

- - - - - Science Fair Logbook - - - - -

Blue - Headlines

Purple - Citations

Wednesday, October 18 2023 - 7:44 P.M - 8:02 P.M

TOPIC & TOPIC IDEAS -----

I was researching topics and came up with some such as: “The Plague”, this was because I was reading a book called “We All Fall Down” and the first few pages were about the Plague. This really interested me and I wanted to do this for my project but I couldn’t think of an experiment to go with it. My other option was soil erosion. My friend gave me this recommendation because she had done the same topic before in Grade 5 and it went well. I was gonna do this topic but then I was talking to my teacher about it and she recommended for me to “continue” a topic i’ve done already and last year for science fair I did Pollution. I thought this was a really good idea because I already had a good base/start because I’ve done it before. I decided to do this because soil erosion was a little harder for me and I didn’t understand it a lot compared to pollution.

Wednesday, October 18 2023 - 8:07 P.M - 8:27 P.M

GUIDING QUESTION -----

I tried to think of a question that matched what I was doing and finally came up with one. My question is: How does water pollution, air pollution, and soil pollution affect the world and how can we as a community, try to reduce it? This is the question I will

be asking because it matches what my topic is about since it includes all the 3 pollutants that will be included in my project.

Wednesday-Thursday, October 18-19, 2023 - 8:36 A.M

MORE PLANNING -----

Wednesday- I was thinking about what I can add onto my experiment and how to make my experiment and project more interesting. I thought of making my project colourful so it stands out more/pops out more.

Thursday- Today I was thinking and I think I can make my project more descriptive and add more pictures so that it's not all words. On this project I'm gonna try to make my project really good because I wanna make it to the Calgary Science fair. I'll add data charts and I'll also record everything that happens in the experiment.

Friday, October 20, 2023 11:25 P.M - 11: 39 P.M

START OF PROJECT -----

Today I started making my project. I went on <https://slidesgo.com/> but couldn't find anything that looked nice and matched my topic. I decided to make my own slides because that was the only thing I could do. I started making my slides and I tried to make them pretty. After I made my title, I started making my Guiding Question slide. On my guiding question slide I wrote:

How does water pollution, air pollution, and soil pollution affect the world and how can we as a community, try to reduce it?

Friday, October 20, 2023 - 11:23 A.M - 12:01

RESEARCH FOR HYPOTHESIS-----

- Pollution affects water in many ways. Some ways it can affect water is making the water unsuitable for drinking, cooking, cleaning and other water related activities. You can't do these things if there's pollution in them because the toxic bacteria and unhealthy chemicals the pollution holds makes the water dirty and toxic which can make you sick, and in some cases, lead to death. -

<https://www.hsph.harvard.edu/ehep/82-2/#:~:text=Water%20pollution%20is%20the%20contamination,make%20their%20way%20to%20water.>

- Pollution affects soil in different types of ways. Some ways it can affect soil can be changing the soil's biodiversity, decreasing soil organic matter and making the soil's volume act like a strain/filter. Soil pollution also causes contamination of soil. -

<https://www.fao.org/fao-stories/article/en/c/1126974/#:~:text=Soil%20pollution%20causes%20a%20chain,an%20imbalance%20of%20soil%20nutrients.> and -

<https://www.toppr.com/guides/chemistry/environmental-chemistry/soil-pollution/#:~:text=The%20incorrect%20way%20of%20chemical,dumping%20oil%20and%20fuel%2C%20etc.>

- Pollution affects air in different ways. Some ways can be: acid rain, agriculture, greenhouse gas pollution, and harm of many forests. -

<https://scied.ucar.edu/learning-zone/air-quality/effects-air-pollution#:~:text=Air%20pollution%20affects%20all%20things,change%20C%20affects%20the%20entire%20planet.>

Friday, October 20, 2023 - 12:08 A.M -

HYPOTHESIS -----

After my research, I wrote my hypothesis. This is my hypothesis: **Water:** I think the water will become dirty because of the pollution I put in. I think it will also be green or brown because the pollution will change the colour of the water. If the pollution in the water makes the water become toxic and unsuitable then I think the water would have dead bugs in it because bugs are attracted to dirty things (mostly fruit flies). **Soil:** I think the soil will become dry and crusty because I think the pollution I put in might have spread all over and inside the soil. I think this would also make the soil toxic and unhealthy because now it has dirty and toxic things spreading inside of it. If the soil becomes dry and poor then I don't think things can grow out of it nor live inside of it.

Saturday, December 16 2023 7:38 P.M

RESEARCH: WHAT IS POLLUTION -----

Pollution is a handful of toxic gases and chemicals. These things are actually called "Pollutants". Pollutants are what makes up pollution. Pollutants can just be natural things such as volcanic ash, some pollutants can also be man made, some man made pollutants are trash or runoff from factories. Pollution can also come from transportation methods because vehicles are usually loud and because of that, noise pollution is made. All living things from one-celled microbes all the way to whales depend on water and air but because these things are threatened by pollution, because of this every living thing is in extreme danger. Water, air and even soil carry pollutants which makes the life for animals and even humans very difficult. Pollution can travel in many ways, two ways are through air patterns and air circulation. Human activity is actually the main cause of pollution spreading and also the reason for how pollution is so populated and such a huge matter. Chemicals in pollution such as Ozone, Nitrogen Dioxide, and Sulphur Dioxide pollutants from China have easily made their way to the west coast of the United States. Looking at a map, you can see that it could have spread into other countries on its way to the United States. The three main pollutants are water, air and land pollution (I'm doing water, air and soil pollution).

<https://education.nationalgeographic.org/resource/pollution/#> and

https://www.who.int/health-topics/air-pollution#tab=tab_1

Sunday, December 17 2023 - 5:47 P.M

WHAT IS AIR POLLUTION?

Air Pollution is when solid or liquid substances and many different types of gases drift away in the environment and make the air around us unhealthy and dangerous to breathe and just be in. There are many things that make up and cause Air Pollution some examples of these things are: the burning of fossil fuels, indoor air pollution, wildfires and open burning of garbage waste, these are only some of many things that can cause air pollution. Air pollution can damage many things harshly, some examples are crops and trees. The reason for this damage is because air pollution reduces the growth and survivability of trees. The trees can also get a disease because of the air pollution which is painful for trees.

Air pollution is also one of the most harmful types of pollutants, the reason being health threats and many other things it can do to humans, plants, animals and the environment.

Air pollution is everywhere around us, mostly in polluted areas, this is because it is in the air and air is everywhere around us. Air Pollution can affect everyone including animals, this is because it's one of 3 major types of pollution known to mankind which makes it even more dangerous and a huger threat. Since air pollution is such a dangerous thing and everyone is inhaling it, it is the cause of 7 million deaths every year. The main materials of air pollution that are affecting the most health are nitrogen oxides (NOx), sulphur oxides (SOx) and ozone. This is because these substances go into your lungs as you breathe which causes a health hazard.

WHAT IS AIR POLLUTION -

<https://education.nationalgeographic.org/resource/pollution>

WHAT IS AIR POLLUTION -

<https://cdn.who.int/media/images/default-source/air-pollution/air-polluti>

[on-mix-of-outdoor-and-indoor-air-pollution.tmb-1920v.jpg?sfvrsn=b5fbc279_3%201920w](https://www.mass.gov/doc/health-environmental-effects-of-air-pollution/download)

WHAT IS AIR POLLUTION - <https://unece.org/air-pollution-and-health>

WHAT IS AIR POLLUTION - <https://climatekids.nasa.gov/air-pollution/>

WHAT IS AIR POLLUTION - <https://www.cdc.gov/air/pollutants.htm>

WHAT IS AIR POLLUTION -

<https://www.mass.gov/doc/health-environmental-effects-of-air-pollution/download>

Sunday, December 17 2023 - 6:34 P.M

WHAT IS WATER POLLUTION?

Water pollution is when chemicals are getting suspended in rivers, lakes, seas, oceans, and more bodies of water. Water pollution can make water unstable for multiple things, some examples are cooking, drinking, cleaning, swimming and other water related activities. Water pollution can affect many things, but not just us humans, water pollution can have an affect on plants and animals too. .

There are many causes of water pollution, some examples are global warming, deforestation, the act of spilling fuel, livestock farming and much more. Along with causes, there come consequences and effects to water pollution, some are agriculture, diseases, food chain disruption, economic impacts and many more. Since water pollution is so populated, 80% of diseases in a lot of countries around the globe are related to water pollution as long as water pollution is one of these diseases. Water pollution has gotten so bad, every year more people die from the unsafe water that water pollution causes compared to all deaths caused from forms of action including war. The population of water pollution has increased so much that there's only 3% of fresh water left in the world and only 1.2% of that can be used as drinking water.

WHAT IS WATER POLLUTION?:

<https://www.nrdc.org/stories/water-pollution-everything-you-need-know>

WHAT IS WATER POLLUTION?: <https://www.hsph.harvard.edu/ehep/82-2/>

WHAT IS WATER POLLUTION?:

<https://www.safewater.org/fact-sheets-1/2017/1/23/facts-and-statistics>

WHAT IS WATER POLLUTION?:

<https://www.iberdrola.com/sustainability/water-pollution>

WHAT IS WATER POLLUTION?:

<https://www.envirotech-online.com/news/water-wastewater/9/breaking-news/6-effects-of-water-pollution/57707>

WHAT IS WATER POLLUTION?:

<https://www.seametrics.com/blog/water-pollution-facts/>

WHAT IS WATER POLLUTION?:

<https://education.nationalgeographic.org/resource/earths-fresh-water>

Sunday, December 17 2023 8:07 P.M

WHAT IS SOIL POLLUTION?

Soil pollution is when toxic chemicals and substances get drawn into the soil and occur harmfully to it. There's many causes of soil pollution and how its population has gotten so big, some examples are climate change, deforestation, industrial waste and loss of soil fertility. Soil pollution can affect various things, some examples are human health, soil biodiversity, ecosystem health, people, plants, and animals. Soil pollution has gotten so overpopulated and intense that the planet loses 24 billion tonnes of topsoil every year just because of soil pollution. Since soil pollution is everywhere, it can affect people by inhalation, the reason being is that when the soil goes into the air, it becomes a type of dust and when you inhale it, the dust particles irritate your lungs which can then lead to puncturing your lungs.

Soil pollution can also be caused by farmers using fertilisers and pesticides which is a high threat for farmers because they usually put fertiliser in their soil since it is made of perfect nutrients that will help the crop.

WHAT IS SOIL POLLUTION?:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10064841/#:~:text=Airborne%20dust%20can%20impact%20human,or%200.1%20%C2%B5m%20in%20diameter.&text=Airborne%20dust%20may%20cause%20irritation,bronchitis%2C%20and%20even%20lung%20cancer.>

WHAT IS SOIL POLLUTION?:

<https://www.environmentalpollutioncenters.org/soil/>

WHAT IS SOIL POLLUTION?:

<https://study.com/academy/lesson/soil-pollution-lesson-for-kids.html>

WHAT IS SOIL POLLUTION?:

<https://www.permaculturenews.org/2017/04/03/38249/>

WHAT IS SOIL POLLUTION?

<https://www.rubbishplease.co.uk/blog/land-pollution-facts-statistics/#:~:text=The%20planet%20loses%2024%20billion,tonnes%20of%20oil%20being%20transported>

POLLUTION'S IMPACT ON RURAL AND URBAN AREAS

Tuesday December 19 2023 3:12 P.M

Firstly, what are rural and urban areas? Rural areas are the population living in towns and villages outside of the scaled down zone of larger urban areas/centres. Urban areas are mostly places with a population of 5,000. Rural areas are usually towns and villages and urban areas are places like the suburbs, cities and towns. Now that we know what rural areas and urban areas are, let's take a look at the pollution's impact on them. Pollution's impact on rural areas can be pretty harsh, things like hay fever, irritation on the eye, irritation on the nose, irritation in the throat, asthma and other allergy related diseases, these are the effects of the pollution spread in rural areas. Pollution's effect on urban areas are things like the risk of heart stroke, heart disease, lung cancer, respiratory diseases and asthma. Pollution makes a bigger impact on urban areas than rural areas because urban areas are more populated and pollution spreads aggressively in populated areas more than it can in minor populated areas. This is a huge risk for the environment and especially for urban areas because pollution has a brutal impact for harshly populated areas.

POLLUTION'S IMPACT ON URBAN AND RURAL AREAS:

<https://byjus.com/free-ias-prep/difference-between-urban-and-rural/>

POLLUTION'S IMPACT ON URBAN AND RURAL AREAS:

<https://www.un.org/sustainabledevelopment/blog/2016/05/un-health-agency-warns-of-rise-in-urban-air-pollution-with-poorest-cities-most-at-risk/>

POLLUTION'S IMPACT ON URBAN AND RURAL AREAS:

<https://www150.statcan.gc.ca/n1/pub/21-006-x/21-006-x2001003-eng.pdf>

POLLUTION'S IMPACT ON URBAN AND RURAL AREAS:

<https://www.intechopen.com/chapters/16341>

Tuesday December 19 2023 5:56 P.M

HOW DOES POLLUTION AFFECT MARINE LIFE?

In “dead” zones there is a huge shortage for oxygen and all marine life lives and struggles in these zones. Since there is so much unwanted plastic/garbage, 1.3% million ends up in the ocean and other bodies of water which causes marine life to suffer in ways that they get tangled up in the plastic, ingest it and suffocate because of it which threatens the population. Most of the deaths are caused because of humans, some examples are habitat destruction, oil spills, overfishing and littering. This pollution can brutally harm the marine food chain which can result in harming human health too. Since pollution has gotten so absurd, water has slowly become acidic and more CO₂ has been sucked into the ocean than usual. Since pollution has gotten so bad in the ocean, we have over 500 “dead” zones where no marine life can live because it’s way too polluted and dangerous. Marine life can be affected by various things but 1 million marine life has been lost because of pollution per year. It is also currently measured that there is 100 million tons of plastic all throughout the world.

HOW DOES POLLUTION AFFECT MARINE LIFE?:

<https://www.pewtrusts.org/en/research-and-analysis/articles/2018/09/24/plastic-pollution-affects-sea-life-throughout-the-ocean#:~:text=It%20is%20estimated%20that%20up,suffocation%2C%20starvation%2C%20and%20drownin>

g.

HOW DOES POLLUTION AFFECT MARINE LIFE?

<https://oceanconservationtrust.org/ocean-advocacy/think-ocean/ways-to-think-ocean/>

HOW DOES POLLUTION AFFECT MARINE LIFE?:

<https://www.coursesidekick.com/health-science/2934448#:~:text=Plastics%20can%20release%20a%20variety,posing%20risks%20to%20human%20health.>

HOW

DOES POLLUTION AFFECT MARINE LIFE?:

<https://www.natgeokids.com/uk/kids-club/cool-kids/general-kids-club/plastic-in-the-ocean/#:~:text=The%20ocean%20has%20always%20sucked,coral%20to%20grow%20their%20shells.>

HOW

DOES POLLUTION AFFECT MARINE LIFE?:

<https://www.condorferries.co.uk/marine-ocean-pollution-statistics-facts#:~:text=Almost%201%2C000%20species%20of%20marine,where%20marine%20life%20cannot%20exist.>

HOW

DOES POLLUTION AFFECT MARINE LIFE?:

<https://conserveturtles.org/information-sea-turtles-threats-marine-debris/#:~:text=The%20Problem%3A%20Over%201%20million,in%20oceans%20around%20the%20world.>

HOW DOES POLLUTION AFFECT MARINE LIFE?:

<https://www.twinkl.com.au/teaching-wiki/ocean-pollution#:~:text=There%20are%20various%20dead%20zones,then%20eaten%20by%20larger%20animals.>

Monday, December 18 2023 4:23 P.M

MATERIALS AND PROCEDURE -----

Pollution has been discovered for a long time and has been increasing since the mid 19 century. Throughout the increase of pollution, humans were one of the reasons for how much pollution has escalated between years.

Since pollution has increased so much, people have come up with ways to minimise and stop pollution, these are some examples, decrease the use of ballone, when you're fishing double check that you don't leave any fish nets or lines in the water, always keep your eyes peeled and look for trash from the beach and pick it up, use reusable water bottles, participating in community clean ups, switch to non plastic resources, decrease the amount of plastic you use in your life, avoid items with "pesticides", try using sustainable transportation choices when possible (ones that aren't too loud and expose less smoke),considering a electric vehicle, always turn of light when you are not using them, taking out plugs that are not in use (energy saving), grow your own fruits and vegetables, try to buy food from local markets and buy reusable resources.

MATERIALS AND PROCEDURE -----

Materials:

- water
- soil
- pollution (litter, dirty things; leaves, dirt, plastic etc..)
- 2 containers (with lids)

Procedure:

Step 1. Collect garbage, litter, dirt, plastic, leaves etc..

Step 2. Collect water and soil.

Step 4. Put water, soil and garbage (litter, dirty things; leaves, dirt, plastic etc..) in 2 separate containers. I will put all 3 containers outside for a more realistic experiment.

Step 5. Observe every day for one week on a piece of paper using a

data chart.

February 1, 2024 10:59 P.M

POLLUTION	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6
Did anything change? (yes/very less/no)	very less	yes	no	no	yes	yes
If it did change how?	The water has only changed a tiny bit, it has become brown & dirty after the snow melted (polluted).	The water became a little grey and it looks clear, the dirty particles have also reached the bottom. On the soil it only looks like there was steam on the sides of the container.	There was no difference.	There was no difference.	The water looks more clear. The soil's compost has blended in the soil and it isn't quite visible anymore.	The water looked like normal water (cleaned) but you can see the dirt on the bottom (a layer of dirt). The soil has started to grow mould and fungus.

This was my observation data chart.

Thursday, February 1, 2024 4:13 P.M

EXPERIMENT DAY 1

Today I started my experiment. I put dirty snow (snow that has been polluted) in my water and soil containers, with my soil container I also put in compost. Today I already saw a difference, water: the water has already become brown and disgusting, soil: I haven't seen much of a difference so far but i have realised the top layer of my soil has become dirty looking and it doesn't quite look like soil.

EXPERIMENT DAY 2

Friday, February 2, 2024 5:29 P.M

Today when I was observing, I realised that the water became a little grey and it looks clear, I also noticed that the particles and dirt from the snow has gotten to the bottom. With the soil I didn't notice a big difference, I did see that it kind of looked like steam covered the inside of the container though.

Saturday, February 3, 2024 9:23 P.M

EXPERIMENT DAY 3

Today when I was observing, I didn't notice a difference but the water looked clear. I also noticed that the particles and dirt from the snow has gotten to the bottom. With the soil I didn't notice a big difference, I did see that it kind of looked like steam covered the inside of the container again.

Sunday, February 4, 2024 6:34 P.M

EXPERIMENT DAY 4

Today when I was observing, I didn't notice a difference but the water looks clean but when you look from the top you can see all the particles. With the soil I didn't notice a big difference and it looked the same.

Monday, February 5, 2024 6:46 P.M

EXPERIMENT DAY 5

Today when I was observing, I didn't notice a huge difference. I did realise that the water looks more clear, I also noticed that the particles and dirt from the snow has gotten to the bottom. With the soil, I realised that the compost in it has basically blended into the soil and it isn't really visible anymore.

Tuesday, February 6, 2024 8:45 P.M

EXPERIMENT DAY 6

Today when I was observing, I noticed that the water looked like real water (cleaned) but when I looked on the top I could see the particles from the snow. With the soil, I realised that the compost in it has basically blended into the soil and it isn't really visible anymore, I also noticed that the soil has started to grow mould and fungus.

Thursday, February 8, 2024 10:17 P.M

CONCLUSION

I started my conclusion because I was done with my experiment. My conclusion: Every kind of pollution leaves a brutal impact on our environment, people and animals. As a society, we must take steps to help reduce pollution because it's only getting worse and worse throughout the years. Pollution is a great topic and that's why I decided to continue it.

My hypothesis was half right, I wasn't right about the water having bugs or turning brown because it was clear and only the bottom was brown because it had all the dirt. For the soil I was correct because it did become crusty and toxic but it also had fungus and mould. For my experiment, I think I could've done an air experiment too, to have a better and improved experiment but overall I think my experiment was good and better than my last year's continuation.

Saturday, February 10, 2024 10:17 P.M

TRIFOLD

I got my trifold and started building it.

