

# The Earth is Getting Warmer!

- Humans have made the Earth about 1 degree Celsius warmer.
- Think of it like raising the temperature in your house a little bit.
- Scientists are pretty sure it's between 0.8 and 1.2 degrees warmer.
- If things keep warming up like they are, it might reach 1.5 degrees warmer between 2030 and 2052!
- That's not too far away.

# Earth is Getting Warmer!

- Imagine Earth has a normal temperature.
- It's like when you have a comfy room temperature.
- But, it's been getting warmer!
- From 2006 to 2015, it was about 0.87 degrees Celsius hotter than long ago.
- That's like making your comfy room a little bit warmer.
- It's mostly because of things people do, like driving cars and using electricity.
- The Earth is getting about 0.2 degrees warmer every ten years now!
- That means the Earth is slowly but surely getting more hot.

# Where is it Getting Hotter?

- Imagine the Earth is like a big pizza!
- Some places on the pizza are getting much hotter than others.
- The land parts of the pizza are getting hotter faster than the ocean parts.
- The very top of the pizza, called the Arctic, is getting super hot, even two or three times hotter than the average!
- So, some places feel the heat more than others.

# Changing Weather Around Us

- The Earth has gotten a little bit warmer, about half a degree (like half a step on a thermometer).
- We've noticed that some types of weather, like really strong storms or very hot days, are happening more often.
- It's like a pattern, these big storms are showing up more than they used to.
- Scientists are pretty sure (they call it medium confidence) that this is happening.
- They looked at information and figured out that these changes are happening since about 1950.
- So, weather is changing, and it's because the Earth is getting warmer.

# Long-Lasting Changes from Our Actions

- Imagine we've been adding extra blankets to the Earth. That's like the gases we release when we burn fuel.
- These extra blankets trap heat, making the Earth warmer.
- Even if we stop adding blankets \*today\*, the Earth will stay warmer for a very, very long time. Think hundreds or even thousands of years!
- This extra heat will keep making big changes:
  - Like the oceans rising higher (sea level rise).
  - This can cause problems for people living near the coast.
- The blankets we've already added are likely to keep making Earth a bit warmer, but alone probably won't make it warmer by 1.5 degrees Celsius

# Our Planet's Temperature

- Humans have released things into the air that can trap heat.
- These things are like a blanket around the Earth.
- Because of this, the Earth has gotten a little warmer.
- It's unlikely the Earth will get more than 0.5 degree Celsius warmer in the next 20-30 years from these past actions.
- We also don't think it will warm much more than that in the next 100 years because of these past actions.
- That's good news!

# Stopping Global Warming

- Imagine Earth is a bathtub filling with warm water. The water is like greenhouse gases.
- If we stop adding more warm water ( $\text{CO}_2$ ), the water level stops rising (temperature stops increasing).
- The highest the water level gets depends on how much water we poured in \*before\* we stopped.
- Other things besides  $\text{CO}_2$  also make the water warm, but  $\text{CO}_2$  is the biggest problem.
- If we even take some water out (negative  $\text{CO}_2$ ), we can start to cool the bath a little bit.
- Taking water out also helps the ocean and keeps sea levels from rising too much.

# How Much Warming is Too Much?

- Imagine Earth is getting a fever.
- A little fever ( $1.5^{\circ}\text{C}$ ) is worse than now, but not as bad as a bigger fever ( $2^{\circ}\text{C}$ ).
- How bad the fever is depends on:
  - How hot it gets and how fast.
  - Where you live.
  - If you're able to handle it.
- We can choose ways to help Earth feel better (like taking medicine and resting).



# Things Are Changing!

- The Earth is getting warmer, and we can already see it happening.
- Like when you leave your ice cream in the sun, the Earth is melting a bit!
- Plants and animals are changing because of the heat.
- Even the ocean is acting different because it's warmer.
- These changes can affect the things we need, like food and clean water.

# Future Climate Risks

- Imagine the Earth is like a stove. How fast we turn up the heat matters a lot.
- If the heat goes way up, even for a little while, it's worse than if we keep it just a little warm.
- Going a little over 1.5 degrees and then back down is not as good as just staying at 1.5 degrees.
  - Especially if the temperature gets really high!
- Some damage might stay forever, like some animals and plants disappearing.
- It's like breaking a toy. Sometimes we can't fix it perfectly.

# Hotter Days and Nights!

- Imagine the Earth is like a big blanket. When the blanket gets a little warmer, it's called global warming.
- If the Earth warms up a little (1.5 degrees), the hottest days in many places will get about 3 degrees hotter!
- If the Earth warms up a bit more (2 degrees), those super hot days will get about 4 degrees hotter! Wow!
- Also, the coldest nights in cold places will get much warmer too. They could warm up 4.5 to 6 degrees!
- There will be more hot days in most places, especially near the middle of the Earth and in the very hot tropics.
- So, things are going to get hotter if we don't try to keep the blanket cool.

# Weather Gets More Extreme!

- Imagine the Earth getting a bit warmer, like by 1.5 degrees.
- Now imagine it getting even warmer, by 2 degrees.
- It's like turning up a water faucet!
- In some places, there will be less rain and more droughts if it warms more.
  - These are like when the land gets very dry.
- In other places, there will be much MORE rain and bigger floods if it warms more.
  - Think of huge rainstorms!
- Especially in places like North America and Asia and higher mountains, it will rain more.
- Big storms like hurricanes will also bring more rain.
- Overall, there will be more big rains and floods on Earth if it warms more.

# Sea Level Rise: What's Going On?

- Imagine the ocean is like a bathtub. If we warm the Earth less (1.5 degrees), the water level will rise a little less.
- If we warm the Earth more (2 degrees), the water level will rise a little more, by about 10 cm!
- Even after 2100 (a long time from now), the ocean will keep rising!
- How much and how fast it rises depends on how much we pollute the air.
- If the sea level rises slowly, it's easier for people and animals living near the coast to adapt.
- Places like small islands, flat coasts, and river areas can be helped if the sea rises slowly.

# Rising Seas: It Matters How Much the Earth Warms Up

- Imagine the ocean getting bigger! That's what happens when the Earth gets warmer.
- If the Earth warms up a little bit (1.5 degrees), the ocean might rise

by about this much:

sea\_level\_1.png

- If the Earth warms up a bit more (2 degrees), the ocean might rise a

little bit more:

sea\_level\_2.png

- See the difference? The less the Earth warms, the less the sea rises.
- A small change in how much the sea rises can make a big difference for people.
- If the sea rises less, about 10 million fewer people could be in danger of flooding!

# The Ocean is Rising!

- Imagine the bathtub is the ocean and we're turning the tap on with heat.
- Even if we turn the heat down a little bit, the water in the tub will keep rising.
- This is like the sea level: it will keep going up even if we stop warming the Earth a lot.
- Big ice sheets in Greenland and Antarctica are like giant ice cubes.
- If the Earth gets too warm, these ice cubes can melt very fast.
- This melting would make the ocean rise a lot, maybe even by many meters!
- This could happen if the Earth gets about 1.5 to 2 degrees warmer.
- It might take a long, long time but it's still important!
- We need to be careful and not warm up the Earth too much.

# Rising Seas: What's Happening?

- Imagine the ocean is like a bathtub, and we are turning up the heat.
- When the Earth gets warmer, the ocean water gets bigger and rises higher. This is called sea level rise.
- This can be a big problem for small islands and places near the ocean!
- Higher seas can cause more flooding, and salty water can get into places it shouldn't, hurting plants and even our houses!
- It's like your bathwater overflowing onto the floor, but bigger.
  
- If we can keep the Earth from getting too hot (aiming for 1.5 degrees, instead of 2), it will be like turning the heat down a little.
- Less warming means the ocean won't rise as fast.
- This gives us time to make things better, like protecting nature and building stronger walls to hold back the water.



# Protecting Our Planet's Animals and Plants

- Imagine the Earth is getting a fever. We call it global warming.
- If the fever is small (1.5 degrees), it's better for animals and plants.
- If the fever is bigger (2 degrees), more animals and plants could disappear.
- If we keep the fever small, we protect forests, rivers, and beaches.
- This also helps us because we need these places too!

# Our Planet's Friends Are Hurting

- Scientists looked at lots of animals and plants.
- If the Earth gets a little warmer ( $1.5^{\circ}\text{C}$ ), some will lose their homes.
  - 6 out of 100 bugs could lose half their homes.
  - 8 out of 100 plants could lose half their homes.
  - 4 out of 100 animals with backbones could lose half their homes.
- If the Earth gets warmer by a bit more ( $2^{\circ}\text{C}$ ), even more will lose their homes!
  - 18 out of 100 bugs could lose half their homes!
  - 16 out of 100 plants could lose half their homes!
  - 8 out of 100 animals with backbones could lose half their homes!
- Problems like big fires are also less bad if the Earth warms less.
- It's better for nature if we keep the Earth from getting too warm.

# Ecosystem Changes with Warming

- Imagine the Earth has different neighborhoods, like forests and grasslands.
- If the Earth gets 1 degree warmer, about 4 out of 100 areas might change neighborhood type (like a forest turning into grassland).
- If the Earth gets 2 degrees warmer, about 13 out of 100 areas might change!
- This means many more areas change at 2 degrees than at 1 degree.
- If we keep the warming at 1.5 degrees, the change would be much less than at 2 degrees. It would be like half as many neighborhoods changing!
- Keeping warming low helps keep the Earth's neighborhoods as they are.

# Cold Places are Warming Up!

- Imagine a place with lots of snow and ice, like the Arctic.
- These cold places, called tundra and boreal forests, are in danger because it's getting warmer.
- Big bushes are growing where there used to be only snow. This is a problem!
- If the Earth gets a little warmer (1.5 degrees), less ice under the ground will melt.
- But if it gets a lot warmer (2 degrees), much more ice will melt, which is bad.
- We can help keep these icy places cold by not making the Earth too warm!

# Things Get Worse When It Gets Hotter!

- Imagine the Earth is like a giant house, and we're turning up the heat.
- If we make it just a little bit warmer (1.5 degrees), bad things will start to happen.
  - People can get sick more easily.
  - It will be harder to grow food.
  - We might not have enough water.
  - Some people might lose their homes or jobs.
- If we make it even warmer (2 degrees), these bad things will get even worse!
- So, it's super important to keep the Earth from getting too hot.

# Who is Most Affected by Climate Change?

- Imagine the Earth is getting a little warmer.
- Some people and places will be hurt more than others.
- People with less money, some native groups, and farmers near the ocean are in danger.
- Places like the Arctic, dry lands, and small islands are also in big trouble.
- If the world gets too warm, some people might get even poorer.
- If we keep warming to a little bit, like 1.5 degrees, we can help millions of people by 2050!

# Global Warming and Our Health

- Imagine the Earth is getting a little bit warmer.
- This warming can make people sick more easily.
- It's like when you get too hot on a summer day, but for everyone!
- If the Earth warms up just a little (1.5 degrees), it's better than if it warms up a lot (2 degrees).
- Too much heat can make people really sick, and even cause problems with breathing.
- Cities can get even hotter than the countryside because of all the buildings, like a giant oven!
- Tiny bugs, like mosquitos that spread sicknesses, can live in more places if it gets warmer.
- Sicknesses like malaria and dengue fever could become more common and spread to new areas.
- Keeping the Earth cooler is better for everyone's health!

# Food and Warming

- Imagine the Earth is getting warmer, like a sunny day in summer.
- If it gets a little bit warmer (1.5 degrees), our food might be a little less.
  - Think of important foods like corn, rice, and wheat.
- If it gets even warmer (2 degrees), we might have even less food!
- Some places will have more trouble getting food, like Africa and South America.
- Even the food we grow might not have all the good stuff it should.
- Animals that give us food, like cows and chickens, will also be affected by the heat.
  - They might have trouble finding good food and water.
- So, keeping the Earth from getting too hot is important for our food!



# Water and Climate Change

- Imagine the Earth getting a little warmer.
- Scientists think it's better if it only warms up a little bit (1.5 degrees) than a lot (2 degrees).
- If it warms up just a little, up to 50% fewer people around the world might have problems with not enough water.
- Some places like tiny islands could get more rain and less dry land if we keep warming low.
- It is important to keep warming as low as possible to make sure everyone has enough water!

# Climate Change and Money

- Imagine the Earth is getting a little warmer, like a bath that's too hot.
- Scientists think it's better if the bath only gets a little warmer ( $1.5^{\circ}\text{C}$ ), not much warmer ( $2^{\circ}\text{C}$ ).
- If it gets too warm, countries around the world might not have as much money.
- It's like your piggy bank getting smaller because of the heat!
- The countries near the equator (the hot middle of the Earth) will be hurt the most if it gets too warm.
- It will be harder for them to have money to buy things if the Earth warms too much.
- Keeping the warming to  $1.5^{\circ}\text{C}$  helps everyone, especially these countries.

# Climate Change: Things Can Get Tricky!

- Imagine the Earth is getting a little warmer.
- If it gets 1.5 degrees warmer, some bad things can happen.
  - More people in Africa and Asia might get hit by problems like heat waves and floods.
  - These problems can make it harder to get food and water.
- If it gets 2 degrees warmer, things get even trickier.
  - The food, water and energy problems can happen at the same time and in the same places.
  - This makes it even harder for people to live well.
  - More people could get sick and have problems finding what they need.
- We need to be careful to keep the Earth from getting too hot!

# Climate Change is Getting Riskier

- Imagine the Earth is getting a fever.
- We've learned that things are getting more dangerous as the Earth gets warmer.
- **Unique and special places:** like coral reefs, go from risky to super risky between 1.5°C and 2°C of warming.
- **Crazy weather:** like big storms, go from a little risky to very risky between 1°C and 1.5°C of warming.
- **Who gets hurt:** climate change starts hurting some places more than others between 1.5°C and 2°C of warming.
- **Big impacts on everyone:** all the bad things start to get worse between 1.5°C and 2.5°C of warming.
- **Really big changes:** like ice melting super fast, go from a little risky to very risky between 1°C and 2.5°C of warming.
- The hotter the Earth gets, the more dangerous these things become!

# Adapting to a Warmer World

- Imagine our planet getting a little warmer, like a warm bath.
- If it warms up just a little (1.5 degrees), we'll need to change our lives a bit less. If it warms up more (2 degrees), we'll need to change a lot more.
- There are many things we can do to make living with a warmer world easier. Think of it like putting on a raincoat when it rains.
- But even with changes, there are some things that can't handle too much warming, like some animals or plants.
- We can do some things to help but not everything will work.
- Some changes work for growing food, others work for keeping water clean, it's all a bit different depending on what we need to protect.

# Helping Our Planet: Adaptation!

- **Problem:** Our planet is changing and this can hurt plants, animals, and people.
- **Good News:** We can do things to help! These are called "adaptation".
- **Helping Nature:**
  - We can take care of nature, plant trees, and stop hurting forests.
  - We can help animals by protecting their homes.
  - We can be smart about how we farm fish.
- **Helping with Rising Seas:**
  - We can build walls to protect our coasts.
- **Helping People:**
  - We can use less water for farming and be smart about watering our plants.
  - We can help people when bad things happen, like storms or floods.
  - We can learn from older people and their special knowledge.
- **Helping Cities:**
  - We can plant more trees and gardens in our cities.
  - We can plan our cities better so they are safe and healthy.
  - We can use water wisely in our cities.

# Keeping the Earth Cool: Our Planet's Temperature

- Imagine Earth is a house, and we want to keep it at a comfy temperature.
- To do that, we need to lower some "bad" gases like methane and black soot. They're like little heaters making the house too hot. We need to reduce them by a lot by 2050!
- It's tricky because also other things that are cooling us down now (aerosols), also go away. So, for a while, it will feel a little warmer when we clean up these "bad" gases.
- We can lower the bad gases with good changes in how we make energy, like using wind and sun.
- We also need to stop some bad gases from farms (methane and nitrous oxide) and trash.
- Using too much bioenergy (like burning plants) can also increase some bad gases. So we have to be smart about how we use bioenergy.
- The good news is that cleaning up all these gases will make the air cleaner for us to breathe! This will make us healthier and help us all feel better.

# Our Carbon Piggy Bank

- Imagine Earth has a piggy bank for carbon dioxide (CO<sub>2</sub>).
- We need to keep the Earth from getting too hot, so we have a limit on how much CO<sub>2</sub> we can put in our piggy bank.
- We've already used up a lot of our piggy bank since factories started (about 2200 big units!).
- We keep adding about 42 big units every year!
- Scientists think we have about 580 units left if we want a 50
- Or only 420 units left for a better chance (66
- Some things make it hard to know for sure how much is left, like how Earth warms up with CO<sub>2</sub>, and past warming.
- Melting ice and gases from the ground could also take up to 100 units.
- We can also make the piggy bank bigger by doing other things that are not related to CO<sub>2</sub> (add or take out up to 250 units).
- We need to be careful and not use up all the CO<sub>2</sub> in our piggy bank!



# Cooling the Earth: A Tricky Idea

- Scientists are thinking about ways to quickly cool the Earth.
- One idea is to use special things in the sky to block some of the sun's light.
- This is called Solar Radiation Modification, or SRM for short.
- But, we don't know a lot about how it will work!
- It might have some bad side effects we don't know about.
- Also, it won't stop the oceans from getting too acidic.
- It's better to stop putting so much bad stuff in the air.
- We need to reduce the bad gases we produce from things like cars and factories.
- Think of it like turning off a leaky faucet instead of trying to mop up the flood.

# Keeping the Earth Cool: A Big Challenge!

- Imagine the Earth is getting a little too warm, like a hot bath!
- To keep it just right (not too hot), we need to make some BIG changes.
- We need to change how we get energy, use land, and build things like houses and roads.
- It's like changing almost EVERYTHING!
- This has never happened before, but we CAN do it quickly!
- We need to use less stuff that makes the Earth warm, like cars and factories.
- We also need to use lots of different ways to make clean energy, like solar and wind.
- It's going to cost some money, but it's important for the Earth!

# Keeping the Earth Cool: It's a Race!

- Imagine Earth is a big oven, and we need to keep it from getting too hot.
- Scientists say it's best to keep the warming under 1.5 degrees Celsius. That's like a small fever, not a huge one!
- To keep it at 1.5 degrees, we need to make big changes really quickly, like in the next 20 years.
- It's like switching from a slow bike to a super fast race car.
- We have made fast changes before in some areas, like using new types of lights, but never this much and this quickly all over the world.
- So, it's a big challenge, but we can do it if we all work together!

# Keeping the Earth Cool: Energy and 1.5 Degrees

- Imagine the Earth is like a big house, and the sun is like a heater.
- We need to keep the house at a nice temperature, not too hot!
- Scientists have made plans to keep the Earth's warming below 1.5 degrees.
- It's like a target temperature.
- These plans look at how we use energy, like electricity for lights and cars.
- We need to use energy in smarter ways to keep the Earth at a safe temperature.
- Some plans allow the Earth to get a little warmer at first, but then we cool it back down quickly. That's called overshoot.
- It's best to keep the temperature close to the target all the time!

# Making Factories Cleaner

- Imagine factories make a lot of a bad gas called CO<sub>2</sub>.
- This CO<sub>2</sub> makes the Earth warmer, like a blanket.
- If we want to keep the Earth from getting too hot, we need to make much less CO<sub>2</sub> from factories.
- If we want to avoid the worst warming, factories need to make 65-90% less CO<sub>2</sub> by 2050 than they did in 2010.
- For a bit warmer world it needs to be 50-80
- We can do this with new and cool ways, like:
  - Using electricity instead of burning stuff.
  - Using hydrogen to power things.
  - Using plants to make things instead of oil.
  - Making different things that don't create as much CO<sub>2</sub>.
  - Capturing the CO<sub>2</sub> before it escapes and storing it.
- We know these things work, but sometimes they are hard to do everywhere because they are expensive or we need more people who know how to do them.
- Just making factories use less energy is not enough, we need all these new ideas

# Making Cities Greener!

- Imagine our cities are like big LEGO sets.
- To keep the Earth healthy (not too hot!), we need to build them differently.
- This means:
  - Planning our neighborhoods better (more parks, less cars)
  - Having cleaner ways to travel (electric cars and buses)
  - Making buildings use less energy (better windows and lights)
- We need lots more electricity in buildings, and it needs to be from clean sources!
  - Like solar panels and wind turbines.
- Our cars and buses need to use less gas and more clean energy.
- Sometimes it's hard to change, but we have to try!
- If we work together, we can make cities amazing and help the planet too!

# How We Use Land is Changing

- Imagine the Earth is like a giant farm. We use the land to grow food, raise animals, and more.
- To keep the Earth from getting too hot, we need to change how we use this land.
- We might need to use less land for growing food for animals and more for growing trees.
- We might also need to grow some plants for energy, like fuel.
- These big changes will be tricky, like solving a puzzle!
- We need to make sure we have enough food, wood, and space for everyone, including animals and nature.
- Some ways to use land better include:
  - Growing food in smarter ways, like using less space.
  - Planting more trees and fixing damaged places.
  - Eating more yummy veggies and less meat sometimes.
- Changing the land is hard and will require people working together to find solutions!

# Saving Our Planet: It Costs Money!

- Imagine we need to cool down Earth a little, like turning down the AC.
- This costs money, like buying new toys!
- To keep Earth from getting too hot (1.5 degrees hotter, at most), we need to spend about 830 billion dollars a year on energy.
- That's like buying lots and lots of LEGO sets for the world!
- We already spend money on energy. This is extra money to make things cleaner.
- Most of the money goes to making clean energy and using energy wisely.
- We need to spend six times more money on clean energy by 2050! That is a lot of money but it's very important.



# Keeping the Earth Cool: 1.5 Degrees!

- Imagine the Earth is like a giant oven.
- We want to keep it from getting too hot!
- Scientists have some ideas to help.
- **Option 1: Keep the oven below 1.5 degrees hotter**
  - Like turning the oven off fast and early.
  - This is a harder job and costs more.
- **Option 2: Keep the oven below 2 degrees hotter**
  - Like turning it down a little slower.
  - This is easier and costs less money.
- It's like choosing between running a marathon and a 5k!
- We don't know exactly how much each option will cost, but Option 1 is pricier.
- Using land for things like forests and crops has a limit.
- Scientists are still learning more to figure out the best way!

# Cleaning Up Our Air: Carbon Dioxide Removal

- Imagine Earth is a balloon, and we're filling it with bad air (carbon dioxide).
- To keep the balloon from getting too big (too much warming,  $1.5^{\circ}\text{C}$ ), we need to take out some of that bad air.
- This "taking out" is called carbon dioxide removal (CDR). Think of it like a big vacuum cleaner for the air.
- We need to take out a LOT, maybe 100 to 1000 big truckloads over the next 100 years!
- This will help fix the bad air from things we've already done and even make the air cleaner than it was before.
- But, taking out that much bad air is hard, like trying to clean a huge messy room.
- If we use less energy and waste less things, we won't need to clean up as much bad air.
- We can do this by making smaller messes (cutting how much bad air we make) now!

# Cleaning Up the Air!

- We have too much carbon stuff in the air, like when you breathe out.
- We need to take some out! It's like cleaning up your room.
- Here are some ways we can do it:
  - **Planting trees:** Trees are like super vacuums for the air.
  - **Fixing land:** Making the ground healthy so it holds carbon.
  - **BECCS:** Using plants to make energy and then storing the carbon.
  - **Air vacuums:** Machines that suck carbon right out of the air.
  - **Rock help:** Using rocks to soak up carbon in the ocean.
- These ways are all different! Some are easy, some are hard.
- We mostly use trees and BECCS right now, but we're learning more ways!

# Cleaning Up the Air: How We Can Take Away CO<sub>2</sub>

- Imagine we need to clean up extra CO<sub>2</sub>, like extra toys on the floor!
- One way is using plants:
  - **BECCS:** Like special plants that help us store CO<sub>2</sub>. We might use them a little in 2030, more by 2050, and a lot by 2100.
  - **Trees Farming:** We can also use regular trees and good farming to help take away CO<sub>2</sub> in these years.
- We need to be careful about how much we use these methods!
- Some smart ways to live mean we might not even need BECCS.
- Using plants for energy can also help clean up our air by stopping us from using yucky old fuels.

# Oops! Going Over 1.5 Degrees

- Imagine we have a goal: keep the Earth from getting too hot, like not going over 1.5 degrees.
- Some paths might go over 1.5 degrees for a bit, like a little too high on a swing.
- To come back down, we need to take out lots of the bad air, more than we are still putting in. Think of it like cleaning up more toys than you're still playing with!
- The higher we go over, the more we need to clean up to come back down. Like the higher the swing, the more you need to pull back to stop.

# Carbon Removal: Think Small!

- Imagine we're cleaning up the Earth's air from too much carbon.
- We can use different ways to do this, like planting trees (afforestation) or using plants for energy (bioenergy).
- But these things need land, water, and energy, just like farms!
- If we try to do too much at once, we might hurt other important things like growing food or helping animals and nature.
- It's better to do lots of different things that help a little bit each, than one big thing that could cause problems.
- We also need grown-ups to help make sure we do it the right way and that the carbon stays gone for a long time!

# Helping the Earth: Plants and Soil

- Imagine our Earth is like a big garden!
- We can help it by planting lots of trees and plants.
- This is like giving the Earth a big, green hug!
- When we do this, the soil becomes healthier.
- Healthy soil is great for growing food.
- It also helps lots of different animals and plants to live together!
- Like making sure everyone has a place to call home.
- If we do this everywhere, we need rules to make sure we're taking care of the land.
- We need to make sure the plants and soil stay healthy for a long, long time.

# Our Planet's Fever

- Think of our Earth like a person with a fever.
- We're adding too much "bad air" called greenhouse gases.
- Countries made promises to help, but it's not enough.
- If we keep going like this, the Earth will get too hot by 2030.
- It's like trying to stop a slide when you're already going fast downhill.
- We need to start slowing down a lot sooner than 2030!
- We must help the planet cool down now, not later.



# Keeping the Earth Cool: Our Plan

- To stop the Earth from getting too hot (more than  $1.5^{\circ}\text{C}$  warmer), we need to make a big change soon.
- We need to release much less of the bad gases into the air by 2030.
- Imagine these bad gases are like a big pile of Lego bricks. We need to make the pile much smaller by 2030.
- Most plans show the pile needs to be less than 35 blocks in 2030. Some show it needs to be between 25 and 30 blocks.
- This means making the pile about half the size it was in 2010!
- If we keep going as we are, the Earth will get much hotter, about  $3^{\circ}\text{C}$  warmer by 2100, and keep getting hotter after that.
- We can't let that happen, so we need to work together to reduce the bad gases we release!

# What Happens if We Go Over 1.5°C?

- Imagine a goal: keeping the Earth from getting too hot (1.5°C warmer).
- If we go over this goal, even a little (like 0.2°C), it's like going too high on a swing.
- It's harder to get back down!
- We'd need to use special tools to cool the Earth very, very fast.
- These tools might be super hard to make work.
- It's much better to try our best not to go over 1.5°C in the first place.

# Why Acting Now is Super Important!

- Imagine a race to keep the Earth from getting too hot.
- If we slow down our pollution a lot by 2030, it will be much easier to keep the Earth from getting too hot later on.
- If we wait too long to stop pollution, things get much harder.
- It's like trying to clean up a big mess when it gets bigger and bigger!
- Waiting also costs more money in the long run.
- If we keep using things that make a lot of pollution, it's like getting stuck with old toys.
- It might be hard for countries to all play fair if some start making changes later than others.
- So, it's better to start now and make things easier for everyone in the future!

# Why 1.5 Degrees is Better

- Imagine the Earth is getting a fever.
- We want to keep the fever as low as possible.
- A fever of 1.5 degrees is much better than 2 degrees.
- Keeping the fever low helps everyone, especially poor people.
- It also makes the world a more fair place.
- We need to work together to keep the fever down!

# Climate Change and a Better World

- Climate change is like a big puzzle!
- How we deal with it is connected to making the world a better place.
- This means helping people, having good jobs, and protecting nature.
- The United Nations has goals to do this! They're called SDGs.
- These goals include stopping poverty, making things fair, and taking action on climate.
- If the world gets too warm (1.5°C or 2°C), it will be harder to reach these goals.
- We need to work together to solve the climate puzzle and build a good world!

# Being Fair About Climate Change

- Imagine the world is a playground.
- Climate change makes the playground less fun for everyone, but some kids get hit harder than others.
- It's like some kids always get the rain while others stay dry.
- Poor families and people who have fewer chances are hit the hardest.
- It's important to be fair!
- When we try to fix climate change (like planting trees or using less gas) we need to make sure we're helping everyone, not just some.
- We need to think about everyone being happy and healthy when we take care of our planet.

# Making the World a Cooler Place

- Imagine we want to keep the Earth from getting too hot, like keeping a glass of lemonade from getting warm in the sun.
- We can do this by two main things:
  - **Mitigation:** Like turning off the sun a little. This means making less pollution that makes the Earth hot.
  - **Adaptation:** Like moving the lemonade into the shade. This means changing how we live so we can be okay even if the Earth gets a little warmer.
- To do both of these things, we need help from many places:
  - Our planet itself, like the land and oceans
  - Our technology, like better cars and power plants
  - Our money, like paying for new clean energy
  - Our rules and laws, like making sure we all play fair
  - And most importantly, all of us changing how we live!
- When we all work together, it's easier to keep the Earth at a good temperature!

# Helping Our World: Adapting to a Warmer Earth

- Imagine the Earth is getting a little warmer, like a cozy blanket on a summer day.
- We can do things to help ourselves and our planet, like wearing lighter clothes in hot weather.
- These helpful things are called "adaptations".
- If we choose the right adaptations, it can be good for everyone, helping us live better lives and have less poverty!
- It's like finding the best way to play outside in any weather.
- Sometimes, it might be a little tricky to figure out what's best, like sharing toys, but it's worth it!



# Helping Our Planet and Ourselves

- It's like fixing a leaky roof! We can help people and nature by making changes.
- These changes can give us more food and water.
- They can help us stay safe from big storms and floods.
- They can also make us healthier!
- And help all the plants and animals stay healthy too!
- It's like being a good team and working together!
- If we fix things now, when the planet gets a little warmer (like 1.5 degrees), things will be much better.
- We can do this by building better houses and roads, and helping each other.
- Making things better for the planet also makes things better for us!

# Helping the Earth, but Carefully!

- The Earth is getting a little warmer. We want to help!
- But, sometimes, trying to help can accidentally cause problems.
- For example, some projects to help with warmer weather might use more water or cause more pollution.
- They might also be unfair to some people or hurt nature.
- It's like trying to fix a bike but making the chain fall off!
- So, we need to be smart about how we help.
- We need to think about helping everyone and not hurting nature when we try to fix the Earth.
- When we are careful, we can make things better for everyone!

# Let's Cool Down Our Planet!

- We can stop the Earth from getting too hot!
- We need to do two things:
  - Adapt: Get ready for changes (like building strong houses)
  - Mitigate: Stop making the problem worse (like using less gas)
- We need to do these things together, like a team!
- It's like a puzzle, we need to fit all the pieces together.
- It's important that what we do helps everyone have a good life and is good for the planet.
- People who make the big decisions need to help local and regional people.

# Helping the Earth: Two Jobs at Once!

- Sometimes, we can do two good things at the same time!
  - Like, planting trees can help soak up bad gases and also stop floods.
  - Or, building houses that use less power also keep us cool without using too much energy.
- But, sometimes we have to pick between two good things.
  - If we grow lots of plants for fuel (bioenergy) or plant too many trees, it might take away land we need to grow food.
  - This can make it hard to have enough food, hurt people's jobs, and be bad for animals and nature.
- It's like a puzzle! We need to find ways to help the Earth that are good for everyone.

# Climate Action: It's Like a Puzzle!

- Imagine we need to cool down our Earth a little bit.
- We can do this by changing how we use energy, like using more solar power and less gas.
- These changes can help with other things too, like making cleaner air and healthier people! That's a **synergy**, where one good thing helps another.
- But sometimes, trying to fix one problem might make another problem a little bit worse. That's a **trade-off**.
- Like, if we make lots of new solar panels, it might use some materials we need for other things.
- We need to be smart and try to make more good things happen than bad things.
- It's like solving a puzzle! We need to find the best pieces that fit together to help our planet.
- How quickly we change and what things we change matters a lot.

# Keeping the Earth Cool: It Helps Us!

- If we keep the Earth from getting too hot (1.5 degrees warmer), lots of good things happen!
  - We'll be healthier! (Like less sickness!)
  - We'll have more clean energy! (Like sun and wind power!)
  - Our cities will be better places to live!
  - We'll use things wisely and make less trash!
  - Our oceans will be healthier too!
- But, if we're not careful about how we keep things cool, we could have some problems:
  - Some people might be more poor.
  - Some people might not have enough food.
  - Some people might not have enough water.
  - And some people might not have enough energy.
- So, we need to be smart and make sure everyone benefits when we try to keep the Earth cool!

# Keeping Our Planet Cool: Low Energy Paths

- Imagine the Earth is like a giant oven.
- We want to keep it from getting too hot, like not more than 1.5 degrees hotter.
- One way to do this is by using less energy.
- Think of it like turning down the oven's heat knob.
- Using less energy means using less electricity and gas.
- This helps the Earth stay cooler!
- If we choose the low energy path, we have a better chance to keep Earth cool and happy!

# Cooling the Planet: It's Like a Puzzle!

- Imagine the Earth is getting a bit too warm. We need to cool it down!
- Scientists are thinking of ways to do this, like planting lots of trees (afforestation) and using plants for energy (bioenergy).
- These are like puzzle pieces!
- But, if we're not careful, these puzzle pieces could make it harder to grow food. We need to make sure everyone has enough to eat!
- Another puzzle piece is taking carbon dioxide (a gas that makes the Earth warm) out of the air. This is like cleaning up the air.
- If we do this wrong, it might cause problems.
- We need to think about everyone's needs, protect animals and plants, and make sure we're helping the planet in a good way.
- It's like a big game of balance! We have to find the best way to solve the puzzle.



# Keeping the Earth Cool: A Challenge!

- Some places use a lot of coal, oil, and gas for money and jobs.
- If we stop using so much of these to keep Earth cool, it can be hard for those places.
- It's like when you stop eating too much candy, it might be hard at first.
- But, places can find new ways to make money and get energy, like using the sun or wind!
- If they do that, everyone can be happy and the Earth stays cool.

# Helping Everyone as We Fight Climate Change

- Imagine we're trying to fix a big problem, like climate change.
- It's like a puzzle, and some pieces are harder for some people.
- We can help those who need it most by sharing resources.
- This includes making sure everyone has food, enough money, and energy to power their homes.
- Spending a little extra to help them doesn't cost that much compared to the big changes we're making.
- It's like helping everyone finish the race, not just the fastest runners.
- This way, we can solve climate change and make the world fair for everyone!

# Keeping the Earth Cool!

- Imagine the Earth is getting a little too warm. We need to help!
- To keep things from getting too hot (more than 1.5 degrees warmer), we need to make some big changes.
- These changes can help everyone, especially people who are poor.
- We need to do a few things:
  - Make our homes and towns better for the changes we see like more rain or heat
  - Use cleaner energy like the sun and wind instead of old energy sources like coal
  - Make new amazing tools and machines to help with this
  - Change some of our habits (like walking more and using less plastic)
- It's like a big team effort! We need lots of people to help make these things happen!

# Saving the Planet: Money Matters!

- Imagine we need to build cool new things to help the Earth, like special walls to stop floods or new ways to make energy from the sun!
- These things cost money, like buying lots of LEGOs!
- We can get money from different places:
  - Like big banks and companies (think of grown-ups who save money).
  - And governments (the people who help us in our town).
- If it's safe to build these new things, more grown-ups and companies will want to help!
- Sometimes it's hard to get enough money, but we need to keep trying!
- It's like saving up for your favorite toy - we need to save up to help the Earth!

# Climate Change: Adapting to a Warmer World

- Imagine the Earth is getting a fever. It's getting warmer!
- We need to adapt, like wearing cooler clothes in summer. This costs money.
- It's hard to know exactly how much money we need to adapt if the Earth warms by 1.5 degrees versus 2 degrees.
- We don't have enough information to figure out all the things we need to build to stay safe. Like stronger bridges and better water systems.
- It might cost less to adapt if the Earth warms by just 1.5 degrees, compared to 2 degrees.
- Right now, governments and organizations give money to help countries adapt.
- This money comes from different places, like budgets and help from other countries.
- More and more, other groups are also helping with this problem.

# Climate Action and Making the World Better

- Imagine we want to fix climate change and make the world a better place!
- We can do this by choosing different things to do, like using clean energy.
- But, some choices help us in more ways than others!
- We need to see if our choices help with other goals, like clean water and healthy food (these are called Sustainable Development Goals or SDGs).
- Some things we do for climate, like using solar panels, can also help give people jobs (that's a good thing!).
- Some other things, like using too much land for farming, might make it harder to protect nature (that's not so good).
- We need to be smart about our choices!
- We looked at different options:
  - Energy: Like using less electricity and more clean energy from the sun and wind.
  - Land: Like growing food in a way that protects the soil and planting

# More Help for Our Planet!

- Scientists are learning even more about our changing planet!
- More people and groups are trying to help, like regular people and companies.
- It's like a superhero team growing bigger!
- But, helping is sometimes tricky because it needs lots of money.
- And sometimes it's hard to get the money to the places that need it the most.
- Think of it like trying to give everyone a band-aid after they fall down. We need lots of band-aids, and need to make sure everyone gets one!

# Keeping the Earth Cool: It Costs Money!

- To stop the Earth from getting too hot (more than 1.5 degrees), we need to spend lots of money on clean energy.
- We're talking about a HUGE amount, like 2.4 trillion dollars every year. That's like having 2400 billion dollars!
- This money would go to things like solar panels, wind turbines, and making energy systems better.
- It might sound like a lot, but it's only about 2.5
- Think of it like saving up for a really important thing, like keeping our planet healthy.
- It's like buying new toys that help the Earth, instead of old toys that make it sick.



# Helping Our Planet: Tools We Can Use

- Imagine our Earth is like a big toy box.
- We need to fix some things, like how we make energy.
- We can use "tools" to help us!
- One tool is moving money. Like taking money from old ways and using it for cleaner energy.
- Another tool is making rules that help. Like making it cheaper to use solar panels.
- We have to be fair. Making sure everyone can still have electricity and other things they need.
- We have to be smart. Changing to clean energy helps us with other things, too, like cleaner air.

# Cooling Down Our Planet!

- Imagine the Earth is getting a fever, it's getting too hot!
- To help, we need to use new and better things, like toys for grown-ups.
- This means making cool new stuff that doesn't make the planet warmer.
- We need to be super clever and come up with these new ideas.
- Countries need to work together to invent, test, and use these new ideas quickly.
- The government can help by supporting people making new things and encouraging everyone to use them.
- We can make our world a better place by inventing smarter tools and helping each other!

# How We Can Help Our Planet

- Learning and talking about climate change is super important.
- Knowing about nature from our elders and neighbors helps too.
- When we all try our best, it's easier to keep the Earth cool.
  - Like if we all use less energy and recycle more!
- It's important to make changes that work for everyone.
  - Fair rules are super important!
- If we like the rules, we are more likely to follow them.
  - This helps us all protect the planet!

# Helping the Earth and People

- Imagine the Earth is a giant playground.
- We need to keep it clean and safe for everyone!
- "Sustainable development" is like being a good friend to the Earth.
- It means taking care of the planet so we can all have a good life.
- It helps us use resources wisely, like water and trees.
- This helps stop the Earth from getting too hot (global warming).
- If the Earth stays at a good temperature, it's easier for us to:
  - Adapt to changes (like floods or heat waves)
  - Help people who don't have enough (like food and homes)
  - Make sure everyone is treated fairly.
- It's like building a super cool treehouse that everyone can enjoy for a long, long time!

# Climate Change and Fairness

- Imagine the Earth is a playground and everyone wants to play.
- Climate change is like a big storm that makes the playground not safe.
- We need to fix the playground so it's safe for everyone, especially kids who don't have as many toys or get pushed around.
- Fixing the playground should be fair. No one should be hurt even more while we make things better.
- We need to talk to everyone and make sure that we help all the kids when we make changes to our playground!
- We should not make the kids who are already having a harder time on the playground have even more problems.
- It's like sharing and taking turns, but with the whole world!

# Climate Change and Us

- Imagine different countries are like different houses.
- Some houses are strong, and some are a bit wobbly.
- Climate change affects each house differently.
- Some places are more easily hurt by climate change.
- It's like some houses are closer to the water and might flood easier.
- We need to make all the houses stronger to handle climate change.
- So far, we haven't done enough to help all the houses.
- Everyone needs to help to make all houses stronger!
- This means governments, companies, and all people have to work together quickly.

# Working Together for a Cooler Planet

- Imagine our Earth is like a big playground.
- We need to keep it cool and safe for everyone.
- When we all work together, it's easier to keep the playground cool.
- It also costs less money to keep it cool when we share.
- If some kids are not sharing or are poor, it's much harder to keep the playground from getting too hot.
- Almost all the pretend games with computers show that we can only keep the playground from getting too hot if we work together.
- So, sharing and helping each other is super important to keep our planet cool!

# Let's Work Together to Help the Planet!

- It's like a team effort! We need everyone to help stop the Earth from getting too hot.
- Grown-ups in charge, helpers in groups, businesses, and even people who live in special places need to work together.
- If we all do our part, we can make sure the Earth doesn't get too warm.
- Countries need to help each other, like sharing toys, so everyone can join the team.
- Helping each other is super important for countries that need it most!