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To help you plan your year 7 geography lesson on: Causes of climate change, download all teaching resources for free and adapt to suit your pupils' needs.The starter quiz will activate and check your pupils' prior knowledge, with versions available both with and without answers in PDF format.We use learning cycles to break down learning into key concepts or ideas linked to the learning outcome. Each learning cycle features explanations with checks for understanding and practice tasks with feedback. All of this is found in our slide decks, ready for you to download and edit. The practice tasks are also available as printable worksheets and some lessons have additional materials with extra material you might need for teaching the lesson.The assessment exit quiz will test your pupils' understanding of the key learning points.Our video is a tool for planning, showing how other teachers might teach the lesson, offering helpful tips, modelled explanations and inspiration for your own delivery in the classroom. Plus, you can set it as homework or revision for pupils and keep their learning on track by sharing an online pupil version of this lesson.Explore more key stage 3 geography lessons from the Weather and climate: how do they vary? unit, dive into the full secondary geography curriculum, or learn more about lesson planning. Climate change is primarily caused by human activities and natural factors. Here are some key causes: Greenhouse Gas Emissions: Burning fossil fuels like coal, oil, and natural gas for energy releases carbon dioxide ($CO_2$) and other greenhouse gases into the atmosphere. These gases trap heat, leading to a warming effect known as the greenhouse effect. Deforestation: Trees absorb $CO_2$, so cutting them down reduces the Earth's capacity to remove this gas from the atmosphere. This contributes to higher $CO_2$ levels. Industrial Processes: Factories and industries release various greenhouse gases, including methane ($CH_4$) and nitrous oxide ($N_2O$), which contribute to climate change. Agriculture: Farming activities, especially livestock production, release methane and nitrous oxide. Fertilizers and manure management also contribute to greenhouse gas emissions. Natural Factors: Volcanic eruptions and variations in solar radiation can influence the climate, but these are not the main drivers of the current changes. Land Use Changes: Urbanization and changes in land use can affect local climates and contribute to global climate change. Understanding these causes helps us find ways to reduce our impact on the climate and work towards a more sustainable future. Analogy / Example default for all languages English current rise in Earth's average temperature and related large-scale shifts in weather patterns due to man-made gasocrine processes. anthropogenic global warmingglobal heatingclimate warmingclimate change The greenhouse effect is essential to life on Earth, but human-made emissions in the atmosphere are trapping and slowing heat loss to space. Five key greenhouse gases are carbon dioxide, nitrous oxide, methane, chlorofluorocarbons, and water vapor. While the Sun has played a role in past climate changes, the evidence shows the current warming cannot be explained by the Sun. Scientists attribute the global warming trend observed since the mid-20th century to the human expansion of the "greenhouse effect"1 — warming that results when the atmosphere traps heat radiating from Earth toward space. Life on Earth depends on energy coming from the Sun. About half the light energy reaching Earth's atmosphere passes through the air and clouds to the surface, where it is absorbed and radiated in the form of infrared heat. About 90% of this heat is then absorbed by greenhouse gases and re-radiated, slowing heat loss to space. FEEDBACKS: A process where something is either amplified or reduced as time goes on, such as water vapor increasing as Earth warms leading to even more warming. Over the last century, burning of fossil fuels like coal and oil has increased the concentration of atmospheric carbon dioxide (CO2). This increase happens because the coal or oil burning process combines carbon with oxygen in the air to make CO2. To a lesser extent, clearing of land for agriculture, industry, and other human activities has increased concentrations of greenhouse gases. The industrial activities that our modern civilization depends upon have raised atmospheric carbon dioxide levels by nearly 50% since 17502. This increase is due to human activities, because scientists can see a distinctive isotopic fingerprint in the atmosphere. In its Sixth Assessment Report, the Intergovernmental Panel on Climate Change, composed of scientific experts from countries all over the world, concluded that it is unequivocal that the increase of CO2, methane, and nitrous oxide in the atmosphere over the industrial era is the result of human activities and that human influence is the principal driver of many changes observed across the atmosphere, ocean, cryosphere and biosphere. The panel's AR6 Working Group I (WGI) Summary for Policymakers report is online at . Scientists use a metric called Total Solar Irradiance (TSI) to measure the changes in energy the Earth receives from the Sun. TSI incorporates the 11-year solar cycle and solar flares/storms from the Sun's surface. Studies show that solar variability has played a role in past climate changes. For example, a decrease in solar activity coupled with increased volcanic activity helped trigger the Little Ice Age. But several lines of evidence show that current global warming cannot be explained by changes in energy from the Sun: Since 1750, the average amount of energy from the Sun either remained constant or decreased slightly3. If a more active Sun caused the warming, scientists would expect warmer temperatures in all layers of the atmosphere. Instead, they have observed a cooling in the upper atmosphere and a warming at the surface and lower parts of the atmosphere. That's because greenhouse gases are slowing heat loss from the lower atmosphere. Climate models that include solar irradiance changes can’t reproduce the observed temperature trend over the past century or more without including a rise in greenhouse gases. IPCC 6th Assessment Report, WG1, Technical Summary, Sections TS.1.2, TS.2.1 and TS.3.1 Header image credit: Pixabay/stevepb Four Major Gases image credit: Adobe Stock/Ilya Glovatskiy Enjoy sharper detail, more accurate color, lifelike lighting, believable backgrounds, and more with our new model update. Your generated images will be more polished than ever.See What's NewExplore how consumers want to see climate stories told today, and what that means for your visuals.Download Our Latest VisualGPS ReportData-backed trends. Generative AI demos. Answers to your usage rights questions. Our original video podcast covers it all—now on demand.Watch NowEnjoy sharper detail, more accurate color, lifelike lighting, believable backgrounds, and more with our new model update. Your generated images will be more polished than ever.See What's NewExplore how consumers want to see climate stories told today, and what that means for your visuals.Download Our Latest VisualGPS ReportData-backed trends. Generative AI demos. Answers to your usage rights questions. Our original video podcast covers it all—now on demand.Watch NowEnjoy sharper detail, more accurate color, lifelike lighting, believable backgrounds, and more with our new model update. Your generated images will be more polished than ever.See What's NewExplore how consumers want to see climate stories told today, and what that means for your visuals.Download Our Latest VisualGPS ReportData-backed trends. Generative AI demos. Answers to your usage rights questions. Our original video podcast covers it all—now on demand.Watch Now The causes of climate changeAsked on 12/20/2024, 2 pageviewsClimate change is primarily driven by a combination of natural processes and human activities. Here are some of the key causes: ### 1. **Greenhouse Gas Emissions** - **Carbon Dioxide (CO2)**: Released from burning fossil fuels (coal, oil, and natural gas) for energy, transportation, and industry. - **Methane (CH4)**: Emitted during the production and transport of coal, oil, and natural gas, as well as from livestock, agricultural practices, and landfills. - **Nitrous Oxide (N2O)**: Released from agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. - **Fluorinated Gases**: Synthetic gases with a high global warming potential, used in various industrial applications. ### 2. **Deforestation** - Trees absorb CO2, and when forests are cleared for agriculture, urban development, or logging, not only is this carbon storage capacity reduced, but CO2 is also released back into the atmosphere. ### 3. **Agricultural Practices** - Certain agricultural practices release greenhouse gases, including methane from ruminant animals and rice paddies, and nitrous oxide from fertilized soils. ### 4. **Industrial Processes** - Various industrial activities produce greenhouse gases and other pollutants that can contribute to climate change. ### 5. **Land Use Changes** - Changes in land use, such as urbanization and agricultural expansion, can alter the natural carbon cycle and lead to increased emissions and reduced carbon sequestration. ### 6. **Waste Management** - Decomposition of organic waste in landfills produces methane. Inefficient waste management practices can exacerbate these emissions. ### 7. **Energy Production and Consumption** - The production and consumption of energy from fossil fuels are the largest single source of global greenhouse gas emissions. ### 8. **Natural Causes** - While human activities are the dominant cause of climate change, natural phenomena such as volcanic eruptions or variations in solar radiation can also impact the climate, albeit generally to a lesser extent in the context of recent climate change. ### 9. **Ocean Acidification** - Increased levels of CO2 in the atmosphere are absorbed by oceans, leading to acidification that can disrupt marine ecosystems, which also plays a role in the broader context of climate change. Addressing climate change requires a multifaceted approach, including reducing greenhouse gas emissions, protecting and restoring forests, improving agricultural techniques, transitioning to renewable energy sources, and enhancing energy efficiency across all sectors.Second Answer Climate change is primarily driven by various factors, both natural and human-induced. Here are the key causes: ### Natural Causes: 1. **Volcanic Activity**: Eruptions can release large amounts of ash and sulfur dioxide into the atmosphere, temporarily cooling the Earth. 2. **Solar Variations**: Changes in the sun's energy output can influence the Earth's climate over long periods. 3. **Earth's Orbital Changes**: Natural cycles in the Earth’s tilt, rotation, and orbit (Milankovitch cycles) can lead to climatic shifts over tens of thousands of years. 4. **Ocean Currents**: Variations in ocean currents can impact global climate patterns by altering heat distribution in the oceans. ### Human Causes: 1. **Greenhouse Gas Emissions**: The burning of fossil fuels (coal, oil, natural gas) for energy, transportation, and industry releases carbon dioxide (CO2) and other greenhouse gases (methane, nitrous oxide) into the atmosphere, enhancing the greenhouse effect and causing global warming. 2. **Deforestation**: The clearing of forests for agriculture, logging, and urban development reduces the number of trees that can absorb CO2, contributing to increased atmospheric CO2 levels. 3. **Industrial Processes**: Certain manufacturing processes release greenhouse gases and other pollutants that can have a warming effect. 4. **Agricultural Practices**: Livestock production emits methane, and the use of fertilizers can release nitrous oxide, both potent greenhouse gases. 5. **Waste Management**: Landfills and waste treatment processes can produce methane as organic waste decomposes. ### Feedback Mechanisms: - **Ice Melt**: As ice caps and glaciers melt, they reduce the Earth’s albedo (reflectivity), leading to more heat absorption and further warming. - **Permafrost Thawing**: The thawing of permafrost can release stored greenhouse gases, adding to atmospheric concentrations and exacerbating climate change. ### Conclusion: While natural processes contribute to climate variability, the overwhelming scientific consensus is that human activities are the primary driver of the current phase of climate change, particularly since the Industrial Revolution. Addressing these human-induced factors is crucial for mitigating climate change and its impacts.Ask Another QuestionLoading... The greenhouse effect is essential to life on Earth, but human-made emissions in the atmosphere are trapping and slowing heat loss to space. Five key greenhouse gases are carbon dioxide, nitrous oxide, methane, chlorofluorocarbons, and water vapor. While the Sun has played a role in past climate changes, the evidence shows the current warming cannot be explained by the Sun. Scientists attribute the global warming trend observed since the mid-20th century to the human expansion of the "greenhouse effect"1 — warming that results when the atmosphere traps heat radiating from Earth toward space. Life on Earth depends on energy coming from the Sun. About half the light energy reaching Earth's atmosphere passes through the air and clouds to the surface, where it is absorbed and radiated in the form of infrared heat. 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In its Sixth Assessment Report, the Intergovernmental Panel on Climate Change, composed of scientific experts from countries all over the world, concluded that it is unequivocal that the increase of CO2, methane, and nitrous oxide in the atmosphere over the industrial era is the result of human activities and that human influence is the principal driver of many changes observed across the atmosphere, ocean, cryosphere and biosphere. The panel's AR6 Working Group I (WGI) Summary for Policymakers report is online at . Scientists use a metric called Total Solar Irradiance (TSI) to measure the changes in energy the Earth receives from the Sun. TSI incorporates the 11-year solar cycle and solar flares/storms from the Sun's surface. Studies show that solar variability has played a role in past climate changes. For example, a decrease in solar activity coupled with increased volcanic activity helped trigger the Little Ice Age. But several lines of evidence show that current global warming cannot be explained by changes in energy from the Sun: Since 1750, the average amount of energy from the Sun either remained constant or decreased slightly3. If a more active Sun caused the warming, scientists would expect warmer temperatures in all layers of the atmosphere. Instead, they have observed a cooling in the upper atmosphere and a warming at the surface and lower parts of the atmosphere. That's because greenhouse gases are slowing heat loss from the lower atmosphere. Climate models that include solar irradiance changes can’t reproduce the observed temperature trend over the past century or more without including a rise in greenhouse gases. IPCC 6th Assessment Report, WG1, Technical Summary, Sections TS.1.2, TS.2.1 and TS.3.1 Header image credit: Pixabay/stevepb Four Major Gases image credit: Adobe Stock/Ilya Glovatskiy 0 ratings0% found this document useful (0 votes)458 views3 pagesOverfishing, industrialization, farming, consumerism, transportation, oil drilling, power plants, waste, deforestation, and the use of oil and gases are 10 causes of climate change according...AI-enhanced title and descriptionSaveSave Causes of Climate Changes- Answer Key For Later0%0% found this document useful, undefined0 ratings0% found this document useful (0 votes)458 views3 pagesOverfishing, industrialization, farming, consumerism, transportation, oil drilling, power plants, waste, deforestation, and the use of oil and gases are 10 causes of climate change according to the document. These human activities pollute the environment, release greenhouse gases such as carbon dioxide and methane into the atmosphere, destroy forests that absorb carbon dioxide, and contribute to global warming.0 ratings0% found this document useful (0 votes)458 views3 pagesOverfishing, industrialization, farming, consumerism, transportation, oil drilling, power plants, waste, deforestation, and the use of oil and gases are 10 causes of climate change according...AI-enhanced title and description CAUSES OF CLIMATE CHANGES There are 10 causes or climate change Due to the amount of people buying and consuming fish, there isnow a reduced amount of marine life. Overfishing has also caused alack of diversity within the ocean. The waste this industry produces all ends up in landfills, or in oursurrounding environment. The chemicals and materials used withinindustrialisation can not only pollute the atmosphere but also the soilunderneath it. Farming takes up a lot of green space meaning localenvironments can be destroyed to create space for farming.These animals produce a lot of greenhouse gases for examplemethane, as well as this they also produce an extreme amountof waste. Due to the innovations in technology and manufacturingcustomers are able to purchase any product at any time. Mostitems we purchase aren't very sustainable, and because of thereduced lifetime of electronics and clothing items, we arecreating more waste than ever. Burning fossil fuels releases carbon and other types of pollutants into the atmosphere. This makes transportationpartly responsible for the greenhouse gases. This effect couldbe reduced with the introduction of electric vehicles. fuels to operate, due to this they produce a variety of differentpollutants. The pollution they Oil drilling is responsible for 30% of the methane populationand around 8% carbon dioxide pollution. Oil drilling is used tocollect petroleum oil hydrocarbons in this process other gasesare released into the atmosphere, which contribute to climatechange. Power plants burn fossil produce not only ends up in theatmosphere but also in the water ways, this largely contributesto global warming. A lot of items, waste and packaging isn’t recyclable, whichmeans it ends up in landfills. When the waste in landfills beginsto decompose/break down it releases harmful gases into theatmosphere which contribute to global warming. Trees and forests turn carbon dioxide into oxygen, so when they arecleared like the stored carbon is then released into the environment.Deforestation can also occur naturally which has a greater effectbecause of the fumes released from the fire. Oil and Gas is used all the time in almost every industry. It is used themost in vehicles, buildings, production and to produceelectricity. When we burn coal, oil and gases it largely adds to theclimate problem. Burning oil releases carbon dioxide into theatmosphere, contributing to the warming of our planet. The use of fossil fuels is also a threat to wildlife and the surroundingenvironments, because of the toxicity it kills off plant life and leavesareas uninhabitable.