

EARTH: The Apple Of My Eye

Claiborne County 4-H
5th Grade

OBJECTIVE:

Students will understand that soil is a non-renewable resource.

Students will understand and appreciate the limited amount of land on the Earth that is suitable to growing food for humans.

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In an earlier lesson we talked about renewable and non-renewable resources.

Who can tell me the difference between the two?

Renewable resources are those things that we use that we can grow more of, resources that can reproduce themselves. Things like animals and plants.

Non-renewable resources are things that we use that, once they have been used up, we cannot make more of them. Things like oil, minerals, water and soil.

So, it makes sense that our food resources are all renewable, right? If they weren't we wouldn't be here!



This slide is a reminder of what we learned in the Conservation lesson.

Make sure your students understand the difference between renewable and non-renewable resources.

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Knowing that we can grow more food (renewable resource) is wonderful!

But what do we need in order to grow food?

Water and Soil!

Are these renewable or non-renewable resources?

Both are non-renewable.

Since we have talked about water in a previous lesson, we are going to talk about soil and the amount of land we have on which to grow our food.



Stress to your students that both soil and water are non-renewable resources.

Also stress that without both soil and water, we would not be able to grow food. The plants that we eat depend on soil to grow. The animals we eat depend on eating the plants that must have soil to grow.

Soil is very important!

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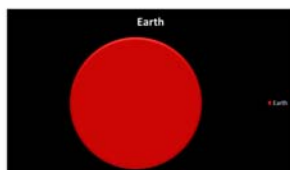
There are now over six billion people on Earth (that's 6,000,000,000) and that's a lot of mouths to feed. These six billion people also take up a lot of room. Everyone has to live somewhere.

So where does food production take place? Can we grow food everywhere on Earth?

Let's take a look at just how much land is available for growing food.

Imagine that this chart is the Earth.

Can we grow food on the entire surface of the Earth?



Point out there are over six billion mouths to feed every day on this planet. Food has to be grown and lots of it!

Six billion people to be fed! If those six billion people were dollars, you could have spent \$8,000 per day, every day, since the birth of Jesus and still have money!

We are going to do an exercise to illustrate just how much of the Earth is available for us to grow food to feed these six billion hungry mouths.

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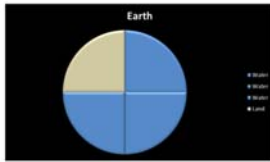
Why can't we grow food on the entire surface of the Earth?

A lot of it is covered with water. How much of the Earth's surface is covered in water?

75% or $\frac{3}{4}$

Okay, so $\frac{3}{4}$ of the Earth is gone for raising food. How much is left?

Yep, $\frac{1}{4}$



This slide starts to take away those parts of the Earth we cannot grow food on.

Since three-fourths of the Earth is covered in water, that is the first to go. We are left with one-fourth that is dry land. (Yes, I know we can get some of our food from the oceans, but not in this discussion)

Try to get your students to do the math in their heads before you pop the answer up.

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So, we have $\frac{1}{4}$ of the Earth on which to grow food. This represents all the dry land on Earth.

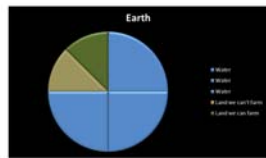
Can we grow food on all of this?

No, we cannot grow food on land that is too extreme. This would land that is too dry (deserts), too cold (Antarctica and the far North), too steep and high (Rockies/Andes/Himalayan mountains), etc.

Half of the $\frac{1}{4}$ must be set aside.

What are we left with?

Yep, $\frac{1}{8}$



Now that we have our $\frac{1}{4}$ of the Earth that is dry, ask if we can grow food on all of this. Then point out why we cannot. Things like too cold, too dry, to high an altitude, etc.

Now we have to take away half of our $\frac{1}{4}$. Ask your students what you get when you divide $\frac{1}{4}$ in half. Try to get them to think about it.

Point out that 1 divided in half is $\frac{1}{2}$. Then $\frac{1}{2}$ divided in half is $\frac{1}{4}$. So... every time a fraction is halved, its denominator doubles... OH!

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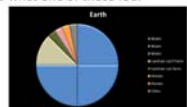
So now we are down to $\frac{1}{8}$ of the surface of the Earth on which to grow enough food to feed six billion people.

Can we grow food on all of this?

No! Remember those six billion people? They have to live somewhere.

On this $\frac{1}{8}$ of the Earth's surface, people must live, go to work, go to school, have fun, etc. Some of this land is set aside for parks. Some of this land is covered by roads, parking lots, malls and all the modern things we humans like.

We must divide our $\frac{1}{8}$ into four sections. Who can tell me what one of those four pieces would be?



Now we have to divide our $\frac{1}{8}$ into four pieces. Walk your students through this if you have to. You can have them divide the $\frac{1}{8}$ in half ($\frac{1}{16}$) and then divide the $\frac{1}{16}$ in half if needed.

Point out that all those six billion people take up a lot of room so we have to set aside $\frac{3}{32}$ of our $\frac{1}{8}$ for people to live, go to work, go to school, roads, etc.

We are now left with just $\frac{1}{32}$ of the Earth's surface on which to grow food. Ask your students what they think about this.

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If we divide $\frac{1}{8}$ in half we get... $\frac{1}{16}$

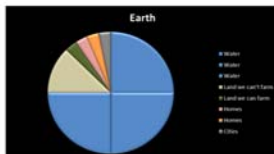
So if we divide $\frac{1}{8}$ into four pieces we get... $\frac{1}{32}$

Of the entire surface of the Earth, we now have only $\frac{1}{32}$ of it in which to grow food for the Earth's six billion inhabitants.

If you look at the chart, our $\frac{1}{32}$ is only the little dark green sliver.

But do we grow food all the way to the center of the Earth?

No, just in top 5 feet of the Earth's surface.



This slide finishes up what we were talking about above.

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Now just think about all this. We have a section of the Earth only five feet deep covering only 1/32 of the Earth's surface. And this is where we grow food for 6,000,000,000 people. WOW!

Do you think our farmers do a good job?

Is there enough food grown on the Earth for all of mankind?

Yes, there is actually a surplus (more than is needed).

Now, not everyone has enough food. But this is not because there is too little food produced. It has more to do with money and governments!



Now point out that our farmers do a great job to feed so many people from such a small percentage of land.

Contrary to what some folks may think, there is enough food grown every year for everyone on Earth. Point out that does not mean that everyone gets fed, but that is not the fault of our farmers!

Point out that builders of houses and shopping malls don't want to build on steep or rough land. That costs too much. That is why good farmland gets turned into subdivisions!

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Now what does all this intense food production on a small part of the Earth make you think about?

Should we, maybe, think more about how we take care of the land?

Should we give more thought to where we build our roads and shopping malls?

Remember that soil is a non-renewable resource. If we destroy it or cover it up with cities and roads, can we make more?

No. Soil is created by nature over an incredibly long time. Weathering of rocks by wind and water have produced the soil that we now have. It would take several billion years to make more.



This slide transitions into thinking about how we use and take care of our land.

There are several questions here. Ask them one at a time and let your students respond to them. Remember, this lesson is meant to get the students to think about a problem with few clear answers!

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What types of threats does our soil and, therefore, our ability to grow food face in our modern world?

- Pollution: The contamination of soil by chemicals, garbage, etc.
- Erosion: Soil particles getting washed or blown away by wind and water.
- Land loss: Farmland being lost to man's desire to build cities and roads.

All of these threats are serious in today's world and we are losing land every day to these three things.



This slide asks the class to name some things that threaten our land and soil. Then we present three threats to our land and soil.

Your students may name some others and you may also come up with some. Remember, this is a lesson plan, make it your lesson!

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Of those three threats to our farmland, what can we do about them?

Pollution – better education, stiffer fines, rewards for clean-up

Erosion – better land management practices such as streambank stabilization, no-till farming, use of cover crops

Land Loss – government incentives to keep land in farms, higher taxes for land taken out of farming

There are many solutions to these problems, some good, some not so good. Who in here can think of a solution to one of these three problems?



Here are some possible solutions for the threats mentioned in the previous slide.

The solutions to pollution are self-explanatory. For the erosion threat, these solutions are agricultural practices that keep as much vegetation on the soil as possible during all phases of crop and livestock production.

The solutions for land loss stem from government policy but should also include more and better education of the public about the problem.

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I want everyone to listen to this situation and think for a minute on what you would do...

Farmer John just celebrated his 75th birthday and has decided to retire. He and his wife own a medium sized farm of 100 acres outside of Nashville, TN. Most of Farmer John's neighbors sold out years ago and those farms are now subdivisions of houses.

Farmer John has two people who want to buy his farm, Farmer Jake who is just out of school and wants to raise beef cattle, sheep and vegetables to sell locally, and Developer Dan, a business man who wants to build a shopping center and more subdivisions.

If you were Farmer John, who would you sell to and why?



Here is a little scenario I like to use to get the students to think about several sides of the problem.

Almost always, the students will answer with their emotions rather than thought.

On this slide, simply read the situation to the class and ask the question below. Give your students the opportunity to answer.

However, you should not venture an opinion, yet. More on the next slide.

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Okay, now that we have discussed that situation, lets go a little further...

Since Young Farmer Jake actually wants to make his living farming the land, he can only pay \$1,800 per acre for the farm. That would be \$180,000 for Farmer John and his wife.

But Developer Dan wants to build houses and a shopping center. He can afford to pay \$10,000 per acre. That means that Farmer John and his wife would receive \$1,000,000 for their farm.

Who would you sell the farm to now?

Would Farmer John and his wife be wrong to sell to Developer Dan?

Why or why not?



Now we add a little more detail to the situation in the form of what the farm is worth. Let the students think about this for a minute.

Point out that Farmer Jake will make less money growing food than Developer Dan will selling houses.

After discussion, point out that there is no right or wrong answers in this situation. Very simply, it is Farmer John's farm and he can do with it what he wants. The only person he has to make happy is his wife!

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Understand that there is no right or wrong answer to these questions. Arguments can be made for both keeping the land in farming and for selling personal property to the highest bidder.

Unfortunately, a lot of land that once grew crops and livestock now grows houses and shopping centers. Our farmers have, so far, kept on feeding the world. But for how long?

Please remember that our land and soil is a non-renewable resource. Without it we cannot feed ourselves. While we are here, whether we own land or not, it our duty to be good caretakers of Earth!



This is just a wrap-up slide of the things we have been talking about.

Please stress the last paragraph!

Thank You

Demonstration Know-How

One of the most interesting contests that we do in 4-H is the...

Demonstration Contest!

Many folks don't know exactly how to do a demonstration and that is what we are going to talk about today.

A demonstration is simply showing someone how to do something while you are explaining how you are doing each step.

The key words are: show what you are doing and tell how you are doing it.

Sounds a lot like kindergarten, doesn't it!

This slide starts talking about the demonstration contest that we have in February.

The number of demonstrations you have will depend, for a large part, on how excited you get the class in telling them about it!

Please go through these four slides carefully. Most of your students do not know what a true demonstration is.

Demonstration Know-How

Now, in order to do a good demonstration, we need to do a few things before the day of the contest.

- Select a Topic: We have to decide what we are going to do a demo about.
It could be showing the class how to make a craft, how to knit, how to cinch a saddle or how to make a PB&J sandwich. Anything that you can show the class how to do.
(NO LIVE ANIMALS!)

Research your Topic: Be sure your information is correct. Just because its on the internet doesn't mean that it is correct.

Keep It Simple: You have 5 minutes. Just tell us what you are showing us.
Don't give us lots of extra info. Keep it short and to the point.

Again, go through each paragraph to ensure that your students understand what we are talking about.

When selecting a topic, it should be something that can be done in the classroom in about five minutes.

Give the class some ideas for demonstrations based on those you done or have seen others do.

Demonstration Know-How

Make an Outline: This is kind of like a speech. Your demo can be divided into three parts.
1. Introduction – brief and catchy
2. Body – clear and informative
3. Summary – brief, repeat main points

Prepare Visual Aids – Only if needed. Many demonstrations are their own visual aids. That means the class sees what you are doing as you do it. Sometimes you may need a poster to show something that class can't see. Sometimes you may need a finished product to show.

REMEMBER – Only explaining what you have drawn on a poster does not count as a demonstration!

Tell them about making an outline of what they are going to do and say during the demonstration. This is very similar to what you would do in preparing for a speech.

Stress that a demonstration should have the student actually doing or making something. Giving a speech while pointing to a poster does not make a good demonstration. Sometimes they get confused when they see 'visual aid.'

Demonstration Know-How

Now that you have your demo planned, you have prepare. Here are some tips.

- Make a list of everything that you will need. Organize your list items in the order that you will use them.
- Pre-measure your ingredients if you are doing a food demonstration
- Make plans to keep your demo area clean
- Practice, Practice, Practice....

Go over the final checklist. Make sure they understand.

At this point, I like to walk them through the planning stages of a demonstration. Give them the topic of demonstrating how to make Kool-Aid.

- what do we need to make Kool-Aid?
- what steps do we go through to make Kool-Aid?
- make Kool-Aid at home to practice
- get your equipment ready and your ingredients measured out the day before the contest
- etc.