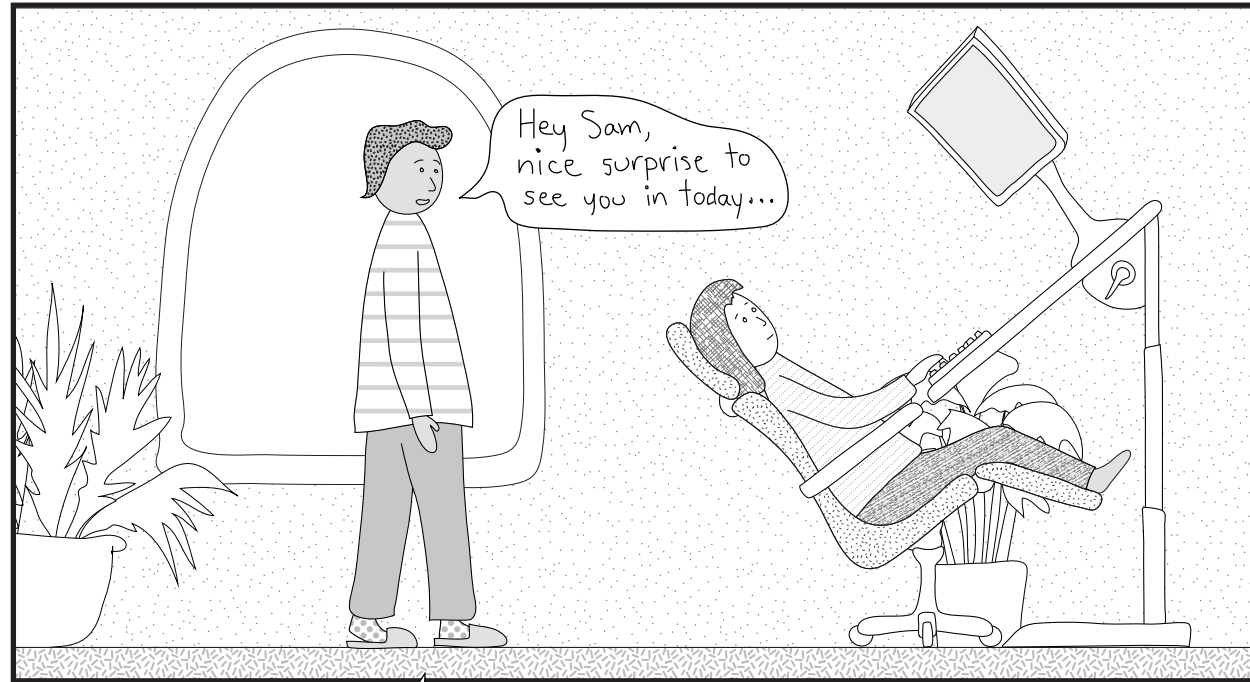






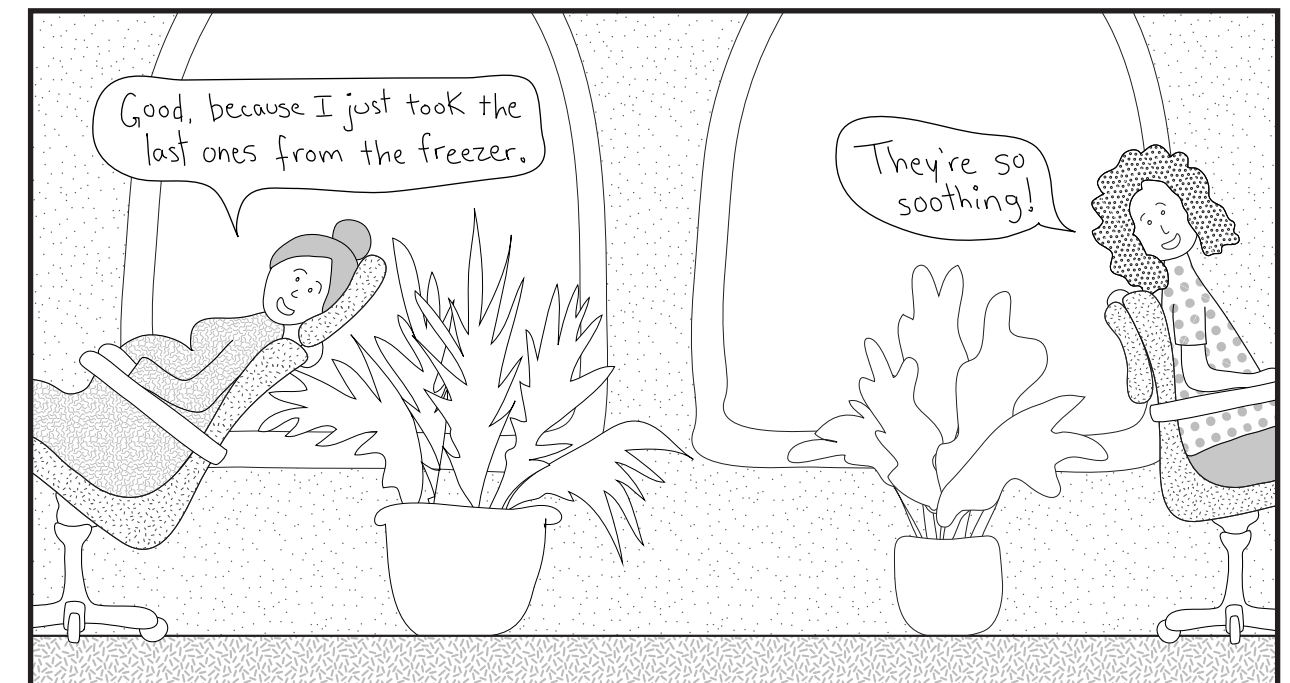
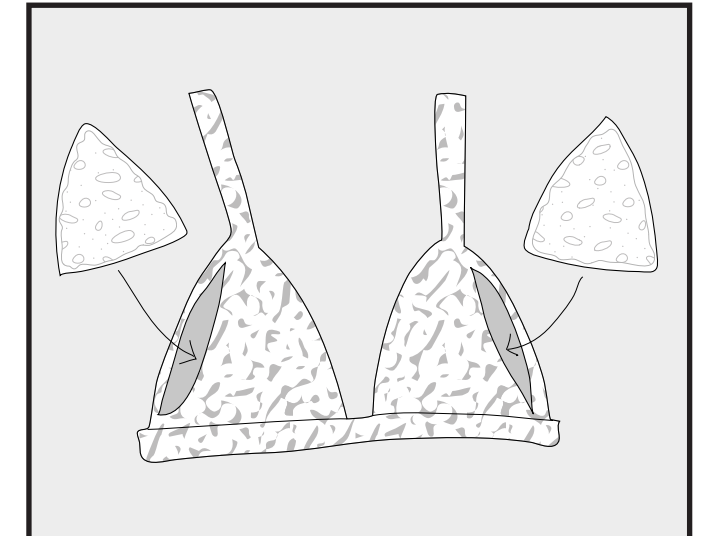


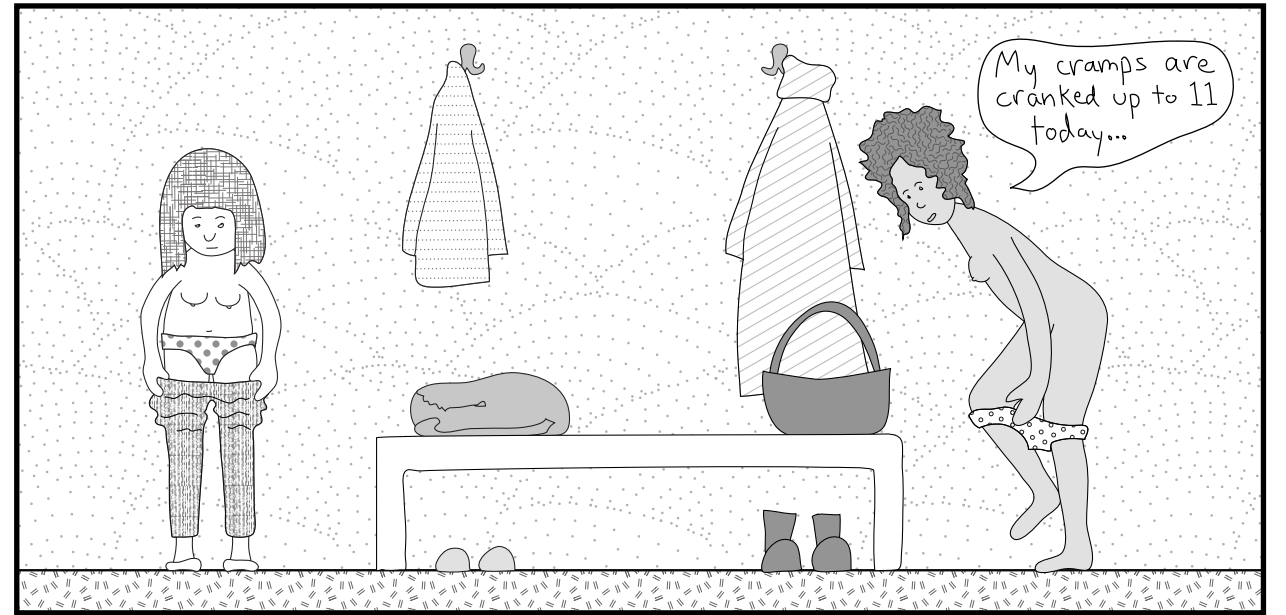
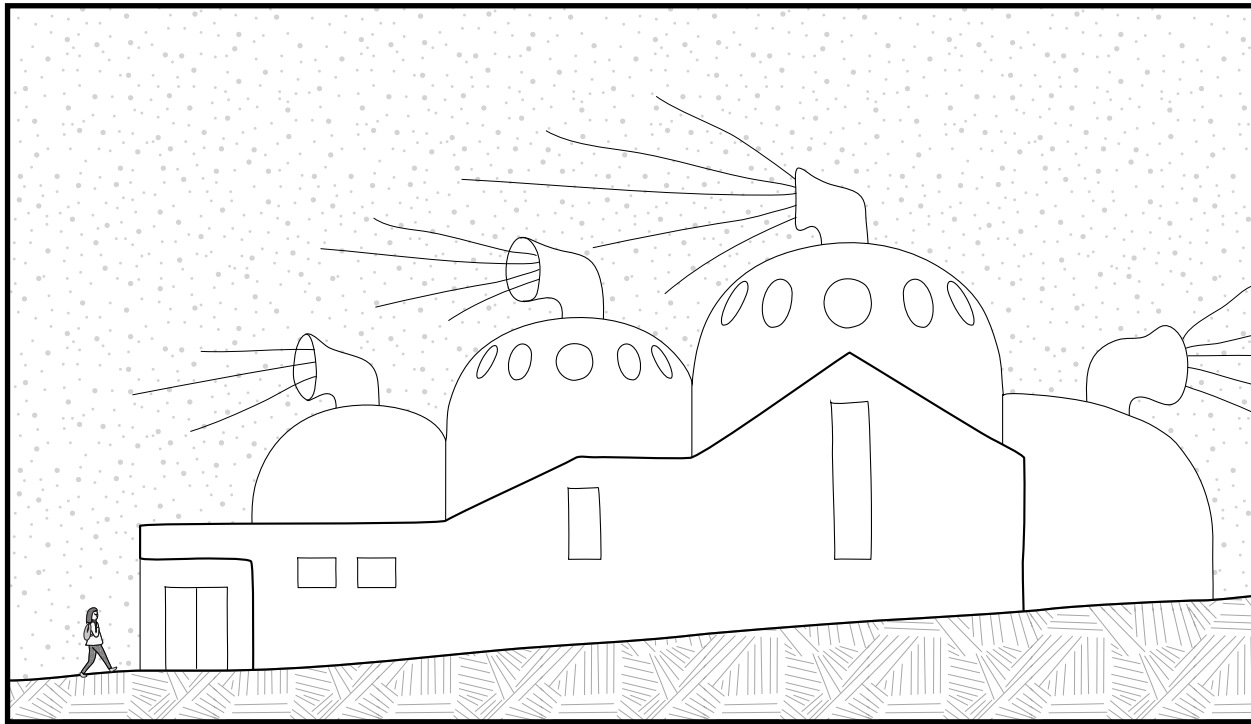
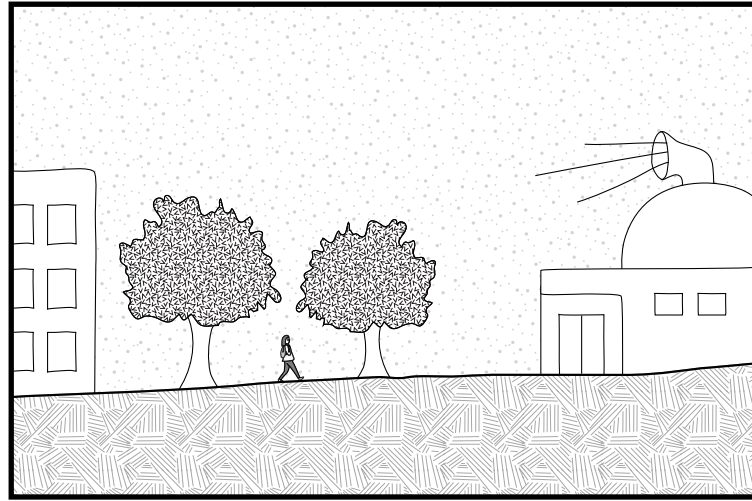
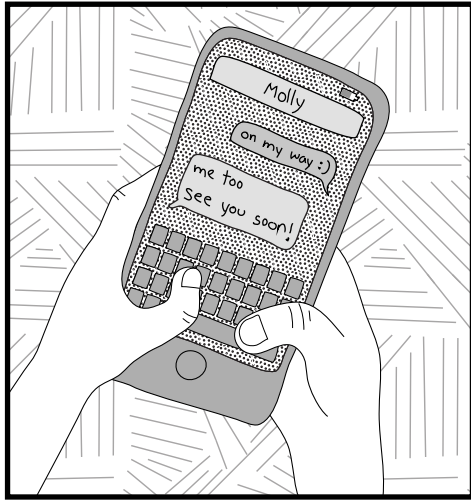


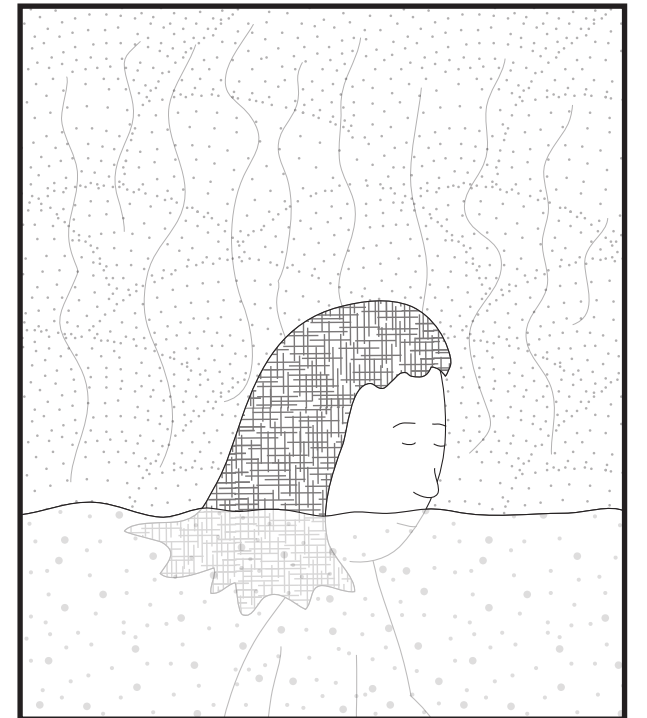
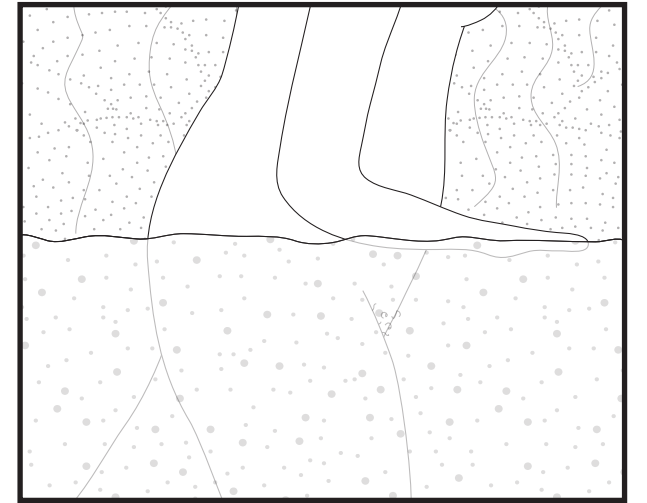
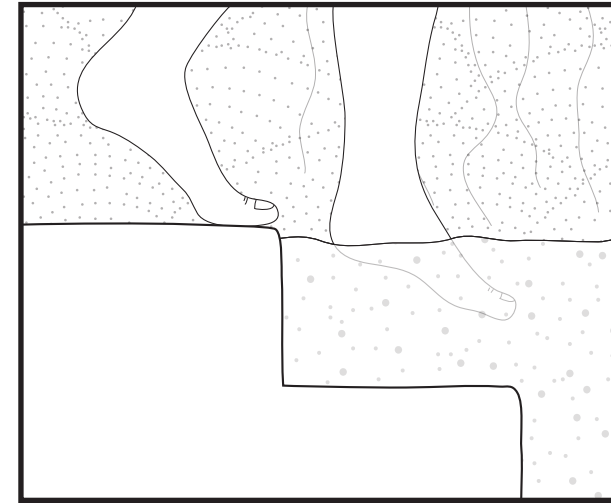
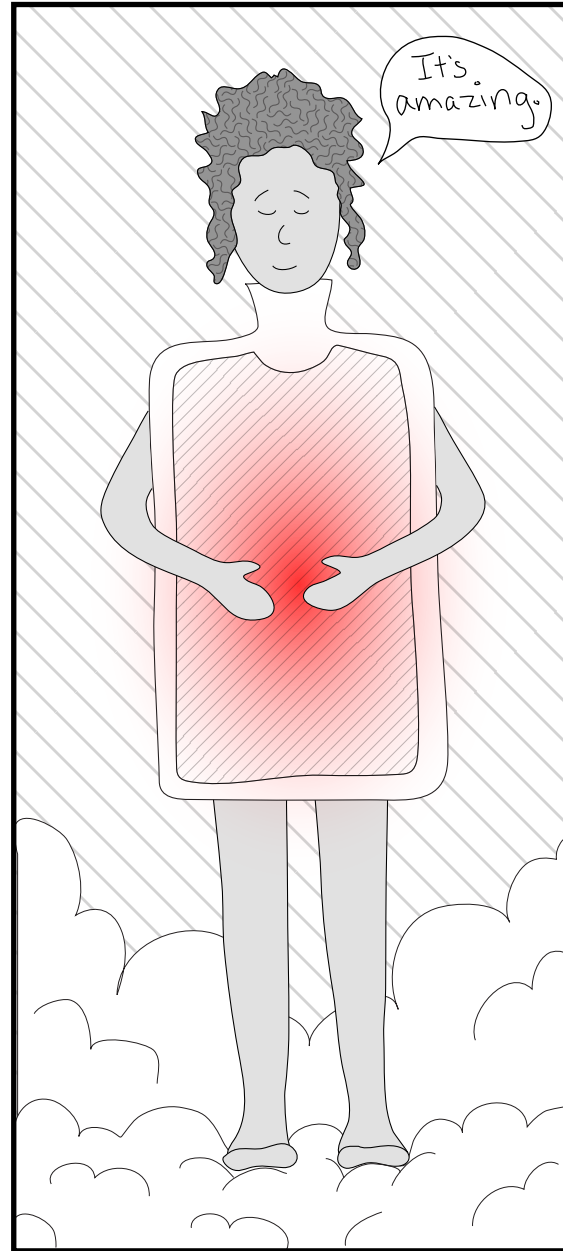
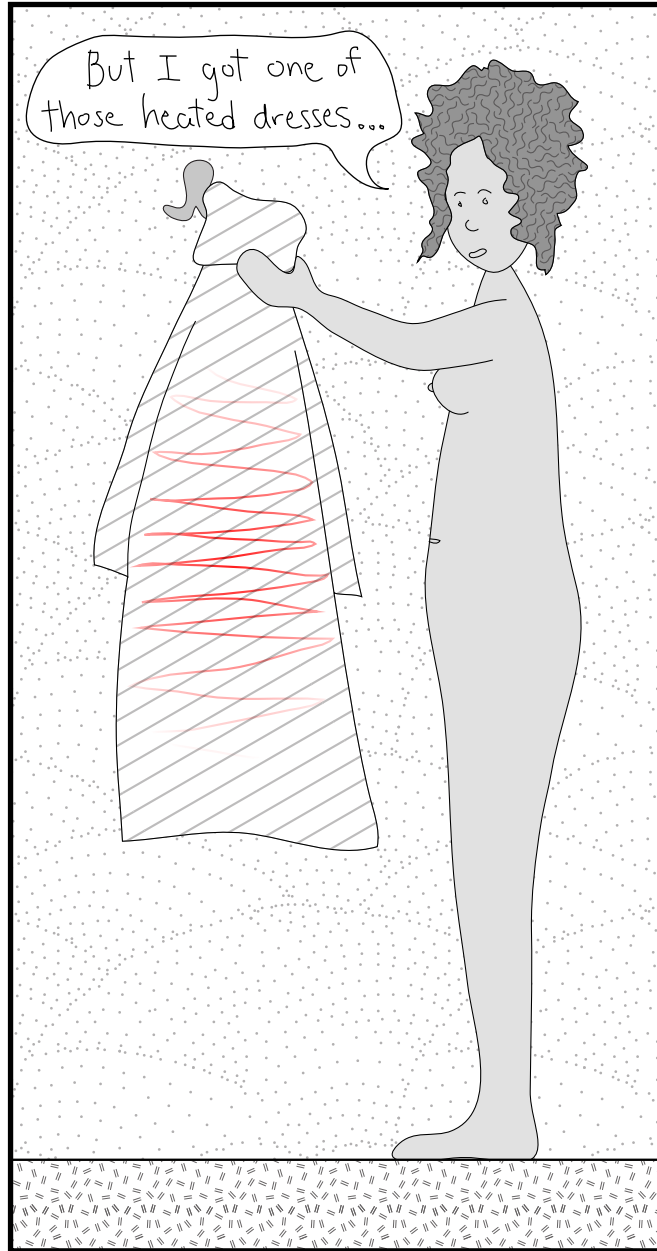


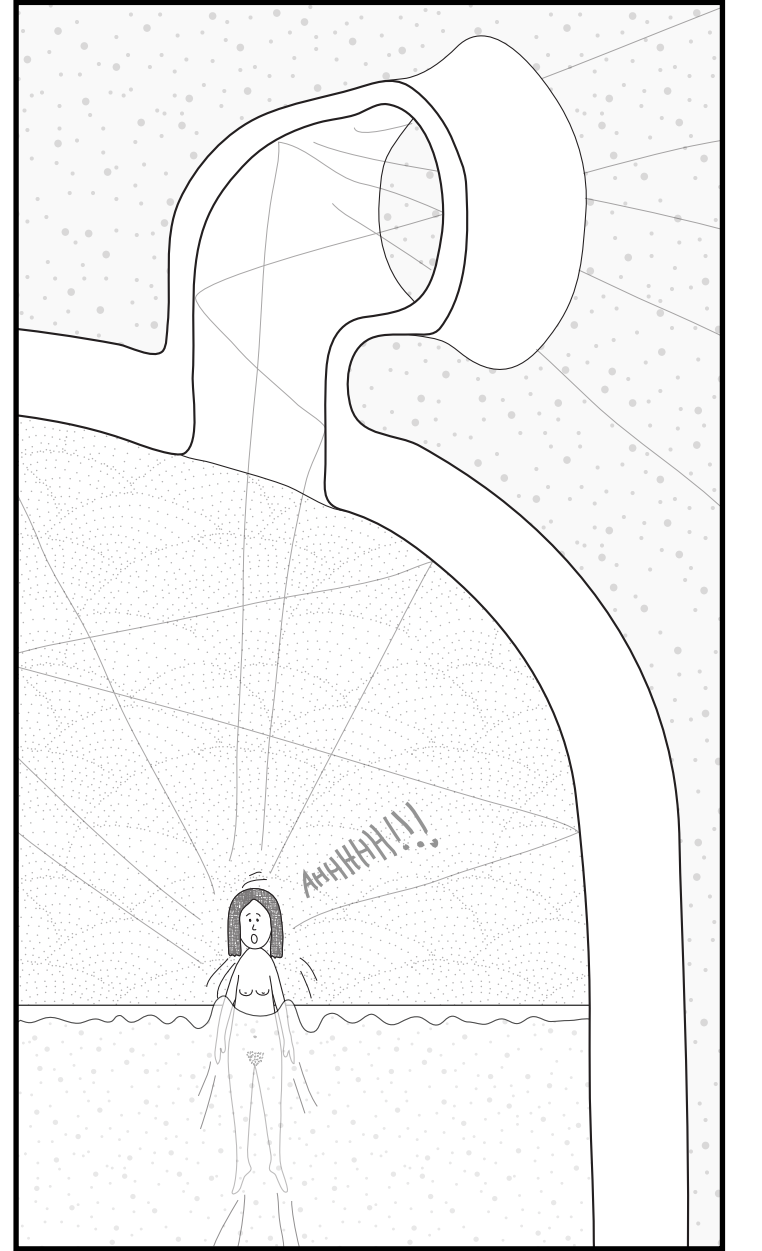
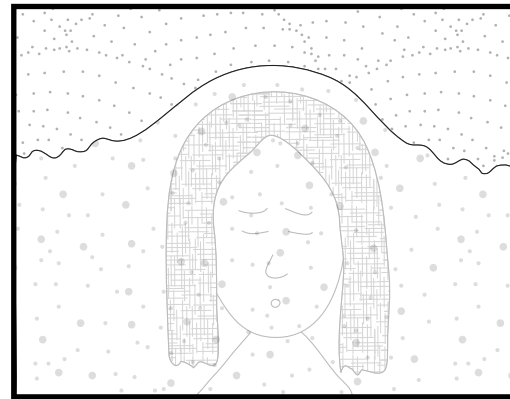
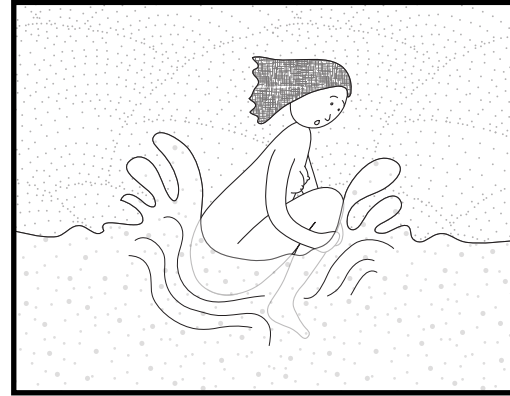
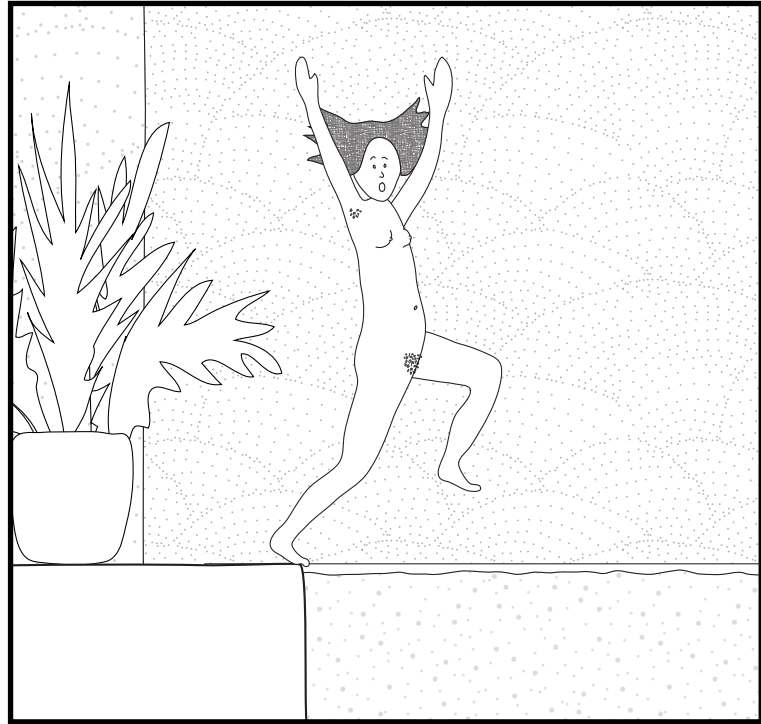
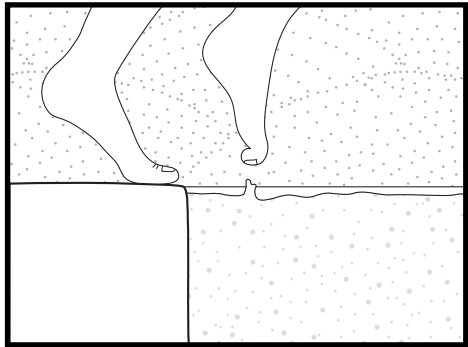
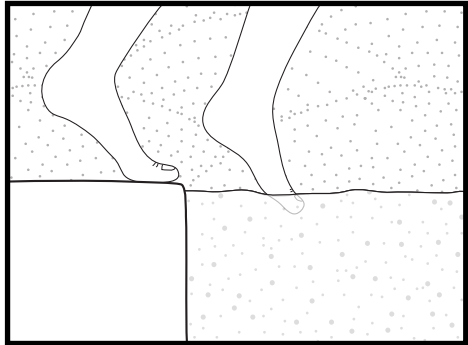
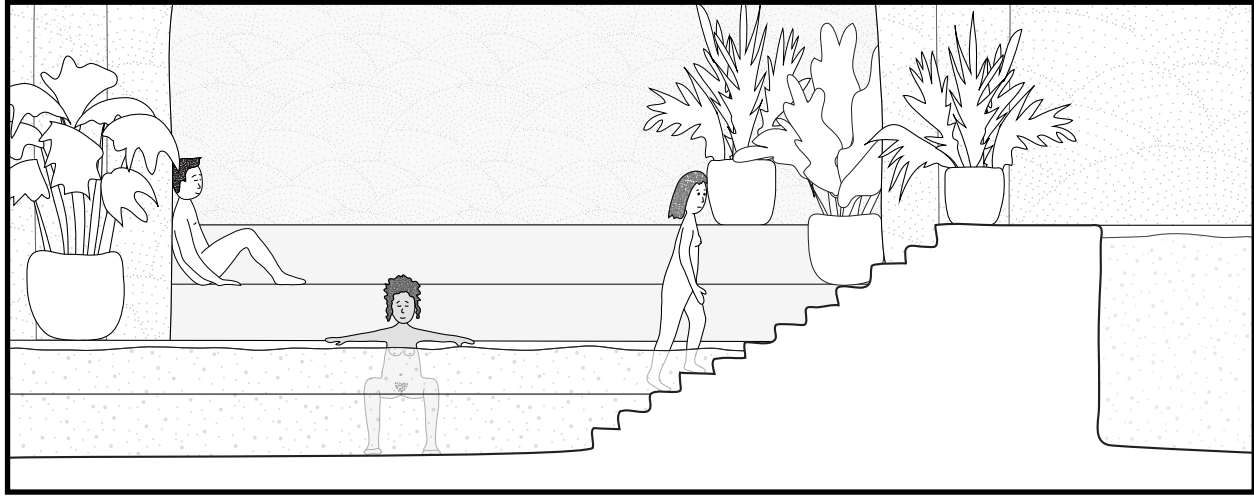
The menstrual leave calendar says you're still on your period.

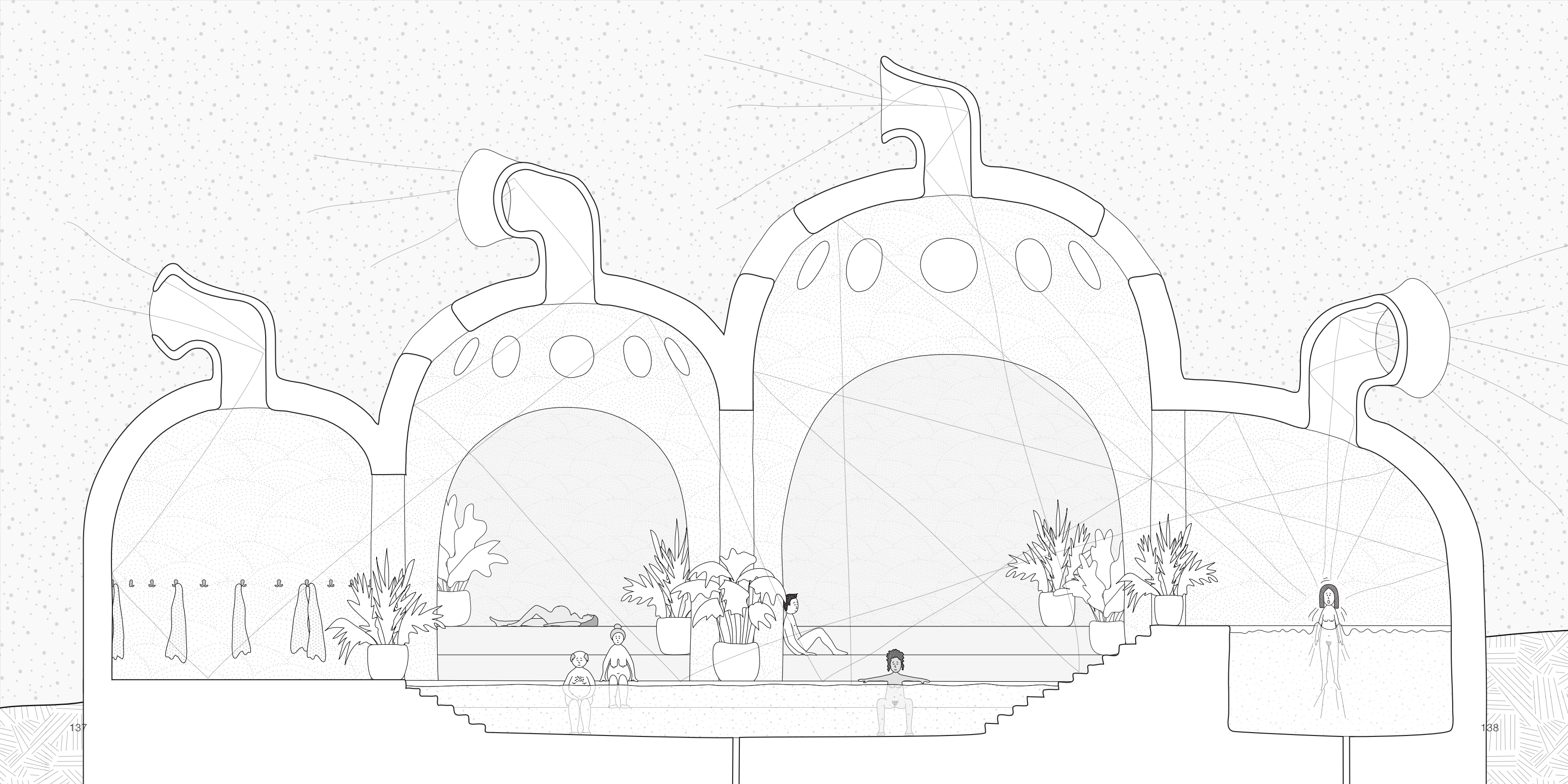
		1	2	3	4	5
		Jules		Maya		
6	7	8	9	10	11	12
Isabel		Remi			Sam	
13	14	15	16	17	18	19
			Gaby			
20	21	22	23	24	25	26
	Joey			Anna		
27	28	29	30	31		
		Nat				

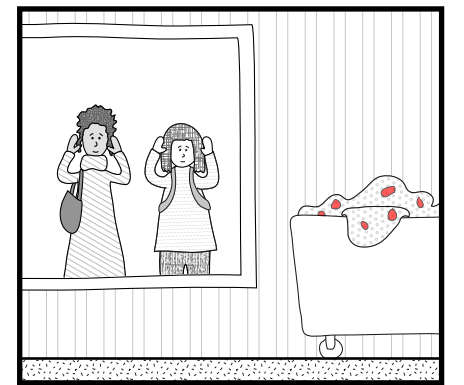
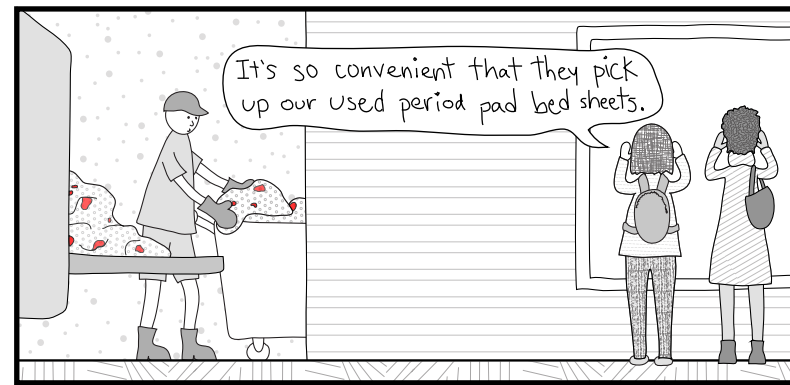
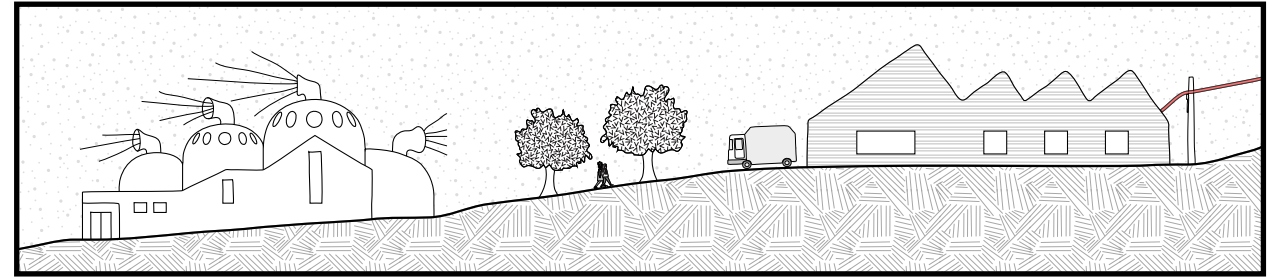
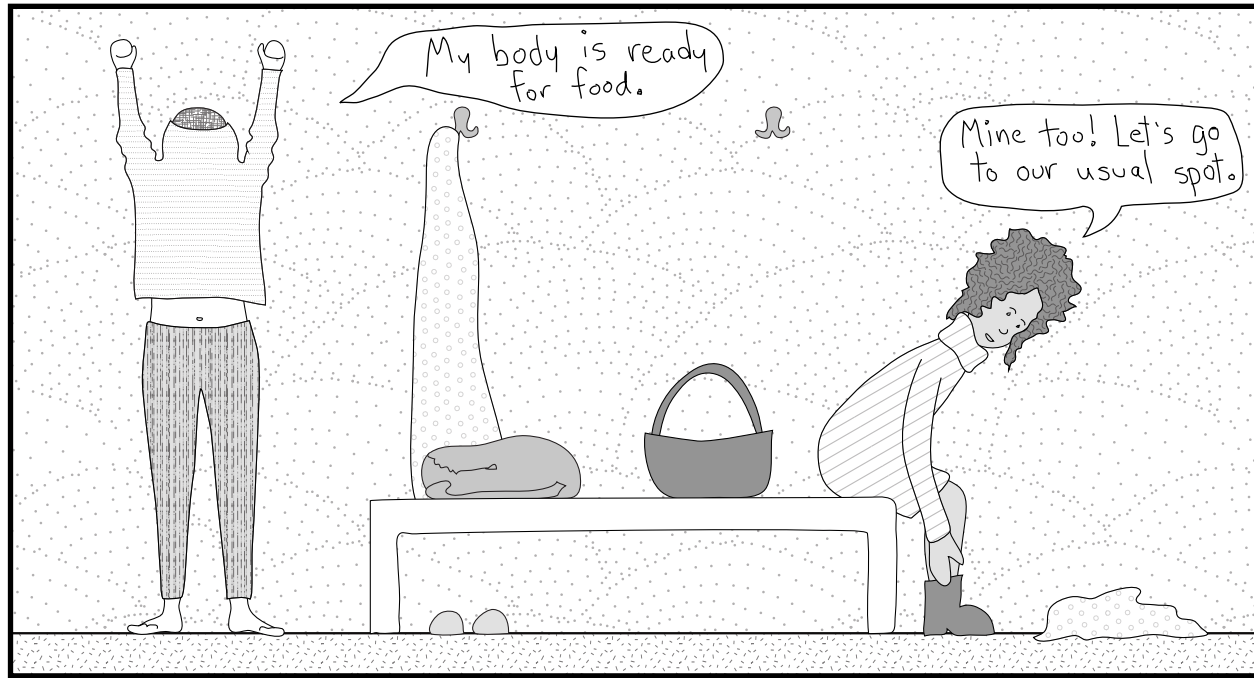
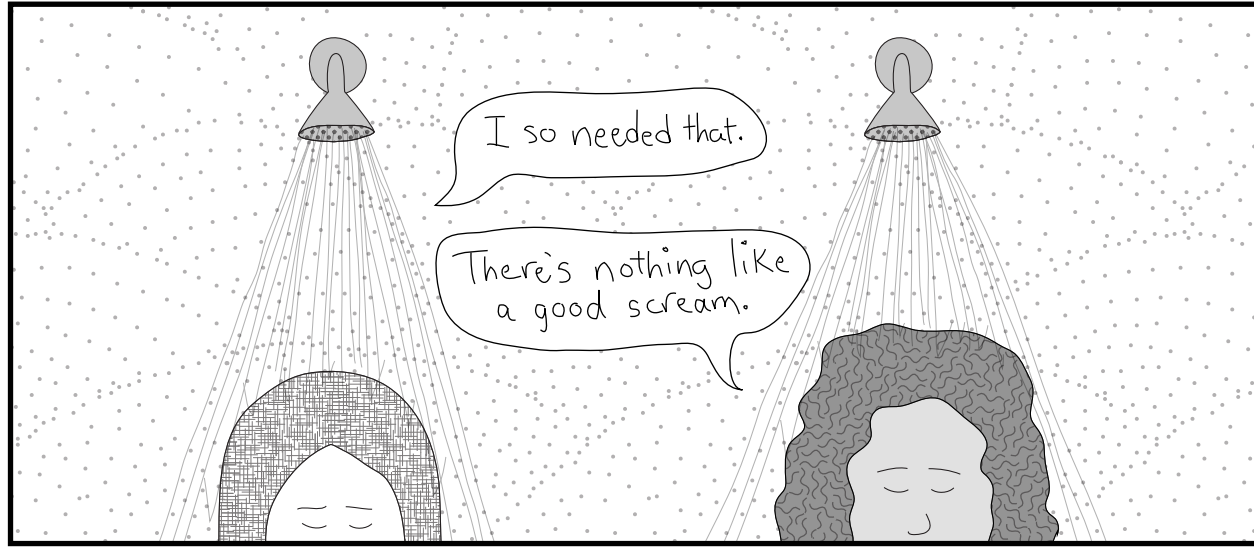


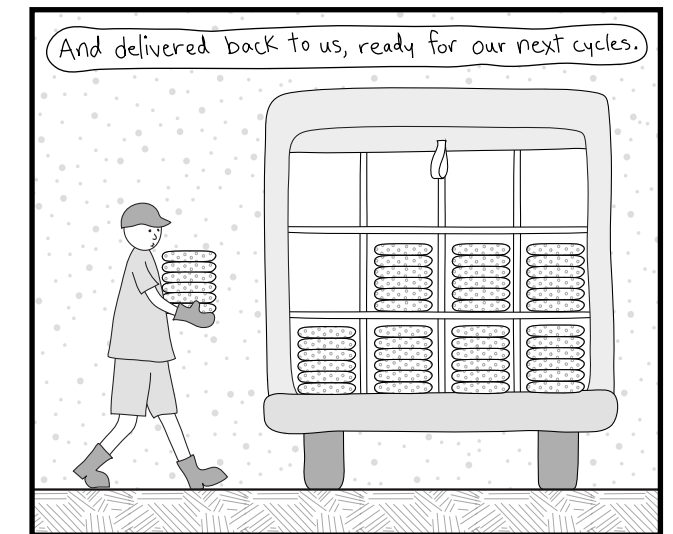
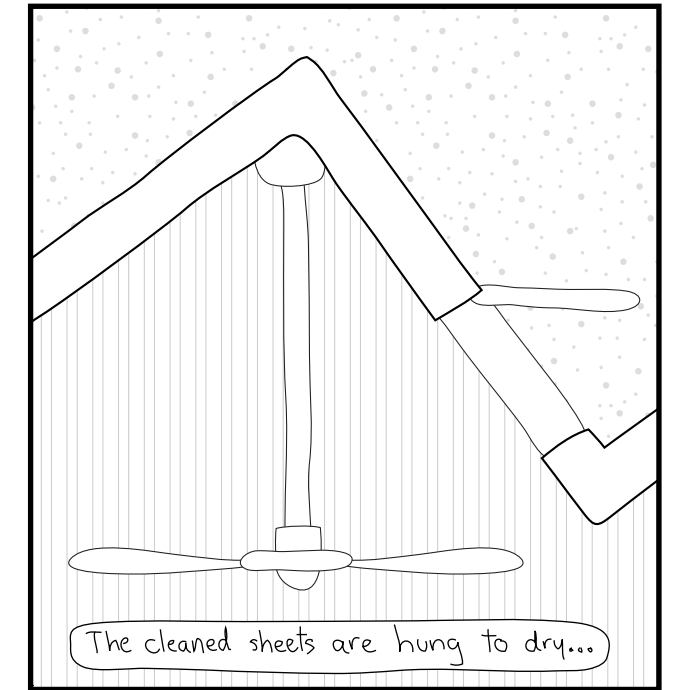
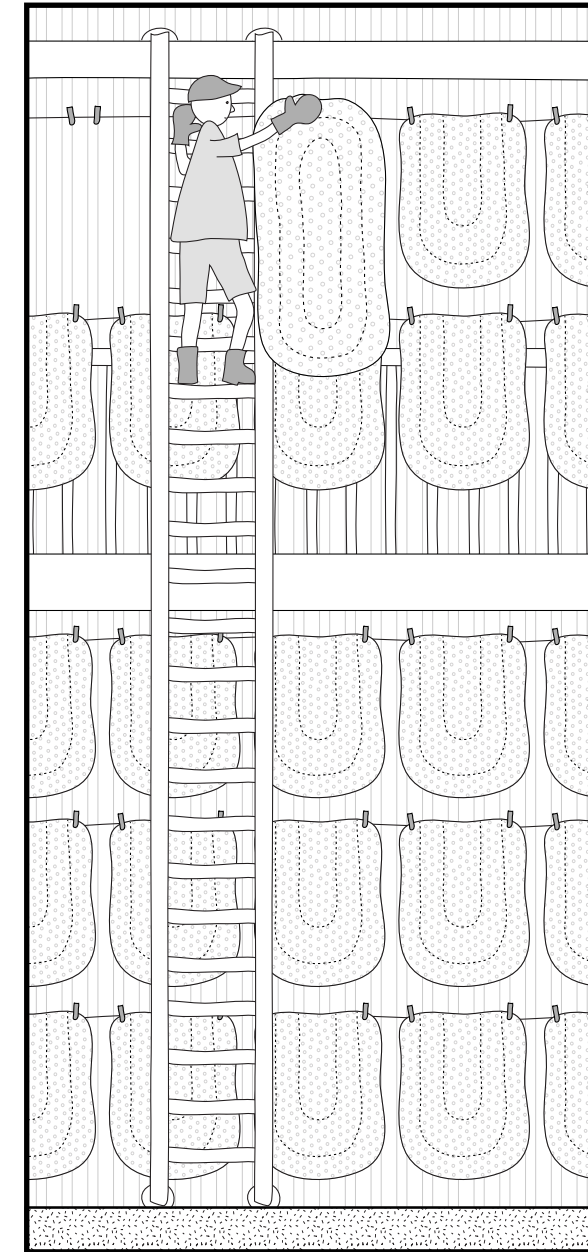
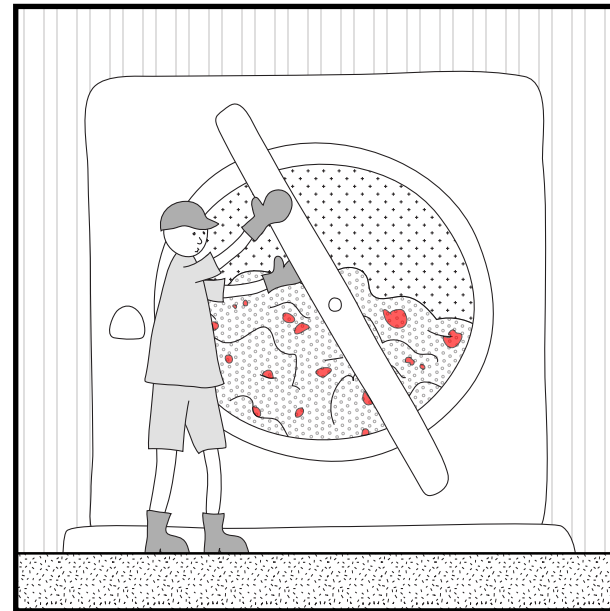
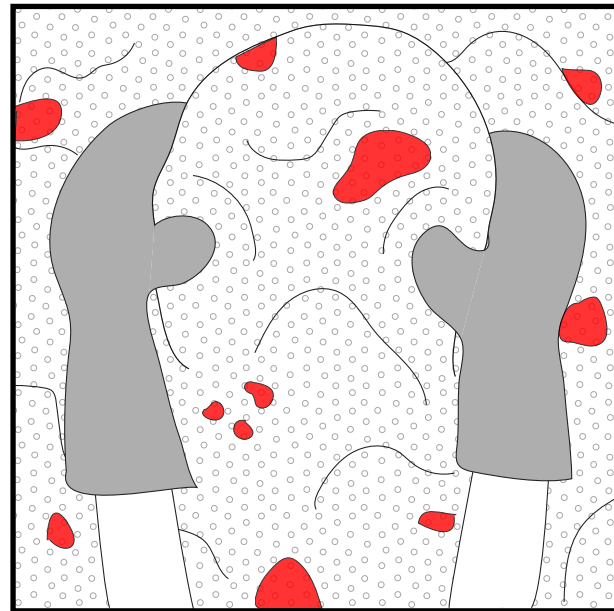
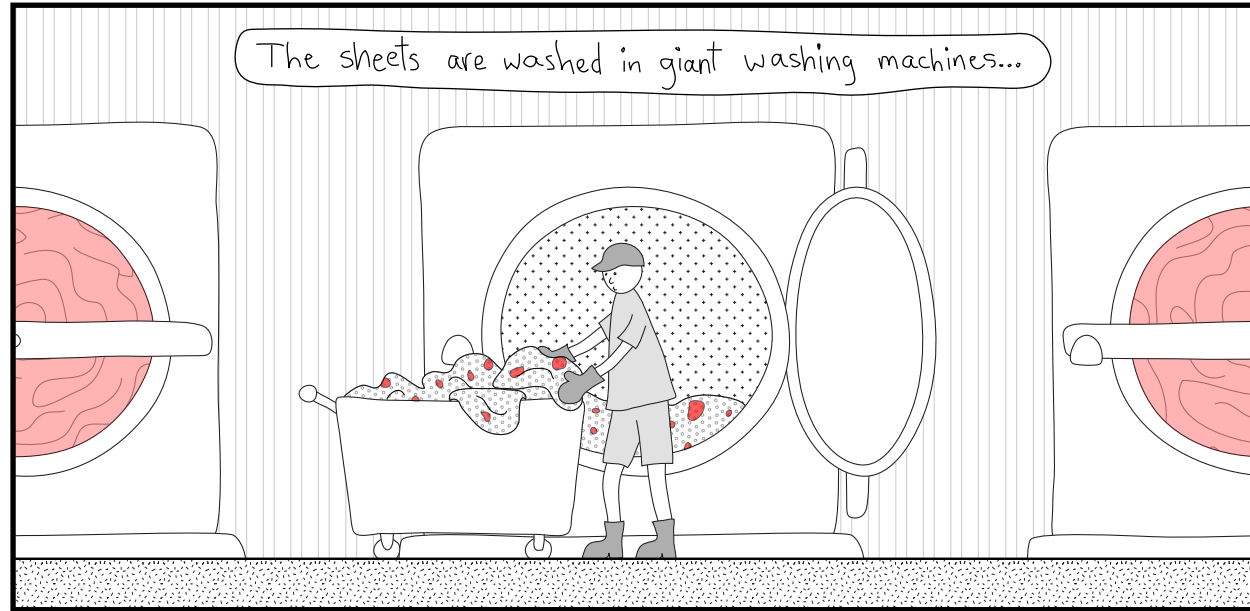


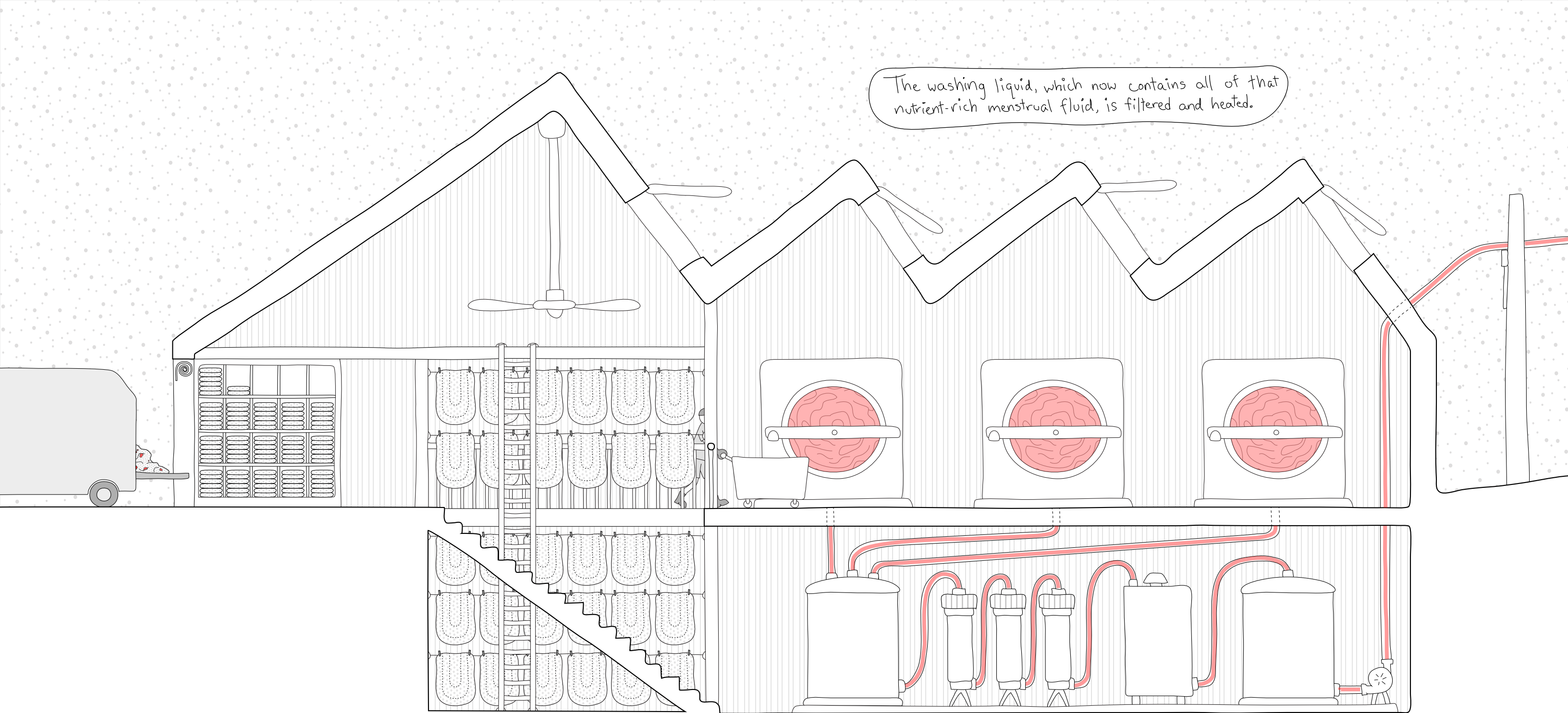




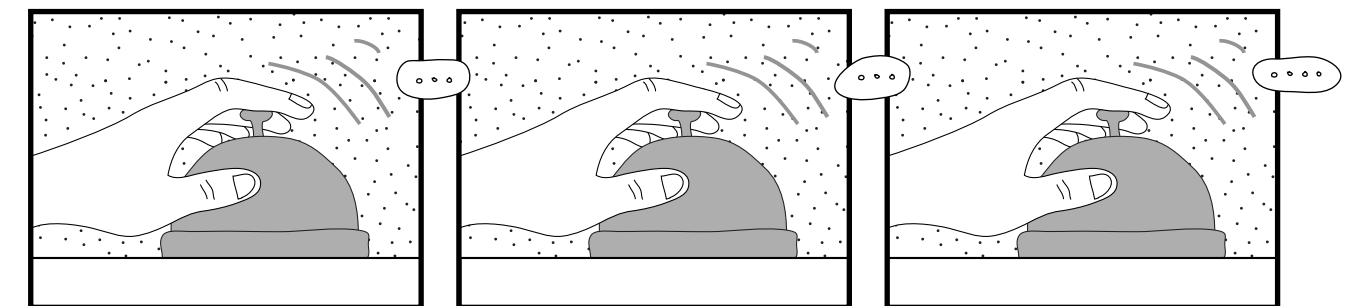
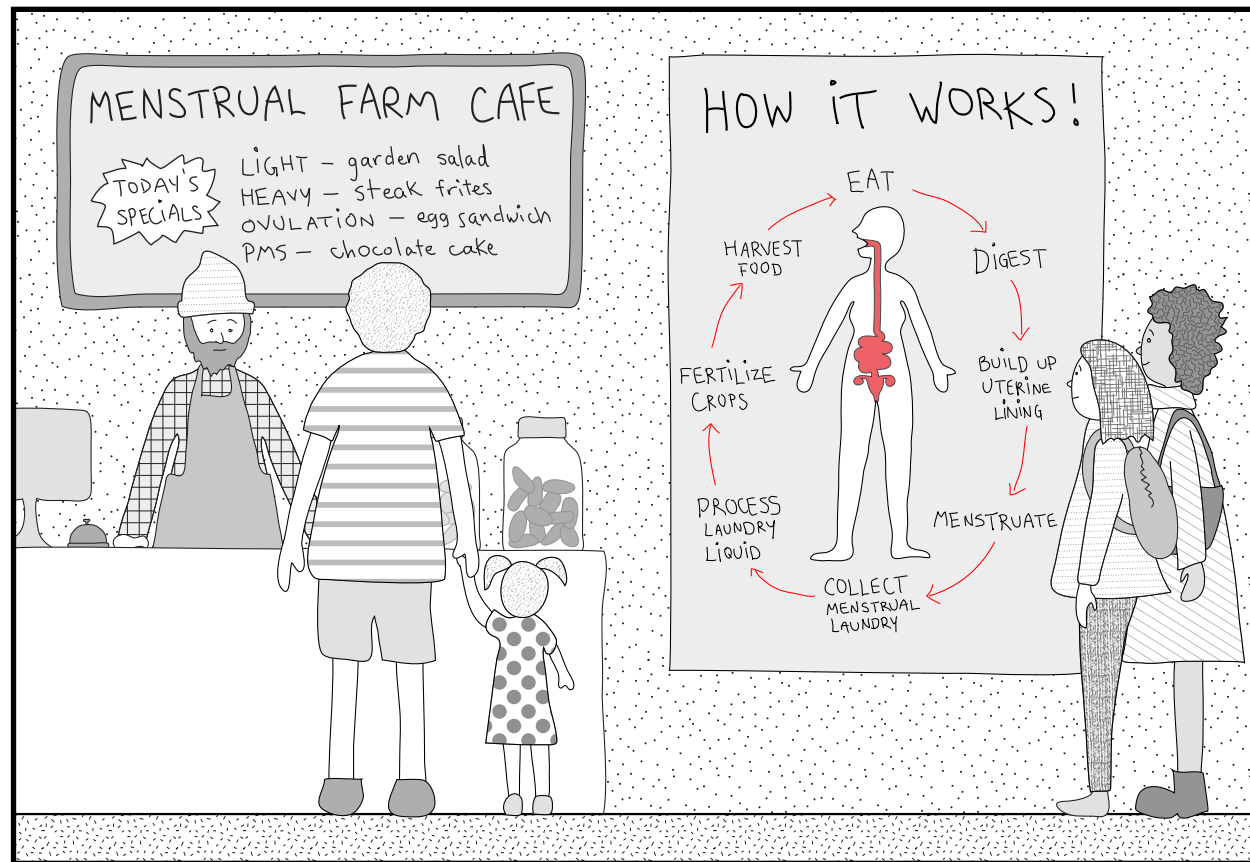
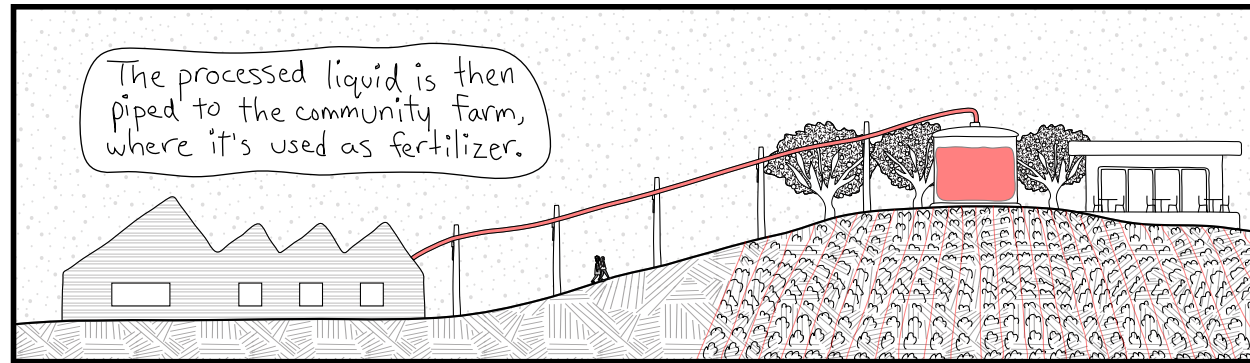


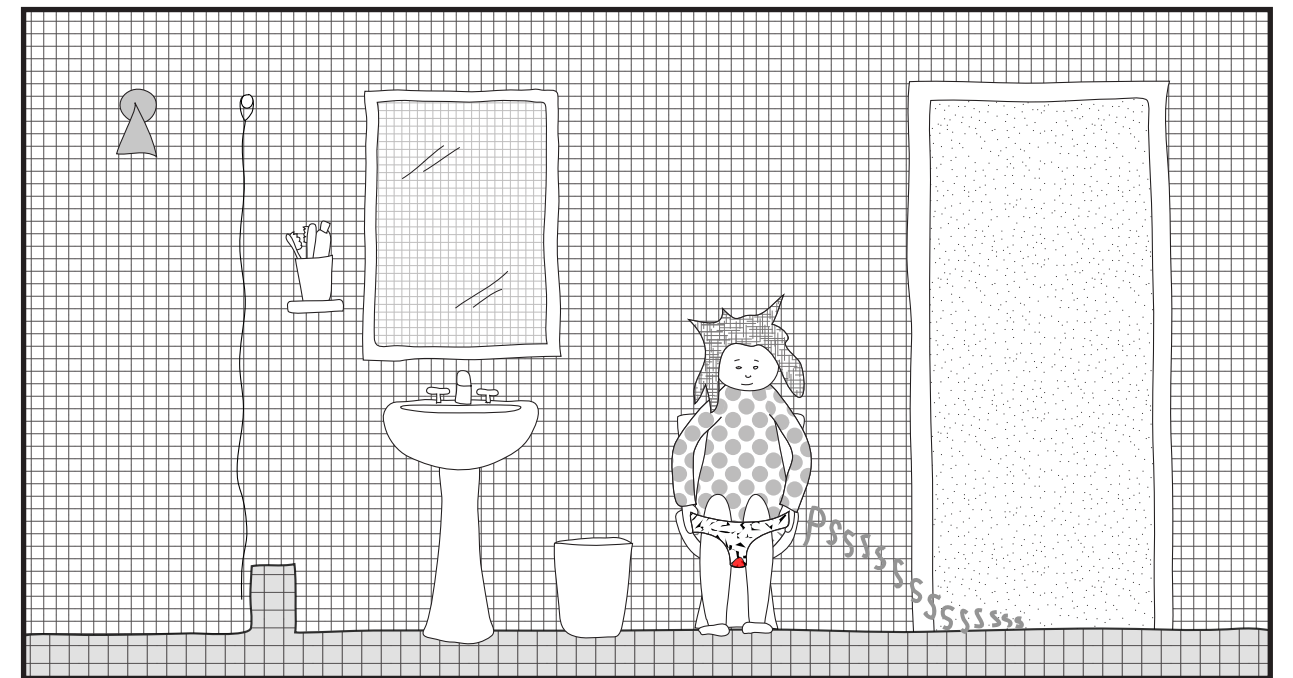
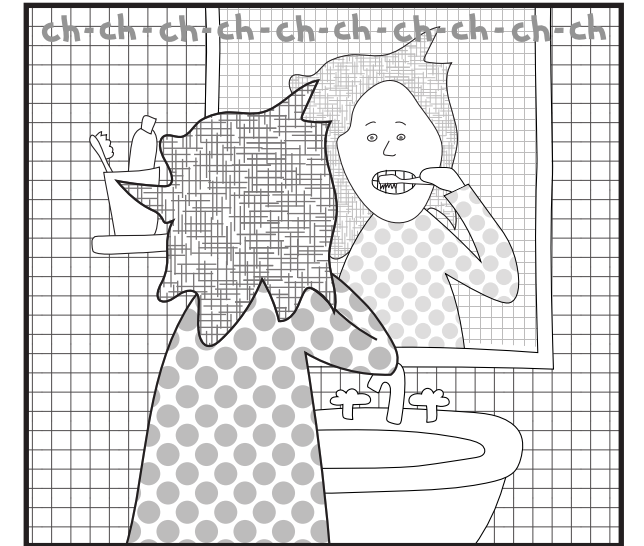
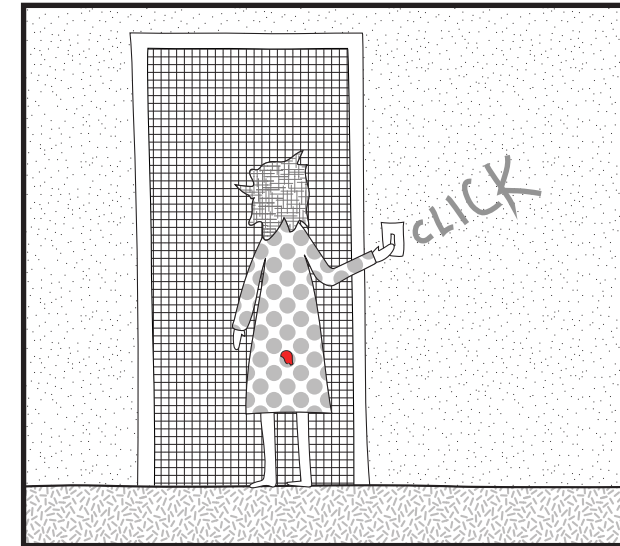
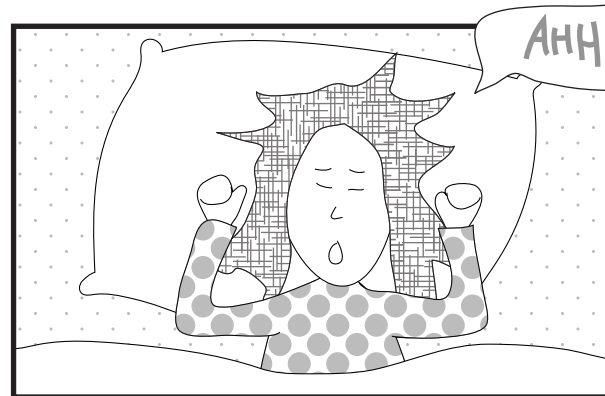
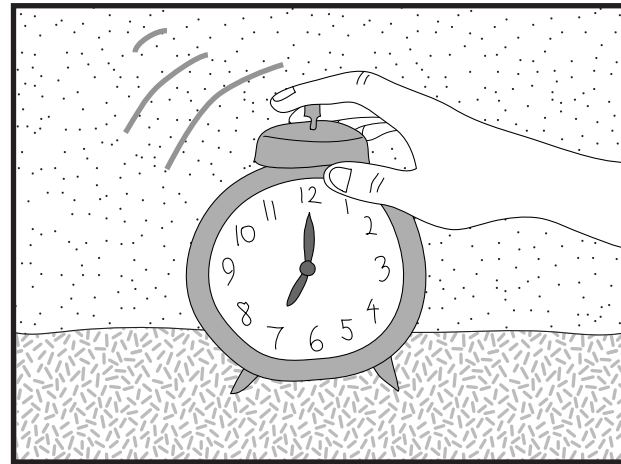
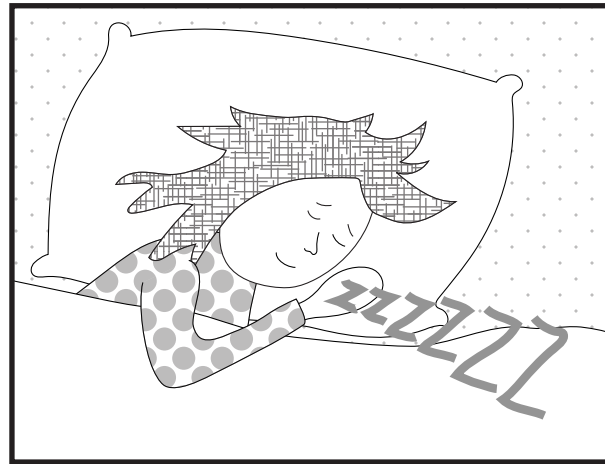


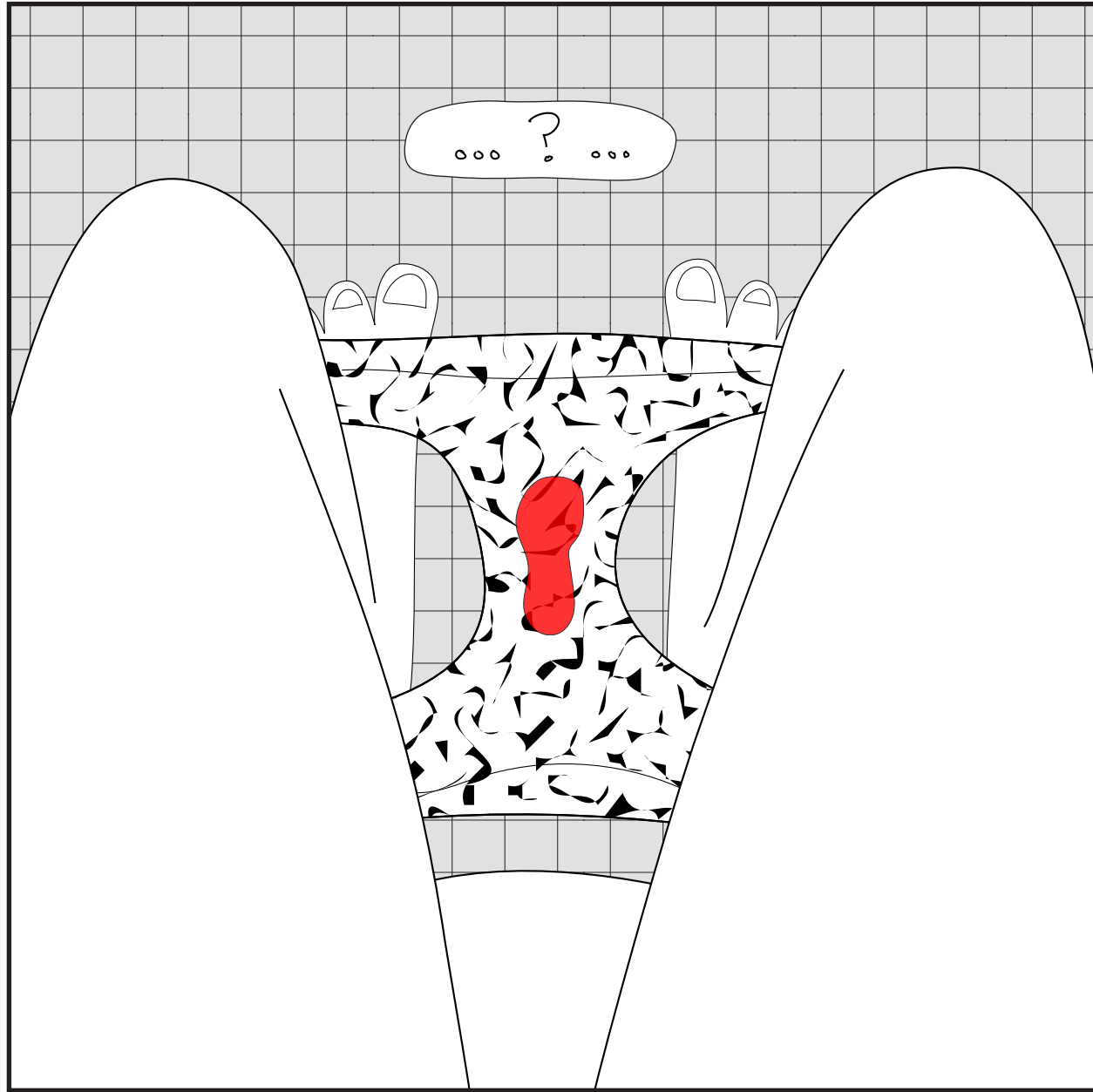




The washing liquid, which now contains all of that nutrient-rich menstrual fluid, is filtered and heated.







And now, Sam has a choice to make – will she make her dream a reality?....

BIBLIOGRAPHY

A'Design. 2019. "Heer Breastfeeding Bench by 52hours." A'Design Award and Competition. Posted February 1, 2019. <https://competition.adesignaward.com/design.php?ID=75218>

Agrest, Diana, Patricia Conway, and Leslie Weisman. 1996. *The Sex of Architecture*. New York: Harry N. Abrams.

Andrist, Linda C., Raquel D. Arias, Deborah Nucatola, Andrew M. Kaunitz, B. Lynn Musselman, Suzanne Reiter, Jennifer Boulanger, Linda Dominguez, and Steven Emmert. 2004. "Women's and providers' attitudes toward menstrual suppression with extended use of oral contraceptives." *Contraception* 70 (5): 359–363. doi:10.1016/j.contraception.2004.06.008. PMID 15504373.

Astrup, Juliette. 2018. "Period Poverty: Tackling the taboo." In *Community Practitioner* 90 (12): 40-42.

Atelier Van Lieshout. 2019. "Excrementus Megalomanus." Access April 29, 2020. <http://www.ateliervanlieshout.com/work/excrementus-megalomanus/>.

Beauvoir, Simone de. 1953. *The Second Sex*. New York: Knopf.

Block, India. 2018. "Ruth Pearn envisions public bathhouse to fight period poverty in Yorkshire." Posted August 23, 2018. <https://www.dezeen.com/2018/08/23/ruth-pearn-designs-public-bathhouse-to-change-attitudes-around-periods/>.

Brown, Lori A. 2013. *Contested spaces: Abortion clinics, women's shelters and hospitals*. Burlington, VT; Farnham, Surrey: Ashgate Publishing Company.

Buckley, Thomas, and Alma Gottlieb. 1988. *Blood Magic: The anthropology of menstruation*. Berkeley; Los Angeles; London: University of California Press.

Busuito, Stephanie. n.d. "Atelier Van Lieshout and the Excrementus Megalomanus." *Transnatural Art and Design*. Accessed April 29, 2020. <http://transnatural.org/blog/atelier-van-lieshout-and-excrementus-megalomanus/>.

Canadian Institutes of Health Research. 2020. "What is Gender? What is Sex?" *Gender and Health*. Last modified April 28, 2020. <https://cihr-irsc.gc.ca/e/48642.html>.

Colomina, Beatriz. 1992. "The Split Wall: Domestic Voyeurism." In *Sexuality and Space*, edited by Beatriz Colomina, 73-130. New York: Princeton Architectural Press.

Criado-Perez, Caroline. 2019. *Invisible Women: Data Bias in a World Designed for Men*. New York: Abrams Press. EBSCO Connect eBook Collection.

Daigneault Deschênes, Olivia. 2018. "Doing Feminism in Architecture." MArch thesis, University of British Columbia, Vancouver. <https://open.library.ubc.ca/cIRcle/collections/graduateresearch/42591/items/1.0372952>.

DaSilva, Anna Luisa L. 2018. "TerraFemme: A Social Entrepreneurship Investigation into Composting Menstrual Waste." *Proceedings of the National Conference on Undergraduate Research*, 73-80. Edmond: University of Central Oklahoma.

Duncan, Nancy. 1996. "Renegotiating Gender and Sexuality in Public and Private Spaces." In *BodySpace*, edited by Nancy Duncan, 127-144. London: Routledge. <https://doi.org/10.4324/9780203974070>.

Funambulist, The. "#Architectural Theories: A Subversive Approach to the Ideal Normalized Body." Accessed February 21, 2019. <https://thefunambulist.net/architectural-projects/architectural-theories-a-subversive-approach-to-the-ideal-normalized-body>.

Goldsmith, Selwyn. 2000. *Universal Design: A Manual of Practical Guidance for Architects*. New York: Architectural Press.

Gollom, Mark. 2018. "Sex-ed curricula can't satisfy everyone, and they shouldn't try, say some experts." *CBC News*. Posted August 16, 2018. <https://www.cbc.ca/news/canada/sex-education-ontario-canada-curriculum-1.4786045>.

HCMA Architecture and Design. 2018. *Designing for Inclusivity: Strategies for Universal Washrooms and Change Rooms in Community and Recreation Facilities*. Published February 2018. https://hcma.ca/wp-content/uploads/2018/01/HCMA_Designing-for-Inclusivity_V1-1.pdf

Jones, Allison. 2019. "Ontario government releases new sex-ed curriculum, similar to scrapped version." *Global News*. Posted August 21, 2019. <https://globalnews.ca/news/5792416/ontario-new-sex-ed-curriculum/>

Kaur, Rupl. 2017. "period." Accessed April 29, 2020. <https://rupikaur.com/period/>

Kogan, Terry S. 2007. "Sex-separation in public restrooms: Law, architecture, and gender." *Michigan Journal of Gender & Law* 14 (1): 1-58. HeinOnline.

Lee, Lauren E. 2017. "Warm Wall." Lauren.E.Lee. Accessed April 29, 2020. <https://laurenelee.com/Warm-Wall>.

Lunette. n.d. "Short History of Menstrual Cups." Accessed April 29, 2020. <https://www.lunette.com/blogs/news/short-history-of-menstrual-cups>.

Patel, Arti. 2020. "Kotex breaks tradition and uses blood-like liquid in new ad." *Global News*. Posted January 24, 2020. <https://globalnews.ca/news/6457156/kotex-red-liquid-ad/>.

St-Denis, Jen. 2020. "Vancouver council to vote on providing free menstrual products in city bathrooms." CTV News. Published March 8, 2020. <https://bc.ctvnews.ca/vancouver-council-to-vote-on-providing-free-menstrual-products-in-city-bathrooms-1.4844038>

Steinem, Gloria. 1986. "If Men Could Menstruate." In *Outrageous Acts and Everyday Rebellions*. New York: New American Library.

THINX. 2015. "How it works." Accessed April 29, 2020. <https://www.shethinx.com/pages/thinx-it-works>

UNICEF. 2018. "Fast Facts: Nine things you didn't know about menstruation." Press Releases. Published May 25, 2018. <https://www.unicef.org/press-releases/fast-facts-nine-things-you-didnt-know-about-menstruation>.

Vaughn, Emily. 2019. "Menstrual Huts Are Illegal In Nepal. So Why Are Women Still Dying In Them?" *Goats and Soda*, NPR. Published December 17, 2019. <https://www.npr.org/sections/goatsandsoda/2019/12/17/787808530/menstrual-huts-are-illegal-in-nepal-so-why-are-women-still-dying-in-them>.

Vostral, Sharra L. 2008. *Under Wraps: A History of Menstrual Hygiene Technology*. Lanham: Lexington Books.

Weisman, Leslie Kanes. 1992. *Discrimination by design: A feminist critique of the man-made environment*. Urbana: University of Illinois Press.