

## *Temp Tools*

By Hannah Dow 12/23/12

Too often, the human race has a tendency to leave its footprint on everything it touches; it is difficult not to. With the majority of our possessions being fabricated from non-recyclable materials, what other option do we have? With the creation of “Temp Tools,” this question is addressed. Temp tools give new meaning to the term “throwing away” by investigating the relationship of consumer and product even *after* an item’s use is complete. Through the creation

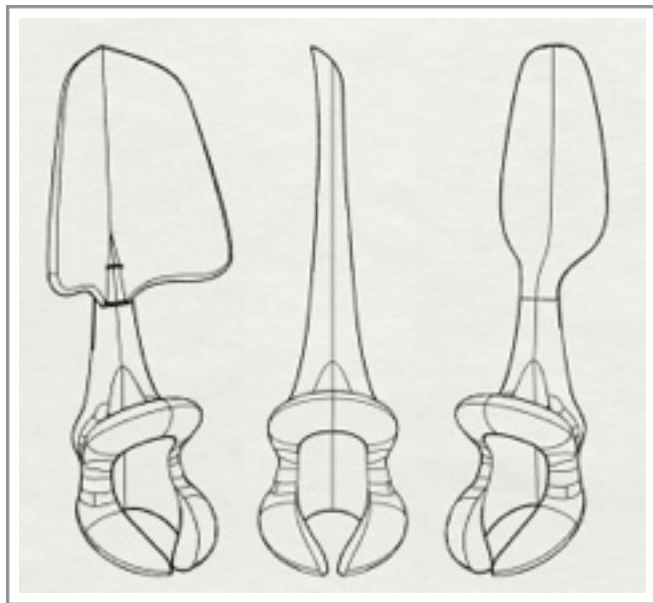


Figure 1- Temp Tool CAD drawings

of modified camping tools, the goal is to bring attention to conversations that focus on the complete life cycle of objects. Temp Tools are, in essence, a set of biodegradable camping tools that can be fitted onto sticks found in the woods. They are made from an all-natural composite material and include a selection of regional flower seeds to encourage an active re-

contribution to nature, allowing the user to leave a positive footprint on their landscape. These camping aids will be helpful during an outdoor trip, remaining very strong and rigid during its role as a tool and yet having the ability to completely biodegrade once the tools are discarded. In addition to persuading the user towards an active repayment to nature, the tools leave regional flower seeds planted in the soil once the products are discarded on site, leaving only beautiful

flowers in the user's wake. Temp Tools include three pieces that can be attached to sticks found out in the woods during an outdoor excursion. Included is a roasting stick attachment as well as a spatula/spoon combination, and a shovel head.

In order to begin enhancing the conversation between the consumer and nature, these camping tools act as a gateway into the world of nature preservation and acknowledgement. The user draws on the Temp Tools during a trip in the natural environment as they manipulate different aspects of the land. Then, after disposing of Temp Tools, the user repairs that land by planting the tool and growing a new life form. The user will get in a habit of giving back to the environment by the active planting of the flower seeds. Beginning this trend with people who are already enjoying and appreciating the outdoors through camping is an ideal stepping-stone to opening up the market to an even bigger audience in the future. The mindset I am installing with this project has the ability to get people physically involved with the land they use, nurturing the strong bond with nature that humans once had before all processes were done through outsourcing and large factory production. "Locating the balance point between using the resources we need and minimizing the repercussions of our consumptions" is the greater scheme of what Temp Tools truly stand for in the context of the design world ("Questioning Consumption: Ecological Footprints" 32-33).

The heart of this project addresses consumerism and consumption in America, where many people don't know what happens to their material possessions once it leaves the house in a garbage bag. While Americans only represent about 5% of the world's total population, the public actually generates 30% of the world's garbage. "In sum Americans waste or cause to be wasted nearly 1 million pounds of materials per person every year" ("Recycling in Zion National

Park”). Due to designers’ habit of designing products for obsolescence, “we’re knee deep in useful things...yet we’re also laden with the detritus of the last generation of objects. The periphery of our comfort zone is lined with waste (“Designing a Sustainable World” 83-87).”

With the current “green craze,” whether simply a social trend or an honest effort to better the Earth, people are interested in being proactive when it comes to improving the planet. Thus, this product puts that

responsibility into the hands

of the consumer who are free to decide where their worn out possessions will live beyond their physical lives. They can now personally and easily make a difference in the issue of

overconsumption. Encouraging the planting of these items on site to improve the natural

surroundings is one of the most important aspects of this project. “We all have needs, and most

of us enjoy buying new things, so when we can’t buy less, we can at least buy smart

(“Consuming Responsibly” 35-39).” Acknowledging that trying to change such a cemented

behavior would be a very trying task, it makes more sense to work towards promoting smart

consumption, taking advantage of the user’s engrained draw to consumerism for nature’s benefit;

thus, creating a product that benefits the earth, the more it is used. Temp Tools solicits an active

return from the consumer, setting it apart from many products that are on the market today.

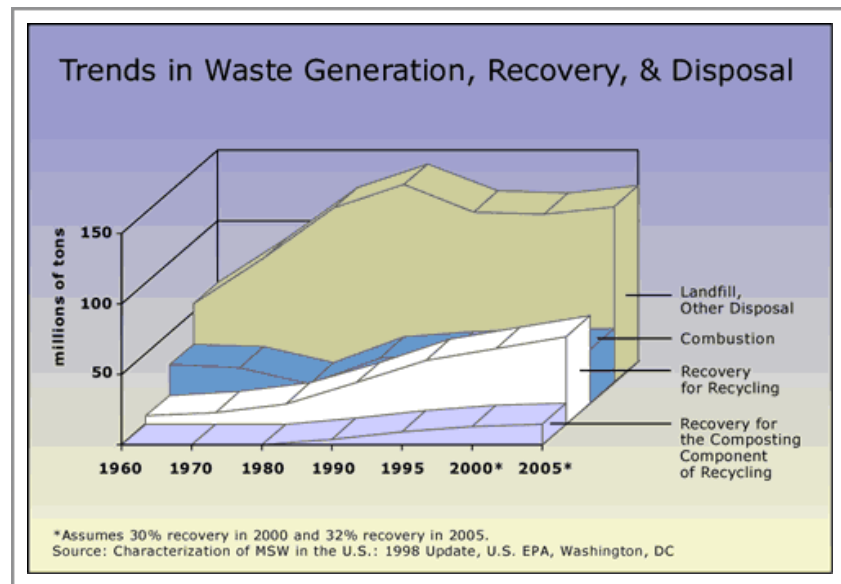


Figure 2- Demonstrates the rise in waste generation over 45 years, highlighted on <http://www.zerowasteamerica.org/statistics.htm>

Currently, there is a disconnect between consumer and producer when it comes to the meaning of the word “biodegradable.” Many companies put the “biodegradable” stamp on their product neglecting to inform its consumers that the item is sent to a waste facility and exposed to specific microorganisms and atmospheric conditions in order to break down into its elements (“What Biodegradable and Compostable Really Mean”). Most consumers see biodegradable and think “natural” or “leaves no trace,” and this lack of knowledge goes unnoticed as consumers throw away all their garbage, putting little thought into its final disposal. What biodegradable truly means is something that is “capable of being decomposed by bacteria or other biological means” (“Biodegradable”). Now painfully obvious, this definition mentions nothing about the footprint left behind by the item. Essentially, it is incorrect as a consumer to think that once you purchase something biodegradable and throw it away, it disappears. Nothing disappears, but Temp Tools are working to make the impact on the environment a positive one.

### Contextual Review: Biodegradables

There are currently a number of designers looking into the creation of “leave no trace” products or those that work themselves back into nature, although this trend has not really crashed into the market *enough* for consumers to take notice. Many people are jumping into the “be green” lifestyle by reusing grocery bags and eating free-range chicken, while producers are moving towards the use of “eco-friendly” plastic bags and paper plates. One company taking part in the creation of biodegradable and recyclable eating tools is BeGreen Packaging. This company along with many others, is focusing on the making of consumer and food packaging using pulp fiber blends. These fibers include bulrush, kenaf, wheatstraw, bamboo, rice, and bagasse (all of

which grow in the wild). Companies like BeGreen provide a good framework for opening up the industry to creating with disposal in mind, yet they do not push the boundaries of what people see as possible in the realm of biodegradable products. Many items currently on the market that claim “eco-roots” are “dressed up in packaging that references nature but merely wears the idea of sustainability” (“Knowing What’s Green” 114-18). These products address the topic of green design but fail to express the full potential of buying with the planet in mind. “Most of the green products on the shelf today are mere half-steps, metaphorical references to sustainability (“Designing a Sustainable World” 83-87),” failing to completely encompass what it means for a product to “be green.”

In the green design community, one company that has chosen to move away from bags and eating related products in the green design community is OneMoment with designer Figtree Studios. They have gone the distance to create a line of biodegradable footwear with a plastic sole at 2mm thick and a price point at as little as 5 euros a



Figure 3- The “OneMoment Shoe” designed by Figtree Studios and shown on [www.yankodesign.com](http://www.yankodesign.com)

pair. The user can wear these shoes around like a typical pair of slip-ons and as time goes on and the shoes begin to wear out, you can simply leave them behind (“01M One Moment® 100% Biodegradable Shoe”). A great factor that goes into these unisex slippers is their fast turnaround. Once the shoes are exposed to the elements in the ground, it only takes 6 months before the shoes are up to 80% composted.

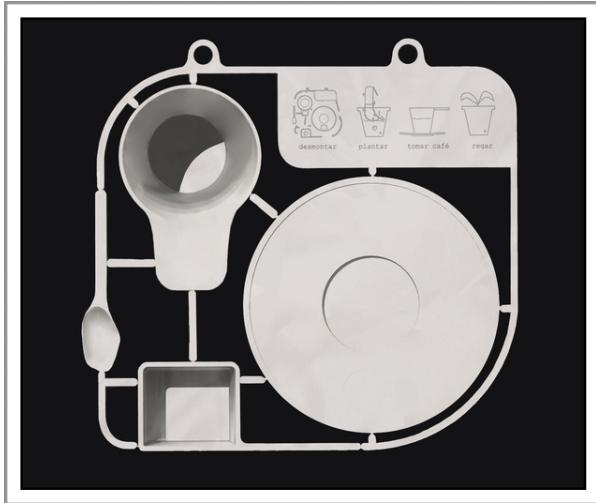


Figure 4- "Kit Cafe" designed by Joanna M. Carvalho and highlighted on Behance Network

Even more groundbreaking in relation to Temp Tools, is a concept design featured on Behance Network that displays a completely biodegradable picnic or "coffee kit." This kit includes a coffee cup, saucer, stirring spoon and another vessel, possibly for milk or cream. While this may only be a concept design, the

Kit Cafe really appeals to the mission of Temp

Tools, where every piece of the kit can be utilized by the consumer and then planted to promote the growth of something. It is refreshing to know that there are creative people looking to address the same issues that my product aims to tackle, and by redefining how consumers view their everyday trash, the designer of Kit Cafe has taken an appreciated approach to innovation. Also in line with Temp Tools is the easy to follow instructions printed right on the material of the Kit Café. It allows the user to easily read what this product does and how they are meant to treat the material during, and even after use. This easy to understand, intuitive design is what many tools are currently missing.

#### Contextual Review: Utility-Tools

While many tools currently on the market are very functional, their ergonomic and aesthetic qualities are quite lack luster. Consider the TAD Gear "B.R.A.T.T." (see figure 5). This tool is very functional yet appears very awkward, not signaling to the user how they should grip or use each piece of this design. What is the primary tool in this design? The overarching

problem is that this product is not intuitive. When it comes to the aesthetic and ergonomic aspects of such tools, the attempts of zodiaceng.com (shown in figure 6) with a piece from their “NME Knife and Tool” line comes the closest to a



Figure 5 and Fig. 6- Seen left: TAD Gear “B.R.A.T.T” multitool. Right: Zodiaceng.com’s multitool from the “NME Knife and Tool” line

product worth emulating. The tool looks fairly comfortable and its shape creates a dialog with the user, telling them how to hold it. The consumer knows what this product does and how to use it, a quality that is hard to find. Even more specifically looking at camping tools such as roasting sticks and tent stakes, the products currently available to the public take on the same ergonomic and aesthetic drawbacks as function overcomes all.

### Contextual Review: Considering the Interaction

Part of Temp Tools’ largest affect resides in the fact that they are so easy to dispose of in a proper way. You use the tools, and even if you lose them and do not have a chance to take part in the planting ritual of the life cycle, the flowers begin to bloom after the tools have time to break down. This way of designing not only the item but also the services and systems that deal with the interaction between product and user, is a mantra used by many well known design companies such as Herman Miller, with their recycled and easily disassembled office furniture, and Method Home, makers of earth-conscious household cleaner and soap. Method was started by two former roommates Adam Lowery and Eric Ryan. Method’s goal was to create household

cleaning products that consumers wouldn't have to keep under the sink, thus establishing recipes for the creation of an all natural, safe, green design. In line with the aforementioned goals of utility, Method's creators share, "when it comes down to it, we're here to make products that work, for you and for the planet, ones that are as easy on the eyes as they are on the nose" ("Our Story").

In addition to these

examples, the following are other designers that work to factor user experience into their designs as well as considering the end of life cycle for their products. Of these include HP who took a big step in the effort to recycle old printer cartridges; This computer and printer company included return mailing packets with all of its new cartridges. "Since 1987 when we began recycling hardware, HP has recovered over 2.3 billion pounds of products for reuse and recycling...as cartridges and parts are reduced to raw materials that can be used to make new cartridges and other metal and plastic products" (HP). Another, Sprout, a UK based design firm and one of few eco-design companies in the world, developed a set of high quality knives for Japanese company,



Figure 7- Shown on the Method Home website, this info-graphic illustrates the main components strived for in each product made by the company.



Toginon. This set includes a collection of high-quality knives, where “every Toginon Knife comes with two blades, and when one is blunt, the user can easily remove the blade from the



Figure 8- Toyota Prius (stock photo from [www.kimballstock.com](http://www.kimballstock.com))

handle and post it back to the producer, who then reconditions and sharpens it” (Toginon Knives).

Most likely, a better known example of designing for use and interaction is the Toyota Prius. Their attitude towards the design of this efficient automobile and future endeavors is to

make green products that are not any different in branding, price, use, or performance than their other “typical” car models. This attitude swayed the public into realizing that design can be fully-functional and earth friendly without giving up any functions of the original product.

The issue among green products in general is that users have not yet become completely trusting of the companies producing these items. This stems from some companies’ tendency to be very vague in concretely establishing what makes their product earth friendly. This makes it hard for consumers to recognize the truly green products when comparing them to the typical buy. *World Changing* goes into length on this subject adding that many consumers “don’t adequately understand the environmental impacts of their purchases...” (“Green Marketing” 389-92). Across the board, most products, and even the successful companies listed above, do not seem to equally address the three main points of a well-rounded design: functionality, ergonomics and aesthetics, and attention to user experience and interaction-this is where Temp Tools stands apart from the competition that is currently on the market.

Methodology:

Initially, the goal of the project was to create a biodegradable pocket knife with the same end of life “renewal” as Temp Tools, it was apparent that material choice was a very strict boundary for the allowance of the



Figure 9- First knife model

tool’s functionality. Creating a pocket knife that was not very sharp or strong would be nearly design suicide. Thus, after making models of possible knife designs and contemplating additional

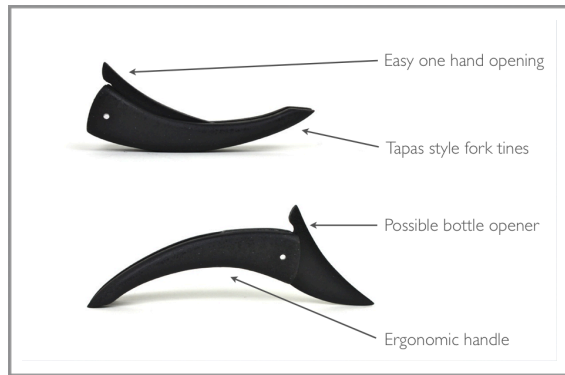


Figure 10- Final pocket knife model

functional elements within the tool (like eating utensils and stakes to hold down your tent), it was clear that the design had become a much bigger focus than function, with no intention of turning back. If the concept was the most important element of the exploration then the design prospect

had to change. It was still important for the product to be delivered to campers and other outdoors-people so the most logical step was to think of other camping tools that consumers would not mind or would prefer to throw away at the end of their trip. Items like fire starters such as matches and tinder, any kind of food related utensil, a walking stick, roasting sticks, tent stakes, and other items of the like. This new angle was combined with a basic camper interaction knowledge to turn into the ideation of Temp Tools. First, when camping it is typically difficult to establish a constant flow of drinking water, making washing plates and utensils quite a hassle. In addition to this, depending on where the user is sitting in regards to a camp fire, they may need a certain length roasting stick to sufficiently cook their food. This is remedied with the Temp Tools

attachment feature, allowing for the transformation of an everyday stick to be turned into a useful tool. After creating my first model (see figure 11) it became clear that hoping to create a tapped interior connection point to



Figure 11- First Temp Tool model

screw the tools onto a stick was not very realistic. Not only would the tooling for this be very expensive and difficult to accomplish, but it was not even the best solution to the challenge of creating something that could grasp and hold tight onto a cylindrical shape. After realizing this, and going back to the drawing board, the final Temp Tools design was created. Figure 12 shows the attachment point where the tool meets the stick, a



Figure 12- Final Temp Tool model of skewer attachment

feature consistent among each tool in the set.

This slip-on, no fuss connection point is easy to use and understand and allows for the use of sticks with different diameters.

As a designer it is very often that your products are not used or disposed of the way you intended, thus it was vital that there

was little to no room for error when it came to the end of life cycle of the Temp Tools. It is literally as simple as dropping your tool on the ground and walking away, a nearly fool-proof ritual for any forgetful or unaware consumer who does not typically contemplate the afterlife cycle of their objects. This straight-forward approach relates to a point highlighted in World Changing regarding happiness “surprisingly, a leading cause of unhappiness, at least in developed nations, appears to be our overabundance of choice...having too many options fosters

stress, anxiety, and uncertainty” (“Questioning Consumption: Choice Fatigue” 33-34). So, while this point may seem a bit out of bounds, keep in mind that Temp Tools are not just a product design exploration, they are also a study into the interaction of user and object as well as an examination of the long-term effects of products on consumer behavior.

### Production and Analysis:

With such a high stress on material, the creation of Temp Tools required extensive research to find just the right mixture of strength and biodegradability. These studies began with looking for a man-made biodegradable plastic pellet that could be injected into a 3-4 part mold of the final form. While many materials call themselves “biodegradable,” very few if any actually have the ability to break down when exposed to the natural elements, as mentioned in the above sections. Thus, it made more sense to go on to create an original material composite from scratch in order to find the best match for Temp Tools. First, a paper pulp mixture was made out of already recycled plates, using techniques seen in traditional paper making. This idea blossomed after interviewing a representative from an “eco” company about my ambitions. Unfortunately, the plates did not biodegrade very much at all, never breaking down even after days of soaking in water and a run through a kitchen blender. In turn, while the original route of using bioplastic casting pellets and re-pulping already recycled materials did not work out, these first hand experiences led me to the creation of homemade glues, testing the strengths of these adhesives with paper pulp as the binder.

The two glues highlighted in the experiment include one made using milk curds and vinegar; better known as casein glue, and a glue made from gelatin, white vinegar, glycerin, and

water. While the gelatin took a few days to completely dry, it becomes extremely strong and stiff without being brittle as the casein proved to be. The gelatin based glue was then mixed with fine paper pulp, creating a very strong and stiff material, becoming the first big step in creating the final Temp Tools body. This first glue sample was easy to mold and sanded nicely for finishing purposes once it was completely dry (ideally about a full 24 hours). Even better was a discovery that arose after placing the sample material in a cup of water for a couple hours and then a couple days; The composite breaks down very nicely, giving hope that it would be able to expose flower seeds ensuring the growth of plants after the tools' disposal.

The only problem with this new material was that it didn't "look" biodegradable which was important to the design. It was pertinent that the user knew from the start that their relationship with my product would only be temporary. This aesthetic conundrum led to thoughts of using wood, but the production methods would not have worked for my application so a mixture of sawdust and the home-made glue was my next best bet. This mixture became the final composite that Temp Tools are made from and displays extraordinary flexibility in different outdoor scenarios.



Figure 13 and Fig. 14- View top: first material test, gelatin glue and paper pulp. Seen bottom: final material selection, gelatin glue and wood sawdust

With the material chosen, it was important to conduct stress tests to gain a better understanding of the material and what it would and would not be able to do in the context of Temp Tools in the future. A big part of these tests was to determine how much heat the material could endure. While as a maker one hopes that their consumer would have the common sense to foresee that a completely biodegradable material would have limits on how long to stick it into an open flame, it was necessary to see just how well the material could stand up. It was determined that while the composite does soften under heat, it does not melt away into nothing and hardens back up once out of the flame. Considering its biodegradability, Temp Tools can endure a fair amount of heat but if completely necessary there is a willingness to include a written instruction on future packaging encouraging users to dip the tools in water before using, much like what is done with cooking skewers before placing them on a grill.

Moving forward with the material refinement and construction phase, the final step was to determine what kind of planted material the tools would incorporate. Originally the plan was to plant trees, a tall order considering their grow time, soil preferences, and most importantly the debate over invasive species. Thus, I spoke to an environment specialist at a local nature center



Figure 15- Regional Michigan flower samples (compilation of google images)

and was informed that working with regional flowers would be the best way to accomplish the overarching goal of creating a bright and positive footprint for users to leave behind on the land. The flowers chosen for the initial application of Temp Tools are native to the Michigan Great

Lakes region and include Bergamot, Black-Eyed Susan, Butterfly Milkweed, and Coneflower species. The future plan for the Tools is to market the product based on region, addressing the problems of invasive species that currently plague many areas of the environment. A positive marketing scheme for the future of the product will include providing Temp Tools to camp grounds operators who could distribute the tools to campers on site, allowing them to be prepared, even last minute.



Figure 16- Trial models of the version 1 Temp Tool roaster using a plastic mold

The final step in the construction of Temp Tools takes place by pouring the composite material into molds carved out using a CNC router. Models of the three forms are created on a 3d modeling software (in the case of Temp Tools- Rhino CAD) and sent to a CNC routing machine to cut the forms out of aluminum stock. This material was chosen because of its durability, ease of cleaning, and long-lasting reputation. Once the molds are cut, the contents are poured in and set to dry. The process in production would be as follows: 3d model > CNC route aluminum > pour in composite material > set to dry (at least 36 hours).

### Final Words

Temp Tools were created to shed more light on the complete cycle of an object's existence, allowing and encouraging users to take responsibility for the things they own and to think about the repercussions of the purchases they will make in the future. "We all have needs and most of us enjoy buying new things, so when we can't buy less, we can at least buy smart" ("Consuming Responsibly" 35-39). This sort of mentality is exactly what I hope Temp

Tools convey to consumers and those who have a chance to read about the project's mission. The final design has successfully paired beautiful design with sustainability, proving that eco-design, everyday design, and good design do not have to be separate entities. What might be even more exciting than the tools themselves though,



Figure 17- Final Temp Tool models

is the material creation. This sort of rigid yet biodegradable composite has the potential to be used in so many different applications. Like flower or vegetable markers, flower pots, coffins (which have actually already been made to biodegrade), even home furniture if it is kept dry until its disposal. The possibilities are endless and I can only hope that people begin to take notice and call on this material for future product design. With Temp Tools it is clear, anything and everything can be designed for sustainability.



## Works Cited

"01M One Moment® 100% Biodegradable Shoe." *01M One Moment® 100% Biodegradable Shoe*. OneMoment, n.d. Web. 24 Apr. 2013.

"Biodegradable." *Dictionary.com Unabridged*. Random House, Inc. 24 Apr. 2013.

"Consuming Responsibly." *World Changing A User's Guide for the 21st Century*. Ed. Alex Steffen. New York: Abrams, 2008. 35-39. Print.

"Designing a Sustainable World." *World Changing A User's Guide for the 21st Century*. Ed. Alex Steffen. New York: Abrams, 2008. 83-87. Print.

"EPA's Waste and Recycling Data." *Statistics*. Zero Waste America, n.d. Web. 24 Apr. 2013. (Fig. 2)

Figure 15 Google Compilation of Flowers:

Pverdonk. "20070704173821 Butterfly Weed or Orange Milkweed (Asclepias Tuberosa)." Flickr. Yahoo!, 13 July 2007. Web. 24 Apr. 2013.

"Grasses and Flowers." *Illinois Department of Natural Resources*. DNR, n.d. Web.

"Black-Eyed Susan: Rudbeckia Hirta." *Medicinal Plants of the Northeast*. N.p., n.d. Web. 24 Apr. 2013.

"Echinacea Purpurea, Purple Coneflower." *Tarheel Gardening.COM*. Tarheel Gardening.com, n.d. Web. 24 Apr. 2013.

"Green Marketing." *World Changing A User's Guide for the 21st Century*. Ed. Alex Steffen. New York: Abrams, 2008. 389-92. Print.

HP. "Global Citizenship." *Product Return and Recycling: Product Return and Recycling*. HP, n.d. Web. 24 Apr. 2013.

"Knowing What's Green." *World Changing A User's Guide for the 21st Century*. Ed. Alex Steffen. New York: Abrams, 2008. 114-18. Print.

"Our Story." *Method*. Method Home, n.d. Web. 24 Apr. 2013.

"Questioning Consumption: Choice Fatigue." *World Changing A User's Guide for the 21st Century*. Ed. Alex Steffen. New York: Abrams, 2008. 33-34. Print.

"Questioning Consumption: Ecological Footprints." *World Changing A User's Guide for the 21st Century*. Ed. Alex Steffen. New York: Abrams, 2008. 32-33. Print.

"Recycling in Zion National Park." *National Parks Service*. National Parks Service, 17 Apr. 2013. Web. 24 Apr. 2013.

"Toginon Knives." *Design to Improve Life*. INDEX, 2007. Web. 24 Apr. 2013.

"What Biodegradable and Compostable Really Mean." *Genpak: Quality Food Packaging Since 1969*. Genpak, n.d. Web. 24 Apr. 2013.