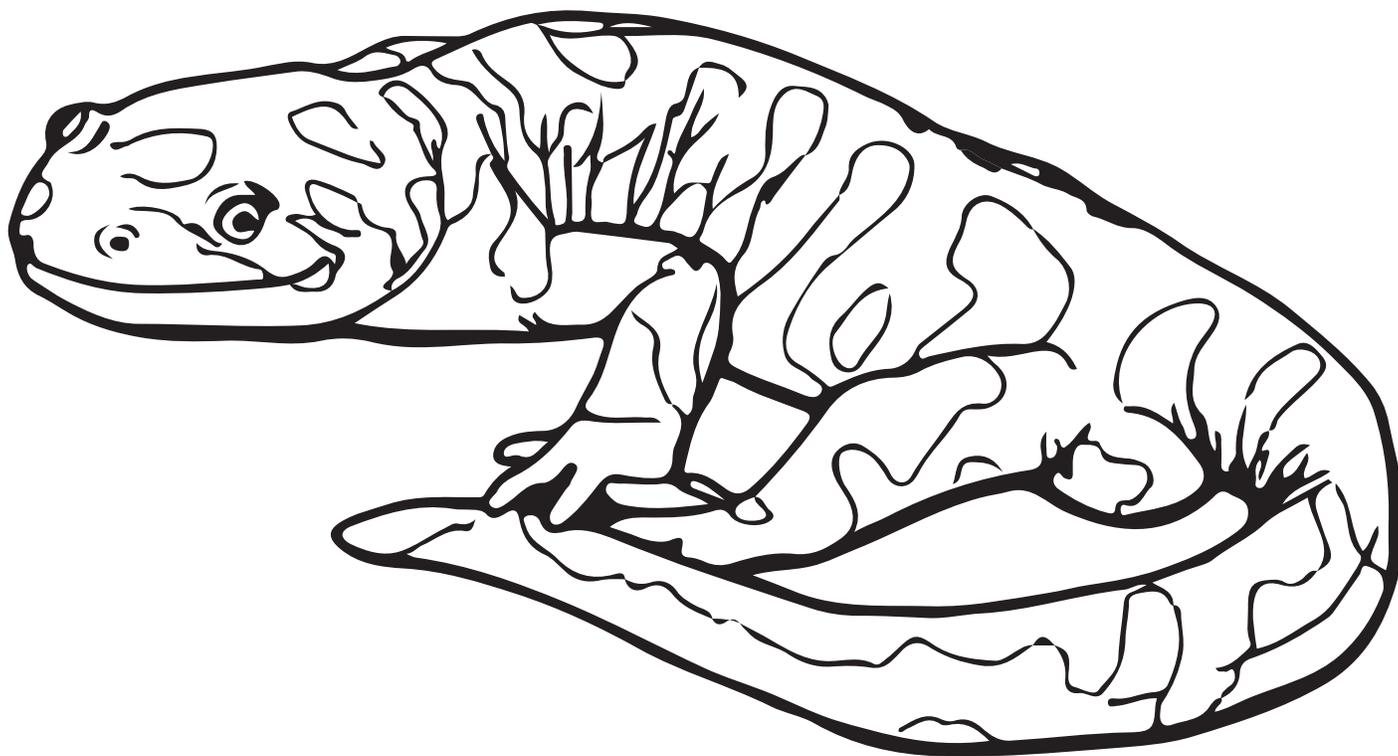


**Draw one thing you  
can do to help keep  
the air, water, and  
soil in Utah clean for  
Tiger Salamanders  
like Newman!**

Post your finished activity page on social media using #EarthChallenge2020 and #EarthRise



**My name is Newman, the Tiger Salamander! I breathe through my skin, and because of this, I need a clean place to live.**



**How can you help Utah stay clean for Tiger Salamanders like Newman?**

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Post your finished coloring page on social media using [#EarthChallenge2020](#) and [#EarthRise](#)

# EARTH DAY SCIENCE

## Understanding air pollution with Newman the Tiger Salamander



### About Newman the Tiger Salamander:

Newman is one of the Tiger salamanders that live at the Aquarium! These amphibians are native to Utah and can often be found buried in mud in our local lakes and streams. Like most amphibians, they breathe through their skin. Due to this, amphibians are the first to get sick when something changes in their environment. They are especially sensitive to pollution in the water and soil. Whatever affects amphibians may also affect people and other animals in that ecosystem.

### Air Pollution Craft:

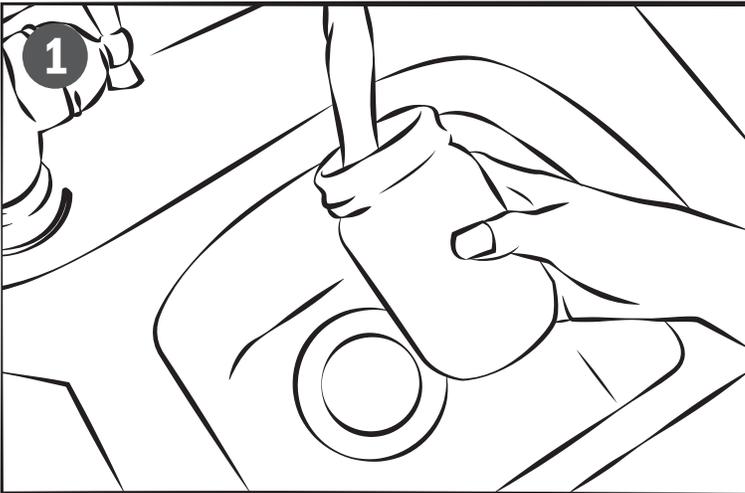
In this craft, you will be able to create a miniature atmosphere, much like Earth's, and watch first-hand how pollution is created.

**NOTE: YOU WILL NEED AN ADULT TO HELP COMPLETE THIS ACTIVITY!**

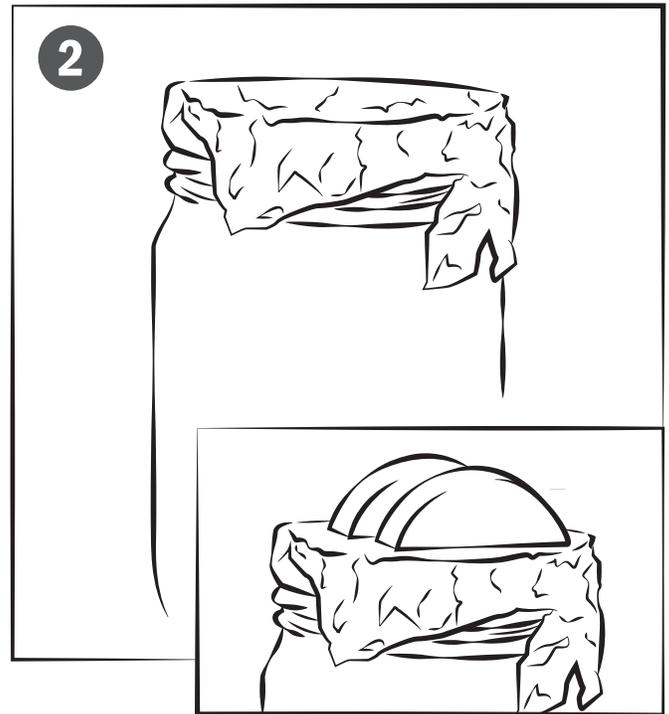
**For this craft, you will need the following:**

- An empty, clean, glass jar
- A lighter
- A small piece of paper about eight inches long and one inch wide
- A 4 inch by 4 inch square of tin foil
- Two to Three ice cubes

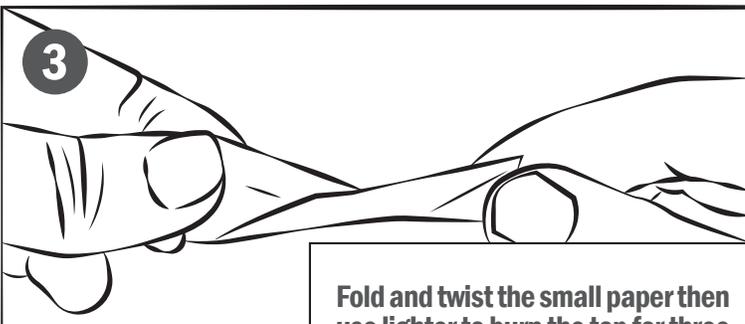
Post your finished craft on social media using #EarthChallenge2020 and #EarthRise



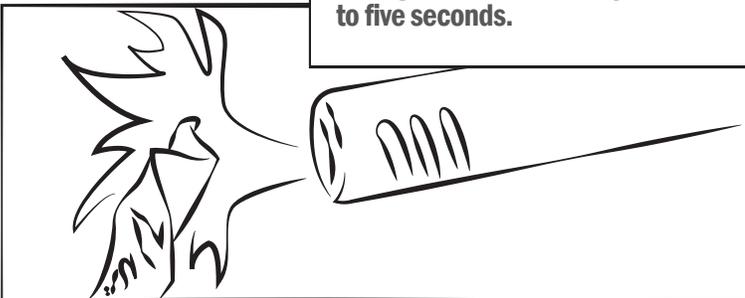
First, lightly wet the inside of your glass jar. The outside can be dry. By keeping the inside of the jar damp, you will recreate clouds and the moisture that is in our sky.



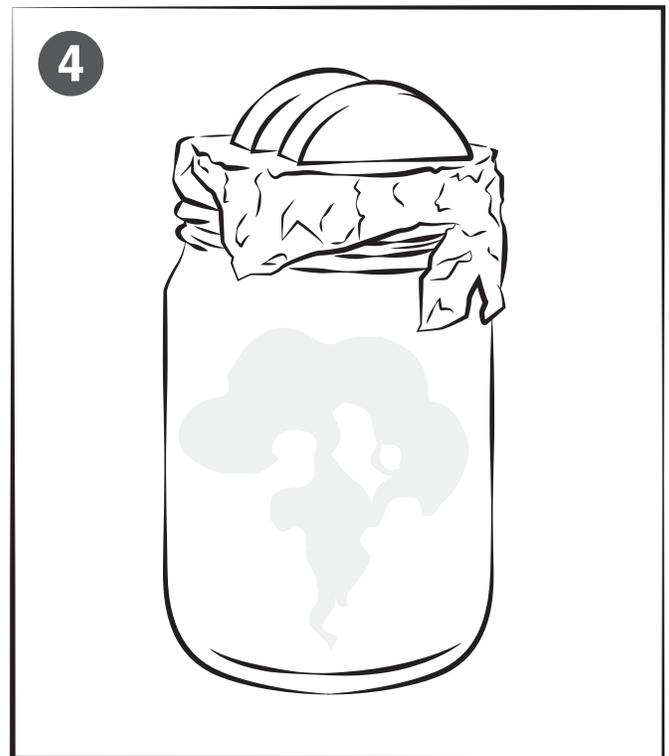
Fit your square of tin foil over the opening of the jar to act as a lid, keep it loose enough to easily put on and take off. Set the ice cubes on top of this tin foil lid and leave to sit for a couple minutes.



Fold and twist the small paper then use lighter to burn the top for three to five seconds.



Take the tin foil and ice cubes off the top of the jar and drop the smoking paper inside. Quickly secure the foil and ice on top of the jar once again. You can try this as many times as you need to until you see visible smoke.



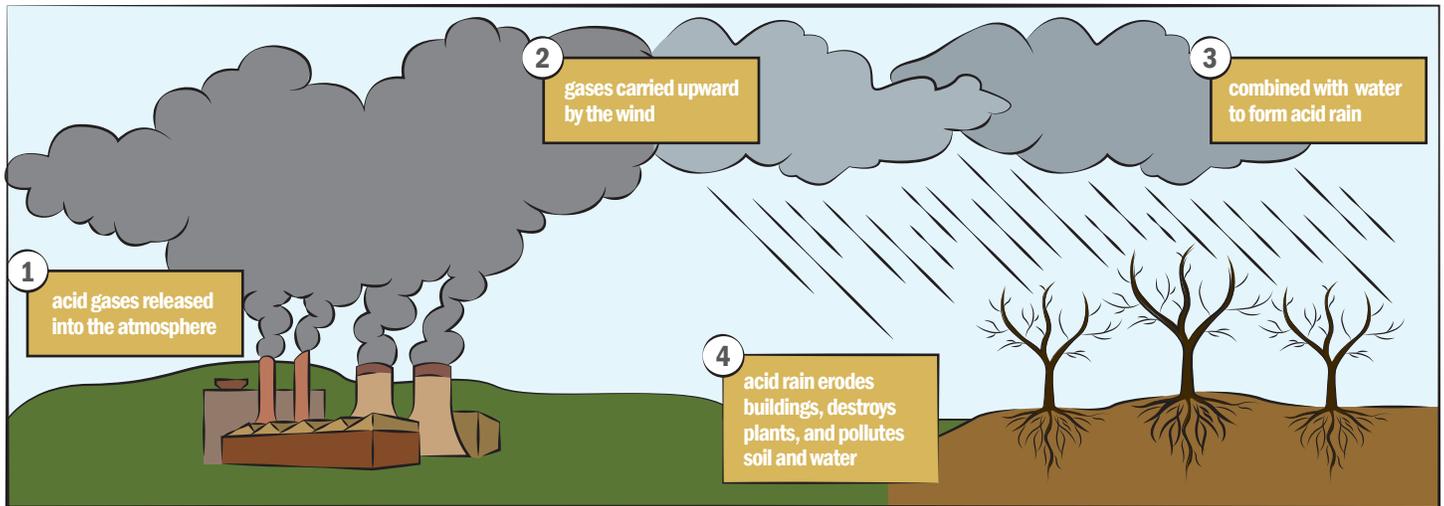
## 5 WATCH AND OBSERVE

Notice how the smoke moves in the jar. Why do you think the air moves that way, and how is this similar to air pollution?

# AIR POLLUTION

## What You Have Created Is Smog

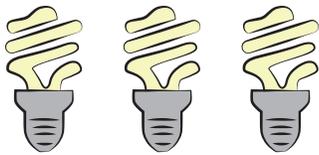
Smog is (almost) exactly how it sounds, smoke and fog! It is a mix of natural fog - tiny droplets of water in the air - and carbon dioxide smoke. When you put the lighted paper inside of your jar, you evaporated the water droplets into vapor. The cold air from the ice makes the moisture in the warm air condense into tiny droplets of water that are held in the air. If there is no wind, smog forms. This is called a temperature inversion. Smog-forming pollutants come from many sources. In typical urban areas, at least half of the smog comes from cars. The average American idles their car for almost 6 minutes every day, wasting 3 gallons of fuel and producing almost 58 million pounds of CO<sub>2</sub> annually. These pollutants are carried in the wind, trapped in clouds, and get caught inside raindrops, polluting the soil, water, plant and animal life. This smog even harms human health in many different ways. We need to practice keeping our air clean!



## Here's How You Can Help Clear The Air

### Use LED Bulbs

Using LED light bulbs can save you \$30 per year and help you reduce your carbon footprint by 183 pounds.



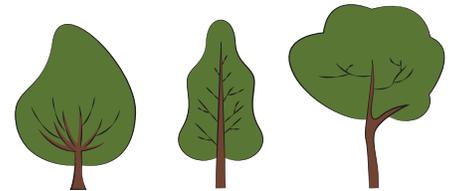
### Drive Less

Driving 20 fewer miles per week saves close to 1,062 pounds of CO<sub>2</sub>.



### Plant Trees

A single young tree absorbs 13 pounds of CO<sub>2</sub> each year.



### Find A Carbon Calculator

There are online carbon calculators that highlight areas of your life you need improvement.



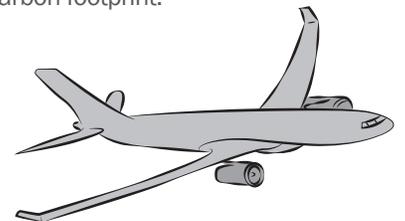
### Go Local

It has been estimated that 13 percent of US greenhouse gas emissions result from the production and transport of food.

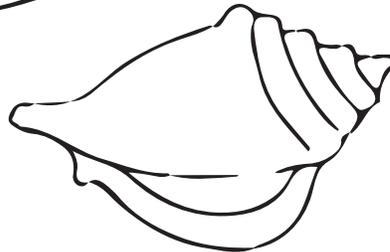
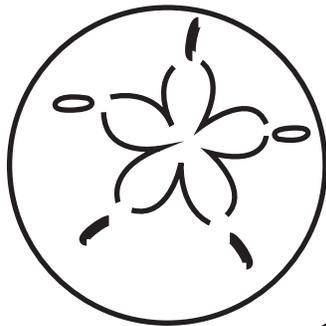
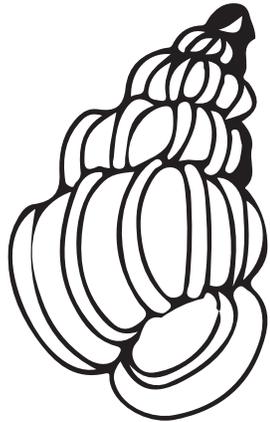
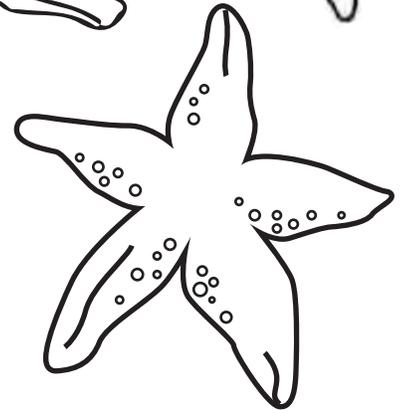
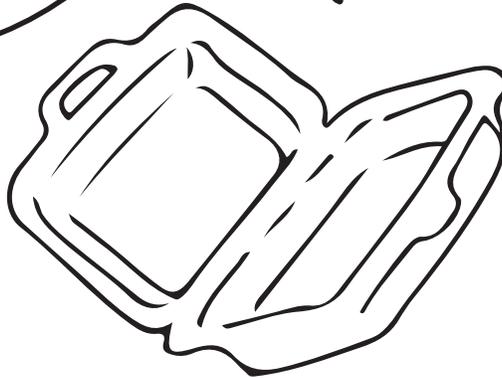
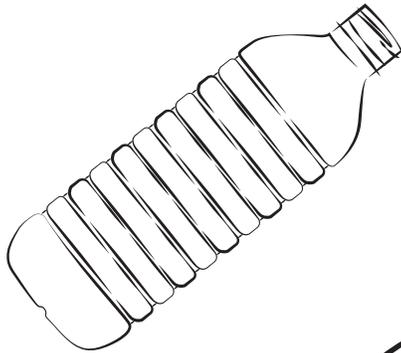
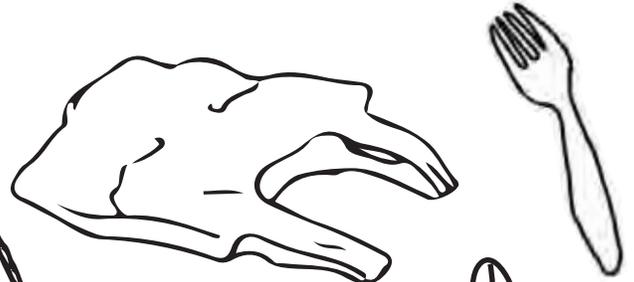


### Fly Less

One round trip from the US to Europe will add three to four tons of CO<sub>2</sub> to your carbon footprint.



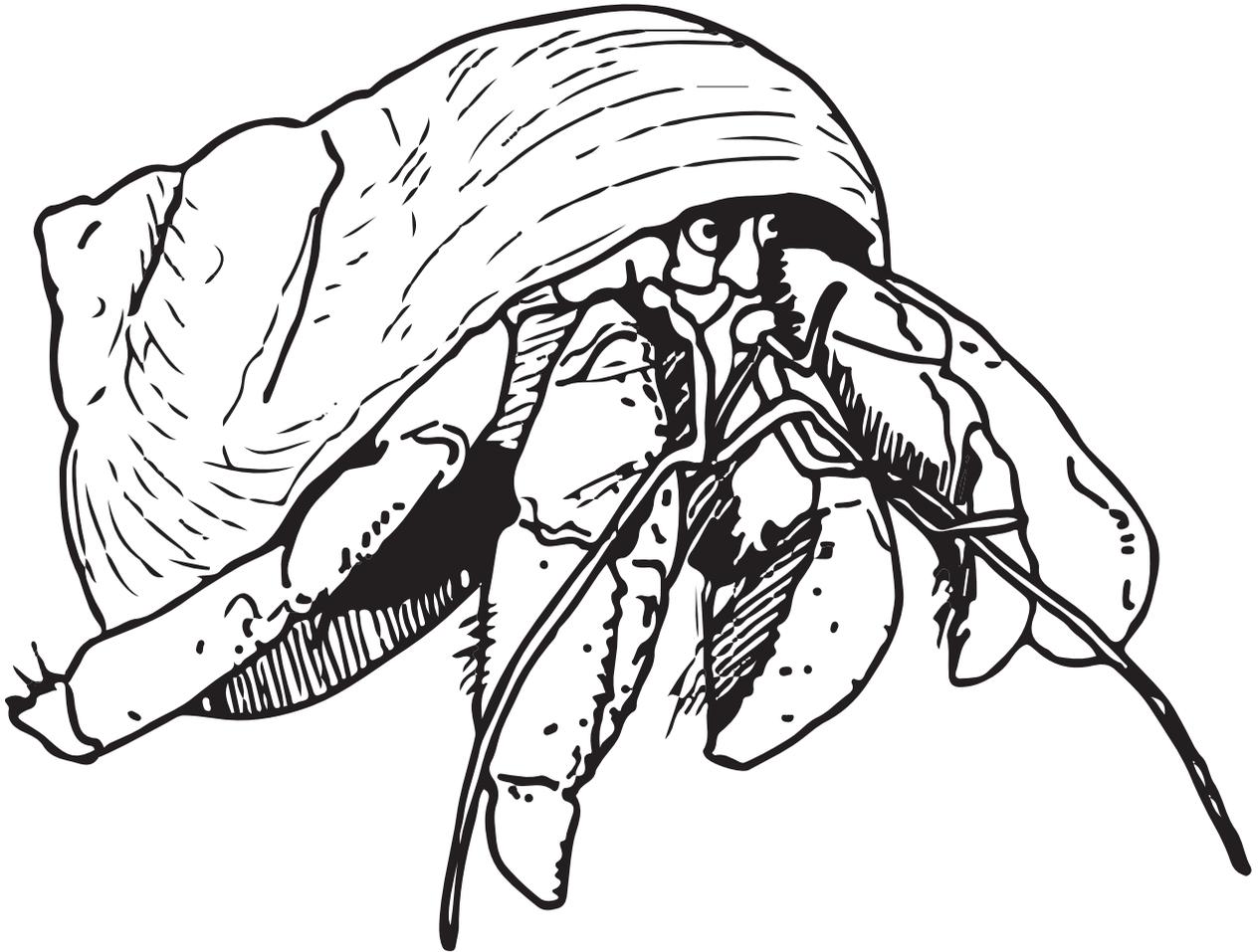
**Look at all that trash!**  
**Can you help Sebastian**  
**the Hermit Crab find all**  
**the shells?**



**How can you help keep plastic off the beach for Hermit crabs like Sebastian?**

Post your finished activity page on social media using #EarthChallenge2020 and #EarthRise

**I'm Sebastian, the Hermit Crab! I am great at reusing and recycling. On my beach, I make sure nothing goes to waste**



**How can you reduce, reuse, and recycle like Sebastian?**

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Post your finished coloring page on social media using #EarthChallenge2020 and #EarthRise

# EARTH DAY SCIENCE

## Reusing and recycling with Sebastian the Hermit Crab



### About Sebastian the Hermit crab:

Caribbean hermit crabs are scavengers, meaning they don't hunt or catch their food like other animals. Instead they clean the beach by eating everyone else's leftovers. They love to eat dead or decaying plant and animal matter. But that's not all they recycle! Hermit crabs can't grow their own shell, so they have a special body adaption that allows them to use old shells from other animals. Half of their body is soft with strong hind legs that can hold on to the inside of a hollow item. Hermit crabs will switch their shells if they're growing and need a bigger home, or sometimes just for fun. Caribbean hermit crabs especially need a variety of shell sizes since they can get four inches long and weigh up to half of a pound! When there is a lot of litter on the beach, these crabs will try to reuse our trash. This is not very healthy for them, because plastic is absorbent and will hold on to any toxins it encounters. Because of this, it is unhealthy for us too.

### Decorated Plant & Colorful Fish Craft

The best way we can prevent our waste from polluting is by treating the "Reduce, Reuse, Recycle" motto like steps! This craft is a simple way to reuse some plastic waste.

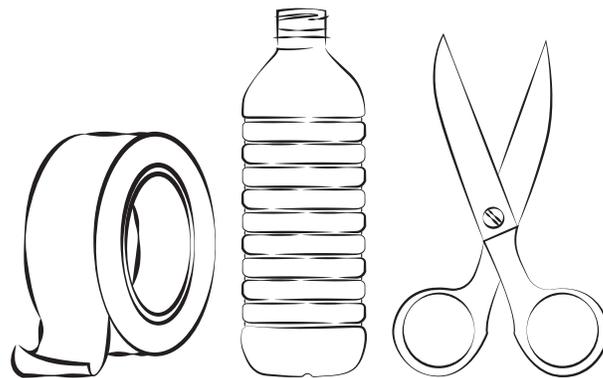
**NOTE: YOU WILL NEED AN ADULT TO HELP COMPLETE THIS ACTIVITY!**

**For this craft, you will need the following:**

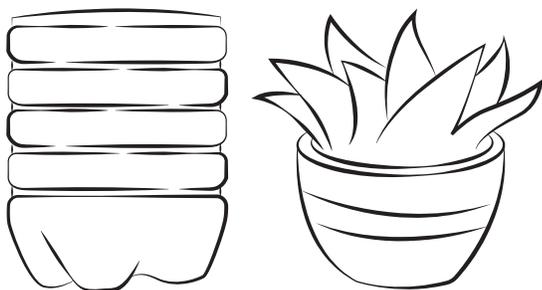
- A plastic bottle
- Tape and glue
- Coloring materials
- Scissors
- Decoration supplies
- A small plant

Post your finished crafts on social media using #EarthChallenge2020 and #EarthRise

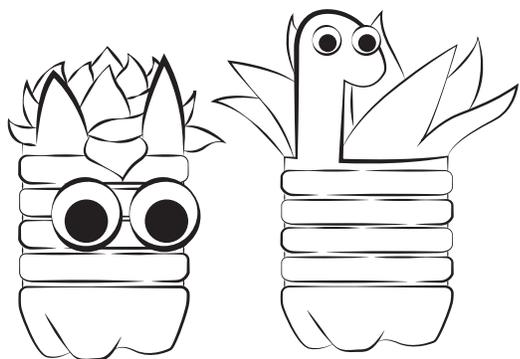
Cut your clean and dry plastic bottle in half. This is easier if you put a ring of tape over the middle so that you can cut a straight line all the way around. The top half will be used to make a fish, while the bottom half will be perfect craft for a decorated planter!



## DECORATED PLANTER

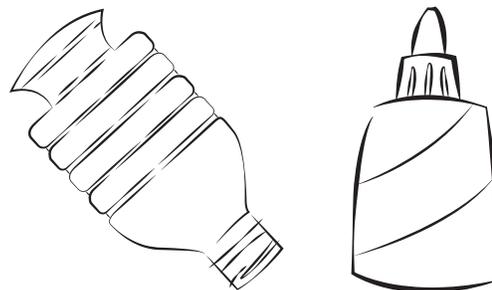


Start by painting or coloring the outside of the bottle. You can choose any color that you'd like. Wait for the paint to dry before you continue to the next steps. You can make a fish in the meantime.

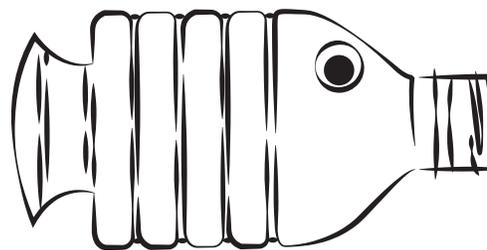


You can decorate your creations with anything you find around the house. Make sure it's okay with an adult first. There are so many fun possibilities. After decorating, place your plant inside, and you're done!

## COLORFUL FISH



Cut the end of your bottle to look like the fins of your fish! The opening of your bottle will be the mouth. Once you get the fins the way you would like them to look, glue or tape the ends together.



After you glue the ends together you can start coloring your fish with your paints or markers. You can also decorate it with anything around the house, but make sure it's okay with an adult first. Enjoy your craft!

# HOW RECYCLING WORKS

## Pick Up Day

All of our bins are emptied into a big dump truck that will take our waste to a recycling plant. It's important to know which plant is recycling your waste since every center might accept (or not allow) different recyclables. Be sure that you're not "wishcycling" by putting things in the bin and hoping it will be recycled.

## Bales

These sorted recyclables will be compressed into 1,400-pound cubes called Bales that can then be sold to companies. One bale of clean PET plastic costs about \$500. Bales that aren't clean or have many stickers or tape on it usually aren't sold. Companies usually won't buy bales if it is cheaper to buy and use new materials. If this happens it is sent to landfill.

## Recycling Center

Once your waste is dropped off at the recycling plant, it will go through two miles of conveyor belts that will sort your waste through multiple optical sorters, stairs, and magnets. These machines can look at up to seven tons of material every hour! That's sorting two pounds of recyclables in a second.

## Old to New

At recycling plants, only 70-percent of plastic is recycled. The plastics that are recycled can only be repurposed one to two times before the material becomes too weak. Most companies won't buy bales simply because there isn't a demand for it. If we choose to recycle, we also need to support the other end of the process by buying recycled goods. Recycling should not be our only tool for solving the growing plastic crisis.

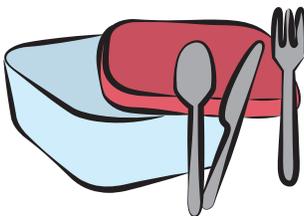


## Reduce, Reuse, Recycle Steps

When the time comes to stock up, try reusing the containers you already have. Re-fill with a homemade alternative, or consider visiting a local bulk store. Here's some simple everyday tips to help you reduce and reuse!

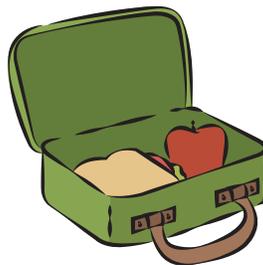
### Bring Your Own Cutlery

By packing your own forks and knives, you could help eliminate the 500,000 plastic forks thrown away every day worldwide.



### Pack a Plastic Free Lunch

Reusable ziplock bags go a long way! Save money and waste by DIY-ing your own, or investing in some plastic free options.



### Use Reusable Produce Bags

By cutting out plastic grocery bags for one year, you could save 350 bags from being disposed!



**Help Dusty show the construction workers the best route to build a road without cutting down too many trees.**



Post your finished activity page on social media using #EarthChallenge2020 and #EarthRise

**My Name is Dusty! I am an African Grey parrot from the Congo rainforests in Africa.**



**How can you protect the rainforests, like where Dusty lives, from deforestation?**

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Post your finished coloring page on social media using #EarthChallenge2020 and #EarthRise

# EARTH DAY SCIENCE

## Learning about deforestation with Dusty the African Grey Parrot



### About Dusty and the Congo rainforests:

Our African grey parrot, Dusty, is one of our Animal Ambassadors at the Aquarium. This means Dusty can go out to schools as well as in the Aquarium lobby with trained educators to teach guests about his species and where he came from. You definitely won't see these intelligent birds in your backyard. African grey parrots are native to the Congo rainforests in Africa. On the ICUN Red List, they are listed as endangered. Their species is struggling because they are targeted by the exotic pet trade, and their home is being destroyed from deforestation. Even though we might not live near Africa, there are a lot of things we do in our day to day lives that affect rainforests all over the world. Our choices make a good or bad impact on these fragile ecosystems.

### A Game About Deforestation

To learn about deforestation and it's effects on our rainforests, here is a fun game that will teach you all about it!

**NOTE: YOU WILL NEED AT LEAST TWO PEOPLE TO PLAY THIS GAME!**

**For this game, you will need the following:**

- A Printed out board game  
(PROVIDED)

- One Dice

- A blank sheet of paper &  
pencil for every person

- Game piece for each player

Post your finished game on social media using #EarthChallenge2020 and #EarthRise

# HOW TO PLAY

## Instructions:

The goal of this game is to make as much profit as possible. Set a time limit, and whoever has the most money in the end will win the game, but you'll soon see that other factors might finish the game for you. There are two parts to the game and after players finish the second part they are free to repeat each round as much as they would like.

### HARVESTING & PROFITING

The game board is made up of squares. On almost all squares, there are different colored trees. Each tree can be harvested and profited for money. Some trees can grow back but it takes a certain amount of rolls. Every time a player rolls it counts toward the regrowth of a tree.

### GAME SET UP & MOVEMENT

Players can set their pieces on any square at the edge of the board. Each player will take turns rolling the dice to determine how many squares their piece will move. If a player rolls a six, they can move a maximum of six squares. Players can move up, down, left, and right. Players cannot move diagonally.

#### TREE KEY



Regrow: 3 Rolls  
Price: \$3



Regrow: 5 Rolls  
Price: \$8



Regrow: \*10 Rolls  
Price: \$20



Regrow: 20 Rolls  
Price: \$40



Regrow: Never  
Price: \$75

\*If all Yellow Trees are harvested at once, they will not grow back

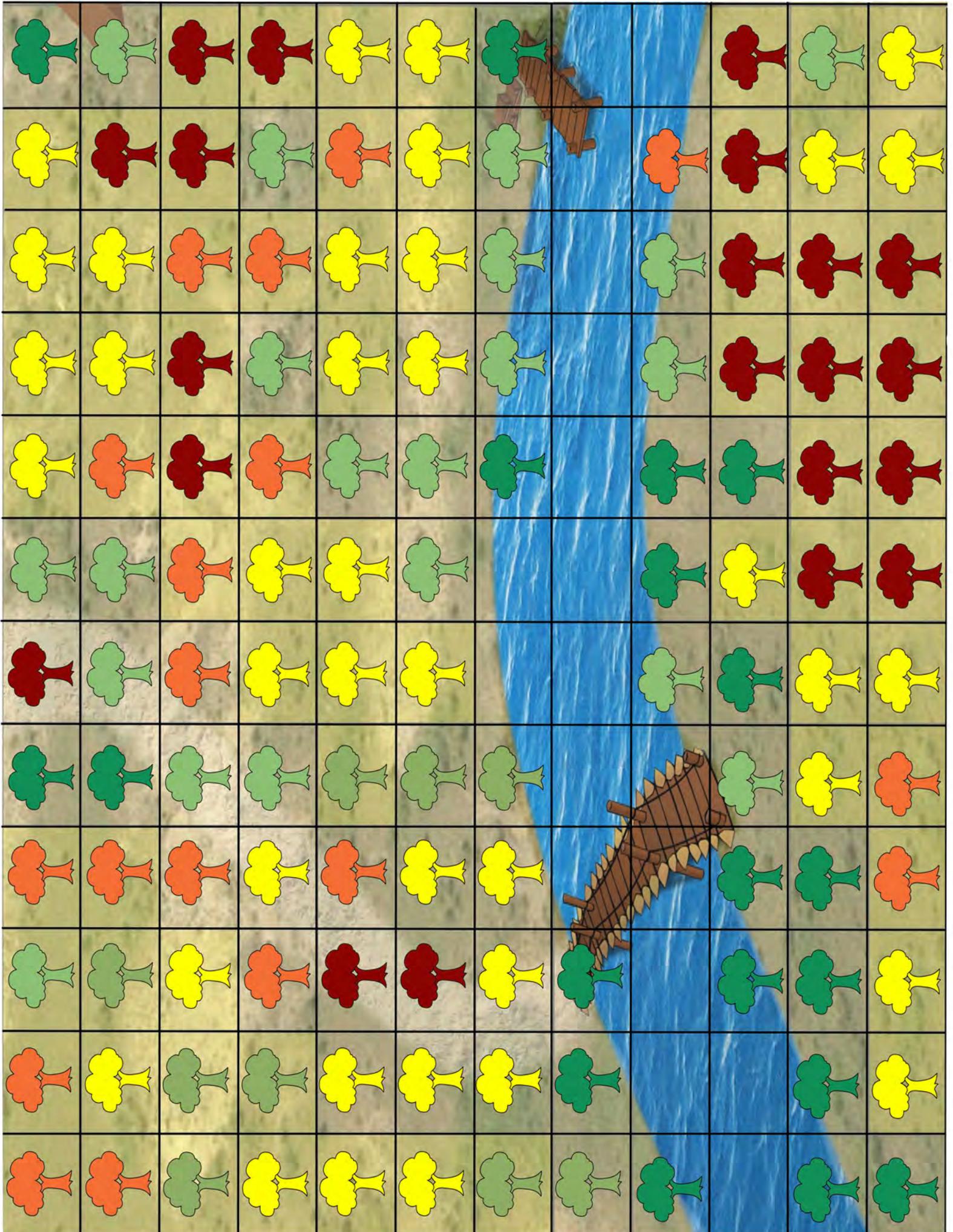
### ROUND ONE: GAINING PROFIT

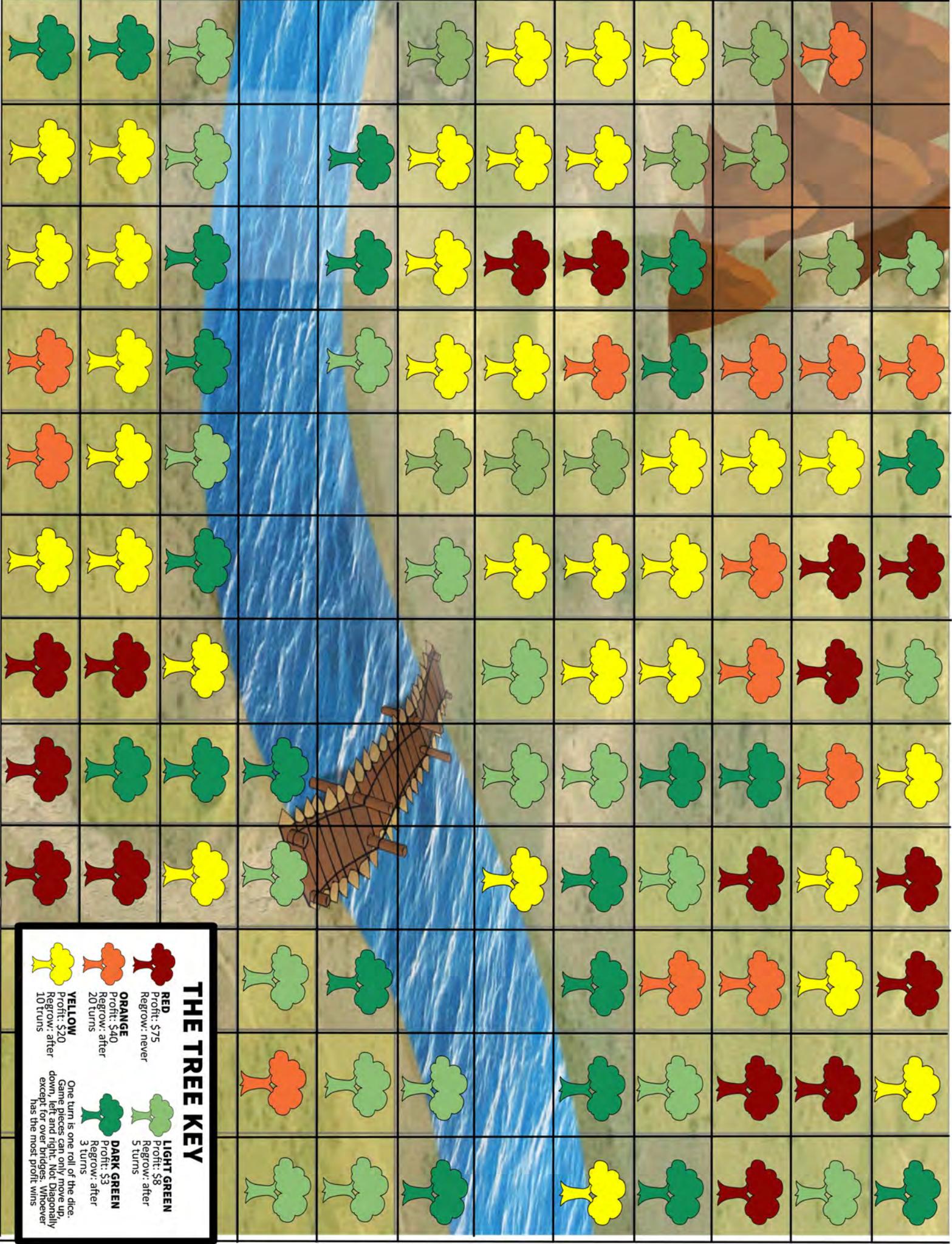
- Each turn will begin by a player rolling the dice confirming how many spots they can move.
- Whatever tree square they land on, they can choose to collect the profit. If the player chooses to collect, write down the value on the piece of paper. Players can keep track of visited squares by marking it.
- To calculate how much money you've made, add up all profits you've written on your paper. Whoever has the most profit wins.

### ROUND TWO: FIXING THE SYSTEM

- Reflect on the previous round. Did profits slow as the game went on? Was it harder to collect profits once trees were re-growing? What can you do to fix this problem? What new rules can you put in place to help conserve trees? (i.e. farm one area at a time, skip all turns to help trees re-grow after five rolls, create fines, etc.)
- Continue playing like round one, with your added new laws. Closely observe the difference in this round in comparison to round one.
- Continue this round for however long you'd like. You can keep refining your conservation laws so that each player gets most profit while keeping the rainforest intact.

**Let's get started! The printable game board is on the next two pages.**





# THE TREE KEY

**RED**  
Profit: \$75  
Regrow: never

**ORANGE**  
Profit: \$40  
Regrow: after 20 turns

**YELLOW**  
Profit: \$20  
Regrow: after 10 turns

**LIGHT GREEN**  
Profit: \$8  
Regrow: after 5 turns

**DARK GREEN**  
Profit: \$3  
Regrow: after 3 turns

One turn is one roll of the dice. Game pieces can only move up, down, left and right. Not diagonally except for over bridges. Whoever has the most profit wins

# DEFORESTATION

## What Did You Learn

Now you've experienced what it's like to farm trees. Forests all over the world are being cleared to make new products, clear areas for developments, cattle ranching or agriculture. What did you learn during the board game about deforestation?

## What Is Deforestation?

Deforestation is when trees are chopped down to clear an area where the land can be used for other purposes. Trees can eventually grow back, but when they are cut down too fast they can't grow back fast enough. Just like our game, some areas or trees can grow back faster than others. Whereas, in some areas, the biodiversity that was once there can never grow back. This deforestation is calculated to be the second biggest contributor to global warming. Even though we might not live anywhere near the rainforests, our decisions can have an impact. As consumers, we can choose to support sustainably forested products to show corporations we have their support. And here's a couple of ways how:

### Rainforest Alliance

Look for the Rainforest Alliance logo on products that use cacao (chocolate), paper, palm oil, and more. They help conserve a forest's biodiversity, and helps restore forests by planting trees.



### Support the Cycle

Support the "reduce, reuse, recycle" cycle! Buy recycled products to help support those that are recycling the paper.



### Sustainable Palm Oil

Palm oil is the most widely used vegetable oil on the planet. When not farmed correctly, harvesting palm oil can be detrimental to ecosystems. Keep a lookout for these logos and support brands that are supporting sustainable palm oil farming methods.



### Meatless Mondays

Try to eat less beef! One day without meat can save four pounds of carbon dioxide. By practicing "Meatless Monday," you can lower the demand for beef and help conserve the forest's ecosystems.

