

Grade 8				
Ch. 9 Lesson 2				
Earth and Space Science				
Page #	Question	Answer(s)	Links/Sources	Student Resources
332	Would you classify land as a renewable or nonrenewable resource?	*Sample answer: Land is a nonrenewable because there is only so much land on Earth.		
332	Why do you think the world population grew so slowly through the start of the Industrial Revolution.	*Sample answer: At the beginning of the Industrial Revolution the world was still suffering from famine and disease and the birth rate was low.		
332	How are you affected by the rising world population?	*Sample answer: As the world population increases, there is more demand for food, oil, housing. This increase in demand means rising costs for living expenses. Note: The rising population also increases pollution of the air, water, and land which has decreased the quality of Earth's environment.		
332	Which continent's population has grown the most over the last 200 years?	*Asia has grown the most and Oceania has grown the least.		
332	How much do you think the world's population has grown since your grandparents were born?	Sample answer: I think the world population has almost doubled.	https://www.infoplease.com/world/population/total-population-world-decade-1950-2050	
332	How much has it grown since you were born?	Sample answer: It has grown by over a billion people.		
332	How much bigger is the world's population today than it was yesterday.	Sample answer: It has grown by more than 100,000 people since yesterday.	https://www.biologicaldiversity.org/programs/population_and_sustainability/population/	
332	Why do you think it grew so slowly?	Sample answer: Fewer babies survived birth and more people died at younger ages.		
332	How does increasing world population affect your family?	Sample answer: Fewer resources are available causing prices to go up. There is more crowding in places we like to vacation.		
332	Is it possible for the population on Earth to get too big?	Sample answer: Yes.		
332	How many people do you think the Earth can sustain?	Sample answer: Maybe 9 or 10 billion.		
332	Why are more people living in urban areas today?	*Sample answer: There is better access to medical services, food, jobs, and housing.		
332	As the urban population grows and urban sprawl occurs, how are natural resources affected?	*Sample answer: Land that was once used for growing crops is being transformed to land with buildings.		
332	What is the projected rate of growth (% per year) in urban population that is predicted for the world population between 2010 and 2050?	*2010 about 52%; 2050 about 67%; $(67-52) \div 40$ years = 38%.		

332	How does increase population affect the natural resources of the area?	Sample answer: More people means there is less natural resources available to everyone, more people often results in greater land, water, and air pollution		
332	What natural resources are affected the most?	Sample answer: Less water availability and quality, poorer air quality, less land available for plants, animals and human recreation, because there are more people using the resources and more garbage produced.		
332	What explanation can you give for the trends shown in the graph?	Sample answer: Since 1950, more and more people have moved from rural areas to urban areas because there are more opportunities for services and goods. Supplies of good and services have diminished in rural areas.		
333	What impact does commuting have on natural resources? On the environment?	*Sample answer: Commuting adds a lot of air pollution, and new highways and use land resources.		
333	How do different types of surfaces affect heat absorption rates?	*Sample answer: Student should notice a difference in heat absorption. The grassy areas should be cooler.		
333	What can result from this kind of urbanization?	Sample answer: Groundwater levels drop, more water runs off increasing the risk of flooding, increased strain on sanitation systems, increase temperature, greater pollution, a loss of biodiversity.		
335	What impact does this slum have on its environment?	*Sample answer: It would cause pollution because of the lack of sanitary services, like garbage pick up and sewers. Note: It might be appropriate to discuss the impact of homelessness on the environment. This is a serious problem that most urban areas, and some rural areas are trying to finds workable solutions to the associated problems.		
335	How many items on your list could you have avoided throwing out in the trash?	*Sample answer: At lunchtime I used a plastic bag for my sandwich, I could have used a reusable container?		
335	How can you reduce the amount of items on your list?	Sample answer: By using reusable containers, and water bottles, by buying less pre-packaged items.		
335	How can you use less paper?	*Sample answer: Use computer with printing, print on the backside of paper, make scratch paper out of used paper.		
335	How much garbage does your family produce in one day? One week?	Answers will vary depending on the practices of the family. The average person produces about 4.6 lbs. of trash per day, using this statistic a family of 4 would produce about 18 lbs./day and 126 lbs./week.	https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials	

335	How far does your garbage have to travel to reach a landfill in your community?	Answers will vary.		
335	In addition to being unsightly, how can trash have negative impacts on plants and wildlife?	Sample answer: It can introduce toxic substances into their environment. It can encourage disease and vermin.		
335	Which type of fertilizer will be best?	Answers will vary based on the types of fertilizers investigated. Make sure students use the data they collect to make their final answer to this question.		
335	How does spraying chemicals on the land affect our water and air resources.	Sample answer: The chemicals seep into the water and soil and can end up in our food. The chemicals that get into the air can kill wildlife and destroy habitats, and cause serious illness in people that breathe in these chemicals.		
336	How has the formation of large and small farms affected the environment?	Sample answer: Both kinds of farms contribute to water, air, and land pollution, and soil depletion.		
336	How could these chemicals affect the microorganisms in the soil.	Sample answer: They could kill the microorganisms in the soil.		
336	What other effect could this runoff have in the environment?	Sample answer: The runoff can get into nearby rivers, streams, lakes and ponds and have a negative effect on aquatic ecosystems and water quality in the community. It can also seep into the ground and contaminate ground water supplies.		
337	How does spraying chemical on land affect our water and air resources?	*Sample answer: The chemicals seep into the water and soil and can end up in our food. The chemical can kill wildlife and destroy habitats.		
337	How is the farming practice you choose good for the environment?	*Discuss the benefits and limitations of all these farming practices.		
337	What are practices that a good farmer can use to protect the environment?	Sample answer: Good farming practices include crop rotation, organic farming, contour plowing, strip farming, and no-till farming.		
337	What are some minerals that plants take in from the soil to support life processes?	Sample answer: Nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, molybdenum, copper, boron, and zinc	https://www.dpi.nsw.gov.au/agriculture/soils/soil-testing-and-analysis/plant-nutrients#:~:text=Soil%20is%20a%20major%20source,are%20calcium%2C%20magnesium%20and%20sulfur.	
337	What happens to the soil in a farm field over time when the same kind of crop is planted there every year for many years?	Sample answer: Soil nutrients are depleted.		
337	How would alternating deep-rooted and shallow-rooted plants improve soil quality?	Sample answer: Deep-rooted plants add important nutrients and oxygen to the soil that shallow-rooted plants need to live well.		

337	What would farmers who do not use these practices have to do to keep their soil healthy enough for crop growth?	Sample answer: They would have to add nutrients to the soil, usually in the form of fertilizers.		
337	What natural substances do you think organic farmers might use to control insect pests?	Sample answer: Natural chemicals that attract harmful insects such as pheromones.		
337	How might they control weeds?	Sample answer: By tilling the soil, using insect control, using cover crops.	https://www.canr.msu.edu/news/organic_weed_control_in_field_crops	
337	How do sod-forming plants help prevent erosion?	Sample answer: Their thick root systems hold the soil in place.		
338	How well will hillside garden plants prevent erosion and runoff?	Sample answer: I think that the garden with the plants will have less erosion.		
338	How can you test erosion control?	*Answers will vary but students should discover that the container with the sod will have less runoff.		
339	What hazardous waste has your family used lately?	*Sample answer: We painted the living room. The leftover paint is a hazardous waste.		
339	What should you do to dispose of that hazardous waste?	<p>*Sample answer: Take it to a recycling center for proper recycling if it is oil-based. If it is latex, take the lid off until it dries and throw it in the trash.</p> <p>Note: In some states, such as California, Washington, and Connecticut, latex paint is considered a hazardous waste and must be recycled or safely disposed.</p>		
339	How many of you have had to replace a computer or mobile device in your lifetime?	*The majority of students have probably dealt with electronic waste.		
339	How do you get "rid" of you old technology?	*Sample answer: Through donations, at a garage sale, at a recycling event.		
339	What are businesses and industries doing to help reduce electronic waste?	*Many computer, TV, and cell phone manufactures, as well as electronic retailers, offer some kind of "take back" program or sponsor recycling events.		
339	What steps could be taken to keep these pollutants out of the water?	*Filters or catch-basins could be installed.		
339	What manufactured products do you use routinely?	Sample answer: home appliances, small appliances, electronic devices, etc.		
339	How do these products influence your daily life?	Sample answer: They make my life easier and better.		
339	Could you live without these products?	Sample answer: Yes, but I would not want to.		
339	What would you be willing to give up to keep these products on the market?	Sample answer: I would be willing to pay more for these products to have them recycled and redesigned to have less impact on the environment.		
339	What hazardous wastes do you have at your home?	Sample answer: We have paint, oil, household cleaners, bug spray, and plant fertilizer.		

339	How should you get rid of these hazardous wastes.	Sample answer: These items should be taken to the proper disposal sites and disposed of.		
339	What safe products could you use in place of these hazardous materials.	Sample answer: I could encourage my family to but non-hazardous, or less hazardous alternative products. Many organic products would be good replacements for hazardous household products.		
339	What industry practices cause these negative effects?	Sample answer: Industrial farming uses high levels of chemicals to insure high production and produce high levels of waste.		
339	What could industries do to prevent the negative effects?	Sample answer: Adopt practices that use less chemicals and produce less waste and use more sustainable and green methods in their manufacturing processes.		
339	What are symptoms and effects of mercury poisoning?	Sample answer: Symptoms and effects of mercury poisoning include muscle weakness, nervousness, mood changes, numbness, memory problems, depression, physical tremors, a metallic taste in the mouth, changes in vision, hearing or speech.		
339	What social and economic impacts might the mercury poisoning have caused 50 years ago and today?	Sample answer: 50 years ago - illness and death, economic decline, families moving away, fish kill, damage to the river ecosystem. Impacts today - continued health concerns, decreased land value, economic loss, poor health of the environment due to mercury still in the environment.		
340	Why do you think it took the government so long to recognize the problem with dumping chemicals in the river?	*Sample answer: People were not aware of the effects on the environment.		
340	When is the best time to plan reclamation?	*Sample answer: Before the mine is developed.		
340	What must individuals, communities, and governments do to prevent impacts such as what occurred at Grassy Narrows?	Sample answer: Better monitoring of the health of the environment, act on reports of pollution, pass laws that prevent potential pollution and require industry to implement better manufacturing processes that insure the health of workers and the communities are protected.		
340	What household products are safe to pour down the drain.	Sample answer: Products that are water soluble can generally be dumped down the drain.		
340	Which are not?	Sample answer: Oil-based paints, pesticides, garden chemicals, batteries, any product that is labeled "hazardous."		
340	How are unsafe substances properly disposed of?	By taking them to approved recycling centers or disposal sites.		

340	How many products can you think of that are made from iron, aluminum, copper, gold, sand and gravel, granite, and marble.	Sample answer: Household fixtures, furniture, automobiles, construction materials, food packaging, appliances, electronics, household wiring, landscape features, counter tops, shower enclosures, etc.		
340	What characteristics make these materials so popular?	Sample answer: Structural strength, versatility, long-lasting, conductivity, cost effectiveness, appearance, etc.		
340	Where are these materials found?	Sample answer: These materials are found on or under the Earth's surface.		
340	How has the mining process changed the land?	Sample answer: It has scarred the land and produced large amounts of waste.		
340	What effect do you think this process has had on the organisms that lived on the land before the mining process began?	Sample answer: It has destroyed all of the plants that covered the ground where the mine as been dug and has either destroyed the animals originally present on the land or caused the to move to other suitable areas.		
340	What effect might the process have on other ecosystems that are not directly mined?	Sample answer: The mine could pollute runoff water that drains into nearby streams, rivers, and lakes, it may cause a sudden growth in human population because of jobs which can put stress on local community resources, it may create air pollution that drifts over other areas, it may interfere with animal migrations.		
340	How can people use the land as it appears in this picture?	Sample answer: During the mining process the land is completely unusable by people other than those involved in the mining operation. After reclamation, while the appearance of the land is improved, it will take time before the land becomes safe for people to use.		
341	Why is it essential to have a restoration plan before the mining starts?	*Sample answer: Problems that will have an impact on the environment can be addressed before they become an issue.		
341	What other problems can an open mine like this cause?	*Sample answer: After a mine is finished, it can collect waste and disrupt the landscape and vegetation. It could also create hazardous pools of standing water.		
341	What roles do you think the local community and mining company should have in the reclamation process?	Sample answer: The local community should design how the land will be used and work with the mining company to develop a plan to reclaim the land as desired. The mining company should provide the funds needed for the complete reclamation process.		

341	What factors other than the removing of the soil and rock do you think the mining companies should consider before they begin the mining process?	Sample answer: They should look at how the mining operation will affect the local and nearby environments and develop ways to lessen any damage that might be caused. They should consider available housing for workers, the health services, emergency services and other community resources and make sure that there will be sufficient resources to accommodate new workers who will arrive to work the mine.		
342	What is sustained in sustainable logging?	*Trees.		
342	What can you infer about the lumber industry now when considering the world's population?	*Sample answer: There is a great need today for lumber because the population is growing and homes need to be built.		
342	What is being done to ensure that we will not run out of lumber?	*Answers will vary. Explain that sustainable logging requires loggers to balance the amount of timber that is removed from an ecosystem with what is planted to protect the landscape and wildlife.		
342	How do you think sustainable logging affects the cost of lumber?	*Sample answer: Sustainable logging helps prices lower because the supply is not as limited.		
342	Why are the logging history curves for the South and North so different from those of the Pacific Coast and the Rocky Mountain region?	*Sample answer: The South and North have seen greater changes in the industry while the Pacific Coast and Rocky Mountain regions have been more steady.		
342	What are some uses of forest trees?	Sample answer: For building homes and businesses, making furniture, patio structures, and paper and packaging products, and for energy production.		
342	Which of these uses do you consider essential?	Sample answer: All of them.		
342	What materials could be used instead of trees to produce these products?	Sample answer: Metals, recycled plastics, concrete, recycled wood, wood composites, fiber cement.		
342	Are those alternate materials more "Earth friendly/?"	Sample answer: In some cases yes, but it sustainable lumber practices are consistently used I am not sure that anything is more "Earth friendly" than wood, especially when carbon dioxide/oxygen cycle is considered.		
342	How do you think these principles affect the availability and cost of lumber?	Sample answer: These practices increase the cost of lumber and related products.		

342	How do they affect the economies of regions that rely on logging?	Sample answer: While some think these practices harm the economies of lumber producing regions, I think they benefit the economies by ensuring conservation of soils and water and by increasing biodiversity, maintaining the sustainability of the resource, and by supporting the livelihoods of lumber producing communities.	https://www.wri.org/insights/why-sustainable-forestry-good-investment	
343	Based on this information, what can you infer about the heat-absorption rates of light-colored objects and light-colored objects?	*Sample answer: Light-colored objects absorb less heat than dark-colored objects.		
343	What would happen to energy consumption in cities if rooftops were painted white?	*Energy consumption would go down.		
343	What would happen if the black rooftops were made into roof gardens?	*Green roofs would be cooler and also decrease water runoff.		
343	Why is parkland important to residents in large cities such as New York City?	*Sample answer: Parkland provides refuge for many species of plant and animals. In addition, it offers a source of enjoyment for people.		
343	What can you do at school to practice environmental stewardship?	Sample answer: Produce less waste paper, use less pre-packaged food in my lunch, plant a bee and butterfly garden, encourage the planting of more native plants, plant more trees, develop larger natural areas if possible, turn off classroom lights when not in use.		
343	What are the benefits of being a good steward of the land?	Sample answer: Improved health of the ecosystem, greater biodiversity, improved health conditions due to a healthy environment, a positive feeling of doing good, fulfilling one of God's purposes for humans.		
343	What national park is closest to where you live?	Answers will vary depending on location. Note: If possible, plan a field trip to visit a nearby national park. The national park service as an extensive amount of educational material and programs developed for schools. School fieldtrips are free, but must be arranged in advance. If there isn't a National Park nearby, visit a nearby State Park or County park. Most importantly, get students out into the natural world. Getting students into nature is the first step in helping them appreciate it. If students appreciate nature, they will want to preserve it.	https://www.nationalparks.org/connect/blog/out-classroom-and-park	
343	What are the features that attract people to it?	Answers will vary depending on the park. People are attracted to national parks because of their beauty, grandeur and the opportunity to see nature first hand.		

344	What effect will rooftop garden have on the environment?	*Sample answer: A rooftop garden will have a positive impact on the environment by helping to clean and purify the air.		
344	How does the park help the environment and people living in the area?	*Sample answer: The park gives animals a place to build their nests and raise their young. It also give people the opportunity to exercise outdoors.		
344	Why is it important for a logging company to plant one tree for every tree it cuts down?	*Sample answer: This helps to replace what has been taken and helps to restore the ecosystem.		
344	Why is it important for governments to mandate that mining companies reclaim the land once mining operations have ended?	*Sample answer: Abandoned mines pose hazards to people and wildlife and, with work, can be used as valuable space.		
344	Why are many businesses adopting environmental stewardship programs?	*Sample answer: Consumers are more aware of environmental practice, and reports of environmental abuses can severely impact business sales. It is also less expensive that cleaning up a spill or pollutant.		
344	How many of these measures are used in your community?	Answers will vary. Some communities are more progressive in this regard than others, but most will practice developing some green space for wildlife and people to enjoy.		
345	What can you personally in your home and neighborhood to protect Earth's environment?	Answers will vary. Students may find community programs, programs run by the church, or state/provincial, or national programs.		
	* Means the answer is found in the TE.			