

# Our Amazing Earth!

- Our land is super important! It gives us food, water, and lots of other good things.
- It's like a giant playground for animals and plants!
- People use most of the land - more than 70
- Land also helps our planet's weather work.

# Our Amazing Earth and Its Gifts

- Imagine the Earth is like a giant garden!
- We use a lot of what this garden grows, about  $\frac{1}{4}$  to  $\frac{1}{3}$ , for things like food, animal feed, clothes and wood.
- The Earth also does many other amazing things for us, like cleaning the air and water and giving us beautiful places to visit.
- These things the Earth does are like free services!
- Some grown-ups think these services are worth about as much money as everything made in the world in a year! That's a lot!
- So, it's super important to take care of our Earth and its garden.

# Land and Our Changing Climate

- **Land is Like a Sponge!**

- It can soak up some bad gases (like a sink).
- But it also makes some bad gases (like a source).

- **Land Helps the Earth!**

- It controls how much heat, water, and tiny particles move between the ground and the air.

- **Climate Change is Hurting Nature!**

- Plants, animals, and special places on land are easily damaged by climate change.
- Things like hot weather and big storms hurt them a lot.

- **We Can Help Land!**

- Taking care of the land can protect it from climate change.
- This helps plants, animals, and us too!

# Our Planet is Changing!

- More people are living on Earth now than ever before!
- We need lots of food, water, and energy to live.
- Since 1961, we've been using lots more land and water.
- Farming uses about 70% of all the fresh water we use!
- We're making more food by using more land for farms and trees.
- This is helping us feed everyone, which is good!
- But, it's also making problems:
  - More gases are going into the air and warming our planet.
  - We're losing forests, grasslands, and animal homes.
  - Some animals and plants are having a hard time.

# Our Food and the Planet

- Imagine everyone on Earth!
  - We now have way more vegetable oil and meat than before! (More than twice as much!)
  - We also have about one-third more food than in the past!
- But... a lot of food gets wasted!
  - About 25-30
- Wasting food and eating too much can hurt the planet.
  - It makes more of the gases that cause the Earth to warm up.
- Sadly, many people are eating too much!
  - About 2 billion adults are overweight.
  - But also, a lot of people don't get enough food.
  - About 821 million people are still hungry.
- We need to find a better way!

# Our Changing Earth

- Imagine the Earth like a giant playground.
- About a quarter of the playground that's not covered in ice is getting hurt because of things people do.
- Like when we farm, the soil gets washed away much faster than it can grow back. It's like if we keep breaking the sandcastle faster than we can build it.
- Climate change, like it getting hotter and drier, makes this even worse in some places like coasts, rivers, and dry lands.
- Dry areas are getting more and more dried out each year.
- A lot of people, like 500 million, live in areas that have turned into deserts since the 1980s. Many are in Asia and Africa.
- Climate change is making things much harder for people who live in these damaged areas.

# Land Use and Our Changing Climate

- **Land use** means how we use the land, like for farming or building.
- This is a look at how land use and climate change are connected.
- We'll see some graphs showing what's happening.
- **Graph A:** Shows how the Earth has been getting warmer.
- **Graph B:** Shows how much bad stuff is going into the air from farming and land use.
  - Stuff like N<sub>2</sub>O and CH<sub>4</sub> from farms and CO<sub>2</sub> from cutting down trees.
  - These things are like blankets around the earth, making it warmer.
- **Graphs D, E, F:** These show changes over time, starting from 0.
- These graphs use data from the UN and other places, starting in 1961.
- All the bad stuff is measured in CO<sub>2</sub>-eq, like a common unit.
- We use special numbers to make sure we are talking about the same thing.

# Our Planet is Getting Warmer!

- The land is getting much warmer than the whole Earth.
- It's like when you stand on hot sand, it feels hotter than the air!
- This warming is making food harder to grow.
- It's also hurting the plants and animals that live on land.
- Some places are turning into deserts because of this!
- We need to take care of our planet!



# The Earth is Getting Warmer!

- Imagine the Earth had a temperature long ago, before big factories.
- The land (where we live) has gotten much warmer than the whole Earth (including the oceans).
- Think of a warm day: it's like that, but the average for years went up!
- The land got about 1.5 degrees Celsius warmer.
- The whole Earth got about 0.9 degrees Celsius warmer.
- So, the land is heating up faster than the oceans!

# The Earth is Getting Warmer!

- Imagine the Earth is like a house. It's getting warmer, and things are changing!
- **Heatwaves:** Like really, really hot days, are happening more often, and lasting longer in many places.
- **Droughts:** Some places are getting much drier, like a garden that hasn't been watered.
- **Heavy Rain:** When it rains, it can rain super hard sometimes, all over the world.
- These things are happening because the Earth is getting warmer than it used to be.

# Earth is Changing: Plants!

- **Good News: Some Places are Getting Greener!**

- Satellites show that parts of Asia, Europe, and other places have more plants now than before!
- This is because the growing season is longer, we use fertilizer, and there's more of a special gas in the air that helps plants grow (CO<sub>2</sub>).
- Also, how we take care of the land helps!

- **Not-So-Good News: Some Places are Getting Brown**

- Some places like parts of North America and Asia are seeing fewer plants.
- This is mostly because these places don't have enough water for the plants to grow well.

- **Overall, Earth is Getting Greener**

- More places are becoming green than brown, which is good!

# Dust Storms are Getting Stronger!

- Imagine strong winds blowing lots of dust and sand. That's a dust storm!
- Lately, dust storms are happening more often and are stronger.
- Why? Because of two things:
  - How we use the land (like farming or building).
  - Changes in the weather caused by climate change.
- This is happening a lot in dry places like the Middle East.
- These strong dust storms are bad for our health. It can make it hard to breathe and cause other problems.
- We need to be careful and find ways to make things better!

# Hotter and Drier Places

- Some places are getting hotter and drier. Think of it like the sun is turning up the heat!
- This is happening in places like parts of Africa, Asia, and Australia.
- When it's too hot and there's not enough rain, the land can become like a desert. This is called desertification.
- **Heatwaves** are when it gets super hot for a long time.
- It's tricky to see exactly what's happening with plants from space. Sometimes the pictures aren't perfect.
- **Greening** means more plants are growing because they have more food from the air, called CO<sub>2</sub>.
- But plants need water too, so if it's too dry, they might not grow well even with more food.
- **Browning** means that plants are not growing as well.
- We need to learn more about how dust storms and heat are affecting people in different places.

# Our Changing World

- The Earth is getting warmer.
- This warming is like moving the weather zones around.
  - Dry places are getting bigger.
  - Cold places near the poles are getting smaller.
- Because of this, plants and animals are changing too.
  - They are moving to new homes.
  - Some are becoming more common, others less.
  - The times they do things, like when flowers bloom, is changing.

# Climate Change and Our Land

- Imagine the Earth is like a playground, and the ground is where we play.
- Climate change, caused by too much heat, can make our playground messy!
  - More rain can cause big floods and wash away the soil.
  - Too little rain can make the ground dry and cracked.
  - The hot sun can make it even harder for plants to grow.
  - Strong winds and waves can take away the land near the sea.
  - Even the frozen ground can melt, making the land change.
- It's like our playground is getting damaged because of the changes in weather.
- We need to be good caretakers of the land to keep it healthy for everyone.

# Climate Change and Our Food

- Imagine the Earth is getting a little bit warmer.
- This warming is changing when and how much it rains.
- Sometimes, there are also bigger storms and heat waves.
- This makes it harder to grow food in some places.
- For example, crops like corn and wheat don't grow as well in some warm places now.
- But in some cooler places, these crops grow a little better!
- The animals that people raise for food in Africa are also not growing as well.
- Climate change also makes it easier for bugs and diseases to hurt our crops.
- People who live in dry places and high mountains are finding it harder to get food.
- This all means it's important to help our Earth stay healthy!



# Farming, Forests, and Our Planet

- Imagine the Earth is like a big garden.
- When we farm, cut down trees, and use land, we create some bad gases.
- These gases are like farts for the Earth, but not funny ones.
- They are called greenhouse gases and make the Earth warmer.
- From 2007 to 2016, farming and land use made:
  - 13% of one bad gas (CO<sub>2</sub>).
  - 44% of another bad gas (methane) - cows make a lot of this!
  - 81% of another bad gas (nitrous oxide).
- This was about 23% of all bad gases we made.
- But, luckily, nature absorbs some of the CO<sub>2</sub>!
- It absorbed about 29% of the CO<sub>2</sub> we made, like the Earth is cleaning up.
- But we might lose this helpful clean-up as the Earth gets warmer.
- If we count all the steps in making food (growing, shipping, etc.)
- Food might be responsible for 21-37% of all the bad gases we make!

# Land and Carbon Dioxide

- Think of land like a sponge for carbon dioxide (CO<sub>2</sub>). Sometimes it soaks it up, and sometimes it lets it out.
- This happens because of nature, but also because of things people do. It's tricky to tell exactly which is which!
- When we cut down forests, it's like squeezing the sponge and releasing CO<sub>2</sub> into the air. This is called deforestation.
- When we plant new trees, it's like soaking the sponge and taking CO<sub>2</sub> out of the air. This is called afforestation and reforestation.
- From 2007 to 2016, more CO<sub>2</sub> went into the air from land use than was taken out. It's like the sponge leaked.
- This leaking is mainly because of deforestation.
- Over time since 1990, there hasn't been a clear change in the amount of CO<sub>2</sub> leaking from land.

# The Earth Helps Us (But We Need to Help It Too!)

- The Earth's land is like a giant sponge, soaking up some of the extra carbon dioxide (CO<sub>2</sub>) we put into the air.
- From 2007 to 2016, the land soaked up about 6 billion tons of CO<sub>2</sub> each year! That's like taking a lot of cars off the road.
- But, the Earth is getting a bit sick.
- More CO<sub>2</sub> in the air, warmer temperatures and other things we do are changing things for the land.
- Some of the extra CO<sub>2</sub> makes plants grow more (like a fertilizer!), which helps them soak up more CO<sub>2</sub>.
- Warmer temperatures are also giving plants longer growing times in some places, so they can soak up more CO<sub>2</sub> too.
- BUT! Climate change can also make the land release CO<sub>2</sub>, especially as the frozen soil (permafrost) melts.
- It's like the Earth is taking a deep breath in (soaking up CO<sub>2</sub>) but also letting out some at the same time.
- We don't know exactly what will happen in the future, but we need to keep our earth healthy!

# Counting Carbon: Big Picture vs. Local

- Imagine we're counting how much carbon dioxide (CO<sub>2</sub>) trees take in and give out.
- Two ways to count:
  - **Big Picture Way:** Like looking at Earth from space. We see big changes like forests being cut down or new forests growing.
  - **Local Way:** Like walking through a forest and checking every tree. We see all the changes, even the small ones.
- Both ways agree on the big forest changes.
- They disagree a bit on "managed forests," like farms that also have trees.
  - Big picture only counts forests where trees are cut down
  - Local counts all forests that humans take care of, even if they grow naturally
- The local way can also count some extra things, like how nature changes because of us
- It's like looking at the same forest with a telescope and with your own eyes! Both are useful!

# Where Do Greenhouse Gases Come From?

- **Land Use Changes** (like cutting down trees): Think of it like taking away plants that clean our air!
  - This adds about 1/10th of all greenhouse gas.
- **Farming and Food:** Growing our food, making it, and moving it around makes greenhouse gases.
  - This adds a lot! Up to 37
- **Other Things (Not Food or Land):** Things like burning gas, factories, and throwing away trash.
  - This adds most of the greenhouse gases.
- **Earth's Natural Cleanup:** Plants and soil take some greenhouse gases back out of the air!
  - This helps us a little bit!

Remember, it's like a big puzzle! We need to make sure we don't put too many gases into the air!

# Methane: A Powerful Greenhouse Gas

- Imagine a gas called methane, like a super-strong blanket around the Earth.
- Lots of it comes from farming, called AFOLU.
- Between 2007 and 2016, farms made a lot of this gas each year.
- The amount of methane in the air went up and up until the 1990s.
- Then it slowed down for a bit, almost stopped growing.
- But since 2007, it's growing again!
- Most of the new methane is coming from living things, like cows.
- Cows burp out methane and growing lots of rice also makes it.
- This is making the Earth warmer.

# Nitrous Oxide: A Sneaky Greenhouse Gas

- Imagine the Earth like a big greenhouse!
- Certain gases trap heat, making our planet warmer.
- One of these gases is called Nitrous Oxide (N<sub>2</sub>O).
- It's like a sneaky heat-trapper!
- People are making more N<sub>2</sub>O than before, especially from farms and land use.
- This means more heat is getting trapped.
- From 2007 to 2016, about 8.7 million tons of N<sub>2</sub>O went into the air each year. That's a lot!
- This extra N<sub>2</sub>O is like adding another 2.3 billion tons of CO<sub>2</sub> to the atmosphere each year.
- It's important to reduce the amount of N<sub>2</sub>O that we make.

# Where Do Our Greenhouse Gases Come From?

- Imagine greenhouse gases are like blankets around the Earth.
- These blankets keep the Earth warm, which is good! But too many are bad.
- A big source of these gases comes from how we use land, like farming and forests.
- It's like if we're using the land too much, it lets out greenhouse gases.
- From 2007 to 2016, these activities gave out about 12 big trucks of gases every year!
- That's about 23 out of 100 greenhouse gas trucks we make.
- We need to be careful with how we use our land so we don't make too many greenhouse gases.



# Land Changes and Our Weather

- Imagine the Earth is like a giant playground.
- When we change the playground (like cutting down trees or building cities), it can change the weather!
- These changes can make the weather hotter or colder, depending on where you are and what time of year it is.
- Sometimes, these changes can make big storms or heat waves worse, or even last longer.
- It's like if you move the slide to a sunny spot, it will get hotter!  
Changing land can change our weather too.

# Land Changes and Temperature

- Humans have changed the land a lot since before factories were common.
- These changes have done two things:
  - Some changes released extra CO<sub>2</sub>, a gas that makes the Earth warmer. It's like adding more blankets.
  - Some changes made the land reflect more sunlight. This is like putting up a big mirror, cooling the Earth.
- It's like a tug-of-war!
- The warming and cooling mostly canceled each other out, so the overall temperature change from land changes has been small.

# Our Land Affects the Weather!

- Imagine the Earth is like a big playground.
- What's on the ground, like trees or concrete, can change the weather.
  - If there is a lot of bare ground, it can make heatwaves hotter and last longer.
  - If there are changes to land it can also make big rainstorms happen more often.
- These changes can even affect weather far, far away!
  - It's like a ripple in a pond – changes in one place can spread.
- So, taking care of the land is super important for our weather!

# Climate Change and Land

- Imagine the Earth like a big puzzle! Climate change is changing the pieces.
- In cold places where trees grow, it's getting warmer in winter.
  - Less snow means the ground soaks up more sun and gets warmer.
  - More trees growing also means more water is going into the air, making it a bit cooler in the summer.
- In hot, rainy places, more rain means more plants!
  - More plants help to keep things a little cooler.
- If the ground gets very dry, heat waves can get worse.
- If the ground is wet, heat waves are not as bad.
- It's like the Earth is trying to balance itself, but climate change is making it harder!

# Deserts and a Warmer Earth

- Imagine lots of plants and trees are like a big green blanket covering the Earth.
- When deserts grow, that blanket gets smaller.
- Less plants means more of the ground is bare.
- Bare ground can let out some of the gas that makes the Earth warmer, like when you breathe out!
- The bare ground also reflects the sun in a different way, and this can sometimes make that area a little cooler.
- So, deserts make some parts of the world warmer overall, even if they can make other parts a tiny bit cooler.

# Trees and Temperature: It's a Bit Tricky!

- Trees can make places cooler or warmer! It depends on where they are.
- **Tropical Trees (like in jungles):** More trees mean more water going into the air, like sweating! This cools the land, especially on hot days. Less heatwaves!
- **Snowy Trees (like in colder places):** More trees and bushes mean less snow can reflect sunlight. It's like wearing a dark shirt instead of a white shirt in the sun; it gets warmer! This can make winters warmer.
- So, trees help cool in some places, but they can make it a little warmer in others. It's important to remember location.

- **Cities Get Hotter:**

- Cities can get extra warm, like an "oven effect".
- This is worse at night than during the day.
- It can also make big rain storms stronger.

- **Changing the Land:**

- When we cut down forests or build cities, it changes how much sun the land reflects.
- Forests can help cool things down, but sometimes they can also have the opposite effect.

- **Different Futures:**

- How we live can change how much the Earth warms.
- Some ways of living are better for the planet.
- Others can make climate change much worse.

- **Risks of a Warmer Earth:**

- More heat means less water in dry places, and less food.
- We can see damage from wildfires, and our homes can be at risk.

# Our Planet is Getting Warmer!

- Imagine Earth is like a big playground.
- It's getting warmer, like being in a hot sun all day!
- This warming can cause problems for our playground and for us.
- **Land Problems**
  - More droughts and less water in some places.
  - Plants and animals losing their homes.
  - More big fires and floods.
- **Food Problems**
  - It might be harder to grow food.
  - Food might get more expensive.
  - Some people might not have enough food to eat.
- These problems can get worse depending on how we live.
- If we are careful, we can help fix these problems!



# Climate Change and Our Earth

- Imagine the Earth is like a big playground. Climate change is like an extra bully that makes things harder.
- It makes problems on the land, like trouble with our food, nature, and houses, even worse.
- No matter what, if we keep making lots of greenhouse gasses, these problems will get bigger.
- Some places will have really big problems, and some places will have new problems they didn't expect.
- Problems can even spread to other things, like if the water is bad, then the food is bad too. It is different everywhere.

# Our Planet is Getting Warmer

- Imagine Earth is like a big oven, and someone is turning up the heat!
- **Heatwaves:** It's going to get hotter more often, and those hot days will last longer.
- **Dry Times:** Some places, like near the Mediterranean Sea and in southern Africa, might not get enough rain and will become very dry.
- **Big Rainstorms:** In many areas, we'll have bigger and stronger rain storms more often.

This means more hot days, less water, and more big storms.

# Our Planet is Changing!

- Imagine Earth has different zones, like hot and cold places.
- As Earth gets warmer, these zones will move closer to the North and South Poles.
- In cold areas with lots of trees (boreal forests), it might get drier, more fires, and more bugs.
- In hot areas (tropics), it will get so hot it will be like nothing we've seen before! This could happen soon.
- This is because of too much pollution in the air.
- We need to help our planet by making less pollution.

# Our Planet is Getting Warmer!

- The Earth is getting a little too warm, and it's causing some problems.
- It's like when you leave ice cream out on a sunny day, it melts!
- If it gets a little warmer, like 1.5 degrees, some places might have:
  - Less water to drink.
  - More big fires.
  - The ground in very cold places might melt.
  - Trouble growing enough food.
- If it gets warmer, like 2 degrees:
  - The ground in very cold places might melt even more!
  - It might be even harder to grow enough food.
- If it gets a lot warmer, like 3 degrees:
  - Plants and trees might disappear in some places.
  - Even more big fires.
  - Even less water to drink in some places.
- The warmer it gets, the bigger these problems will be!

# Our Food and a Changing Climate

- Imagine your favorite foods. Climate change can make it harder to grow them!
- Big storms and floods, which will happen more often, can mess up farms.
- Even when we can grow food, the air with too much bad stuff in it can make it less healthy for us to eat.
- Because of climate change, the price of things like cereal might go up a lot!
- This means that some people might not have enough food to eat, especially people who are already struggling.
- We need to take care of our planet so everyone has enough healthy food!

# Climate Change and Dry Lands

- Imagine dry places like deserts.
- Climate change makes these places even harder to live in.
  - It's like the plants and animals have less food.
  - It can make it hard to grow crops and raise animals.
  - Some plants and animals might even disappear.
- If the Earth gets a little warmer (1.5 degrees), lots of people (178 million) will have trouble finding water.
- If it gets even warmer (2 degrees), even more people (220 million) will have trouble.
- If it gets very warm (3 degrees), many more people (277 million) will struggle with water.
- This is because these dry places can get even drier.

# Our Planet is Changing!

- Imagine the Earth is like a big playground. Some parts are getting too dry and turning into deserts, especially in Asia and Africa. That's not good for the people who live there.
- Other places, like North and South America, and some parts of Africa and Asia, might have more big fires like wildfires.
- Places near the equator are where many of our foods grow. These places might not have as much food as before.
- When the sea goes up and storms get stronger, some areas will have really big problems and many people can't live there as safely.
- The people who are most likely to have problems because of these changes are women, kids, old people, and people who don't have much money.

It's important for us to learn about these changes so that we can help our planet and help each other!

# Climate Change and Moving Around

- Climate change can make people move from their homes.
  - This can happen inside their country or to a different country.
- It's like when a game of tag gets too hot, some players might need to move to a cooler spot.
- Really bad weather, like big storms, or slow changes like long droughts, can make people leave.
  - It can mess up food, jobs, and make it harder to live in some places.
- Sometimes, this can even make people argue more.
- So, climate change can make it harder for people to stay in the same place.



# Taking Care of Our Land

- Imagine our Earth is like a big garden.
- Sometimes, we don't take care of our garden very well.
- This bad care can cost us money, like if plants don't grow or soil gets washed away.
- Climate change is like a storm that makes these problems even worse.
- If we don't take care of our land, it will be more difficult to grow food and it can cost us more money too.
- Let's all be good gardeners and protect our Earth!

# Climate Change Risks

- Imagine the Earth is like a playground.
- Climate change is like the playground getting hotter.
- How much trouble we have depends on two things:
  - How hot it gets.
  - How we play on the playground.
- If we use a lot of water, food, and stuff, it's like making the playground hotter.
- If we don't have good ways to grow food, the playground can become dry and hard.
- This can make it hard to find food and water.
- If we are smart and careful, we can keep the playground fun for everyone!

# Our Planet in the Future

- More People and More Money: By 2050, there will be more people, and many will have more money.
- More Food and Water: This means we will need more food and water.
- Changes in how we grow food, like farming and using land will change.
- These changes can cause problems like:
  - Not enough food for everyone
  - Not enough water for everyone
  - More gases that warm the Earth
  - Less space for animals and plants
- If we can find ways to grow more food without needing too much new land, it will be better for everyone.
- But it will still be hard to have enough water for everyone.
- If we need to clear a lot of land to grow food, there will be even less space for animals and plants.

# Water Problems in Dry Places

- Imagine dry lands like deserts, where water is already hard to find.
- It's like sharing a small juice box with many friends.
- If we have fewer friends (less population), it's easier to share.
- If we don't need as much juice (less water demand), there's more for everyone.
- And if we are good at finding other ways to get juice (high adaptive capacity), we can all have enough.
- This means, having less people, using less water, and being clever about water, makes water problems smaller in dry areas.

# Climate Change and Our Land

- Imagine our Earth like a big playground.
- Climate change can hurt this playground, making the land not so good.
- This is called land degradation.
- If there are too many people using the land, it gets worse faster.
  - Like when many kids play on a small swing set.
- If we don't take care of the land, we might see more:
  - Less trees and plants.
  - More fires.
  - More floods by the sea.
- It's like a game:
  - If the Earth gets a little warmer (about  $1.8^{\circ}\text{C}$ ), the land will get pretty bad.
  - If it gets much warmer (about  $2.2^{\circ}\text{C}$ ), the land will be very bad.
- We need to be careful and protect our playground Earth!

# Food and a Warmer World

- Imagine the Earth getting warmer, like a hot summer day.
- This can make it harder to grow food.
- If we don't have enough money, it's even harder.
  - Food costs more.
  - There might not be enough land to grow food.
- Some places, like West Africa, might become like deserts!
- Some places, like North Africa, might run out of water.
- The hotter it gets, the bigger the problem becomes.
- If it gets a little warmer, we have some problems.
- If it gets much warmer, it's a very big problem.
- We need to be smart and help everyone grow food!

# Cities and Farms

- Imagine cities growing bigger!
- As cities grow, they sometimes take over farmland.
- When farms become cities, we can grow less food.
- This can make it harder to get all the food we need.
- But we can help!
- We can grow some food in our cities too!
- We can also plant more trees and gardens in cities.
- Green spaces help keep cities cool and safe from weather problems.

# Helping the Earth

- **Land Can Help!** We can use land in smart ways to fix climate change, stop deserts from growing, and grow more food.
- **It's like a puzzle!** How we use land depends on the place and the people who live there. Some places need to focus on fixing problems, and others can try to slow down climate change.
- **We can do a lot!** Using land wisely can help us get ready for changes and slow down the world from getting too hot.
- **It's not magic!** There are some things we can't fix with land, and some limits on how much it can help with the big climate problem.



# Helping Our Planet

- Some people are already helping the Earth!
- They are finding ways to stop climate change, protect nature, and make sure everyone has enough food.
- It's like a superhero team tackling lots of problems at once!
- What are their super moves?
  - Growing food in a good way (sustainable farming).
  - Taking care of forests and trees.
  - Keeping soil healthy.
  - Protecting animals and nature.
  - Planting more trees and fixing damaged land.
  - Stopping trees from being cut down.
  - Not wasting food.
- To make these super moves work, we need to think about nature, people, and how to make it all happen.

# Helping Our Planet: Quick and Slow Ways

- Some ways to help our planet work quickly!
  - Like protecting forests, swamps, and grasslands that store a lot of carbon.
  - This is like keeping the earth's piggy bank safe!
- Other ways take a bit longer:
  - Like planting new forests or fixing old ones.
  - And bringing back healthy soil for growing food.
  - These are like saving up for a bigger piggy bank!
- Both quick and slow ways are important to help our Earth!

# Helping Our Earth!

- Imagine the Earth is like a giant garden!
- Different parts of the garden need different care.
- Some places need help with their soil, like adding good stuff to it.
- Other places, like swamps or wet areas, need special care because they are unique.
- How we help the garden depends on where it is and what's important to the people there.
- For example, farms in hot places might need different help than farms in cold places.
- To keep the garden healthy, we need to help in many different ways!
- This means helping with farms, grasslands, forests and water all together.
- We need to work together, at home, in our town and all over the world!

# Plants and Soil Store Carbon, But Not Forever!

- Trees and soil can suck up carbon dioxide (CO<sub>2</sub>) from the air like a sponge.
- This is good because CO<sub>2</sub> makes the Earth warmer!
- Planting trees (afforestation), planting trees again (reforestation), and mixing trees with farms (agroforestry) help store CO<sub>2</sub>.
- Good soil management also stores carbon.
- But, the sponge gets full! Trees and soil can't store carbon forever.
- Once they are full, they don't suck up as much CO<sub>2</sub>.
- Peatlands (wet, mossy areas) are special, they store CO<sub>2</sub> for a very long time!
- Carbon stored in trees and soil can be lost if there are big problems like floods, fires, or bugs.
- We need to take care of the carbon in our plants and soil!

# Good News About Helping Our Planet!

- **Lots of things we can do are good for everyone!** These things help make the world a better place.
- Many solutions don't need much land. They can help with more than one problem at once.
- We can also try to use less land overall. This makes it easier to grow food, stop deserts from spreading, and fight climate change.
- It's like a win-win-win! Doing good for our planet can help us too!

# Helping the Earth Without Changing Everything

- **Smarter Farming:** We can take better care of farms and grazing areas. This means helping the soil be healthy so it can grow more food.
- **Happy Forests:** We can look after our forests really well. This keeps them healthy and helps them store carbon (which is good for the air!)
- **Soil Superpower:** We can help the soil hold onto more carbon. It's like giving the soil a superpower!
- **Less Food Waste:** We should try not to waste food! Eating all the food we have and not throwing it away helps a lot.
- **Eating Smarter:** We can choose foods that help the Earth. Eating lots of plants is a good start!
- **Less Need for New Land:** When we do these things, we don't need to turn as much nature into farmland. That leaves more space for animals and plants!
- **Everyone Can Help:** These ideas work on big farms and small gardens! We can all do our part!

# Helping Our Planet and Ourselves!

- We can help the Earth in many ways!
- Like saving and fixing natural places:
  - Peatlands (like big, wet sponges)
  - Coastal areas (where the land meets the sea)
  - Forests (lots of trees!)
- Protecting all the different animals and plants is important too.
- We need to be smart about using land and stop big fires.
- Good soil helps plants grow!
- Using local seeds and having plans for when bad things happen can help us a lot.
- These things help the Earth **and** people!
- For example, mangroves (special trees near the sea) can protect us from big waves, make the air cleaner, and give people jobs!
- It's like helping nature help us.

# Helping the Earth and Everyone!

- **Smart Land Use:** We can grow food and take care of land in ways that don't fight over space.
- **Food Choices:** Choosing what we eat can help!
- **Less Waste:** Let's not waste food after it's grown or when we're done eating.
- **Safety First:** We can prepare for problems with weather, like floods or droughts.
- **These ideas help:**
  - Get rid of poverty and hunger
  - Be healthy and happy
  - Have clean water and toilets
  - Protect the planet
  - Take care of the plants and animals on land



# Land and Climate Change

- Some things we do to help the climate need land.
- If we use too much land, it can be bad.
  - Less space for animals and plants
  - More deserts
  - Bad soil
  - Less food
- If we use just a little land, in a good way, it's better.
  - Less bad stuff
  - Some good stuff!

# Helping the Earth Breathe Easier

- **Planting Trees!** Imagine planting lots and lots of trees. We call this afforestation and reforestation. They soak up the bad air, CO<sub>2</sub>, like a big sponge!
- **Bioenergy Plants:** We can also grow special plants for energy, sometimes capturing the bad air from that too!
- These things could take up lots of land! Like making a giant park.
- If we plan carefully, we can make sure these new forests are good for everyone and everything living there.
- **Other Good Ideas:** Protecting grassy fields, swamps, and oceans also help, but don't use up as much land.
- So we have many ways to help the Earth, big and small!

# Helping Our Planet with Land

- We can use land to help fight climate change! Think of planting trees.
- But, we can't use too much land for this.
- If we use huge areas for things like growing special plants for energy, it could cause problems.
- These problems could be:
  - More deserts!
  - Damaged land!
  - Less food for everyone!
- It's better to use a smaller amount of land carefully.
- If we do it right, using land can help with things like:
  - Adapting to climate change
  - Stopping deserts from growing
  - Protecting our soil
  - Making sure everyone has enough food.
- So, let's help the Earth, but be smart about it!

# Biomass Energy: Good or Bad?

- Biomass is like using plants for energy! Think wood or corn.
- Sometimes it's good, sometimes it's not. It's complicated!
- **Good things:** Can help with energy, sometimes uses waste.
- **Bad things:** Can hurt land, cause less food, increase greenhouse gases if done poorly.
- It all depends on:
  - How much we use.
  - What kind of land we use.
  - What plants we use.
- Using leftover stuff (like stalks) is better than using new plants, but there isn't a ton of it.
- Taking too much leftover stuff can hurt the soil!

# How Land Use Affects Our Planet

- Imagine our Earth has special areas for growing food and getting water.
- Some ways of living are like being a super helpful farmer (SSP1).
  - We have fewer people.
  - We are very careful with our land.
  - We make food without much pollution.
  - We don't waste food.
- If we grow plants for energy (like burning wood) in these areas, we can do it a lot (between 1 to 4 million square kilometers) before having problems with food and water.
- Other ways of living are less helpful (SSP3).
  - We have many people.
  - We are not as careful with the land.
  - We don't make food as cleanly.
- If we grow plants for energy in these areas, we have problems much sooner (between 0.1 and 1 million square kilometers) with food and water.
- Being a good farmer is much better for our planet!

# Helping Our Planet!

- We can do lots of things to help dry lands and fight climate change at the same time!
- It's like getting two good things for one effort!
- When dry lands get better, the soil becomes richer.
- This richer soil can hold more of the bad carbon that heats up our world.
- It also means more yummy food can grow!
- It's easier to keep land healthy than to try and fix it when it's hurt.
- Let's keep our land strong so it can keep taking care of us.

# Helping the Earth

- Some places get very dry and become deserts.
- Climate change can make this worse.
- But we can help!
  - Catching rainwater and using it carefully to water plants.
  - Planting special plants that can grow even when it's dry.
  - Growing trees and crops together.
  - Using nature to help, like keeping the soil healthy.
- These ideas are like special tools that work best in different places.
- We can all help make our planet a better home!

# Making the Air Better!

- **Dust and Sand Storms are Bad:** They make the air dirty and unhealthy.
- **Wind Can Move Sand:** This can hurt the land and make it hard to grow things.
- **Trees Can Help!**
  - Planting trees is like building a wall against the wind.
  - We call these "green walls" and "green dams".
  - Special trees that don't need much water are best.
- **Good Things Trees Do:**
  - Stop sand storms and wind from moving sand.
  - Clean the air and help us breathe better.
  - Store carbon (which is good for the planet).
  - Make the soil richer and hold water better.
- **Let's Plant Trees!** They're good for us and the Earth.



# Helping Our Soil

- Imagine soil is like a big sponge that holds water and important stuff called carbon.
- When land becomes desert, the soil loses its sponge power.
- But we can help!
  - By growing plants and trees, we help put carbon back into the soil. It's like filling the sponge again!
  - When we take care of the land, like farmers do, the soil can hold more carbon.
- If we lose the carbon in the soil, it takes a long time to get it back. So, let's protect it!

# Helping the Earth and People

- Imagine the Earth like a big garden. We want to keep it healthy!
- When land gets damaged, it's like the garden gets sick. This is called land degradation.
- Bad things like too much cutting down of trees, not taking care of the soil can cause problems.
- If we help the land, it helps us!
- **We can help by:**
  - Not cutting down too many trees.
  - Taking care of grasslands and forests.
  - Stopping big fires from hurting the land.
- When we do these things, we grow more food, make sure everyone has enough, and help stop climate change. It's a win-win!

# Climate Change and Dry Land Problems

- It's hard to know exactly how dry lands will handle BOTH climate change and becoming more like a desert.
- If we don't find good ways to help, things could get really bad.
- Sometimes, even if we know what to do, it's hard to make it happen because of money or other reasons.
- Some solutions can actually make things worse!
  - Like using too much water for farming can hurt the soil and underground water.
- When land becomes a total desert, it's almost impossible to grow anything, making it very hard to fix.

# Cooler Energy for a Better Planet!

- Imagine we can get energy from the sun and wind! That's like magic, but it's real!
- Using sun and wind energy is much cleaner than burning wood or other stuff.
- Cleaner energy helps stop the planet from getting too hot. That's like turning down the oven for our Earth!
- It also stops deserts from spreading and forests from disappearing. Yay for trees!
- This cleaner energy makes people healthier, especially kids and moms!
- Wind and solar power are really good at making electricity.
- Sometimes, dusty and sandy storms can make them not work as well but mostly they are super helpful.
- Using clean energy helps everyone and makes the world a better place!

# Taking Care of Our Land!

- **Healthy Land is Important!:** When we take care of the land, it stays healthy and can grow yummy food.
- **Stop Land From Getting Sick:** Bad things like too much heat or too little water can hurt the land. We can stop this!
- **Good Land Helps Us:** When we care for the land, it helps us grow food, stay safe, and deal with climate change.
- **It's a Win-Win!:** Taking care of the land is good for us and the Earth. It makes things better for everyone!
- **Sometimes, It's Hard:** Even if we try our best, sometimes the land might still have trouble because of too much change.

# Helping the Earth and Our Farms

- Imagine our farms are like gardens. Sometimes the soil gets tired.
- This is called land degradation, like the soil isn't healthy.
- We can help! It's like giving the soil vitamins.
- We can grow plants that are like green blankets (green manure cover crops).
- We can leave the leftover plant bits on the soil (crop residue).
- We can be gentle with the soil and not dig too much (reduced/zero tillage).
- We can make sure plants always cover the ground, even when animals graze.
- These things help keep the soil strong and healthy.
- And it's also good for the climate! It's like a win-win!

# Helping Our Planet With Farms!

- **Farming Can Help!** Farms can help stop climate change.
- **Healthy Soil:** We can make soil healthier by adding more good stuff to it. Like adding yummy compost!
- **Stop Soil from Washing Away:** We can plant things that stop soil from being washed away by rain.
- **Smart Fertilizer:** We can use fertilizer better so plants grow strong without hurting the planet.
- **Happy Plants:** We can grow special plants that can handle heat and need less water.
- **Happy Animals:** We can take good care of farm animals. Like giving them good food and letting them graze on healthy grass.
- **Less Animal Poop Pollution:** We can take better care of animal poop so it doesn't hurt the air.
- **Stronger Communities:** Helping farms be better helps the people who live in those areas become stronger!
- **Win-Win!** When we help farms be good to the Earth, we also help them grow more food!

# Let's Talk About Food and Climate!

- **Good News!** We can make our food system better for the planet.
- **Mix it Up!** Growing lots of different foods helps us deal with climate change. Think about having many types of plants and animals.
- **Eat Smart!** Eating more fruits, veggies, beans, nuts, and seeds (and some meat from farms that are good for the earth) is healthy and helps the planet.
- **Less Space, Less Problem!** If we eat better, we can use less land for farming.
- **Less Bad Air!** Eating the right way can also mean less bad air pollution.
- **Changing is tricky!** It can be hard to change how we eat because of our habits, money, and where we live.



# Saving Food, Helping the Planet!

- Imagine all the food we grow - some of it gets lost or thrown away. That's called food loss and waste!
- When we waste food, it's like adding to the Earth's problems, making it warmer.
- Did you know that about 8 to 10 out of every 100 parts of the planet's warming comes from wasted food? That's a lot!
- Right now, almost  $\frac{1}{3}$  of all the food made is either lost or wasted.
- We can be super food heroes! By using better tools to pick crops, storing food in good places, and even packing it better, we can stop food from being wasted.
- It's like a puzzle – rich countries waste food differently than poorer countries, so we have to solve different parts of the puzzle!
- If we waste less food, we'd need less land to grow food! That would be great!

# Land and Our Future

- Imagine the Earth is like a big garden. How we use it changes the weather!
- If we want to keep Earth cool (not too hot!), we need to be smart about our land.
- We can help by:
  - Planting lots of new trees.
  - Not cutting down too many trees.
  - Using plants for clean energy, like fuel.
- Some ways can help keep Earth cool without changing the land so much. This is very good for keeping our food and the ground healthy.
- It's like a puzzle - we need to find the best way to take care of our planet!

# Keeping the Earth Cool!

- Imagine the Earth is getting a fever. We want to keep it low, at 1.5 degrees.
- To do that, we need to use the land more to help, like planting lots of trees.
- It's like giving the Earth a big hug with plants!
- If we let the fever get higher, the Earth will get more sick.
- If we keep the fever low, the land won't get hurt as much, and it will stay healthy.

# Forests and a Warmer World

- Imagine our Earth like a big puzzle with lots of trees!
- Scientists use models (like super-smart video games) to see what happens to forests when the world gets warmer.
- If we try really hard to keep warming low (1.5 or 2 degrees), we might have more forest by 2050, about the size of 2 million to 12 million soccer fields.
- If we don't try so hard and it gets hotter (3 degrees), we might lose some forest, around 4 to 6 million soccer fields.
- So, keeping the Earth cool helps keep our forests healthy and growing!

# Bioenergy and Land: A Balancing Act

- Imagine we use plants for energy, like special firewood! That's bioenergy.
- We need land to grow these plants. How much land depends on how hot the Earth gets.
  - If we keep the Earth cool ( $1.5^{\circ}\text{C}$  warmer), we need a lot of land for these energy plants! (Like 7 million big fields by 2050).
  - If the Earth gets a bit warmer ( $2^{\circ}\text{C}$ ), we need less land.
  - If the Earth gets quite hot ( $3^{\circ}\text{C}$ ), we need even less land.
- If we change too much land, it can cause problems.
  - Less water for everyone.
  - Animals and plants might lose their homes.
  - The land can get sick and dusty.
  - It might be harder to grow food.
- But, if we do it carefully, using the best ways:
  - We can help dry land.
  - We can protect animals and plants.
  - We can keep the soil healthy!
- It's all about finding a good balance!

# Saving the Planet: Different Paths

- Imagine we need to lower the Earth's temperature.
- Many plans use lots of bioenergy - that's like using plants for fuel.
- Some plans use less bioenergy and less machines that suck CO<sub>2</sub> from the air.
  - These plans need us to change very quickly.
  - We need to change how we use energy, land, and our cities.
  - We also need to change how we live and act each day.
  - It's like switching from playing video games all day to playing outside.
- These plans can still help us reach a cooler Earth.

# Helping the Earth: Big Choices and Big Ideas

- **Imagine we're playing a game to help the Earth!**
  - We have to make some big choices about how we use land.
- **Some ideas can help us:**
  - Growing more food in the same space.
  - Planting trees and forests in the right places.
  - Taking care of our soil, like giving it good food.
- **Some ideas need a lot of space:**
  - Growing plants for energy can use up a lot of land that could grow food.
  - Planting lots of trees can also take over land needed for food.
- **It's important to be smart about it:**
  - If we do it right, these ideas can help us fight climate change AND have enough food.
  - If we aren't careful, we might make it harder for some people to get enough to eat.
- **We need to choose our actions carefully!**
  - We can make a big difference in helping Earth by doing things the best way.

# How Can We Help Our Planet?

- **Big Problems:** Our planet faces big problems like warming up, dry land turning into desert, and not enough food for everyone.
- **Good News:** We have ways to help! These are like superpowers we can use.
- **Superpower 1: Stopping Warming**
  - Some superpowers can stop lots of warming, like planting trees.
  - Some superpowers are smaller but still helpful.
- **Superpower 2: Getting Ready for Changes**
  - We need to get ready for changes like hotter weather and less rain.
  - Some superpowers can help a lot of people, others help a bit.
- **Superpower 3: Fixing Dry Land**
  - Some places are turning into desert.
  - Superpowers can help the land get healthy again.
- **Superpower 4: Growing More Food**
  - We can use superpowers to grow enough food for everyone.
  - This means growing food in smart ways without hurting the Earth.
- **Superpower levels:** We have different levels of superpowers
  - Some are super strong, some are normal, and some are still being learned



# Protecting Our Planet: Land and Climate

- Imagine the Earth is like a big playground. We need to take care of it!
- Good rules and plans for how we use land can help us deal with climate change.
- These plans can also help us become stronger when the weather gets tough.
- When we make good choices for the land and climate together, it's like hitting two birds with one stone!
- It helps save things we need, like water and clean air.
- It also makes nature stronger and helps everyone work together.

# Helping Our Planet with Land

- **Land Rules Help!**

- We can plan how we use land carefully, like a big puzzle.
- We can make rules to protect nature.
- We can pay people to help, like planting trees.

- **Good Land Use = Good Things!**

- This helps us adapt to a changing world.
- It helps reduce climate change!
- It can even make money!

- **Healthy Land for Everyone!**

- If we stop hurting the land, it will help us grow food.
- It will make us happier and healthier.

# Keeping Our Land Safe and Sound

- Imagine having a favorite toy, but someone could take it anytime.
- That's kind of like not having secure land rights. It makes it hard to take care of the land.
- If people don't feel the land is truly theirs, they won't plant trees or protect it from climate change.
- When we respect how different people own and use the land, everyone can be part of taking care of the Earth.
- Giving people secure land rights and working together helps us fight climate change.
- Rules about land use can also help people adapt and be safer during bad weather.

# Saving Our Soil!

- Imagine our land is like a big playground. Sometimes, it gets messy and broken. That's called land degradation.
- We need to be good land keepers!
- To fix this, we need to:
  - Be careful not to break the land in the first place.
  - Fix the broken parts by planting trees and helping the soil.
  - This helps the land AND our climate! It's like two great things at once.
- When we take care of the land, it takes care of us and the Earth too.

# Helping Our Planet's Land

- Solving problems with land and climate is tricky!
- We need lots of different ideas, not just one.
- Like a toolbox, we need many tools to fix things.
- These tools help protect people and nature from climate change.
- Some tools are:
  - Insurance for when the weather is bad
  - Help for people who need it
  - Saving money for emergencies
  - Knowing when bad weather is coming (early warnings)
  - Having a plan ready when things go wrong.
- Using all these tools together is the best way to help!

# Helping the Earth and Our Food

- We can make our food system better for everyone and for the planet!
- This means less wasted food and eating healthy foods.
- It also means taking care of the land where our food grows.
- This can help us stop climate change and make sure everyone has enough food.
- We can help farmers sell their food, and make sure everyone owns their land.
- We should also think about how much it costs to grow our food.
- We need to protect our environment and work together to make things better.

# Helping Our Planet: Land and Climate

- Imagine our planet is like a big garden. We need to take care of it!
- **Good News:** We can help our planet by how we use land.
- **How?**
  - Make it easier for farmers to buy and sell good stuff.
  - Give women and native people more power.
  - Help people work together in their communities.
  - Stop giving money to things that hurt the Earth and support good things.
  - Make it easier to trade good things between countries.
- **Cleaning up** land that's not healthy is easier when we let local people help.
- We also need countries to work together!
- If we do these things, our Earth will be healthier!

# Taking Care of Our Earth While Farming

- Imagine our Earth is like a big playground.
- Some ways of farming hurt the playground, making it less fun.
- This is like making the grass turn brown or the soil wash away.
- If we know how much damage bad farming does, we can fix it.
- It's hard to know the exact cost, like how much muddy water comes from the soil.
- But, if we try hard and make food prices fair for the environment, it encourages good farming.
- This way we keep the playground healthy and fun for everyone!



# Helping Our Food Stay Safe

- Imagine a bad storm that can hurt our farms and food!
- We can help farms be ready for these bad storms. This is like giving them a superhero suit!
- **Risk Sharing:** It's like everyone helping each other out if a farm gets hurt by bad weather.
- **Growing Different Things:** If one crop gets hurt, we have other food to eat!
- **Better Markets:** This helps farmers sell their food to more people, so no food goes to waste.
- **Plan for Problems:** We can think ahead about how to get food to everyone even if something goes wrong.
- These things help us make sure we have good food even if the weather is bad!

# Healthy Food, Healthy Planet!

- Eating healthy food is good for you!
- It can also be good for the planet.
- How? Let's see!
- 
- **More Variety:** When schools and hospitals buy lots of different healthy foods, it makes people want to eat them.
- **Cheaper Good Food:** Helping people afford healthy food encourages them to choose it.
- **Healthier Choices:** When people learn about healthy food, they're more likely to eat it.
- 
- Eating healthy food and less meat can help farms grow food in a better way.
- It also helps us reach important goals like having a healthier and better world.

# Helping the Earth and Us

- Sometimes, when we try to help the Earth, it can be tricky.
- It's like trying to build a LEGO castle - you need to think about all the pieces!
- When we make rules about land and food, it can help in more than one way.
- We can grow yummy food AND help the Earth at the same time! These are called "co-benefits."
- But sometimes, helping in one way might make another way harder. These are called "trade-offs."
- It's like trying to share your toys: if you give one friend a lot, the other might get less.
- So, we need to make plans that work together like a team.
- That means people from farms, cities, and even the government all need to work together!
- We need to keep checking if our plans are working and change them if we need to.
- That way, we can make sure everyone has enough food and the Earth

# Helping Our Planet

- Imagine the Earth is like a big garden.
- Sometimes, parts of the garden become like a desert - dry and not good for growing things. This is called desertification.
- When the land gets damaged, it's called land degradation.
- When the land is not healthy, it's harder to grow enough food. This is bad for food security.
- But we can help! If we work together and fix the land, it's like giving the garden a big drink.
- Healthy land means more food, and also helps us deal with changes in our weather, making our future safer.
- It's like helping the Earth help us!

# Helping the Earth: It's Tricky!

- Sometimes, it's hard to help the Earth with things like planting trees.
- It's like trying to build a super cool LEGO castle, but you're missing some bricks!
- We might not have enough money, tools, or know-how.
- Sometimes people don't own the land, so they can't plant trees.
- It can be hard to get good advice or help too.
- But, if we talk about it and learn together, we can make changes!
- Good rules from grown-ups and new ways of buying and selling can also help.
- Together, we can knock down these barriers!

# Helping the Land and Food

- Imagine our land and farms are like a big puzzle.
- Sometimes, the pieces don't fit well together.
- Different people work on different parts and don't always talk to each other.
- We need everyone to work together!
- When we talk and share ideas, we can make things better.
- Like when we work with health experts, we get healthier food!
- When we work with energy experts, we use less energy to grow our food.
- This makes our land, our food, and everyone healthier and safer!

# Making Choices about Climate Change

- Sometimes, fixing one climate problem can make another problem worse. It's like trying to fix a leaky faucet and accidentally breaking the sink!
- We need to be careful and think about all the things that could go wrong. This helps us avoid making the situation worse.
- It's important to plan ahead and see if our solutions are good for everyone, not just some people.
- We need to figure out the good things and the bad things about each solution. This helps us make the best choice!
- It's like choosing between having ice cream or cake - each has good and bad sides.
- We need to listen to what everyone thinks, especially people in the communities who will be affected.
- We can use maps and talk together to help us decide what to do.
- We can try things out and change them if they don't work very well.
- It's like trying different ingredients in a recipe until we get it just right!

# Working Together to Help the Earth

- Imagine we're all on a team trying to help our planet.
- It's super important that **everyone** gets to help decide what to do, especially people who are hurt most by climate change, like:
  - People who live close to nature.
  - Women.
  - People who don't have much money.
- When we all work together, it's easier to pick good ideas for planting trees and helping the Earth.
- This means we choose, check, and watch to make sure things are working!
- We also have to work together with all sorts of groups, like people who plant food and people who build houses.
- This makes things work better, like helping more plants grow **and** making our homes safer.
- It also helps us make sure we aren't doing things that could cause other problems.
- Teamwork makes the dream work for the Earth!



# Taking Care of Our Land

- Imagine we have a garden.
- If we're not careful, we can hurt the soil when we grow our food.
- This is like not giving the soil enough water or using too many chemicals.
- When the soil is unhealthy, it's not good for us or the planet.
- To fix this, we can think about how much it costs to hurt the soil.
- Then, we can try to use ways of farming that are much nicer to the land.
- It's hard sometimes to know how much it hurts the land and how it all adds up.
- But, if we try our best to take care of the soil, we can all eat healthy food and keep the Earth happy!

# Keeping Our Food Safe When Things Get Tricky

- Imagine our food system is like a big game of building blocks. Sometimes, there are big storms and floods that can knock them down.
- We need to be ready for these surprises! This is called **adaptation**.
- One way to adapt is like having a superhero plan. We can share the risks, so if one farmer has a problem, others can help.
- Another trick is to grow lots of different kinds of food, not just one. This is like having different kinds of building blocks!
- We can also make sure there are more ways to get our food to us, like more paths to the market.
- Finally, we can practice what to do when the ways we get our food get blocked sometimes.
- Doing these things helps us make sure there is always enough yummy food for everyone!

# Eating Healthy and Helping the Planet!

- Eating healthy food is super important for our bodies!
- Things like healthy food at schools and helping people afford good food are really good ideas.
- These good ideas can help people choose healthy food.
- When people eat healthy food, it can also be good for the planet.
- It can make our farms healthier.
- Healthy farms can help us grow food in a way that makes less pollution!
- This means we can take better care of ourselves AND the Earth!

# Making Land and Food Choices Fair

- Imagine we're planning what to grow and how to take care of the land.
- Sometimes, good things for the land can also be good for our food, like healthy soil making yummy vegetables.
- But sometimes, we have to choose between two good things, like planting trees (good for air) or making more farms (good for food).
- We need to think about all these things when making plans.
- It's like a puzzle! We need everyone to help, from farmers to people in charge, and keep making changes as we learn.
- We need to be smart and flexible to make the best choices for everyone and the Earth!

# Helping the Land and Our Food

- Imagine the Earth like a big garden.
- Sometimes, parts of the garden turn into deserts or become unhealthy. This is bad for plants!
- When we take care of the land all together, it's like giving the garden a big hug.
- This helps plants grow better, so we have more yummy food!
- Also, when the land is healthy, it can handle changes in the weather much easier.
- Taking care of the land, food, and weather all together helps everything be better!

# Why Isn't Everyone Helping the Land?

- Sometimes, it's hard to change how we use land, like farms and forests.
- Things like not having enough money, or not knowing how to do things, can stop us.
- It's also hard if we're not sure if helping the land will really work.
- If people don't own the land, or can't get help, they might not be able to use good farming methods.
- Sometimes, we need better ideas and help to make these good ways happen.
- Talking about it, making good rules, learning together, and changing markets can make things easier.

# Let's Talk About Our Land and Food!

- Imagine lots of people working on farms and food, but not talking to each other much. That's a problem!
- It's like having many cooks in the kitchen, but nobody knows the whole recipe.
- Sometimes, the rules for farms and food are only about one small thing, not the big picture.
- We need to work together with other important groups, like doctors, bus drivers, and people who care about water and nature.
- If we all work together, we can make better food, be healthier, and have a safer Earth!

# Making Choices About Climate Change

- Sometimes, trying to fix one climate problem might cause another problem.
  - Like, building a dam might help with water, but hurt the fish.
- We need to think about all the good and bad things that could happen.
  - This helps us avoid doing things that make things worse.
- It's important to listen to lots of people when making decisions.
  - Kids, grown-ups, and scientists should all have a say!
- We should keep learning and changing our plans as we go.
  - Like, if we find a better way, we should try it!



# Making Smart Climate Choices

- **It's important to include everyone!**

- Like people who live in the area, especially if they are most affected by climate change.
- This includes people from local communities and people who are poor.

- When we make choices about climate change, we should:

- Talk to people about what to do.
- See if our plans are working.
- Make changes if needed.

- When we all work together on climate change, we get better results!

- We can help the environment AND help people at the same time.

# Taking Care of Our Land

- To keep our land healthy, we need to think about where we live and how it is special.
- It's like everyone working together to solve a puzzle!
- We need to see what is hurting the land, like:
  - Fewer animals and plants
  - Soil washing away
  - Using too much water
  - Losing homes for animals
- And things like changing our farms and forests.
- We can help by:
  - Stopping the bad things
  - Making the land better again!

# Working Together to Help the Land

- **Being Fair is Important:** When we check if our rules for land are working, it's important to be fair to everyone.
- **Everyone Gets a Say:** We should ask everyone who cares about the land to help decide how we measure things.
- **Collecting Data Together:** When we gather information about the land and the weather, we should do it together.
- **Planning Together:** When we make plans for how we use the land, we should ask everyone for ideas.
- **Better Plans for Everyone:** When we all work together, we can make better plans for the land and choose rules that help everyone.

# Helping the Earth and Growing Food!

- Old Ways Can Help: Farmers using special knowledge passed down for years can help us fight climate change and grow enough food.
- It's a Team Effort: Everyone needs to help! Businesses, farmers, people who buy food, and governments must work together.
- Working with local communities is super important too!
- Together we can grow food, help the planet, and protect nature all at the same time!

# Helping Women Helps the Planet!

- Imagine if everyone, including women, had a chance to help take care of the Earth.
- It's like having a superhero team where everyone gets to use their special powers!
- But sometimes, it's harder for women to be part of the team.
- This isn't fair, and it also means we aren't doing our best to look after the Earth.
- When women are included and given equal opportunities, it's like planting a seed that grows into a big tree!
- How can we help women?
  - Give them money to help their families.
  - Make sure they can go to school, learn new things, and get healthy.
  - Help them start their own businesses.
  - Work with women's groups that are already doing good things in their communities.
- If we help women, they can help us make sure we have enough food and take better care of the land.

# Our Future and the Land

- Imagine we're planning a big trip! We need to know what the road will be like.
- Climate scientists use "stories" about the future called "scenarios."
- These stories help us see how things like money and what we do about climate change will affect the land.
- One set of stories is called "SSPs" or Shared Socioeconomic Pathways.
- They are like different ways our trip could go based on how much we work together and how well we take care of our planet.
- Some stories have us working together to protect the land and some have us less focused on it.
- These stories help us understand if we are going to have lots of farms or lots of forests.

# We Can Help Our Planet!

- We know how to stop land from turning into desert and help grow more food.
- We can learn more and share what we know about these problems.
- We can help each other by learning new skills and using new tools.
- We can get money to help make changes that are good for the Earth.
- We can have ways to know when things are going to be bad so we can get ready.
- We can plan better to avoid risks.
- We need to make all these good ideas work better and in more places!

# Helping the Earth

- We can make our land healthy even when the weather changes!
- We need to learn and share cool ways to grow food and use nature wisely.
- It's like sharing secrets that help us take care of the Earth better.
- Learning more about how to treat the land will help us avoid hurting it.
- Things like talking to farmers and learning about good land care are important.
- If everyone learns about being kind to the land, it will help us all!



# Keeping Track of Our Planet

- **Watching the Land:** We use cool tools like phones, computers, and even drones to see how our land is changing.
  - This helps us know if it's getting better or worse.
- **Weather Warnings:** It's super important to know when big storms or heat waves are coming.
  - Early warnings help keep us safe!
- **Helping Food Grow:** Knowing the weather helps farmers grow enough food for everyone.
  - We can also keep an eye on bugs and sickness that hurt plants.
- **Brain Power Matters:** Learning how to use these tools is really valuable.
  - It helps us understand our planet better and keep it healthy.

# Taking Care of Our Land

- Imagine our land is like a giant playground.
- We need to take good care of it, just like we take care of our toys!
- Climate change can make things tricky, like sudden rainstorms or too many bugs.
- Good land management is like planning for those changes, so things don't get too messy.
- **Thinking about Risk:**
  - We can look at the whole "playground" to see what might happen.
  - We can use "nature's helpers" (like ladybugs) to eat bad bugs.
  - We can learn to share and help each other if there's a problem.
- **Knowing is Powerful:**
  - When we know what might happen with the weather, we can make smarter choices.
  - That helps us take care of our land better and faster!

# Helping the Earth: Taking Care of Our Land

- Imagine Earth is like a big garden! We need to take good care of it.
- We can be better gardeners by knowing more about what works best.
- It's like having a treasure map to healthy land!
- We need to find out what helps the soil grow healthy plants.
  - For example, learning how to keep the soil nice and full of good stuff (like carbon!)
- Some good ideas are still small, like tiny gardens.
- We need to learn how to make these good ideas work everywhere, in big fields too!
- That means we need more knowledge, more money and more people helping out!

# Helping Our Planet and Ourselves!

- Doing things to stop climate change is like being a superhero!
- It helps protect our Earth.
- It also makes things better for people.
  - We can grow more food.
  - We can stop deserts from spreading.
  - We can help people who are poor.
- When we help nature, we help ourselves too!

# Helping the Earth is Easy!

- **Let's be good to the land!** If we take care of the Earth, it will take care of us.
- Good farming helps us grow more food, makes people safer and healthier, and helps plants and animals too.
- We can stop land from turning into desert and losing its plants and animals.
- If we work together, we can make things better for everyone!
- When we farm in a good way, we help stop bad things from happening (like climate change), and we make a better world for all.
- Let's help nature do its job and keep the Earth healthy!

# Helping Our Planet with Land!

- Imagine the Earth is like a big playground. Sometimes, parts of it get a little worn out.
- We can fix these worn-out places! This is called land restoration.
- When we fix the land, it's like giving the Earth a big hug! It makes everything better.
- It's like planting new trees and helping the soil be healthy again.
- This helps plants grow better, which gives us yummy food!
- And it can also help stop climate change, a big problem we are all trying to solve.
- It's like getting 3 to 6 dollars of benefit for every dollar spent on fixing the land. Cool, right?
- It might cost some money to start, but it's like buying a toy that will bring even more joy later!
- It helps the Earth, animals, and people. It's a win-win-win!

# Helping the Land

- It costs money to take good care of the land.
- Think of it like fixing your bike, sometimes it's a little, sometimes it's a lot.
- On average, it's like spending \$500 on each part of land, like a soccer field.
- Governments can help by giving money or making it easier to borrow money.
- This helps farmers who don't have much money.
- Eating more balanced meals can also help the land.
- It means we don't need to grow as much food.
- It's also good for our bodies to eat healthy!

# Protecting Our Planet: It's Time to Act!

- **Big Problem:** We're making too much bad air (greenhouse gases) that is hurting our planet.
- **What's Happening:** This bad air is making the Earth warmer, which is bad for nature and our food.
- **Good News:** We can fix it! If we stop making so much bad air, things will get better for the land and our food.
- **Act Now!:** If we wait too long to fix this, it will get much harder, and we might not have enough food and good land.
- **Let's Work Together:** We need to act quickly to make our planet happy and healthy!



# Why Acting Now is Important

- Imagine a messy room. If you don't clean it up soon, it gets much harder and messier later!
- That's like our planet and climate change. If we don't act now, it becomes harder to fix.
- We need to use the land wisely to help stop climate change and adapt to changes that are already happening.
- If we start fixing things now, we can avoid big problems like floods, droughts, and not having enough food.
- Acting now helps everyone and makes our future much better and safer.
- If we wait, we'll have fewer ways to fix things.

# Climate Change: Why We Need to Act Now!

- Imagine we're playing a game. If we wait to stop making so much pollution, the game gets harder and more expensive to win.
- The Earth is like a big sponge that soaks up some pollution. But, if it gets too hot, the sponge can't soak up as much.
- When we don't take care of the land, things can get worse. We could have trouble growing food, and the ground could start to melt where it's usually frozen.
- It's like letting our toys break - it's much harder to fix them later.
- So, it's better to act now to keep the Earth healthy for everyone!

# What Happens If We Wait?

- Imagine Earth is a garden. We need to take care of it!
- If we don't stop making too much pollution (like greenhouse gases) now, things will get tricky.
- It's like waiting too long to water the plants.
- We might lose important things like:
  - Good soil for growing food.
  - Clean water.
  - Places where animals and plants can live.
- If we wait too long, we might not be able to fix some things. It's like breaking a toy and not being able to fix it!
- Waiting also makes global warming worse because nature will start to release more pollution on its own.
- It's better to help the Earth now than wait!