

Food Waste Prevention Resource Guide Series

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August 2023



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FOOD WASTE PREVENTION RESOURCE GUIDE SERIES: DATE LABELS



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Up to **40% of the food supply** is wasted in the United States. Reducing this staggering number and meeting **national goals** to reduce food waste requires consumers to make meaningful changes to how they buy, store, prepare, and consume food. Yet, food waste remains off the radar for many consumers. According to a **2019 study**, one in five people never consider food waste in their decision-making while eating at home or grocery shopping. More than two-thirds of people never consider food waste while eating out. Providing effective education is a proven strategy to help address this lack of awareness. Consumer education **has the potential** to divert an additional 3.22 million tons of wasted food, prevent 18.7 million metric tons of CO₂ emissions, and provide a financial net benefit of \$15.8 billion.

Increased consumer attention to the issue may also push businesses to operate more responsibly. **The Nashville Food Waste Initiative** (NFWI) aims to provide food waste education to everyone in Nashville, from business owners and staff to educators to students. Originally developed in 2015 as a pilot project by NRDC, NFWI is now led by **Urban Green Lab** (UGL) in partnership with the **Environmental Law Institute** (ELI). UGL offers trainings that include information on how to reduce food waste in classrooms, households, and workplaces.

ELI and UGL collaborated to create the Food Waste Prevention Resource Guide Series to help expand food waste content in UGL trainings and provide ready-to-use resources for other sustainability non-profits or similar organizations creating their own trainings or curriculums.

The Resource Guide Series highlights five **proven** food waste prevention strategies: packaging design and use, date labels, meal prepping and kits, storage and freezing, and plate and portion size. Each Resource Guide covers one of the five topics, includes key tips as well as a list of helpful resources, and is organized into three charts tailored to a different audience—classrooms, households, and workplaces. Some resources appear across multiple charts.

Organized by both resource type (columns) and topic (rows), the Resource Guide Series provides a straightforward way for sustainability educators to find vetted content for building effective, fact-based trainings.

There are no consistent federal standards for food date labels, with the exception of baby formula. This lack of standardization means some labels, such as “Best if Used by,” refer to peak freshness of food (as estimated by the manufacturer), not food safety—which can confuse consumers and cause them to throw out edible food.

NOTES: The Resource Guides provide targeted resources on specific food waste prevention strategies. More free information on food waste prevention, reduction, and recycling, including general overviews, are widely available such as from **USDA**, **NRDC**, **ReFED**, **WRAP** and **World Wildlife Fund**. Additionally, though the Resource Guides largely compile free resources from governments, NGOs, and academics, note that there are also private and/or paid resources that can provide useful information on food waste prevention (e.g., Dana Gunders’ **Waste-Free Kitchen Handbook**, **LeanPath**).



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DATE LABELS: CLASSROOMS

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The table below compiles free resources for teaching classrooms about sustainable choices to reduce food waste through interpreting date labels.



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KEY TAKEAWAYS FOR DATE LABELS IN CLASSROOMS

When teaching about date labels, educators should be able to:

- ▶ Explain that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Explain how lack of date label standardization and confusion around date label interpretation can lead to food waste.
- ▶ Articulate why date labels can be confusing and clarify date label terminology.
- ▶ Share how students can tell if food is spoiled and no longer safe to eat by using their senses, including looking for changes in appearance, smell and texture (e.g., moldy bread or lumpy milk).
- ▶ Educate students about how they can engage with elected officials and other community members to encourage sustainable practices such as reducing food waste.
- ▶ Help students understand the impacts of their own actions and how they can discuss and help implement sustainable practices at home.

“Training educators to bring a sustainable lens to the classroom is crucial for culture change in a community. If we want to push the dial for sustainability in a meaningful way, we need to ensure educators have the confidence and tools to deepen the standards they are already teaching while connecting to the real world outside of the classroom.”

- CHRISTINA LANGONE, DIRECTOR OF EDUCATION, URBAN GREEN LAB



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Key Resources on Food Waste

Lesson Plans & Classroom Activities

WWF, [*Be a Food Waste Warrior*](#) (n.d.): K-12 lessons, activities, and resources that educators can use to teach about the environmental impacts of food waste—organized by age group.

Toolkits & Similar Resources

U.S. EPA, [*Too Good to Waste Implementation Guide and Toolkit*](#) (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

ReFED, [*Resources & Guides*](#) (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

Reports & Articles

NRDC, [*Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*](#) (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Rubicon, [*Food Waste in America: Facts and Statistics*](#) (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, [*The US Has a Food Waste Problem and It's Getting Worse*](#) (2023): Article that provides an overview of food waste trends and key numbers.

Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.



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Toolkits & Similar Resources

USDA, [*Food Product Dating*](#) (n.d.): Guide that provides an explanation of food product dating.

Reports & Articles

Dana Gunders, Business Insider, [*How to Tell if Food Is Actually Safe to Eat \(Excerpted from “Waste-free Kitchen Handbook”\)*](#) (2015): Article that explains common indications of food aging and spoilage.

NRDC, [*The Dating Game: How Confusing Food Date Labels Lead to Food Waste in America*](#) (2013): Policy brief that examines the historical impetus for placing dates on food, relevant federal law, and connection to food waste.

Shaheen Hosany, The Conversation, [*How Children are Helping to Make Their Families More Eco-Friendly - New Research*](#) (2022): Article that explains how sustainability education at school leads children to develop and implement sustainable practices at home.

Creative Media

Harvard Law School Food Law and Policy Clinic, [*EXPIRED? Food Waste in America*](#) (2016): Film and corresponding discussion guide that reveals the consequences of patchwork date labeling regulations.

ABC News, [*New Plan to Change Food Labels*](#) (2023): Video that explains the case for standardized food date labeling.





All Ages

Lesson Plans & Classroom Activities

WWF, [*The No Food Waste Game*](#) (2020): Educational game for students that challenges players to think of different ways to prevent food waste generally.

Toolkits & Similar Resources

USDA, [*FoodKeeper*](#) (n.d.): Guide that lists by when foods should be consumed.

Reports & Articles

The Scholarship System, [*5 Ways Students Can Get Involved in Politics \(And Why They Should\)*](#) (2023): Blog that explores ways students can be politically active and engage with elected officials and community members.



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	Lesson Plans & Classroom Activities	Reports & Articles	Creative Media
Elementary School	<p>Wonderopolis, <i>How Are Expiration Dates for Food Determined?</i> (n.d.): Article and activities that show how date labels are determined and can contribute to food waste.</p> <p>Food Standards Scotland, <i>It's a Date!</i> (n.d.): Classroom activity that educates children ages 7 to 9 about date labels and how to prevent food waste.</p>		<p>Carolyn Beans, TED-Ed, <i>Food Expiration Dates Don't Mean What You Think</i> (2023): Video that explains the history of date labeling, how date labels contribute to food waste, and potential solutions.</p>
Middle School	<p>Wonderopolis, <i>How Are Expiration Dates for Food Determined?</i> (n.d.): Article and activities that show how date labels are determined and can contribute to food waste.</p>	<p>The Scholarship System, <i>5 Ways Students Can Get Involved in Politics (And Why They Should)</i> (2023): Blog that explores ways students can be politically active and engage with elected officials and community members.</p>	<p>Carolyn Beans, TED-Ed, <i>Food Expiration Dates Don't Mean What You Think</i> (2023): Video that explains the history of date labeling, how date labels contribute to food waste, and potential solutions.</p>



Lesson Plans & Classroom Activities

ReFED, [*Test Your Date Label Knowledge*](#) (n.d.): Quiz that tests knowledge on date labels.

ReFED, [*U.S Food Waste Policy Finder*](#) (n.d.): Map that shows date labeling policies and in-depth explanations by state.

Foodspan & John Hopkins Center for a Livable Future, [*Our Wasted Food*](#) (2023): 50-minute lesson plan that teaches students about food waste and potential solutions, with extension projects that will further empower students to take action.

Reports & Articles

University of Connecticut, [*Expiration, Use-By and Sell-By Dates: What Do They Really Mean?*](#) (2019): Article that provides an explanation of date labeling terminology.

Chris Hunt, Food Print, [*Are Food Date Labels a Waste of Food and Money?*](#) (2013): Blog that explains date label regulations and recommendations for improving the system.

Xaq Frohlich, The Washington Post, [*Mandatory Date Labels on Food Could End Confusion and Prevent Food Waste*](#) (2023): Article that analyzes an example of federal legislation on date labels.

Creative Media

Let's Teach, [*How Are Expiration Dates Determined? Are They Just Suggestions?*](#) (2021): Video that explains date labels and how to use your senses to determine if food is spoiled.

Harvard Law School Food Law and Policy Clinic, [*EXPIRED? Food Waste in America*](#) (2016): Film and corresponding discussion guide that reveals the consequences of patchwork date labeling regulations.

DATE LABELS: HOUSEHOLDS

There are no consistent federal standards for food date labels, with the exception of baby formula. This lack of standardization means some labels, such as “Best if Used by,” refer to peak freshness of food (as estimated by the manufacturer), not food safety— which can confuse consumers and cause them to throw out edible food.

The table below compiles free resources for teaching households about sustainable choices to reduce food waste through interpreting date labels.



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KEY TAKEAWAYS FOR DATE LABELS IN HOUSEHOLDS

When teaching about date labels, educators should help households:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Understand how lack of date label standardization and confusion around date label interpretation can lead to food waste.
- ▶ Understand date label terminology and the current federal and state regulations on date labels.
- ▶ Learn to recognize food spoilage using senses instead of relying solely on date labels, including by looking for changes in appearance, smell and texture (e.g., moldy bread or lumpy milk).
- ▶ Be able to name foods that can commonly be kept past the date label (e.g., eggs, packaged breads).
- ▶ Evaluate the impacts of their own actions and how they can adopt more sustainable practices at home and encourage businesses, schools, and other institutions to do the same.

"Educating residents to find simple, sustainable solutions within their homes impacts the entire city. Once sustainability has been integrated into the everyday lives and actions of households, that knowledge then pours into our relationships, neighborhoods, and communities."

- KARISSA HAMPTON, SUSTAINABLE HOUSEHOLDS MANAGER, URBAN GREEN LAB



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Key Resources on Food Waste

<p>Reports & Case Studies</p>	<p>Ready-to-Use Resources</p>	<p>Toolkits & Similar Resources</p>	<p>Articles</p>
<p>NRDC, <i>Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill</i> (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.</p>	<p>ReFED, <i>Resources & Guides</i> (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.</p>	<p>U.S. EPA, <i>Too Good to Waste Implementation Guide and Toolkit</i> (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.</p>	<p>Rubicon, <i>Food Waste in America: Facts and Statistics</i> (2023): Primer on food waste in America that includes statistics and recommendations.</p>
<p>Creative Media</p>			<p>Bloomberg, <i>The US Has a Food Waste Problem and It's Getting Worse</i> (2023): Article that provides an overview of food waste trends and key numbers.</p>
<p>Our Changing Climate, <i>Food Waste Causes Climate Change. Here's How We Stop it.</i> (2020): Video that provides key food waste statistics and possible avenues for change.</p>			



Overview of Date Labels

Reports & Case Studies	Toolkits & Similar Resources	Articles	Creative Media
<p>Carter Weis et al., <i><u>Sustainability, Effects of Date Labels and Freshness Indicators on Food Waste Patterns in the United States and the United Kingdom</u></i> (2021): Study that finds that date labels impact consumers' likelihood to waste food.</p> <p>NRDC, <i><u>The Dating Game: How Confusing Food Date Labels Lead to Food Waste in America</u></i> (2013): Policy brief that examines the historical impetus for placing dates on food, relevant federal law, and connection to food waste.</p>	<p>USDA, <i><u>Food Product Dating</u></i> (n.d.): Guide that explains food product dating.</p>	<p>University of Connecticut, <i><u>Expiration, Use-By and Sell-By Dates: What Do They Really Mean?</u></i> (2019): Article that explains date labeling terminology.</p>	<p>Carolyn Beans, TED-Ed, <i><u>Food Expiration Dates Don't Mean What You Think</u></i> (2023): Video that explains the history of date labeling, how they contribute to food waste, and potential solutions.</p> <p>Vox, <i><u>It's Not You. Date Labels on Food Make No Sense</u></i> (2018): Video that explains the confusion created by date labels and proposed solutions.</p>



Determination of Food Freshness & Safety

Ready-to-Use Resources

USDA, [*FoodKeeper*](#) (n.d.): Guide that lists by when foods should be consumed.

Dana Gunders, Business Insider, [*How to Tell if Food Is Actually Safe to Eat \(excerpted from “Waste-free Kitchen Handbook”\)*](#) (2015): Article that explains common indications of food aging and spoilage.

Articles

Kristin Salaky, [*You Can Still Eat Food After Its Expiration Date if You Keep These Factors in Mind*](#) (2021): Article that explains factors that help determine whether food is safe to eat.

Creative Media

Times Foodie, [*How to Check if the Eggs Are Fresh or Spoiled*](#) (n.d.): Short video that demonstrates how to test whether eggs are spoiled.

Howcast, [*How to Tell if Beef is Spoiled*](#) (n.d.): Short video that demonstrates how to determine if beef is spoiled.



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Reports & Case Studies

NRDC, [*The Dating Game: How Confusing Food Date Labels Lead to Food Waste in America*](#) (2013): Policy brief that examines the historical impetus for placing dates on food, relevant federal law, and connection to food waste.

Toolkits & Similar Resources

U.S. EPA, [*Preventing Wasted Food in Your Community: A Social Marketing Toolkit*](#) (2023): A toolkit that can be used by communities to develop wasted food prevention campaigns (pages 6, 8).

Ready-to-Use Resources

ReFED, [*Test Your Date Label Knowledge*](#) (n.d.): Quiz that tests knowledge on date labels.

ReFED, [*U.S Food Waste Policy Finder*](#) (n.d.): Map that shows date labeling policies and in-depth explanations by state.

Creative Media

Harvard Law School Food Law and Policy Clinic, [*EXPIRED? Food Waste in America*](#) (2016): Film and corresponding discussion guide that reveals the consequences of patchwork date labeling regulations.

ABC News, [*New Plan to Change Food Labels*](#) (2023): Video that explains the case for standardized food date labeling.

Articles

NPR, [*To Reduce Food Waste, FDA Urges ‘Best If Used By’ Date Labels*](#) (2019): Article and audio that informs consumers about federal recommendations to standardize date labels.

Chris Hunt, Food Print, [*Are Food Date Labels a Waste of Food and Money?*](#) (2013): Blog that explains date label regulations and recommendations for improving the system.

Xaq Frohlich, The Washington Post, [*Mandatory Date Labels on Food Could End Confusion and Prevent Food Waste*](#) (2023): Article that analyzes an example of federal legislation on date labels.

Ian Prasad Philbrick & David Leonhardt, The New York Times, [*How to Participate in Politics*](#) (n.d.): Article that offers strategies for individuals to engage with elected officials and community members to enact change.

For more information: Linda Breggin, ELI Senior Attorney (breggin@eli.org) and Todd Lawrence, UGL Executive Director (todd@urbangreenlab.org).



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DATE LABELS: WORKPLACES

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The table below compiles free resources for teaching workplaces about sustainable choices to reduce food waste through interpreting date labels.



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KEY TAKEAWAYS FOR DATE LABELS IN WORKPLACES

When teaching about date labels, educators should help workplaces:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Understand how lack of date label standardization and confusion around date label interpretation can lead to food waste.
- ▶ Understand date label terminology and federal, state, and local regulations for donating food past or near the date indicated on the label.
- ▶ Look for opportunities to partner with other organizations to promote awareness and action on date label standardization.
- ▶ Understand the ability of workplaces to reduce food waste through sustainable choices and knowledge-sharing within their workforce, customer base, and business communities.

"It's a wonderful experience to distill complex scientific information into tangible actions for citizens to digest and utilize in their own way. If an attendee walks away from one of my trainings doing just one or two new sustainable activities that add value to their life, that's a huge win. Connecting people to resources in sustainability that are vetted and accurate is one of the best things we can do to empower them to make long-lasting changes."

- JACQUELINE GOODWIN, ASSISTANT DIRECTOR OF WORKPLACES, URBAN GREEN LAB



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Key Resources on Food Waste

Reports & Case Studies

NRDC, [*Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*](#) (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.

Ready-to-Use Resources

ReFED, [*Resources & Guides*](#) (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

The Chancery Lane Project, [*Reducing Supply Chain Food Waste*](#) (2022): Model contractual clause that can be used by businesses to reduce food waste in their supply chains in order to reduce greenhouse gas emissions and realize financial benefits.

Toolkits & Similar Resources

U.S. EPA, [*Too Good to Waste Implementation Guide and Toolkit*](#) (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

Articles

Rubicon, [*Food Waste in America: Facts and Statistics*](#) (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, [*The US Has a Food Waste Problem and It's Getting Worse*](#) (2023): Article that provides an overview of food waste trends and key numbers.



Reports & Case Studies

National Consumers League, Johns Hopkins University & Harvard Food Law and Policy Clinic, [*Consumer Perceptions of Date Labels: National Survey*](#) (2016): Survey that explores consumer confusion around date labels.

Articles

University of Connecticut, [*Expiration, Use-By and Sell-By Dates: What Do They Really Mean?*](#) (2019): Article that provides an explanation of date labeling terminology.

Toolkits & Similar Resources

USDA, [*Food Product Dating*](#) (n.d.): Guide that provides an explanation of food product dating.

Creative Media

Vox, [*It's Not You. Date Labels on Food Make No Sense*](#) (2018): Video that explains the confusion created by date labels and proposes solutions.

Harvard Law School Food Law and Policy Clinic, [*EXPIRED? Food Waste in America*](#) (2016): Film and corresponding discussion guide that reveals the consequences of patchwork date labeling regulations.

State & Federal Date Label Regulations

Reports & Case Studies	Ready-to-Use Resources	Articles
<p>NRDC, <i>The Dating Game: How Confusing Food Date Labels Lead to Food Waste in America</i> (2013): Policy brief that examines the historical impetus for placing dates on food, relevant federal law, and connection to food waste.</p>	<p>ReFED, <i>Test Your Date Label Knowledge</i> (n.d.): Quiz that tests knowledge on date labels.</p> <p>ReFED, <i>U.S Food Waste Policy Finder</i> (n.d.): Map that shows date labeling policies and in-depth explanations by state.</p>	<p>NPR, <i>To Reduce Food Waste, FDA Urges 'Best If Used By' Date Labels</i> (2019): Article and audio that informs consumers about federal recommendations to standardize date labels.</p> <p>Chris Hunt, Food Print, <i>Are Food Date Labels a Waste of Food and Money?</i> (2013): Blog that explains date label regulations and recommendations for improving the system.</p>
Creative Media	Toolkits & Similar Resources	<p>Xaq Frohlich, The Washington Post, <i>Mandatory Date Labels on Food Could End Confusion and Prevent Food Waste</i> (2023): Article that analyzes an example of federal legislation on date labels.</p> <p>Ian Prasad Philbrick & David Leonhardt, The New York Times, <i>How to Participate in Politics</i> (n.d.): Article that offers strategies for individuals to engage with elected officials and community members to enact change.</p>





Date Labels & Food Donation

Reports & Case Studies

Harvard Food Law and Policy Clinic & The Global Foodbanking Network, *[Promoting Food Donation: Date Labeling Law and Policy](#)* (2021): Issue brief that outlines how strong date labeling and food donation policies can help address food insecurity.

Articles

Leah Butz, Hunter College New York City Food Policy Center, *[“Expiration” Dates: Can You Donate Past-Date Packaged Foods?](#)* (2021): Article that explores the reasons for and against donating past-date foods.

For more information: Linda Breggin, ELI Senior Attorney (breggin@eli.org) and Todd Lawrence, UGL Executive Director (todd@urbangreenlab.org).



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THANK YOU

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FOOD WASTE PREVENTION RESOURCE GUIDE SERIES: MEAL PREPPING AND KITS



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Up to **40% of the food supply** is wasted in the United States. Reducing this staggering number and meeting **national goals** to reduce food waste requires consumers to make meaningful changes to how they buy, store, prepare, and consume food. Yet, food waste remains off the radar for many consumers. According to a **2019 study**, one in five people never consider food waste in their decision-making while eating at home or grocery shopping. More than two-thirds of people never consider food waste while eating out. Providing effective education is a proven strategy to help address this lack of awareness. Consumer education **has the potential** to divert an additional 3.22 million tons of wasted food, prevent 18.7 million metric tons of CO₂ emissions, and provide a financial net benefit of \$15.8 billion.

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ELI and UGL collaborated to create the Food Waste Prevention Resource Guide Series to help expand food waste content in UGL trainings and provide ready-to-use resources for other sustainability non-profits or similar organizations creating their own trainings or curriculums.

The Resource Guide Series highlights five **proven** food waste prevention strategies: packaging design and use, date labels, meal prepping and kits, storage and freezing, and plate and portion size. Each Resource Guide covers one of the five topics, includes key tips as well as a list of helpful resources, and is organized into three charts tailored to a different audience—classrooms, households, and workplaces. Some resources appear across multiple charts.

Organized by both resource type (columns) and topic (rows), the Resource Guide Series provides a straightforward way for sustainability educators to find vetted content for building effective, fact-based trainings.

Meal prepping is the process of preparing and/or cooking all or parts of meals ahead of time which can help avoid over-preparing of food, which in turn can lead to food waste if leftovers are not subsequently eaten. In addition, meal prepping can reduce food waste because it entails estimating the portions needed and building a grocery shopping list in advance that accounts for the number of people and meals to be served as well as food already purchased.

Meal kits can help reduce food waste by providing the exact quantities of raw ingredients needed while allowing households and workplaces to vary meals without over-purchasing. However, meal kits can be more expensive per meal than buying meal ingredients at a grocery store. Furthermore, meal kits typically include a lot of packaging, with small portions of ingredients often packaged separately. The packaging may or may not be recyclable, reusable, or incorporate other positive environmental attributes.

NOTES: The Resource Guides provide targeted resources on specific food waste prevention strategies. More free information on food waste prevention, reduction, and recycling, including general overviews, are widely available such as from **USDA, NRDC, ReFED, WRAP** and **World Wildlife Fund**. Additionally, though the Resource Guides largely compile free resources from governments, NGOs, and academics, note that there are also private and/or paid resources that can provide useful information on food waste prevention (e.g., Dana Gunders' **Waste-Free Kitchen Handbook, LeanPath**).



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MEAL PREPPING AND KITS: CLASSROOMS

Meal prepping is preparing all or parts of meals ahead of time which entails estimating portions in advance and building a focused shopping list, thereby reducing the likelihood of overpreparation and over-purchasing that can lead to waste. Meal kits can help reduce food waste by providing the exact quantities of raw ingredients needed, but they also can be more expensive and include a lot of packaging.

The table below compiles free resources for teaching classrooms about sustainable choices to reduce food waste through meal prepping and meal kits.



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KEY TAKEAWAYS FOR MEAL PREPPING AND KITS IN CLASSROOMS

When teaching about meal prepping and kits, educators should be able to:

- ▶ Explain that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Explain how a lack of meal prepping can lead to food waste.
- ▶ Define meal prepping and explain the concept of meal kits.
- ▶ Explain that meal prepping and the use of meal kits can help correctly portion food and help avoid over-buying, which in turn can reduce food waste (although often with a trade-off of increasing purchased packaging).
- ▶ Share that families can work together to prep meals (e.g., check what is already in the refrigerator, make a shopping list, put individual servings into containers).
- ▶ Share that families can select meal kits together that fit their needs and preferences.
- ▶ Educate students about how they can engage with elected officials and other community members to encourage sustainable practices such as reducing food waste.
- ▶ Help students understand the impacts of their own actions and how they can discuss and help implement sustainable practices at home.

“Training educators to bring a sustainable lens to the classroom is crucial for culture change in a community. If we want to push the dial for sustainability in a meaningful way, we need to ensure educators have the confidence and tools to deepen the standards they are already teaching while connecting to the real world outside of the classroom.”

- CHRISTINA LANGONE, DIRECTOR OF EDUCATION, URBAN GREEN LAB



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Key Resources on Food Waste

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Toolkits & Similar Resources

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Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.



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Lesson Plans & Classroom Activities

MSNBC, [*Teaching Kids to Waste Less Food*](#) (2015): Guide that K-12 educators can use to teach about food waste generally (not specific to meal prepping), including conversation starters, lessons and activities.

Creative Media

Shelie Miller, University of Michigan, Sustainable Food Systems Initiative, [*Can Meal Kit Services Actually be Green?*](#) (2019): Lecture that addresses the greenhouse gas emissions associated with every phase of producing meals from meal kits compared to grocery shopping.

Toolkits & Similar Resources

Gee et al., [*Deliver Me from Food Waste: Model Framework for Comparing the Energy Use of Meal-Kit Delivery and Groceries*](#) (2019): Academic article that concludes meal kit delivery system energy requirements could be reduced to less than traditional grocery shopping if low-impact packaging is used and grocery trips are reduced.

Reports & Articles

Fraser et al., [*Meal Kits in the Family Setting: Impacts on Family Dynamics, Nutrition, Social and Mental Health*](#) (2022): Academic study that examines how meal kits reduce caregivers’ mental loads, enhance family participation, reduce food waste, and provide nutritionally-dense and correctly-portioned meals.

Linchpin SEO, [*Trends Shaping The Meal Kit Industry and Market Outlook*](#) (2023): Article that lists top ten trends within the meal kit industry, and includes industry statistics and growth projections.

Heard et al., [*Comparison of Life Cycle Environmental Impacts from Meal Kits and Grocery Store Meals*](#) (2019): Academic article that compares the life cycle environmental impacts associated with five dinner recipes from meal kits as compared to grocery shopping.



Toolkits & Similar Resources

NRDC Save the Food, [*Understanding Meal Prepping*](#) (2023): Resource that provides background information on meal “prep” which includes preparing all or part of meals in advance.

NRDC Save the Food, [*Meal Prep Mate*](#) (2023): Online tool that helps users avoid food waste by “prepping” which entails preparing all or parts of meals in advance.

Reports & Articles

Attivo Culinary, [*Meal Prepping vs. Meal Planning: What’s the Difference?*](#) (2022): Blog that explains the difference between and compares the pros and cons of meal prepping and meal planning.

U.S. News, [*How to Save Money by Meal Prepping*](#) (2022): Article that describes ways to save money by meal planning.

NRDC, [*10 Easy Tips for Meal Planning*](#) (2016): Article that lists ten easy tips for planning meals in advance.

The Fit Cook, [*How Much Does a Meal Prep Cost?*](#) (2023): Article that describes meal prep cost and food waste benefits, as well as the cost of meal kit services.

Scripps, [*How to Get Your Kids Cooking & into Meal Prepping*](#) (n.d.): Article that discusses positive ways to engage kids in meal prep.

Creative Media

Josh Curtis, [*How to Become a Meal Prep Pro in 2023 | The Beginner’s Guide to Meal Prep*](#) (2023): Overview that discusses meal prepping, including cost savings, useful kitchen items, and helpful strategies.

Lesson Plans & Classroom Activities

NRDC Save the Food, [*Store It – Interactive Storage Guide*](#) (2023): Web-based interactive storage guide that allows users to get tailored information on storage of specific food items.

WWF, [*The No Food Waste Game*](#) (2020): Educational game for students that challenges players to think of different ways to prevent food waste generally.

Toolkits & Similar Resources

NRDC Save the Food, [*Understanding Meal Prepping*](#) (2023): Resource that provides background information on meal “prep” which entails preparing all or parts of meals in advance.

Good Housekeeping, [*A Beginner’s Guide on How to Meal Prep for the Week*](#) (2023): Guide that explains how to meal prep to save time and money, including suggestions for containers and prepping apps.

Reports & Articles

The Scholarship System, [*5 Ways Students Can Get Involved in Politics \(And Why They Should\)*](#) (2023): Blog that explores ways students can be politically active and engage with elected officials and community members.

Creative Media

MinuteFood, [*Are Meal Kits Environmentally Friendly?*](#) (2023): Video that investigates the environmental impacts (e.g., greenhouse gas emissions) of meal kits relative to grocery store shopping.

USDA, [*Plan Ahead to Reduce Food Waste*](#) (2021): Short video that addresses the link between food waste and climate change and why planning can reduce food waste.



	Lesson Plans & Classroom Activities	Reports & Articles	Creative Media
Elementary School	<p>World Wildlife Fund, <i>What is Food Waste? (Grades K-5)</i> (n.d.): Slides that include presenter notes for teaching elementary students about food waste and what they can do to reduce it.</p>		<p>PBS, <i>Kids Go Green: Reducing Food Waste</i> (n.d.): Video that offers solutions to plate waste.</p>
Middle School	<p>World Wildlife Fund, <i>What is Food Waste? Grades 6-12</i> (n.d.): Slides that include presenter notes for teaching middle and high school students about the environmental impacts of food waste and how to reduce food waste at home and school.</p>	<p>MarketLine, <i>The Meal Kit Industry Boomed in 2020 and Will Continue to Thrive Beyond the Pandemic</i> (2021): Article that describes the impact of the pandemic on the growth of the meal kit industry and its projected market growth.</p>	



Lesson Plans & Classroom Activities

World Wildlife Fund, [*What is Food Waste? \(Grades 6-12\)*](#) (n.d.): Slides that include presenter notes for teaching middle and high school students about the environmental impacts of food waste and how to reduce food waste at home and school.

Foodspan & John Hopkins Center for a Livable Future, [*Our Wasted Food*](#) (2023): 50-minute lesson plan that teaches students about food waste and possible solutions, with extension projects that will further empower students to take action.

Toolkits & Similar Resources

Utah State University, [*Food Waste Prevention Part 2: Meal Planning*](#) (n.d.): Website that outlines meal planning steps, tips, printable templates, and recommended apps.

U.S. EPA, [*Planning and Shopping Tips*](#) (2023): Website that provides key considerations for meal planning and grocery shopping to help households reduce food waste.

Stop Food Waste, [*Back to School - Tips on How to Avoid School Lunchbox Food Waste*](#) (n.d.): Website that gives tips to parents to reduce food waste from kids' lunches, including advice on planning, involving kids, and keeping track of food consumption patterns.

Reports & Articles

Michigan State University Extension, [*Meal Planning Can Improve Health and Reduce Food Waste*](#) (2018): Article that provides steps to begin meal planning to save money and time, improve health, and reduce food waste.

CNET, [*Are Meal Kits Now Cheaper Than Grocery Shopping? We Did the Math to Find Out*](#) (2023): Article that discusses a methodology for comparing the cost per serving of the same meal from a meal kit service versus groceries, including a discussion of environmental costs, packaging, and waste.

University of Michigan, [*Those Home-Delivered Meal Kits are Greener Than You Thought, New Study Finds*](#) (2019): Article that addresses new study that finds despite the packaging, meal kits have an overall lower carbon footprint than the same meals purchased at a grocery store.

Creative Media

Shelie Miller, University of Michigan, Sustainable Food Systems Initiative, [*Can Meal Kit Services Actually be Green?*](#) (2019): Lecture that addresses the greenhouse gas emissions associated with every phase of producing meals from meal kits compared to grocery shopping.

High School

For more information: Linda Breggin, ELI Senior Attorney (breggin@eli.org) and Todd Lawrence, UGL Executive Director (todd@urbangreenlab.org).



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MEAL PREPPING AND KITS: HOUSEHOLDS

Meal prepping is preparing all or parts of meals ahead of time which entails estimating portions in advance and building a focused shopping list, thereby reducing the likelihood of overpreparation and over-purchasing that can lead to waste. Meal kits can help reduce food waste by providing the exact quantities of raw ingredients needed, but they also can be more expensive and include a lot of packaging.

The table below compiles free resources for teaching households about sustainable choices to reduce food waste through meal prepping and meal kits.



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KEY TAKEAWAYS FOR MEAL PREPPING AND KITS IN HOUSEHOLDS

When teaching about meal prepping and kits, educators should help households:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Understand how a lack of meal prepping can lead to food waste.
- ▶ Understand the concept of meal prepping and meal kits.
- ▶ Learn how meal prepping and meal kits not only reduce food waste but can save money and time as well.
- ▶ Learn how families can work together to prep meals (e.g., check what is already in the refrigerator, make a shopping list, put individual servings into containers).
- ▶ Understand that families can select meal kits together that fit their needs and preferences.
- ▶ Evaluate the impacts of their own actions and how they can adopt more sustainable practices at home and encourage businesses, schools, and other institutions to do the same.

"Educating residents to find simple, sustainable solutions within their homes impacts the entire city. Once sustainability has been integrated into the everyday lives and actions of households, that knowledge then pours into our relationships, neighborhoods, and communities."

- KARISSA HAMPTON, SUSTAINABLE HOUSEHOLDS MANAGER, URBAN GREEN LAB



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Key Resources on Food Waste

Reports & Case Studies

NRDC, [*Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*](#) (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.

Ready-to-Use Resources

ReFED, [*Resources & Guides*](#) (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

Toolkits & Similar Resources

U.S. EPA, [*Too Good to Waste Implementation Guide and Toolkit*](#) (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

Articles

Rubicon, [*Food Waste in America: Facts and Statistics*](#) (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, [*The US Has a Food Waste Problem and It's Getting Worse*](#) (2023): Article that provides an overview of food waste trends and key numbers.



Overview of Meal Kits

Reports & Case Studies

ReFED, [*Meal Kits*](#) (n.d.): Report that addresses the potential of meal kits to reduce consumer food waste, detailing challenges, stakeholder actions, and implementation metrics.

Fraser et al., [*Meal Kits in the Family Setting: Impacts on Family Dynamics, Nutrition, Social and Mental Health*](#) (2022): Academic study that examines how meal kits reduce caregivers' mental loads, enhance family participation, reduce food waste, and provide nutritionally-dense and correctly-portioned meals.

Progressive Grocer, [*Almost Half of Americans Have Tried Meal Kits*](#) (2021): Report that addresses the growth trajectory of the meal kit industry and discusses the meal kit benefits that most appeal to consumers.

Articles

Grist, [*Should I Trade My Grocery Trips for a Meal Kit Subscription?*](#) (2019): Article that evaluates the sustainability of meal kits and offers strategies to reduce food waste associated with grocery shopping practices.

CNET, [*Are Meal Kits Now Cheaper Than Grocery Shopping? We Did the Math to Find Out*](#) (2023): Article that discusses a methodology for comparing the cost per serving of the same meal from a meal kit service versus groceries, including a discussion of environmental costs, packaging, and waste.

Linchpin SEO, [*Trends Shaping The Meal Kit Industry and Market Outlook*](#) (2023): Article that lists top ten trends within the meal kit industry, and includes industry statistics and growth projections.

Creative Media

CNET Home, [*Choosing the Right Meal Kit*](#) (2022): Video that introduces strategies for choosing the right meal kit and reviews six popular services.



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Reports & Case Studies

University of Michigan, [*Those Home-Delivered Meal Kits are Greener Than You Thought, New Study Finds*](#) (2019): Article that addresses new study that finds despite the packaging, meal kits have an overall lower carbon footprint than the same meals purchased at a grocery store.

Heard et al., [*Comparison of Life Cycle Environmental Impacts from Meal Kits and Grocery Store Meals*](#) (2019): Academic article that compares the life cycle environmental impacts associated with five dinner recipes from meal kits as compared to grocery shopping.

Ready-to-Use Resources

Gee et al., [*Deliver Me from Food Waste: Model Framework for Comparing the Energy Use of Meal-Kit Delivery and Groceries*](#) (2019): Academic article that concludes meal kit delivery system energy requirements could be reduced to less than traditional grocery shopping if low-impact packaging is used and grocery trips are reduced.

Toolkits & Similar Resources

RE:Source, [*Meal Kits and Grocery Food Delivery*](#) (n.d.): Guide for meal kit shopping and handling that includes tips for insulating food and managing packaging waste.

Articles

FoodBoxHQ, [*Meal Kits & The Environment: How to Find an Eco-Friendly Meal Kit + Our Favorites*](#) (2020): Guidance that informs consumers about choosing an eco-friendly meal kit.

Shrink That Footprint, [*Meal Kits – The Green Revolution in Your Kitchen*](#) (n.d.): Article that explains why consumers should choose eco-friendly meal kits, as well as descriptions and reviews of meal kit options.

Creative Media

MinuteFood, [*Are Meal Kits Environmentally Friendly?*](#) (2023): Video that investigates the environmental impacts (e.g., greenhouse gas emissions) of meal kits relative to grocery store shopping.

Shelie Miller, University of Michigan, Sustainable Food Systems Initiative, [*Can Meal Kit Services Actually be Green?*](#) (2019): Lecture that addresses the greenhouse gas emissions associated with every phase of producing meals from meal kits compared to grocery shopping.

USDA, [*Plan Ahead to Reduce Food Waste*](#) (2021): Short video that addresses the link between food waste and climate change and why planning can reduce food waste.



Toolkits & Similar Resources

NRDC Save the Food, [*Understanding Meal Prepping*](#) (2023): Resource that provides background information on meal “prep” which includes preparing all or part of meals in advance.

Good Housekeeping, [*A Beginner’s Guide on How to Meal Prep for the Week*](#) (2023): Guide that explains how to meal prep to save time and money, including suggestions for containers and an prepping apps.

Articles

The Fit Cook, [*How Much Does a Meal Prep Cost?*](#) (2023): Article that describes meal prep cost and food waste benefits, as well as the cost of meal kit services.

Attivo Culinary, [*Meal Prepping vs. Meal Planning: What’s the Difference?*](#) (2022): Blog that explains the difference between and compares the pros and cons of meal prepping and meal planning.

U.S. News, [*How to Save Money by Meal Prepping*](#) (2022): Article that describes ways to save money by meal planning.

Creative Media

Josh Curtis, [*How to Become a Meal Prep Pro in 2023 | The Beginner’s Guide to Meal Prep*](#) (2023): Overview that discusses meal prepping, including cost savings, useful kitchen items, and helpful strategies.

Ready-to-Use Resources

NRDC Save the Food, [*Meal Prep Mate*](#) (n.d.): Meal prep guide and calculator that creates personalized shopping lists and portions meals to reduce plate waste.

WRAP, [*How Do I Create Flexible and Simple Meal Plans?*](#) (n.d.): Guide that addresses creating effective meal plans, including how to plan around a budget and choose meals to prepare.

NRDC Save the Food, [*The Guestimator*](#) (n.d.): Calculator that estimates portion-sizes for dinner parties.

Creative Media

Love Food Hate Waste, [*Plan Like a Boss!*](#) (2016): Short video that provides tips for meal planning to reduce food waste and save time and money.

Toolkits & Similar Resources

Utah State University, [*Food Waste Prevention Part 2: Meal Planning*](#) (n.d.): Website that outlines meal planning steps, tips, printable templates, and recommended apps.

Stop Food Waste, [*Back to School – Tips on How to Avoid School Lunchbox Food Waste*](#) (n.d.): Website that gives tips to parents to reduce food waste from kids' lunches, including advice on planning, involving kids, and keeping track of food consumption patterns.

Food Rescue Maine, [*Try Meal Prepping To Stop Wasting Food – Save Money And Time, Too!*](#) (2021): Website that lays out steps for creating a meal prepping plan with links to supporting tools and guides.

Articles

Help! We've Got Kids, [*10 Tips for Getting Kids Involved in Meal Prep*](#) (2017): Article that includes a list of ten tips for how to involve kids in meal prep and teach valuable life skills.

NRDC, [*10 Easy Tips for Meal Planning*](#) (2016): Article that lists ten easy tips for planning meals in advance.

Stop Food Waste, [*Meal Planning*](#) (n.d.): Article that addresses ways to reduce food waste and save money through meal planning.

Scripps, [*How to Get Your Kids Cooking & into Meal Prepping*](#) (n.d.): Article that discusses positive ways to engage kids in meal prep.



MEAL PREPPING AND KITS: WORKPLACES

Meal prepping is preparing all or parts of meals ahead of time which entails estimating portions in advance and building a focused shopping list, thereby reducing the likelihood of overpreparation and over-purchasing that can lead to waste. Meal kits can help reduce food waste by providing the exact quantities of raw ingredients needed, but they also can be more expensive and include a lot of packaging.

The table below compiles free resources for teaching workplaces about sustainable choices to reduce food waste through meal prepping and meal kits.



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KEY TAKEAWAYS FOR MEAL PREPPING AND KITS IN WORKPLACES

When teaching about meal prepping and kits, educators should help workplaces:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Understand the components of meal prepping and meal kit basics, including environmental benefits, cost, and range of options.
- ▶ Understand how meal prepping can help workplaces meet sustainability goals if implemented in connection with businesses' events, meetings and on-site food service.
- ▶ Educate their employees about the benefits of meal prepping and meal kits.
- ▶ Apply lessons learned from case studies of businesses in similar sectors that have made the switch to more sustainable practices for meal prepping.
- ▶ Understand the ability of workplaces to reduce food waste through sustainable choices and knowledge-sharing within their workforce, customer base, and business communities.

"It's a wonderful experience to distill complex scientific information into tangible actions for citizens to digest and utilize in their own way. If an attendee walks away from one of my trainings doing just one or two new sustainable activities that add value to their life, that's a huge win. Connecting people to resources in sustainability that are vetted and accurate is one of the best things we can do to empower them to make long-lasting changes."

- JACQUELINE GOODWIN, ASSISTANT DIRECTOR OF WORKPLACES, URBAN GREEN LAB



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Key Resources on Food Waste

Reports & Case Studies

NRDC, *[Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill](#)* (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Creative Media

Our Changing Climate, *[Food Waste Causes Climate Change. Here's How We Stop it.](#)* (2020): Video that provides key food waste statistics and possible avenues for change.

Ready-to-Use Resources

ReFED, *[Resources & Guides](#)* (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

The Chancery Lane Project, *[Reducing Supply Chain Food Waste](#)* (2022): Model contractual clause that can be used by businesses to reduce food waste in their supply chains in order to reduce greenhouse gas emissions and realize financial benefits.

Toolkits & Similar Resources

U.S. EPA, *[Too Good to Waste Implementation Guide and Toolkit](#)* (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

Articles

Rubicon, *[Food Waste in America: Facts and Statistics](#)* (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, *[The US Has a Food Waste Problem and It's Getting Worse](#)* (2023): Article that provides an overview of food waste trends and key numbers.



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Reports & Case Studies

ReFED, [*Meal Kits*](#) (n.d.): Report that addresses the potential of meal kits to reduce consumer food waste, detailing challenges, stakeholder actions, and implementation metrics.

Morning Consult, [*Why Meal Planners Are an Attractive Audience for Food & Beverage Brands*](#) (2022): Survey that shows the demographics of meal planners and meal kit usage in the U.S.

Fraser et al., [*Meal Kits in the Family Setting: Impacts on Family Dynamics, Nutrition, Social and Mental Health*](#) (2022): Academic study that examines how meal kits reduce caregivers' mental loads, enhance family participation, reduce food waste, and provide nutritionally-dense and correctly-portioned meals.

Progressive Grocer, [*Almost Half of Americans Have Tried Meal Kits*](#) (2021): Report that addresses the growth trajectory of the meal kit industry and discusses the meal kit benefits that most appeal to consumers.

Toolkits & Similar Resources

RE:Source, [*Meal Kits and Grocery Food Delivery*](#) (n.d.): Guide for meal kit shopping and handling that includes tips for insulating food and managing packaging waste.

NRDC Save the Food, [*Understanding Meal Prepping*](#) (2023): Resource that provides background information on meal "prep" which includes preparing all or part of meals in advance.

Creative Media

CNET Home, [*Choosing the Right Meal Kit*](#) (2022): Video that introduces strategies for choosing the right meal kit and reviews six popular services.

Articles

Grocery Dive, [*The Newest Trend in Meal Kits: School Lunches*](#) (2019): Article that explores increasing consumer interest in kid-friendly meal kit services.

CNET, [*Are Meal Kits Now Cheaper Than Grocery Shopping? We Did the Math to Find Out*](#) (2023): Article that discusses a methodology for comparing the cost per serving of the same meal from a meal kit service versus groceries, including a discussion of environmental costs, packaging, and waste.

Linchpin SEO, [*Trends Shaping The Meal Kit Industry and Market Outlook*](#) (2023): Article that lists top ten trends within the meal kit industry, and includes industry statistics and growth projections.

MarketLine, [*The Meal Kit Industry Boomed in 2020 and Will Continue to Thrive Beyond the Pandemic*](#) (2021): Article that describes the impact of the pandemic on the growth of the meal kit industry and its projected market growth.

Reports & Case Studies

University of Florida, [*Fully Recyclable Packaging Makes Consumers Feel Better about Meal Kits*](#) (2021): Study that finds that consumers prefer meal kits with organic, local and pre-cut ingredients and recyclable packaging.

University of Washington, [*Grocery Delivery Service is Greener than Driving to the Store*](#) (2013): Report that compares carbon emissions of grocery delivery services to individual household trips, and includes strategies for service providers to reduce emissions.

Grocery Dive, [*Reusable Boxes Aim to Reduce Meal Kit Packaging Waste*](#) (2019): Case study that reveals how one company developed reusable shipping containers for meal kit companies to reduce packaging waste.

Waste360, [*Fresh Prep's Answer to Meal Kit Packaging Pileup*](#) (2021): Case study that explores how one company developed “Zero Waste Meal Kits.”

Ready-to-Use Resources

Gee et al., [*Deliver Me from Food Waste: Model Framework for Comparing the Energy Use of Meal-Kit Delivery and Groceries*](#) (2019): Academic article that concludes meal kit delivery system energy requirements could be reduced to less than traditional grocery shopping if low-impact packaging is used and grocery trips are reduced.

Creative Media

MinuteFood, [*Are Meal Kits Environmentally Friendly?*](#) (2023): Video that investigates the environmental impacts (e.g., greenhouse gas emissions) of meal kits relative to grocery store shopping.

Shelie Miller, University of Michigan, Sustainable Food Systems Initiative, [*Can Meal Kit Services Actually be Green?*](#) (2019): Lecture that addresses the greenhouse gas emissions associated with every phase of producing meals from meal kits compared to grocery shopping.

Articles

Forbes, [*Five Ways to Make Your Delivery Business More Sustainable*](#) (2021): Article that lists five tips for decreasing the carbon footprint of delivery services, including planning greener delivery routes and using alternative fuel vehicles.

Sifted, [*What are Meal Kit Startups Doing to Solve Their Excess Packaging Problem?*](#) (2021): Article that discusses problems with the meal kit industry’s use of single-use packaging and how meal kit startups are reducing packaging waste.

Smithsonian Magazine, [*Meal Kit Delivery May Not Actually Be That Bad for the Environment*](#) (2019): Article that reports on a study of the greenhouse gas emissions associated with every phase of producing meals from meal kits compared to grocery shopping.



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Background on Meal Prepping

Toolkits & Similar Resources

Good Housekeeping, [*A Beginner's Guide on How to Meal Prep for the Week*](#) (2023): Guide that explains how to meal prep to save time and money, including suggestions for containers and an prepping apps.

Articles

U.S. News, [*How to Save Money by Meal Prepping*](#) (2022): Article that describes ways to save money by meal planning.

NRDC, [*10 Easy Tips for Meal Planning*](#) (2016): Article that lists ten easy tips for planning meals in advance.

The Fit Cook, [*How Much Does a Meal Prep Cost?*](#) (2023): Article that describes meal prep cost and food waste benefits, as well as the cost of meal kit services.

Creative Media

Josh Curtis, [*How to Become a Meal Prep Pro in 2023 / The Beginner's Guide to Meal Prep*](#) (2023): Overview that discusses meal prepping, including cost savings, useful kitchen items, and helpful strategies.



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Ready-to-Use Resources

NRDC Save the Food, [*Meal Prep Mate*](#) (2023): Online tool that helps users avoid food waste by “prepping” which entails preparing all or parts of meals in advance.

WWF, [*Hotel Kitchen: Fighting Food Waste in Hotels*](#) (2017): Toolkit that challenges the hotel industry to prevent food waste, donate what cannot be prevented and divert what remains.

WWF, [*A Toolkit for Communicating Food Waste to Guests*](#) (n.d.): Step-by-step guide that helps communicate food waste messages to guests for food and beverage program directors, restaurant general managers, guest service managers, etc.

Toolkits & Similar Resources

Utah State University, [*Food Waste Prevention Part 2: Meal Planning*](#) (n.d.): Website that outlines meal planning steps, tips, printable templates, and recommended apps.

Stop Food Waste, [*Meal Planning*](#) (n.d.): Article that addresses ways to reduce food waste and save money through meal planning.

Creative Media

USDA, [*Plan Ahead to Reduce Food Waste*](#) (2021): Short video that addresses the link between food waste and climate change and why planning can reduce food waste.

Articles

Agricultural Climate Network, [*How Do Grocery and Meal Kit Deliveries Impact the Carbon Footprint of Our Food?*](#) (2021): Article that discusses consumers’ perceptions of grocery and meal kit delivery services and differences between the environmental impact of different delivery business models.

Leanpath, [*11 Ways to Crack the Catering Food Waste Code*](#) (2017): Blog post that contains general guidance on how caterers can reduce food waste including through planing and portioning.

PCMA, [*What Meeting Planners Can Do to Reduce Food Waste*](#) (2019): Article that includes specific strategies for meeting planners to reduce food waste.

THANK YOU

This resource is made possible by support from



Thank you to Natural Resources Defense Council for reviewing the resources included in this guide.



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FOOD WASTE PREVENTION RESOURCE GUIDE SERIES: PLATE AND PORTION SIZE



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Up to **40% of the food supply** is wasted in the United States. Reducing this staggering number and meeting **national goals** to reduce food waste requires consumers to make meaningful changes to how they buy, store, prepare, and consume food. Yet, food waste remains off the radar for many consumers. According to a **2019 study**, one in five people never consider food waste in their decision-making while eating at home or grocery shopping. More than two-thirds of people never consider food waste while eating out. Providing effective education is a proven strategy to help address this lack of awareness. Consumer education **has the potential** to divert an additional 3.22 million tons of wasted food, prevent 18.7 million metric tons of CO₂ emissions, and provide a financial net benefit of \$15.8 billion.

Increased consumer attention to the issue may also push businesses to operate more responsibly. **The Nashville Food Waste Initiative** (NFWI) aims to provide food waste education to everyone in Nashville, from business owners and staff to educators to students. Originally developed in 2015 as a pilot project by NRDC, NFWI is now led by **Urban Green Lab** (UGL) in partnership with the **Environmental Law Institute** (ELI). UGL offers trainings that include information on how to reduce food waste in classrooms, households, and workplaces.

ELI and UGL collaborated to create the Food Waste Prevention Resource Guide Series to help expand food waste content in UGL trainings and provide ready-to-use resources for other sustainability non-profits or similar organizations creating their own trainings or curriculums.

The Resource Guide Series highlights five **proven** food waste prevention strategies: packaging design and use, date labels, meal prepping and kits, storage and freezing, and plate and portion size. Each Resource Guide covers one of the five topics, includes key tips as well as a list of helpful resources, and is organized into three charts tailored to a different audience—classrooms, households, and workplaces. Some resources appear across multiple charts.

Organized by both resource type (columns) and topic (rows), the Resource Guide Series provides a straightforward way for sustainability educators to find vetted content for building effective, fact-based trainings.

Offering flexibility in plate and portion size is the number one solution to reducing greenhouse gas emissions associated with food waste, according to **ReFED**. Adjusting plate and portion sizes and implementing other food-saving measures can help reduce post-service food waste, also referred to as plate waste.

NOTES: The Resource Guides provide targeted resources on specific food waste prevention strategies. More free information on food waste prevention, reduction, and recycling, including general overviews, are widely available such as from **USDA, NRDC, ReFED, WRAP** and **World Wildlife Fund**. Additionally, though the Resource Guides largely compile free resources from governments, NGOs, and academics, note that there are also private and/or paid resources that can provide useful information on food waste prevention (e.g., Dana Gunders' **Waste-Free Kitchen Handbook, LeanPath**).



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PLATE AND PORTION SIZE: CLASSROOMS

Offering flexibility in plate and portion size is the number one solution to reducing greenhouse gas emissions associated with food waste, according to ReFED. Adjusting plate and portion sizes and implementing other food-saving measures can help reduce post-service food waste, also referred to as plate waste.

The table below compiles free resources for teaching classrooms about sustainable choices to reduce plate waste through plate and portion size adjustments.



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KEY TAKEAWAYS FOR PLATE AND PORTION SIZE IN CLASSROOMS

When teaching about plate and portion size, educators should be able to:

- ▶ Explain that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Define plate waste (i.e., post-service food waste) and share how plate and portion size adjustments can prevent and reduce plate waste.
- ▶ Explain how status quo plate and portion size practices can lead to food waste.
- ▶ Contextualize how school cafeterias contribute to plate waste and explore solutions, such as adjusting plate and portion size, removing trays, providing multiple portion sizes, and adopting an “Offer Versus Serve” approach that allows students to decline a certain number of food items and select preferred foods during meal service.
- ▶ Help students understand how behavior and visual factors lead to plate waste and provide steps to combat food-wasting behaviors (e.g., reducing snacking throughout the day to increase hunger at meal times).
- ▶ Explain the importance of being sensitive to issues such as food shaming (i.e., making negative or judgmental remarks about what or how much an individual is eating) and food insecurity in addressing food waste reduction through portion size flexibility.
- ▶ Educate students about how they can engage with elected officials and other community members to encourage sustainable practices such as reducing food waste.
- ▶ Help students understand the impacts of their own actions and how they can discuss and help implement sustainable practices at home.

“Training educators to bring a sustainable lens to the classroom is crucial for culture change in a community. If we want to push the dial for sustainability in a meaningful way, we need to ensure educators have the confidence and tools to deepen the standards they are already teaching while connecting to the real world outside of the classroom.”

- CHRISTINA LANGONE, DIRECTOR OF EDUCATION, URBAN GREEN LAB



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Key Resources on Food Waste

Lesson Plans & Classroom Activities

WWF, [*Be a Food Waste Warrior*](#) (n.d.): K-12 lessons, activities, and resources that educators can use to teach about the environmental impacts of food waste—organized by age group.

Toolkits & Similar Resources

U.S. EPA, [*Too Good to Waste Implementation Guide and Toolkit*](#) (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

ReFED, [*Resources & Guides*](#) (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

Reports & Articles

NRDC, [*Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*](#) (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Rubicon, [*Food Waste in America: Facts and Statistics*](#) (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, [*The US Has a Food Waste Problem and It's Getting Worse*](#) (2023): Article that provides an overview of food waste trends and key numbers.

Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.



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Toolkits & Similar Resources

USDA, [*Offer Versus Serve \(OVS\), Tip Sheet for School Food Service Managers*](#) (2020): Tip sheet that covers Offer Versus Serve for the National School Lunch Program.

Guardians of Grub, [*Rise Up Against Food Waste*](#) (n.d.): Calculator that measures avoided costs and emissions from reduced plate waste.

I Value Food, [*Eating Out Without Waste*](#) (n.d.): Infographics that provide strategies for reducing plate waste when dining out.

NRDC, [*Wasting Less Food in K-12 Settings: Best Practices for Success*](#) (2018): Brief that details best practices for reducing plate waste in K-12 settings.

Reports & Articles

Jimmy Nguyen, National Academy of Medicine, [*The Power of Postconsumer School Food Waste Audits*](#) (2016): Article that describes best practices for postconsumer plate waste audits in K-12 schools.

Shaheen Hosany, The Conversation, [*How Children are Helping to Make Their Families More Eco-Friendly – New Research*](#) (2022): Article that explains how sustainability education at school leads children to develop and implement sustainable practices at home.

Creative Media

David Just, Healthy Food Choices in School, [*Right Sizing: Creating Appealing & Satisfying Portions in School Meals*](#) (2017): Video that demonstrates the behavioral and visual factors influencing students' level of satisfaction with portion size.

Lesson Plans & Classroom Activities

The City of Calgary, [*Food Waste Reduction Plan*](#) (n.d.): Lesson plan that provides conversation starters and tips on preventing plate waste.

USDA, [*My Plate*](#) (n.d.): Interactive webpage that offers guidance on the relative portion sizes of different food groups.

WWF, [*The No Food Waste Game*](#) (2020): Educational game for students that challenges players to think of different ways to prevent food waste generally.

Reports & Articles

Green Schools National Network, [*K-12 Cafeterias are Spaces of Civic Engagement for Kids and Cooks*](#) (2019): Article that explains how by leading plate waste audits, students are able to design solutions to reduce plate waste.

The Scholarship System, [*5 Ways Students Can Get Involved in Politics \(And Why They Should\)*](#) (2023): Blog that explores ways students can be politically active and engage with elected officials and community members.

Lesson Plans & Classroom Activities

Florida Health Department, *[Be Wise About Your Portion Size](#)* (n.d.): Guide that helps children ages 3 to 5 select and measure healthy portion sizes.

Food and Agriculture Organization of the United Nations and International Food Waste Coalition, *Do Good: Save Food!* (2018): Two educational packages, one for *[ages 5 to 7](#)* and one for *[ages 8 to 9](#)*, that offers lessons, presentations, and activities on plate waste solutions.

Reports & Articles

Let's Eat Healthy, *[Serving Sizes: Introduction](#)* (2020): Video that introduces students to serving sizes and measuring food.

PBS, *[Kids Go Green: Reducing Food Waste](#)* (n.d.): Video that offers solutions to plate waste.

World Wildlife Fund, *[Food Waste Warrior Posters](#)* (n.d.): Poster that encourages students to eat what they take.

Middle School

Lesson Plans & Classroom Activities

Food and Agriculture Organization of the United Nations and International Food Waste Coalition, [*Do Good: Save Food!*](#) (2018): Educational package for ages 10 to 13 that offers lessons, presentations, and activities on plate waste solutions.

World Wildlife Fund, [*What is Food Waste? Grades 6-12*](#) (n.d.): Slides that include presenter notes for teaching middle and high school students about the environmental impacts of food waste and how to reduce food waste at home and school.

Reports & Articles

Mary Institute and Saint Louis Country Day School, [*Middle Schoolers Learn about Food Waste*](#) (2019): Article that highlights an example of middle schoolers working to reduce plate waste at their school by measuring food waste and educating their peers.

Creative Media

Food Insight, [*Servings Sizes and Portion Sizes: Making Smaller Sizes the New Normal Again*](#) (2020): Video that explains the difference between serving size and portion size and their relationship to plate waste.



Lesson Plans & Classroom Activities

Food and Agriculture Organization of the United Nations and International Food Waste Coalition, [*Do Good: Save Food!*](#) (2018): Educational package for ages 14 years and up that includes lessons, presentations, and activities on plate waste solutions.

World Wildlife Fund, [*What is Food Waste? Grades 6-12*](#) (n.d.): Slides that include presenter notes for teaching middle and high school students about the environmental impacts of food waste and how to reduce food waste at home and school.

Foodspan & John Hopkins Center for a Livable Future, [*Our Wasted Food*](#) (2023): 50-minute lesson plan that teaches students about food waste and possible solutions, with extension projects that will further empower students to take action.

Reports & Articles

Amber Werkman, Jenny van Doorn & Koert van Ittersum, [*Are You Being Served? Managing Waist and Waste via Serving Size, Unit Size, and Self-serving*](#) (2022): Study that explains the “serving-size effect” and finds that self-serving diminishes plate waste.

Creative Media

Peter Lehner, TEDxManhattan, [*A Recipe for Cutting Food Waste*](#) (2013): Talk that explains how increasing portion and plate sizes have contributed to plate waste (10:20 to 11:30).

PLATE AND PORTION SIZE: HOUSEHOLDS

Offering flexibility in plate and portion size is the number one solution to reducing greenhouse gas emissions associated with food waste, according to ReFED. Adjusting plate and portion sizes and implementing other food-saving measures can help reduce post-service food waste, also referred to as plate waste.

The table below compiles free resources for teaching households about sustainable choices to reduce plate waste through plate and portion size adjustments.



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KEY TAKEAWAYS FOR PLATE AND PORTION SIZE IN HOUSEHOLDS

When teaching about plate and portion size, educators should help households:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Understand how status quo plate and portion size practices can lead to food waste.
- ▶ Learn how increased plate and portion sizes have contributed to plate waste and the negative cost, health, and environmental impacts associated with plate waste.
- ▶ Explore solutions to preventing and reducing plate waste, such as relying on measuring cups to determine portion size, using smaller plates, and waiting 20 minutes before taking a second helping.
- ▶ Learn to properly measure and serve portion sizes of different foods, while being cognizant of food shaming (i.e., making negative or judgmental remarks about what and how much an individual is eating).
- ▶ Evaluate the impacts of their own actions and how they can adopt more sustainable practices at home and encourage businesses, schools, and other institutions to do the same.

"Educating residents to find simple, sustainable solutions within their homes impacts the entire city. Once sustainability has been integrated into the everyday lives and actions of households, that knowledge then pours into our relationships, neighborhoods, and communities."

- KARISSA HAMPTON, SUSTAINABLE HOUSEHOLDS MANAGER, URBAN GREEN LAB



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Key Resources on Food Waste

Reports & Case Studies	Ready-to-Use Resources	Toolkits & Similar Resources	Articles
<p>NRDC, <i>Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill</i> (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.</p>	<p>ReFED, <i>Resources & Guides</i> (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.</p>	<p>U.S. EPA, <i>Too Good to Waste Implementation Guide and Toolkit</i> (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.</p>	<p>Rubicon, <i>Food Waste in America: Facts and Statistics</i> (2023): Primer on food waste in America that includes statistics and recommendations.</p>
<p>Creative Media</p>			
<p>Our Changing Climate, <i>Food Waste Causes Climate Change. Here's How We Stop it.</i> (2020): Video that provides key food waste statistics and possible avenues for change.</p>			<p>Bloomberg, <i>The US Has a Food Waste Problem and It's Getting Worse</i> (2023): Article that provides an overview of food waste trends and key numbers.</p>



Understanding Consumers' Impact and Behaviors

Reports & Case Studies	Ready-to-Use Resources	Articles	Creative Media
<p>Amber Werkman, Jenny van Doorn & Koert van Ittersum, <i>Are You Being Served? Managing Waist and Waste via Serving Size, Unit Size, and Self-serving</i> (2022): Study that explains the “serving-size effect” and finds that self-serving diminishes plate waste.</p>	<p>Love Food Hate Waste, <i>Food Portion Calculator</i> (n.d.): Calculator that helps measure the appropriate portion size of different types of foods.</p> <p>McKinsey & Company, <i>McKinsey for Kids: (Food) Waste not, Want not</i> (2021): Interactive resource that demonstrates the most wasted foods on children’s plates.</p> <p>Guardians of Grub, <i>Rise up Against Food Waste</i> (n.d.): Calculator that measures avoided costs and emissions from reduced plate waste.</p>	<p>Susan Shain, New York Times, <i>How Central Ohio Got People to Eat their Leftovers</i> (2023): Article that contextualizes households’ role in creating food waste and documenting how one family reduced their plate waste.</p> <p>Healthy Food Choices in Schools, <i>Hot or Cold: How State of Mind Influences Food Selection</i> (2019): Article that explains how impulsive “hot state” decisions lead individuals to select larger portions.</p> <p>Green Schools National Network, <i>K-12 Cafeterias are Spaces of Civic Engagement for Kids and Cooks</i> (2019): Article that explains how by leading plate waste audits, students are able to design solutions to reduce plate waste.</p>	<p>USDA, <i>Serve Smart to Reduce Food Waste</i> (2022): Video that encourages consumers to reduce plate waste by serving smart portions.</p> <p>Food Insight, <i>Servings Sizes and Portion Sizes: Making Smaller Sizes the New Normal Again</i> (2020): Video that explains the difference between serving size and portion size and their relationship to plate waste.</p>



Plate and Portion Size: Dining Out

Reports & Case Studies

WRAP, [*Citizen Food Waste Attitudes and Behaviors Out of Home*](#) (2023): Survey that analyzes citizens' portion-sizing behaviors when dining out and explores behaviors that could reduce plate waste.

Toolkits & Similar Resources

I Value Food, [*Eating Out Without Waste*](#) (n.d.): Infographics that provide strategies for how to reduce plate waste when dining out.

Mississinewa Community Schools, [*Parent FAQ \(Offer vs. Serve\)*](#) (n.d.): Resource that guides parents on Offer Versus Serve USDA standards.

Articles

Food & Wine, Jillian Kramer, [*What to Do if You Can't Decide What to Order at a Restaurant*](#) (2019): Article that describes strategies to avoid plate waste when selecting dishes at a restaurant.

Creative Media

Clean and Green Singapore, [*Tips to Reduce Food Waste \(ordering\)*](#) (2018): Video that offers tips on how to avoid plate waste when eating out.



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Plate and Portion Size: At Home

Ready-to-Use Resources	Toolkits & Similar Resources	Articles	Creative Media
<p>I Value Food, <i>Food Waste Quiz</i> (n.d.): Quiz that measures the individual’s plate waste and provides strategies for reduction.</p> <p>NRDC Save the Food, <i>The Guest-imator</i> (n.d.): Calculator that estimates portion-sizes for dinner parties.</p> <p>NRDC Save the Food, <i>Meal Prep Mate</i> (n.d.): Meal prep guide and calculator that creates personalized shopping lists and portions meals to reduce plate waste.</p>	<p>I Value Food, <i>Portion Size Guide</i> (n.d.): Guide that offers solutions to portion distortion and including a portion size “cheat sheet.”</p> <p>British Nutrition Foundation, <i>5532 a-day: Perfect Portions for Little Tums</i> (2019): Booklet that guides parents on serving correct portion sizes to children ages 1 to 4.</p>	<p>I Value Food, <i>Ten Ways to Get Kids to Waste Less Food</i> (n.d.): Guide that provides families with strategies to reduce food waste with young children.</p> <p>Steve Green, Homenish, <i>Guide to Plate Sizes (with Drawings)</i> (2022): Guide that helps readers select the appropriate plate size at home to avoid over-portioning.</p> <p>British Heart Foundation, <i>8 Top Tips for Portion Control</i> (n.d.): Article that lists strategies for portion control.</p>	<p>Peter Lehner, TEDx Manhattan, <i>A Recipe for Cutting Food Waste</i> (2013): Talk that explains how increasing portion and plate sizes contributed to plate waste (10:20 to 11:30).</p> <p>Dana Gunders, <i>Waste Free Kitchen Handbook</i> (2015): Handbook that includes checklists, recipes, strategies, and infographics to reduce plate waste.</p> <p>Robin Donovan, <i>5-Ingredient Cooking for Two</i> (2020): Cookbook that includes portioned recipes for two.</p>

For more information: Linda Breggin, ELI Senior Attorney (breggin@eli.org) and Todd Lawrence, UGL Executive Director (todd@urbangreenlab.org).





PLATE AND PORTION SIZE: WORKPLACES

Offering flexibility in plate and portion size is the number one solution to reducing greenhouse gas emissions associated with food waste, according to ReFED. Adjusting plate and portion sizes and implementing other food-saving measures can help reduce post-service food waste, also referred to as plate waste.

The table below compiles free resources for teaching workplaces about sustainable choices to reduce food waste through plate and portion size adjustments.



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KEY TAKEAWAYS FOR PLATE AND PORTION SIZE IN WORKPLACES

When teaching about plate and portion size, educators should help workplaces:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Recognize how status quo plate and portion size practices can lead to food waste.
- ▶ Understand why plate waste is a problem and how reducing it can lower costs as well as result in other benefits.
- ▶ Leverage plate and menu design to reduce plate waste.
- ▶ Learn about food waste audits as a mechanism for identifying and measuring which food items constitute the most plate waste and subsequently adjusting portion sizes and ingredients.
- ▶ Learn how to help educate customers and employees on the importance of reducing plate waste.
- ▶ Share food waste reduction successes internally and with customers.
- ▶ Understand the ability of workplaces to reduce food waste through sustainable choices and knowledge-sharing within their workforce, customer base, and business communities.

"It's a wonderful experience to distill complex scientific information into tangible actions for citizens to digest and utilize in their own way. If an attendee walks away from one of my trainings doing just one or two new sustainable activities that add value to their life, that's a huge win. Connecting people to resources in sustainability that are vetted and accurate is one of the best things we can do to empower them to make long-lasting changes."

- JACQUELINE GOODWIN, ASSISTANT DIRECTOR OF WORKPLACES, URBAN GREEN LAB



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Key Resources on Food Waste

Reports & Case Studies

NRDC, *[Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill](#)* (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Creative Media

Our Changing Climate, *[Food Waste Causes Climate Change. Here's How We Stop it.](#)* (2020): Video that provides key food waste statistics and possible avenues for change.

Ready-to-Use Resources

ReFED, *[Resources & Guides](#)* (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

Toolkits & Similar Resources

U.S. EPA, *[Too Good to Waste Implementation Guide and Toolkit](#)* (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

Articles

Rubicon, *[Food Waste in America: Facts and Statistics](#)* (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, *[The US Has a Food Waste Problem and It's Getting Worse](#)* (2023): Article that provides an overview of food waste trends and key numbers.



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The Role of the Foodservice Industry and other Businesses in Reducing Plate Waste

Reports & Case Studies

Amber Werkman, Jenny van Doorn & Koert van Ittersum, [*Are You Being Served? Managing Waist and Waste via Serving Size, Unit Size, and Self-serving*](#) (2022): Study that explains the “serving-size effect” and finds that self-serving diminishes plate waste.

Ready-to-Use Resources

The Chancery Lane Project, [*Reducing Supply Chain Food Waste*](#) (2022): Model contractual clause that can be used by businesses to reduce food waste in their supply chains, in order to reduce greenhouse gas emissions and realize financial benefits.

Toolkits & Similar Resources

National Restaurant Association, [*86 Food Waste: Customer Messaging*](#) (2021): Guide that lists best practices for restaurants when communicating food waste reduction efforts to customers.

Articles

Linda Himmelstein, New York Times, [*Hotel Buffets, a Culprit of Food Waste, Get Downsized*](#) (2017): Article that contextualizes the buffet’s role in plate waste and identifies relevant solutions.

Creative Media

National Restaurant Association, [*86 Food Waste: Reduce Food Waste in your Restaurant Kitchen*](#) (2019): Video that explains restaurants’ role in reducing food waste and offers best practices for portion sizes and communication (4:00 to 4:47).



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Reducing Costs by Reducing Plate Waste

Reports & Case Studies	Ready-to-Use Resources	Toolkits & Similar Resources	Creative Media
<p>Champions 12.3, <i>The Business Case for Reducing Food Loss and Waste</i> (2017): Report that finds that businesses can save money by training staff and implementing other food-saving measures.</p> <p>David Blum, International Journal of Applied Management and Technology, <i>Ways to Reduce Restaurant Industry Food Waste Costs</i> (2020): Literature review that explores how smaller portion and plate sizes in restaurants can reduce plate waste and food costs (pages 3, 6, 8).</p>	<p>Guardians of Grub, <i>Rise up Against Food Waste</i> (n.d.): Calculator that measures avoided costs and emissions from reduced plate waste.</p>	<p>WRAP & Guardians of Grub, <i>Protecting Profits from Plate Waste</i> (2023): Toolkit that includes actions to increase profit by reducing plate waste.</p>	<p>The City of Portland, <i>Reduce Plate Waste</i> (2023): Video that provides tips for restaurants to reduce plate waste and food costs, by tracking plate waste and adjusting portion sizes.</p> <p>The City of Portland, <i>Reduce Food Waste in the Kitchen</i> (2023): Video that shares chefs' tips on adjusting portion sizes to manage profit margins and reduce plate waste (Chapter 3, 6:41).</p>



Reports & Case Studies

WRAP, [*Citizen Food Waste Attitudes and Behaviors Out of Home*](#) (2023): Report that includes recommendations for businesses to reduce plate waste.

Steffen Kallbekken & Håkon Sælen, [*Nudging Hotel Guests to Reduce Food Waste as a Win-Win Environmental Measure*](#) (2013): Study that finds that hotel restaurants reduced plate waste by decreasing plate size and providing social cues.

Emil Juvan, Bettina Grün & Sara Dolnicar, [*Biting Off More Than They Can Chew: Food Waste at Hotel Breakfast Buffets*](#) (2018): Study that offers strategies to reduce buffet plate waste.

Ready-to-Use Resources

U.S. EPA, [*Food Loss Prevention Options for Restaurants*](#) (2016): Guide that includes serving tips and a checklist for restaurants to prevent plate waste.

Articles

Steve Green, Homenish, [*Guide to Plate Sizes \(with Drawings\)*](#) (2022): Guide that helps readers select the appropriate plate size to avoid over-portioning.

Toolkits & Similar Resources

LeanPath, [*20 Waste-Cutting Tips Every Foodservice Chef Should Know*](#) (2004): Guide that covers plate design and portioning strategies to reduce plate waste.

LeanPath, [*Preventing Food Waste at the Buffet: A Guide for Chefs and Managers*](#) (2019): Guide that covers best practices for reducing plate waste through managing portion size.

National Restaurant Association, [*Managing Food Waste in Restaurants*](#) (2021): Guide that helps restaurants design menus to reduce waste (page 11).

ReFED, [*Restaurant Food Waste Action Guide*](#) (2018): Guide that describes best practices for menu design (pages 9–11).



THANK YOU


This resource is made possible by support from



Thank you to Natural Resources Defense Council for reviewing the resources included in this guide.



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FOOD WASTE PREVENTION RESOURCE GUIDE SERIES: PACKAGING DESIGN AND USE



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Up to **40% of the food supply** is wasted in the United States. Reducing this staggering number and meeting **national goals** to reduce food waste requires consumers to make meaningful changes to how they buy, store, prepare, and consume food. Yet, food waste remains off the radar for many consumers. According to a **2019 study**, one in five people never consider food waste in their decision-making while eating at home or grocery shopping. More than two-thirds of people never consider food waste while eating out. Providing effective education is a proven strategy to help address this lack of awareness. Consumer education **has the potential** to divert an additional 3.22 million tons of wasted food, prevent 18.7 million metric tons of CO₂ emissions, and provide a financial net benefit of \$15.8 billion. Increased consumer attention to the issue may also push businesses to operate more responsibly. The **Nashville Food Waste Initiative** (NFWI) aims to provide food waste education to everyone in Nashville, from business owners and staff to educators to students. Originally developed in 2015 as a pilot project by NRDC, NFWI is now led by **Urban Green Lab** (UGL) in partnership with the **Environmental Law Institute** (ELI). UGL offers trainings that include information on how to reduce food waste in classrooms, households, and workplaces.

ELI and UGL collaborated to create the Food Waste Prevention Resource Guide Series to help expand food waste content in UGL trainings and provide ready-to-use resources for other sustainability non-profits or similar organizations to rely upon in creating their own trainings or curriculums. The Resource Guide Series highlights five **proven** food waste prevention strategies:

packaging design and use, date labels, meal prepping and kits, storage and freezing, and plate and portion size. Each Resource Guide covers one of the five topics, includes key tips as well as a list of helpful resources, and is organized into three charts each of which is tailored to a different audience—classrooms, households, and workplaces. Some resources appear across multiple charts.

Organized by both resource type (columns) and topic (rows), the Resource Guide Series provides a straightforward way for sustainability educators to find vetted content for building effective, fact-based trainings.

Packaging is a complex aspect of food waste prevention. While it plays an important role in keeping food safe and fresh until it is eaten, packaging, especially single-use plastics, contributes significantly to landfills and ocean pollution.

NOTES: The Resource Guides provide targeted resources on specific food waste prevention strategies. More free information on food waste prevention, reduction, and recycling, including general overviews, are widely available such as from **USDA**, **NRDC**, **ReFED**, **WRAP** and **World Wildlife Fund**. Additionally, though the Resource Guides largely compile free resources from governments, NGOs, and academics, note that there are also private and/or paid resources that can provide useful information on food waste prevention (e.g., Dana Gunders' **Waste-Free Kitchen Handbook**, **LeanPath**).



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PACKAGING DESIGN AND USE: CLASSROOMS

Packaging is a complex aspect of food waste prevention. While it plays an important role in keeping food safe and fresh until it is eaten, packaging, especially single-use plastics, contributes significantly to landfills and ocean pollution.

The table below compiles free resources for teaching classrooms about sustainable choices to reduce food waste associated with packaging.



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KEY TAKEAWAYS FOR PACKAGING DESIGN AND USE IN **CLASSROOMS**

When teaching about packaging design and use, educators should be able to:

- ▶ Explain that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Explain how unsustainable packaging can lead to food-waste.
- ▶ Share how sustainable packaging can advance specific sustainability goals (e.g., reducing greenhouse gas emissions, reducing food waste by keeping food fresh longer, diverting waste from landfills).
- ▶ Explain the environmental impacts of different packaging options, including reduced/no packaging, and the pros and cons of various sustainable options.
- ▶ Teach how to properly handle (e.g., reuse, recycle, compost, dispose) product packaging.
- ▶ Educate students about how they can engage with elected officials and other community members to encourage sustainable practices such as reducing food waste.
- ▶ Help students understand the impacts of their own actions and how they can discuss and help implement sustainable practices at home.

“Training educators to bring a sustainable lens to the classroom is crucial for culture change in a community. If we want to push the dial for sustainability in a meaningful way, we need to ensure educators have the confidence and tools to deepen the standards they are already teaching while connecting to the real world outside of the classroom.”

- CHRISTINA LANGONE, DIRECTOR OF EDUCATION, URBAN GREEN LAB



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Key Resources on Food Waste

Lesson Plans & Classroom Activities

WWF, [*Be a Food Waste Warrior*](#) (n.d.): K-12 lessons, activities, and resources that educators can use to teach about the environmental impacts of food waste—organized by age group.

Toolkits & Similar Resources

U.S. EPA, [*Too Good to Waste Implementation Guide and Toolkit*](#) (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

ReFED, [*Resources & Guides*](#) (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

Reports & Articles

NRDC, [*Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*](#) (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Rubicon, [*Food Waste in America: Facts and Statistics*](#) (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, [*The US Has a Food Waste Problem and It's Getting Worse*](#) (2023): Article that provides an overview of food waste trends and key numbers.

Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.



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Lesson Plans & Classroom Activities

Project Learning Tree, [*Waste and Recycling Investigation*](#) (2016): Guide that can help educators investigate and improve the waste and recycling practices at early childhood education centers, while also engaging young students in the process.

Toolkits & Similar Resources

U.S. EPA, [*Model Recycling Program Toolkit*](#) (n.d.): Compilation of resources that will help institutions, including schools, create effective programs for recycling, composting, anaerobic digestion, reuse, repair, and waste reduction.

Cafeteria Culture, [*Plastic Free Lunch Day USA*](#) (n.d.): Toolkit for hosting a “Plastic Free Lunch Day,” that includes educational movies, template letters to families, flyers, and a step-by-step guide for implementation.

Reports & Articles

FoodPrint, [*The FoodPrint of Food Packaging*](#) (2019): Report that provides a detailed outline of the problems associated with food packaging and shares how consumers can make a difference.

StopWaste, [*Reduce Packaging Waste*](#) (n.d.): Article that offers tips for reducing packaging waste to reduce individuals’ packaging footprints.

BPI, Learn (n.d.): Articles that provide concise explanations of the following topics related to sustainable packaging: [*biodegradable vs. compostable*](#); [*composting*](#); [*organics in landfills*](#); [*reduce, reuse, recycle*](#); and [*labeling*](#).

Lesson Plans & Classroom Activities

San Mateo Office of Sustainability, [*Wrap it Up! A Plastic Packaging Activity*](#) (2020): Classroom activity that teaches students to analyze the packaging of everyday items through the lens of waste reduction.

Waste Sorting Games (n.d.): Online games that test students' knowledge of waste sorting, tailored to local governments' waste management strategies (e.g., [*Albuquerque*](#), [*Austin*](#), [*Denver*](#), [*District of Columbia*](#), [*Nashville*](#)). Try searching for your city!

Toolkits & Similar Resources

U.S. EPA, [*Reduce, Reuse, Recycle Resources for Students and Educators*](#) (n.d.): Resource compilation that exposes teachers and students to various topics related to reducing, reusing, and recycling.

Boston Public Schools, [*Recycling Education Resource List*](#) (n.d.): Resources that cover recycling, some of which are specific to Boston and/or Massachusetts.

Creative Media

The Story of Stuff, [*The Story of Plastic*](#) (2021): Short animated video that tells the story of the lifecycle of plastic packaging and explores driving factors, current data, and potential avenues for change.



Lesson Plans & Classroom Activities

Reports & Articles

Creative Media

Elementary School

Young People’s Trust for the Environment, [*Lesson Plans: Food Packaging and Recycling*](#) (2020): Customizable PowerPoint slides and notes for a lesson that covers food packaging and recycling and includes ideas for classroom activities.

National Geographic Kids, [*How to Reduce Your Plastic at School!*](#) (n.d.): Article that provides actionable steps for young students to reduce their plastic usage at school, including in their lunches.

Change by Degrees, [*Plastic Free 4 Kids – Plastic and Our Food*](#) (2020): Video that explains why foods are often packaged in plastic and how students can reduce plastic in their lunches.

Project Learning Tree, [*11 Books About Recycling for Elementary Students*](#) (n.d.): List of books that cover a range of recycling topics for ages 5 to 11.

Middle School

Kenan Fellows Program, [*Price Check: What is the True Cost?*](#) (n.d.): Lesson plan and educational resources for a classroom unit that cover sustainable packaging for middle schoolers.

Teaching Engineering, [*Food Packaging*](#) (2013): Lesson plan that teaches students how food packages are designed and made, with an activity for designing their own food packaging.

Alimentarium, [*Food Packaging and Labels*](#) (2019): Short video that explores the history and use of food packaging and labels.



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High School

Lesson Plans & Classroom Activities

Teaching Engineering, [*Making Decisions: Packaging and the Environment*](#) (n.d.): Hands-on learning activity for 9th grade students to redesign the packaging used in consumer products.

Toolkits & Similar Resources

Upstream, [*Community Action*](#) (n.d.): Compilation of resources that help consumers make the case for businesses to opt for reusable items over single-use packaging.

Reports & Articles

McKinsey & Company, [*Sustainability in packaging 2023: Inside the minds of global consumers*](#) (2023): Article that explores recent trends, data, and issues in the sphere of sustainable packaging.

Creative Media

CBC News, [*Why Buying Plastic Free Packaging Is So Hard*](#) (2019): Video of a news segment that challenges families to avoid plastic food packaging and discusses the socioeconomic factors involved in their decisions.

NowThis Earth, [*Why Zero-Waste Grocery Shopping Matters*](#) (2019): Short video that describes the impacts of zero-waste grocery shopping.

The Telegraph, [*Decodes: Sustainable Packaging*](#) (2020): Short video that provides background information about the current state of sustainable packaging.

For more information: Linda Breggin, ELI Senior Attorney ([*breggin@eli.org*](mailto:breggin@eli.org)) and Todd Lawrence, UGL Executive Director ([*todd@urbangreenlab.org*](mailto:todd@urbangreenlab.org)).



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PACKAGING DESIGN AND USE: HOUSEHOLDS

Packaging is a complex aspect of food waste prevention. While it plays an important role in keeping food safe and fresh until it is eaten, packaging, especially single-use plastics, contributes significantly to landfills and ocean pollution.

The table below compiles free resources for teaching households about sustainable choices to reduce food waste associated with packaging.



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KEY TAKEAWAYS FOR PACKAGING DESIGN AND USE IN HOUSEHOLDS

When teaching about packaging design and use, educators should help households:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Understand how unsustainable packaging can lead to food waste.
- ▶ Understand how sustainable packaging can advance specific sustainability goals (e.g., reducing greenhouse gas emissions, reducing food waste by keeping food fresh longer, diverting waste from landfills).
- ▶ Remember that, although packaging can help reduce food waste, single-use plastics should be avoided when possible.
- ▶ Learn how to properly handle (e.g., reuse, recycle, compost, dispose) product packaging according to local waste management regulations.
- ▶ Recognize that they should use the storage and packaging materials they already have before buying new solutions (e.g., use a plastic container until it wears out and then buy glass or stainless steel).
- ▶ Evaluate the impacts of their own actions and how they can adopt more sustainable practices at home and encourage businesses, schools, and other institutions to do the same.

"Educating residents to find simple, sustainable solutions within their homes impacts the entire city. Once sustainability has been integrated into the everyday lives and actions of households, that knowledge then pours into our relationships, neighborhoods, and communities."

- KARISSA HAMPTON, SUSTAINABLE HOUSEHOLDS MANAGER, URBAN GREEN LAB



URBAN GREEN LAB

Key Resources on Food Waste

Reports & Case Studies

NRDC, [*Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*](#) (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Ready-to-use Resources

ReFED, [*Resources & Guides*](#) (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

Toolkits & Similar Resources

U.S. EPA, [*Too Good to Waste Implementation Guide and Toolkit*](#) (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

Articles

Rubicon, [*Food Waste in America: Facts and Statistics*](#) (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, [*The US Has a Food Waste Problem and It's Getting Worse*](#) (2023): Article that provides an overview of food waste trends and key numbers.

Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.



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Understanding Consumer's Impact

Reports & Case Studies

FoodPrint, [*The FoodPrint of Food Packaging*](#) (2019): Report that provides a detailed outline of the problems with food packaging and shares how consumers can make a difference.

Ready-to-use Resources

Plastic Free Foundation, [*Plastic Free July*](#) (n.d.): Website that offers resources and instructions for participating in an annual challenge to reduce plastic consumption during the month of July.

Toolkits & Similar Resources

Green Living Toolkit, [*Waste*](#) (n.d.): Tools that help consumers reduce single use plastics, reuse products, and correctly recycle.

Upstream, [*Community Action*](#) (n.d.): Compilation of resources to help consumers make the case for businesses to opt for reusable items over single-use packaging.

Articles

Eco & Beyond, [*The Packaging Problem*](#) (n.d.): Article that describes consumer best practices for reducing packaging and how to move towards a zero-waste lifestyle.

Creative Media

The Telegraph, [*Decodes: Sustainable Packaging*](#) (2020): Short video that provides background information about the current state of sustainable packaging.



URBAN GREEN LAB™

Reports & Case Studies

Cavaliere et al., Sustainability, [*Do Consumers Really Want to Reduce Plastic Usage? Exploring the Determinant of Plastic Avoidance in Food-Related Consumption Decisions*](#) (2020): Academic study that finds that environment- and health-related concerns drive consumers to avoid single-use plastics while grocery shopping.

Ready-to-use Resources

GreenPeace USA, [*Shopping for Plastic: The 2021 Supermarket Plastics Ranking*](#) (2021): Site that scores 20 major US grocery stores based on their efforts to reduce their reliance on plastics.

Articles

Laurie Fanelli, [*Seven Ways to Reduce Grocery Store Waste*](#) (n.d): Blog post that gives tips for ways to reduce waste while grocery shopping.

Sophie Hirsh, [*Six Tips For Zero-Waste Grocery Shopping, Even if You Don't Have a Bulk Section*](#) (2020): Blog post that provides information on how to reduce waste in grocery stores both with and without bulk sections.

StopWaste, [*Reduce Packaging Waste*](#) (n.d.): Article that offers tips for reducing packaging waste to reduce individuals' packaging footprints.

Creative Media

NowThis Earth, [*Why Zero-Waste Grocery Shopping Matters*](#) (2019): Short video that describes the impacts of zero-waste grocery shopping.



Food Packaging Waste Management

Reports & Case Studies

The Sustainability Institute, [*Engaging Consumers to Reduce and Recycle*](#) (n.d.): Research insights that reveal how to encourage consumers to reduce and recycle by using “nudges,” and raising awareness.

Ready-to-use Resources

Waste Sorting Games: Online games that test students’ knowledge of waste sorting, tailored to local governments’ waste management strategies (e.g., [*Albuquerque*](#), [*Austin*](#), [*Denver*](#), [*District of Columbia*](#), [*Nashville*](#)). Try searching for your city!

Toolkits & Similar Resources

US EPA, [*Model Recycling Program Toolkit*](#) (n.d.): Compilation of resources that will help institutions, including schools, create effective programs for recycling, composting, anaerobic digestion, reuse, repair, and waste reduction.

Articles

Eco & Beyond, [*Disposing of Compostable Packaging, The Compost Conundrum*](#) (n.d.): Article that explains how to responsibly discard compostable packaging materials.

Creative Media

Oregon Metro, [*Recycling Tips: Food Packaging in the Kitchen*](#) (2020): Short video that demonstrates how to properly discard common food packaging, some of which is specific to the Oregon Metro area.

For more information: Linda Breggin, ELI Senior Attorney (breggin@eli.org) and Todd Lawrence, UGL Executive Director (todd@urbangreenlab.org).



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PACKAGING DESIGN AND USE: WORKPLACES

Packaging is a complex aspect of food waste prevention. While it plays an important role in keeping food safe and fresh until it is eaten, packaging, especially single-use plastics, contributes significantly to landfills and ocean pollution.

The table below compiles free resources for teaching workplaces about sustainable choices to reduce food waste associated with packaging.



URBAN GREEN LAB

KEY TAKEAWAYS FOR PACKAGING DESIGN AND USE IN WORKPLACES

When teaching about packaging design and use, educators should help workplaces:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Understand how unsustainable packaging can lead to food waste.
- ▶ Identify specific sustainability goals (e.g., reduce greenhouse emissions, eliminate single-use plastic, increase recyclability of packaging).
- ▶ Learn about how to use the least amount of material to contain products safely and avoid packaging with multiple materials (e.g. soup boxes) and/or require use of such practices by contractors.
- ▶ Understand the sustainable packaging options appropriate for a product/service that will achieve sustainability goal(s), including for one-time packaging (e.g., compostable, recyclable, plastic alternatives) and reusable packaging (coupled with a reuse system).
- ▶ Apply lessons learned from case studies of businesses in similar sectors that have switched to more sustainable packaging.
- ▶ Educate customers/consumers about sustainable packaging and how to properly handle product packaging (e.g., reuse, recycle, compost, dispose).
- ▶ Understand the ability of workplaces to reduce food waste through sustainable choices and knowledge-sharing within their workforces, customer bases, and business communities.

"It's a wonderful experience to distill complex scientific information into tangible actions for citizens to digest and utilize in their own way. If an attendee walks away from one of my trainings doing just one or two new sustainable activities that add value to their life, that's a huge win. Connecting people to resources in sustainability that are vetted and accurate is one of the best things we can do to empower them to make long-lasting changes."

- JACQUELINE GOODWIN, ASSISTANT DIRECTOR OF WORKPLACES, URBAN GREEN LAB



URBAN GREEN LAB

Key Resources on Food Waste

Reports & Case Studies

NRDC, *Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill* (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Toolkits & Similar Resources

U.S. EPA, *Too Good to Waste Implementation Guide and Toolkit* (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

Ready-to-use Resources

ReFED, *Resources & Guides* (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

Chancery Lane Project, *Reducing Supply Chain Food Waste* (2022): Model contractual clause that can be used by businesses to reduce food waste in their supply chains in order to reduce greenhouse gas emissions and realize financial benefits.

Articles

Rubicon, *Food Waste in America: Facts and Statistics* (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, *The US Has a Food Waste Problem and It's Getting Worse* (2023): Article that provides an overview of food waste trends and key numbers.

Creative Media

Our Changing Climate, *Food Waste Causes Climate Change. Here's How We Stop it.* (2020): Video that provides key food waste statistics and possible avenues for change.



Reports & Case Studies

McKinsey & Company, [*Sustainability in Packaging 2023: Inside the Minds of Global Consumers*](#) (2023): Article that explores recent trends, data, and issues in the sphere of sustainable packaging.

FoodPrint, [*The FoodPrint of Food Packaging*](#) (2019): Report that provides a detailed outline of the problems with food packaging and shares how consumers can

Ready-to-use Resources

Waste Sorting Games (n.d.): Online games that test students' knowledge of waste sorting, tailored to local governments' waste management strategies (e.g., [*Albuquerque, Austin, Denver, District of Columbia, Nashville*](#)).
Try searching for your city!

Toolkits & Similar Resources

US EPA, [*Model Recycling Program Toolkit*](#) (n.d.): Compilation of resources that will help institutions, including schools, create effective programs for recycling, composting, anaerobic digestion, reuse, repair, and waste reduction.

Articles

The Sustainability Institute, [*Engaging Consumers to Reduce and Recycle*](#) (n.d.): Research insights that reveal how to encourage consumers to recycle by using “nudges,” and raising awareness.

Creative Media

The Telegraph, [*Decodes: Sustainable Packaging*](#) (2020): Short video that provides background information about the current state of sustainable packaging.

Reports & Case Studies

Guillard et al., *[The Next Generation of Sustainable Food Packaging to Preserve Our Environment in a Circular Economy Context](#)* (2018): Paper that reviews major challenges to sustainable food packaging and proposes specific solutions and tools.

Grönman et al., *[Framework for Sustainable Food Packaging Design](#)* (2012): Journal article that proposes a process for sustainable food package design that considers the entire life cycle of the product–package combination.

Santi et al., *[Sustainable Food Packaging: An Integrative Framework](#)* (2022): Journal article that proposes a framework for designing and evaluating food packaging products.

Ready-to-use Resources

The Recycling Partnership, *[Plastic IQ](#)* (n.d.): Data-driven digital tool that allows U.S. companies making and selling packaged goods to analyze the environmental footprint and cost of plastic packaging.

Articles

Michael Dillon, Meyers, *[The Switch to Sustainable Packaging: A Guide for Your Business](#)* (2023): Comprehensive guide that explains the basics of sustainable packaging, reviews various options, and suggests strategies.

Toolkits & Similar Resources

Upstream, *[Business Resources](#)* (n.d.): Variety of case studies, toolkits, articles, podcasts, vlogs, and livestreams that can help businesses make the switch from single-use to reusable items.

BPI, *[Home Page](#)* (n.d.): Home page of an organization that provides a certification for compostable packaging, a search engine for certified products, and advocacy information for businesses.

Packaging Design And Use Best Practices

Reports & Case Studies

Repak, *Case Studies & Best Practice Guides* (n.d.): Case studies from a cross-section of industries and sectors that include best practices guides for retail, hotels, offices, restaurants and grocery retailers on reducing packaging waste.

Sustainable Packaging Coalition, *Best Practices for Designing Packages to Prevent and Divert Food Waste* (2022): Report that provides best practices for grocery environments on use of packaging design to both prevent/divert food waste and educate consumers about food waste.

Ready-to-use Resources

U.S. EPA, *Reducing Wasted Food & Packaging: Guide for Food Services and Restaurants* (2014): Toolkit that includes best practices, templates, and case studies to help food service establishments and commercial kitchens reduce wasted food and packaging.

Articles

Plastic Pollution Coalition, *Plastic Free Eateries* (n.d.): Article that lists steps restaurants and other food businesses can take to reduce plastic use and educate customers.

Toolkits & Similar Resources

Natural Products Insiders, *Sustainable Packaging Toolkit* (2020): Toolkit that can aid suppliers interested in improving and innovating packaging.

For more information: Linda Breggin, ELI Senior Attorney (breggin@eli.org) and Todd Lawrence, UGL Executive Director (todd@urbangreenlab.org).



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This resource is made possible by support from



*Thank you to Natural Resources Defense Council for
reviewing the resources included in this guide.*



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FOOD WASTE PREVENTION RESOURCE GUIDE SERIES: STORAGE AND FREEZING



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Up to **40% of the food supply** is wasted in the United States. Reducing this staggering number and meeting **national goals** to reduce food waste requires consumers to make meaningful changes to how they buy, store, prepare, and consume food. Yet, food waste remains off the radar for many consumers. According to a **2019 study**, one in five people never consider food waste in their decision-making while eating at home or grocery shopping. More than two-thirds of people never consider food waste while eating out. Providing effective education is a proven strategy to help address this lack of awareness. Consumer education **has the potential** to divert an additional 3.22 million tons of wasted food, prevent 18.7 million metric tons of CO₂ emissions, and provide a financial net benefit of \$15.8 billion.

Increased consumer attention to the issue may also push businesses to operate more responsibly. **The Nashville Food Waste Initiative** (NFWI) aims to provide food waste education to everyone in Nashville, from business owners and staff to educators to students. Originally developed in 2015 as a pilot project by NRDC, NFWI is now led by **Urban Green Lab** (UGL) in partnership with the **Environmental Law Institute** (ELI). UGL offers trainings that include information on how to reduce food waste in classrooms, households, and workplaces.

ELI and UGL collaborated to create the Food Waste Prevention Resource Guide Series to help expand food waste content in UGL trainings and provide ready-to-use resources for other sustainability non-profits or similar organizations creating their own trainings or curriculums.

The Resource Guide Series highlights five **proven** food waste prevention strategies: packaging design and use, date labels, meal prepping and kits, storage and freezing, and plate and portion size. Each Resource Guide covers one of the five topics, includes key tips as well as a list of helpful resources, and is organized into three charts tailored to a different audience—classrooms, households, and workplaces. Some resources appear across multiple charts.

Organized by both resource type (columns) and topic (rows), the Resource Guide Series provides a straightforward way for sustainability educators to find vetted content for building effective, fact-based trainings.

Storage and freezing are integral to food waste prevention. Optimal storage methods maximize food freshness and shelf life, helping to extend the time food is safe for consumption and reducing the amount of spoiled food that ends up in landfills or incinerators.

NOTES: The Resource Guides provide targeted resources on specific food waste prevention strategies. More free information on food waste prevention, reduction, and recycling, including general overviews, are widely available such as from **USDA**, **NRDC**, **ReFED**, **WRAP** and **World Wildlife Fund**. Additionally, though the Resource Guides largely compile free resources from governments, NGOs, and academics, note that there are also private and/or paid resources that can provide useful information on food waste prevention (e.g., Dana Gunders' **Waste-Free Kitchen Handbook**, **LeanPath**).



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STORAGE AND FREEZING: CLASSROOMS

Storage and freezing are integral to food waste prevention. Optimal storage methods maximize food freshness and shelf life, helping to extend the time food is safe for consumption and reducing the amount of spoiled food that ends up in landfills or incinerators.

The table below compiles free resources for teaching classrooms about sustainable storage and freezing practices to reduce waste from food spoilage.



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KEY TAKEAWAYS FOR STORAGE AND FREEZING IN CLASSROOMS

When teaching about storage and freezing, educators should be able to:

- ▶ Explain that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Explain how improper storage and freezing practices can lead to food waste.
- ▶ Explain why food storage and freezing are necessary to prevent spoilage of perishable foods, which can protect health and save money and resources.
- ▶ Teach how different storage and freezing methods are appropriate for preserving various types of food.
- ▶ Share different methods of storing food (e.g., refrigerator, freezer, pantry) and the advantages and disadvantages of each.
- ▶ Educate students about how they can engage with elected officials and other community members to encourage sustainable practices such as reducing food waste.
- ▶ Help students understand the impacts of their own actions and how they can discuss and help implement sustainable practices at home.

“Training educators to bring a sustainable lens to the classroom is crucial for culture change in a community. If we want to push the dial for sustainability in a meaningful way, we need to ensure educators have the confidence and tools to deepen the standards they are already teaching while connecting to the real world outside of the classroom.”

- CHRISTINA LANGONE, DIRECTOR OF EDUCATION, URBAN GREEN LAB



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Key Resources on Food Waste

Lesson Plans & Classroom Activities

WWF, [*Be a Food Waste Warrior*](#) (n.d.): K-12 lessons, activities, and resources that educators can use to teach about the environmental impacts of food waste—organized by age group.

Toolkits & Similar Resources

U.S. EPA, [*Too Good to Waste Implementation Guide and Toolkit*](#) (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

ReFED, [*Resources & Guides*](#) (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

Reports & Articles

NRDC, [*Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*](#) (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Rubicon, [*Food Waste in America: Facts and Statistics*](#) (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, [*The US Has a Food Waste Problem and It's Getting Worse*](#) (2023): Article that provides an overview of food waste trends and key numbers.

Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.



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Toolkits & Similar Resources

USDA, [Refrigeration & Food Safety](#) (2015): Detailed guide that provides information on refrigerators and food safety.

U.S. EPA, [Storage Tips](#) (2023): Guide that provides tips, toolkits, and resources for storing produce, meat, poultry, and grains and using refrigerators and freezers.

Reports & Articles

NRDC, [Freeze More. Waste Less.](#) (2022): Article that describes how freezing food can reduce food waste.

Shaheen Hosany, [The Conversation, How Children Are Helping to Make Their Families More Eco-Friendly - New Research](#) (2022): Article that explains how sustainability education at school leads children to develop and implement sustainable practices at home.

Creative Media

Eat Happy Project, [Benefits of Freezing Your Food](#) (2016): Short video that illustrates the economic and environmental benefits of freezing food and how to freeze different types of food at home.

Chowhound, [The Proper Way to Store Food in Your Fridge](#) (2019): Video that shows what foods can be refrigerated and their proper placement in refrigerators.

Lesson Plans & Classroom Activities

NRDC Save the Food, [*Store It - Interactive Storage Guide*](#) (2023): Web-based interactive storage guide that allows users to get tailored information on storage of specific food items.

WWF, [*The No Food Waste Game*](#) (2020): Educational game for students that challenges players to think of different ways to prevent food waste generally.

Toolkits & Similar Resources

Partnership for Food Safety Education, [*Take a Fresh Look at Frozen Foods*](#) (n.d.): Article, flyer, and infographic that provide information on how frozen food can reduce spoilage waste.

USDA, [*Refrigeration & Food Safety*](#) (2015): Detailed guide that provides information on refrigerators and food safety.

USDA, [*Freezing & Food Safety*](#) (2013): Guide that describes how freezing preserves food, proper freezing techniques, and storage times for frozen foods.

Reports & Articles

The Scholarship System, [*5 Ways Students Can Get Involved in Politics \(And Why They Should\)*](#) (2023): Blog that explores ways students can be politically active and engage with elected officials and community members.

Creative Media

Maine Department of Education, [*Proper Food Storage with Alisa Roman*](#) (2020): Video that details how educational institutions should store produce in facilities and how to assess produce for spoilage.

Chowhound, [*The Proper Way to Store Food in Your Fridge*](#) (2019): Video that shows what foods can be refrigerated and their proper placement in refrigerators.



Elementary School

Lesson Plans & Classroom Activities

Food Standards Scotland, [*What Goes Where?*](#) (n.d.): Interactive learning activity that includes handouts, a video, an interactive game, and assessment opportunities to teach students about where different foods are stored and the importance of storage for food safety.

Reports & Articles

Stephen Bosi, [*The Conversation, Curious Kids: How Do Freezers Work?*](#) (2021): Article for children that provides an overview of solids, liquids, and gases to explain how freezers keep foods cold.

Middle School

Unique Learning System, [*Safely Storing Food*](#) (2020): Lesson that covers safe storage of food in freezers, refrigerators, and pantries with instructional targets, activities, handouts, and a teaching model.

Food Standards Scotland, [*Fridge Facts*](#) (n.d.): Interactive game that educates children ages 10 to 12 about safe ways to store food in the fridge.

Academy of Nutrition and Dietetics, [*Refrigerate - The Basics*](#) (2023): Article that covers the basics of refrigeration, including general tips on refrigerator storage.



Lesson Plans & Classroom Activities

Food Standards Scotland, [*Storage Solutions*](#) (n.d.): Interactive lesson that teaches students about correct food storage conditions for common household items with guidance on set-up, activities, and assessment opportunities.

Foodspan & John Hopkins Center for a Livable Future, [*Our Wasted Food*](#) (2023): 50-minute lesson plan that teaches students about food waste and possible solutions, with extension projects that will further empower students to take action.

The Centre for Science Education, Sheffield Hallam University, [*Food Preservation: Teacher's Notes*](#) (n.d.): Unit plan that covers the role of food preservation in preventing spoilage with activities, handouts, teaching models, and objectives.

Toolkits & Similar Resources

North Dakota State University, [*Food Storage Guide*](#) (2023): Comprehensive guide that lists storage times and handling tips for different foods in cupboards, refrigerators, and freezers.

Creative Media

Eat Happy Project, [*Benefits of Freezing Your Food*](#) (2016): Short video that illustrates the economic and environmental benefits of freezing food and how to freeze different types of food at home.

Reports & Articles

University of Nebraska, [*Refrigerator and Freezer Storage*](#) (n.d.): Article that describes correct temperatures and best practices to keep food fresh longer in refrigerators or freezers.

For more information: Linda Breggin, ELI Senior Attorney (lreggin@eli.org) and Todd Lawrence, UGL Executive Director (todd@urbangreenlab.org).



URBAN GREEN LAB

STORAGE AND FREEZING: HOUSEHOLDS

Storage and freezing are integral to food waste prevention. Optimal storage methods maximize food freshness and shelf life, helping to extend the time food is safe for consumption and reducing the amount of spoiled food that ends up in landfills or incinerators.

The table below compiles free resources for teaching households about sustainable storage and freezing practices to reduce waste from food spoilage.



URBAN GREEN LAB™

KEY TAKEAWAYS FOR STORAGE AND FREEZING IN HOUSEHOLDS

When teaching about storage and freezing, educators should help households:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Recognize how improper storage and freezing practices can lead to food waste.
- ▶ Understand optimal storage and freezing methods for different types of food to extend shelf life.
- ▶ Learn different techniques (e.g., freezing, canning, drying) for preserving perishable food to prevent spoilage, which in turn can protect health and save money and resources.
- ▶ Understand that preventing food waste at home requires keeping food fresh as well as inventorying current food supplies and using them up.
- ▶ Evaluate the impacts of their own actions and how they can adopt more sustainable practices at home and encourage businesses, schools, and other institutions to do the same.

"Educating residents to find simple, sustainable solutions within their homes impacts the entire city. Once sustainability has been integrated into the everyday lives and actions of households, that knowledge then pours into our relationships, neighborhoods, and communities."

- KARISSA HAMPTON, SUSTAINABLE HOUSEHOLDS MANAGER, URBAN GREEN LAB



URBAN GREEN LAB

Key Resources on Food Waste

Reports & Case Studies	Ready-to-Use Resources	Toolkits & Similar Resources	Articles
<p>NRDC, <i>Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill</i> (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.</p>	<p>ReFED, <i>Resources & Guides</i> (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.</p>	<p>U.S. EPA, <i>Too Good to Waste Implementation Guide and Toolkit</i> (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.</p>	<p>Rubicon, <i>Food Waste in America: Facts and Statistics</i> (2023): Primer on food waste in America that includes statistics and recommendations.</p>
<p>Creative Media</p>			
<p>Our Changing Climate, <i>Food Waste Causes Climate Change. Here's How We Stop it.</i> (2020): Video that provides key food waste statistics and possible avenues for change.</p>			<p>Bloomberg, <i>The US Has a Food Waste Problem and It's Getting Worse</i> (2023): Article that provides an overview of food waste trends and key numbers.</p>



Freezing

Reports & Case Studies	Ready-to-Use Resources	Toolkits & Similar Resources	Articles
<p>Gorter et al., <i>Measurement of Frozen versus Fresh Food Waste at the Retail and Consumer Levels: A Critical Review and Meta Analysis</i> (2023): Literature survey that finds retail and consumer waste rates are lower for frozen food than fresh food.</p>	<p>NRDC Save the Food, <i>Store It - Interactive Storage Guide</i> (2023): Web-based interactive storage guide that allows users to get tailored information on storage of specific food items.</p>	<p>North Dakota State University, <i>Food Freezing Guide</i> (2019): Resource guide that covers information on freezing food.</p>	<p>NRDC, <i>Freeze More. Waste Less.</i> (2022): Article that describes how freezing food can reduce food waste.</p> <p>USDA, <i>Freezing & Food Safety</i> (2013): Guide that describes how freezing preserves food, proper freezing techniques, and storage times for frozen foods.</p>
<p>Creative Media</p>			
<p>Eat Happy Project, <i>Benefits of Freezing Your Food</i> (2016): Short video that illustrates the economic and environmental benefits of freezing food and how to freeze different types of food at home.</p>			



Refrigeration

Reports & Case Studies

Ohio State News, [*Much Fridge Food 'Goes There to Die'*](#) (2019): Survey that finds that households used significantly less of the meat, vegetables, fruit, and dairy in their refrigerators than they projected.

Creative Media

Chowhound, [*The Proper Way to Store Food in Your Fridge*](#) (2019): Video that shows what foods can be refrigerated and their proper placement in refrigerators.

Ready-to-Use Resources

NRDC, [*The Refrigerator Demystified*](#) (2013): Infographic that visualizes temperature differences across refrigerator compartments and the optimal placement for different types of food.

Toolkits & Similar Resources

USDA, [*Refrigeration & Food Safety*](#) (2015): Detailed guide that provides information on refrigerators and food safety.

Articles

Real Simple, [*The Ultimate Guide to Storing Every Type of Food in the Refrigerator for Long-Lasting Freshness*](#) (2023): Guide that explains how to store different types of food in the refrigerator, with tips on placement and storage times, and packaging.



Shelf-Stable Food

Ready-to-Use Resources

My Pantry Tracker, [*My Pantry Tracker Application*](#) (2023): Mobile or web browser application that allows users to track pantry items' quantities, best-by dates, and purchase dates by scanning item barcodes.

Toolkits & Similar Resources

Los Angeles Regional Food Bank, [*A Shelf Life Guide*](#) (2018): Guide that lists the shelf life of shelf-stable foods when properly stored, including information on refrigeration storage times after opening.

Articles

USDA, [*Shelf-Stable Food Safety*](#) (2015): Guide that covers the production, safety, and storage of canned and dried foods, including a shelf-stable food storage chart.

EatingWell, [*7 Pantry Mistakes You're Probably Making*](#) (2023): Article that describes top mistakes leading to wasted pantry food and how households can resolve them.

For more information: Linda Breggin, ELI Senior Attorney (linda@eli.org) and Todd Lawrence, UGL Executive Director (todd@urbangreenlab.org).



URBAN GREEN LAB™



STORAGE AND FREEZING: WORKPLACES

Storage and freezing are integral to food waste prevention. Optimal storage methods maximize food freshness and shelf life, helping to extend the time food is safe for consumption and reducing the amount of spoiled food that ends up in landfills or incinerators.

The table below compiles free resources for teaching workplaces about sustainable storage and freezing practices to reduce waste from food spoilage.



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KEY TAKEAWAYS FOR STORAGE AND FREEZING IN WORKPLACES

When teaching about storage and freezing, educators should help workplaces:

- ▶ Understand that food waste contributes to climate change through unnecessary use of energy and resources, as well as emissions generated during landfill decay.
- ▶ Understand how improper storage and freezing practices can lead to food waste.
- ▶ Decide on specific workplace sustainability goals (e.g., preventing food spoilage, avoiding food surplus through storage inventory, keeping food fresh).
- ▶ Use optimal storage and freezing methods for different types of food or require use of such methods by contractors (e.g., caterers, hotels that host conferences), in order to reduce food waste, protect health, and reduce food and storage costs.
- ▶ Inform food orders by regularly tracking food waste and stock inventories.
- ▶ Consult case studies of businesses in similar sectors that have made the switch to more sustainable storage and freezing practices.
- ▶ Understand the ability of workplaces to reduce food waste through sustainable choices and knowledge-sharing within their workforce, customer base, and business communities.

"It's a wonderful experience to distill complex scientific information into tangible actions for citizens to digest and utilize in their own way. If an attendee walks away from one of my trainings doing just one or two new sustainable activities that add value to their life, that's a huge win. Connecting people to resources in sustainability that are vetted and accurate is one of the best things we can do to empower them to make long-lasting changes."

- JACQUELINE GOODWIN, ASSISTANT DIRECTOR OF WORKPLACES, URBAN GREEN LAB



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Key Resources on Food Waste

Reports & Case Studies

NRDC, [*Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*](#) (2017): Seminal report on food waste that includes a thorough description of the problem, recent progress, and emerging solutions.

Creative Media

Our Changing Climate, [*Food Waste Causes Climate Change. Here's How We Stop it.*](#) (2020): Video that provides key food waste statistics and possible avenues for change.

Ready-to-Use Resources

ReFED, [*Resources & Guides*](#) (n.d.): Compilation of online food waste tools that includes a food waste monitor, solutions database, impact calculator, and policy finder.

The Chancery Lane Project, [*Reducing Supply Chain Food Waste*](#) (2022): Model contractual clause that can be used by businesses to reduce food waste in their supply chains in order to reduce greenhouse gas emissions and realize financial benefits.

Toolkits & Similar Resources

U.S. EPA, [*Too Good to Waste Implementation Guide and Toolkit*](#) (n.d.): Comprehensive toolkit that provides strategies and resources for consumers and educators to engage in food waste reduction activities.

Articles

Rubicon, [*Food Waste in America: Facts and Statistics*](#) (2023): Primer on food waste in America that includes statistics and recommendations.

Bloomberg, [*The US Has a Food Waste Problem and It's Getting Worse*](#) (2023): Article that provides an overview of food waste trends and key numbers.



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Reports & Case Studies	Ready-to-Use Resources	Toolkits & Similar Resources	Articles
<p>Gorter et al., <i>Measurement of Frozen versus Fresh Food Waste at the Retail and Consumer Levels: A Critical Review and Meta Analysis</i> (2023): Literature survey that finds retail and consumer waste rates are lower for frozen food than fresh food.</p> <p>Martindale & Schiebel, <i>The Impact of Food Preservation on Food Waste</i> (2017): Study that finds that frozen food can significantly reduce food waste as compared to fresh food.</p>	<p>NRDC Save the Food, <i>Store It - Interactive Storage Guide</i> (2023): Web-based interactive storage guide that allows users to get tailored information on storage of specific food items.</p> <p>U.S. Food and Drug Administration, <i>Social Media Toolkit for Food Loss and Waste</i> (2022): Toolkit that includes model social media posts on food waste including those on date labels.</p>	<p>Virginia Cooperative Extension, <i>Food Storage Guidelines for Consumers</i> (2018): Guide that educates consumers about recommended storage methods for various foods, with a food storage chart.</p> <p>Creative Media</p> <p>Eat Happy Project, <i>Benefits of Freezing Your Food</i> (2016): Short video that illustrates the economic and environmental benefits of freezing food and how to freeze different types of food.</p> <p>Chowhound, <i>The Proper Way to Store Food in Your Fridge</i> (2019): Video that shows what foods can be refrigerated and their proper placement in refrigerators.</p>	<p>USDA, <i>10 Smart Tips to Keep Your Restaurant Leftovers Safe</i> (2021): Article that provides tips on storing restaurant leftovers safely.</p>

Food Storage in Commercial Settings

Ready-to-Use Resources	Toolkits & Similar Resources	Articles	Creative Media
<p>U.S. EPA, <i>Food Loss Prevention Options for Restaurants</i> (2016): Checklist that includes a section on preparation and storage tips for restaurants to prevent food loss and waste.</p> <p>U.S. EPA, <i>Food Loss Prevention Options for Grocery Stores</i> (2016): Checklist that includes a section on preparation and storage tips for grocery stores to prevent food waste.</p>	<p>North Dakota State University, <i>Food Storage Guide</i> (2023): Comprehensive guide that lists storage times and handling tips for different foods in cupboards, refrigerators, and freezers.</p>	<p>University of Nebraska, <i>Refrigerator and Freezer Storage</i> (n.d.): Article that describes correct temperatures and best practices to keep food fresh longer in refrigerators or freezers.</p>	<p>Food Standards Agency, <i>Chilled Storage and Display</i> (2012): Video that explains how businesses can keep foods cold in a fridge or display unit.</p> <p>Food Standards Agency, <i>Chilling Foods</i> (2012): Video that includes tips on how businesses can chill prepared foods as quickly as possible.</p>



Inventory Management

Reports & Case Studies

RIS News, [*Albertsons Completes Rollout of Predictive Ordering and Inventory Management Software Platform*](#) (2023): Article that explores a case study of Albertsons' new software to manage, produce and deliver fresher products to customers.

Ready-to-Use Resources

UpMenu, [*Restaurant Inventory Management Template*](#) (2023): Free Google Sheets template that provides restaurants a structure for recording and tracking inventory data such as best-by dates and storage location.

Toolkits & Similar Resources

UpMenu, [*Restaurant Inventory Management \(Complete Guide & Template\)*](#) (2023): Guide that covers restaurant inventory management and its importance to food waste reduction and food safety.

Articles

Forbes, [*7 Ways to Minimize Inventory Waste*](#) (2020): Article that explains how effective inventory management can reduce businesses' food spoilage and waste.

Creative Media

National Restaurant Association, [*Inventory Food and Track Food Waste*](#) (2013): Video strategies for food inventory and food waste tracking so businesses can reduce food spoilage and save money.

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THANK YOU

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