Greenhouse gases and global warming worksheet

Since greenhouses use the sun to create a warm environment for plants, when the temperature drops, there is less sun generation of heat in the greenhouse. For plants that need more heat than greenhouses can provide naturally, heating is needed to make a difference. Greenhouses are divided into categories based on how much additional heat they need to produce to keep plants at a certain temperature. Cold houses and cold frames: Cold houses provide protection for plants, but internal temperatures can still dip below freezing in winter as they do not have additional heat sources. Cold houses can help start the early spring crop a few weeks and prolong the growing season in autumn, but they are limited by the weather. Cool homes: Warmer cold homes, cooler homes keep plants on freezing and in a temperature range from 45 to 50 degrees Fahrenheit (7 to 10 degrees Celsius) [source: Britannica Online Encyclopedia]. Keeping temperatures above freezing will protect frost-sensitive plants, such as geraniums and tbiscus flowers, which will not be able to keep year-round in areas with freezing temperatures. Warm homes: A warm home will allow a wider range of plants, but requires slightly warmer temperatures too, around 55 degrees Fahrenheit (13 degrees Celsius). Although the temperature range does not support many tropical plants, some orchid and fern varieties can pass winter in a warm home environment. Hot homes: These greenhouses are designed to house tropical plants such as caladium, dieffenbachia and gardenia, which need a temperature range of 60 degrees Fahrenheit (15.5 degrees Celsius) and higher. They require the most additional heat and insulation and can be expensive to maintain. Music Hall: The Academy is designed to show plants, not just maintain and propagate them. They often have finished floors, ornate window treatments and space for furniture. Greenhouse windows and small table greenhouses are also considered greenhouses because they are used mainly for display. In the next section, we'll look at some interesting styles of greenhouses, and you can see if any will work for your house. This site is not available in your country Hanh mitakuyapi. Recently, I have seen many letters to editors and articles on various Internet boards asking for evidence that global warming is real. To me, the definitive evidence of the reality - and the ausp inspired danger - of global warming is photography. Specifically, satellite imagery of polar ice caps. Moreover, because 'proof' is photography, it is indisputable. Before any of you start screaming about the possibility that the photos are tampered with, let's ask, how would it benefit anyone to tamper with satellite imagery? The answer is, it won't. Hechetu ye - End of discussion. At least that. you visit the National Oceanic and Atmospheric Administration's website, www.noaa.gov, you can click on the polar ice cap image in the menu. There you'll see things like the January 2008 image of the arctic ice cap, and comparing them to January images going back quite a lot of years - and you'll see that in January 2008, there were 40 miles of open water where in the very recent past, there were 40 miles of polar ice packs. Polar ice packs are where polar bears hunt seals. Polar bears are strong swimmers, but no one can regularly swim 40 miles for a meal. The polar ice pack image will prove that over time, the polar ice bags have been shrinking. This is the most basic evidence of global warming, and the most un-nerving. If it is warm enough that seawater does not freeze at the poles, how much warmer must it be in the south of that? Average winter temperatures at the poles are usually in the -50F range - with no wind and wind chill related factors. Seawater freezing below +32F, we used to get down here in 48 lower states, but not all that much. However, even if seawater freezes at +32F like fresh water, the temperature increase from -50F to +32F is a whopping 82 degrees Fahrenheit!! Anyone who wanted more evidence than that was a fool and an arrogant self-centered greed at the time. Hechetu ye. End of discussion. The globe is warming. Both the mainland and the ocean are now warmer than when record keeping began, in 1880, and temperatures are still rising. This increase in heat is global warming, in short. Here are the naked figures, according to the National Oceanic and Atmospheric Administration (NOAA): From 1880 to 1980, global annual temperatures rose at an average rate of 0.13 degrees Fahrenheit (0.07 degrees Celsius) per decade. Since 1981, the rate of increase has increased, to 0.32 degrees Fahrenheit (0.18 degrees Celsius) per decade. This has led to an increase in the global average temperature of 3.6 degrees Fahrenheit (2 degrees Celsius) compared to the pre-industrial period. In 2019, the global average temperature on land and oceans was 1.75 degrees Fahrenheit (0.95 degrees Celsius) above the 20th century average. That makes 2019 the second hottest year on record, after only 2016. This increase in heat is caused by humans. The burning of fossil fuels has released greenhouse gases into the atmosphere, trapping warmth from the sun and pushing up surface and air temperatures. How the greenhouse plays a roleThe main motivation of today's warming is the burning of fossil fuels. These hydrocarbons heat the planet through a greenhouse effect, which is caused by the interaction between the Earth's atmosphere and radiation coming from the sun. The basic physics of greenhouses were discovered more than a hundred years ago by a smart guy using only pencils and paper, said Josef Werne, a professor of geography and environment at the University of Pittsburgh, told Live Science.That smart guy is Svante Arrhenius, a Swedish scientist and event last Nobel Prize winner. Simply put, solar radiation hits the Earth's surface and then bounces toward the atmosphere like heat. The gas in the atmosphere traps this heat, preventing it from escaping into the void of space (good news for life on the planet). In a paper presented in 1895, Arrhenius found that greenhouse gases such as carbon dioxide can trap heat near the Earth's surface, and that small changes in that amount of gas can make a big difference in the amount of heat trapped. Where the greenhouse gases came from since the beginning of the industrial revolution, humans have quickly changed the balance of gases in the atmosphere. Burning fossil fuels such as coal and oil releases steam, carbon dioxide (CO_2), methane (CH_4), ozone and nitrous oxide (N_2O), the main greenhouse gases. Carbon dioxide is the most common greenhouse gas. Between about 800,000 years ago and the beginning of the industrial revolution, the presence of CO_2 in the atmosphere reached about 280 parts per million (ppm, which means that there are about 208 CO_2 molecules in the air per million air molecules). As of 2018 (the last year when there is full data), the average CO_2 in the atmosphere is 407.4 ppm, according to the National Center for Environmental Information. That may not sound like much, but according to the Scripps Oceanolytic Institute, co2 concentrations have not been so high since the Pliocene, which occurred between 3 million and 5 million years ago. At the time, the Arctic had no ice for at least part of the year and was significantly warmer than it is today, according to a 2013 study published in the journal Science. In 2016, CO_2 accounted for 81.6% of total U.S. greenhouse gas emissions, according to analysis from the Environmental Protection Agency (EPA). We know through highly accurate instrument measurements that there is an unprecedented increase in CO_2 in the atmosphere. We know that CO_2 absorbs infrared radiation [heat] and global average temperatures are rising, Keith Peterman, a chemistry professor at York University of Pennsylvania, and his research partner, Gregory Foy, an associate professor of chemistry at York University in Pennsylvania, told Live Science in a joint email. CO_2 enters the atmosphere through various routes. Burning fossil fuels release CO_2 and is, by far, the largest U.S. contribution to that global warming emissions. According to the 2018 EPA report, U.S. fossil fuel combustion, including electricity emissions, released just over 5.8 billion tons of CO_2 into the atmosphere in 2016. Other processes - such as unnecessary fuel use, iron and steel production, cement production and waste burning - increased the total Co_2 emissions in the United States amount to 7 billion tons (6.5 billion tons). Deforestation is also a major contributor to excess CO_2 in the atmosphere. In fact, deforestation is the second largest source of artificial (man-made) carbon dioxide, according to research published by Duke University. After the plants die, they release the carbon they stored during photothesy. According to a 2010 global forest resource assessment, deforestation releases nearly a billion tons of carbon into the atmosphere each year. Globally, methane is the second most common greenhouse gas, but it is the most effective in heat trapping. The EPA reports that methane is 25 times more efficient at heat traps than carbon dioxide. In 2016, the gas accounted for about 10 percent of total U.S. greenhouse gas emissions, according to the EPA. Methane is the second most abundant and persistent greenhouse gas. Cattle form the largest source of methane production. (Photo credit: Shutterstock) Methane may come from many natural sources, but humans cause a large portion of methane emissions through mining, the use of natural gas, mass breeding and the use of landfills. Cattle form the largest source of methane gas in the United States, according to the EPA, with animals producing nearly 26% of total methane emissions. There are some hopeful trends in the number of U.S. greenhouse gas emissions. According to the 2018 EPA report, this emissions increased by 2.4% between 1990 and 2016 but decreased by 1.9% between 2015 and 2016.Part of that decline was driven by a warm winter in 2016, which required less heating fuel than usual. But another important reason for this recent decline is the replacement of coal with natural gas, according to the Center for Climate and Energy Solutions. The United States is also transitioning from a production-based economy to a less carbon-less service economy. Fuel-efficient vehicles and energy-saving standards for buildings have also improved emissions, according to the EPA. The effects of global warmingGlobal warming don't just mean warming, which is why climate change has become the preferred term among researchers and policymakers. While the globe is becoming hotter than average, this temperature increase can have paradoxical effects, such as more frequent and severe blizzards. Climate change can and will affect the globe in many big ways: by melting ice, by drying out already arid areas, by causing weather extremes and by disrupting the delicate balance of the oceans. Melting Ice The most obvious impact of climate change to date is the melting of glaciers and sea ice. The ice has retreated since the end of the last ice age, about 11,700 years ago, but the warming of the last century has accelerated their demise. A 2016 study 99% of the likelihood that global warming has caused of glaciers; In fact, research shows, these glaciers retreat 10-15 times the distance they would have if the climate had stayed stable. Glacier National Park in Montana had 150 glaciers in the late 1800s. Today, it has 26. The loss of glaciers can cause the loss of human life, when ice dams retain unstable glacier lakes and ruptures or when avalanches caused by villages bury unstable ice. In the Arctic, warming is progressing twice as fast as in mid latitudes, and sea ice is showing stress. Arctic autumn and winter ice reached record lows in both 2015 and 2016, meaning extended ice did not cover much of the open sea as previously observed. According to NASA, the 13 smallest values for the maximum level of sea ice in the Arctic have been measured in the past 13 years. Ice also forms at the end of the season and melts more easily in spring. According to the National Snow and Ice Data Center, January sea ice levels have fallen by 3.15% per decade over the past 40 years. Some scientists think the Arctic Ocean will see ice-no summer within 20 or 30 years. In Antarctica, the picture was a little less clear. The West Antarctic Peninsula is warming faster than anywhere other than some parts of the Arctic, according to the Antarctic and Antarctic Alliance. Now, scientists say a quarter of West Antarctic ice is at risk of collapse and giant thwaites and Pine Island glaciers are flowing five times faster than they did in 1992.The sea ice off Antarctica is extremely variable, though, and some areas have actually reached record highs in recent years. However, these records can carry the fingerprints of climate change, as they may be the result of land ice moving out to sea as glaciers melt or from changes related to warming to wind. However, in 2017, this record high ice pattern abruptly reversed, with the arrival of record lows. On March 3, 2017, Antarctic sea ice was measured at 71,000 square miles (184,000 square kilometers) less than the previous low, since 1997. Heating upGlobal warming will change everything between the poles, too. Many already dry areas are expected to become drier as the world warms. The southwestern and central allies of the United States, for example, are expected to experience decades-long megadroughts harsher than anything else in human memory. The future of drought in western North America is likely to be worse than anyone has ever experienced in U.S. history, said Benjamin Cook, a climate scientist at NASA's Goddard Institute for Space Studies in New York City who published the study in 2015 showing these droughts , told Live Science. These are droughts far beyond our modern experience they are almost unthtymable. The study predicted an 85% risk of a drought lasting at least 35 years in the region by 2100. The main driver, the researchers found, was the increasing evaporation of water from hotter and hotter soils. Much of the precipitation that falls in these arid regions will be lost. Meanwhile, a 2014 study found that many areas will likely see less rainfall as the climate warms. Subtropical regions, including the Mediterranean, Amazon, Central America and Indonesia, are likely to be hardest hit, research suggests, while South Africa, Mexico, western Australia and California will also dry out. Extreme weatherM radiates another impact of global warming: extreme weather. Hurricanes and hurricanes are expected to become more intense as the planet warms. The hotter oceans evaporate more moisture, which is the engine that drives these storms. The United Nations Inter-Governmental Council on Climate Change (IPCC) predicts that even as the world diversifies energy sources and transitions to a less fossil fuel-consuming economy (known as the A1B scenario), tropical storms are likely to be up to 11% stronger on average. That means more damage to wind and water on the vulnerable coast. The climate change paradox can also cause extreme blizzards more often. According to the National Center for Environmental Information, extreme blizzards in the eastern United States have become twice as common as in the early 1900s. Here again, this change comes because warming ocean temperatures lead to increased humidity evaporation into the atmosphere. This humidity powers storms that hit the continental United States.Ocean disruptionM some of the most immediate effects of global warming are beneath the waves. Oceans act as carbon tanks, which means they absorb dissolved carbon dioxide. That's not a bad thing for the atmosphere, but it's not great for marine ecosystems. When carbon dioxide reacts with seawater, the pH of water decreases (that is, it becomes more acidic), a process known as ocean acidification. This increased acidity eats away calcium carbonate shells and skeletons on which many oceanic organisms depend on survival. These creatures include shellfish, pteropods and corals, according to NOAA. Corals, in particular, are canaries in a coal mine for climate change in the oceans. Marine scientists have observed alarming levels of coral bleaching, events in which corals expel algae that provide corals with nutrients and give them their vivid colors. Bleaching occurs when corals are stressed, and stressors can include high temperatures. In 2016 and 2017, Australia's Great Barrier Reef experienced continuous bleaching events. Corals may survive bleaching, but repeated bleaching events make survival less and less likely. One of the most visible effects global warming is the prevalena of corals (Photo credit: Shutterstock) There is not an overwhelming scientific consensus on the causes and reality of global warming, the issue is politically controversial. For example, deniers of climate change have argued that warming slowed between 1998 and 2012, a phenomenon known as climate change disruption. Unfortunately for the planet, disruption never happened. Two studies, one published in the journal Science in 2015 and one published in 2017 in the journal Science Advances, re-analyzed ocean temperature data showing a slowdown in warming and found that it was just a measurement error. Between the 1950s and 1990s, most ocean temperature measurements were taken on research vessels. Water will be pumped into the pipe through the engine room, which ends up heating the water a bit. After the 1990s, scientists began using ocean float-based systems, more precisely, to measure ocean temperatures. The problem came because no one corrected the change in measurements between boats and buoys. Those adjustments showed that the oceans warmed by an average of 0.22 degrees Fahrenheit (0.12 degrees Celsius) per decade since 2000, nearly twice as fast as the previous estimate of 0.12 degrees Fahrenheit (0.07 degrees Celsius) per decade. Rapid global warming According to NASA: Atmospheric carbon dioxide concentrations are 412 ppm by 2020, the highest level in 650,000 years. The global average temperature has risen by 1.9 degrees Fahrenheit (3.4 degrees Celsius) since 1880.The minimum expansion of Arctic summer sea ice has fallen by 12.85% every decade since satellite measurements began, In 1979.Land ice has fallen at poles of 413 gigatons a year since 2002.Global sea levels have risen by 7 inches (176 mm) over the past century. Additional resources: resources: