

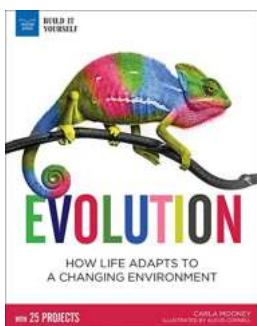
# How Life Adapts To Changing Environment With 25 Projects Build It Yourself

Life on Earth has a remarkable ability to adapt to changing environments. From the smallest microorganisms to the largest animals, every living being has evolved mechanisms to ensure survival in the face of ecological challenges.

In this article, we will explore the fascinating world of organismic adaptation and showcase 25 exciting projects that you can build to understand and appreciate this phenomenon. These hands-on activities will not only enhance your knowledge but also provide an opportunity to witness the incredible ways life adapts to its changing surroundings.

## 1. The Power of Camouflage: Make Your Own Camouflage Shirt!

Camouflage is a popular adaptation strategy that helps certain organisms blend into their surroundings, making them less visible to predators or prey. In this project, you can design and create your own camouflage shirt using different fabric patterns and colors.



## Evolution: How Life Adapts to a Changing Environment with 25 Projects (Build It Yourself)

by Todd Parr (Kindle Edition)

★★★★☆ 4 out of 5

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First, choose the environment you want to blend into. Is it a forest, a desert, or maybe a coral reef? Select fabrics with patterns and colors that resemble the surroundings. Cut and sew the pieces together to make your unique camouflage shirt.

## **2. Mimicry in Nature: Build a Bird Feeder to Attract Beautiful Butterflies**

Mimicry is another intriguing adaptation mechanism employed by animals. Some organisms mimic the appearance, behavior, or sound of others to gain an advantage. Butterflies, in particular, showcase beautiful mimicry patterns.

To attract these stunning creatures, build your own bird feeder using materials such as wood, wire, and paint. Mimic the patterns and colors of flowers to entice butterflies. Hang the feeder in your garden and observe the marvelous mimicry occurring right before your eyes.

## **3. Surviving Extreme Temperature: Construct a Solar Powered Fan**

Extreme temperature conditions pose a significant challenge to life forms. Yet, many organisms have evolved unique strategies to adapt and survive. One of these strategies is the use of solar energy to regulate body temperature.

By constructing a solar-powered fan, you can witness the incredible ways in which organisms utilize renewable energy. Gather materials such as a small motor, solar panels, and wires. Assemble the components and watch as the fan starts spinning when exposed to sunlight.

## **4. The Art of Hibernation: Create a DIY Bat House**

Hibernation is a well-known adaptation mechanism used by many animals to survive harsh winter conditions when food becomes scarce. Bats, in particular, seek shelter in protected spaces, such as caves or specially designed bat houses.

Construct your own bat house using materials like wood, screws, and mesh. Hang it in a suitable location and observe as bats make use of the safe haven during their hibernation period.

## **5. Adapting to Changing Diets: Set Up a Worm Composting System**

Some organisms adapt to changes in food availability by altering their dietary preferences. One incredible example is the ability of worms to convert organic waste into nutrient-rich compost.

Build your own worm composting system using two plastic bins, a drill, and some worms. Drill holes in the bin bottoms to allow for drainage. Layer kitchen scraps, shredded paper, and soil in one bin. Place the worms on top, cover with moist newspaper, and close the lid. Over time, witness the worms transform your kitchen waste into fertile compost.

## **6. Surviving Water Scarcity: Construct a Rainwater Harvesting System**

Water scarcity is a common challenge faced by many organisms in arid regions. To address this, some species have developed mechanisms to collect and store water for future use.

Construct your own rainwater harvesting system using a large barrel, gutter, and pipes. Position the barrel under a gutter to collect rainwater and use it for watering plants or other purposes. Observe how this adaptation strategy helps organisms cope with water scarcity.

## **7. From Land to Water: Build an Amphibious Robot**

Amphibians are masters of adaptation, having the ability to live both on land and in water. Emulate their remarkable versatility by constructing an amphibious robot.

Gather materials such as motors, wheels, a waterproof container, and a remote control. Assemble these components to create a robot that can navigate across different terrains, just as amphibians do.

## **8. Resilience in the Face of Pollution: Develop a DIY Air Purifier**

Organisms exposed to pollution often develop strategies to mitigate its harmful effects. Some plants, for instance, have air-purifying properties that help combat toxins in the atmosphere.

Create your own air purifier using a fan, activated charcoal, and a container. As the fan draws air in, it passes through the activated charcoal, which absorbs pollutants. Witness how this adaptation strategy can improve air quality in your surroundings.

## **9. The Need for Speed: Build a Solar-Powered Car**

Adaptation often involves optimizing energy usage. Many organisms, such as certain insects and reptiles, have developed efficient mechanisms for locomotion.

Construct your own solar-powered car using a small motor, solar panels, and wheels. Enjoy the challenge of designing a vehicle that runs solely on renewable energy.

## **10. The Benefits of Cooperation: Construct an Ant Farm**

Cooperation within species is a common strategy for survival. Ants, for example, work together in highly organized colonies, creating intricate tunnels and chambers.

Create your own ant farm using a transparent container, sand, and ants. Observe their cooperative behavior as they build complex structures and carry out various tasks.

## **11. Adaptation in Flight: Make a Paper Airplane**

Flight is a remarkable adaptation strategy utilized by various organisms, including birds and insects. While creating a paper airplane may not compare to the complexity of their wings, it offers a glimpse into the principles of aerodynamics.

Experiment with different designs and folds to create the perfect paper airplane. Launch it into the air and marvel at how adaptation to flight has shaped the natural world.

## **12. Surviving in Low Light: Design a Solar Bottle Light**

Plants and other photosynthetic organisms have adapted to thrive in low light conditions by utilizing various mechanisms. Reflect on their incredible resilience by designing a solar bottle light.

Using a plastic bottle, water, and bleach, create a cost-effective lighting solution for places with limited access to electricity. Witness how the solar bottle light harnesses sunlight, diffusing it to illuminate its surroundings.

## **13. Defense Mechanisms: Build a Birdhouse with Predator Protection**

Defense mechanisms are vital for organisms to avoid predation. Birds, for example, construct nests that offer protection from predators such as squirrels and snakes.

Construct a birdhouse with predator protection features using wood, screws, and wire mesh. Hang it in your garden and observe how its design helps safeguard nesting birds and their offspring.

#### **14. Adaptation to High Altitudes: Create a DIY Oxygen Tank**

High altitudes present unique challenges due to reduced oxygen levels. Yet, some organisms, like certain birds, have adapted mechanisms to thrive in such environments.

Create your own DIY oxygen tank using readily available materials such as plastic bottles, tubing, and water. Observe how the system generates oxygen and demonstrates the incredible adaptations of high-altitude dwellers.

#### **15. Working Together: Construct a Bee Hotel**

In nature, many organisms rely on symbiotic relationships for survival. Bees, for instance, play a crucial role in pollination, benefiting both plants and themselves.

Construct a bee hotel using wood, bamboo, and other nesting materials. Hang it in your garden to attract these essential pollinators and witness firsthand the mutually beneficial relationship between bees and plants.

#### **16. Adaptation to Subzero Temperatures: Build an Insulated Shelter**

In extreme cold, some organisms have adapted by developing insulating structures or behaviors. Arctic mammals, for example, possess thick fur and layer of fat to survive freezing temperatures.

Build your own insulated shelter using materials like cardboard, foam, and reflective sheets. Test its effectiveness by placing a temperature recorder inside and observing how the shelter retains heat in chilly conditions.

## **17. Surviving with Limited Resources: Make a Desert Terrarium**

Desert organisms face scarcity of water and other essential resources. They have evolved unique adaptations to conserve water and thrive in arid environments.

Create your own desert terrarium using a glass container, desert plants, and sand. Observe how these plants have adapted to store water and survive in a harsh, water-scarce environment.

## **18. Oceanic Adaptations: Set Up a Saltwater Aquarium**

Marine organisms have developed various strategies to adapt to the challenges of life underwater. From fish with specialized gills to corals utilizing symbiotic relationships, each organism displays unique adaptations.

Set up a saltwater aquarium, carefully maintaining the water temperature, salinity, and other necessary parameters. Observe the diverse range of adaptations in action as your aquarium thrives with marine life.

## **19. Overcoming Gravity: Construct a DIY Parachute**

Some organisms have evolved adaptations to enable them to navigate through the air by either gliding or actively flying. Creating a DIY parachute can help us understand concepts related to aerodynamics and gravity.

Using a plastic bag, string, and small weights, fashion a mini parachute. Experiment with different designs and weights to uncover the mechanics behind slow-descending objects.

## **20. Adaptation to Toxic Environments: Design a Plant Terrarium with Air Purifying Properties**

Plants have developed incredible adaptations to flourish in toxic environments. Certain species can effectively remove pollutants from the air, improving overall air quality.

Create a plant terrarium with air-purifying properties by using glass containers, activated charcoal, and suitable indoor plants such as spider plants or peace lilies. Witness how this miniature ecosystem helps cleanse the surrounding air.

## **21. Surviving in Darkness: Make a DIY Bioluminescent Night Light**

In dark environments, some organisms exhibit bioluminescence as an adaptation mechanism. This ability helps them communicate, attract mates, or deter predators.

Construct a DIY bioluminescent night light using glow-in-the-dark materials, LED lights, and a power source. Observe how these captivating adaptations are put to use in the natural world.

## **22. Adapting to High Pressure: Build a Submersible Robot**

Deep-sea organisms face extreme pressures in their underwater habitats. Their adaptations allow them to withstand the crushing weight of the ocean above.

Create a submersible robot using waterproof materials, motors, and a remote control. Test its ability to withstand high pressure by submerging it in water and observing its functionality in these challenging conditions.

## **23. The Benefits of Bioluminescence: Create a DIY Glow Stick**



Bioluminescence serves many purposes in nature, including attracting mates, luring prey, and confusing predators.

Create your own DIY glow stick using non-toxic chemicals, glass vials, and a suitable activator. Witness the mesmerizing glow these adaptations emit in various organisms, and uncover the chemistry behind this phenomenon.

## **24. Adaptation to Extreme Heights: Build a Tower with Structural Stability**

Tall structures, such as trees and skyscrapers, require adaptations to withstand strong winds and prevent collapse.

Build a tower with structural stability using materials like straws, tape, and paper. Experiment with different designs and heights to understand the ingenious ways life adapts to reach new heights.

## **25. Surviving in Extreme Heat: Create DIY Sunblock**

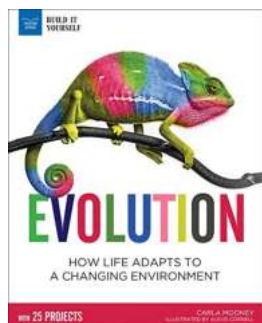
Organisms in sun-scorched environments have developed adaptations to protect themselves from intense ultraviolet (UV) radiation.

Create your own DIY sunblock using natural ingredients like shea butter, coconut oil, and zinc oxide. Test its effectiveness by exposing it to sunlight and observing its UV-blocking properties.

These 25 projects provide hands-on opportunities to explore the incredible and diverse ways life adapts to changing environments. By engaging in these activities, you will gain a deeper appreciation for the intricacies of adaptation and the ingenious mechanisms employed by various organisms.

Remember, adaptation is not limited to biological entities alone. Humans, too, have adapted to their surroundings throughout history, using their intelligence and creativity to thrive in diverse environments.

So, get ready to embark on an exciting journey of discovery and build your way through the fascinating world of adaptation!



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Why do humans walk on two legs? Why do fish have gills? Life on Earth is incredibly diverse and part of the reason for this is evolution, or the theory that living things change with time. Evolution: How Life Adapts to a Changing Environment explores the theory of evolution, its history, how we think it works, examples of creatures who have evolved in response to specific circumstances, and what this might mean for the future of our planet.

For billions of years, the amazing story of life on Earth has been unfolding. Millions of years ago, life on earth was nothing like it is today. Dinosaurs roamed the earth and pterosaurs flew through the skies. Millions of years before the

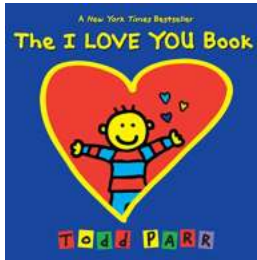
dinosaurs, it was even more different. Strange ocean creatures lived in the seas, while the land was barren. Throughout its history, Earth has been home to an incredible diversity of living things that have changed dramatically over the many millennia. How have these living creatures changed so much? And how did that change happen? The answer: evolution!

In *Evolution: How Life Adapts to a Changing Environment*, readers ages 9 to 12 will study evolution, or the process by which living things change over time. One of the most important ideas in biology, evolution explains why there are so many different living organisms on earth. It also explains why you are the way you are. Because of evolution, you walk on two legs and communicate with language. And although evolution is the story of our past, it also helps us understand our future and how we continue to evolve.

Throughout *Evolution*, investigations and experiments provide hands-on, problem-solving opportunities for students, incorporating various challenges and tools. Readers simulate the process of natural selection, trace the blue whale's evolutionary tree, and examine how fossils provide evidence of evolution and adaptation. Using readily available household and recycled materials, each activity takes the reader through an inquiry-based, open-ended investigation that leaves plenty of room to explore individual creativity. *Evolution: How Life Adapts to a Changing Environment* takes readers on a journey from our common ancestry to our shared future on an incredibly diverse planet.

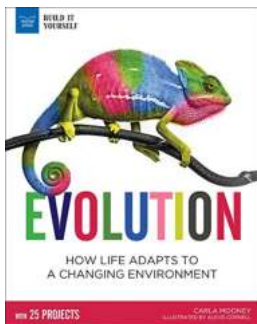
Nomad Press books in the Build It Yourself series integrate content with participation. Common Core State Standards, the Next Generation Science Standards and STEM Education all place project-based learning as key building blocks in education. Combining content with inquiry-based projects stimulates

learning and makes it active and alive. Nomad's unique approach simultaneously grounds kids in factual knowledge while allowing them the space to be curious, creative, and critical thinkers.



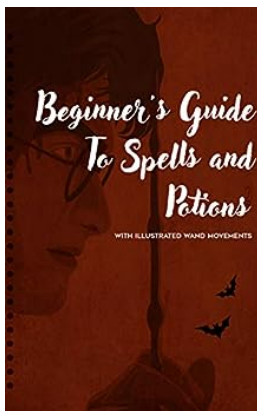
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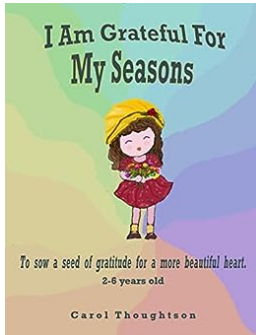
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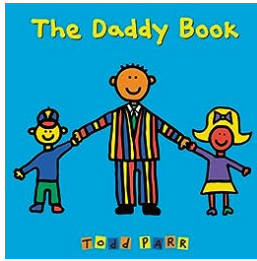
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