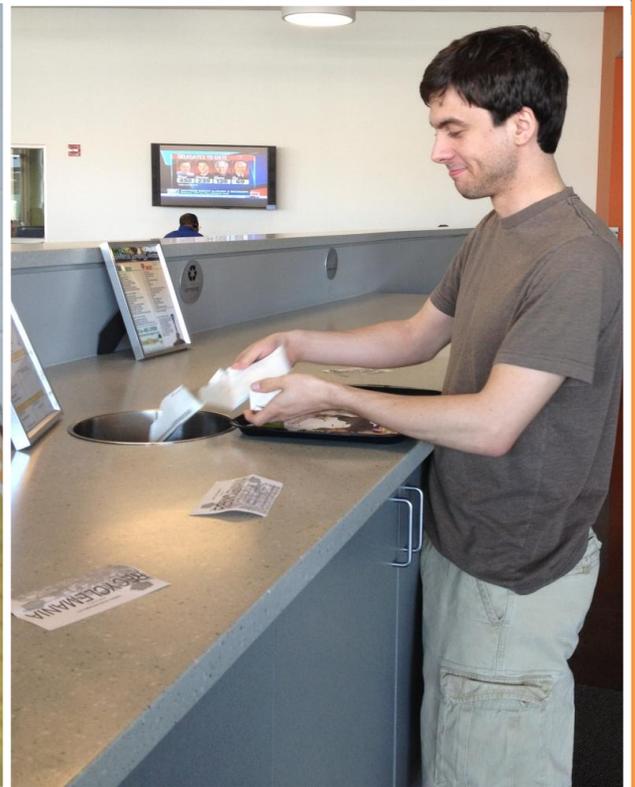


# Guide to a More Effective RecycleMania: Using Behavior Change Strategies to Motivate Students to Waste Less and Recycle More



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## I. Introduction and Overview

The goal of this guide is to give you the tools to engage and motivate students to recycle through the RecycleMania Tournament. By utilizing the behavior change strategies discussed below, you will be more likely to create meaningful engagement with students and help them develop a habit of recycling—one that will have the potential to continue beyond the eight-week competition.

### Why Behavior Change?

Individual behaviors can have measurable and significant environmental impacts.<sup>i,ii</sup> Building effective programs that increase the level of environmentally responsible behaviors, such as recycling, can be an important part of creating positive environmental change.

### What is, and what *isn't*, Behavior Change?

Behavior is a distinct construct from knowledge, awareness, and concern. While people express concern about environmental issues, they continue to behave in ways that are harmful to the environment.<sup>iii,iv</sup>

- Informational programs, such as those based on simply handing out pamphlets or posting flyers, have a low likelihood of influencing behavior.<sup>v,vi,vii,viii,ix</sup>

Behavior change is complex; there are many motivators and barriers to behavior that vary based on the individual and the particular behavior.<sup>x,xi,xii</sup> Therefore, it is important to use multiple behavior change strategies to target different motives. “Know your audience”—what motivates them to recycle? What discourages them from recycling?

- For example, one person may be motivated to recycle because all of his or her friends also recycle; another may only recycle when it is convenient, such as when there is a recycling bin nearby.

By surveying, interviewing, or using focus groups to learn what motivates your audience to recycle, you will be much more capable of designing an effective behavior change program. For more information on this topic, visit: [www.environmentalmotivation.com/strategy-guide](http://www.environmentalmotivation.com/strategy-guide).

## II. Competition as a Behavior Change Tool

The RecycleMania Tournament uses competition to motivate recycling and waste reduction behaviors among college students. It seeks to create an atmosphere in which students across the U.S. and Canada strive to recycle more, and waste less, than students at other schools.

There are two types of competition: *direct competition*, or comparing one’s own performance directly to another’s, and *indirect competition*, or comparing one to oneself. The pros and cons of both are discussed below.

*How do we know competition works?*

- Research suggests that competitions can be effective in promoting environmentally responsible behavior.<sup>xiii,xiv,xv</sup>
- They have been especially popular and effective in college settings. Prior to 2010, there have been more than 150 dorm energy use competitions; these competitions reported median energy reductions of 22% and a maximum energy use reduction of 80%.<sup>xvi</sup>
- Dorms provide an interesting case study for recycling competitions because there is no economic incentive for students to recycle, as they do not directly pay waste management bills or receive a refund for recycling.<sup>xvii</sup>

### ***Tips for Using Competition:***

- If you use direct competition, **be careful not to overemphasize the need to win**—doing so may compromise participants’ feelings of self-esteem if they do not win (See *Social Norms*).
  - Direct competition may reduce intrinsic interest because of demands to perform, a threat to self-esteem, and greater social pressure.<sup>xviii</sup> Conversely, direct competition may compel a group to form a strong identity, which may increase social support and performance of recycling behavior.<sup>xiv</sup>
- Throughout the competition, frequently **provide students their own results as well as those of others**, allowing them to monitor their own progress and their performance compared to others<sup>xiii,xv</sup> (See *Feedback*).
  - Participants may respond more positively to indirect competition, which causes less stress than direct competition, and is less likely to undermine personal interest.<sup>xviii</sup>
- **Balance a competitive environment with one that is encouraging**—participants should feel they have a chance to win due to their own skill or ability, and the emphasis on competition should not cause one to feel threatened or discouraged.
- When advertising your program, **emphasize its elements of competition**. Competitions are common and easily understood,<sup>xvi</sup> further strengthening their use as a behavior change tool.
- **Ensure that all competitors have the opportunity to win**, such as by making sure competing schools have the same infrastructure capacities or that the results are evaluated in a way that takes into account inequalities.
  - If all other competitors are clearly superior, discouragement and reduced performance may result.<sup>xiii,xv</sup>
- If using mini-competitions within your campus (such as between dorms or buildings), **encourage communication on “best recycling practices”** (what’s working, what isn’t) between high- and low-achieving groups.
  - Pitting people with the same goal against each other can reduce their ability to work together and eliminate gains that could result from doing so. Participants may also try to hurt a competitor’s achievement rather than improve their own.<sup>xiii,xv</sup>

- Rather than reward all correct behavior, **distribute a few smaller rewards** to the top performers during the competition. People are more likely to recycle when they are given a small chance at winning a big reward rather than frequently given smaller cash awards or coupons.<sup>xix</sup>

### III. Behavior Change Strategies

In addition to the above elements of competition, there are a number of behavior change strategies that are effective at motivating environmentally responsible behaviors, such as recycling.

Behavior change strategies are techniques that provide information and motivation for behavior change. The next section of this guide will provide you with tips for implementing these strategies to result in more effective programs, and in particular, competition-based programs like RecycleMania.

- A. **EXTRINSIC REWARDS:** Using incentives that are external to the individual, (such as money, food, or prizes,) to motivate behaviors or make high-cost behaviors more economically feasible



*University of Pennsylvania students hand out reusable water bottles with recycling information.*

*How do we know this works?*

Research suggests that economic rewards for recycling may make recycling more appealing.<sup>xix</sup> In addition, a meta-analysis of over 100 studies shows that extrinsic rewards can have a positive role in creating environmental behavior change.<sup>xx</sup>

### Tips for Using Extrinsic Rewards:

- If your audience has misperceptions about recycling, or is disinterested in or opposed to recycling, **provide a small reward at the beginning of the competition** to encourage participation.
- Rewards can encourage individuals to try out new behaviors that they were otherwise reluctant to try.<sup>xxi</sup> Rewards for recycling may also result in greater behavior change among non-recyclers than among current recyclers.<sup>xix</sup>
- **Make sure rewards are not too large or valuable.** A small reward that promotes self-determination or competence may increase intrinsic motivation.<sup>xviii</sup>
  - Receiving a reward for a behavior may cause a decrease in intrinsic motivation,<sup>xi,xx,xxii,xxiii</sup> particularly when the reward is large or valuable.<sup>xxiv</sup>
  - Rather than indiscriminately issuing rewards for participation, **link rewards to performance**<sup>xviii,xx</sup>—for example, provide rewards to dorms that increased their recycling from one week to the next, rather than rewarding all dorms that recycled.
- **Offer a pro-social reward**, such as a donation to charity or a local school—doing so rewards a participant for doing the right behavior while also preserving their sense of self as an altruistic person.
  - A pro-social reward can prevent a decrease in intrinsic motivation by allowing an altruistic alternative to an individual reward.<sup>xix, xxii</sup>
- **Reward students for doing the right behavior**, rather than punishing them for doing the wrong behavior.
  - Rewards are more effective than punishments because rewards are associated with positive affect and attitudes while punishments may cause negative associations and resentment towards the behavior<sup>xii,xxv,xxvi</sup> (See *Positive Emotional States*).

### B. FEEDBACK: Providing information about the level of success or need for improvement in response to a particular behavior

#### *How do we know this works?*

- A review of 38 studies involving energy conservation shows that providing feedback can increase awareness of energy consumption and reduce consumption by about ten percent.<sup>xxvii</sup>
- Posting a feedback sign to encourage paper recycling increased pounds of paper recycled by 76.7% above the baseline period; when the sign was removed during the one-week follow up period, recycling remained 48.4% above the baseline.<sup>xxviii</sup>

	THIS WEEK (POUNDS/PERSON)	TO DATE
<b>OHIO</b>	2.21	13.48
Kent State	2.04	11.51
W SU	1.85	6.04
Western MI	1.48	4.61
Toledo	1.16	7.99
Buffalo	1.11	5.11
Central MI	1.07	4.78
Temple	.74	2.79
Miami	.67	2.79
Ohio State	.61	2.79

*A sign at Ohio University lets students know they're ahead of the competition.*

### *Tips for Using Feedback:*

- **If you have a particularly low-performing school or a low-performing building, provide feedback** to motivate them.
    - Feedback works best for those who are performing well below a set goal,<sup>xxix</sup> such as very high producers of waste. If individuals are *above* a set goal, giving feedback that they are doing better than the norm can result in a decrease in behavioral performance<sup>xxx</sup> (See *Social Norms*).
  - **Provide individual feedback rather than group feedback** when possible.
    - Group feedback, while generally easier to implement than individual feedback, may make it difficult for individuals to assess themselves and may hinder their sense of responsibility for their own actions.<sup>xxx</sup>
  - **Give feedback frequently and immediately after the behavior** is performed.<sup>xxix</sup>
  - **Make feedback as personalized as possible.**<sup>xxvii</sup> Try holding mini-competitions between buildings, dorms, and/or halls, allowing you to provide participants with more individualized feedback.
  - When using feedback to compare an individual to others, **compare similar or closely related social groups.**<sup>xxxi</sup> For example, compare the freshman dorms to other freshman dorms, not senior dorms.
  - **When reporting results to low-performing schools or buildings, focus on their improvements** (“You recycled 25% more than you did last week!”) rather than their weaknesses (“You recycled 10% less than the rest of the dorms.”) Feedback works best, and is often perceived as more credible, when it is framed positively.<sup>xxx</sup> (See *Positive Emotional States*.)
  - **Make sure the feedback is clear and concrete**<sup>xxvii</sup> **and given in units that make sense**<sup>xxxii</sup> to students.  
**Example:** tell students *how much more* they recycled than another school rather just saying they recycled “a large amount”.<sup>xxxiii</sup>
- C. POSITIVE EMOTIONAL STATES:** Appealing to positive emotions, such as hope and enjoyment, as a way to change individuals’ behaviors

### *How do we know this works?*

- Appealing to positive emotional states may be more effective than appealing to negative emotions because positive messaging tends to be perceived as more credible<sup>xxx</sup> and result in people behaving more creatively and being more open to new thoughts and actions.<sup>xxxiv</sup>

- In a study on curbside recycling, survey respondents indicated that they preferred rewards to penalties as incentives for recycling; being penalized for not recycling did not cause them to take recycling more seriously.<sup>xix</sup>

*Tips for Using Positive Emotional States:*

- **Avoid fear tactics or punishment**, such as fines for not recycling or messages about a negative environmental future that do not offer any hope.
  - Appealing to negative emotions can lead to skepticism, feelings of helplessness, and decreased intention to act.<sup>xxvi,xxxv</sup> Negative emotions have also been shown to limit individuals to think only short term and be less able to plan for the future.<sup>xxxvi</sup>
- **Give positive feedback on recycling behaviors**—this can result in feelings of pride or accomplishment that spur further behavior.<sup>xxxiii</sup> Environmentally responsible behaviors should be framed so that they encourage positive feelings while discouraging negative feelings.<sup>xxxvii</sup>
- **Do not punish individuals for not performing a behavior well or failing to meet a behavioral goal**—a neutral reaction may be more effective at sustaining interest and engagement in a program.<sup>xxv</sup>
  - People may have legitimate reasons for not performing a behavior and punishing them for slip-ups may be perceived as unfair or harsh, causing negative reactance.<sup>xxv, xxxviii</sup>
- **Keep social and recreational events light-hearted and fun.** Evoking positive emotions during recreational experiences has been shown to have positive effects on self-image, performance, and pro-social behavior.<sup>xxxix</sup>

**D. PROMPTS:** Short, simple reminders to perform a desired behavior, such as a sign that reads “Recycle Here” with photos of what can and cannot be recycled.



*Chalk art at San Diego State University reminds students to recycle beverage containers.*

*How do we know this works?*

In one study, distributing flyers urging shoppers to purchase returnable bottles resulted in a 15% increase of returnable bottle purchases. In another study, prompts posted in university restrooms for two to four weeks led to a 54% decrease in the percentage of lights left on.<sup>xl</sup>

### Tips for Using Prompts:

- **Use prompts to break habitual behaviors.** Prompts may be most effective if used to promote a behavior in which the opposite, undesirable behavior is habitual.<sup>xli</sup>

**Example:** a prompt might be used to facilitate remembering to throw plastic water bottles in the recycling bin rather than the trash bin.

- **Ensure that prompts are clear and visible, but not overly obtrusive.**
  - Effective prompts must first capture the attention of the audience.<sup>xl,xlii,xliii</sup> Utilize elements such as large size,<sup>xliii</sup> narrative format, or humor<sup>xliii</sup>, to better capture the attention of your audience.
  - At the same time, be careful not to make prompts too large or invasive. In a study on decreasing water use in locker rooms, signs placed in the middle of the shower area were often knocked them down or defaced, likely because of their obtrusive nature.<sup>xliiv</sup>
- **Locate prompts close to where the desired behavior takes place** so that once the prompt is noticed, the action can be taken immediately.<sup>xl</sup>
- **A message encouraging one to recycle should not be abstract**, such as a sign reading “Save the Environment”; rather, it should be specific to the desired behavior,<sup>xlii</sup> such as “Reduce Waste: Recycle your paper here.”
- **Keep prompts short, easy to understand, and relevant to audience**,<sup>xlii</sup> such as a prompt with photos of recyclable materials placed above a bin.
- **Have a trustworthy source** such as the environmental club, elected student leaders, or administration **sponsor your prompts**.<sup>xl</sup>
- **Consider your audience’s motives for doing a behavior** when designing the message.<sup>xxx</sup> Messages will be more effective when tailored to the most salient motivations of the target population.<sup>xl</sup>

**Example:** a prompt using a social motive could read, “Recycle: 80% of the students in this dorm do it!”



**A clear, simple sign on Bentley bins shows students what is recyclable. The University’s official logo also lends authority to the prompt.**

**E. SOCIAL NORMS:** Demonstrating the importance of a behavior by describing it as common (*descriptive norms*) or socially acceptable (*injunctive norms*)

*How do we know this works?*

- A study comparing the effectiveness of neighborhood leaders, prompts, and pamphlets at changing recycling behavior found that one-third of households with neighborhood leaders recycled regularly, while only one-fifth of households that received prompts or pamphlets recycled regularly.<sup>xlv</sup>
- Research found that three public service announcements designed to convey that recycling was prevalent, acceptable, or prevalent *and* acceptable were all found to increase intent to recycle and result in up to a 25% net increase in recycling tonnage compared to the control group.<sup>xlvi</sup>

*Tips for Using Social Norms:*

- **If recycling isn't common at your school**, do not publicize this fact. Instead, **focus on positive social norms**<sup>xlvii</sup>—for example, publish survey results that show that most students or faculty support recycling, or emphasize that important people in your audience (such as popular students or well-known faculty members) recycle.
  - Emphasizing that an undesirable behavior is common can backfire, and actually result in more, not less action<sup>xlvii</sup>; people do not want to be in the minority, or may not see a reason to care about taking that action if no one else does.
- Try to **avoid peer pressure and allow people to easily say “no”** to the request if they do not want to participate.
  - Social norms that are overly strong can make people feel coerced or manipulated into doing a behavior; this may result in refusal or negative associations with that behavior.<sup>xlviii</sup>
- Ensure that your program's messages **align descriptive norms with injunctive norms**.<sup>xlvii,xlix</sup> For example, pair a message saying that the administration values recycling with an image of a student recycling so the message coincides with the socially normal behavior.
- Research supports using the following factors to encourage a positive response to program elements involving interaction between participants and non-participants,<sup>xxxviii,xlviii</sup> such as having participating students asking other students to recycle plastic bottles or paper:
  - **Social validation:** Individuals often decide what to do in a situation by observing what others do.  
**Example:** Make recycling a prominent part of sports events or other school-wide events to make it more visible.

- **Liking:** Individuals want to say “yes” to and help out people they like. Therefore, requests to try a new behavior will be more effective if they come from well-liked friends and family, or by a person who is perceived as attractive, similar, or friendly, such as a person with similar interests.

**Example:** Take advantage of charismatic people or participants’ social connections.

- **Authority:** Individuals are more influenced by people they consider powerful, wise, or smart.

**Example:** Have an influential student or popular professor model the target behavior, such as by creating an online video showing that person recycling.

- **Scarcity:** Individuals are more inclined toward things that are hard to get or limited to a certain group.

**Example:** Make appealing rewards available only to top recyclers to motivate behavior.

## REFERENCES

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- <sup>i</sup> Dietz, T., Clausen, J.C., Filchak, K.K. (2004). Education and changes in residential nonpoint source pollution. *Environmental Management* 32(5), 684-690.
- <sup>ii</sup> Dietz, T., Gardner, G.T., Gilligan, J., Stern, P.C., Vandenberg, M.P. (2009). Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions. *Proceedings of the National Academy of Sciences*, 106(44), 18452-18456.
- <sup>iii</sup> McClafferty, J.A. (2001). A survey of Chesapeake Bay watershed residents: Knowledge, attitudes and behaviors towards Chesapeake Bay watershed water quality issues. Conservation Management Institute. Human Dimensions Division. College of Natural Resources. Virginia Polytechnic Institute and State University. Retrieved from: [http://www.chesapeakebay.net/content/publications/cbp\\_14321\\_14323.pdf](http://www.chesapeakebay.net/content/publications/cbp_14321_14323.pdf).
- <sup>iv</sup> Opinion Works. (2011). *Marylander's Attitudes about Environmental Stewardship: Results from our Statewide Survey*. Annapolis, MD: S. Raabe.
- <sup>v</sup> Barrett, M. J. (2006). Education for the environment: Action competence, becoming, and story. *Environmental Education Research*, 12(3-4), 503-511.
- <sup>vi</sup> Geller, E. S. (1981). Evaluating Energy Conservation programs: Is verbal report enough? *Journal of Consumer Research* 8, 331-335.
- <sup>vii</sup> Kollmuss, A. & Agyeman, J. (2002). Mind the Gap: why do people act environmentally and what are the barriers to environmental behavior? *Environmental Education Research* 8(3), 239-260.
- <sup>viii</sup> McKenzie-Mohr, D. (2011). *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing*. Gabriola Island, British Columbia: New Society Publishers.
- <sup>ix</sup> Owens S. (2000). Engaging the public: information and deliberation in environmental policy. *Environment and Planning A* 32(7), 1141-1148.
- <sup>x</sup> Allcott, H. & Mullainathan, S. (2010) Behavior and energy policy. *Science*, 327, 1204-1205.
- <sup>xi</sup> De Young, R. (2000). Expanding and evaluating motives for environmentally responsible behavior. *Journal of Social Issues*, 56(3), 509-526.
- <sup>xii</sup> Steg, L. & Vlek, C. (2009) Encouraging pro-environmental behaviour: An integrative review and research agenda, *Journal of Environmental Psychology* 29, 309-317.
- <sup>xiii</sup> Bainbridge, J.R. (1999) Motivation through competition? *Army Logistician* 31(5), 20-21.
- <sup>xiv</sup> Grevet, C., Mankoff, J., & Anderson, S. D. (2010). Design and evaluation of a social visualization aimed at encouraging sustainable behavior. In *System Sciences (HICSS), 2010 43rd Hawaii International Conference* (pp. 1-8). IEEE.
- <sup>xv</sup> Nalebuff, B.J. & Stiglitz, J.E. (1983). Prizes and Incentives: Towards a General Theory of Compensation and Competition. *The Bell Journal of Economics* 14(1), 21-43.
- <sup>xvi</sup> Brewer, R. S., Lee, G. E., & Johnson, P. M. (2011, January). The Kukui Cup: a dorm energy competition focused on sustainable behavior change and energy literacy. In *System Sciences (HICSS), 2011 44th Hawaii International Conference on* (pp. 1-10). IEEE.

- 
- <sup>xvii</sup> Petersen, J.E., Shunturov, V., Janda, K., Platt, G., & K. Weinberger. (2007). Dormitory residents reduce electricity consumption when exposed to real-time visual feedback and incentives. *International Journal of Sustainability in Higher Education* 8: 16-33.
- <sup>xviii</sup> Tripathi, K.N. (1992) Competition and Intrinsic Motivation, *Journal of Social Psychology* 132(6), 709-715.
- <sup>xix</sup> Shaw, P.J. & Maynard, S.J. (2008). The potential of financial incentives to enhanced householders' kerbside recycling behaviour. *Waste Management* 28, 1732-1741.
- <sup>xx</sup> Eisenberger, R. & Cameron, J. (1996). Detrimental Effects of Reward: Reality or Myth? *American Psychologist* 51(11) 1153-1166.
- <sup>xxi</sup> Steg, L. & Vlek, C. (2009) Encouraging pro-environmental behaviour: An integrative review and research agenda, *Journal of Environmental Psychology* 29, 309-317.
- <sup>xxii</sup> Bénabou, R. & Tirole, J. (2006). Incentives and pro-social behavior. *The American Economic Review*, 96(5), 1652-1678.
- <sup>xxiii</sup> Schwartz, B. (1990). The creation and destruction of value. *American Psychologist*, 45, 7-15.
- <sup>xxiv</sup> Thøgersen, J. (1996). Recycling and morality: A critical review of the literature. *Environment and Behavior*, 28(4), 536-558.
- <sup>xxv</sup> Consolvo, S., McDonald, D. W., & Landay, J. A. (2009, April). Theory-driven design strategies for technologies that support behavior change in everyday life. In *Proceedings of the 27th international conference on Human factors in computing systems* (pp. 405-414). ACM.
- <sup>xxvi</sup> Hastings, G., Stead, M., & Webb, J. (2004). Fear appeals in social marketing: Strategic and ethical reasons for concern. *Psychology & Marketing*, 21(11), 961-986.
- <sup>xxvii</sup> Darby, S. (2001). Making it obvious: Designing feedback into energy consumption. In P. Bertoldi, A. Ricci, & A. deAlmeida (Eds.), *Energy Efficiency in Household Appliances and Lightly*. (pp. 685-696). Berlin: Springer.
- <sup>xxviii</sup> Katzev, R. & Mishima, H.R. (1992). The use of posted feedback to promote recycling. *Psychological Reports*, 71(1), 259-264.
- <sup>xxix</sup> Abrahamse, W., Steg, L., Vlek, C., & Rothengatter, T. (2005). A review of intervention studies aimed at household energy conservation. *Journal of Environmental Psychology*, 25, 273-291.
- <sup>xxx</sup> De Young, R. (2011, February) Prompting Behavior Change. NRE 561 Psychology of Environmental Stewardship. School of Natural Resources and Environment, University of Michigan: Ann Arbor, MI.
- <sup>xxxi</sup> Lewis, M. A. & Neighbors, C. (2006). Social Norms Approaches Using Descriptive Drinking Norms Education: A Review of the Research on Personalized Normative Feedback. *Journal of American College Health* 54(4), 213-218.
- <sup>xxxii</sup> Ilgen, D.R., Fisher, C.D., and Taylor, S. (1979). Consequences of individual feedback on behavior in organizations. *Journal of Applied Psychology*, 64(4), 349-371.
- <sup>xxxiii</sup> Kelly, M., Little, S., Phelps, K. & Roble, C. (2012). *Strategies for motivating watershed stewardship: A guide to research-based practices* (unpublished document). School of Natural

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Resources and Environment, University of Michigan: Ann Arbor, MI. Retrieved from: [www.environmentalmotivation.com/strategy-guide/](http://www.environmentalmotivation.com/strategy-guide/)

<sup>xxxiv</sup> Frederickson, B.L. (1998). What good are positive emotions? *Review of General Psychology*, 2(3), 300-319.

<sup>xxxv</sup> Feinberg, M. & Willer, R. (2011). Apocalypse soon? Dire messages reduce belief in global warming by contradicting just-world beliefs. *Psychological Science*, 22(1), 34-38.

<sup>xxxvi</sup> Carter, D.M. (2011). Recognizing the role of positive emotions in fostering environmentally responsible behaviors. *Ecopsychology*, 3(1), 65-69.

<sup>xxxvii</sup> Vining, J. & Ebreo, A. (2002). Emerging theoretical and methodological perspectives on conservation behavior. In R. Bechtel & A. Churchman (Eds.), *The New Handbook of Environmental Psychology* (pp. 541-558). New York, NY: Wiley.

<sup>xxxviii</sup> Cialdini, R.B. & Goldstein, N.J. (2004). Social Influence: Compliance and Conformity. *Annu. Rev. Psychol.* 55, 591-621.

<sup>xxxix</sup> Farber, M.E. & Hall, T.E. (2007). Emotion and environment: Visitors' extraordinary experiences along the Dalton Highway in Alaska. *Journal of Leisure Research*, 39(2), 248-270.

<sup>xl</sup> Katzev, R. & Johnson T. (1987) "Antecedent communications", in Promoting energy conservation: an analysis of behavioral research. Boulder, CO: Westview Press. 23-52.

<sup>xli</sup> Kwak, L., Kremers, S.P.J., van Baak, M.A., and Brug, J. (2007). A poster-based intervention to promote stair use in blue- and white-collar worksites. *Preventative Medicine* 45, 177-181.

<sup>xlii</sup> Ester, P. & Winett R.A. (1981-82). Toward more effective antecedent strategies for environmental programs. *Journal of Environmental Systems* 11(3), 201-221.

<sup>xliii</sup> Hall, T. E., Ham, S. H. & Lackey, B. K. (2010). Comparative evaluation of the attention capture and holding power of novel signs aimed at park visitors. *Journal of Interpretation Research* 15 (1), 15-36

<sup>xliv</sup> Aronson, E. & O'Leary, M. (1982-83). The relative effectiveness of models and prompts on energy conservation: A field experiment in a shower room. *Journal of Environmental Systems* 12 (3). 219-224.

<sup>xlv</sup> Hopper, J.R., & Nielsen, J.M. (1991). Recycling as altruistic behavior: Normative and behavioral strategies to expand participation in a community recycling program. *Environment and Behavior* 23(2), 195-220.

<sup>xlvi</sup> Cialdini, R.B. (2003) Crafting Normative Messages to Protect the Environment. *Current directions in psychological science*, 12(4), 105-109.

<sup>xlvii</sup> Schultz, P. W., Nolan, J. M., Cialdini, R. M., Goldstein, N. J. & Griskevicius, V. (2007). The Constructive, Destructive, and Reconstructive Power of Social Norms. *Psychological Science* 18(5), 429-434.

<sup>xlviii</sup> Cialdini, R.B. (2001). *Influence: Science and Practice*. Boston: Pearson.

<sup>xlix</sup> Goldstein, N. J. & Cialdini, R. (2010). Managing Normative Influences in Organizations. In D. De Cremer, R. van Dick, & J. K. Murnighan (Eds.), *Social Psychology and Organizations* (67-85).