Pathways and Strategies

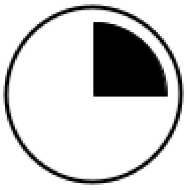
From thousands of sustainable practices that environmental groups, government agencies, and other authors suggest, we've selected ones that really make a measurable positive difference based on verifiable science. To help you appreciate how practices build on each other to achieve meaningful and ultimately transformative sustainability milestones, we organize them by pathway, strategy, and implementation level. If you already know exactly which practices you want to improve, go to the next chapter, Practice Guides, for step-by-step details.

Which practices make sense for you depends on where you are, where you want to go on your journey to sustainability, and what you enjoy doing. Some people prefer to invest in efficiency, while others thrive on the challenge of frugally conserving resources. Familiarizing yourself with every possible strategy empowers you to set attainable goals and select the best practices for your current situation. This chapter is like a map of all the available trails; the Practice Guides chapter explains how to hike along each section of every trail. Rather than plodding along every trail, plan your journey wisely.

Pathways	Strategies
 **Community**	Understand sustainability Demonstrate sustainable practices Interact with other people
 **Food**	Reduce food waste Choose wise ingredients Eat plant-based meals Cultivate healthy harvests
 **Water**	Optimize water efficiency Conserve water Prevent water pollution
 **Movement**	Reduce travel miles Get exercise Drive electric
 **Energy**	Optimize energy efficiency Conserve energy Electrify Solarize
 **Goods**	Buy less Choose green goods Maintain and reuse Manage waste wisely
 **Habitat**	Shelter well Renovate wisely Protect nature

Implementation Levels

Get a quick start with easy practices and work your way up to transformative practices.

Level 1. Quick Start 	**Focus:** Building awareness and taking first steps
	Prerequisites: None
	Preparation: You can start right away; no preparation required
	Time / Cost: < 1 hour per practice / Free or minimal cost (<$50)
	Skills: No special skills required
	Equipment: No specialized equipment needed
	Scale: Individual, household, or department
Level 2. Intermediate 	**Focus:** Building good habits and engaging others
	Prerequisites: Several Level 1 practices
	Preparation: Some preparation useful
	Time / Cost: Hours / Low to moderate cost ($50-2,500)
	Skills: Some skills may be required
	Equipment: Some special tools may be required
	Scale: Extended family or entire organization
Level 3. Advanced 	**Focus:** Creating structured programs and measuring impact
	Prerequisites: Multiple Level 2 practices
	Preparation: Significant preparation required
	Time / Cost: Days / Moderate to high cost ($2,500-25,000)
	Skills: Project management, leadership, technical expertise
	Equipment: Specialized tools or software may be required
	Scale: Up to neighborhood or campus
Level 4. Transformative 	**Focus:** Permanently changing habits and systems
	Prerequisites: Multiple Level 3 practices
	Preparation: Professional education or training required
	Time / Cost: Weeks or more / High cost ($25,000 or more)
	Skills: Strategic planning, system design, policy analysis
	Equipment: Extensive infrastructure may be required
	Scale: Up to whole community and region

Community Pathway

Practical sustainability is inherently collaborative. You become an agent for positive change when you help people work together–sharing knowledge, demonstrating successful practices, and interacting in positive ways. The best, most durable progress happens when you include all stakeholders in a property, from owners and residents to users and neighbors.

- Understand sustainability to build a solid foundation of knowledge that will inform and guide your practices.
- Demonstrate practices to learn by doing and lead by example.
- Interact with other people in positive ways to strengthen connections, so community members can take meaningful steps together toward a sustainable future.

	Unsustainable	*Somewhat Sustainable*	*Positively Sustainable*
Understand Sustainability	Lacking an understanding of sustainability and believing falsehoods	Having a fact-based understanding of sustainability basics	Superbly understanding sustainability
Demonstrate Practices	Demonstrating few or no sustainable practices	Demonstrating several sustainable practices	Demonstrating many sustainable practices well
Interact with Other People	Interacting rarely or never with others, or in negative ways	Interacting occasionally or neutrally with others	Interacting often and in positive ways with others

Here are strategies and practices to go from *unsustainable* to *positively sustainable* community milestones. See the Practice Guides section for *how to implement* these practices and *measure results*.

Understand Sustainability

Build a solid foundation of knowledge that informs and guides your practices

Understand Sustainability 1: Quick-Start

Learn	Prompt AI to explain sustainability science. Read the best articles and books about sustainability science. Watch the best nature and technology documentaries. Take the best online courses about sustainability science.
Verify	Check credible sources to confirm facts and inferences. Take knowledge tests to verify your understanding of sustainability science.

Understand Sustainability 2: Intermediate

Learn	Attend hands-on workshops to learn sustainable practices. Earn professional sustainability certifications.
Verify	Investigate the credibility of information sources. Conduct research to verify the environmental impacts of practices.

Understand Sustainability 3: Advanced

Learn	Build a personal resource library for sustainable practices. Research sustainable practices in your community. Earn an undergraduate degree in an environmental field.
Verify	Develop procedures to measure sustainability indicators.

Understand Sustainability 4: Transformative

Learn	Earn an advanced degree in an environmental field.

Demonstrate Sustainability

Learn by doing and lead by example

Demonstrate Sustainability 1: Quick-Start

Commit	Commit to improving sustainability indicators.
Act	Attempt quick-start sustainable practices.
Track Results	Keep a personal sustainability journal. Calculate a Quick-Start Suspra Score for your home or organization.

Demonstrate Sustainability 2: Intermediate

Commit	Set achievable sustainability goals. Create simple plans to achieve sustainability goals.
Act	Attempt intermediate sustainable practices.
Track Results	Create and use checklists for sustainable practices. Calculate a regular Suspra Score for your home or organization.

Demonstrate Sustainability 3: Advanced

Commit	Create a detailed sustainability plan for your household or organization.
Act	Attempt advanced sustainable practices.
Track Results	Calculate a detailed Suspra Score for your home or organization. Compare Suspra Scores to past periods to measure rates of change.

Demonstrate Sustainability 4: Transformative

Act	Attempt transformative sustainable practices.
Track Results	Improve the Suspra scoring system.

Interact with Others

Nurture a community of people who can take meaningful steps together toward a sustainable future

Interact with Others 1: Quick-Start

Share	Forward verified articles and interesting opinion pieces to friends and family. Discuss environmental issues with friends and family.
Volunteer	Join volunteer environmental projects in your community.
Vote	Vote for pro-environment candidates and policies.

Interact with Others 2: Intermediate

Share	Use social media to post photos and videos of your own sustainable practices. Blog about sustainability challenges you face and successes you achieve. Host parties to celebrate successes achieving sustainability goals. Offer tours of properties showcasing sustainable practices. Lead book clubs, discussion groups, and study circles on environmental topics.
Volunteer	Join a community service organization like Rotary, a church green team, or an environmental group. Become a sustainability coach. Organize and lead teams to accomplish sustainable projects.
Work	Suggest practical ways to reduce environmental impacts at work.

Interact with Others 3: Advanced

Share	Build educational displays about sustainable practices. Publish infographics to explain environmental issues. Write articles or a newspaper column about sustainability. Give talks about sustainable practices. Teach classes and lead workshops about sustainable practices.
Volunteer	Serve on your local government's sustainability committee. Recruit and train sustainability coaches. Lead a local chapter of an environmental organization.
Work	Work in a job or for a company with an environmental mission.

Interact with Others 4: Transformative

Share	Publish books and films about environmental sustainability. Host a sustainability podcast. Establish learning centers for sustainable practices. Build research programs for sustainable practices.
Volunteer	Start a sustainability coaching program in your community.

Work	Start a new organization or business with an environmental mission.
Govern	Develop certification systems for sustainability practitioners. Propose pro-environment ordinances and legislation. Run for public office.

Food Pathway

It is positively sustainable to eliminate *food waste*, choose *eco-friendly ingredients*, eat *plant-based meals*, and buy or grow food from *healthy farms and gardens*.

- Food waste includes food that goes bad in storage and food that is prepared but not eaten; effective actions that reduce food waste include understanding expiration dates, buying only as much food as you can eat (including when dining out at restaurants), storing food properly, and eating leftovers rather than throwing them out.
- Eco-friendly ingredients have lower environmental impacts than close substitutes, such as ground turkey instead of ground beef, or aquafaba instead of eggs. When choosing seafood, in particular, you can eat from abundant stocks rather than overfished stocks.
- Eating plants is more sustainable than eating animals mostly due to the greater agricultural efficiency of growing crops compared to raising animals.
- Healthy farms and gardens produce food using regenerative practices, including certified organic methods, with beneficial environmental impacts that sustain agricultural productivity.

	Unsustainable	*Somewhat Sustainable*	*Positively Sustainable*
Reduce Food Waste	Often wasting food	Wasting food only occasionally	Very rarely wasting food
Choose Eco-Friendly Ingredients	Rarely choosing eco-friendly ingredients	Frequently choosing eco-friendly ingredients	Always choosing eco-friendly ingredients
Eat Plant-Based Meals	Rarely eating plant-based meals	Usually eating plant-based meals	Always eating vegan meals
Cultivate Healthy Harvests	Seldom supporting healthy farms or gardens	Often supporting healthy farms or gardens	Always getting food from healthy farms or gardens

Here are strategies and practices to go from *unsustainable* to *positively sustainable* food milestones. See the Practice Guides section for *how to implement* these practices and *measure results*.

Reduce Food Waste

Get more value from your food expenditures

Reduce Food Waste 1: Quick-Start

Understand	Understand food date labels. Understand food safety and signs of spoilage.
Buy	Buy “ugly” fruits and vegetables that have cosmetic blemishes. Buy dried, pickled, fermented, or frozen food that stores well. Buy root vegetables and fruit like blueberries that last longer than other types.
Store	Store bread and pastries in the freezer to prevent mold.

Eat	Prepare and order smaller portions so you have fewer leftovers.

Reduce Food Waste 2: Intermediate

Plan	Create a meal plan each week.
Buy	Buy perishable food in quantities no larger than you can eat before it spoils. Buy from local farms to reduce the risk of spoilage due to transportation.
Store	Wash and store produce well so it lasts longer. Organize your food storage system so you eat food before it spoils.
Eat	Save and eat leftovers rather than throwing them out. Bring a takeaway container when eating out so you can bring home leftovers.

Reduce Food Waste 3: Advanced

Buy	Buy fruits and vegetables when they are in season and most affordable.
Store	Dry, freeze, can, or ferment what you can't eat fresh.
Eat	Make soup stock from vegetable scraps and leftover carcasses and bones.

Reduce Food Waste 4: Transformative

Store	Create a community kitchen so people can preserve more home-grown food.
Share	Organize ways for local grocery stores to donate unsold food to people in need. Distribute preserved food from a community kitchen to people in need.

Choose Wise Ingredients

Improve the environmental impact of your diet

Choose Wise Ingredients 1: Quick-Start

Select	Select wild-caught venison instead of beef. Drink more tap water and less bottled water or bottled beverages.
Avoid	Avoid eating all orange roughy, bluefin tuna fish, and Atlantic rock and Jonah crab.

Choose Wise Ingredients 2: Intermediate

Select	Select Atlantic halibut or pike certified by the Marine Stewardship Council.
Avoid	Avoid meat from any ranched ruminant animal that chews cud (beef, lamb, goat, deer, etc.)

Choose Wise Ingredients 3: Advanced

Select	Select meat from wild-caught game instead of farmed meat from land animals. Select legumes (including aquafaba) instead of dairy or eggs. Only eat Giant Tiger Prawn (*Penaeus monodon),* Whiteleg shrimp (*Litopenaeus vannamei),* or eel if it is farmed in recirculating tanks. Only eat shark if it is blue, common thresher, or spiny dogfish from U.S. fisheries.
Avoid	Avoid eating meat from any mammal. Avoid eating codfish, except Atlantic cod caught with poles in the Gulf of Maine.

Choose Wise Ingredients 4: Transformative

Serve	Change menus at your local schools, hospitals, jails, and other public institutions so they serve meals prepared with eco-friendly ingredients. Create a restaurant that serves meals prepared with eco-friendly ingredients.

Eat Plant-Based Meals

Obtain more nutrition consuming fewer agricultural resources

Eat Plant-Based Meals 1: Quick-Start

Reduce	Reduce the amount of meat you add to pasta, rice, and tortilla meals.
Substitute	Drink water, fruit juice, or plant-based milk instead of mammal milk.

Eat Plant-Based Meals 2: Intermediate

Plan	Find vegetarian recipes that taste good and are fun to make. Start eating plant-based meals at least once a week, then increase the frequency of plant-based meals so you're eating at least one plant-based meal per day.
Increase	Meet more nutritional needs by eating a wider variety of fruits and vegetables.
Substitute	Eat ice cream made from plant milk instead of mammal milk ice cream. Eat cheese made from plants instead of from mammal milk.

Eat Plant-Based Meals 3: Advanced

Plan	Find vegan recipes that taste good and are fun to make. Begin observing meat-free Mondays, then increase meat-free days per week.
Increase	Try vegetarian and vegan meals from a wide variety of food traditions and cultures.
Substitute	Substitute plant-based products for all dairy products. Get your protein and fat from eggs, legumes, nuts, and other sources besides meat.

Eat Plant-Based Meals 4: Transformative

Plan	Understand human nutrition and your own nutritional needs.
Increase	Eat an exclusively vegan diet.
Serve	Change menus at public institutions, like schools, so they serve plant-based meals. Create a restaurant that serves plant-based meals.

Cultivate Healthy Harvests

Safeguard our food supply

Cultivate Healthy Harvests 1: Quick-Start

Buy	Buy food that meets USDA organic standards. Buy palm oil certified by the Roundtable on Sustainable Palm Oil. Buy chocolate that scores "green" on the Chocolate Scorecard. Buy coffee that meets Rainforest Alliance standards.
Grow	Sprout seeds.

Cultivate Healthy Harvests 2: Intermediate

Buy	Buy from local farmers who practice regenerative methods.
Grow	Grow microgreens. Grow a windowsill herb garden. Plant fruit bushes or vines and fruit or nut trees.

Cultivate Healthy Harvests 3: Advanced

Grow	Grow a home garden that builds healthy soil and requires minimal pesticides. Raise chickens for eggs or meat using organic methods. Tap trees and boil down syrup using solar power.

Cultivate Healthy Harvests 4: Transformative

Grow	Practice permaculture, landscaping and gardening in harmony with nature.

Water Pathway

It is positively sustainable to use *one hundred liters of water or less per person per day* and to *prevent water pollution*.

- Increasing water efficiency means investing in better techniques or technology so that you can use less water to meet all your needs without any inconvenience.
- Conserving water means accepting inconvenience or discomfort for the greater good of using less water.
- Preventing water pollution protects water quality.

	Unsustainable	*Somewhat Sustainable*	*Positively Sustainable*
Optimize Water Efficiency	Using more than 200 liters of water per person per day	Using about 150 liters of water per person per day	Using 100 liters or less per person per day
Conserve Water			
Prevent Water Pollution	Doing nothing to prevent pollution	Preventing some pollution	Preventing almost all pollution

Here are strategies and practices to go from *unsustainable* to *positively sustainable* water milestones. See the Practice Guides section for *how to implement* these practices and *measure results*.

Optimize Water Efficiency

Decrease the amount of water you use to meet your needs, without discomfort or inconvenience

Optimize Water Efficiency 1: Quick-Start

Maintain	Review water bills to check for leaks and fix them.
Streamline	Skip pre-rinsing dishes before putting them in a dishwasher. Scrape food waste into your compost bin, not down your garbage disposal.
Upgrade	Install showerheads and faucet aerators that meet WaterSense standards.

Optimize Water Efficiency 2: Intermediate

Upgrade	Install toilets that meet WaterSense standards. Install sprinklers, and irrigation controllers that meet WaterSense standards. Install and use a more efficient automatic dishwasher. Install and use a more efficient washing machine.

Optimize Water Efficiency 3: Advanced

Maintain	Install a leak detection system.

Optimize Water Efficiency 4: Transformative

Maintain	Organize a “fix a leak” brigade for your neighborhood.

Conserve Water

Reduce your water use, accepting some inconvenience or discomfort for the greater good

Conserve Water 1: Quick-Start

Reduce	Flush toilets less frequently. Wait to run dishwashers and clothes washers until you have a full load. Take fewer or shorter showers. Wash clothes and vehicles less frequently.
Substitute	Take short showers instead of baths. Sweep driveways and patios instead of hosing them down with water.

Conserve Water 2: Intermediate

Reduce	Take navy showers: run water a few seconds to get wet, turn it off while you lather up with soap and shampoo, then turn the water back on to rinse off.
Downsize	Put a brick or bottle in your toilet tank to displace some water.

Conserve Water 3: Advanced

Substitute	Xeriscape: plant native drought-resistant species that improve the ability of your soil to hold moisture or install features such as rock gardens that require no water at all.

Conserve Water 4: Transformative

Substitute	Install and use a waterless urinal. Install and use a composting toilet. Install and use an incinerating toilet.

Prevent Water Pollution

Protect water quality

Prevent Water Pollution 1: Quick-Start

Cleaning	Choose non-polluting cleaning solutions. Choose soap free of antibacterial chemicals and without synthetic dyes or fragrances. Choose phosphate-free detergents.
Dispose	Pick up litter and pet waste and dispose of it safely. Dispose of medications and household hazardous waste safely, not down the drain.

Prevent Water Pollution 2: Intermediate

Cleaning	Clean with steam rather than chemicals. Clean with electrolyzed water rather than chemicals.
Install	Install microfiber filters on washing machine drain lines. Install a rain barrel to retain precipitation and reduce runoff.

Prevent Water Pollution 3: Advanced

Install	Install a rain garden to retain precipitation and reduce runoff. Install semi-permeable or permeable driveways and walkways to allow precipitation to soak into the ground rather than run off into storm drains. Install bridges or raised walkways across streams and wetlands.
Manage	Build fencing to prevent livestock and pets from wading in streams. Maintain an unmowed riparian strip of vegetation.

Protecting Water Quality 4: Transformative

Install	Install green roofs to provide permeable areas over buildings.

Movement (Transportation) Pathway

It is positively sustainable to *travel 25 miles per day or less on average*, *get exercise* by walking or cycling for short trips, and *drive fully electric vehicles* for longer trips.

- Traveling *more* than 25 miles per day on average indicates that your movement practices have significant *negative* environmental impacts. Very high average daily travel distance indicates that you often fly or drive long distances; it's infeasible to walk or bicycle more than 25 miles per day on average over the course of a year.
- Getting exercise while you move drastically reduces environmental impacts for several reasons. First, walking or bicycling places less wear and tear on machinery and roads. Second, these modes of movement use food, rather than fossil fuel, as the primary energy source, avoiding emissions of particulate matter, ozone, and other dangerous pollutants. Third, these low-speed modes of transportation are much less likely to kill or injure people or animals than high-speed modes such as driving a passenger vehicle.
- Fully electric vehicles (EVs) are typically four or five times more efficient than fuel-burning ones (achieving the equivalent of 130 miles per gallon compared to less than 30 miles per gallon). Hybrid vehicles combine a high-efficiency electric drivetrain with a low-efficiency fuel-burning engine to achieve fuel efficiency about half that of full EVs. Batteries in vehicles can be recharged with electricity generated from sunlight. When an EV reaches the end of its useful life, materials in its motors and batteries are recycled to make new motors and batteries.

	Unsustainable	*Somewhat Sustainable*	*Positively Sustainable*
Reduce Travel Miles	Traveling more than 60 miles per day	Traveling around 40 miles per day	Traveling 25 miles or less per day
Get Exercise	Rarely using active transportation	Often using active transportation	Almost always using active transportation
Drive Electric	Driving non-hybrid fuel-burning vehicles	Driving hybrid vehicles	Driving fully electric vehicles

Here are strategies and practices to go from *unsustainable* to *positively sustainable* movement milestones. See the Practice Guides section for *how to implement* these practices and *measure results*.

Reduce Travel Miles

Reduce the environmental impacts that fast movement speeds cause

Reduce Travel Miles 1: Quick-Start Practices

Plan	Plan your use of fuel-burning vehicles to minimize both engine starts and mileage.
Shop	Shop online to purchase goods not available within walking or cycling distance.

Reduce Travel Miles 2: Intermediate Practices

Plan	Plan your work, family visits, and vacations to minimize air travel.

Reduce Travel Miles 3: Advanced Practices

Carpool	Share rides when traveling to a common destination.
Telecommute	Work from home.

Reduce Travel Miles 4: Transformative Practices

Telecommute	Encourage and empower employees to work from home.

Get Exercise

To improve your health and protect your planet, and get where you need to go

Get Exercise 1: Quick-Start Practices

Walk	Walk five minutes in nice weather so you can reduce engine starts and mileage.

Get Exercise 2: Intermediate Practices

Walk	Walk fifteen minutes in sunny or rainy weather.
Cycle	Ride a bicycle or a tricycle for fifteen minutes in nice weather.
Ride	Take micro-mobility (scooters) or public transit when convenient.

Get Exercise 3: Advanced Practices

Walk	Walk sixty minutes in all weather conditions.
Cycle	Ride a bicycle or a tricycle for sixty minutes in all weather conditions.
Ride	Travel by micro-mobility or public transit rather than renting a passenger vehicle.

Get Exercise 4: Transformative Practices

Live	Live without owning a passenger vehicle.

Drive Electric

To go faster and further than you can using muscle power, but still without any tailpipe emissions

Drive Electric 1: Quick-Start Practices

Choose	Choose an electric vehicle when ride sharing.

Drive Electric 2: Intermediate Practices

Borrow	Rent or borrow an electric vehicle.

Drive Electric 3: Advanced Practices

Buy	Buy a used plug-in hybrid vehicle.

Drive Electric 4: Transformative Practices

Buy	Buy or lease a new fully electric vehicle.
Cycle	Ride an electric bicycle or tricycle rather than drive a passenger vehicle.

Energy Pathway

It is positively sustainable to use *20 kilowatt hours or less* of energy per person per day, to use *electricity* rather than fuel for energy, and to generate electricity from *sunlight*.

- Energy flow charts published by the Lawrence Livermore National Laboratory show that the United States wastes two-thirds of its power due to the inefficiency of burning fuel. This means that if per person we're currently demanding 60 kWh per day, simply by electrifying and solarizing, we will reduce our energy demand to 20 kWh. Sufficient surface area is available to provide each person 20 kWh of solar electricity per day forever.
- Electrifying is the process of replacing fuel-burning equipment, such as a gas stove or a diesel truck, with electric equipment, such as an induction stove or an electric truck. Fully electrifying every home and organization in North America will lower our total energy demand so that solar power, batteries, and pumped hydropower become a practical solution to our energy challenge.
- Fossil fuel and uranium are unsustainable diminishing resources; consuming these fuels today diminishes the amount available tomorrow. Wind, water, and sunlight are renewable resources; using these power resources today does *not* diminish the amount available tomorrow. Solar power is orders of magnitude more abundant than wind power, and much more evenly distributed. The ubiquity of sunlight, combined with the fact that photovoltaic modules convert light to electricity with no moving parts, makes solar by far the most practical renewable power supply on Earth (and in orbit). Batteries are the most practical way to store any amount of electricity (from millijoules to gigajoules); pumped hydropower is a cheap way to store huge amounts of energy for months. Natural gas turbines can provide temporary power while people build a sustainable energy system of solar arrays, batteries, and pumped hydropower facilities.

	Unsustainable	*Somewhat Sustainable*	*Positively Sustainable*
Optimize Energy Efficiency	Using more than 60 kWh per person per day	Using about 40 kWh per person per day	Using 20 kWh or less per person per day
Conserve Energy			
Electrify	Burning fuel for most energy needs	Using electricity for most energy needs	Using electricity for all energy needs
Solarize	Generating no electricity from sunlight	Generating some electricity from sunlight	Generating all electricity from sunlight

Here are strategies and practices to go from *unsustainable* to *positively sustainable* energy milestones. See the Practice Guides section for *how to implement* these practices and *measure results*.

Optimize Energy Efficiency

To decrease the energy you use to meet your needs, without discomfort or inconvenience

Optimize Energy Efficiency 1: Quick-Start

Fenestration	Tightly close windows when outside air temperature or humidity is uncomfortable. In winter, open curtains or blinds to let in direct sunshine; close them when the sun

	is not shining through.
Heating & Cooling	Set back thermostats overnight and when you are away.
Lighting	Install energy-efficient light-emitting diode (LED) lighting.
Maintain	Clean coils, ducts, and filters to maintain efficient operation of heating and cooling systems, such as furnaces, boilers, heat pumps, and refrigerators.
Refrigerating	Ensure your refrigerator has good air circulation around it to allow hot air to escape.
Sealing	Use caulk and foam to seal air gaps to reduce unwanted airflow.
Vehicles	Keep tires inflated to the proper pressure. Use cruise control to maximize fuel economy.
Washing	Wash clothes in cold water using detergents containing cold-water enzymes.

Optimize Energy Efficiency 2: Intermediate

Appliances	Install smart power strips that automatically turn off devices. Replace inefficient televisions and computers with more efficient models.
Fenestration	Install storm windows or insulating inserts to reduce air and energy flows. Install and use window shades or awnings to keep the summer sun out. Fix cracked panes in windows.
Heating & Cooling	Install and program smart thermostats to control heating and cooling systems. Use wood stove fans to circulate warm air.
Lighting	Install motion sensors to turn off lighting automatically.
Maintain	Replace disposable filters per manufacturer recommendations. Maintain insulation around ducts that go through unconditioned spaces. Inspect and clean all fuel-burning equipment every year.
Plumbing	Insulate hot water and heating pipes.
Refrigerating	Shade refrigerators and freezers from sunlight.
Sealing	Maintain window and door weatherstripping to prevent unwanted airflow.
Vehicles	Use a trunk rack or hitch rack rather than a roof rack to improve fuel economy.
Washing	Install an energy-efficient washing machine with a high-speed spin cycle.

Optimize Energy Efficiency 3: Advanced

Building	Check and upgrade insulation in the building envelope. Remove unused chimneys.
Cooking	Install an energy-efficient electric induction stove. Install an energy-efficient electric convection oven.
Fenestration	Repair or replace windows with broken seals. Install energy-efficient windows. Install energy-efficient doors.
Heating & Cooling	Locate and seal air leaks in ducting. Install an EPA-certified wood stove with dedicated makeup air. Install and use energy-efficient ceiling fans to circulate air. Install and use a whole-house fan. Install energy-efficient heat pumps for heating and cooling. Install a heat recovery or energy recovery ventilator.
Landscaping	Plant deciduous trees to provide noon and afternoon shade in summer. Plant evergreen trees and shrubs to provide windbreaks in winter.
Lighting	Install automatic dimmers to reduce energy use when daylight is available. Install light pipes to provide passive daylight in interior rooms.
Plumbing	Install an electric heat pump water heater.
Refrigerating	Install an energy-efficient refrigerator or freezer.
Vehicles	If you need a roof rack, choose an aerodynamic roof rack with a wind deflector.
Washing	Install a ventless electric clothes dryer.

Optimize Energy Efficiency 4: Transformative

Building	Build a passive solar structure. Install a cool roof that reflects more sunlight than a conventional roof.
Heating & Cooling	Replace forced air with hydronic, electric, or advanced heat distribution.

Conserve Energy

To reduce your energy demand, accepting some inconvenience or discomfort for the greater good

Conserve Energy 1: Quick-Start

Appliances	Unplug electronic devices so they don't draw power in standby mode.

Choose	Drink more cold beverages and fewer hot beverages. Watch shows on your phone, tablet, or laptop rather than on a large television. Listen to music on headphones rather than speakers. Walk to your local library to check out and read printed books from their collection.
Fenestration	Open windows in summer to catch cross breezes instead of running fans.
Heating & Cooling	Lower heating temperatures in winter and raise cooling temperatures in summer.
Lighting	Turn off lights when you leave a room if you'll be gone for more than a minute. Leave lights off when daylight is sufficient.
Plumbing	Take colder showers to use less hot water.
Vehicles	Drive slower. Drive gently. Drive with less weight; offload unnecessary items before driving. Keep windows rolled up at highway speeds to reduce drag.

Conserve Energy 2: Intermediate

Choose	Rake leaves instead of using a leaf blower. Shovel snow instead of using a snow blower.
Cooking	Cook in a microwave oven instead of a full-sized oven. Cook in a pressure cooker. Cook outside during the summer to reduce your indoor cooling load. Eat cold meals that don't require heat for cooking. Plan multi-meal cooking.
Heating & Cooling	Use fans instead of air conditioning to stay cool. Only heat and cool rooms that are in use.
Lighting	Install less powerful lighting. Use task lighting rather than ambient lighting that lights up an entire room.
Plumbing	Lower the temperature of domestic hot water for showers, sinks, and washing.
Refrigerating	Operate a single refrigerator instead of multiple refrigerators. Raise the temperature of your refrigerator without spoiling food too quickly.
Vehicles	Transport items inside your vehicle rather than on a rack.

Conserve Energy 3: Advanced

Choosing	Choose flooring you can sweep instead of vacuum.
Cooking	Use a solar cooker.
Plumbing	Put your water heater on a timer and schedule your use of hot water.
Refrigerating	Move your refrigerator so that it isn't next to any heat sources, such as an oven.

	Install a smaller refrigerator that uses less power.
Vehicles	Remove roof racks or bike racks when not needed. If you drive an electric car in cold weather, minimize use of cabin heat.
Washing	Hang clothes to dry rather than use a gas or electric clothes dryer.

Conserve Energy 4: Transformative

Refrigerating	Dig a root cellar to store food.
Synchronize	Synchronize electricity usage with solar power generation. Shift your schedule to get up at dawn to make maximum use of sunlight.

Electrify

To transition from burning fuel to using electricity for energy

Electrify 2: Intermediate

Yard Care	Borrow or rent electric yard tools rather than fuel-burning ones. Buy an electric leaf blower. Buy an electric lawnmower. Buy an electric chain saw. Buy an electric weed whacker or hedge trimmer. Buy an electric snow blower.

Electrify 3: Advanced

Cooking	Upgrade to a 100% electric cooking system.
Heating & Cooling	Upgrade to a 100% electric heating system.
Plumbing	Upgrade to a 100% electric water heating system.
Vehicles	Replace all fuel-burning vehicles with fully electric ones.

Electrify 4: Transformative

Heating & Cooling	Organize a buying group in your neighborhood for heat pumps.
Lend	Create a library of things to lend out electric tools.

Solarize

To use clean power for energy

Solarize 1: Quick-Start Practices

Charge	Use solar chargers for cell phones and small devices.

Solarize 2: Intermediate Practices

Choose	Choose a "green" electricity supplier that generates electricity from sunlight. Subscribe to a community solar farm for electricity.
Install	Install a solar shed or greenhouse for storing and charging electric tools. Install solar-powered outdoor lighting. Install solar-powered water pumps. Install solar-powered attic fans.

Solarize 3: Advanced Practices

Install	Install solar thermal systems to heat water. Install a solar photovoltaic (PV) system to power your property.

Solarize 4: Transformative Practices

Install	Install batteries to store electricity.
Invest	Invest in a community solar farm.
Organize	Organize a group purchase of solar PV for your neighborhood. Build a direct current microgrid to distribute solar for a campus or neighborhood.

Goods (Materials) Pathway

It is positively sustainable to buy *25 kilograms of material goods* or less per person per day on average, buy *eco-friendly materials*, *maintain and reuse* durable goods and packaging, and *compost or recycle* solid waste.

- The less mass of material goods purchased per day, the fewer the negative environmental impacts from mining, manufacturing, storing, shipping, and disposing. Lowering the amount of material flowing through your home to below 25 kilograms per person per day keeps these impacts well within safe limits.
- Buying eco-friendly materials reduces the negative environmental impacts of the goods you buy. *Replenishing* materials (like wood) and fully *recyclable* materials (like glass and metal) are sustainable because we can use them over and over. With sustainable forestry practices, paper, cardboard, and wood are sustainable materials, especially if we return nutrients to the soil by composting. *Diminishing* materials (like plastic derived from fossil fuel) are not sustainable. Fossil-derived plastic is not a sustainable material because the feedstocks (fossil gas, oil, and coal) are not replenishing and most plastic resins cannot be recycled.
- Maintaining and reusing goods and packaging reduces the environmental impacts associated with mining and manufacturing to produce new goods. Reusing is more sustainable than recycling because it is much more efficient; however, compared to recycling, reusing requires more careful coordination among manufacturers, retailers, and consumers for certain items, like packaging. The more expensive and durable the item, the more likely a reuse market exists.
- In a fully circular economy, eco-friendly materials enter a sustainable cycle in which they are fully reused, composted, or recycled rather than incinerated or landfilled.

	Unsustainable	*Somewhat Sustainable*	*Positively Sustainable*
Buy Less	Buying 50 kg or more per day	Buying around 35 kg per day	Buying 25 kg or less per day
Choose Eco-Friendly Goods	Buying disposable goods, toxic substances, plastics, and fuels	Buying few disposable goods, and more non-toxic substances and durable goods	Buying only non-toxic substances and goods that can be fully reused, composted, or recycled
Maintain and Reuse	Never maintaining goods; always buying new	Doing essential maintenance; occasionally buying used	Carefully maintaining goods; frequently buying used goods
Manage Waste Well	Incinerating and landfilling waste	Recycling but not composting	Composting and recycling

Here are strategies and practices to go from *unsustainable* to *positively sustainable* material goods milestones. See the Practice Guides section for *how to implement* these practices and *measure results*.

Buy Less

To reduce the environmental impacts associated with material consumption

Buy Less 1: Quick-Start

Plan	Resist impulse purchases and cultivate intentional consumption. Track and adjust washing and cleaning frequency.
Choose	Give experiences or gift certificates rather than physical items. Buy quality items that are durable and repairable.

Buy Less 2: Intermediate

Borrow	Borrow tools from a library of things or from family, friends, or neighbors. Rent rather than buy things you'll need only for a few days or weeks.
Choose	Buy concentrated solutions and in bulk to buy less unnecessary packaging. Use washable menstrual products.
Join	Join your local Buy Nothing group or use the Buy Nothing app. Participate in your local Freecycle Network.

Buy Less 3: Advanced

Plan	Organize your possessions so you know what you already have.
Lend	Lend your tools to family, friends, and neighbors so they don't have to buy.
Craft	Make household items from natural materials.

Buy Less 4: Transformative

Volunteer	Lead your local Freecycle Network.

Choose Green Goods

To prevent pollution and close the loop on material flows

Choose Green Goods 1: Quick-Start

Avoid	Avoid single-use plastic.
Cleaning	Use microfiber cloths to clean.

Choose Green Goods 2: Intermediate

Avoid	Avoid products containing mercury, such as fluorescent lighting.
Cooking	Cook on stainless steel or cast iron; avoid non-stick coatings that contain PFAS (per- and polyfluoroalkyl substances).
Select	Buy products made from wood, glass, and metal–fully recyclable materials.

Choose Green Goods 3: Advanced

Avoid	Avoid products with high amounts of volatile organic compounds. Avoid products made from plastic.
Clothing	Buy durable clothes made from natural fibers. Avoid clothing treated with PFAS for stain resistance or water repellency.
Furniture	Buy furniture made from wood or metal. Avoid furniture treated with PFAS for stain resistance or water repellency.
Select	Buy products that comply with RoHS (Restriction of Hazardous Substances).

Maintain and Reuse

To extend the useful life of products and reduce the need to manufacture new goods

Maintain and Reuse 1: Quick-Start

Choose	Choose reusable goods, such as bagless vacuum cleaners with washable filters. Use rechargeable batteries rather than disposable ones.
Maintain	Read and keep maintenance manuals for reference. Inspect, clean, and replace components per operating instructions.
Reuse	Reuse containers and bags. Reuse glass jars for drinking glasses. Accept gifts of hand-me-down items from friends and family. Shop at second-hand stores and yard sales to buy used items.

Maintain and Reuse 2: Intermediate

Repair	Repair torn clothing and broken zippers.

Maintain and Reuse 3: Advanced

Repair	Repair efficient appliances; replace inefficient ones.

Maintain and Reuse 4: Transformative

Organize	Organize a reuse program at your local school or community organization.
Repair	Lead a repair team for your local library of things.

Manage Waste Wisely

To return materials safely back into a circular economy

Manage Waste Wisely 1: Quick-Start

Compost	Compost yard waste, such as leaves and grass clippings, in a simple outdoor pile. Bury organic waste to compost.
Dispose	Share hand-me-downs, such as children's clothing, with friends and family. Resell or donate useful items that are no longer needed. Recycle glass, metal, and clean cardboard. Landfill plastic and other synthetic waste materials.
Organize	Sort your waste into five streams: reuse, compost, recycle, landfill, and divert. Store household hazardous waste in a safe collection area.

Manage Waste Wisely 2: Intermediate

Compost	Subscribe to a curbside composting program. Drop off kitchen and yard waste at a municipal composting facility. Compost in a three-bin outdoor system. Compost in a kitchen appliance.
Dispose	Hire a junk removal company. Recycling electronic devices and batteries.

Manage Waste Wisely 3: Advanced

Compost	Ferment first, then compost. Compost in an enclosed tumbler. Compost in a buried chamber. Compost in a worm bin. Compost in a fly house.

Manage Waste Wisely 4: Transformative

Organize	Organize a neighborhood composting program. Organize a household hazardous waste collection event. Organize a neighborhood "green" yard sale and waste removal event.

Habitat (Buildings and Landscapes) Pathway

It is positively sustainable to *choose sustainable shelter* and *build to green standards*, *renovate wisely* using non-toxic materials and green building techniques, and to *protect natural systems*.

- Many green building certification and rating standards exist; meeting any of them improves sustainability indicators compared to building to conventional code minimums.
- Renovation projects (including both restorative and preventative maintenance as well as improvements) are chances to extend the useful life of buildings, abate hazards, and provide more people with shelter within the footprint of an existing building.
- Landscaping and land use decisions are opportunities to protect natural systems. For example, planting a garden instead of a lawn increases the amount of food available on Earth and provides more opportunities for native species to persist. Installing a permeable driveway instead of a hardscape increases your community's resilience against flooding and provides a path for precipitation to filter through sediment to recharge ground-water reservoirs.

	Unsustainable	*Somewhat Sustainable*	*Positively Sustainable*
Shelter Well	Building to code minimums	Implementing a few green building features	Achieving a green building certification
Renovate Wisely	Adding toxins, lowering occupancy	Fixing problems, maintaining occupancy	Abating hazards, increasing occupancy
Protect Nature	Destroying natural systems	Occasionally protecting natural systems	Consistently protecting natural systems

Here are strategies and practices to go from *unsustainable* to *positively sustainable* habitat milestones. See the Practice Guides section for *how to implement* these practices and *measure results*.

Shelter Well

To have a more positive environmental impact choosing and creating shelter for people

Shelter Well 1: Quick-Start

Choose	Live in a walkable neighborhood. Live in an apartment building rather than a single-family house.
Share	Share housing with other people.

Shelter Well 2: Intermediate

Choose	Select existing housing that meets high performance standards.
Inspect	Hire a professional rater to inspect and rate your home's performance.

Shelter Well 3: Advanced

Choose	Choose to downsize into a smaller living space.

Share	Rent out rooms in your home to provide more housing in your community.

Shelter Well 4: Transformative

Build	Build a new “green” single family home. Build a new “green” commercial building. Build an apartment building.
Share	Build an accessory dwelling unit in your backyard to rent.
Develop	Develop a cohousing community with clustered homes and microgrid solar power.

Renovate Wisely

To have a more positive environmental impact maintaining and renovating buildings

Renovate Wisely 1: Quick-Start

Maintain	Clean kitchen and bathroom exhaust fans and ducting. Maintain indoor humidity below 60% to mitigate mold and mildew.

Renovate Wisely 2: Intermediate

Abate	Replace fluorescent lighting that contains mercury. Replace thermostats that contain mercury. Remove or encapsulate surfaces covered in lead paint. Remove soil contaminated with lead paint chips. Install vapor barriers in basements.
Construct	Select lumber from locally available tree species. Use metal ground screws or helical posts rather than poured concrete footings. Choose fiberglass instead of vinyl windows.
Maintain	Fix roof leaks. Install gutters or roofline drainage to direct water away from buildings.
Paint	Paint with non-toxic, zero-VOC coatings.

Renovate Wisely 3: Advanced

Abate	Abate asbestos.
Construct	Construct floors, walls, ceilings, and siding from reclaimed lumber. Construct fences and decking from rot-resistant recycled plastic composites. Construct siding from fiber cement that contains recycled content. Upgrade asphalt shingle roofing to metal roofing that simplifies adding solar.
Insulate	Insulate with cellulose, rock wool, or cotton, not fiberglass.
Maintain	Install battery backup to maintain power during grid outages.

Plumbing	Move plumbing runs to avoid frozen pipes.

Renovate Wisely 4: Transformative

Construct	Construct walls from straw bales. Construct floors and walls from rammed earth. Construct walls from adobe.
Share	Convert rooms in your home to an in-law apartment to rent.

Protect Nature

To benefit from ecosystem services that nature provides for free

Protect Nature 1: Quick-Start

Learn	Identify environmental hazards in and around your home and yard.
Manage	Keep cats indoors so birds and wild animals can live in your neighborhood. Keep dogs on leash when hiking in areas where sensitive species live.
Support	Donate money to land trusts and other organizations that conserve natural land. Vote for parks and wilderness areas.

Protect Nature 2: Intermediate

Landscape	Plant native species in your yard. Manage pests with an integrated plan that minimizes synthetic pesticide use.
Support	Register your native plantings on the Homegrown National Park Biodiversity Map. Turn your yard or garden into a National Wildlife Federation Certified Wildlife Habitat.

Protect Nature 3: Advanced

Landscape	Landscape with organic methods; avoid all synthetic fertilizers and pesticides.
Manage	Put your land under conservation easement.

Protect Nature 4: Transformative

Remove	Remove roads on your land. Remove unnecessary buildings on your land.