

Turning the Page

A Behavior Change Toolkit for Reducing Paper Use



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Solutions



The Association for the Advancement
of Sustainability in Higher Education®

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Root Solutions would also like to thank New Society Publishers for allowing use of content from our upcoming book.

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INTRODUCTION

In 2017, the Association for the Advancement of Sustainability in Higher Education (AASHE) and Root Solutions, with funding from the Lisa and Douglas Goldman Fund, created the *Turning the Page on Campus Paper Use* initiative to assist higher education institutions in developing and implementing paper reduction behavior change projects. From 2017-2019, Root Solutions trained more than 20 higher education institutions in how to use behavioral insights to save paper. Several campuses are already seeing tangible paper reduction results and are starting to apply behavior change techniques to other campus sustainability efforts.

Turning the Page: A Behavior Change Toolkit for Reducing Paper Use draws upon real world experiences from the *Turning the Page* initiative as well as other paper reduction campaigns. The process and interventions laid out, and the tools and worksheets provided, are borrowed from Root Solutions' forthcoming book, *Designing for Environmental Action*,¹ and its BEHAVIORAL Building Blocks™ framework, both of which help sustainability practitioners understand, select, and effectively apply hundreds of behavioral interventions.

The concepts, concrete examples, and tools in this guide will empower practitioners to more effectively target paper consumption behaviors at their institutions. **Although this guide focuses on tackling paper reduction efforts at higher education institutions, the advice and examples provided can be applied by any organization looking to foster more sustainable behaviors.** Our hope is that this guide gives you the background, inspiration, and confidence to ideate and implement the kinds of evidence-based behavior campaigns that can result in transformational impact at your organization.

The paper problem: Why worry about paper & printing?

Higher education institutions and other large organizations face countless sustainability challenges and opportunities. Though many higher education institutions across the country have made commitments to sustainability, zero waste, and climate neutrality, many still purchase and use large amounts of paper, ink, and individual desktop printers. Although the presence of digital tools might lead us to believe that digital media is replacing paper, paper use on college campuses remains significant, with campuses regularly using millions of sheets of paper per year.^{2,3}



Photo credit: Jami Dwyer / Wikimedia / Flickr

1 Van Leuvan, N., Highleyman, L., Fujita R., & Miller, P. (2020). *Designing for environmental action: A practitioner's guide to environmental behavior change*. Chicago: New Society Publishers.

2 Penn State News. (2016, July, 6). Penn State Berks reduces paper usage as part of sustainability efforts. Retrieved from <https://news.psu.edu/story/416873/2016/07/07/campus-life/penn-state-berks-reduces-paper-usage-part-sustainability-efforts>

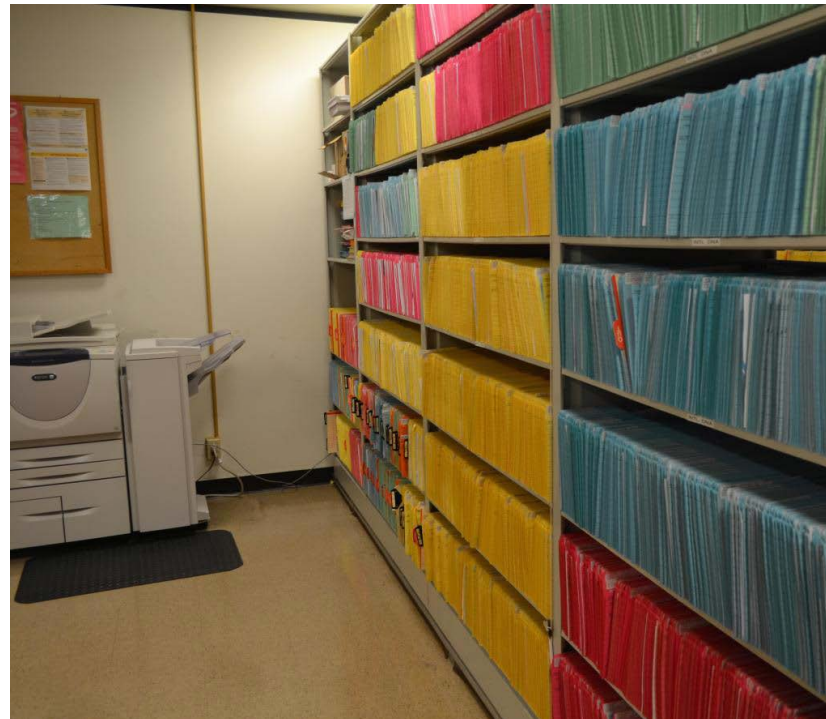
3 Randall, J. E. (2005). Campus paper waste. *Journal of Undergraduate Research at Minnesota State University, Mankato*, 5(19). Retrieved from <https://cornerstone.lib.mnsu.edu/jur/vol5/iss1/19/>

Unfortunately, pulp and paper manufacturing contributes to a range of serious environmental problems, including air pollution, deforestation, habitat fragmentation, excessive waste production, and water resource pollution, in addition to human rights abuses.^{4,5} Additionally, pulp and paper manufacturing is energy intensive - it was the third largest consumer of energy in the U.S. manufacturing sector (after chemical manufacturing and petroleum refining) in 2014 - making it a large contributor of greenhouse gas (GHG) emissions.⁶

“Paper manufacturing contributes to a range of serious environmental problems, including air pollution, deforestation, habitat fragmentation, excessive waste production, and water resource pollution.”

~R. Smith, 2011

In addition to myriad environmental impacts, paper-related behaviors also **come at a significant financial cost to colleges and universities**, which pay for paper storage, transport and recycling, lost document retrieval, printer maintenance, technical support, and proper disposal. For example, by streamlining its printing operations, including removing individual desktop printers in favor of shared multifunction printers, Regis University reduced print volume by 40% and saved \$166,000 in just the first year of its program.⁷ Larger institutions can see even greater savings. For example, the University of Kentucky is projected to save \$22 million over six years.⁸



Fortunately, higher education sustainability staff are increasingly aware of and concerned about the direct environmental impacts of paper usage, as well as the embodied emissions in products like paper and printers. They understand that addressing these emissions should be part of any comprehensive climate action plan. This guide is intended to help institutions use a behavior-based approach to reduce printing-related costs and negative environmental impacts.

University of Washington switched to reviewing applications electronically, saving thousands of reams of paper per year, reducing storage needs, improving efficiency, flexibility, and reducing risk from natural disasters.⁹ Photo credit: Daimon Eklund, University of Washington Sustainability.

4 Rainforest Action Network. (n.d.). Pushing the paper industry toward environmental and social responsibility. Retrieved from https://www.ran.org/paper_industry/

5 Smith, R. (2011). The environmental sustainability of paper. *Graduate Studies Journal of Organizational Dynamics*, 1(1), article 4. Retrieved from <https://repository.upenn.edu/gsjod/vol1/iss1/4/>

6 U.S. Department of Energy. (2015, June). *Bandwidth study on energy use and potential energy saving opportunities in U.S. pulp and paper manufacturing* [PDF File]. Retrieved from https://www.energy.gov/sites/prod/files/2015/08/f26/pulp_and_paper_bandwidth_report.pdf

7 Ricoh. (2013). Regis University drives cost out of printing with a new output fleet and expert print management. Retrieved from: <https://www.ricoh-usa.com/en/insights/library/case-studies/regis-university>

8 Ricoh. (2013). University of Kentucky saves big with massive document management overhaul. Retrieved from <https://www.ricoh-usa.com/-/media/Ricoh/Common/PDFs/Infocenter/CaseStudies/CS-161-RIC-university-of-kentucky>

9 Toman, C. (2016). UW admissions modernization and paper reduction. Retrieved from <https://hub.aashe.org/browse/casestudy/15209/UW-Admissions-Modernization-and-Paper-Reduction>

How can the behavioral sciences help solve the paper problem?

Paper consumption is driven in significant part by individual behavior, and therefore requires behavior-based solutions. Every time a student prints coursework that can be done online, a staff member prints an email, a faculty-member prints lecture slides for every student, or someone abandons freshly printed documents at the printer, individual behavior is at play. Even policies set by the institution, such as requiring that certain records be printed and stored, or that all printing is to be set to double-sided by default, must initially be developed and later enforced by individuals or groups of individuals.

Fortunately, the behavioral sciences offer hundreds of insights and high-impact strategies that sustainability staff can leverage to promote the adoption of more sustainable behaviors on campus. The behavioral sciences - including research from the fields of cognitive science, conservation psychology, behavioral economics, social marketing, design thinking, and strategic communication - use an evidence-based approach to encouraging behavior change.

As students often develop lifelong habits and skills during their higher education experiences, behavioral insights aimed at empowering them to adopt paper-saving habits can have long-lasting and far-reaching impacts. Students continue these habits into their post-graduate lives and careers, thereby reducing paper use in their homes and at the institutions they go on to lead.

**"Human behavior is at the root of both environmental problems and their solutions."
~ Root Solutions**



Students participate in a waste sorting activity at new student orientation as part of efforts to help Bow Valley College make progress toward its 90% waste diversion goal. Photo credit: Amy Spark, Sustainability Coordinator, Bow Valley College.

How to use this guide

Part 1 of this guide provides a primer on the pre-implementation steps that are important to a successful behavior change campaign, including how to select your target audience, how to select which behavior(s) to focus on, and how to better understand the key factors influencing your audience's behavior (also commonly known as barriers and motivators).

Part 2 presents specific behavior-based-interventions for reducing paper use based on Root Solutions' BEHAVIORAL Building Blocks™ and real-world examples. After you understand the myriad potential interventions, Part II also helps you determine which to use based on barriers and motivators uncovered in Part I.

Part 3 presents case studies from several Turning the Page on Campus Paper Use participants. These case studies show how different institutions employed the BEHAVIORAL Building Blocks™ and discusses their successes and challenges.

Finally, the **Appendix** includes worksheets, deep dives into select topics, and additional resources.



Office of Communications staff Carrie Brown and Rachel Caldwell-Mullins participate in a paper towel reduction demonstration during Sustainability Week at University of Kansas Medical Center. Photo credit: Selena Jabara, University of Kansas Medical Center

PART 1: SELECTING AND STUDYING THE AUDIENCE AND BEHAVIOR

Choosing your target audience & behavior

Step 1: Determine potential target audiences

Use the questions below to identify potential target audiences. Note that you do not yet need to have a specific paper saving behavior in mind: that comes in Step 2. If you already have a set audience (i.e., if you can't choose which audience to work with), you can skip this step (though you might still find the questions useful to reflect on).

1. What are ALL of the groups of people at your organization that contribute to the problem you are seeking to address? Potential target audiences include:
 - Students (e.g., undergraduate business school students, all freshmen).
 - Staff (e.g., procurement staff, all employees).
 - Faculty (e.g., Department of Engineering faculty, all university faculty).
 - Campus visitors.
2. Based on the available information, to what degree do these audiences contribute to the problem?
 - Which departments or sub-populations use the most paper per capita?
 - Which departments or sub-populations use the most ink/toner?
 - Which departments or sub-populations have the most desktop printers per capita?
 - How large is each potential audience?
3. Are any of these audiences unlikely to be receptive to a paper-saving campaign at this time? Examples include:
 - An audience that just underwent a major change in leadership.
 - An audience that just launched a major campaign on another issue and may be experiencing "campaign fatigue."
 - A department that you do not have a strong working relationship with, or for which there are "gatekeepers" that may not give approval.
 - A department that is understaffed.
 - A department that is notorious for being a "laggard" as opposed to early adopters of new technologies, new ways of thinking, etc.



This section aims to help you:

- Brainstorm and select a target audience.
- Brainstorm several potential behavior changes relevant to the audience.
- Apply evaluation criteria to determine which behavior to target.
- Determine the behavioral sequence and uncover the audience's real barriers to and motivators of each behavior in the sequence.

4. On the other hand, which audiences do you think would be most willing to engage with you? Are there certain audiences that have successfully engaged in past behavior change efforts? Examples include:

- Enthusiastic departments with existing Green Teams.
- Departments already expressing interest in and motivation to work on paper-reduction.
- Departments that are known to be “early adopters,” i.e., willing to try, and ultimately adopt, new technologies, products and ways of thinking and behaving.

5. Does one audience stand out as a preferred option for a “pilot” program to test-run your initiative and demonstrate success? This could be based on some of the questions above (such as willingness to work with you), but you may also consider other factors that might make for a good pilot department, such as:

- Well-known or well-respected departments that, if successful in changing behavior, could be particularly influential in encouraging additional departments to join your campaign.
- Departments that are of a smaller and more manageable size.
- Departments that are representative of or similar to many different departments across campus.

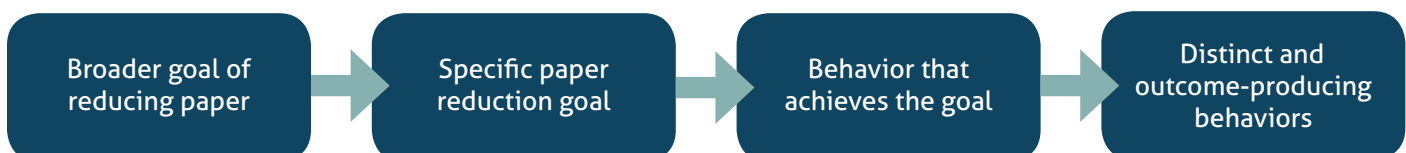


Supporting Worksheet 1: Determine the Target Audience

Use the [Determine the Target Audience](#) worksheet (also listed in the [Appendix](#)) to brainstorm at least THREE target audiences that you could work with for a paper reduction campaign and the relevant “stakeholders” that might need to be involved in the project.

Step 2: Identify distinct, outcome-producing, paper-saving behaviors

In this step, you will move beyond the overall goal of reducing paper use to brainstorm behaviors that can help achieve that goal. Specifically, you will brainstorm all of the behaviors that your potential target audience(s) could take that would help in reaching the goal. At this stage, you are not focused on assessing and evaluating the behaviors, but simply developing a list to later choose from and evaluate.



Distinguish between behavior and knowledge or awareness

As you begin brainstorming behaviors, remember that while knowledge, understanding, awareness, and beliefs may influence behavior, they are not behaviors themselves. Statements like “the audience understands that” or “the audience believes” or “the audience is aware that” are not behavior statements.

Focus on distinct behaviors

Next, keep in mind that your chosen behavior(s) should be as specific, or “distinct” as possible, meaning that the behavior takes the form of a single action that is indivisible¹⁰ and cannot be broken down further into smaller behaviors.

Identify outcome-producing behaviors

To ultimately achieve a desired outcome, the audience has to complete the “outcome-producing behavior.” This is also known as the “end-state”¹¹ behavior, or the behavior that comes last in a sequence of behaviors. If our audience does not complete the behavior that comes last in the sequence, the desired outcome cannot be achieved. Thus, we call these the “outcome-producing” behaviors.

When possible, the outcome-producing behavior in the behavioral sequence should be targeted, because this is the actual behavior that results in the desired outcome. In some cases, however, you may have no influence on the outcome-producing behavior, but might be able to strongly influence one of the behaviors in the behavioral sequence. For example, if your sustainability department's goal is to get off-campus students to ride bikes to school three days per week, you might have great leverage over providing discounted bikes to students, or providing them with information about safe bike routes, but you may have little ability to influence them to actually ride their bike on a daily basis. In such cases, it may make sense to focus on a non-outcome producing behavior.

For example, consider the behavioral sequence involved in “using a programmable thermostat.” In this example, the outcome producing behavior is programming the thermostat to operate using energy-saving settings. Using a programmable thermostat is a general behavior, but it is made up of multiple distinct behaviors. This is especially true if the person does not own a programmable thermostat yet. Distinct behaviors in this sequence include:

- Researching programmable thermostats to decide on the brand and model.
- Researching where to get chosen thermostat.
- Going to the store to purchase the thermostat.
- Buying the thermostat.
- Installing the thermostat or hiring someone to install it.
- Researching how to program the thermostat to energy-saving settings.

¹⁰ McKenzie-Mohr, D. (2011). *Fostering sustainable behavior: An introduction to community-based social marketing*. Chicago: New Society Publishers.

¹¹ McKenzie-Mohr, D. (2011). *Fostering sustainable behavior: An introduction to community-based social marketing*. Chicago: New Society Publishers.

Relinquishing desktop printers - Distinguishing between goals and outcome-producing behaviors

Overall goal

Reduce the number of desktop printers on campus to save paper, ink, energy, and money.

Specific goal

By fall semester of 2020, the number of desktop printers on campus will be reduced by 50%.

Vague behavior

Staff stop using desktop printers.

Outcome-producing behavior

Staff voluntarily relinquish their desktop printers to IT staff by May 31, 2020 and only use shared multifunction printers.

Distinct behaviors leading up to the outcome-producing behavior

- Reading an email about transitioning from desktop to shared multifunction printers.
- Signing up to attend a meeting to learn more about print management.
- Attending the meeting.
- Connecting to the shared multifunction printer.
- Disconnecting the desktop printer.
- Delivering the desktop printer to IT staff.

Generate a list of potential paper-saving behaviors on which to focus

The questions below can be used to identify potential paper-saving behaviors on which to focus.

1. For each target audience identified in Step 1, what are all the activities or business processes that use large amounts of paper? Examples include:
 - Printing specific forms.
 - Printing coursework.
 - Providing paper readers to all students.
 - Printing marketing materials.
2. For each target audience, which of the above activities do you think promote the most paper waste?
3. In which locations on campus might each target audience produce the most paper waste? Thinking by location, rather than processes and activities, might bring to mind other behaviors that had not been considered before.

Add to your list of brainstormed ideas by:

1. Informally asking colleagues or potential target audience members what parts of their jobs require printing the most paper.
2. Asking students what aspects of their coursework use the most paper.
3. Checking abandoned documents and waste/recycling bins to find out what paper materials end up being discarded.
4. Incorporating an investigation of paper waste streams into a larger campus waste audit.



Supporting Worksheet 2: Brainstorming Behaviors

Use the [Brainstorming Behaviors](#) worksheet (also listed in the [Appendix](#)), which includes the prompting questions provided in this section, to help brainstorm potential behaviors for your campaign.



Photo credit: WOC in Tech Chat.

Categories of paper-saving behaviors

Choose electronic alternatives

- Conduct paperless meetings (e.g., by sharing documents like agendas and spreadsheets electronically in advance).
- Don't print emails.
- Use electronic signatures instead of printing and signing.
- Institute paperless billing and payments.
- Use cloud-based filing and sharing.
- Use digital invites and flyers rather than paper.
- Course materials:
 - Set policies that don't require students to print reading materials and slides.
 - Use online learning platforms to distribute course materials.
 - Condense printed syllabi to a page and offer a full online version or go fully electronic.
 - Grade assignments electronically.

Say "no" to paper

- Unsubscribe from paper mailing lists and catalogs.
- Refuse items in paper packaging.
- Ask people to NOT print documents for you.

Print less

- Print one copy of promotional materials or instructions and ask people to take a picture instead of a handout.
- Print envelopes and letterhead on an as-needed basis, rather than ordering in advance.
- Institute (or lower) a print limit.
- Use scrap paper for internal communications. Collect discarded one-sided prints for re-use on future one-sided printing.

Slow down

- Preview and edit documents before printing (e.g., use print preview, spell check, etc.).
- Format documents to save paper (e.g., smaller margins and font) and make these settings the default.
- Ask yourself, "do I really need to print this?"

Change printing systems

- Set up default double-sided printing.
- Switch from individual desktop printers to multifunction printers.
- Only purchase printers that can print double-sided.
- Employ a print management system (e.g., Ricoh, Xerox, Pharos and PaperCut).

Change purchasing habits and policies

- Enact a policy that no new desktop printers can be purchased.
- Centralize purchasing to eliminate unnecessary paper and printer purchases.

Step 3: Evaluate the potential paper-saving behaviors



Supporting Worksheet 3: Evaluating Priority Behaviors

Use the [Evaluating Priority Behaviors](#) worksheet (also listed in the [Appendix](#)) to score each potential behavior by the below criteria to decide which ask is optimal.

Once a list of potential target audiences and several distinct behaviors are established, it is time to decide which target audience and which single behavior (or suite of behaviors) will be the focus of the campaign.

Use the criteria and questions in Table 1 to slow down, test assumptions, consider options, and make an informed decision on which behavior to center the campaign around.

Table 1: Evaluating potential behaviors

Impact	Impact Potential of Behavior Change	If this behavior is changed, what level of impact will it have? For example, eliminating printed readers for every student has a greater impact than eliminating printed syllabi for every student.
	Saturation of Behavior	How many people in the target population already perform this behavior? Is it a priority to get the laggards on board, or is it a higher priority to move on to another behavior with lower saturation?
Likelihood of Success	Probability of Adoption	How likely is it that the target population will adopt this behavior? How easy or difficult is this behavior? To what degree is the target population already motivated to address this issue? Might it be “low-hanging fruit”?
	Success of Past Behavior Change Efforts	Have past behavior change efforts applied to a similar issue succeeded? Has your audience already successfully adopted related behaviors?
	Organizational Effort Required	Will the effort required to change the behavior drain resources (e.g., should enabling policies be enacted first)? Are relevant partners or stakeholders willing and have the capacity to contribute to this effort?
	Potential for Controversy	Would stakeholders agree that it is appropriate to focus on this behavior? Could controversies surrounding this issue derail your efforts?
Future Impact	Potential to Scale	Are similar audiences engaging in the same undesirable behavior? Is there a demand elsewhere for a successful behavior change model to address this behavior? Have similar initiatives previously been able to scale?
	Potential to Serve as Proof of Concept	Would focusing on this behavior demonstrate the feasibility of expanding efforts to other target audiences or addressing other behavioral issues?
Evaluation	Ability to Collect Data & Evaluate Success	Can you access baseline data? Can you collect data from a control group? How difficult is it to collect data post-intervention to demonstrate whether there was a change in behavior?
	Ability to Observe Behavior	Can you directly observe the effectiveness of the behavior change effort, or will you need to rely on indirect measures? Some behaviors, like those done at home, cannot be directly observed, and thus evaluation typically relies on self-reporting by target audience or other indirect measures.

Uncovering the barriers and motivators of audience behavior

Now that one or more paper-saving behavior(s) have been established for the campaign, it's time to uncover the barriers to, and positive drivers of, those behaviors.

Research on human behavior shows that behavior change is not guaranteed just because something is important, good for us, or environmentally beneficial.¹² Even when we do *intend* to do something, there are still many factors - or *barriers* - that can get in the way.¹³ A classic example is that most people know that eating vegetables is important, yet only one in ten adults consume the daily recommended servings of fruits and vegetables!¹⁴

Step 1: Brainstorm potential barriers and drivers of behavior

To create strategies that will work, you need to uncover the barriers and motivators that influence whether your audience will perform the desired behavior. Table 2 summarizes some of the most common barriers to, and drivers of, environmental behaviors. Do any of these sound familiar? Take notes on which you *think* may apply to your audience.

It is important to note that every behavior in the sequence leading up to the outcome-producing behavior may have its own barriers and drivers. Also, barriers are initially considered to be "perceived"; a staff member might perceive that they do not have access to a shared printer, when in reality they do.

Table 2: Common barriers, drivers and motivators that influence behavior change

Barrier/Driver Category	Description	Paper Examples
Memory*	Inability to remember to perform a behavior (or the steps involved in the behavior). *With the vast number of decisions we make each day and the amount of information that comes at us, MEMORY is ALWAYS a barrier for our audience!	"I always forget to print double-sided." "I can never remember how to put scrap paper in the multifunction printer."
Perceived Benefits	Perception that something positive may happen as a result of performing the behavior.	"I like how having to walk to the printer gets me exercise." "I feel good when I know I am saving trees by using less paper." "Using a multifunction printer saves time."

Table 2 continued on next page.

12 Envolve. (2018, August 28). Easier read than done: Knowledge alone isn't enough to change behavior. Retrieved from <https://www.envolvehealth.com/news/knowledge-doesnt-change-behavior.html>

13 Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY: Macmillan.

14 Lee-Kwan, S. H., Moore, L. V., Blanck, H. M., Harris, D. M., & Galuska, D. (2017). Disparities in state-specific adult fruit and vegetable consumption - United States, 2015. *MMWR Morbidity and Mortality Weekly Report*, 66(45), 1241-1247. doi: 10.15585/mmwr.mm6645a1

Table 2 (continued): Common barriers, drivers and motivators that influence behavior change

Barrier/Driver Category	Description	Paper Examples
Perceived Consequences	Perception that something negative may happen as a result of performing the behavior.	<p>"I dislike having to walk to the printer because it is inconvenient."</p> <p>"I prefer to read documents on paper because staring at the computer makes my eyes hurt."</p> <p>"The shared printer always breaks down."</p>
Perceived Susceptibility	Perception that the environmental challenge will impact the person or those they care about.	<p>"I am not directly affected by deforestation."</p> <p>"All aspects of over-printing contribute to climate change, which impacts us all."</p>
Perceived Severity & Importance	Perception that the problem is serious or important.	<p>"The university should be worrying about things bigger than paper."</p> <p>"Paper use is very important because it impacts water, climate, and forests."</p>
Perceived Ability & Self-Efficacy	Perception that the person can identify the appropriate course of action and has the knowledge, skills, and judgment to succeed at the action.	<p>"I don't know how to use the multifunction printer."</p> <p>"I am confident that I can learn how to use online learning platforms to teach my courses."</p>
Perceived Action Efficacy	Perception that the behavior will solve or mitigate the problem.	<p>"Me printing double-sided isn't going to make a big impact."</p> <p>"Giving up my desktop printer will have a huge impact on paper and energy use, and it might influence others to do the same."</p>
Perceived Social Acceptability	Perception that the action is performed or accepted by one's social reference network (i.e., their direct colleagues, community, family, or others that are important to them).	<p>"My professors will not be happy if my assignment is printed on scrap paper."</p> <p>"People will think I'm unprofessional if I print on scrap paper."</p> <p>"Most of my colleagues don't have desktop printers, so I would feel weird if I had one."</p>
Perceived Responsibility	Perception that it is the person's responsibility to address the problem, whether due to fairness, a sense of altruism, care for the environment, or other factors.	<p>"I see it as my responsibility to reduce paper use because it is the right thing to do."</p> <p>"It's not my responsibility to worry about paper use in this department."</p>
Perceived Access to Resources	Perception that the person has the access and resources (services, products, time and money) required to adopt the behavior.	<p>"I don't have time to set up my course online."</p> <p>"I am satisfied with the amount of support I receive from IT and how accessible they are when I need help."</p>
Perceived Alignment with Ideologies & Values	Perception that the behavior aligns with the person's values, political identity, or their views on religion and divine will.	<p>"As an environmentalist, I strongly believe in reducing paper use."</p> <p>"I don't believe that the university should try to influence anyone's behavior. They should mind their own business. The bureaucracy is too big."</p>

Step 2: Don't assume! Ask your audience

It is common to assume that you know the reasons behind why people do or do not do certain behaviors. Unfortunately, this speculation can lead to wasted resources and campaigns that are ineffective or even detrimental.

Identifying perceptions of barriers and benefits to the behavior will result in more effective campaigns. For example, knowing that multifunction printers have secure printing, you might not realize a barrier to faculty giving up their desktop printer is the assumption that their desktop printers are more secure. Taking the time to learn about the audience's perceived barriers and motivators will uncover the factors that are actually driving hesitation and opposition (and, on the flip side, enthusiasm and support) towards the desired behavior. The focus can then shift toward the interventions that are most likely to overcome the identified barriers and strategically communicating the benefits of the desired behavior change.

Conduct a barriers & motivators analysis

If time and resources allow, a complete barriers and motivators study of your audience will help identify the drivers and sticking points to adopting the desired behavior. Such a study would include a survey of the audience asking several questions about each barrier/benefit category (e.g., perceived self-efficacy susceptibility, etc.) from Table 2.

Alternative: conduct short interviews

Uncovering barriers to and motivators of behavior doesn't have to be an onerous task. If you are short on time and resources, asking your audience about the perceived barriers and motivators through informal conversations and open-ended questions is a great start and can often reveal perceptions on factors like social norms, perceived responsibility, and more.



Supporting Worksheet 4: Behavior Sequence + Drivers of Behavior

Use the [Behavior Sequence + Drivers](#) worksheet (also listed in the [Appendix](#)) after determining the target behavior to help you:

1. List out the behavioral sequence.
2. Brainstorm potential barriers and motivators of the desired behavior.

Keep these in mind while you learn about the interventions in the BEHAVIORAL Building Blocks™ section that follows, and start to brainstorm which are most relevant to your audience.

Suggested short interview or survey questions

Barriers

- What might be the most challenging aspects of participating in [desired behavior]?
- What are the biggest disadvantages of [...]?
- What would make it easier for you to participate in [...]? (checklist or open-ended question)

Motivators

- What do you see as personally beneficial about participating in [...]?
- Please rate how important the following benefits are with regards to [...].
- What are the most important benefits of [...]?
- What are the most important reasons to participate in [...]?

PART 2: USING BEHAVIORAL BUILDING BLOCKS™ TO ACHIEVE PAPER SAVINGS

- B** BENEFITS
- E** EASY
- H** HOPEFUL
- A** ASSOCIATIONS
- V** VIVID
- I** IDENTITY
- O** ORDINARY
- R** RELATABLE
- A** AWARENESS
- L** LASTING

The first part of this section describes interventions to change paper-related behaviors, categorized according to Root Solutions' BEHAVIORAL Building Blocks™ framework. There are ten Building Blocks that spell out the word BEHAVIORAL, each with multiple strategies to reduce paper use. The second part of this section explains how to apply the Building Blocks in the design of behavioral interventions.



Photo credit: Freepik.

The building blocks of behavior change



Utilize **BENEFITS** | Building Block 1

As is often the case with environmental behaviors, individuals may be aware that their actions are environmentally harmful, but feel that the personal costs of changing their behavior outweigh the environmental benefits. As practitioners, we can move this scale by implementing combinations of intrinsic and extrinsic rewards and penalties. We can attach benefits to desired behaviors or disincentives to undesired behaviors to help our target audience break bad habits or adopt new environmental behaviors.



Fundamentals:

- Determine whether to incentivize behaviors or outcomes.
- Consider intrinsic vs. extrinsic motivators.
- Determine HOW and WHEN the benefit will be offered.

1. Determine whether to incentivize behaviors or outcomes

Incentivizing outcomes (e.g., a 10% reduction in paper use) means that the audience can achieve the outcome through a variety of actions of their choice. On the other hand, incentivizing a specific, predetermined behavior (e.g., printing double-sided) tells your audience exactly what you want them to do. Both are valid approaches that have advantages and disadvantages. Whether you choose to reward specific behaviors or broad outcomes depends on your audience and goal. Choose what will work best for your unique situation.

Table 3: Choosing between incentivizing outcomes or behaviors

Incentivize outcomes when:	Incentivize specific behaviors when:
There are multiple paths of action and the audience is familiar with those actions	The audience IS NOT familiar or experienced with various courses of action
When audience members can apply many different behaviors to reach the goal, and are adept at taking those actions, then they should be empowered to respond creatively and flexibly to meet the goal, which can also increase ownership, buy-in, and motivation.	Incentivizing a predetermined behavior provides a clear roadmap for people to follow if they don't already possess knowledge of the specific paper-saving actions they can take. Starting with specific behaviors can be less overwhelming and can also provide greater opportunities for reinforcement and feedback along the way.
It is hard to monitor specific behaviors	You can readily monitor specific behaviors
When it is difficult or impossible to monitor whether people are doing a specific paper-saving behavior (e.g., holding paperless meetings,) it may be most feasible to track paper usage or purchasing.	It may be feasible to monitor specific behaviors. For example, most managed print systems can easily track the number of pages each user prints and whether printing is duplex or single-sided. If specific problem behaviors are known or "low hanging fruit" can be identified, then you can target those behaviors.



Examples of incentivizing outcomes and specific behaviors

Incentivizing outcomes

- Offer a prize or bonus based on the actual amount of paper reduction achieved.
Red River College instructors in the Mechanical Engineering Technology department received a \$5 gift card to the campus' food outlets if they met a 10% print reduction goal over the 2018 fall term. If instructors were able to reduce their printing by 15%, they received an additional \$5 gift card.¹⁵
- Include paper reduction outcomes as part of individual performance targets or project plans.
Require form designers to find ways to reduce paper use through paper-saving form design. For example, "The Project Manager will achieve a minimum 5% reduction in paper usage over the course of the 2019-2020 school year."

Incentivizing specific behaviors

- Give out a prize or bonus based on adherence to the desired behavior.
Reward switching to an online learning management platform, award a prize to those that relinquish a desktop printer, or enter everyone into a lottery for a substantial prize.
- Provide paper/toner/ink in communal printers free of charge, but stop supplying those resources for desktop printers.



SPOTLIGHT: Incentivizing specific behaviors using reputational rewards

Columbia University's Mailman School of Public Health incentivized employees to reduce their paper consumption by offering them the ability to earn different levels of a sustainability certificate that could be publicly displayed to peers. The employees formed teams, signed a participation pledge, then completed actions from a checklist of behaviors. Teams must have completed all items from a specific level - gold, silver, and bronze - to receive that level of certificate. Examples of behaviors from each certificate level:

- **Bronze:** Add a "think before printing" email tagline and host three paperless meetings.
- **Silver:** Adopt the Mailman School of Public Health endorsed paperless workflow guidelines for submitting items to the finance department.
- **Gold:** Create a paper allotment and individual incentives for those who exceed the quota.
- **Platinum:** Complete every listed action and create your own intervention.

By implementing these incentives for specific behaviors, the school reported that overall paper use decreased by 23% in the first year of its ongoing program.

¹⁵ Crooks, W. (2019). Personal communication.

2. Consider intrinsic vs. extrinsic motivators

As humans, we are motivated both by **extrinsic motivation** - doing something because it leads to an outcome separate from the behavior itself, such as financial benefits or social recognition - and by **intrinsic motivation** - doing something because it is inherently interesting, enjoyable, or is aligned with our values, rather than for any external pressures or rewards.¹⁶

Extrinsic motivation

Campaigns often use **extrinsic motivators** to encourage people to do environmental behaviors. Examples include receiving a 10¢ discount for bringing a reusable mug to a coffee shop or a rebate for home weatherization. Extrinsic rewards like prizes or penalties are often used because they are relatively simple to administer. In the case of penalties and taxes, they can also bring in revenue.

People often go to great lengths to avoid potential losses, including taking risks and cheating,^{17,18} which makes penalties powerful motivators. Financial penalties in particular must be carefully applied since they can create perverse incentives to avoid them. See [ASSOCIATIONS](#) for more on loss aversion.



Examples of extrinsic motivators for paper and/or desktop printer reduction

Financial rewards and penalties involve a transfer of money

- Charge for printing or charge students less for printing double-sided.
- Give monetary rewards to individuals or departments for relinquishing desktop printers.
- Give gift cards to top paper-savers.

Tangible/physical rewards involve non-monetary items such as food, toys, and stickers

- Place snacks next to shared printers to reward people who choose to use them.
- Promise a “pizza party” for the department that reduces their paper usage the most.
- Distribute tokens of appreciation like stickers or useful items like pens, whiteboards, etc.



Photo credit: Rawpixel.

16 Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67. doi: [10.1006/ceps.1999.1020](https://doi.org/10.1006/ceps.1999.1020)

17 Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-292. doi: [10.2307/1914185](https://doi.org/10.2307/1914185)

18 Schindler, S., & Pfattheicher, S. (2017). The frame of the game: Loss-framing increases dishonest behavior. *Journal of Experimental Social Psychology*, 69, 172-177. doi: [10.1016/j.jesp.2016.09.009](https://doi.org/10.1016/j.jesp.2016.09.009)

Reputational rewards and penalties include praise, recognition, and status

- Publicly praise or recognize individuals that reduce their paper usage.
- Publicly honor professors that switch to using online learning platforms.
- Develop “ranks” or “badges” to include on resumes or LinkedIn profiles for individuals or departments that are top paper-savers.
- Seek out national or local sustainability awards your organization could win by participating in or designing a paper reduction project.
- Use a rotating trophy that goes to the department that used the least amount of paper that month, or that reduced their usage by the highest percentage.

Competitions and games

- Create an interdepartmental competition about who can reduce their paper usage the most. See [Steps for Designing a Competition](#) in the Appendix for design advice.

Deadlines and directives

- Set deadlines for reducing desktop printers in departments by X%.
- Require double-sided printing.

Intrinsic motivation

Intrinsic motivation requires recognizing what inherently motivates an audience and crafting interventions to tap into those motivations. For example, we can give our audience a sense of accomplishment by providing them with the opportunity to do meaningful work and to master new tasks or concepts. When emphasizing environmental benefits, try using language that activates intrinsic values such as generosity and helpfulness. When intrinsic values are salient, people may be more open to environmentally friendly behavior.¹⁹



Examples of intrinsic motivators for reducing paper use

Meaningfulness and purpose

- Help the audience feel that they have the opportunity to accomplish something of real value that matters in the larger scheme of things (e.g., by connecting paper use to the climate crisis).
- Emphasize how financial savings from paper-saving behaviors can be used by departments or by the campus.
- Provide opportunities for staff to learn about, experience first-hand, and discuss the positive environmental and social benefits of paper reduction.

19 Sheldon, K. M., Nichols, C. P., & Kasser, T. (2011). Americans recommend smaller ecological footprints when reminded of intrinsic American values of self-expression, family, and generosity. *Ecopsychology*, 3(2), 97-104. doi: [10.1089/eco.2010.0078](https://doi.org/10.1089/eco.2010.0078)

Competence (self-efficacy) and personal growth

- Provide the opportunity for staff and students to learn new skills that save paper. Training can be provided on how to format documents to save paper, how to use cloud-based services, and how to run paperless meetings.

Progress

- Positive performance feedback can increase intrinsic motivation. Set milestones and give feedback to let audience members know that they are moving in the right direction. See the section on [providing feedback](#) in [LASTING](#).

Autonomy/choice/control

- Delegate authority to allow people to choose what behaviors they will do to reduce paper usage.
- Emphasize how some paper-reduction behaviors can actually increase autonomy. For example, cloud-based filing systems enable staff and students to access documents on-the-go.



Photo credit: WOC in Tech Chat.

Exploration, novelty

- Give people the opportunity to explore the many ways that they can reduce paper usage.
- Provide opportunities for staff to learn from departments or other institutions that have saved large amounts of paper.

KEY CONSIDERATION: Extrinsic rewards can undermine intrinsic motivation

While extrinsic rewards like prizes can be easy and quick to implement, they do have their pitfalls. The most important thing to know is:

Virtually all types of extrinsic rewards or penalties DIMINISH intrinsic motivation.²⁰

Careful consideration should be taken before introducing extrinsic rewards.

If your audience is already intrinsically motivated to do the desired paper-saving behavior, or already performs the behavior without any rewards in place, offering an extrinsic reward can result in less motivation when the reward is later taken away.

Table 4 on the next page provides guidelines for making an informed decision about whether to solely tap into intrinsic motivation or to introduce extrinsic rewards.

²⁰ Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67. doi: 10.1006/ceps.1999.1020

Table 4: Choosing between tapping into intrinsic motivation or using extrinsic motivation

Tap into intrinsic motivation when:	Consider extrinsic rewards when:
Intrinsic motivation already exists	Intrinsic motivation is unlikely
Tap into intrinsic motivators when the target behaviors are inherently interesting, allow for exploration, and provide opportunities for autonomy, mastery, purpose, progress, or social connection.	For behaviors that are inherently uninteresting or that lack opportunities for exploration, mastery, or social connection, you may need to rely on extrinsic rewards.
It is an ongoing, regular behavior	It is a one-time or infrequent behavior
For repetitive or ongoing behaviors, extrinsic rewards may prove expensive over time and their effectiveness is likely to peter out.	For infrequent behaviors, it may be simplest to reward (or penalize) the behavior once. An example is providing a bonus or prize to those that relinquish their desktop printer.
Opportunities for creative misbehavior exist	There are limited opportunities for creative misbehavior
When there are ample opportunities for your audience to “fake” an action to get around a penalty or to win a reward, you’ll want to rely on the “honor system” rather than extrinsic rewards.	When there are no or very limited opportunities for your audience to fake a behavior, extrinsic motivation can work well.
When the main barriers are not financial	When the main barrier is financial
If the main barriers are time or other non-financial barriers, consider the ways that intrinsic motivation can reward or subsidize a behavior.	When the primary barrier is financial, extrinsic (financial) incentives may be the only way to get the behavior you seek.
When the behavior is relatively simple	When the behavior is extremely challenging
When a behavior is relatively easy, extrinsic rewards may not be needed. Consider highlighting how easy the behavior is and how the individual can make a difference through simple actions.	When the behavior demands a lot of energy, time, or commitment, extrinsic benefits may be needed. Some behaviors in a behavioral sequence may need extrinsic support whereas others do not. For example, students may need support buying a programmable thermostat, but may not need extrinsic motivation to install and program it.

3. Determine WHEN and HOW the benefit will be offered

In addition to the importance of the type of benefit offered, the **timing** of offering the benefit and **how it is presented** also influence audience motivations.

Make the most of immediacy

Although individual impulsivity varies, as a species we are generally predisposed to prioritize immediate consequences over those that will occur in the future. We are more likely to desire a smaller reward immediately over a larger reward in the future. Similarly, we discount the probability of future negative consequences.²¹ To prevent the targeted population from discounting the potential costs and benefits of the penalty or reward, they should be applied as immediately as possible.



Examples of immediacy

- **Include a stimulus up front:** Immediately provide a token of participation (sticker, button, etc.) when an audience member signs a paper reduction pledge.
- **Offer incentives at or near the point where the target behavior takes place:** Put a snack jar near the scrap paper bin.

Determine the schedule of benefits

For guidance on making rewards last as long as possible and promoting long-term behavior change, see “Determine the schedule of benefits” under the [LASTING](#) Building Block.

Limit benefits to increase the perceived value

Constraining rewards can enhance perceived attractiveness and is more cost effective to the project team. People are usually more motivated by something that is limited and appears scarce or unique, or only available for a limited time. Scarce rewards incite high competition and increase desirability.²²



Examples of limited benefits

- **Time-limited rewards:** Especially if you are in a time crunch, restrict rewards to a certain time period, or to a certain number of participants. For example, only reward the first 100 people who relinquish their desktop printer.
- **Diminishing rewards:** Reward each person that relinquishes their printer less than the person before to create a race to relinquish first. This can be especially powerful when a deadline to reach the goal is on the horizon.

Supersize rewards

Lotteries are particularly effective because as humans, we are more attracted to the possibility of winning a large amount than being guaranteed to win a small amount. Offering fewer but more valuable prizes could actually reduce costs.



An example of supersizing the reward

- Fifty professors may not be motivated to give up a desktop printer in exchange for \$50, but all might be willing to for the chance to win \$2,500 for their lab or research.

21 Green, L., & Myerson, J. (2004). A discounting framework for choice with delayed and probabilistic rewards. *Psychological Bulletin*, 130(5), 769–792. doi: [10.1037/0033-2909.130.5.769](https://doi.org/10.1037/0033-2909.130.5.769)

22 Verhallen, T. M. (1982). Scarcity and consumer choice behavior. *Journal of Economic Psychology*, 2(4), 299–322. doi: [10.1016/0167-4870\(82\)90034-4](https://doi.org/10.1016/0167-4870(82)90034-4)

Harness the power of group accountability

We humans have an innate motivation to avoid letting down our peers, and may go to great lengths to evade the uncomfortable feeling that results when others are disappointed in us. Social pressures can be effectively harnessed by providing a reward only when all members of the associated group have adopted the desired behavior.²³

An example of harnessing the power of group accountability

- Only reward the class with a celebration when 100% of students remembered to submit their assignment electronically.

Tailor rewards to your audience

As with all interventions, it is important to carefully consider the unique beliefs, perceptions, barriers, and motivators of your particular audience²⁴. Social recognition may actually be a disincentive to people that shy away from attention. A \$5 gift card is likely to be more motivating to college students than professors. Conversely, rewards of time may be more motivating to professors than students.

Refer to the [IDENTITY](#) and [RELATABLE](#) Building Blocks for more tips on relating benefits to what the audience most values and identifies with.



Julie Houston, who offers insight for students, faculty and staff by teaching responsible waste reduction and disposal, won the Cornell University Partners in Sustainability staff award. Photo credit: Mark Vorreuter.

23 Handgraaf, M.J., Van Lidth de Jeude, M.A., & Appelt, K.C. (2013). Public praise vs. private pay: Effects of rewards on energy conservation in the workplace. *Ecological Economics*, 86, 86–92. doi: [10.1016/j.ecolecon.2012.11.008](https://doi.org/10.1016/j.ecolecon.2012.11.008)

24 Deci, E., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. Retrieved from <https://www.springer.com/gp/book/9780306420221>



Make it EASY | Building Block 2

Any kind of hassle factor, whether mental or physical, can deter us from a behavior. To promote eco-friendly behaviors, environmental advocates should reduce mental and physical hurdles and design easy-to-make choices. Removing barriers to desired actions and erecting barriers to undesired actions will make involvement in environmental endeavors easier for the average person.



Fundamentals:

- Set the stage for easy action.
- Employ choice architecture.
- Erect barriers to undesirable behaviors.

1. Set the stage for easy action

Reduce or eliminate hassle factors such as time, distance, and effort

As busy humans, we are more likely to avoid an action entirely when we feel there are too many hoops to jump through. By limiting the amount of time, distance, and (physical or mental) effort it takes to do something, we can increase our audience's rate of participation and cooperation.^{25,26}



Examples of reducing hassle factors:

- Place shared printers in central, easy-to-access locations.
- Reduce the inconvenience of using a shared printer by designating one shared printer for small print jobs and another for more time-consuming print jobs.
- Place scrap paper boxes near all printers.
- Share "tips" for using a new shared printer and hold orientation sessions.

Ensure supportive policies and infrastructure

We cannot expect people to engage in behaviors if current policies and infrastructure make these behaviors difficult or impossible.^{27,28}



Examples of supportive policy and infrastructure:

- Coordinate with administrators, staff, and faculty to ensure that current policies make it acceptable to print-double sided, print on scrap paper, format to save paper, or to not print at all!
 - If students must print, professors should allow students to print on scrap paper or format documents to reduce paper use.
 - Do not require staff to file hard copies of invoices, receipts, etc.
- Provide easy-to-use online tools for file sharing, electronic signatures, and electronic invoicing.

25 Brothers, K. J., Krantz, P. J., & McClannahan, L. E. (1994). Office paper recycling: a function of container proximity. *Journal of Applied Behavior Analysis*, 27(1), 153-160. doi: [10.1901/jaba.1994.27-153](https://doi.org/10.1901/jaba.1994.27-153)

26 Benartzi, S., & Thaler, R. H. (2013). Behavioral economics and the retirement savings crisis. *Science*, 339(6124), 1152-1153. doi: [10.1126/science.1231320](https://doi.org/10.1126/science.1231320)

27 Derksen, L., & Gartrell, J. (1993). The social context of recycling. *American Sociological Review*, 58(3), 434-442. doi: [10.2307/2095910](https://doi.org/10.2307/2095910)

28 McCarty, J. A., & Shrum, L. J. (1994). The recycling of solid wastes: Personal values, value orientations, and attitudes about recycling as antecedents of recycling behavior. *Journal of Business Research*, 30(1), 53-62. doi: [10.1016/0148-2963\(94\)90068-X](https://doi.org/10.1016/0148-2963(94)90068-X)

Design information to be easy to understand, remember, and execute

When information is complicated or difficult to understand, we as a species often avoid following through on certain actions.²⁹ Make it easy to adopt and sustain the preferred behavior by offering the audience simple, uncluttered information and clear directions upon which to act. Avoid jargon, use pictures to demonstrate, group related behaviors into categories, use headings and subheadings, and make instructions or information memorable by using lists, alliteration, and rhyming.

Examples of information that helps the audience do the behavior:

- Provide signage that helps people correctly orient scrap paper in the printer.
- Make signs with pictures that illustrate what can go in each recycling bin.
- Provide information on eco-friendly paper sourcing (e.g., Canopy's [Ecopaper Database](#)).
- Give step-by-step instructions on how to make the switch to using shared printers: who to contact, how to connect to the network, tips for secure printing, etc. (See Portland Community College's Panther Print example below.)



PLACE SCRAP PAPER
BLANK SIDE DOWN



Photo credit: Cole and Fieselman (2013).



SPOTLIGHT: Specific and easy-to-follow instructions for desktop printer removal

PCC Rock Creek utilized the EASY principle by making very specific instructions outlining the exact steps people need to take to give up their desktop printers. The sustainability team sent emails and set up a web page explaining:

- How to open a printer removal request and what details should be included in the request.
- How to make the printer accessible to IT for removal.
- Who to contact for help.

The school also held a workshop and Q&A to help people adapt to the new system and to give them the opportunity to ask questions. Information about the Panther Print Program and relevant easy-to-use forms are kept online for easy access. Learn more in [PCC's full Case Study](#).

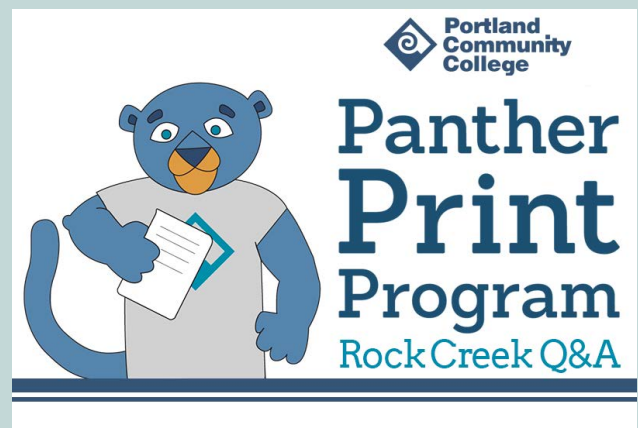


Photo credit: Portland Community College.

29 Kaplan, S. (2000). New ways to promote proenvironmental behavior: Human nature and environmentally responsible behavior. *Journal of Social Issues*, 56(3), 491-508. doi: [10.1111/0022-4537.00180](https://doi.org/10.1111/0022-4537.00180)

2. Employ choice architecture

The design of our surroundings influences the decisions we ultimately make. Because we are faced with many daily choices and decisions, even subtle changes in the way we encounter information, like seeing an item listed first, can significantly influence our behavior. Choice architecture encompasses the strategic design and presentation of this information to promote a desired behavior.³⁰ Marketers have been using choice architecture to maximize profit for decades, but sustainability practitioners can also use this approach to encourage more sustainable behaviors. In contrast to [BENEFITS](#), choice architecture does not restrict freedom of choice (e.g., bans) or change financial incentives (e.g., taxes, fees, or rewards).

Elevate the desired choice

When leaving full choice control to the audience or individual, there are small tweaks that can be made to elevate a preferred option, such as strategic visual placement or the order in which items are presented. For example, when healthier options were placed on the front side of menus, customers were nearly 50% more likely to choose a healthy option. This was even more effective than providing calorie information!³¹



Examples of elevating the desired choice:

- List the digital version of a course's textbook before the paper one.
- Make scrap paper bins clearly visible and easily accessible while placing new reams of paper in a cupboard.
- Place a flyer at eye level above a stack of flyers with a prominent sign encouraging people to snap a photo instead of taking the flyer.

Make it the default

Default options are a popular kind of choice architecture because they are particularly effective and, in many cases, relatively easy to implement. Setting a default involves pre-selecting a choice for the audience but still gives them the option to choose something different. Defaults can be used to automatically opt people into the desired green behavior, or opt them out of a less sustainable choice. For example, when a German electricity provider made their renewable energy plan the default, nearly 70% stayed in the program, compared to only about 7% joining the program when people had to opt in.³² Defaults work well because we tend to stick to the status quo. We stick to the status quo because it signals the “norm” or the recommended option. It also takes less effort than reversing the default.

30 Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: Improving decisions about health, wealth, and happiness*. London, England: Penguin.

31 Downs, J. S., Loewenstein, G., & Wisdom, J. (2009). Strategies for promoting healthier food choices. *American Economic Review*, 99(2), 159-164. doi: [10.1257/aer.99.2.159](https://doi.org/10.1257/aer.99.2.159)

32 Ebeling, F., & Lotz, S. (2015). Domestic uptake of green energy promoted by opt-out tariffs. *Nature Climate Change*, 5(9), 868-871. doi: [10.1038/nclimate2681](https://doi.org/10.1038/nclimate2681)



SPOTLIGHT: Making it easy to set smaller margin defaults

Portland Community College provided clear and visual how-to instructions on how to make smaller margins the default. This contributed to a 9.53% reduction in paper use over one year.

Changing your Margin Settings

To make your document's margins smaller, click on the Margins icon under the Page Layout tab. Then choose the option Narrow.

If you want to make this your default setting, click on Custom Margins and then choose Set As Default.

Photo credit: Portland Community College Green Team.

Examples of defaults:

- Set campus printers to print double-sided by default.
- Set a smaller margin size as the default.
- Make direct deposit the default option for employee paychecks.
- Make emailing receipts the default over using paper ones.



SPOTLIGHT: Impact of defaulting to double-sided printing

By changing university printer defaults from 'single-sided' to 'double-sided' printing, Rutgers University reduced paper consumption over four years by 55 million sheets (a 44% reduction in consumption) and saved the equivalent of 4,650 trees!³³

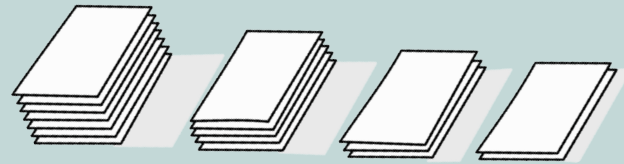


Photo credit: Pixabay.



UW-Madison students from an environmental studies class and the Associated Students of Madison conduct outreach in a student union about receipts on campus. Photo credit: Rachel Feil.

33 Sunstein, C. R., & Reisch, L. (2013). Green by default. *Kyklos*, 66(3), 398-402. doi: [10.1111/kykl.12028](https://doi.org/10.1111/kykl.12028)

3. Erect barriers to undesirable behaviors

When given a choice between two options, people tend to prefer the option that requires the least amount of effort. We can use this tendency to our advantage by making environmentally unsound behaviors harder to perform.³⁴ For example, an office could cut its paper consumption by moving the office printer to a less convenient location. Use other building blocks to alleviate negative push back from erecting barriers to undesirable behaviors (e.g., by emphasizing the benefits in terms that your audience most cares about).

Examples of erecting barriers to printing:

- Allocate a set number of pages or reams per individual or department and require justification for additional page allowances.
- Require print access codes or ID cards to retrieve print jobs, making it difficult to accidentally print documents or forget to pick them up.
- Require students to submit printed papers in a remote campus location if they do not submit online. Or, set earlier deadlines for hard copy assignments than for electronic versions.
- Remove desktop printers and replace them with communal printers; the extra effort to walk to the printer may deter people from printing as often.
- Require an extra approval process if staff want to print more than the standard number of marketing materials or mailings. For example, University of Notre Dame's mail services implemented a policy that allows people to distribute no more than 300 copies of the same item each month to encourage communication through online channels. The change resulted in an estimated annual savings of \$100,000.³⁵

Examples of erecting barriers to acquiring or keeping desktop printers:

- If you can't abandon desktop printers entirely, require people to submit special exception requests to use a desktop printer.
- If people opt to use personal printers, require them to be responsible for providing their own supplies and technical support.
- Require ID to print; Carleton College saw a 30% reduction in paper usage after they began requiring ID cards for printing!³⁶



Feedback gathered during redesign of waste and recycling signage at Red River College. Photo credit: Red River College.

34 Van Houten, R., Nau, P. A., & Merrigan, M. (1981). Reducing elevator energy use: A comparison of posted feedback and reduced elevator convenience. *Journal of Applied Behavior Analysis*, 14(4), 377-387. doi: 10.1901/jaba.1981.14-377

35 Environmental Paper Network, National Wildlife Federation, Recycling Organizations of North America, & The Repaper Project. (2017). *Paper steps on campus* [PDF File]. Retrieved from <https://environmentalpaper.org/wp-content/uploads/2017/08/paper-steps-on-campus.pdf>

36 Environmental Paper Network, National Wildlife Federation, Recycling Organizations of North America, & The Repaper Project. (2017). *Paper steps on campus* [PDF File]. Retrieved from <https://environmentalpaper.org/wp-content/uploads/2017/08/paper-steps-on-campus.pdf>



Emphasize HOPEFULNESS | Building Block 3

Hopelessness leads to avoidance and inaction. Rather than focusing on “doom and gloom” messaging, audiences can be uplifted with optimistic, practical appeals to immediate actions. We can also help our audiences gain self-efficacy, or the ability to actually make a difference, to further motivate action. Additionally, collective action can be inspired by showing images and sharing stories of communities working together and making progress. By engendering hopefulness, we can transform despair, apathy, and inaction into an energized resolve to participate in protecting the planet.



Fundamentals:

- Highlight solutions and positive impacts.
- Cultivate conditions for increased self-efficacy.
- Make it a collective endeavor.
- Demonstrate and celebrate progress and momentum.

1. Highlight solutions and positive impacts

Concrete solutions challenge the notion that environmental problems are beyond repair. They evoke opportunity and allow us to work toward a better world. Highlight not just one, but many different solutions.

Emphasize the positive impacts

Positivity inspires action, whereas guilt can be paralyzing and counterproductive. Rather than emphasizing the problems caused by a negative behavior, the focus should be on the positive behaviors that disrupt negative outcomes.^{37,38} Put less emphasis on the things your audience is doing “wrong” and more emphasis on the changes they can make to do the “right” thing for the environment.



Examples of emphasizing the positive impacts:

- Emphasize the positive impacts of saving paper (number of trees saved, pounds of solid waste not created, gallons of water saved, and emissions eliminated) rather than the negative impacts of wasting paper (deforestation, energy and water use, etc.).
- In addition to grabbing attention and raising awareness by displaying stacks of how much paper is used by a department or campus, show the amount of paper being saved (e.g., with clear bins, or painted green boxes).



Photo credit: David Yan.

37 O'Neill, S., & Nicholson-Cole, S. (2009). “Fear won’t do it” promoting positive engagement with climate change through visual and iconic representations. *Science Communication*, 30(3), 355-379. doi: [10.1177/1075547008329201](https://doi.org/10.1177/1075547008329201)

38 Roser-Renouf, C., Maibach, E. W., Leiserowitz, A., & Zhao, X. (2014). The genesis of climate change activism: From key beliefs to political action. *Climatic Change*, 125(2), 163-178. doi: [10.1007/s10584-014-1173-5](https://doi.org/10.1007/s10584-014-1173-5)

Show how small actions add up

Hopefulness is fostered by communicating that no action is too small, e.g., “every sheet counts”, especially when an action has numerous benefits or when many individual actions add up to large positive impact. Help your audience to see everyone’s choices adding up to something big. Pair these messages with wording to “keep up the effort” to show that the work is not yet done.

Examples of using statistics that show the additive impact of saving paper:

- Use the Environmental Paper Network's [Paper Calculator](#)³⁹ to show how small amounts of paper savings have numerous benefits: “Because every student printed their term papers double sided, our class saved X sheets of paper AND X gallons of water.”
- Clark University used the following statistic to communicate how paper saving actions have additional environmental benefits: “Saving one pound (approximately 111 sheets) of paper prevents over 4 pounds of carbon dioxide from being emitted.”⁴⁰

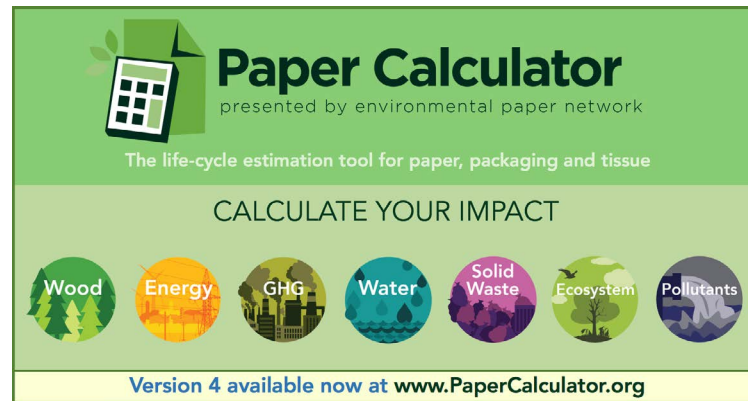


Photo credit: Environmental Paper Network.

Use positive imagery

Showing images of people doing the desired behavior can encourage positive behavior, and is particularly useful when specific success stories aren't available.

Examples of images that model paper saving behavior:

- Show images of people holding paperless meetings.
- Use paperless work space icons.
- Highlight campuses that have installed interventions such as displaying amount of paper saved.

SPOTLIGHT: Share success stories like Penn State Berks

Penn State Berks successfully reduced printing from 5.5 million sheets in 2015 to 2.6 million in 2018! This was achieved by:

- Instituting a print allocation of 250 pages per student.
- Sharing paper-saving strategies like how to use the “multiple pages per sheet” setting.
- Creating vivid displays (like the one pictured here) showing the annual paper use of one Berks student. See [VIVID](#) for related tips.



Photo credit: Penn State News.

39 Environmental Paper Network. (n.d.). Calculate your impact. Retrieved from <https://c.environmentalpaper.org/>

40 Clark University. (n.d.). *Think before you ink: Reducing paper consumption on campus* [PDF File]. Retrieved from: https://www2.clarku.edu/offices/its/pdf/Think_Before_You_Ink.pdf

2. Cultivate conditions for increased self-efficacy

To be motivated into action, it is important to have the necessary skills, knowledge, and resources. We can help our audience build their sense of ability or “self-efficacy.”

Walk through the behavior with the audience

Walk through the steps of a complicated behavior with your audience to help build their confidence and familiarity with the task.

Examples of opportunities to improve the audience’s abilities:

- Hold an in-person tutorial on using document formatting options to save paper.
- Walk people through the steps to set up and use a multifunction printer.
- Have in-personal tutorials to ensure teaching assistants and faculty know how to use online learning platforms like Canva.
- Have experienced Green Teams coach others on how to initiate and maintain a paper-saving campaign.

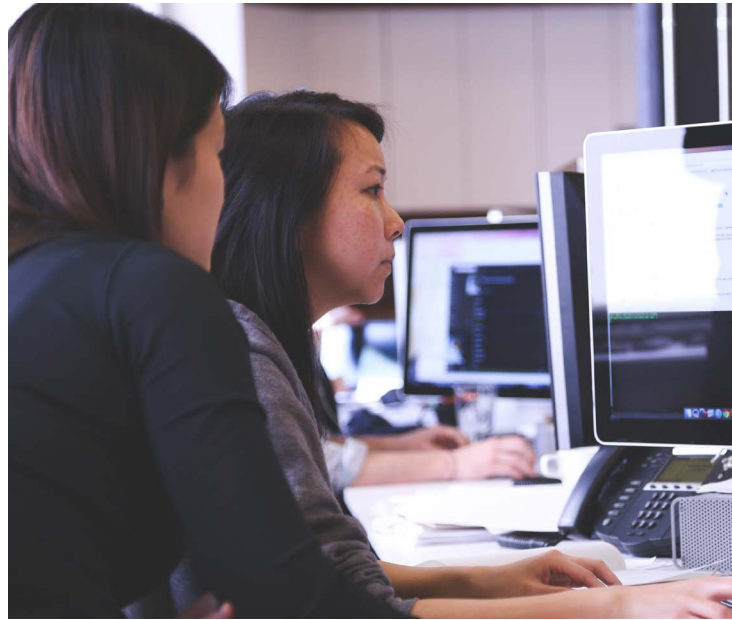


Photo credit: Startup Stock Photos from Pexels.

Help the audience access their existing knowledge

We can also build the audience’s confidence by helping members access their existing skills and knowledge; for example, by leading the audience through games and activities that help them recall and connect with the related knowledge they already have.

An example of activities that highlight existing abilities:

- Have the audience play a paper trivia or brainstorming game to demonstrate how much they already know about reducing paper consumption. The activity can be as simple as spending two minutes brainstorming paper-saving actions.

Idea: Paper saving “BINGO”

- Create a simple BINGO game where players mark which paper reduction actions they already take. In addition to increasing one’s sense of self-efficacy, this provides procedural information about how to reduce paper consumption.
- A more general sustainability BINGO game could be useful in recalling sustainability behaviors being done already that are not paper related. This can help your audience feel hopeful about tackling the paper problem next!

Turns off tap when brushing teeth.	★ FREE	Has a veggie garden.	Uses Greenpower at home.	Always turns off the lights.
Is Vegetarian.	Has 1 meat-free day a week.	Lets it mellow if it's yellow.	Has a rainwater tank at home.	Locks up their pets at night.
Is wearing something secondhand.	Always picks up their dogs poo.	★ FREE	Never uses plastic bags.	Picks up other people's rubbish.
Has a no junkmail sticker at home.	Turns off standby at home.	Always recycles.	Has a plastic-free lunch box.	Walks or rides to school.
Don't have a MP3 player or gameboy.	Has a small car.	Takes short showers.	★ FREE	Uses greywater at home.

Photo credit: Cool Australia.

3. Make it a collective endeavor

We are more likely to act and be hopeful if we believe that we are not alone in our efforts.⁴¹ Framing the issue as a collective endeavor and facilitating teamwork will increase our audience's sense of collective efficacy. Humans are naturally predisposed to cooperation and generosity, so collective engagement increases our sense of shared agency while also tapping into our biological need for connection.

Spotlight success stories

Show the effectiveness of successful paper reduction efforts at similar institutions, other departments or groups on your campus, or individuals within your target audience. You can use the examples and [case studies](#) from this document to help. This will demonstrate what is possible and also help to signal positive social norms. For tips related to social norms, see the [ORDINARY](#) section.



Examples of spotlighting success stories:

- “Penn State Berks reduced the student print allocation and shared paper-saving tips, resulting in a 44% reduction in student printing. We can do it too!”⁴²
- “In 2010/11, UBC achieved a 65 per cent reduction in volume of paper consumption from 2000 levels, despite a 34 per cent increase in students. Let's make this happen here!”⁴³

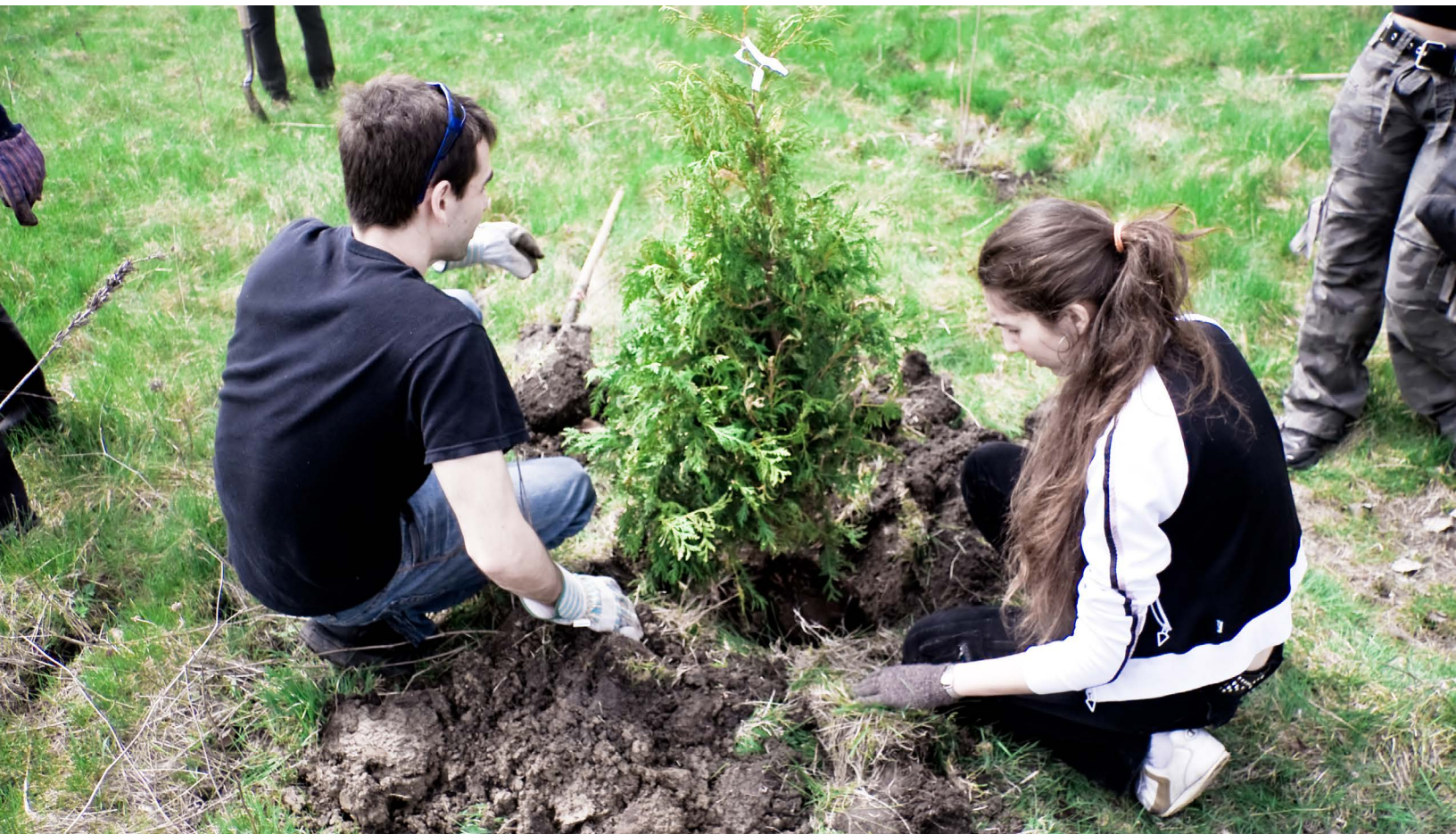


Photo credit: Alex Indigo.

41 Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science*, 9(3), 75-78. doi: [10.1111/1467-8721.00064](https://doi.org/10.1111/1467-8721.00064)

42 Penn State Berks. (2016, September 27). Penn State Berks reduces paper usage as part of sustainability efforts. Retrieved from <https://berks.psu.edu/story/3451/2016/09/27/penn-state-berks-reduces-paper-usage-part-sustainability-efforts>

43 The University of British Columbia Sustainability. (n.d.). Recycling & waste. Retrieved from <https://sustain.ubc.ca/campus/recycling-waste>

Share stories of communities taking action, not just individuals

Share stories and photos of groups of people doing the work rather than individuals. This shows the audience that they are not alone in their efforts and that the burden doesn't rely solely with them.

Facilitate and encourage collective involvement and personal connection

Establishing a Green Team is a great way to spearhead sustainability solutions, create a sense of shared hopefulness, and provide individuals greater support to effect change. Additionally, Green Teams signal to their colleagues that others are passionate about taking action on campus sustainability issues. There are many how-to guides about how to institute and manage Green Teams, including:

- [Tufts University's "Starting and Sustaining a Green Team."](#)
- [University of Pennsylvania's "Green Team Guide."](#)
- Though not campus-focused, the City of Portland, Oregon has a comprehensive ["Sustainability at Work: Green Team Guide."](#)



2017-18 Green Team at Portland Community College. Photo credit: Rock Creek Campus.

4. Demonstrate and celebrate progress and momentum

Whenever possible, show the audience how much progress they have made to promote a sense of accomplishment.⁴⁴ Viewing gains on a progress thermometer or crossing items off a daily checklist, for example, can sustain our motivation and help us believe our goals are attainable. Without progress reminders, we're more likely to feel that our efforts are futile.

Show quantitative progress with engaging visuals

In addition to stating the number of pages or dollars saved, represent progress visually. Progress "thermometers", graphs like Yale's, as shown,⁴⁵ and other visuals make it easier for the audience to visualize how far they've come.

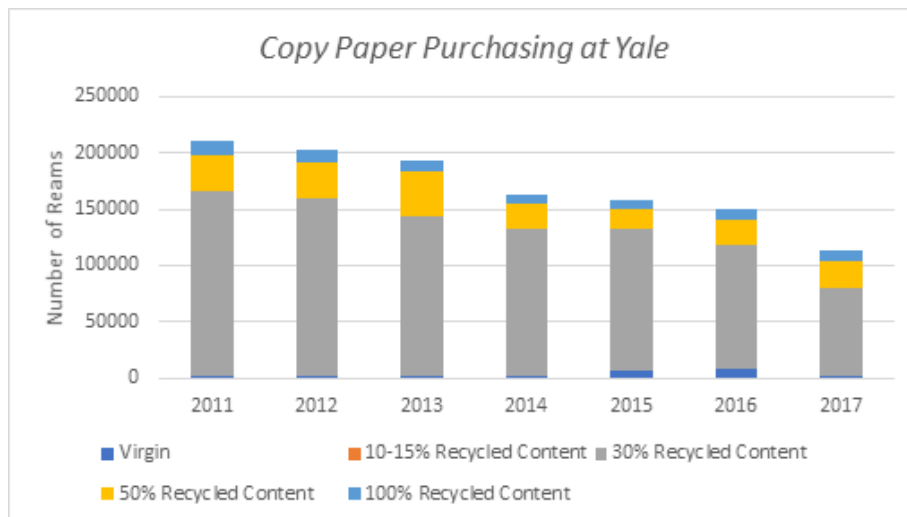


Photo credit: Yale University Office of Sustainability.

⁴⁴ Amir, O., & Ariely, D. (2008). Resting on laurels: the effects of discrete progress markers as subgoals on task performance and preferences. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 34(5), 1158-1171. doi: 10.1037/a0012857

⁴⁵ Yale Sustainability. (n.d.). Reducing paper use. Retrieved from <https://sustainability.yale.edu/take-action/reducing-paper-use>

Show qualitative progress with stories and imagery

When showing progress and momentum in quantitative terms isn't possible, we can still share stories and depict images of individuals taking action on the issue.

Don't just show progress, celebrate it

You don't need to reward progress with prizes, but it is important to celebrate and recognize it! If you choose the route of prizes and rewards, be sure to review the best practices for using positive incentives in the [BENEFITS](#) section. Help the audience recognize and celebrate success.

Examples of ways to celebrate progress:

- Newsletters with progress updates and praise.
- Milestone celebrations.
- Public recognition walls or signage.

For more information on providing feedback to motivate lasting change, see [providing feedback](#) in [LASTING](#).



University of Alberta Campus Sustainability Leadership Award winners. Photo credit: Trevor Chow-Fraser.

KEY CONSIDERATION: Use doomsday messaging cautiously

Negative statistics, fear-inducing images, and messages that focus on how big or ubiquitous the problem is can effectively capture attention. However, these doomsday narratives often cause us to feel overwhelmed and powerless. As a result, we are discouraged from taking action and may retreat from a cause that we genuinely care about.

Instead of relying on doomsday narratives, carefully consider whether negative messaging is productive to the cause. If deciding to use negative messaging, protect the audience's sense of hopefulness by pairing the threatening message with clear-cut solutions that the audience can implement immediately to channel the intense emotions that they may be feeling.

For example, when pointing out a problem (such as water consumed by producing paper), provide an immediate and specific action people can take to alleviate the problem, such as use of on-screen markup tools.



Frame for the appropriate ASSOCIATIONS |

Building Block 4

People use mental models, past experiences, and pre-existing values and beliefs to interpret new information. We also interpret messages through the distorting lens of our cognitive biases. Mental models and cognitive biases can lead to systematic and predictable errors in judgment and decision-making. However, message uptake, agreement, and willingness to act can be increased by using metaphors and frames that fit our audience's mental models, and by taking into account shared cognitive biases. We can even alter mental models over time by repeating value-based messages and avoiding the messages we want to negate.



Fundamentals:

- Leverage cognitive biases.
- Frame around mental models.
- Use metaphors for the big picture.
- Change frames over time.

1. Leverage cognitive biases

We often use mental shortcuts to navigate our world. In the case of cognitive biases, these shortcuts result in predictable mistakes. Although in many cases we will need to work against these biases, it is also possible to capitalize on them. See [AWARENESS](#) for more on overcoming biases.

Consider the effect of anchoring

On a daily basis, we make estimates (e.g., how much time something should take or how much rent should cost in a neighborhood) by starting from an initial value and adjusting away from that value. We tend to rely too heavily on the first piece of information we receive, and insufficiently adjust when we make decisions. For example, people who were given a higher randomly generated number had higher guesses for the number of African countries in the United Nations.⁴⁶



Examples of leveraging anchoring:

- Set print allocations low to serve as a low anchor for the appropriate paper use.
- Share stories of paper savings at other institutions or units to set a high anchor for paper savings.
- Create templates for certain documents (e.g., syllabi) with low suggested page lengths.

Utilize loss aversion

Loss aversion captures the idea that we hate to lose more than we like to gain. People who are given generic mugs, for example, ask for a much higher amount to give up their new possession than their peers would be willing to pay for that same item.^{47,48} Highlighting a potential loss can often be an effective motivational tool. This could take the form of carefully applied penalties for failing to perform a desired behavior. Refer to [BENEFITS](#) for more on penalties and rewards. Loss aversion is an important cognitive bias to watch out for since it can lead to pronounced behaviors such as risk taking and cheating,^{49,50} and could work against a campaign.

46 Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131. doi: [10.1126/science.185.4157.1124](https://doi.org/10.1126/science.185.4157.1124)

47 Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1990). Experimental tests of the endowment effect and the Coase theorem. *Journal of Political Economy*, 98(6), 1325-1348. doi: [10.1086/261737](https://doi.org/10.1086/261737)

48 The BE Hub (n.d.). Endowment effect. Retrieved from <https://www.behavioraleconomics.com/resources/mini-encyclopedia-of-be/endowment-effect/>

49 Kahneman, D. & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-292. doi: [10.2307/1914185](https://doi.org/10.2307/1914185)

50 Schindler, S. & Pfattheicher, S. (2017). The frame of the game: Loss-framing increases dishonest behavior. *Journal of Experimental Social Psychology*, 69, 172-177. doi: [10.1016/j.jesp.2016.09.009](https://doi.org/10.1016/j.jesp.2016.09.009)



Examples of leveraging loss aversion:

- “Don't lose precious time! Double check your documents before hitting print to avoid reprinting.”
- “Never lose a piece of paper again - go digital!”



Examples of avoiding loss aversion:

- If students are facing a reduction in printing credits, amplify messaging about the savings to be gained, and avoid discussing what the students may lose. For example, “the new \$100 print credit will help the school save \$X, or X acres of rainforest.”
- Avoid taking printers away from staff and faculty mid-year.
- Don't take desktop printers away before multifunction printers are in place and fully functional, but don't wait until people get used to having both.

2. Frame around mental models

People's values, morals, and worldviews (sometimes called mental models) shape how we engage with the environment, so it's necessary to frame communications to fit the audience's understanding of the world. For example, researchers found that describing a proposed cost system as a “carbon offset” rather than a “carbon tax” garnered much more support from Republican and Independent participants, while retaining support from Democrats.⁵¹

If your audience is fairly conservative, consider emphasizing the energy and waste reduction benefits of the campaign without drawing attention to sustainability or environmental impacts. Advertising environmental benefits can actually alienate conservative audiences.⁵²

3. Use metaphors for the big picture

Metaphors are especially effective in helping people understand abstract, complex systems such as the indirect causal relationships that are inherent in the climate system. Metaphors allow people to draw on their mental models of more familiar systems - like the network of organs needed to keep the body functioning - to better comprehend these relationships. For example, describing the ocean as the “heart” of the climate system incites systems thinking and helps an audience conceptualize the ocean's crucial role in regulating things like temperature and humidity, just as the heart regulates blood flow within the body. This comparison not only helps the audience better understand how the oceans regulate climate, but equips them for discussions about preventative care.⁵³



Examples of forest related metaphors:

- “Forests are the climate umbrellas of the earth.”
- “Forests are air purifiers; they take in carbon dioxide and release oxygen.”

51 Hardisty, D. J., Johnson, E. J., & Weber, E. U. (2010). A dirty word or a dirty world? Attribute framing, political affiliation, and query theory. *Psychological Science*, 21(1), 86-92. doi: [10.1177/0956797609355572](https://doi.org/10.1177/0956797609355572)

52 Gromet, D. M., Kunreuther, H., & Larrick, R. P. (2013). Political ideology affects energy-efficiency attitudes and choices. *Proceedings of the National Academy of Sciences*, 110(23), 9314-9319. doi: [10.1073/pnas.1218453110](https://doi.org/10.1073/pnas.1218453110)

53 Volmert, A. (2014). *Getting to the heart of the matter: Using metaphorical and causal explanation to increase public understanding of climate and ocean change. A FrameWorks research report* [PDF File]. Retrieved from https://www.frameworksinstitute.org/assets/files/PDF_oceansclimate/occ_metaphor_report.pdf

4. Change frames over time

Repeating messages over time that communicate a desired association helps build a link between the message and people's values. When people's values align with our message, they will be more willing to agree with and act on behavioral asks.

Don't repeat the negative

Repeating a message, even to deny it, can strengthen that frame by amplifying the very messages we are trying to negate. Instead, stick to the intended messages and repeat them in a non-defensive way.⁵⁴



Examples of alternative positive messages:

- Instead of denying that walking to a multifunction printer is inconvenient, focus on how its use creates convenience (e.g., faster printing).
- Many items that do not need to be printed are still called "papers" - for example "term paper" or "research paper." Consider using alternative words like essay, article, thesis, dissertation, study, report, review to avoid associating academic work with printing.

Repeat your frames and appeal to VALUES

Frequent exposure to a message or related imagery improves recall, but changing frames over time involves more than just repeating catchy sound bytes. In addition to being repeated, messages must appeal to values to be internalized.⁵⁵ Without existing values like freedom, fairness, and opportunity, these messages would not resonate.⁵⁶ We can start building associations between messages and values by exposing the audience to value-based paper messages.



Examples of using values-based messages:

- Present a united front by aligning with other messengers and agreeing to repeat the same message.
- Designing messages to appeal to core American values like freedom and opportunity will make the messages more effective. Try reminding your audience that when they print a lot of paper, they may diminish their colleagues' opportunity to print.



Photo credit: Root Solutions.

⁵⁴ Lakoff, G. (2004). *Don't think of an elephant!: Know your values and frame the debate: The essential guide for progressives*. White River Junction, VT: Chelsea Green Pub. Co.

⁵⁵ Lakoff, G. (2004). *Don't think of an elephant!: Know your values and frame the debate: The essential guide for progressives*. White River Junction, VT: Chelsea Green Pub. Co.

⁵⁶ Lakoff, G. (2006). *Whose freedom? The battle over America's most important idea*. New York, NY: Picador.



Design it to be VIVID | Building Block 5

Because we are constantly barraged with information and stimuli that compete for our finite attention, it is important for environmentalists to understand what “stands out” to their audience. Designing specifically to capture an audience’s attention can increase the likelihood that they will notice and act upon our messages and calls to action.

1. Make the desired behavior obvious

Use attention-grabbing design that makes the desired behavior appear striking and obvious - like green footprints that lead to recycling and composting bins.



Examples of using visuals to signal the desired behavior:

- Make scrap paper bins more prominent than recycling bins, trash bins, or new reams of paper.
- Use attention-grabbing arrows or footprints guiding people to the behaviors you seek.

2. Prompt people at the point of behavior

Appropriately placed and well-timed cues and prompts help people follow through with their intentions.⁵⁷ Prompts remind people to do the desired behavior right at the point where they are doing the action or making the decision. For example, prompts in the form of magnets on washing machines at Oberlin College reminded students that cold water saves energy and provided instructions on using the cold water bright color setting.⁵⁸



Fundamentals:

- Make the desired behavior obvious.
- Prompt people at the point of behavior.
- Make the problem stand out.



SPOTLIGHT: Striking visuals cue pro-environmental behavior

In Copenhagen, experimenters from the group iNudgeYou found that litter decreased by 46% when green footprints leading to the recycling can were painted on the ground.⁵⁹

How can you use a similar technique to encourage paper recycling or guide people to the scrap paper bin?



Photo credit: kai.bates / Flickr.

57 Sussman, R., & Gifford, R. (2012). Please turn off the lights: The effectiveness of visual prompts. *Applied Ergonomics*, 43(3), 596-603. doi: 10.1016/j.apergo.2011.09.008

58 Oberlin. (n.d.) Office of environmental sustainability. Retrieved from http://new.oberlin.edu/office/environmental-sustainability/CBSM/Laundry-Pilot_2015+Final+Report.pdf

59 iNudgeYou (n.d.). Green nudge: Nudging litter into the bin. Retrieved from <https://inudgeyou.com/en/green-nudge-nudging-litter-into-the-bin/>

Best practices for prompting paper saving behaviors

Prompt a **SPECIFIC** behavior

A vague message such as "Print less" is too general to be effective. Instead, prompt the audience to do a specific behavior like "Print double-sided" or "Proofread before you print."

Prompt at the appropriate **TIME** and **SPACE**

Prompt people at the appropriate physical location and point in time. A flyer in the bathroom urging people to print less may be quickly forgotten once someone gets back to their desk.

Rather than prompting to proofread, format, or print double-sided at the printer (where it is already too late) prompt people at their computer/desk or even within the computer software, when possible. To encourage the use of scrap paper and recycling draft pages, prompts at the printer/copier are appropriate.

Prompt relatively **SIMPLE** behaviors

Prompt a behavior the audience probably knows how to do but may need to be reminded of, like deleting unneeded pages in a document.

Prompts are not appropriate for overly complex tasks with many different steps.

Keep it **POLITE** and **UPLIFTING**

Positive phrasing helps create positive feelings and reduce the likelihood of producing negative reactions from the audience. Rather than negative messaging like "Stop wasting paper!" you can say: "About to print that? Remember to use print-preview first! Thanks for saving paper!"

Incorporate **NORMS**, **HUMOR**, & **IDENTITY STATEMENTS**

Use prompts as an opportunity to establish a norm or to remind a person of their pro-environmental identity. For more information see [ORDINARY](#) and [IDENTITY](#).

Keep prompts **FRESH**

When possible, create a prompt that can be easily refreshed and updated to keep the message novel.

71% of Haas students don't print lecture slides!

ASK YOUR FRIENDS ABOUT HOW TO SAVE PAPER!



71% of your fellow Haas students do not print lecture slides!



I thought everyone was doing that!

What can I do instead?

- Ask your professors to allow laptops/iPads (But don't distract those behind you!)
- Print **MULTIPLE SLIDES** per page
- Print **DOUBLE SIDED** or print on half-used paper
- Take notes on scrap paper

Examples of ways that a prompt can be refreshed and updated in campaign messaging. Photo credit: Root Solutions for UC Berkeley Haas School of Business.



Ideas and examples of prompts:

- At the computer:
 - Use a “Think before printing” email signature, or “Please don’t print this email unless absolutely necessary”. ThinkBeforePrinting.org has a graphic banner that you can copy.⁶⁰
 - Work with the IT team to design pop ups reminding people to print double-sided, proofread, etc.
 - Create desktop backgrounds that prompt various print-related behaviors.
- At the desk:
 - Use table tent prompts, desktop stickies, magnets, postcards on the cubicle, etc. prompting behavior that happens before pressing “print” such as printing double-sided, not printing at all, printing fewer copies, and reformatting to save paper.
- At the printer/copier:
 - Use a “Please use scrap paper” sign and make sure to include clear instructions for loading into the print tray.
 - Use a “Please make double sided copies” sign and make sure to include clear how-to instructions.
 - Use a “Have a one-sided copy you don’t need? Add to the scrap paper bin!” sign.
- Signs to use If you have to enter a code/card before releasing print jobs:
 - “Did you proofread before you sent to print? It’s not too late!”
 - “Take a pause: Are you sure you need to print? Thanks for saving paper!”
 - “How many copies do you *actually* need? Thanks for saving paper!”⁶¹

PRINT A PAGE, LEAVE A PAGE.



Clean paper that’s been printed on one side can be placed in the **REUSE** trays to be used as scrap paper.

Photo credit: Wichmann et al. (2017)⁶¹.

ABOUT TO PRINT?



• PLEASE •
**CHECK THE PREVIEW
FIRST!**

THANK YOU FOR SAVING PAPER

Photo credit: Root Solutions

PRINTING?

SAVE PAPER BY
REMEMBERING TO



- R** EUSE SCRAP PAPER
- E** DIT ON SCREEN BEFORE PRINTING
- D** UPLEX
- U** SE ONLY WHAT’S NECESSARY. DO YOU NEED TO PRINT THAT?
- C** ONDENSE YOUR DOCUMENT BY REDUCING THE MARGIN AND FONT SIZE.
- E** MAIL OR ELECTRONICALLY SHARE YOUR DOCUMENT INSTEAD OF PRINTING

Photo credit: Root Solutions

60 [Think before printing campaign] (n.d.). Retrieved from <http://thinkbeforeprinting.org/get-the-message.php>

61 Wichmann, B.; Luckert, M., Bissonnette, K., Cumberland, A., Doll, C., Gupta, T., & Shi, Y. (2017). Using pro-environmental information to modify conservation behavior: Paper recycling and reuse. *Recycling*, 2(1), article 5. doi: [10.3390/recycling2010005](https://doi.org/10.3390/recycling2010005)

3. Make the problem stand out

When environmental problems are communicated in clear terms, we are more likely to respond to them. Use engaging images and descriptive language to bring the problem to life in terms that will be attention-grabbing and meaningful to the audience.

Demonstrate magnitude by using relatable metrics

Using units that members of the audience are not familiar with, such as kilowatt hours, metric tons, or even reams, may result in wasted opportunities.⁶² Translate those units into terms that are easier to understand. Instead of using “reams of paper”, try “number of trees” or “a forest the size of X.”



Examples of vivid metrics:

- Show direct **financial costs** like the money spent on paper, ink, toner, or printer repair.
- Highlight **opportunity costs by** calling out other things that money could be spent on such as sustainability projects, faculty salaries, scholarships, or school infrastructure.
- Use the [Paper Calculator](#) to translate your institution's paper use metrics into measurements that will resonate, such as energy use, greenhouse gas emissions, or wetland disturbance.

Physically show the size and severity of the problem through real-world displays

Go beyond just sharing metrics about the problem by creating physical displays that show how big the problem is.



Examples of paper related displays:

- Display big piles of unclaimed print jobs, a semester's worth of empty paper boxes, or piles of old toner cartridges.

DID YOU KNOW?
The amount of paper Haas students use in one school year weighs as much as 13 grizzly bears

PRINT LESS. WIN PRIZES.
Visit [HTTPS://HBSASUSTAINABILITY.WIXSITE.COM/PAPER](https://HBSASUSTAINABILITY.WIXSITE.COM/PAPER)

Environmental impact estimates were made using the Environmental Paper Network Paper Calculator Version 4.0. For more information visit www.papercalculator.org.
@Haas_Sustainability

The Haas School of Business used EPN's Paper Calculator to translate the school's paper use into pounds, and then into the weight of UC Berkeley's mascot, the grizzly bear. Photo credit: Root Solutions for UC Berkeley Haas School of Business.



SPOTLIGHT: Showing the severity of the paper problem through displays

Portland Community College's sustainability coordinator Elaine Cole collected empty paper ream boxes to build a vivid display. The boxes were stacked in a high-traffic area to show people what a fraction of the school's annual paper use actually looks like.

The display also included solutions to the paper waste problem, such as how to print more mindfully and use scrap paper.⁶³



Photo credit: Portland Community College.

62 Camilleri, A. R., & Larrick, R. P. (2014). Metric and scale design as choice architecture tools. *Journal of Public Policy & Marketing*, 33(1), 108-125. doi: [10.1509/jppm.12.151](https://doi.org/10.1509/jppm.12.151)

63 Cole, E. (2018). Personal communication.

Link actions to their impact

We are more likely to ignore problems if we cannot see how our individual actions impact environmental outcomes. Help the audience conceptualize their role in the problem by linking action to impact.⁶⁴



Examples of visuals that link action to impact:

- Add a tree cut-out to the side of a box of blank paper to show users their paper use impacts forests.
- Add “Remember, these comes from trees!” stickers, signage, and messaging anywhere paper is being used, whether it be near a printer or a stack of flyers, napkins, or paper towels.

Focus on immediate impacts: Emphasizing the most immediate and concrete impacts - rather than consequences that may occur in the distant future - will help counteract our human tendencies to undervalue faraway events and misinterpret probabilities.⁶⁵



Examples of focusing on the immediate impacts of paper reduction:

- Looking for paper documents takes time - “Switch to digital filing to save time.”
- Printers take up desk space - “Free up desk space by turning in your desktop printer.”
- Printing documents takes time - “Save time by editing online instead of standing in line.”


Tie the issue to current events

Tie your cause into events and efforts that are already gaining attention or are top-of mind.



Examples of tying the issue to current events:

- Amplify paper-saving messaging when deforestation, the climate crisis, or zero waste are in the news.
- Work with your marketing department or newspaper to accompany articles highlighting student environmental projects with ideas about paper reduction.
- Tie projects and paper campaigns to other environmental campaigns and events such as RecycleMania, climate action week, or zero waste month.



833,333
sheets of paper
were printed last year in the CTX library alone.

That weighs as much as
1 ELEPHANT.

Think before you print.

concordia.edu/print 

This campaign is brought to you by Concordia University Texas Information Technology Services.

Photo credit: Concordia University.

r(eco)gnize these come from trees
USE ONLY WHAT YOU NEED
Reduce. Reuse. Recycle. Learn more at becomegreen.info.

Photo credit: Half Price Books.

Remember to accompany messages about problems with solutions!

Be sure to pair messages and images about the severity or size of the problem with hopeful messaging about the actions people can take to solve the problem. Failing to do so can make people feel hopeless and can lead to inaction or paralysis.

See [HOPEFULNESS](#) and [EASY](#) for related concepts and tips.

64 Ahn, S. J. G., Bailenson, J. N., & Park, D. (2014). Short-and long-term effects of embodied experiences in immersive virtual environments on environmental locus of control and behavior. *Computers in Human Behavior*, 39, 235-245. doi: <http://dx.doi.org/10.1016/j.chb.2014.07.025>

65 Center for Research on Environmental Decisions and ecoAmerica. (2014). *Connecting on Climate: A Guide to Effective Climate Change Communication* [PDF File]. New York and Washington, D.C. Retrieved from <http://ecoamerica.org/wp-content/uploads/2014/12/ecoAmerica-CRED-2014-Connecting-on-Climate.pdf>



Encourage consistent IDENTITY | Building Block 6

Humans have a desire to appear consistent and trustworthy to ourselves and to others by behaving in accordance with our stated beliefs and commitments. As such, the values and societal roles with which we most strongly identify shape every aspect of our lives - how we interact with others, how we respond to messages we encounter, and our daily actions. Practitioners can communicate about environmental problems and their corresponding solutions in ways that align with and support - rather than threaten - our audience's relevant identities and drive for consistency.



Fundamentals:

- Draw on the appropriate identity.
- Set and meet goals with implementation intentions.
- Plan a powerful pledge.
- Help your audience move up the ladder of engagement

1. Draw on the appropriate identity

Emphasizing certain identities can inspire stronger environmental engagement. Our goal as environmental practitioners is to highlight and reinforce identities that are most aligned with pro-environmental behavior. Different labels evoke different mental frameworks through which we judge incoming information, so as practitioners, we should make sure not to alienate our audiences with polarizing labels. This means that extra care and attention is required in how, when, and which identities are evoked when addressing our audiences.

Use positive identity statements

Using statements that highlight positive identities, such as “voter,” “citizen,” and “steward,” can have a positive impact on human behavior. For example, people were found to be more likely to vote when asked “How important is it for you to be a voter in the next election?” (identity statement) compared to being asked “How important is it for you to vote in the next election?” (identity-neutral statement).⁶⁶



Examples of paper saving identity statements

- Use identity-laden statements like “Are you a paper saver?” and “Thank you for being a paper saver!” rather than identity-neutral statements like “Thank you for saving paper”.
- Tie your mascot to identity statements through phrases such as “Cal Bears are paper savers!”

Avoid evoking negative identities

While positive identity statements like “I am a paper saver” can be helpful, be careful to avoid identity statements with negative connotations. For example, even using the word “consumer” can have negative consequences. Research shows that people are more likely to behave cooperatively in a game when they are told that their role in the game is one of a “citizen” rather than a “consumer.”⁶⁷

66 Bryan, C. J., Walton, G. M., Rogers, T., & Dweck, C. S. (2011). Motivating voter turnout by invoking the self. *Proceedings of the National Academy of Sciences*, 108(31), 12653-12656. doi: 10.1073/pnas.1103343108

67 Bauer, M. A., Wilkie, J. E., Kim, J. K., & Bodenhausen, G. V. (2012). Cuing consumerism: Situational materialism undermines personal and social well-being. *Psychological Science*, 23(5), 517-523. doi: 10.1177/0956797611429579

2. Set and meet goals with implementation intentions

Setting goals links specific outcomes with actions. Often, we would like to implement an environmental action, but lack the structure to carry it out. Clear goals and targets help us commit and track progress toward a concrete mark, which keeps the problem from feeling too large and overwhelming. As practitioners, we should encourage our audience to set S.M.A.R.T. goals⁶⁸ (specific, measurable, achievable, realistic, and timely). We can help them achieve these goals and navigate around barriers to action by having them write down an “implementation intention” plan.⁶⁹

Determine the baseline data

When setting goals, figure out the baseline so you can set realistic and measurable goals.

Examples of paper related baseline measurements:

- Before setting a paper reduction goal, measure how much paper your audience currently uses and/or how much paper is being purchased.
- Before setting a desktop printer reduction goal, perform a printer audit to determine how many desktop printers are being used. As part of the audit, you may want to collect data on printer location, owner, whether it is networked, whether it is left idling, and the brand and model.

Encourage specific, measurable goals

People are more likely to hold themselves accountable if goals are specific rather than general.⁷⁰

Examples of general versus specific goals:

- GENERAL (do not use): “I will use less paper.”
- SPECIFIC: “I will set my printer to print double-sided by default by the end of the day.”
- SPECIFIC: “I will reduce my paper use by 30% within 2 months.”



SPOTLIGHT: Create an identity

UC Berkeley’s Haas School of Business used identity statements during a paper reduction campaign. These statements also utilize the [ORDINARY Building Block](#) to convey saving paper as the normal student behavior.

What you got printing there?

Did you choose to print double-sided?

Did you try to reformat your document to print fewer pages?

Do you really have to print this?

**Cal Bears are
paper savers!**



BerkeleyHaas

Photo credit: Root Solutions for UC Berkeley Haas School of Business.

68 Doran, G. T. (1981). There’s a S.M.A.R.T. way to write management’s goals and objectives. *Management Review*, 70(11), 35–36. Retrieved from <https://community.mis.temple.edu/mis0855002fall2015/files/2015/10/S.M.A.R.T-Way-Management-Review.pdf>

69 Gollwitzer, P. M. (1993). Goal achievement: The role of intentions. *European Review of Social Psychology*, 4(1), 141-185. doi: [10.1080/14792779343000059](https://doi.org/10.1080/14792779343000059)

70 Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705-717. doi: [10.1037//0003-066X.57.9.705](https://doi.org/10.1037//0003-066X.57.9.705)

Help your audience achieve their goals with implementation intentions

It can be difficult to carry out behaviors that are foreign to us, and unforeseen obstacles could create barriers to carrying out our plans.⁷¹ To break through the intention-implementation gap, ask your audience to design a specific plan of action - an **implementation intention**⁷² - for carrying out their goals. This involves creating a “when and where” plan, and then brainstorming potential barriers to action and creating “if/then” scenarios for how to overcome those barriers. This helps reduce the anxiety associated with a new task, creates alternative action plans for potential barriers, and provides a transition from goal setting to action.

Create a “where and when” roadmap to clarify cues for action:

Even those motivated to achieve a certain goal may fail to take action if they lack clarity on how to execute the desired behavior or do not recognize when an opportunity to act has arrived.⁷³ Asking the audience to specify the time, date, and/or place for performing the action increases awareness of situational cues, which will trigger the desired behavior.



Example roadmaps:

- How will you make time to set up an electronic filing system?
“**When** I return to my office **I will** write down the steps needed to make the transfer and I will block off an hour on Thursday and Friday on my calendar. On Thursday **I will** brainstorm what I will label each folder and what folders will be in each folder, then I will create the folders. On Friday, **I will** start sorting all my documents to the correct folders. At the end of the day Friday I will block off time next week to finish the transfer.”
- Do you know how to use online platforms to grade papers, and, if not, how will you learn?
“**At** 3 pm today **I will** call IT and determine when the next informational session is. **When** I know when the next training session is, **I will** write it on my calendar. On the day of the training session **I will** set a phone reminder to attend...”
- How and when will you change your computer settings to double-sided printing?
“**When** I get back to my dorm from class today, **I will** go to my printer system settings and change the default to double-sided printing.”
- How and when will you switch to direct deposit paychecks?
“**When** I receive my next paper paycheck, **I will** immediately fill out a direct deposit form and submit it to HR.”

Anticipate potential barriers with “if/then” scenarios

Sometimes our plans can get derailed by unexpected barriers, conflicting goals, bad habits, or distractions.⁷⁴ To prevent these situations from inhibiting the pursuit of goals, ask the audience to brainstorm potential barriers and create alternative plans using if/then statements.

If [barrier X] arises, then I will do [behavior Y].

71 Behavioural Insights Team. (2014). *EAST: Four simple ways to apply behavioral insights* [PDF file]. Retrieved from https://www.behaviouralinsights.co.uk/wp-content/uploads/2015/07/BIT-Publication-EAST_FA_WEB.pdf

72 Gollwitzer, P. M. (1993). Goal achievement: The role of intentions. *European Review of Social Psychology*, 4(1), 141-185. doi: [10.1080/14792779343000059](https://doi.org/10.1080/14792779343000059)

73 Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta analysis of effects and processes. *Advances in Experimental Social Psychology*, 38, 69-119. doi: [10.1016/S0065-2601\(06\)38002-1](https://doi.org/10.1016/S0065-2601(06)38002-1)

74 Gollwitzer, P. M. (1999). Implementation intentions: strong effects of simple plans. *American Psychologist*, 54(7), 493-503. doi: [10.1037/0003-066X.54.7.493](https://doi.org/10.1037/0003-066X.54.7.493)



Examples of if/then scenarios:

- BARRIER: Not enough space in my computer to file my documents.
“If I do not have enough space in my computer to file all my documents electronically, **then I will** purchase a USB.”
- BARRIER: Can't attend the training session to learn the online platform for grading papers.
“If I can't attend the training session, **then I will** search for online video tutorials.”
- BARRIER: I do not know how to set my computer's setting to double-sided printing.
“If I can't figure out how to change the setting in my computer to double-sided printing, **then I will** ask my roommate, the computer lab...”
- BARRIER: I don't have a direct deposit form.
“If I don't have my direct deposit form, **then I will** email HR asking for one and fill out immediately.”

Implementation intentions are powerful tools for achieving desired goals, and their effects are even greater when coupled with a strong commitment like a pledge.⁷⁵

3. Ask for a commitment

One powerful approach to convincing people to take up pro-environmental behaviors is to use commitment-based interventions. Commitments to adopt certain behaviors (often known as pledges) are effective because people who make pledges want to appear consistent both to themselves and their peers by following through with their promises. Commitments can even change individuals' self-perceptions and attitudes. For example, individuals who pledge to recycle more may begin to see themselves as the “type of person who recycles.” As a result, they are more likely to continue recycling so that their behavior remains consistent with their self-perception.

Make pledges VOLUNTARY

We need to be willing to do a specific behavior before a commitment is asked.⁷⁶ If we feel coerced into making a commitment or performing a certain behavior, the intervention risks losing its potency or may be viewed as unethical. Additionally, when individuals have chosen to act of their own free will, this decision bolsters their self-characterization as someone who believes in environmental action.

Make the pledge SPECIFIC and REALISTIC

Similar to best practices for prompts (see [VIVID](#)), asking someone to commit to something vague like “saving paper” is less likely to result in behavior change than a concrete ask. However, asking people to pledge to do 10 different things may cause them to get overwhelmed in the face of too much information and too many choices.⁷⁷ Reduce mental effort by asking people to do ONE thing, or give them the choice to choose one or two actions among only a handful. Ideally, commitments should also adhere to a specific time-frame.

75 Gollwitzer, P. M. (1999). Implementation intentions: strong effects of simple plans. *American Psychologist*, 54(7), 493-503. doi: [10.1037/0003-066X.54.7.493](https://doi.org/10.1037/0003-066X.54.7.493)

76 Cialdini, R. B. (2009). *Influence: Science and practice (5th ed.)*. Boston: Pearson Education.

77 Iyengar, S. & Lepper, M. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality & Social Psychology*, 79(6), 995-1006. doi: [10.1037//0022-3514.79.6.995](https://doi.org/10.1037//0022-3514.79.6.995)

Make the pledge WRITTEN

Writing down a commitment reinforces it more than a verbal pledge. People may forget making verbal-only pledges, and they may feel more motivation to stick to pledges that are in writing.⁷⁸

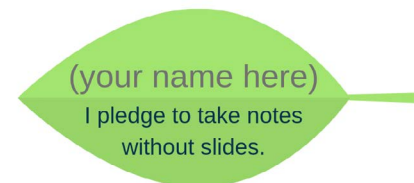
Ask your audience to write a commitment statement in their own words. Alternately, ask your audience to record their chosen commitment from a list of options; ensure the audience at least writes out the action and their name.

Make the pledge PUBLIC: While commitments can be successful when made either publicly or privately, aim to share commitments in public when possible. Public commitments inspire follow through because we want to appear consistent in the eyes of our community.⁷⁹



Examples of public pledges

- Ask for permission from the pledger to recognize their commitment on a websites/kiosks/sign or in a newsletter.
- Create a pledge board where each person can pin their pledge statement to the board.
- Create leaf-shaped pledge cards out of scrap paper and post them publicly in the shape of a tree. (Publicize that the pledges are on scrap paper).



Provide REMINDERS and FEEDBACK

Combining commitments with feedback can help your audience maintain motivation to adhere to a pledge. For example, at a university-affiliated apartment complex, residents pledging to recycle paper did so at a greater rate when they received feedback on the weight of the paper they recycled.⁸⁰ See more tips about feedback in [LASTING](#).

Photo credit: Root Solutions.



SPOTLIGHT: Combining commitments and feedback

Researchers at a Midwestern university tested the impact of three interventions on recycling behavior:

- Providing participants with feedback on the total pounds of paper their group had recycled in each of the last six weeks.
- Having participants make a formal commitment to recycle as much as possible and agree to publish their names in the local newspaper.
- Providing both feedback and publishing committed participants' names on the newspapers.

Combining interventions ultimately yielded the best results. Researchers believe requiring public commitment from the participants strengthened the effects of the intervention that only provided them with feedback!⁸¹

78 Pardini, A. U., & Katzev, R. D. (1983). The effect of strength of commitment on newspaper recycling. *Journal of Environmental Systems*, 13(3), 245-254. doi: [10.2190/6PN9-MXFP-3BFF-CHHB](https://doi.org/10.2190/6PN9-MXFP-3BFF-CHHB)

79 Cialdini, R. B. (2009). *Influence: Science and practice* (5th ed.). Boston: Pearson Education.

80 De Leon, I. G., & Fuqua, R. W. (1995). The effects of public commitment and group feedback on curbside recycling. *Environment and Behavior*, 27(2), 233-250. doi: [10.1177/0013916595272007](https://doi.org/10.1177/0013916595272007)

81 De Leon, I. G., & Fuqua, R. W. (1995). The effects of public commitment and group feedback on curbside recycling. *Environment and Behavior*, 27(2), 233-250. doi: [10.1177/0013916595272007](https://doi.org/10.1177/0013916595272007)

Provide a TOKEN of the commitment

Provide a token of participation to help people remember their pledge, and to allow others to see which of their peers have made the commitment.



Token examples:

- Create stickers for cubicles that say: "I took the pledge to save paper. I commit to proofreading every document before printing."
- Create signs for professor's doors that say: "I have pledged to offer digital course packets to my students, saving more than 200 pages per student!"

Ask people to commit as a GROUP

Some individuals may be more motivated if they are being held accountable as a group. In addition to individual pledges, require the entire group to participate to achieve the goal.⁸²



Examples of group commitments:

- "100% of department staff must..."
- Set specific paper reduction goals for each group such that the whole group must work together to achieve it.

4. Help your audience move up the ladder of engagement

Action requires dedication, mental consideration, and energy. We don't like to identify ourselves as time wasters, so we justify the time we spend by overestimating the value of our actions.⁸³ According to the "foot-in-the-door" technique, psychologists have found that once a small request, like signing a homelessness petition, is honored, we are more likely to accept larger requests, such as attending a canned food drive, because we want to appear consistent.⁸⁴ Even small investments of time or personal effort can significantly strengthen our ties to a cause, as we start to form an identity as someone who engages in that activity⁸⁵. Try asking for a small commitment before asking for a larger one. People will be more willing to commit to something small and once they do, they will be more motivated and willing to carry out a larger ask.



Examples of ramping up asks:

- **Start small:** Ask people to add a "think before you print email signature," ensure double-sided printing the default, pick a "print-less" day of the week, or watch a video about deforestation.
- **Ask for bigger asks after the small action has been completed:** After someone has successfully completed the small ask, request a larger commitment such as: joining (or starting) a green team, giving up their desktop printer, or conducting a paper waste audit.



Students at UC Berkeley's Haas School of Business were asked to take a paper reduction pledge, either by submitting their own or filling in blanks on a form. The fill-in version asks students to state the specific actions they will take to reduce their paper use. Photo credit: Root Solutions for UC Berkeley Haas School of Business.

82 Wang, T. H., & Katzev, R. D. (1990). Group commitment and resource conservation: two field experiments on promoting recycling 1. *Journal of Applied Social Psychology*, 20(4), 265-275. doi: [10.1111/j.1559-1816.1990.tb00411.x](https://doi.org/10.1111/j.1559-1816.1990.tb00411.x)

83 Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

84 Burger, J. M., & Caldwell, D. F. (2003). The effects of monetary incentives and labeling on the foot-in-the-door effect: Evidence for a self-perception process. *Basic and Applied Social Psychology*, 25(3), 235-241. doi: [10.1207/S15324834BASP2503_06](https://doi.org/10.1207/S15324834BASP2503_06)

85 Burger, J. M., & Caldwell, D. F. (2003). The effects of monetary incentives and labeling on the foot-in-the-door effect: Evidence for a self-perception process. *Basic and Applied Social Psychology*, 25(3), 235-241. doi: [10.1207/S15324834BASP2503_06](https://doi.org/10.1207/S15324834BASP2503_06)



Demonstrate what is ORDINARY | Building Block 7

Individuals save time by modeling our choices on the values, expectations, and practices of our community, neighbors, and friends. Combined with our need for group cohesion, this means that what is normal, or *ordinary*, has significant influence on human behavior. Although people tend to underestimate how much social norms influence their own behavior, research shows that they are among the most powerful motivators of behavior change.⁸⁶

1. Provide positive social proof

If most people are engaging in the right behavior, highlight it. Through a concept called “social proof”, showing, telling, or implying that most of an audience is engaging in a behavior can significantly increase the chances that others will begin doing it, too.^{87,88} Social proof can be provided when people - or the surrounding context - model the behavior, but it can also be embedded in graphics or written communications.

Use survey data if available

Norms are powerful, so if you know that the majority of the audience does the desired behavior, make it clear.⁸⁹ Use statistics when you can or substitute “the majority” in place of the number or percentage.



Examples of statistics conveying the norm:

- “9 in 10 students don't print lecture slides.”
- “85% of students print double-sided.”
- “70% of professors have switched to online course packets.”
- “Most instructors in this department have given up their desktop printers.”



Fundamentals:

- Provide positive social proof.
- Address misconceptions about the norm.
- Call attention to society's expectations.
- Strengthen the norm through social networks.

**71% of Haas students
don't print lecture slides!**

**ASK YOUR FRIENDS ABOUT HOW
TO SAVE PAPER!**



Haas School of Business used survey data to provide positive social proof that the vast majority of students do not print their lecture slides. Photo credit: Root Solutions for UC Berkeley Haas School of Business.

86 Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, 34(7), 913-923. doi: [10.1177/0146167208316691](https://doi.org/10.1177/0146167208316691)

87 Cialdini, R. B. (2006). *Influence: The psychology of persuasion*. New York: Harper Collins.

88 Psychology Notes HQ. (2015, August 31). What is the social proof theory? Retrieved from: <https://www.psychologynoteshq.com/social-proof/>

89 Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research*, 35(3), 472-482. doi: [10.1086/586910](https://doi.org/10.1086/586910)

Use visuals to contextually model the desired behavior

Practitioners can increase the likelihood of positive behaviors by creating or maintaining a physical environment that reflects positive social norms. When we can't observe the behavior of others, we infer social norms based on the state and characteristics of the surrounding environment.^{90,91}



Examples of contextual modelling:

- Make the undesirable behavior less visible. For example, if some desktop printers are necessary, hide them so they are not seen as the norm.
- Provide large and highly visible scrap paper bins in printing areas to suggest that recycling is the desired and normal behavior. See [VIVID](#).
- Reinforce that it is normal and desirable to print on recycled paper by adding “printed on recycled paper” footers when this type of paper is used.

Recruit people who already believe in your cause to model the behavior: We look to other people for clues on how we should behave⁹² (e.g., if I see someone walking off of a forest trail, I may assume it's acceptable to do so).



Examples of social modelling:

- Recruit influential campus figures to model the behavior first.
- Recruit a large number of people to overtly model paper reduction behaviors to establish them as the norm.
- Ask people for testimonials about why they like using shared printers, or not having desktop printers, then share these testimonials with your audience.
- Ask Green Team members to model the behavior.
- Model the behavior yourself: send out meeting materials and agendas ahead of time or run a paperless meeting to show others how it can be done.

Use social comparisons to foster motivation: Compare the performance of individual audience members with that of their peers to capitalize on their desire to perform above the average of their communities.⁹³ See more on social norms in [ORDINARY](#).



Examples of leveraging social comparisons:

- Compare desktop printer reduction between multiple departments.
- Compare paper usage between colleges.

90 Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58(6), 1015–1026. doi: [10.1037/0022-3514.58.6.1015](https://doi.org/10.1037/0022-3514.58.6.1015)

91 Dwyer, P. C., Maki, A. & Rothman, A. J. (2015). Promoting energy conservation behavior in public settings: The influence of social norms and personal responsibility. *Journal of Environmental Psychology*, 41, 30–34. doi: [10.1016/j.jenvp.2014.11.002](https://doi.org/10.1016/j.jenvp.2014.11.002)

92 Sussman, R., & Gifford, R. (2013). Be the change you want to see: Modeling food composting in public places. *Environment and Behavior*, 45(3), 323-343. doi: [10.1177/0013916511431274](https://doi.org/10.1177/0013916511431274)

93 Fischer, C. (2008). Feedback on household electricity consumption: A tool for saving energy? *Energy Efficiency*, 1(1), 79-104. doi: [10.1007/s12053-008-9009-7](https://doi.org/10.1007/s12053-008-9009-7)

Desktop printer case study: social modeling

Portland Community College (PCC) recruited two important campus figures, the president and one of the school's deans, to model giving up personal desktop printers. The images were advertised in the campus' weekly news along with a story about PCC's paper reduction initiatives.

PCC Rock Creek's President, Sandra Fowler-Hill, and Dean Jeremy Estrella shown giving up their personal desktop printers.



Photo credit: Elaine Cole.



2. Address misconceptions about the norm

We often misinterpret how common or uncommon a belief or behavior is. If your audience has misconceptions about the norm, you can use accurate data to correct these assumptions.

Bring beliefs into alignment with reality

Use data to discuss the number of people doing the desired or "right" behavior.



Examples of misconceptions:

- Professors may believe students prefer printed assignments or readers when this may not be true. Use survey data and feedback to update the audience's assumptions about paper use.
- Staff may think that "everyone has a desktop printer," when in fact, most staff do not. Use data to show the proportion of people who only use shared printers.

3. Call attention to society's expectations

Finding out that we are actually more “green” than most of our peers (e.g., “you save more paper than 70% of your colleagues”), may result in regressing to less environmentally-friendly behaviors. To combat this “boomerang effect,” give environmental achievers general messages about what is expected (e.g., “please save paper” or “thank you for being a paper champion”) when revealing that their peers are less green. Even a smiley face provided on the bills of energy saving superstars has been found to be enough to prevent high energy savers from regressing to their peers’ level of energy use.⁹⁴

On the other hand, if the audience as a whole is performing poorly, focus messages on ideals, beliefs, and what is expected rather than disclosing poor performance. For example, if the data suggests that most people still have a desktop printer despite believing that they should give it up, a message stating “90% of the staff surveyed believe that reducing the number of desktop printers is important” would send the right message.



Examples of using messages that signal expectations:

- “It’s not cool to print alone. Use a shared device.”
- “We do X here.”
- Add smiley faces to messaging to signify preferred behavior.
- Include the percentage of the audience that think the issue is important and/or would be willing to take action (even if they have not yet taken action).

4. Strengthen the norm through social networks

Social networks help to spread, sustain, and build identity around certain behaviors.⁹⁵ As practitioners, we should seek out networks to accelerate the social diffusion of our message. Techniques include using social media; asking committed individuals to tell their friends, family, and neighbors about a cause; and showcasing the names of environmentally-friendly actors within groups. As social beings, in-person interactions can also make messages more salient and easy-to-remember than impersonal communications like emails.



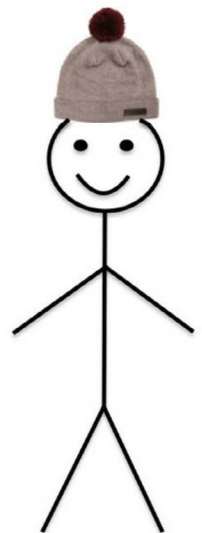
Berkeley’s Haas School of Business used identity statements to evoke a positive group identity and message that saving paper is the norm among Cal Bears. Photo credit: Root Solutions for UC Berkeley Haas School of Business.

This is Tim.

Tim, like 84% of students here at Haas, support efforts to reduce paper usage!

Tim doesn’t waste paper.

Be like Tim.



BerkeleyHaas

Surveys at Berkeley’s Haas School of Business revealed that the vast majority of students believe that reducing paper usage is important. Photo credit: Root Solutions for UC Berkeley Haas School of Business.

94 Shultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429-34. doi: [10.1111/j.1467-9280.2007.01917.x](https://doi.org/10.1111/j.1467-9280.2007.01917.x)

95 Rogers, E. (2003) *Diffusion of innovations (5th ed.)*. New York, NY: Free Press.



Examples of sharing and community building opportunities:

- Encourage departments to discuss which actions have been most effective at reducing paper waste.
- Ask Green Teams and environmental clubs to have paper reduction conversations with their colleagues and classmates.
- Ask ambassadors that have successfully completed a paper reduction project to talk to other groups that are in the beginning phases of one.



SPOTLIGHT: Success of peer-to-peer sharing

To address faculty concerns at Red River College about student experiences and cutting out paper entirely, the sustainability team set up a Q&A session. Along with other meetings, the team found an unforeseen benefit of faculty working as a group: peer-to-peer sharing. When one instructor expressed uncertainty about how to use a feature, it provided an opportunity for other instructors to step up and help their colleagues.

Once faculty began to see the benefits of adopting the new technology, they shared their successes with others. One instructor used a tablet compatible with the school's smart classrooms to reduce paper use. His success inspired him to share his tablet with other instructors.

Winning RRC's BRAVO award for sustainability leadership gave instructors the opportunity to celebrate their success and share their experiences with a wider audience. By the end of the project, the sustainability office noted that people had changed their attitudes toward paper-use reduction. Instructors who had previously been against the project became supporters.⁹⁶



RRC Staff at the tour of our Recycling Hauler's facility. Photo credit: Red River College.

⁹⁶ Crooks, W. (2018). Personal communication.

As our way of life becomes increasingly separated from nature, we struggle to find a personal connection to mounting environmental challenges.⁹⁷ It is critical that our environmental messages align with what our audience cares about most. By connecting to audience concerns, speaking through emotional and empathetic appeals, drawing upon local pride, and carefully selecting relatable messengers, we can personalize the issues and foster a sense of collective engagement, thereby reducing the perceived gap between the individual and the problem, and better engaging audiences to act.



Fundamentals:

- Relate your message to what the audience cares about most.
- Choose the appropriate messenger.
- Make the call to action personal.

1. Relate your message to what the audience cares about most

Because people often seek out and pay greater attention to information that supports preexisting beliefs,⁹⁸ we can increase our audience's support of an initiative by connecting it to what the audience already deems important. Consider the audience's personal experiences, concerns, favorite causes, and daily responsibilities.

Relate it to the audience's existing interests and concerns

Even the most anxious of people can't worry about everything. We all have mental and emotional limits to the concerns that we hold. Our capacity to care is sometimes referred to as a "finite pool of worry."^{99,100} As practitioners, we can frame our efforts to connect environmental issues to our audience's pool of worry. For example, if the audience is most concerned with issues of human health, highlight the detrimental effects of pollution on the body instead of its effect on the ecosystem or wildlife.



Relate paper saving to financial and environmental concerns.
Photo credit: Yale University Office of Sustainability.

97 Louv, R. (2011). *The nature principle: Human restoration and the end of nature-deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.

98 Plous, S. (1993). *The psychology of judgment and decision making*. New York: McGraw-Hill Education.

99 Linville, P. W., & Fischer, G. W. (1991). Preferences for separating or combining events. *Journal of Personality and Social Psychology*, 60(1), 5-23. doi: 10.1037/0022-3514.60.1.5

100 Shorne, D., & Marx, S. (2009). Beware the overuse of emotional appeals. In *The psychology of climate change communication: A guide for scientists, journalists, educators, political aides, and the interested public* (section 4). Retrieved from: <http://guide.cred.columbia.edu/guide/sec4.html>

Table 5: Examples of messages that are tailored to specific concerns.

Audience Concern	Message Emphasis
Budget	Highlight the financial impact of saving paper through printing less, switching to networked printers, using recycled paper, etc.
Efficiency	Emphasize that switching to digital filing reduces the time spent sorting papers and simplifies document transmission. Proofreading documents on a computer saves time compared to printing and proofreading paper drafts.
Environment	Highlight the number of trees saved or how much waste will be diverted from the landfill. Paper production also consumes water, uses energy, and impacts climate.
Local/campus issues	Explain how paper reduction aligns with campus-wide identity, values, or goals.
Health	Highlight that multifunction printers provide an opportunity for exercise. For example "Trying to get more steps in? Take a walk to the communal printer."

Use imagery to relate paper reduction to personal experiences

Increase the perceived significance of the environmental problem by linking it to the audience's personal experiences.¹⁰¹ This might involve encouraging the audience to imagine how they might react in relevant situations.



Examples of personal experience imagery:

- Contrast images of a messy, paper-laden desk with a clean "paper-free" office.
- Contrast images of sorting through a pile of papers versus doing a search in an online

Foster empathy and compassion

Pinpoint a certain person, animal, or place impacted by the environmental challenge. Drawing attention to a specific victim of an environmental problem can elicit a stronger reaction from your audience than citing statistics about the problem's scale.¹⁰² This also allows the audience to see the direct consequences of their behavior.¹⁰³ Use vivid personal narratives when possible, and show how the victims are similar to the target audience.¹⁰⁴ See [VIVID](#).



Photo credit: Root Solutions.

101 Weinstein, N. D. (1989). Effects of personal experience on self-protective behavior. *Psychological Bulletin*, 105(1), 31-50. doi: [10.1037/0033-2909.105.1.31](https://doi.org/10.1037/0033-2909.105.1.31)

102 Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgement*. Englewood Cliffs, NJ: Prentice Hall.

103 Small, D. A., & Loewenstein, G. (2003). Helping a victim or helping the victim: Altruism and identifiability. *The Journal of Risk and Uncertainty*, 26(1), 5-16. doi: [10.1023/A:1022299422219](https://doi.org/10.1023/A:1022299422219)

104 Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgement*. Englewood Cliffs, NJ: Prentice Hall.



Examples of fostering empathy:

- Discuss the ecological impact on animals that live in habitats undergoing active deforestation.
- Discuss health impacts on people who live near paper mills; tell the story of one person if possible.
- Highlight people and projects that could be supported from paper use reduction cost savings, such as more money for student scholarships or other sustainability projects.
- Feature people or groups that will benefit from donated printers.

Tap into local pride and highlight local impacts

Show how an issue directly relates to the audience's immediate environment and to the people whom they hold dear. Reframe challenges and solutions as local undertakings to make them feel more manageable and to evoke a sense of local pride and immediate responsibility.¹⁰⁵



Examples of tapping into local pride:

- Use school mascots, school colors, local places of interest, or well-known campus figures to personalize messages to your campus. Call to mind examples like “Don’t Mess with Texas” for inspiration.¹⁰⁶
- Set up a paper reduction competition between university departments to tap into department-level community pride.
- Respectfully draw inspiration from the local and cultural identity of the campus locale. For example, University of Hawaii campuses sometimes use well-known Hawaiian words to draw upon place-based identity.



Examples of tapping into local impacts:

- Speak specifically about the impacts of paper reduction at your school rather than only discussing continent-wide or worldwide impacts.
- If applicable, discuss how paper production impacts local forests, local air quality, or local energy use.
- Connect campus paper reduction efforts to related city-wide sustainability efforts to demonstrate community-wide impacts.



Northern Spotted Owls are a threatened species due to heavy deforestation in North America.¹⁰⁷ Photo credit: Kameron Perensovich.



University of Hawai‘i, Hilo’s Sustainability Committee using the Hawaiian word for land, “āina”, to put a local spin on sustainability.¹⁰⁸ Photo credit: UH Hilo Student Sustainability Committee.

105 Scannell, L., & Gifford, R. (2013). Personally relevant climate change: The role of place attachment and local versus global message framing in engagement. *Environment and Behavior*, 45(1), 60–85. doi: [10.1177/0013916511421196](https://doi.org/10.1177/0013916511421196)

106 Don’t Mess With Texas. (n.d). Retrieved from <http://www.dontmesswithtexas.org>

107 National Geographic. (2012, February 24). Northern spotted owl. Retrieved from <http://www.nationalgeographic.org/media/northern-spotted-owl>

108 Students of Sustainability, Hilo Hawaii. (2018). First ever sustainability fair. Retrieved from <https://soshilo.weebly.com/sustainabilityfair.html>

2. Choose the appropriate messenger

Choose an appropriate person to deliver the message to increase the likelihood that it will be well-received. This person should be a well-respected or trusted authority in the audience's community - someone to whom they are already inclined to listen.¹⁰⁹



Examples of strong messengers:

- Ask the school's president to model giving up his or her personal desktop printer. See [ORDINARY](#).
- Ask department heads or respected faculty and staff members to deliver paper reduction information.
- If you are targeting professors, have students make the case for how paper reduction positively impacts the student experience and learning outcomes.

3. Make the call to action personal

We are more likely to complete a task when we feel personally called upon, recognized, or special.^{110,111} Crafting messages that directly address our audience can increase the rate of follow-through. Make requests in person so that the audience member feels connected to the cause, and craft messages reminding individual audience members of past contributions.



Examples of personal outreach:

- Follow up in person with individuals that did not complete an online paper use survey.
- Individually contact colleagues that have expressed interest in sustainability to assist with paper reduction efforts.
- Personalize messages, such as individually distributed posters, emails, and other materials, as much as possible. For example, address emails with the recipient's name, or at least use "Dear Business School Faculty" instead of just addressing "faculty."



SPOTLIGHT: Lesson learned - following up is important for success

The sustainability coordinator and interns at Portland Community College completed "walkabouts," where they visited individual faculty and staff offices to discuss desktop printer removal. When sustainability team weren't successful the first time, they followed up. In many cases, taking multiple trips was more effective at achieving voluntary printer removal than non-personal forms of communication.¹¹²



Photo credit: Esther Forbyn.

109 The World Bank. (2015). *World development report 2015: Mind, society, and behavior* [PDF file]. Retrieved from <http://documents.worldbank.org/curated/en/645741468339541646/pdf/928630WDR0978100Box385358B00PUBLIC0.pdf>

110 Heerwegh, D. (2005). Effects of personal salutations in email invitations to participate in a web survey. *Public Opinion Quarterly*, 69(4), 588-598. doi: 10.1093/poq/nfi053

111 Garner, R. (2005). Post-It note persuasion: A sticky influence. *Journal of Consumer Psychology*, 15(3), 230-237. doi: 10.1207/s15327663jcp1503_8

112 Cole, E. (2018). Personal communication.



Foster AWARENESS | Building Block 9

In this guide, “awareness” refers to our tendency to make decisions on the basis of unconscious judgments, assumptions, and cognitive biases.^{113,114} As practitioners, it is crucial to cultivate a mindful awareness of human thought patterns - those of our audiences as well as ourselves. Awareness practices provide the tools to become cognizant of cognitive pitfalls so that we can better align actions with intentions and be better stewards of our planet.

1. Pause with mindfulness practices

Cultivating mindfulness makes us better decision makers and environmental leaders.¹¹⁵ While it is not always practical to prescribe a mindfulness practice, there are steps we can take to help people pause, notice, and think before they hit print, and maybe build more mindful printing habits along the way.



Examples of prompts that cultivate mindfulness:

- Prompts that ask audience members to pause and think before printing:
 - Signs in computer labs such as: “STOP! Think of the trees! Do you really need to print these?”
 - Signs near the printer’s paper refill drawer/insert such as: “Reloading the printer? Before you do, consider using scrap paper.”
- For more information about prompts, see [VIVID](#).

2. Notice and overcome cognitive biases

Mindful awareness provides space between thoughts and actions and can show us how our behavior is influenced by cognitive biases. When we are aware of our biases, we can (sometimes) better control their impact on our decisions. In some cases, simply drawing attention to our biases is enough to help us overcome them.



Fundamentals:

- Pause with mindfulness practices.
- Notice and overcome cognitive biases.

WAIT! CAN YOU RECYCLE THAT?

- MIXED OFFICE PAPER
(ENVELOPES, POST-ITS, FILE FOLDERS)
- CANS & SCRAP METAL
- PHONE BOOKS
- MAGAZINES & CATALOGS
- CARDBOARD
- NEWSPAPER
- MILK & JUICE CARTONS
- PLASTIC BOTTLES & JUGS



Pacific University’s Greening Pacific campaign prompted people to pause and think before recycling to avoid contamination.¹¹⁶ Photo credit: Cole, E.J. (2007).

113 Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization*, 1(1), 39-60. doi: 10.1016/0167-2681(80)90051-7

114 Simon, H. A. (1957). *Models of man: Social and rational*. Oxford, England: Wiley.

115 Amel, E.L., Manning, C.M., & Scott, B.A. (2009). Mindfulness and sustainable behavior: Pondering attention and awareness as means for increasing green behavior. *Ecopsychology*, 1(1). doi: 10.1089/eco.2008.0005

116 Cole, E. J. (2007). *A community-based social marketing campaign to green the offices at Pacific University: Recycling, paper reduction, and environmentally preferable purchasing* (Doctoral dissertation). Retrieved from https://etd.ohiolink.edu/pg_10?::NO:10:P10_ETD_SUBID:47997

Table 6: Some common biases and interventions to help combat them

Cognitive Bias	Mitigating Interventions
<p>Moral licensing is when we allow ourselves to engage in problematic, or even immoral, behaviors after performing a good deed.¹¹⁷ Moral licensing might present itself as: "I'm using the duplex function, so I'm not going to worry about printing out a few extra pages."</p>	<ul style="list-style-type: none"> • Help people realize when they might be partaking in moral licensing. Funny signage at computer stations can be sufficient to reduce morally licensed behaviors. • Offer feedback to create a realistic picture of actual progress. See LASTING. • Use identity statements to remind audience members of their commitment to paper reduction, then offer them a behavior that aligns actions with beliefs and commitments. See "Alleviate cognitive dissonance" in IDENTITY.
<p>Status Quo Bias is the tendency to prefer a present situation from any other.¹¹⁸ A switch from the status quo forces people to face uncertainty about how the future is going to go. This is why someone might prefer to eat the same lunch every day - even though there might be something better on the menu.¹¹⁹ People may prefer the status quo when they are experiencing choice overload and have too many options to choose from.^{120,121} And status quo bias can manifest partly due to loss aversion - the potential for an awful meal is more potent than the possible benefit of discovering a new favorite.^{122,123} Both status quo bias and loss aversion are in effect when the audience is reluctant to give up a desktop printer.</p>	<p>In addition to helping our audience be mindful of this bias, other interventions to mitigate status quo bias include:</p> <ul style="list-style-type: none"> • Use defaults. For example, don't provide desktop printers in the first place or make desktop printer removal an opt-out process. See "defaults" in EASY. • Leverage loss aversion. Draw attention to the bias by reframing the situation in terms of what people give up by sticking with the status quo. For example, ask: "Would you give up an all expenses paid shared printer for a personal printer you have to pay for?" See ASSOCIATIONS for more about loss aversion. • If your audience is choosing among sustainable options, don't overload them with choices. Decisions like which brand of multi-function printer to buy, where to put the printer, who changes the ink, etc., take valuable cognitive resources, and may paralyze your department into remaining with their original system.^{124,125} • Provide positive social proof of others who made the change.¹²⁶ Showcase "success stories" by sharing stories of people or departments who had similar initial doubts, and show how those doubts changed to approval over time. See ORDINARY.

Table 6 continued on next page.

117 Merritt, A. C., Effron, D. A., & Monin, B. (2010). Moral self-licensing: When being good frees us to be bad. *Social and Personality Psychology Compass*, 4(5), 344-357. doi: [10.1111/j.1751-9004.2010.00263.x](https://doi.org/10.1111/j.1751-9004.2010.00263.x)

118 The BE Hub. (n.d.). Status quo bias. Retrieved From: <https://www.behavioraleconomics.com/resources/mini-encyclopedia-of-be/status-quo-bias/>

119 Samuelson, W. & Zeckhauser, R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty*, 1, 7-59. doi: [10.1007/BF00055564](https://doi.org/10.1007/BF00055564)

120 Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology*, 79(6), 995-1006. doi: [10.1037//0022-3514.79.6.995](https://doi.org/10.1037//0022-3514.79.6.995)

121 Dean, M., Kibris, O., & Masatlioglu, Y. (2017). Limited attention and status quo bias. *Journal of Economic Theory*, 169, pp. 93-127. doi: [10.1016/j.jet.2017.01.009](https://doi.org/10.1016/j.jet.2017.01.009)

122 Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1990). Anomalies: The endowment effect, loss aversion, and status quo bias. *The Journal of Economic Perspectives*, 5(1), 193-206. doi: [10.1257/jep.5.1.193](https://doi.org/10.1257/jep.5.1.193)

123 Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization*, 1(1), 39-60. doi: [10.1016/0167-2681\(80\)90051-7](https://doi.org/10.1016/0167-2681(80)90051-7)

124 Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology*, 79(6), 995-1006. doi: [10.1037//0022-3514.79.6.995](https://doi.org/10.1037//0022-3514.79.6.995)

125 Dean, M., Kibris, O., & Masatlioglu, Y. (2017). Limited attention and status quo bias. *Journal of Economic Theory*, 169, 93-127. doi: [10.1016/j.jet.2017.01.009](https://doi.org/10.1016/j.jet.2017.01.009)

126 Solin, D. (2017). Recognize and overcome status quo bias. Retrieved from: <https://www.advisorperspectives.com/articles/2017/05/01/recognize-and-overcome-status-quo-bias>

Table 6 continued: Some common biases and interventions to help combat them

Cognitive Bias	Mitigating Interventions
<p>The Ostrich Effect is the tendency to ignore or avoid dangerous or negative information.^{127,128} For example, your target audience may be avoiding information about the harmful effects of paper use because they like the convenience of having a desktop printer and do not want to feel guilty about it.</p>	<ul style="list-style-type: none"> • Draw attention to the bias and remind people that avoidance doesn't make the problem go away. • Avoid inducing the ostrich effect by keeping things hopeful. See HOPEFUL for ideas. • Validate people's aversion to paper reduction. See IDENTITY.
<p>Projection Bias is the tendency to misjudge our future preferences. Projection bias is evident when we order too much food at the beginning of a meal due to hunger, and we discount how quickly it will take to become full later. An implication of projection bias is that we tend to underestimate the degree to which we will adapt to future changes.¹²⁹ People contemplating a change from a desktop to a shared printer may overrate the difficulties caused by the change and underrate the degree to which they will adapt.</p>	<ul style="list-style-type: none"> • Ask for commitments when the audience's present state is favorable (e.g., when they are in a good mood or when workload is light) as they might project their lack of stress into the future. • Ask for commitments when the benefits of switching to a shared printer are salient. People might project those benefits into the future, and their present state will influence their expectations about the long-term positive impact of the switch. • Avoid situations where people's current state could negatively impact their attitude toward your campaign, like at the end of the year when people are overwhelmed. • Bridge the gap between present and future by reminding people that they will adapt after a switch to a shared printer.¹³⁰ Have people remember a time when their routines changed in the past, and they adjusted. Remind them that they will develop a new routine around the shared printer, and that their disgruntlement won't last forever.
<p>The False Consensus Effect is our tendency to overestimate the degree to which people agree with us.¹³¹ For example, someone might assume that because they don't see the point of using a multifunctional printer, no one else does, either.</p>	<ul style="list-style-type: none"> • Survey the audience to find out what percentage would actually prefer things like a multifunction printer or online tools. Then, if applicable, correct mistaken assumptions. See ORDINARY. • Give examples of people having a positive experience using shared printers.

127 Galai, D., & Sade, O. (2006). The "ostrich effect" and the relationship between the liquidity and the yields of financial assets. *The Journal of Business*, 79(5), 2741-2759. doi: [10.1086/505250](https://doi.org/10.1086/505250)

128 Karlsson, N., Loewenstein, G., & Seppi, D. (2009). The ostrich effect: Selective attention to information. *Journal of Risk and Uncertainty*, 38(2), 95-115. doi: [10.1007/s11166-009-9060-6](https://doi.org/10.1007/s11166-009-9060-6)

129 Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). Projection bias in predicting future utility. *Quarterly Journal of Economics*, 118(4), 1209-1248. doi: [10.1162/003355303322552784](https://doi.org/10.1162/003355303322552784)

130 Ubel, P.A., Loewenstein, G., & Jepson, C. (2005). Disability and sunshine: Can hedonic predictions be improved by drawing attention to focusing illusions or emotional adaptation? *Journal of Experimental Psychology*, 11(2), 111-123. doi: [10.1037/1076-898X.11.2.111](https://doi.org/10.1037/1076-898X.11.2.111)

131 Ross, L., Greene, D., & House, P. (1977). The "false consensus effect": An egocentric bias in social perception and attribution bias. *Journal of Experimental Social Psychology*, 13(3), 279-301. doi: [10.1016/0022-1031\(77\)90049-X](https://doi.org/10.1016/0022-1031(77)90049-X)

Table 6 continued: Some common biases and interventions to help combat them

Cognitive Bias	Mitigating Interventions
<p>Omission Bias is the tendency to judge harmful action more harshly than harmful inaction. For example, people judged a hypothetical tennis player more harshly when he recommended food that he knew his rival was allergic to, as opposed to when he simply said nothing and allowed his rival to eat the food.¹³²</p>	<ul style="list-style-type: none">• Draw attention to people’s omission bias by putting an inaction into actionable terms (e.g., “Not signing up = 100 pages thrown away!”). See VIVID for more.• Reframe non-participation as a choice (i.e., “no, I don’t want to sign up to help the environment.”)• Make the pro-environmental action the default, so that deviation requires action. See EASY for more.



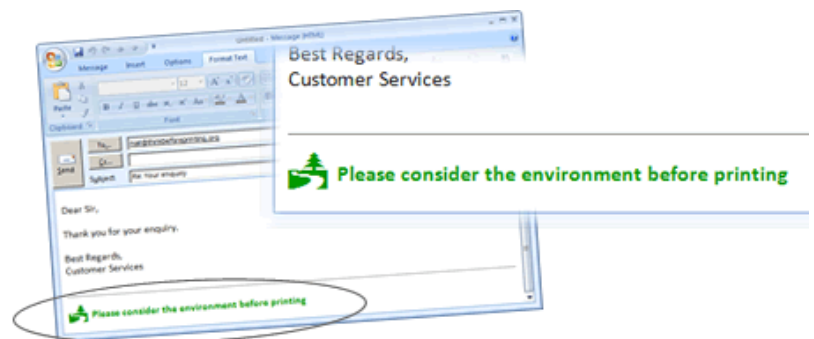
5 Paper Tips

THINK BEFORE YOU PRINT!

1. Be selective about what you print.
2. Use recycled content paper.
3. Use both sides of the paper.
4. Go digital- read, send, and save soft copies of your documents.
5. Recycle or reuse for scrap paper.



Portland Community College prompts less printing with five simple reminders. Photo credit: Portland Community College.



Add a “think before you print” reminder to your email signature to encourage others to print more mindfully. Photo credit: Ink Factory.

132 Spranca, M., Minsk, E., & Baron, J. (1991). Omission and commission in judgment and choice. *Journal of Experimental Social Psychology*, 27(2), 776-105. doi: [10.1016/0022-1031\(91\)90011-T](https://doi.org/10.1016/0022-1031(91)90011-T)



Achieve LASTING change | Building Block 10

Although many one-time actions can reap lasting benefits for the environment (such as buying an electric vehicle), helping audiences develop pro-environmental habits (such as always checking a document before printing it) is critical. Simple, environmentally friendly habits can have significant impacts if they are upheld over time. These habits can spill over into other pro-environmental behaviors or evolve into more complex behaviors.¹³³ As practitioners, we can help audiences transform negative habits into new habits that are more in tune with their environmental goals.

1. Capitalize on periods of change

Interruptions to routine events like trips or big life transitions disrupt established habits and behavioral patterns.¹³⁴ During these periods, we are already undergoing behavioral transitions to adapt to our new circumstances and are thus usually more receptive to change.¹³⁵ Furthermore, existing triggers to previous bad behavior might not be present in our new environment, which now leaves room for new habits to form.^{136,137} Identify moments of change, such as a department reorganization or the beginning of a new academic year, to create an opening for new habits to form.



Examples of using school breaks and other disruptions to your advantage:

- Install new devices during the summer months when students aren't on campus and introduce the changes on the first day back.
- Don't provide personal desktop printers when people move departments.
- Begin requiring online assignment submissions when new classes start.



Fundamentals:

- Capitalize on periods of change.
- Build on a tiny behavior.
- Determine the schedule of benefits.
- Provide feedback.



SPOTLIGHT: Using real-time feedback

UC Berkeley shared a slide on paper reduction with incoming Haas School of Business students during orientation and plans to also include it in the Haas employee on-boarding packet.¹³⁸

How to be a paper saver

Pause and think: Do I really need to print this?
If yes:

- Use scrap paper for notes
- Ask your professors if you can take notes on an electronic device
- Format documents to use less paper
 - "Condensed fonts", reduce font size
 - Green fonts like Century Gothic
 - Smaller margins
 - Print multiple slides per page
- Use online tools instead of printing
- Check print preview before pressing print!
- Print only the pages you need (avoid printing blank pages or citations, appendices)

Photo credit: UC Berkeley Haas School of Business.

133 Lanzini, P., & Thøgersen, J. (2014). Behavioural spillover in the environmental domain: An intervention study. *Journal of Environmental Psychology*, 40, 381-390. doi: 10.1016/j.jenvp.2014.09.006

134 Verplanken, B., Walker, I., Davis, A., & Jurasek, M. (2008). Context change and travel mode choice: Combining the habit discontinuity and self-activation hypotheses. *Journal of Environmental Psychology*, 28(2), 121-127. doi: 10.1016/j.jenvp.2007.10.005

135 Thompson, S., Michaelson, J., Abdallah, S., Johnson, V., Morris, D., Riley, K., & Simms, A. (2011). *Moments of change as opportunities for influencing behaviour* [PDF file]. Retrieved from <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=16193>

136 Wood, W., Tam, L., & Witt, M. G. (2005). Changing circumstances, disrupting habits. *Journal of Personality and Social Psychology*, 88(6), 918-933. doi: 10.1037/0022-3514.88.6.918

137 Verplanken, B., Walker, I., Davis, A., & Jurasek, M. (2008). Context change and travel mode choice: Combining the habit discontinuity and self-activation hypotheses. *Journal of Environmental Psychology*, 28(2), 121-127. doi: 10.1016/j.jenvp.2007.10.005

138 Doud-Martin, D. (2018). Personal communication.

2. Build on a tiny behavior

While establishing a pro-environmental habit is the ultimate goal, it is important to “meet people where they are” at the beginning of an initiative.

Shaping

The technique of “shaping”¹³⁹ involves rewarding smaller actions that gradually bring individuals closer to the desired behavior. Practitioners can use shaping to reward frequent but small behaviors and encourage the audience to gradually take on more challenging habits.



An example of shaping:

1. First, ask that faculty limit themselves to a one page printed syllabus and provide a full version electronically. Reward the behavior by recognizing the faculty members that made the change.
2. Next, ask professors to upload additional resources and provide training sessions about how to use online tools for uploading assignments and classwork. Thank them at the end of the training.
3. Finally, invite the faculty who participated to join a panel or discussion on paper reduction.

Influence the first choice

After making a choice initially, we are more likely to choose the same option the next time it is presented, even if offered among alternatives.¹⁴⁰ This bias towards initial choice intensifies over time.¹⁴¹ By influencing an individual’s very first choice, we can direct them toward more environmentally friendly behaviors down the line.



Examples of influencing the first choice:

- Demonstrate how to load scrap paper into the printer to new hires before they establish habits of using blank paper.
- Make paper reduction asks and suggest new behaviors during new student orientation.
- Show new students or employees how to use communal multifunction printers before they build a habit of printing at their dorm or desk.
- Encourage direct deposit at new-hire orientation and include time for new employees to fill out the form.

3. Determine the right schedule of benefits

Reward schedules can reinforce a target behavior. The success of the intervention depends on several factors, including the nature and size of the reinforcement, its timing, and the consistency of how it is applied. Table 7 on the subsequent page provides examples of reward schedules.

139 Skinner, B. F. (1958). Reinforcement today. *American Psychologist*, 13(3), 94–99. doi: [10.1037/h0049039](https://doi.org/10.1037/h0049039)

140 Schwartz, B. L. (1994). Sources of information in metamemory: Judgments of learning and feelings of knowing. *Psychonomic Bulletin & Review*, 1(3): 357–375. doi: [10.3758/BF03213977](https://doi.org/10.3758/BF03213977)

141 Carrus, G., Passafaro, P., & Bonnes, M. (2008). Emotions, habits and rational choices in ecological behaviours: The case of recycling and use of public transportation. *Journal of Environmental Psychology*, 28(1), 51-62. doi: [10.1016/j.jenvp.2007.09.003](https://doi.org/10.1016/j.jenvp.2007.09.003)

Table 7: Determining which schedule of benefits to use

Does the audience do the behavior?	Frequency of behavior?	Schedule of reinforcement to use	Example
No	Never	Use shaping, with rewards for discrete behaviors	See "Build on a tiny behavior" on previous page.
Yes	Infrequent	Consistent	Reward staff members use of a multifunction printer for large print jobs by rewarding use of the multifunction printer for any kind of print job.
Yes	Frequent	Variable	Reward every 25th person who prints their entire document on scrap paper; the chance of being a winner increases motivation to keep performing the desired behavior. ¹⁴² Try a series of lotteries to motivate the audience into trying a more difficult behavior than they have yet taken.
Yes	Always	None	Do not use rewards. See BENEFITS, Key Consideration: Extrinsic rewards can undermine intrinsic motivation.

4. Provide feedback

Well-timed feedback promotes lasting behavior change. When we see that we have made progress or are making a difference, our enhanced sense of achievement or responsibility can cue the desired behavior while simultaneously boosting motivation.^{143,144} While our progress itself is a form of feedback (like picking trash up off the beach), practitioners can also use formal feedback mechanisms to highlight less visible benefits, such as the amount of water saved by using less paper.

Highlight the consequences of our actions by providing real-time feedback

Research suggests that real-time feedback is more effective than periodic feedback.¹⁴⁵ Quick feedback helps establish a clear connection between our actions and their consequences, increasing the chances that we'll change our behavior. While real-time feedback is a powerful tool, it can be costly to implement.



Examples of using real-time feedback:

- Display the total number of sheets printed to date each time an account user prints. Indicate how this measures up to their peers.
- Include a pop-up that shows how many sheets of paper people saved through double-sided printing.

¹⁴² Ferster, C. B., & Skinner, B. F. (1957). *Schedules of reinforcement*. East Norwalk, CT, US: Appleton-Century-Crofts. doi: 10.1037/10627-000

¹⁴³ Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward, and intrinsic motivation: A meta-analysis. *Review of Educational Research*, 64(3), 363–423. doi: 10.3102/00346543064003363

¹⁴⁴ Brophy, J. (1981). Teacher praise: A functional analysis. *Review of Educational Research*, 51(1), 5–32. doi: 10.2307/1170249

¹⁴⁵ Fischer, C. (2008). Feedback on household electricity consumption: a tool for saving energy? *Energy Efficiency*, 1(1), 79–104. doi: 10.1007/s12053-008-9009-7



SPOTLIGHT: Using real-time feedback

University of Michigan created a website where individuals can see their personal printing impact over different time periods as well as the organization's overall impact.

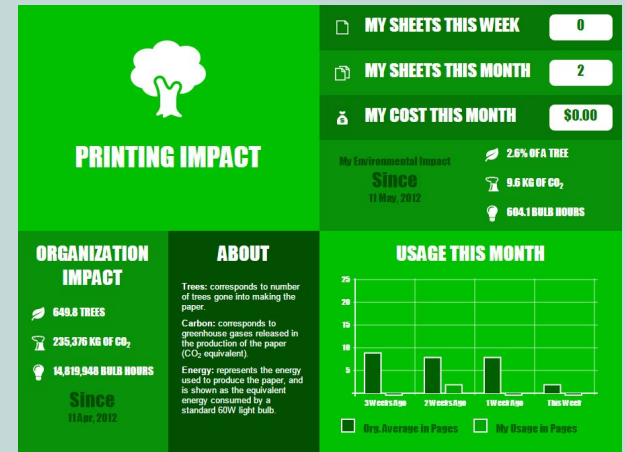


Photo credit: © 2019 University of Michigan, ITS.

Show change over time by providing periodic feedback

Periodic feedback may be more practical and less costly to implement than real-time feedback.¹⁴⁶ Providing feedback periodically allows for tracking change over time while still reinforcing the hard-to-see, longer-term benefits of positive behavior.



Examples of using periodic feedback:

- Compare current month's paper use to paper use from the same month last year.
- Provide weekly feedback on pounds of paper recycled in a student residence hall.
- Track weekly percent reduction in paper consumption over a certain period of time.

Make feedback specific to indicate where improvement is needed or praise is due

Specific feedback makes it easier for us to identify and resolve problem areas, while also allowing us to see where our efforts will have the most payoff. For example, receiving feedback about the energy use of particular appliances allow us to target our behavior to the appliances with the highest consumption, which would not be possible from higher-level information about the energy use of the house.¹⁴⁷



Examples of providing specific feedback:

- Disclose the amount of paper saved for each printer due to double-sided printing.
- Break down department-specific paper use percentages.

Make unseen benefits visible

Some pro-environmental behaviors, such as those aimed at reducing carbon emissions, do not have many immediate benefits, either because the consequences are not visible, or the impact of one individual's behavior is small. Create rewards that make the benefits more salient to motivate pro-environmental behaviors.



Examples of making benefits visible:

- Publicize the number of desktop printers that have been given up and how many more are needed to reach the goal.
- Calculate and share the institution's cost savings from paper reduction.
- Send an e-newsletter highlighting the number of trees saved by a department.

146 Carroll, E., Hatton, E., & Brown, M. (2009). *Residential energy use behavior change pilot* [PDF file]. Retrieved from <https://www.cards.commerce.state.mn.us/CARDS/security/search.do?method=showPoup&documentId=%7BF6C9D825-D9CC-4F4F-9F6D-805EB3C7AF1F%7D&documentTitle=34448&documentType=6>

147 Fischer, C. (2008). Feedback on household electricity consumption: a tool for saving energy? *Energy Efficiency*, 1(1), 79-104. doi: 10.1007/s12053-008-9009-7

Provide feedback that acknowledges the audience's efforts

Acknowledging your audience's efforts can be an effective way to provide feedback even when you can't showcase the direct results of their behavior. Receiving praise for our efforts can help motivate us to continue.

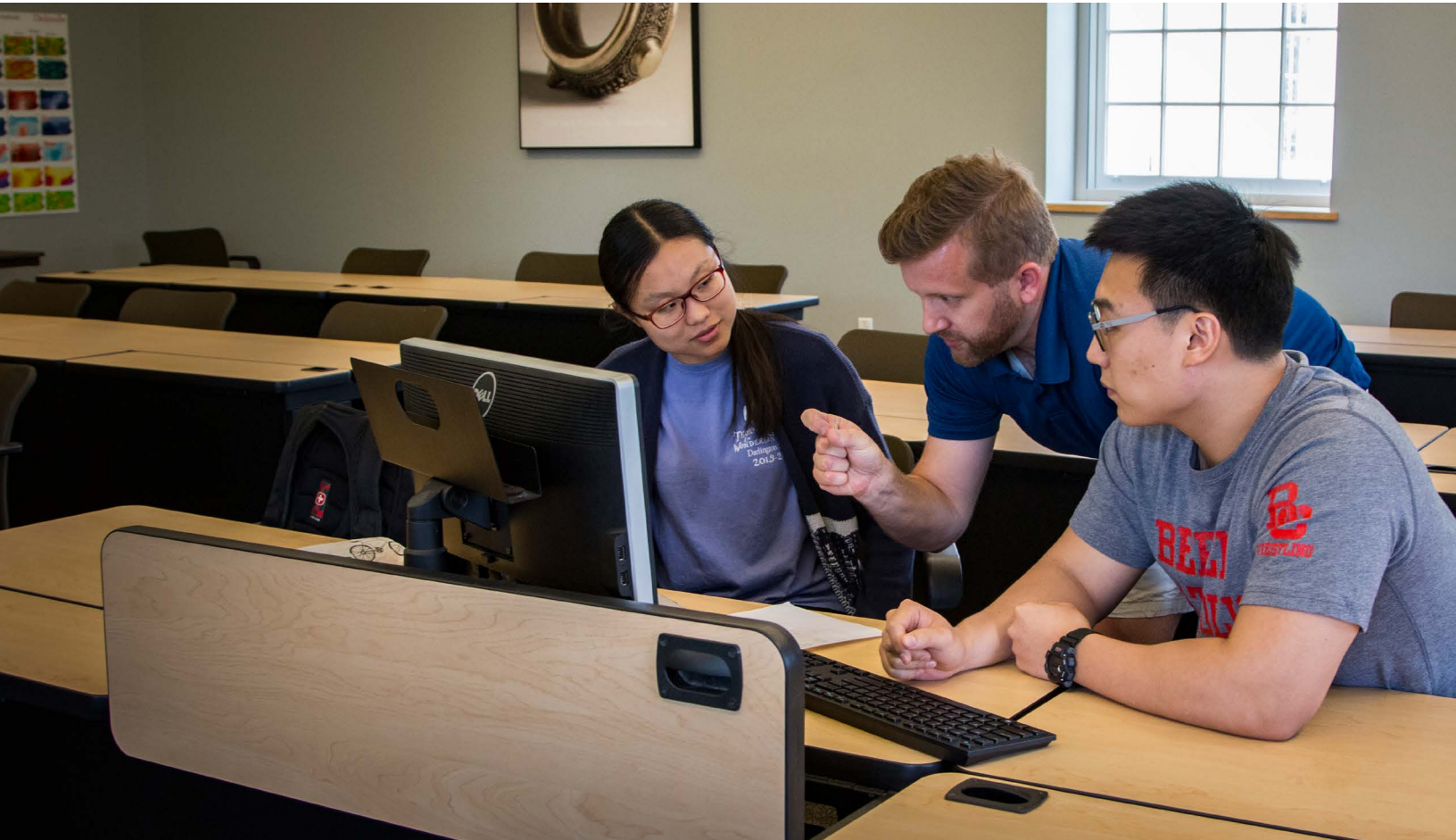


Examples of acknowledging the audience's efforts:

- Thank staff for holding a paperless meeting.
- Show appreciation by hosting a (sustainable) party once a department has met its goals.
- Create an award (e.g., "Biggest paper saver") and present it monthly, quarterly, or per semester.



Template for a paper reduction progress thermometer. Photo credit: Root Solutions.



Dickinson College student-faculty research utilizes an online sustainability dashboard. Photo credit: Joe O'Neil.

Selecting interventions

After becoming familiar with the common motivators of, and barriers to, behavior change and the interventions that make up the BEHAVIORAL Building Blocks™, you're ready to apply them to YOUR campaign! Table 8 lists shortcuts for remembering which interventions are most effective at addressing specific campaign needs.

Step 1: Choose interventions to overcome barriers and amplify benefits

Table 8: Solutions based on barriers and motivators

Barrier/benefit category	Solutions
MEMORY	Remind the audience what to do and how through prompts, how-to information, skill-building, feedback, and action bundling: EASY , VIVID , LASTING .
BENEFITS	Highlight and amplify benefits by using any building block.
NEGATIVE ATTRIBUTES	Address the audience's concerns by eliminating hassle factors and providing incentives: BENEFITS , EASY .
SUSCEPTIBILITY	Show the audience how the problem impacts them by making it salient, connecting to their concerns, and creating opportunities to connect with nature: VIVID , RELATABLE , AWARENESS .
SEVERITY & IMPORTANCE	Help the audience recognize the severity of the problem by demonstrating scale and immediacy, connecting to their existing "pool of worry", highlighting relevant personal experiences, using frames and metaphors, and creating opportunities to connect with nature: VIVID , RELATABLE , AWARENESS , ASSOCIATIONS .
ABILITY / SELF-EFFICACY	Boost the audience's confidence by making it easier to do the behavior, walking them through it, showing that others have successfully done it, and using commitments that encourage positive self-perception: EASY , HOPEFUL , IDENTITY .
ACTION EFFICACY	Show the audience how their actions will make a difference by providing feedback, highlighting solutions, sharing positive social proof, and connecting action to impact: LASTING , HOPEFUL , VIVID , ORDINARY .
SOCIAL ACCEPTABILITY	Use positive social proof to show how the behavior is accepted or socially desirable, correct mistaken assumptions, and tap into group identity: ORDINARY , IDENTITY .
RESPONSIBILITY	Help people recognize their responsibility by tying actions to impact, tapping into relevant identities, highlighting consequences, and using framing and metaphors: VIVID , IDENTITY , BENEFITS , ASSOCIATIONS .
ACCESS & RESOURCES	Provide greater access to resources and help people find and utilize the resources: EASY , BENEFITS .
IDEOLOGIES & VALUES	Create opportunities for the audience to be in nature, adjust messaging to tap into the audience's existing values and ideology, and create unifying messages across departments and issue areas, and repeat these messages often: IDENTITY , AWARENESS , ASSOCIATIONS .

Step 2: Creating a suite of interventions

It's highly unlikely that a successful behavior change campaign will utilize only one intervention from the BEHAVIORAL Building Blocks™. For example, if the only medium you want to use is signage to prompt audience remembers to save paper, you should incorporate aspects from [ORDINARY](#) (such as noting the social norm) or [RELATABLE](#) to better connect with the audience. To choose interventions, look to the barriers and motivators you identified and develop interventions that are best suited for overcoming those barriers or amplifying the motivators. This section provides a few additional tips.

Fundamental building blocks

Certain barriers and motivators of behavior are relatively universal. Address them with interventions from the following Building Blocks™:

- **Make it EASY** - Even the smallest hassle factors can deter an audience from completing the behavior.
- **Design it to be VIVID** - Attentional capacity and memory are barriers to change due to the large amounts of information we are processing. Interventions should make the call to action stand out, and remind the audience what to do and how.
- **Craft it to be RELATABLE** - To help the audience feel more connected to an issue, relate the message to something they care about, use metrics that are meaningful to them, and choose messengers that they trust.

A common combination of interventions

Listed below are some of the most common and fundamental interventions that fit well together to form powerful campaigns.

- **Prompts** (See [VIVID](#).)
- **Feedback** (See [LASTING](#).)
- **Normative messaging** (See [ORDINARY](#).)
- **Pledges (Commitments)** (See [IDENTITY](#).)
- **How-to information** (See [EASY](#).)



Supporting Worksheet 5: Brainstorming Interventions

Use the [Brainstorming Interventions](#) worksheet (also listed in the [Appendix](#)) to brainstorm interventions to overcome your audience's barriers and amplify their motivators.

PART 3: CAMPUS FINDINGS

In 2018, Root Solutions worked with staff and students at the University of California, Berkeley's Haas School of Business to design and implement a campaign to reduce student paper use. This project set the foundation for the remaining studies in this section, which present a selection of results from the *Turning the Page on Campus Paper Use* partnership. Through this partnership, Root Solutions and AASHE collaborated with colleges and universities from across the U.S. and Canada to facilitate paper reduction projects based on best practices from behavioral science. Root Solutions assisted each campus in designing and analyzing a survey to reveal the motivators and barriers to the desired behavior change (e.g., relinquishing desktop printers).

Paper Saving Challenge at the Haas School of Business

Summary

Root Solutions began working on a staff and student campaign to reduce student paper use at the University of California, Berkeley Haas School of Business in 2018. Through interviews and surveys, factors facilitating and preventing student paper reduction were uncovered. The subsequent campaign, The Haas Paper Saving Challenge, was designed to address identified behavior levers through a suite of interventions including how-to knowledge, prompts and reminders, incentives, feedback, pledges, and social norms. The campaign successfully achieved the goals of reducing student paper use, shifting existing norms on paper use, and increasing awareness of the environmental consequences of paper waste.



Earth Week Carnival at University of California, Berkeley.
Photo credit: Katherine H. Walsh.

Outcomes at-a-glance

- Paper use decreased by 32.5%.
- Printing of non-mandatory lecture slides was reduced.
- Student print credits were initially reduced from \$200 to \$150 per semester, and later to \$100.
- Student awareness of paper consumption consequences increased.
- Student procedural knowledge (how to reduce use) increased.
- Student support for paper-saving policies and behaviors increased.
- Paper saving actions increased; a majority of students completed two or more paper-saving actions during the challenge.
- Commitments increased; 50 students formally committed to continuing to save paper.

Research

Identifying common student printing issues and potential target behaviors

Before embarking on a campaign to reduce student printing, Root Solutions worked to better understand Haas student printing behaviors, to identify specific behaviors to address. Because there were some sources of printing that students could not control (such as printing of assignments required by professors), the focus was on identifying which non-mandatory sources of printing were responsible for large volume student print jobs.

Initial meetings with Haas staff and students from the Haas Business School Association's (HBSA) Sustainability Committee informed the design of a User Analysis survey. This brief, face-to-face survey was conducted in the Haas undergraduate computer lab. The User Analysis survey revealed that:

- Lecture slides were among the greatest sources of student printing.
- Students were divided on whether printing lecture slides should be mandatory or optional.
- Many students felt that their peers' printing of slides was unnecessary.
- Students identified strategies they could use to reduce their own print volume.

Determining major motivators of student printing behavior

After identifying that printing of non-mandatory lecture slides was a major contributor to excess paper use, we created a survey and distributed it via SurveyMonkey to measure the barriers and motivators that lead to students printing non-mandatory lecture slides. In addition to questions specifically about printing lecture slides, we also included questions that could inform our design of interventions to reduce printing overall.

Campaign Logistics

Audience

After presenting the results and recommendations to the HBSA Sustainability Committee and staff liaison, we worked together to determine which interventions were realistic and most likely to be effective for the target audience. It was determined that a student-focused campaign was most desirable, while a campaign with greater emphasis on engaging professors could be pursued at a later stage.

Marketing the paper saving challenge

The Paper Saving Challenge was marketed to students via email, a campaign webpage, an Instagram campaign, Facebook, a student newsletter, and in-person tabling. The Paper Saving Challenge ran from October through November 2018.

Measuring success

Haas used a computer program to track student paper use. Usage during the campaign was compared with usage during the same period in 2017. Self-reported data from pre- and post-campaign surveys were also analyzed.



Photo credit: Root Solutions for UC Berkeley Haas School of Business.

Interventions

Information presented at new student orientation

Because starting a new school year is a great time to develop new habits (see [LASTING](#)), information to encourage paper reduction was shared as a new student orientation presentation slide (the first time that information about saving paper had been shared at orientation). The slide included multiple behavioral best practices, and used identity statements like “Paper Saver” (see [IDENTITY](#)). In addition to incoming students, all matriculated students were sent the slide deck. Various other signage and materials were created to highlight a positive social norm of paper consciousness for new Haas students. See [ORDINARY](#).

Abundant “procedural” information was provided to increase knowledge of saving paper

Providing students with the “how-to” knowledge for using less paper was critical in removing barriers to behavior change. In the pre-campaign survey, students expressed that more training on how to use less paper was desired. Throughout the campaign, practical, easy-to-understand information about how to save paper was provided to students in various formats, including email, website, social media, signage, and prompts. This information made it easier for students to save paper and also increased hopefulness about their ability to make a difference. See [EASY](#), [VIVID](#), [HOPEFUL](#).

Students were prompted to save paper at the appropriate time and place

Prompts for the Haas computer labs (the ideal location for reminders) were created, as well as tabletop tent cards to be placed next to print lab computer monitors. Per best practices, prompts also included normative and identity messaging. See [EASY](#), [VIVID](#), [AWARENESS](#), [ORDINARY](#), [IDENTITY](#).

Various signs and messages highlighted positive social norms about paper use

All messaging about the Paper Saving Challenge highlighted positive social norms. For example, it was frequently mentioned that 71% of Haas students do not print lecture slides often, and that 89% of Haas students support/strongly support paper-saving efforts. See [ORDINARY](#).

How to be a paper saver

Pause and think: Do I really need to print this?

If yes:

- Use scrap paper for notes
- Ask your professors if you can take notes on an electronic device
- Format documents to use less paper
 - “Condensed fonts”, reduce font size
 - Green fonts like Century Gothic
 - Smaller margins
 - Print multiple slides per page
- Use online tools instead of printing
- Check print preview before pressing print!
- Print only the pages you need (avoid printing blank pages or citations, appendices)

Image of a student orientation slide. Photo credit: Root Solutions for UC Berkeley Haas School of Business.

Haas students
conserve paper.

BerkeleyHaas



1 Think to yourself: Do I need to print this?

2 If yes → check the back of this card for tips on how to use less paper & ink!

- ✓ Print double-sided & in black & white
- ✓ Reformat: Use smaller margins, fonts & styles
- ✓ Use eco fonts like Century Gothic and Garamond
- ✓ Double check before printing - Use print preview
- ✓ Print multiple slides/pages per page

BerkeleyHaas

Tent card was designed for the Haas School of Business computer print lab, to be placed right next to the student computers. Photo credit: Root Solutions for UC Berkeley Haas School of Business.

Paper-savers socially modeled desirable behavior

Students were encouraged to share instances of their paper-saving behaviors. They were given extra points in the Challenge for sharing photos on social media of themselves committing to the Paper Saving Challenge or taking paper-saving actions, such as using scrap paper to take notes. When images were shared on the Paper Saving Challenge Instagram account, they were further circulated. See [ORDINARY](#).

Messages were framed to match the audience's goals, values, and identities

Survey results and conversations with students revealed that, not surprisingly, undergraduate business students enjoyed competition and highly valued being leaders and innovators. Messages that tapped into these values and identities were used whenever possible, and the challenge format was chosen because of the students' love of competition. Students were also passionate about making Haas the first zero waste building on campus and achieving carbon neutrality, so paper-saving messages were tied to these goals. See [BENEFITS](#), [VIVID](#), [ASSOCIATIONS](#), [IDENTITY](#), [RELATABLE](#).

Students made commitments to save paper

Students were asked to make a pledge to reduce their paper usage. The pledge was simple and followed best practices:

- **Specific** - Students needed to specify the action that they would take to reduce their paper consumption.
- **Written** - Students filled out handwritten pledges in-person or submitted electronic pledges.
- **Public** - Pledges were posted on social media.



Photo credit: Root Solutions for UC Berkeley Haas School of Business.

Multiple forms of incentives and feedback encouraged student participation

The competition utilized social recognition and tangible rewards to incentivize group and individual participation. Students won a variety of prizes for low-effort behavior (such as taking a photo of oneself doing a paper-saving behavior, or referring friends to sign up for the competition) as well as for higher-effort participation (such as printing zero pieces of paper during the competition). See [BENEFITS](#), [LASTING](#).

Social incentives:

- Mid-campaign updates provided ongoing feedback about which cohorts were leading the way, and the winning cohort ultimately won bragging rights.
- Participating students submitted pictures of themselves taking paper saving actions and posted them in the competition's social media accounts.

Tangible incentives:

- Points were earned for recruiting friends, following the Challenge on social media, and signing up for the pledge. Each participation point entered students into a raffle to win a variety of smaller prizes including gift cards and reusable notebooks. The two individuals with the lowest paper usage received \$100 prizes (courtesy of a print management company). Fifty-dollar raffle prizes were also offered to incentivize participation in a follow-up survey.

Survey data supported efforts to reduce incentives for overprinting

Historically, a printing credit of \$200 was provided to each Haas student per semester, providing them up to 8,000 printed pages per year at no cost. Because of the “use it or lose it” norm, students indicated that credit was often used for non-university related printing or for friends in other departments. Survey results indicated that many students did not require their full print credit, and most students agreed that a \$150 print credit or lower would be sufficient. In January 2019, the print credit was lowered to \$150, and more recently, it was announced that it would be lowered again to \$100. See [BENEFITS](#).



Photo credit: Root Solutions for UC Berkeley Haas School of Business.

Campaign Outcomes

- **Students that signed up for the competition reduced their paper use by 32.5%.**
Data comparing student printing during the competition to the equivalent period in the previous year prior revealed that Haas students reduced their printing use by nearly one-third.
- **Students reported printing lecture slides less often for courses that do not require print-outs.**
The percentage of students reporting that they printed lecture slides “All of the time” (for courses that do not require it) decreased from 29% to 8%. The percentage of students reporting that they “NEVER” print lectures slides (for courses that do not require it) increased from 26% to 49%.
- **A majority of student respondents said they did at least two paper-saving behaviors during the Challenge.**
Paper-saving behaviors reported by students during the campaign included printing double sided, using print preview before printing, using electronic tools instead of printing, taking a picture instead of making a copy, using an eco-friendly font, and not printing course materials.
- **63% of total post-campaign survey respondents reported that their paper-saving knowledge increased during the Paper Saving Challenge.**
79% of Challenge participants reported that their paper-saving knowledge increased, compared to 54% of respondents that did not sign up for the Challenge. Even students that did not officially sign up for the Challenge (and thus did not receive all communications) were positively impacted by the campaign.
- **83% of post-campaign survey respondents reported that their awareness of paper consumption issues and consequences increased during the Paper Saving Challenge.**
97% of Challenge participants reported that their awareness increased, compared to 68% of respondents that did not sign up for the Challenge. Even though not all students officially participated in the competition, the campaign still helped to increase their awareness of paper consumption consequences.
- **The percentage of students that do not want professors and TAs to print lecture slides increased.**
Post-campaign survey results showed that the percentage of students that “disagree” or “strongly disagree” that they want professors or TAs to print lecture slides for them increased from 37% to 52%.
- **Students made public commitments to save paper.**
Fifty students submitted commitments to save paper. Pledges included commitments to always printing double-sided, thinking twice before printing, only printing when absolutely necessary, not purchasing course readers unless it was mandatory, and more. In addition, 86% of students said they would take paper-saving actions and zero waste actions in the future.
- **Printing incentives were altered to promote less paper consumption.**
Survey data revealing that many students did not need the entire \$200 print credit supported efforts to reduce the print credit to \$150 in January 2019, and more recently to just \$100 per semester.

Reducing Desktop Printers at Portland Community College

Background

Portland Community College (PCC) serves over 70,000 students on four main campuses across five counties in the Portland metropolitan area. PCC piloted its paper reduction project at the Rock Creek campus, which serves approximately 20,000 students and used 884 cases (over 4.4 million sheets) of paper during the 2016-2017 academic year.

PCC sought to reduce the number of pages printed overall and also transition from desktop printers to networked, multifunction printers. As many large institutions have found, switching from desktop printers to fewer, centrally located multifunction printers can result in significant financial savings in the form of reduced paper, ink and toner, energy, and maintenance costs. PCC discovered that it was spending \$72,000 per month just on toner for personal printers. After taking into account costs associated with contracting a printing vendor, PCC estimated that it would save more than \$900,000 annually from transitioning to the new system!

To help manage this transition, PCC adopted the Panther Print Program in September 2018. This mandatory print management program is designed to streamline printing services, reduce labor and storage space for supplies, improve digital security, free up the IT Department for other tasks, improve departmental budgeting capabilities, and ultimately save PCC money.



A pallet of empty cartridges at PCC's Central Distribution Services (CDS) Warehouse. CDS sorts and recycles about 26 pallets worth of toner cartridges from individual printers per year. Used printer toner and ink cartridges for desktop printers take up warehouse space and staff time.¹⁴⁸ Photo credit: Briar Schoon, Portland Community College.

Audience and Behavior

PCC's campaign focused on encouraging faculty and staff to give up their personal desktop printers and switch to shared networked printers. PCC worked with Root Solutions to design and conduct a survey to reveal barriers and motivators that could influence whether faculty and staff were willing to give up their desktop printers.

¹⁴⁸ Schoon, B. (2018). Personal communication.

Findings and Interventions

Privacy and security concerns

Survey results revealed that security of multifunction printers was a common concern. For example, respondents expressed concerns about sensitive documents being left on the multifunction printer for anyone to pick up.

To address these concerns and correct misconceptions, the Panther Print and sustainability teams held a Q&A session. Many staff and faculty were unaware that the multifunction printers had a “secure print” feature that required a PIN code to release their job from the printer, preventing sensitive information from sitting openly. During the session, team members demonstrated how to use the secure print feature, and experienced users from the audience’s peer groups shared their success stories. Additionally, signage at the print stations and email and website messages were updated to include clear instructions for how to use secure print. For related tips, see the [EASY](#) and [ORDINARY](#) Building Blocks.

Familiarity and ease of use

Some faculty and staff were reluctant to switch to the centralized printing system because they were not familiar with how to use aspects of the new system. For example, there were concerns about not knowing how to scan or use scrap paper with the new printers. The Panther Print team heard and validated audience members’ concerns about switching to a new system ([IDENTITY](#)). The team worked to make it [EASY](#) for faculty and staff to find solutions by providing phone numbers, email addresses, and websites offering relevant instructions. The Panther Print team also supplied instructions on how to print, who to contact if anyone had issues, and how to find training opportunities. See [EASY SPOTLIGHT: Specific and easy-to-follow instructions for desktop printer removal](#).

Social acceptability

Desktop printers were common in PCC offices, and this social norm had the potential to discourage some employees from removing their printers. To change the **norm**, PCC’s sustainability team recruited two prominent campus leaders (the President and a Dean) to model the desired behavior and give up their printers. This demonstrated that not only were their **peers participating** in the program, but that program participants included campus leaders. See [Desktop Printer Case Study: Social Marketing](#) in [ORDINARY](#) and the [RELATABLE](#) Building Block.

Raising awareness and increasing motivation

Many faculty and staff had to change their workflow to accommodate the loss of an easily accessible printer. This not only brought inconvenience, but uncertainty as well (where will I be able to print?; how will I print while students are visiting my office?; will I be able to use the special paper I need?). Such concerns tend to decrease motivation and can impede progress if not resolved. Surveying the employees revealed that most faculty and staff members would be more willing to give up desktop printers if they felt that the printers could be better used elsewhere. The audience’s motivation increased when they learned that the printers would be donated to K-12 schools in need. See the [BENEFITS](#), [EASY](#), [ORDINARY](#), and [RELATABLE](#) Building Blocks for more tips.

Outcomes

- As a result of PCCs overall paper reduction effort, the number of printers across the district dropped by 12%. In total, 56 printers were given up between September 2018 and March 2019.
- PCC's district-wide Panther Print effort will implement district-wide networked multifunction printers and phase out personal printers in the next few years. The sustainability team has formed a "team of champions" to support this effort.
- In just one year, 1.2 million fewer sheets of paper were used at the campus Print Center.

Lessons Learned

- **The audience needed access to information about the change.** Some staff at PCC were unfamiliar with technical aspects of the new printing services. For this group, uncertainty served as a barrier to meeting the goal.
- **Be flexible.** Using a shared printer was not an option for all (e.g., for accessibility reasons). PCC developed an exemption protocol to create a way for those who had no other accessible printing options to retain (or obtain) a desktop printer.
- **Include other groups that have a vested interest in the project.** The IT department was aware of the issues associated with desktop printers and was happy to support the project.

"Once we addressed the barriers, whether it's getting them networked, educating them on secure print, or talking them through the program, they might need to sit with it for awhile. They're not comfortable with change. We come back again a few weeks or a month later and then we've had success."

~ Elaine Cole, Sustainability Coordinator at Portland Community College, Rock Creek Campus (2019).

Increasing the Use of an Online Learning Management Tool at Red River College

Background

Red River College (RRC) operates eight campuses across Manitoba, Canada and serves 22,000 students per year. In 2017, the college surveyed its staff and found that 65% felt that paper reduction was a sustainability issue that the College should address. An analysis revealed that academic departments generally use more paper than non-academic departments.

Audience and Behavior

RRC decided to focus on reducing faculty paper use. The Office of Sustainability recognized that there were paper-free options that faculty could be using, including the school's online learning management system (LEARN), and other electronic document-sharing platforms. The sustainability team decided to run a pilot program with the Mechanical Engineering Technology Department, where only 40% of faculty were using LEARN, compared to about 70% of faculty campus-wide.



Photo credit: Red River College.

Findings and Interventions

Engagement and rewards

Having the right information and intending to act doesn't bring about actual behavior change. While staff felt that paper reduction was an important issue, many faculty members had made assumptions about the LEARN platform's usability and popularity that discouraged participation. The Office of Sustainability looked for ways to engage faculty and help them to begin utilizing LEARN. Team members provided **incentives** and **feedback**. The resource reduction specialist worked with the chair of the department to develop a 10% paper reduction goal for the department overall. Each faculty member would receive a \$5 gift card if the goal was met, and an extra \$5 if individual reductions were 15% or more. It was a small reward, but faculty members were excited. See the [BENEFITS](#) and [LASTING](#) Building Blocks.

Finding the right solutions

When faculty members heard "paper reduction" and "LEARN," some assumed that it meant setting up whole courses on the platform, which would be time consuming and not how they wanted to present their courses. Without knowing all of the options for moving portions of a course to LEARN and the availability of other electronic tools, instructors were stuck in the mindset that the change was unreasonable. The Office of Sustainability coordinated Q&A sessions with the office that provided LEARN training. At the sessions, faculty explained their reasoning for not using the platform, and a LEARN representative answered questions, addressed misconceptions, and clarified features that faculty thought were missing. Added functionalities of LEARN that encouraged electronic documentation were also explained, like integration with Google Drive and Dropbox. Faculty learned of various paper reduction options and solutions for their courses. See the [EASY](#) Building Block for more.



Success of peer-to-peer sharing at Red River College. Photo credit: Red River College.

Maintaining memory to form habits

While new habits were still forming, it was important to remind faculty members to go through with the new behaviors by encouraging them to work toward the goal: a 10% reduction in paper use. The team sent monthly individualized reports on each faculty member's paper usage. The report offered positive reinforcement by commending good behaviors that were already happening. For faculty that were not yet performing the desired behavior, the team reminded them of opportunities to meet next month's goal. Monthly emails also offered tips and additional paper reduction challenges. At the end of the term, after the reduction goals had been met (and even exceeded by many), the Office of Sustainability nominated the department for a sustainability leadership award (which they ultimately won!). See the [BENEFITS](#), [LASTING](#), and [IDENTITY](#) Building Blocks.

Outcomes

- By the end of the fall 2018 term, five out of the nine faculty members in the Mechanical Engineering Technology Department had achieved at least a 15% reduction in their paper use.
- During the fall 2018 term, the department's instructors reduced their printing by 29% in comparison to fall 2017. This resulted in a cost reduction of 28% for ink and printer use, not including the potential savings for the cost of paper.
- The Mechanical Engineering Technology Department won the school's BRAVO award for sustainability leadership.

Lessons Learned

- **Be clear with messaging.** Some faculty believed that they were being asked to go completely paperless, which created pushback.
- **Collaborate with students.** Students are important stakeholders and should be brought into the discussion. Survey responses indicated that students embraced the idea of switching to online course tools, lending support for greater use of electronic tools in the classroom.
- **Strong leadership is important.** The Chair of the department being present at every key meeting provided motivation to faculty members.
- **Savings weren't just from using online platforms.** Cost savings were also achieved by providing fewer hand-outs and printing double-sided more often.
- **Reinforcement and communication.** At the final celebration, instructors listed the monthly emails as one of the driving factors for helping them change habits and reduce printing.

Promoting a Learning Management System at Fort Lewis College

Background

Fort Lewis College (FLC) is a small liberal arts college in Durango, Colorado. Serving around 3,300 students, FLC estimates that its campus used about 2.3 million sheets of paper in 2018, which costed about \$125,000 and amounted to roughly 650 sheets per student. The FLC Environmental Center's student-led Zero Waste Team ran the school's paper reduction project with support from the Environmental Center's Coordinator.

Audience and Behavior

The Zero Waste Team reviewed printing data provided by the IT department and determined that academic departments were the largest source of printing on campus. Given the relatively small size of the school, the team decided to target all faculty to encourage less printing for course materials. Professors at FLC have access to Canvas, a web-based learning management system that allows them to share content with students electronically. About 80% of professors already used Canvas regularly, but the team wanted to boost participation in Canvas from new and existing users.



Photo credit: Fort Lewis College.

Findings and Interventions

Updating perceptions of the problem

A barriers and motivators survey showed that professors who did use Canvas thought it had a positive impact on student learning outcomes. However, professors who did not use Canvas believed that students preferred paper and did not have the skills to use Canvas. Both groups of professors were mainly concerned about students' experiences in their classes. This inconsistency in beliefs about student preferences prompted the Environmental Center's team to survey students about sentiments regarding Canvas as a learning platform. 84% of students said they preferred digital materials over paper handouts. Over 60% of students preferred both digital paper submission and accessing syllabi online. Many students said that Canvas also helped them stay organized.

Perceived negative attributes

The determinants analysis survey showed that some faculty did not know how to use Canvas, while others felt that setting up a course on Canvas was time consuming.

To address these issues, the Zero Waste Team promoted existing resources, trainings, and guides offered by the college's Teaching & Learning Services office. Team members discussed the benefits of using Canvas, including how it can help save time as well as paper. They included results from the student survey, and asked faculty to sign a pledge to take at least one action to reduce their paper use such as posting online syllabi and seeking out Canvas training.

Asking for a commitment

Some instructors needed extra motivation to follow through with new behaviors, and others were not sure how to meet a certain goal. Sending out a digital paper reduction pledge resulted in only a handful of signatures, so the team recruited students to ask for pledge signatures from professors in person. Involving students in the pledge process also opened doors for further conversations about paper reduction and encouraged accountability. See the [IDENTITY](#) Building Block.



SPOTLIGHT: Fort Lewis College Faculty Pledge

- Your Name (or "Anonymous" if desired).
- Your Department, Program, or Office. (Leave blank if desired.)
- I pledge to (pick one):
 - Only print a one-page syllabus summary sheet and put a full copy of the syllabus on Canvas.
 - Grade written papers in Canvas rather than requiring printed copies.
 - Seek out support and training for how to better utilize Canvas.
 - Always print double sided when I need to print.
 - Distribute documents digitally rather than printing them out.
 - Find a colleague to work with on ways to reduce our courses' paper use.

Outcomes

- The Environmental Center identified sources of paper waste and strengthened its relationship with the college's IT department and faculty administrative assistants.
- The school's Teaching and Learning Services office, with the help of the Zero Waste Team, became a useful contact for training and guidance on using Canvas and other paper reduction strategies.

Lessons Learned

- **Timing is important.** The college was undergoing changes in staffing and administration while also undertaking a college-wide strategic planning process. Faculty and staff attention was focused on these changes, which reduced attention for other projects such as paper reduction.
- **Gathering data may be challenging.** A new print management system was proposed just a few months after the Zero Waste Team began its paper reduction investigations. The new system is expected to reduce overall paper use, but poses a challenge for gathering consistent longitudinal data.
- **Identify stakeholders early on.** The staff conducting the behavior change program were initially not aware that printing was largely done through faculty's administrative assistants. The team could have benefited from engaging administrative assistants in the early stages of the project.

Replacing Printed Handouts at University of Iowa's International Programs Office

Background

One of the largest public universities in the state, the University of Iowa serves over 30,000 students. The university's Office of Sustainability worked with Root Solutions to create a pilot paper reduction project for the International Programs Office (IPO), which serves thousands of study abroad students each year, as well as 4,000 international students. The IPO uses large literature displays of printed materials for all of their programs and hands out printed information at events. It used 30,456 sheets of paper in 2017.

Audience and Behavior

The International Programs Office has an active green team, is an early adopter of sustainability behaviors, and has the ability to influence large numbers of students, staff, faculty, and parents. After an initial discussion with the green team and reviewing print data from the IT department, brochures and flyers were identified as the largest portion of the office's paper use. Because these documents were integral for promoting their programs, a shift to electronic distribution became the most viable option for reducing paper use.

Findings and Interventions

Measuring (positive and negative) attitudes

The determinants analysis survey revealed that a majority of IPO staff recognized cost savings and environmental benefits as the most important advantages of using electronic tools instead of printed copies. Additionally, most staff identified audience engagement and editability as top benefits of using electronic tools. Most staff said the worst thing about not having printed materials is that many of their "customers" prefer hard copies. The survey also found that people who did use electronic methods for publicizing programs found the behavior difficult because the process wasn't streamlined, citing the need for updated technology.

Interventions

The Office of Sustainability needed to ensure that interventions were compatible with existing technology and protocols, since updating technology was not feasible for this project. The Office of Sustainability developed a solution by having students take pictures of the information using their camera phones. "Say Trees!" cue cards and an instructional guide were developed to encourage students to take photos of brochures rather than taking a hard copy. The guide emphasized the benefits of taking photos and offered tips on how to encourage people to use the photo option. See the [EASY](#) and [BENEFITS](#) Building Blocks.



Photo credit: Elizabeth Mackenzie, University of Iowa.

Perceived access

The survey also revealed that about one-quarter of IPO staff did not feel that they had the support needed to successfully utilize electronic tools to reduce their general paper use not related to brochure distribution. To address this, the Office of Sustainability developed additional guides to help the IPO and others use electronic tools to reduce paper used in daily operations. These included a paper reduction formatting guide, a listing of monthly tips to reduce paper use, and a printer/desktop prompt to think before you print. See the [EASY](#) Building Block.

Outcomes

- University of Iowa reported that using the “Say Trees!” cue cards how-to guide resulted in moderate reduction. The staff tabling at orientation estimated that one in four students chose to take a photograph instead of taking a flyer.
- As a result of this success, other offices have expressed interest in working with the Office of Sustainability on paper reduction projects.
- The Office of Sustainability developed paper reduction information to distribute to other university departments, including:
 - A guide for using less paper at tabling events.
 - Monthly tips for reducing paper.
 - A formatting guide.
 - Desktop/printer prompts.

Lessons Learned

- **Budget extra time for coordination:** It was difficult to find the time to meet with all partners, which lengthened the project's timeline.
- **Determine alternative methods of measuring success.** It was difficult to obtain actual paper use data from a different department. Be prepared to find other ways to measure your success.



SPOTLIGHT: Desktop prompts

University of Iowa's Office of Sustainability created postcard prompts to remind people to print more mindfully and efficiently. The postcards were placed at the point where people initiate printing: their desks.

The postcards emphasized the environmental benefits identified as important by staff.

Save Money! Save Trees!

Before You Print, Check These:

- **Spellcheck**
- **Reduce margins**
- **Reduce font size**
- **Double-sided print**
- **Do I really need to print this?**


Photo credit: Elizabeth Mackenzie, University of Iowa.

APPENDIX

Root Solutions' Behavioral Building Block™ Worksheets

The following worksheets are available for download on Google Drive:

Worksheet 1: Determine the Target Audience

2019

Determine the Target Audience

What are ALL of the groups of people at your organization that contribute to the problem?

To what degree do these audiences contribute to the problem?

Are any of these audiences unlikely to be receptive to a paper-saving campaign at this time?

On the other hand, which audiences do you think would be most willing to engage with you? Are there certain audiences that have successfully engaged in past behavior change efforts?

Now write down three target audiences that you could work with for a paper-reduction campaign	List who the relevant stakeholders are that might need to be involved in the project, either at the beginning, middle, or end.
1	
2	
3	

Does one audience stand out as a preferred option for a "pilot" program to test-run your initiative and demonstrate success?



Brainstorming Behaviors

For each target audience, list all the activities or business processes that use large amounts of paper (Examples: Printing specific forms, printing coursework, printing marketing materials, etc.)

For each target audience, which of the above activities do you think promote the most paper waste? (Examples: Providing paper readers to all students)


In which locations on campus might each target audience produce the most paper waste? (Thinking by location, rather than processes and activities, might bring to mind other behaviors you hadn't thought of before.)

Using the answers to the questions above, write down at least five distinct (and ideally, outcome-producing) behaviors for each target audience that you could center your campaign around.

- 1.
- 2.
- 3.
- 4.
- 5.

Worksheet 3: Evaluating Priority Behaviors

- Write a short list of potential behaviors at the top. Score each behavior on impact, likelihood of success, future impact and the ability to evaluate behavior change, then sum each column. Focus your campaign on one of the behaviors with the highest scores. See *Evaluating Priority Behaviors* table on [page 15](#) for a description of each of these priority filters.


2019

Evaluating Priority Behaviors

Potential Outcome-Producing Behaviors:		1	2	3	4	5	6	7	8
Behavior Description →									
Impact	Impact Potential of Behavior Change <small>(Greatest impact = 4, Least = 1)</small>								
	Saturation of Behavior <small>(Least saturation = 4, GREATEST= 1)</small>								
Likelihood of Success	Probability of Adoption <small>(Greatest probability = 4, Least = 1)</small>								
	Success of Past Behavior Change Efforts <small>(Greatest success = 4, Least = 1)</small>								
	Organizational Effort Required <small>(Least effort = 4, GREATEST= 1)</small>								
	Controversial <small>(Least controversial = 4, GREATEST= 1)</small>								
Future Impact	Potential to Scale <small>(Greatest potential = 4, Least = 1)</small>								
	Potential to Serve as Proof of Concept <small>(Greatest potential = 4, Least = 1)</small>								
Evaluation	Ability to Collect Data & Evaluate Success <small>(Greatest ability = 4, Least = 1)</small>								
	Ability to Observe Behavior <small>(Greatest ability = 4, Least = 1)</small>								
Total:									

Note: Three of these criteria (Saturation, Organizational Effort & Controversial) are scored in the opposite order than the others.

Including all Criteria: You need not score all criteria – e.g., you may choose to focus on only one aspect of “Future Impact.”

Criteria Weighting: You can create a multiplier to weight certain criteria as more important. For example, if “Impact Potential of Behavior Change” is more important than “Potential to Scale” you could multiply your Impact Potential of Behavior Change score by 2.


Selecting the Target Behaviors: The behaviors with the highest scores are the top candidates for your campaign. Behaviors with the lowest scores may be the most difficult and least successful to target.

Which two behaviors have the highest score? _____ & _____

Worksheet 4: Behavioral Sequence + Barriers and Motivators of Behavior

- Use this worksheet to write out the behavioral sequence leading to the desired outcome-producing behavior. Then, use the rows above each behavior to list the potential motivators that might drive the audience to do the behavior. Use the rows below each behavior to list the barriers that may prevent the audience from doing the behavior.
- Keep these potential motivators and barriers in mind when considering potential interventions based on the BEHAVIORAL Building Blocks™.

Behavior Sequence, Drivers & Deterrents



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Behavior Sequence					Outcome Producing Behavior
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					Barriers to each step in sequence

Drivers-to-Interventions Brainstorming



Target Audience:	
Specific Target Behavior:	
Drivers	Intervention Ideas
Audience's Barriers, Benefits, & Motivators	How can you address each driver?
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Steps for Designing a Competition

1. Decide on your goal, target audience, and target behaviors.

- See [Part 1: Selecting and Studying Your Audience and Behavior](#).

2. Decide whether to reward specific behaviors or outcomes.

- **Specific behavior:**
 - Best if the audience is unsure of how to make reductions.
 - People can compete to accomplish the specific behavior the fastest, the best, or the most.
 - Examples: giving up desktop printers, submitting assignments electronically, not printing.
- **Outcome based:**
 - Best if the audience is the expert.
 - Reduce paper consumption by 10%.
 - People can compete to come up with the best or most creative reduction method.
 - Departments can compete to achieve the reductions first using a method chosen by them.
- See [BENEFITS](#).

3. Choose your metrics of success.

- What can you measure? Which metrics are most meaningful to you?
- Reams of paper used or purchased in a semester.
- Number of pages printed.
- Number of pages saved.
- Number of print credit pages left unused.
- Amount of paper reused as scrap.
- Number of desktop printers remaining.

4. Decide who is competing.

- **Make it a group effort:**
 - Having the audience sign up and work in groups can be effective in keeping people motivated and feeling that their actions are making a difference.
 - Groups of friends or colleagues informally form teams.
 - Departments or dorms compete against one another.
 - Green teams from one unit compete against green teams from another
 - Individuals sign up to represent specific labs, departments or groups.
- **Make it an individual effort:**
 - Working in groups is not always feasible, or may not be the best option for achieving your goal.
 - Consider whether you can track behavior at the individual level?

5. Determine rules for entry.

- Ask the following questions:
 - Are individuals entered automatically or do they volunteer?
 - Are participants required to sign up in groups?
 - Will participants be required to list their department or other affiliation?

6. How will you pick winners?

- How many winners will there be? What opportunities will there be to win prizes or titles?
- Multiple prizes helps people feel they have a chance to win at least one prize.
- Be inclusive of a variety of skills, abilities, and actions. In addition to paper reductions, reward creative paper-saving solutions and recruiting friends to participate.
- See [BENEFITS](#).

7. Use intrinsic and extrinsic motivators.

- See [BENEFITS](#).
- Examples of motivators include:
 - **Social rewards:** a leaderboard for most paper saved
 - **Intangible rewards:** donate money saved by reducing consumption to a scholarship
 - **Tangible rewards:** prizes don't need to be large (i.e. a token of participation).
 - **Supersize rewards:** Use lottery systems if allowed; a few larger prizes are more motivating than many small prizes.

8. Market the competition.

- Use messaging that utilizes various BEHAVIORAL Building Blocks™: highlight the benefits of paper reduction, make the content relatable, make marketing materials vivid, etc.

9. Provide feedback.

- How are individuals or teams performing compared to others?
- How much progress have they made in relation to their goal?
- Use a public display of real-time standings (ex. a thermometer display showing progress toward the reduction goal).
- See [LASTING](#).

Additional Resources

Relevant websites:

Canopy

Canopy harnesses the purchasing power of forest product customers to advance conservation of forests. It maintains the [EcoPaper Database](#), which paper purchasers can use to source more environmentally friendly paper.

Environmental Paper Network

EPN is a network of environmental organizations working to transform the paper industry. It maintains the [Paper Calculator](#), which converts paper use data into other metrics, like water used, energy consumed, or number of equivalent trees.

Environmental Association for Universities and Colleges (EAUC)

EAUC is an association of educational institutions in the UK and Ireland that are working toward sustainability. It offers a [guide to reducing paper use at higher education institutions](#).

ForestEthics

[Business Guide to Paper Reduction](#) by Heather Sarantis. A paper reduction campaign toolkit that provides tips, resources, and case studies related to paper reduction.

StopWaste

StopWaste is a public agency in Alameda County, California that offers tips, resources, and case studies for reducing waste. It has published the [steps Alameda County followed to pilot an office paper waste reduction campaign](#).

Additional case studies and research:

[Faculty Views on the Teaching Tools of Tomorrow](#)

Results from a national survey of college professors' perceptions of digital textbooks and teaching tools.

[U.S. EPA, Region 6: Printer Consolidation Case Study, 12/13/2011](#)

A real world example of printer consolidation and the impacts on cost, paper use, and energy use. Discusses desktop printing.

[Ricoh, Pharos, Xerox](#)

Network provider insights on organizations switching to shared/networked printing devices. Can be filtered for case studies on higher education institutions.

[Alameda County's desktop printer reduction project](#)

The county's pilot project reduced the number of desktop printers in the office by 70%.