EarthT3

88 Question(s)
Test ID: 298293

Name:_____ Date:_____

1) (1) The Grinnell Glacier in Glacier National Park, Montana has been retreating rapidly since the early 1900's. (2) Photographs taken of the glacier document its reduced size since 1850. (3) Mountain glaciers are excellent monitors of climate change. (4) The worldwide shrinkage of mountain glaciers is caused by a combination of climate cycles and increased greenhouse gasses. Which of the sentences in this paragraph is an inference?

A. 1
B. 2
C. 3
D. 4

2) Much of Utah's water flows to California via the Green, Colorado and San Juan Rivers. However, as farmers irrigate farmland in Uintah, San Rafael and San Pete basins, salt is washed into the rivers, tending to make the water less useful for farmers in California.
How might this problem be solved?

A. Scientists might invent some kind of distillation or filtering system to remove the salt from the lower Colorado River.
B. Laws could be passed which would prohibit any of the polluted water from going into California.
C. Utah farmers could dump their irrigation water back into an aquifer where it would not do any damage.
D. Time will solve the problem. As the salt polluted water gets to Lake Powell and Lake Mead it evaporates and the salt settles to the bottom of the lakes where it harms no one.

3) Water moves against gravity up a tree stem and upwards through soil. What property of water allows this to happen?

A. density
B. solubility
C. color
D. surface tension
E. taste

4) Which of these reference sources would be the most help if you wanted to find the current status of Utah's aquifers?

A. Channel 4 weather report.
B. Newspaper article "Utah Water Storage Problems".
C. Utah Division of Water Resources Report.
D. Encylopedia entry on aquifers.

5) How does the salt content of sea water affect its usefulness to people? The salt

A. reduces the number of ways people can use it.
B. makes it valuable for farming and aquariums.
C. makes it impossible for living things to survive.
D. makes it as useful as freshwater, just different.

6) Where is the majority of the Earth's water found?

A. In rivers
B. In lakes
C. In oceans
D. In wetlands

7) What has caused our nation to reduce the pollution in some of its lakes?

A. Scientific studies showing the effect of pollutants on fish and animal life.
B. The fact that most people who swam in polluted lakes got sick.
C. Boats and water sport vehicles were being damaged by the pollutants.
D. Factories that were polluting lakes developed products that didn't need a water source.

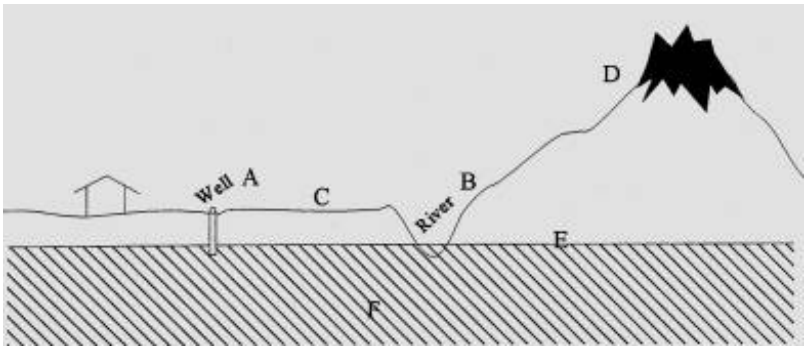
8) Which of the following aspects of stream water would NOT affect the types of life that could live in the stream?

A. temperature
B. turbidity
C. dissolved oxygen content
D. molecular composition of water
E. stream gradient

9) Which best describes the future of water use in Southern Utah?

A. The use of computers will enable us to better recognize water needs and control water distributed to those communities.
B. The decline in growth of cities in Southern Utah will decrease the demand for water in that part of the state.
C. The supply of water in Southern Utah will dry up and the area will become a desert.
D. Meteorologists will be able to predict and control when storms hit Southern Utah.

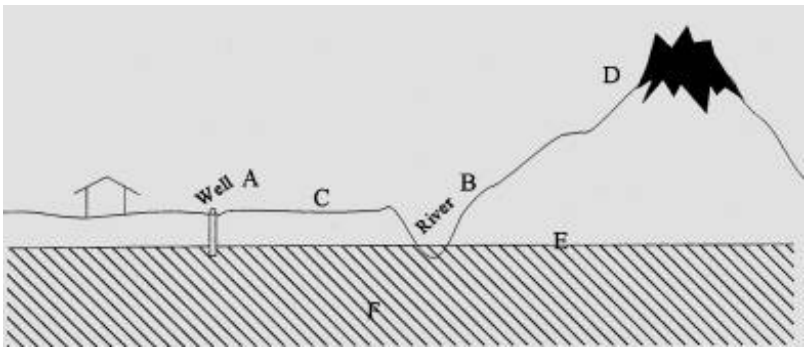
10) Use this diagram of a cross section of the earth to answer the following question.



Insecticides sprayed on a field near point "C" are found in the well water. How did they get there?

A. they were carried by water flowing through the soil
B. they evaporated into the air and were drawn in as the well pumped
C. the well was open when they were sprayed

11) Use this diagram of a cross section of the earth to answer the following question.



The line labeled "E" is called the:

A. water table
B. watershed
C. recharge area
D. reclamation dam

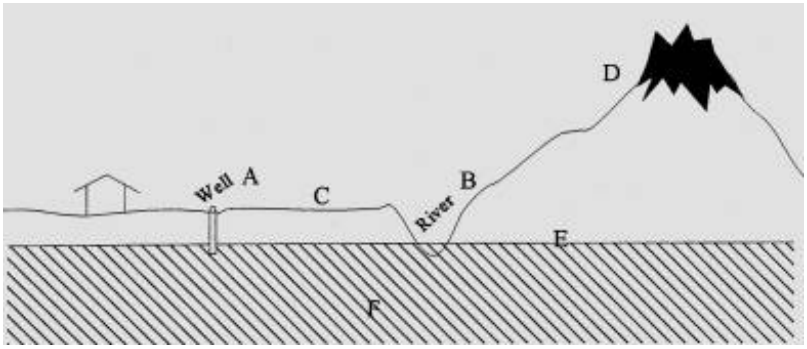
12) Which of the following is NOT a source of water for people in Utah?

A. ground water
B. streams
C. lakes
D. glaciers

13) Utah is mostly a desert. In much of the state there is not enough water from rain and snow to sustain any major farming. Yet dairy, livestock, hay, and grain production is a major source of income for the State.
How have the people of Utah tried to solve the problem of not enough water for farmers?

A. We use technology to change the climate.
B. The people of Utah save almost all of the water that comes from rain and snow for farming.
C. Farmers only grow plants and animals in the years when there is ample rainfall.
D. We store water and move it around the state through reservoirs, aqueducts, and pipelines.

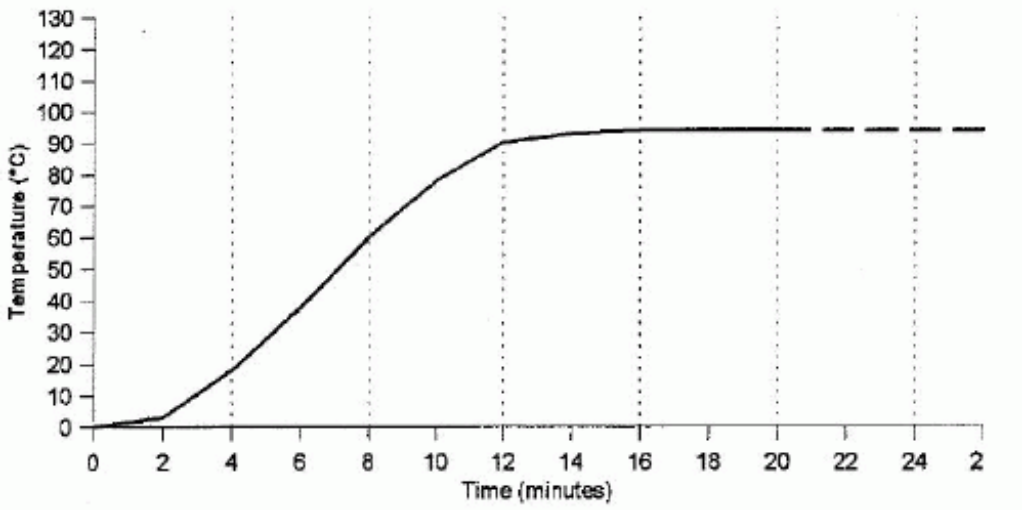
14) Use this diagram of a cross section of the earth to answer the following question.



If more wells were built and a great deal of water was pumped from them, what might happen to the river?

A. its flow would increase
B. its flow would decrease
C. the wells would not affect the river
D. more snow would melt and maintain the balance

15) Water is placed over a burner until it boils. The graph shows the temperature at each two minute interval. The experiment ended at 20 minutes. Yet the fellow extrapolated until 26 minutes. At what Temperature did the water boil?



A. 35
B. 70
C. 94
D. 100

16) The way to save the most water in your home is to:

A. use less water in the yard
B. do less cleaning
C. use less in cooking
D. put a brick in the back of the toilet

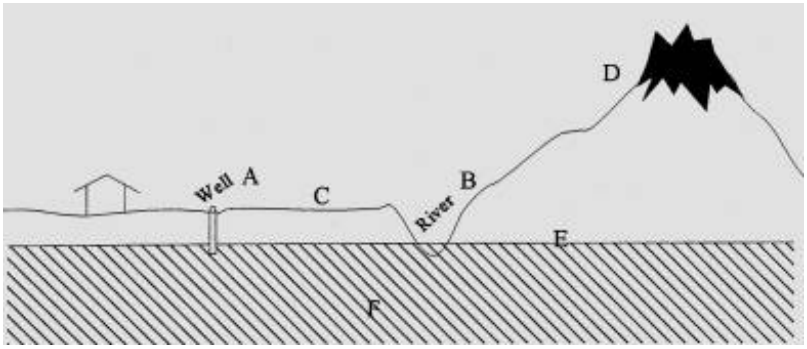
17) What assumption do people make every time they fill a glass with water from the tap and drink it?

A. It contains nothing but pure water.
B. It came from a pure mountain stream near the town.
C. It contains approved levels of contaminants.
D. It may make a small percentage of susceptible people sick.

18) Jill wants to measure the stream flow volume (amount of water flowing through a stream) of the stream that flows down a nearby canyon. What aspects of the stream should she measure?

A. The width, length, and depth of the stream
B. The width, depth, and meters per second flow of the stream
C. The meters per second flow of the stream
D. The length, depth, and meter per second flow of the stream
E. The width and length of the stream

19) Use this diagram of a cross section of the earth to answer the following question.



The water table will remain in the same place if

A. losses at "B" and "C" are greater than gains at "D"
B. losses at "B" and "C" are less than gains at "D"
C. the well at "A" doesn't pump more than "B"
D. snow and rain from "D" replace the losses at "A" and "B"

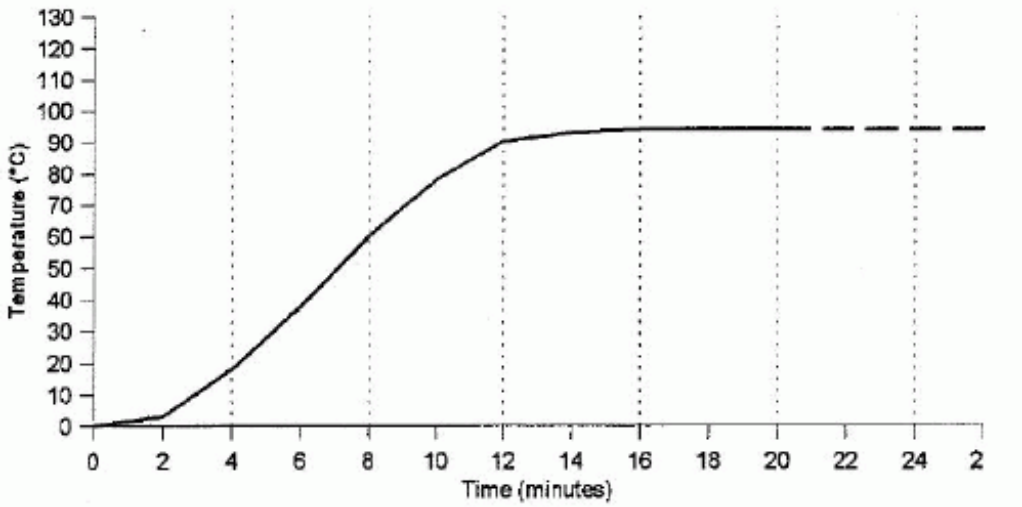
20) Water expands when it freezes. What would happen if water did NOT expand when frozen?

A. Ice would sink, ponds would freeze from the bottom up, and many aquatic plants and animals would die
B. Water would be more dense than wood therefore wood would not float. Beavers would be adversely affected
C. The surface tension would be destroyed. Water striders and other creatures that walk on the water's surface would sink
D. Water would not evaporate therefore clouds would not form. There would be no snow or rain
E. Water would not dissolve many substances. It would be impossible to make root beer or clean bathrooms

21) Why is water called the universal solvent?

A. it can solve any problem
B. it can dissolve many substances
C. it is found many places in the universe
D. it is part of most living things

22) Water is placed over a burner until it boils. The graph shows the temperature at each two minute interval. The experiment ended at 20 minutes. Yet the fellow extrapolated until 26 minutes. If the water was left to boil for 1 hour more, how hot would the water get?



A. 32
B. 96
C. 100
D. 212

23) An oil spill at sea often damages birds and sea mammals but fish are relatively unaffected. What properties of water and oil are responsible for this situation?

A. oil is less dense than water and floats on the surface
B. oil is darker in color and has a stronger odor
C. water is harmless to sea life, oil is a poison to most things
D. water floats when it freezes, oil sinks when frozen

24) A 9th grade student wants to test the effect of excess fertilizer on algae growth in freshwater versus algae growth in saltwater. The student predicts the saltwater will be more affected. A gram of fertilizer is added to a liter of local pond water in one container and a liter of saltwater from the classroom aquarium in another. Both samples are placed in the same windowsill for a week. Daily observations are recorded. The student's observations are below:

	Saltwater	**Freshwater**
Day 1	Water is cloudy. Some floating organisms	Water is clear. Some floating organisms.
Day 2	No change.	No change.
Day 3	Water is cloudier.	Green algae start to appear.
Day 4	No change.	More algae. It is difficult to see through the water.
Day 5	Water is a little cloudier. Some organisms still floating.	Water is a lot greener than day one. Lots of floating material.

Was the experiment adequate to resolve the student's question?

A. No, the hypothesis was not correct
B. No, careful observations were not made
C. Yes, if the results are reproducible
D. Yes, he used the correct amount of fertilizer

25) Which best describes the future of water use in Southern Utah?

A. The use of computers will enable us to better recognize water needs and control water distributed to those communities.
B. The decline in growth of cities in Southern Utah will decrease the demand for water in that part of the state.
C. The supply of water in Southern Utah will dry up and the area will become a desert.
D. Meteorologists will be able to predict and control when storms hit Southern Utah.

26) Which of the following is NOT a problem concerning dams on the Colorado River?

A. they provide irrigation water and hydroelectric power
B. wildlife habitat has been destroyed
C. water becomes increasingly salty as it moves through the system
D. water no longer reaches Mexico

27) What has caused our nation to reduce the pollution in some of its lakes?

A. Scientific studies showing the effect of pollutants on fish and animal life.
B. The fact that most people who swam in polluted lakes got sick.
C. Boats and water sport vehicles were being damaged by the pollutants.
D. Factories that were polluting lakes developed products that didn't need a water source.

28) People protect watershed areas in many ways, including placing bans on dogs and horses in the areas near streams. Why?

A. Dogs and horses drink a great deal of water that people need
B. The animals' wastes can wash into the streams, polluting them
C. More people will visit the area if they can bring their pets
D. Animals frighten wildlife and ruin the natural environment
E. Animals will walk in the water, stirring up mud

29) (1) The Grinnell Glacier in Glacier National Park, Montana has been retreating rapidly. (2) Photographs taken of the glacier document its reduced size in since 1850. (3) Mountain glaciers are excellent monitors of climate change. (4) The worldwide shrinkage of mountain glaciers is thought to be caused by a combination of climate cycles and increased greenhouse gasses. Which sentence has data to support the argument that the glacier is shrinking?

A. 1
B. 2
C. 3
D. 4

30) Which factor affects the boiling point of water?

A. the amount of air pressure present
B. the latitude of the water's location
C. the longitude of the water's location
D. the air temperature around the water

31) An oceanographer collected data on the physical properties of the sea in several locations. Then she counted the number of sea snails in the same locations over a period of several days.

Which factor is not easily analyzed with this data?

Location	Temperature (degrees C)	Salinity (parts per thousand)	Depth (meters)	Average number of snails
Site 1	15	31	22	56
Site 2	22	30	7	31
Site 3	16	30	17	49

A. temperature
B. salinity
C. depth
D. snail populations

32) A student wonders if waves are caused by wind. To test this hypothesis he goes to a beach and measures the wind speed, wind direction and wave height for a week. According to this table of his results, what conclusion best summarizes this experiment?

Day	Wind Speed (mph)	Wind Direction	Average Wave Height (meters)
1	8	S	2.4
2	5	S	1.0
3	16	S	.8
4	22	S	1.0
5	13	SW	1.2
6	9	N	1.3
7	6	N	.5

A. Wave height depends on many factors but not wind speed or direction.
B. Wave height is determined by movements of currents and tides
C. Waves move for no testable reason.
D. Wave height at the beach does not depend on local winds.

33) Where would you expect the greatest number of living organisms in the ocean?

A. on the surface
B. in the top 100 meters
C. in the top half mile
D. in the lowest regions

34) Most scientists agree that global warming is taking place, and as a result, sea levels will rise. What do they recommend people do to prevent this?

A. Reduce fossil fuel consumption.
B. Reduce nuclear energy production.
C. Increase electricity use in order to reduce CO2 emissions.
D. Increase fossil fuel use in order to save electricity.

35) What do organisms living in the inter-tidal zone (area of land between low and high tides) have in common?

A. they eat the same things
B. they like the same temperatures
C. they have few predators
D. they can survive out of water

36) Fish living far below the oceans' surface are rarely or never displayed at seawater aquariums. Why?

A. They are fast swimmers and hard to catch
B. The types of food they need are not available at aquariums
C. They have adapted to intense pressures of the deep
D. Aquariums do not think people will pay to see them

37) What is the main cause of waves on the ocean?

A. currents
B. tides
C. the moon
D. wind

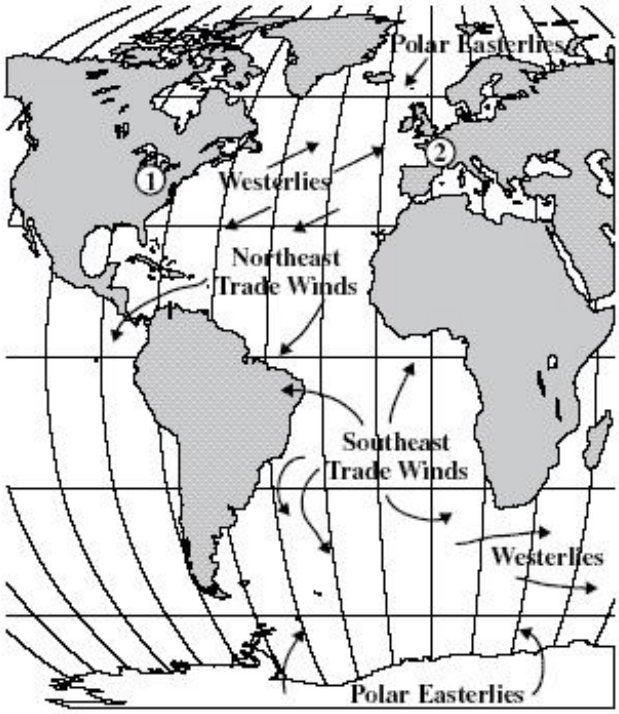
38) An oceanographer collected data on the physical properties of the sea in several locations. Then she counted the number of sea snails in the same locations over a period of several days.

Why did the oceanographer count the snail populations several times and do an average?

Location	Temperature (degrees C)	Salinity (parts per thousand)	Depth (meters)	Average number of snails
Site 1	15	31	22	56
Site 2	22	30	7	31
Site 3	16	30	17	49

A. to increase the accuracy of her results
B. to make sure she didn't miss any
C. to have more opportunities to see the snails
D. to see if the snails are moving from one place to another

39) The diagram below illustrates the motion of prevailing winds over oceans on Earth.



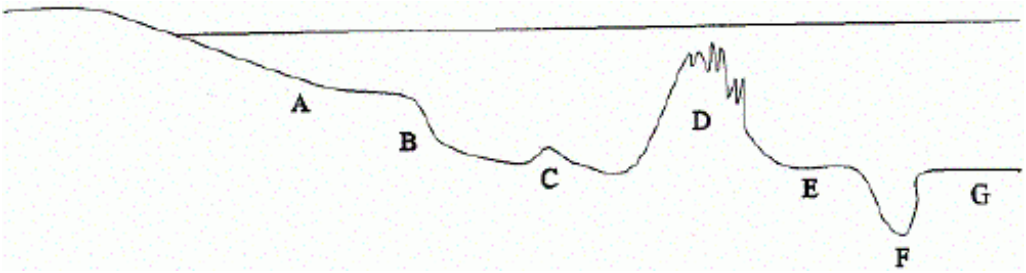
If a sailboat sailed from the eastern United States to Europe and then back, which of the following winds would **most** directly power the sailboat?

A. Polar Easterlies going and Westerlies returning
B. Northeast Trade Winds going and Westerlies returning
C. Westerlies going and Northeast Trade Winds returning
D. Southeast Trade Winds going and Northeast Trade Winds returning

40) While walking along an ocean beach, you and a friend find live barnacles and mussels attached to rocks and hermit crabs in shells. You infer that these organisms can live under water much of their life. What data would support this inference?

A. A tide chart showing that at high tide the beach is underwater.
B. The barnacles are anchored to some rocks.
C. There are fish swimming in the ocean nearby.
D. All three of the animals found have shells.

41) Use the diagram to answer the following question:



Organisms living at "G" would be adapted to which kind of conditions?

A. high amounts of light, high pressures
B. high amounts of light, low pressures
C. no light, high pressures
D. no light, low pressures

42) Where in the ocean would large schools of fish most likely be found?

A. in deep water
B. in areas of up welling
C. near river mouths
D. near undersea volcanoes

43) What is the main cause of ocean tides?

A. currents
B. the sun and the moon
C. waves
D. wind

44) Ocean organisms have adapted to live in salty water. Chin Li is curious about what range of salinity ocean organisms can tolerate. Which of the following field studies could she conduct to satisfy her curiosity?

A. Expose sea urchin eggs to saline solutions of varying concentrations and collect data on egg survival rates
B. Expose sea urchin eggs to salt water of varying temperatures and collect data on egg survival rates
C. Expose goldfish eggs to saline of varying concentrations and collect data on egg survival rates
D. Expose sea urchin and goldfish eggs to fresh and salt water and collect data on egg survival rates
E. Expose sea urchin eggs to solutions of varying saline concentrations and temperatures and collect data on egg survival rates

45) Use this map of ocean currents to answer the following question:

A boat sailing across the Atlantic Ocean would take advantage of which current on the journey east?

A. A
B. B
C. C
D. D
E. E

46) How has technology increased our understanding of the ocean?

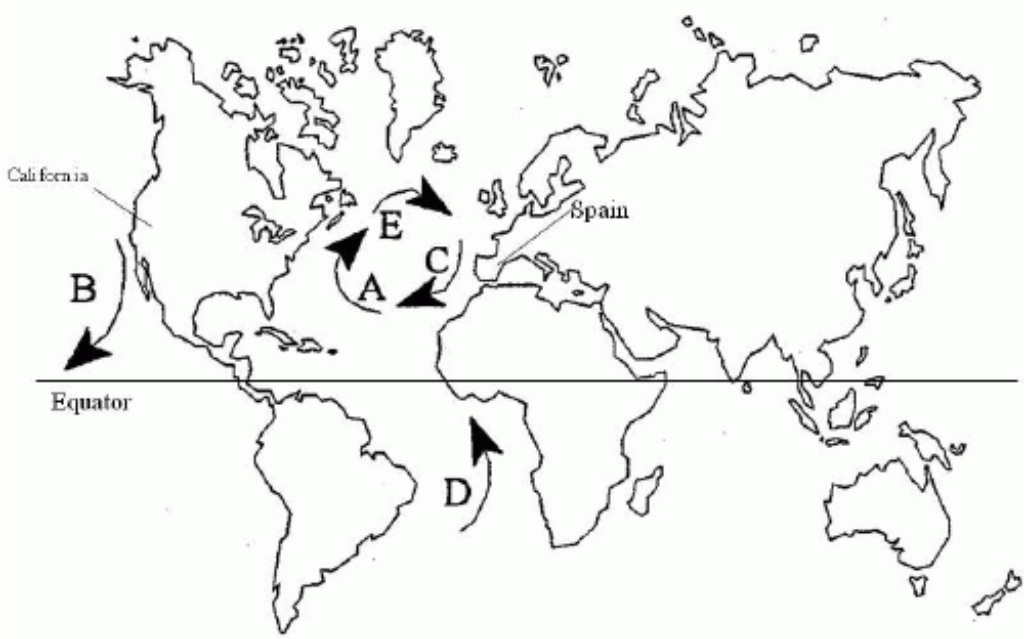
A. Oceanographers use remote sensing satellites to map the ocean floor.
B. Technology has prevented the pollution of ocean waters.
C. Technology has allowed oceanographers to identify plate boundaries and prevent their movement.
D. Oceanographers have used technology to even out the high tides.

47) A student wonders if waves are caused by wind. To test this hypothesis he goes to a beach and measures the wind speed, wind direction and wave height for a week. According to this table of his results, which of the following hypothesis would be a logical follow-up to this experiment?

Day	Wind Speed (mph)	Wind Direction	Average Wave Height (meters)
1	8	S	2.4
2	5	S	1.0
3	16	S	.8
4	22	S	1.0
5	13	SW	1.2
6	9	N	1.3
7	6	N	.5

A. If waves are not influenced by wind, then nothing else will affect them.
B. If winds out at sea are strong, wave height will be higher the next day.
C. If waves are not interfered with by coral reefs, then they will be higher.
D. If currents are present, then waves will be smaller.

48) If you had no data other than the map above, what evidence could you supply to support the inference that the coast of Spain has a climate like the coast of California?



A. Spain and California are both on the west side of their continents.
B. Spain and California are both near an ocean.
C. Ocean currents flowing near Spain and California both flow south.
D. Spain and California are both in the Northern Hemisphere.

49) Use this map of ocean currents to answer the following question:

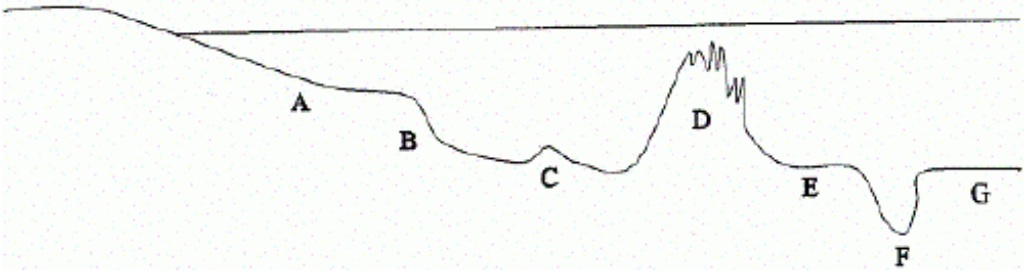
Which current would be warm?

A. A
B. B
C. C
D. D

50) What type of changes would you expect as you go down from the ocean's surface to its bottom?

A. Temperature, pressure, light, and density all decrease
B. Temperature and pressure increase; light and density decrease
C. Temperature and light decrease; pressure and density increase
D. Temperature and density decrease; light and pressure increase

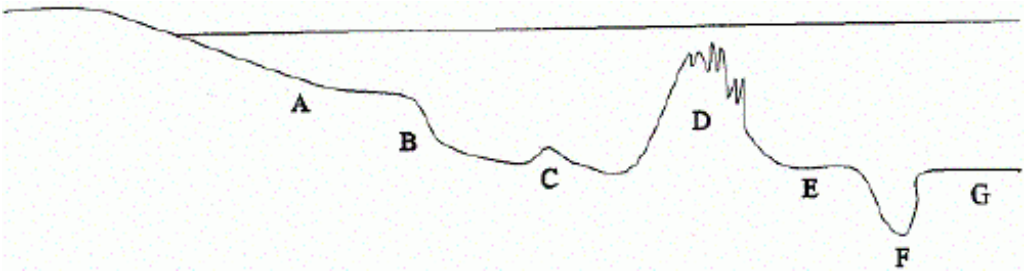
51) Use the diagram to answer the following question:



The feature labeled "A" is called the:

A. ridge
B. abyssal plains
C. continental shelf
D. continental rise

52) Use the diagram to answer the following question:



The greatest number of living things would be found in which area?

A. A
B. B
C. C

D. E

53) When do areas of upwelling in the ocean occur?

A. When fish gather for feeding
B. When the tides are at their lowest
C. When surface water is replaced by deep water
D. When the currents collide and form whirlpools

54) A student wonders if waves are caused by wind. To test this hypothesis he goes to a beach and measures the wind speed, wind direction and wave height for a week. According to this table of his results, does wave height appear to be related to wind speed or direction?

Day	Wind Speed (mph)	Wind Direction	Average Wave Height (meters)
1	8	S	2.4
2	5	S	1.0
3	16	S	.8
4	22	S	1.0
5	13	SW	1.2
6	9	N	1.3
7	6	N	.5

A. Yes, the highest waves occurred during a SE wind.
B. Yes, the lowest waves occurred during the lowest wind
C. No, there is no pattern of wind speed or direction related to wave height.
D. No, the measurements this student took were inaccurate and cannot be used.

55) An oceanographer collected data on the physical properties of the sea in several locations. Then she counted the number of sea snails in the same locations over a period of several days.

Using this data, what relationship appears between depth and temperature?

Location	Temperature (degrees C)	Salinity (parts per thousand)	Depth (meters)	Average number of snails
Site 1	15	31	22	56
Site 2	22	30	7	31
Site 3	16	30	17	49

A. no apparent relationship exists
B. deeper waters are warmer
C. deeper waters are cooler
D. deeper waters lose heat more rapidly

56) Where would the warmest water in the ocean be found?

A. the poles, on the surface
B. the poles, deep below the surface
C. the equator, deep below the surface
D. the equator, on the surface

57) What is the main cause of ocean currents?

A. The prevailing winds
B. The Coriolis effect
C. Waves
D. The sun and the moon

58) Which process returns nutrients and gases collected in deep ocean water to the surface?

A. currents
B. rip tides
C. up-welling
D. waves

59) What important function do currents, waves and El Nino provide for living things in the sea?

A. Provides a way for living things to move around
B. Brings nutrients up from deeper water
C. Mixes land and sea organisms
D. Allows Earth to have weather

60) Global warming conditions are causing ice caps and glaciers to melt. The fresh water from the melting ice dilutes the surrounding salt water. Cold, salty water in the North Atlantic Ocean normally sinks to the bottom of the ocean and slowly creeps along until it reaches an area of upwelling. Scientists believe that this process circulates nutrients and heat throughout the world's oceans. Some scientists worry that the melting glaciers will change these salty circulations and therefore change the cycling of nutrients in the ocean, ultimately impacting food sources for animals living in the ocean. Which statement is evidence that causes scientists to believe that the biological environment in the ocean is changing?

A. Melting ice is diluting salty ocean water.
B. Melting glaciers will change the cycling of nutrients in the ocean.
C. Cold, salty water circulates nutrients and heat throughout the world's oceans.
D. Melting glaciers will change the food sources for animals living in the ocean.

61) An oceanographer collected data on the physical properties of the sea in several locations. Then she counted the number of sea snails in the same locations over a period of several days.

Using this data, which physical properties do sea snails appear to prefer?

Location	Temperature (degrees C)	Salinity (parts per thousand)	Depth (meters)	Average number of snails
Site 1	15	31	22	56
Site 2	22	30	7	31
Site 3	16	30	17	49

A. Colder, deeper water
B. Colder, shallower water
C. Warmer, deeper water
D. Warmer, shallower water

62) Which of the following is NOT a physical dynamic of oceans?

A. fish
B. waves
C. ocean currents
D. tides

63) Use this map of ocean currents to answer the following question:

How would current "B" affect the land it runs near?

A. increase temperatures
B. decrease temperatures
C. would not affect temperatures
D. decrease humidity

64) What does sunlight striking a blacktop highway change into?

A. light
B. electricity
C. motion
D. heat

65) Kendra's mom is purchasing a car, but cannot decide what color to get. Kendra advises her mom that a car with a black exterior will be uncomfortable in the summer. This observation is correct because dark objects, as compared to lighter colored objects,

A. reduce heat transfer.
B. are generally more dense.
C. absorb more of the Sun's energy.
D. reflect sunlight more efficiently.

66) What does photosynthesis in plants convert light energy into?

A. mechanical energy
B. motion
C. chemical energy
D. kinetic energy

67) The cycles of sun spots have been monitored since Galileo's time. Evidence has shown that there may be a relationship between the climate on Earth and solar activity. The evidence shows that an increase in solar activity is associated with warmer than normal climates and that a decrease is associated with colder climates.
Which of the following best describes the importance of understanding the relationship between solar activity and climate?

A. Variations in solar activity and climate affect many aspects of human life.
B. Solar activity needs further study to see if Galileo's observations were correct.
C. Most climate changes are the direct result of modern human activities.
D. Future climate prediction is essential for scientific investigations to continue.

68) How does energy flow through an ecosystem?

A. The sun's energy is captured by plants, used by animals, and eventually returns to space as heat
B. Energy from the sun is recycled over and over again in the ecosystem
C. Energy from the sun is captured by animals to make sugars and fats
D. The sun's energy is captured by oxygen molecules, which causes photosynthesis

69) Which of the following is an example of an ethical question raised by science that science cannot answer?

A. Does burning fossil fuels contribute to global warming?
B. What evidence confirms that global warming is occurring?
C. Should businesses be allowed to clear forests for housing or commercial use?
D. How does the greenhouse effect help keep the earth at a warm temperature?

70) Which of the following is NOT a fossil fuel?

A. coal
B. gas
C. oil
D. wood

71) Over the last few decades, scientists have indicated an increase in global temperatures. Scientists have been encouraged to investigate what factors are causing these changes. How has this new research about global warming affected human life?

A. Global warming has decreased the amount of fossil fuels used by human activities.
B. More people are aware of the possible impact their activities have on global warming.
C. Students are required to learn about global warming in all science classes.
D. There has been no significant change in human life due to global warming.

72) Ms. Magnificent, Lance's Earth Systems teacher, gave him an assignment to design and conduct an energy related experiment. Lance decided to compare the amount of energy required to melt ice with the amount of energy required to melt snow.

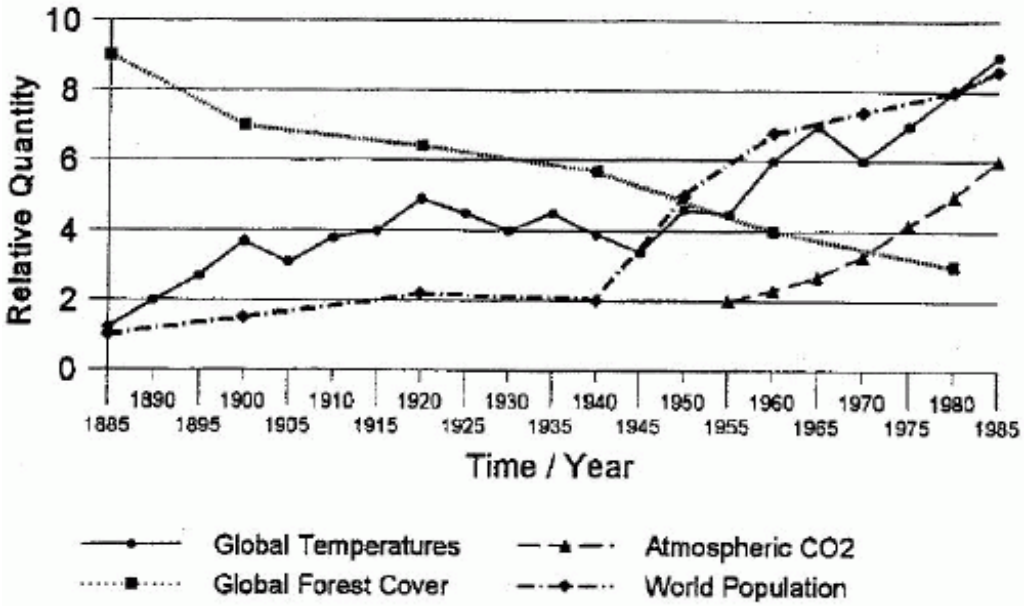
Lance designed an experiment to compare the energy to melt snow with the energy required to melt ice. He put 100 ml of snow in a 250 m; beaker and 2 ice cubes in another 250 ml beaker. He put the beakers at equal distances over a Bunsen burner and measured the amount of time it took for the ice and snow to be completely melted.

Which of the following statements accurately describes Lance's experimental design?

A. The design was flawed because he did not use equal volumes of snow and ice
B. The design was flawed because he cannot determine how much energy was used to melt the snow and ice by measuring the amount of time each took to melt when placed over a burner
C. The design was flawed because he should have used two different burners
D. The design was valid because he compared the energy required to melt snow with the energy required to melt ice

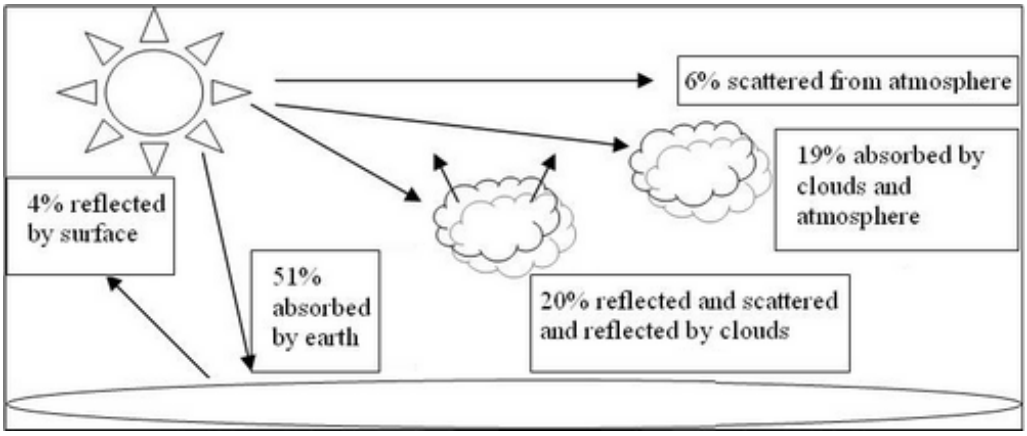
E. The design was valid because he timed the ice and snow until they were completely melted

73) Between which approximate dates was there a significant change in the rates of the events displayed on the graph?



A. 1885 to 1895 AD
B. 1920 to 1940 AD
C. 1950 to 1960 AD
D. 1980 to 1985 AD

74) Which of the following is the best title for the above diagram?



A. How the Greenhouse Effect Works
B. The Creation of Weather Patterns on Earth
C. The Use of Fossil Fuels on Earth
D. How Energy is Distributed on Earth

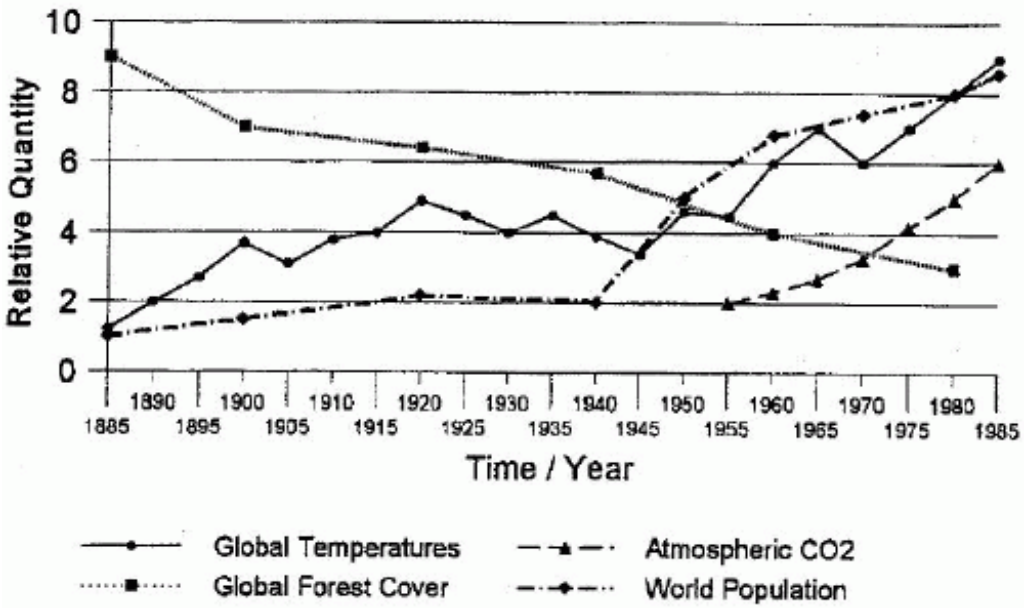
75) The 'greenhouse effect' could cause a number of problems. Which is NOT a problem associated with it?

A. rising sea level
B. changes in weather patterns
C. changes in ocean currents
D. increased skin cancer

76) Heat is a form of energy. Why?

A. It can be produced in many ways
B. It can do work
C. It happens to atoms
D. It is found everywhere
E. It can change into other forms

77) Clear-thinking communicators often say "correlation is not necessarily cause." By this they mean that two or more events which are related may occur at the same time or may influence each other, but this does not always mean that one directly causes the other to occur. Choose the combination of graphed global events listed below which most clearly presents this point-- the first event is MOST LIKELY NOT a direct cause of the other.

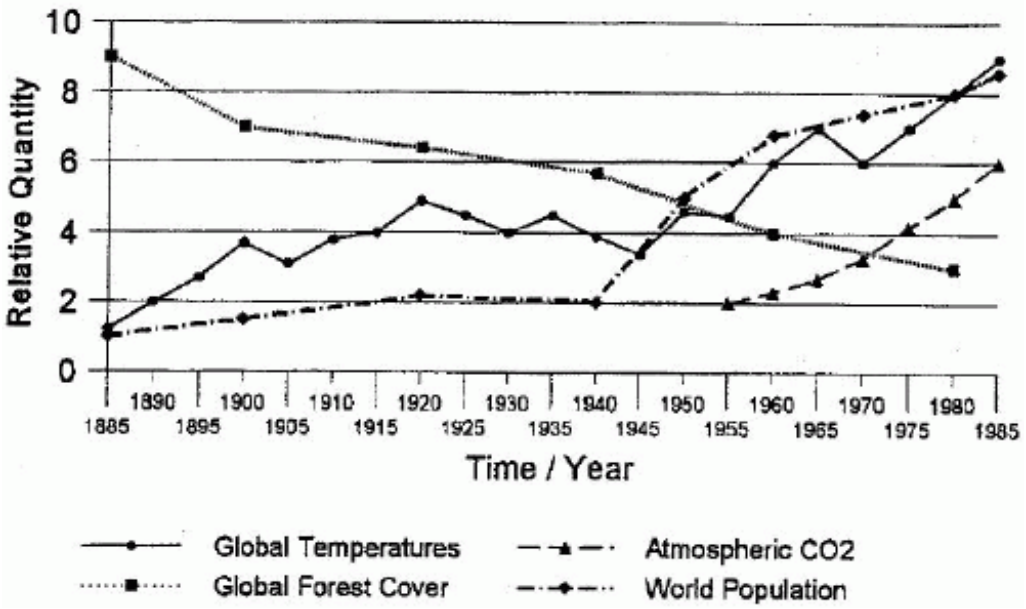


A. Population and Forestation change
B. CO2 levels and Temperature change
C. Temperature and Ocean volume change
D. Population and Temperature rise

78) The main source of 'greenhouse' gas is

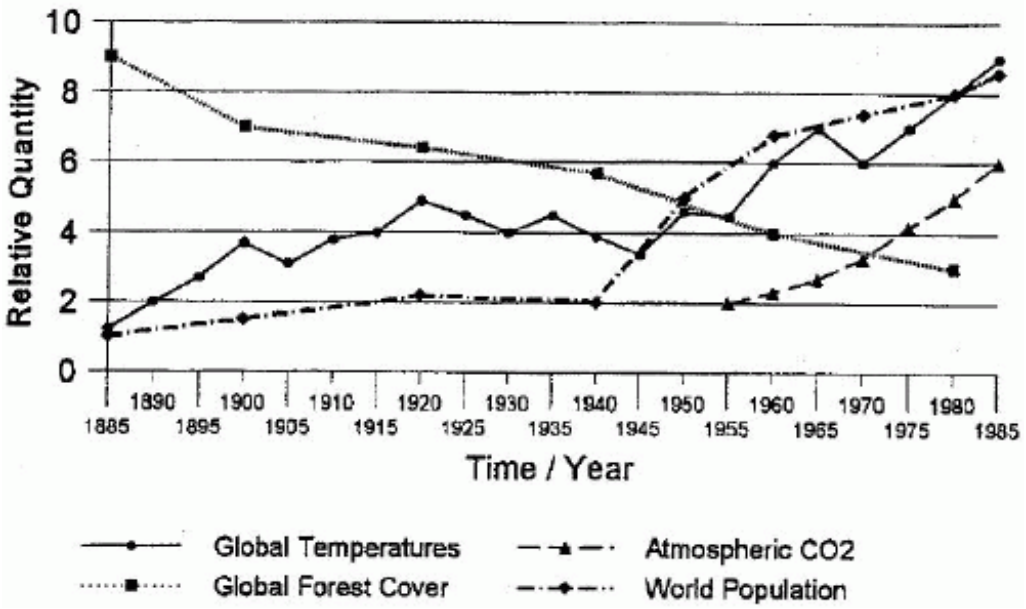
A. burning of fossil fuels
B. aerosol cans
C. the rainforests
D. methane from rice paddies

79) Which two of the continuous measurements displayed on the graph show an INVERSE relationship with each other?



A. Forest and Population
B. CO2 and Temperature
C. CO2 and Population
D. Temperature and Population

80) Clear-thinking communicators often say "correlation is not necessarily cause." By this they mean that two or more events which are related may occur at the same time or may influence each other, but this does not always mean that one directly causes the other to occur. Which two of the global events depicted on the graph are most clearly and directly related?



A. Population and Forestation change
B. CO2 levels and Temperature change
C. Temperature and Ocean volume change
D. Population and Temperature rise

81) Hans designed an experiment to measure the effect of color on the absorption of solar energy. He put a 3m x 3m black plastic tarp and a 3m x 3m clear plastic tarp over a snow back that was 1m deep. At 4:00 pm each day for a week he measured the amount of snow remaining under the tarps. Which of the following statements accurately describes Hans's experimental design?

A. The design was valid because Hans measured the effect of color on the absorption of solar energy
B. The design is flawed because the results cannot be quantified
C. The design is flawed because it tests two variables
D. The design is flawed because it has two controls
E. The design is flawed because it has no controls

82) Ms. Magnificent, Lance's Earth Systems teacher, gave him an assignment to design and conduct an energy related experiment. Lance decided to compare the amount of energy required to melt ice with the amount of energy required to melt snow.

Which of the following hypothesis compares the energy required to melt ice with the energy required to melt snow?

A. If salt is applied to snow and ice, then snow will melt faster
B. Ice is 50 more dense than snow
C. If the polar ice caps melted, then how many cities would be flooded?
D. If energy is applied to snow and ice, then it will change water from a liquid to a solid state
E. If energy is applied to snow and ice, then it will require 50 more energy to melt ice than snow

83) Which of the following best describes this statement? “By increasing the amount of greenhouse gases, it is possible to increase the greenhouse effect.”

A. Superstition
B. Hypothesis
C. Observation
D. Fact
E. Law

84) Which of the following is NOT considered a 'greenhouse' gas?

A. Carbon dioxide
B. Methane
C. Water vapor
D. Nitrogen

85) How do plants store energy during photosynthesis?

A. in light energy
B. in chemical bonds
C. as radiation
D. as motion of molecules

86) You are asked to create a poster that teaches how light energy is converted and stored as chemical energy. You search and find information for your topic on the following websites:
Chemical of the Week
The Biology Project
School of Physics, Department of Physical Optics
Earth Science Energy Education Curriculum Project
Which of the following best explains why information on your topic is found on websites of chemistry, biology, physics and earth science?

A. Most research sources are owned by the same science companies.
B. Light energy is related to concepts in many different areas of science.
C. All science websites are required to have information on most science topics.
D. Each website must be created by scientists who work in chemistry, biology, physics and earth science.

87) Where would you go to find the most reliable information on the “greenhouse effect”?

A. U.S. News and World Report
B. American Chemical Society weblog
C. The Greenpeace website
D. Better Homes and Gardens environmental section

88) Tess designed an experiment to measure how color affects the absorption of solar energy. She covered one Styrofoam cup with a black, nylon sock and another Styrofoam cup with a white, cotton sock. She left a third cup uncovered. She filled all three cups with 100 ml of room temperature water and set them in the sun. After 60 minutes, she measured the temperature of each of the cups. Which of the following statements accurately describes Tess's experimental design?

A. The design was valid because Tess measured the absorption of solar energy
B. The design is valid because she used two variables
C. The design is flawed because she used different materials as well as different colors
D. The design is flawed because water temperature cannot be used as an indicator of the absorption of solar energy
E. The design is flawed because 60 minutes is not long enough to measure the absorption of solar energy

EarthT3

!!!!!!!!ANSWER KEY!!!!!!!!

(Do not photo copy)
88 Question(s)
Test ID: 298293

1) (1) The Grinnell Glacier in Glacier National Park, Montana has been retreating rapidly since the early 1900's. (2) Photographs taken of the glacier document its reduced size since 1850. (3) Mountain glaciers are excellent monitors of climate change. (4) The worldwide shrinkage of mountain glaciers is caused by a combination of climate cycles and increased greenhouse gasses. Which of the sentences in this paragraph is an inference?

A. 1
B. 2
C. 3
✔ 4

[ILOs ESS, B, C, & P:4 - SC:ES:4:1]

2) Much of Utah's water flows to California via the Green, Colorado and San Juan Rivers. However, as farmers irrigate farmland in Uintah, San Rafael and San Pete basins, salt is washed into the rivers, tending to make the water less useful for farmers in California.
How might this problem be solved?

✔ Scientists might invent some kind of distillation or filtering system to remove the salt from the lower Colorado River.
B. Laws could be passed which would prohibit any of the polluted water from going into California.
C. Utah farmers could dump their irrigation water back into an aquifer where it would not do any damage.
D. Time will solve the problem. As the salt polluted water gets to Lake Powell and Lake Mead it evaporates and the salt settles to the bottom of the lakes where it harms no one.

[ILOs ESS, B, C, & P:5 - SC:ES:4:1]

3) Water moves against gravity up a tree stem and upwards through soil. What property of water allows this to happen?

A. density
B. solubility
C. color
✔ surface tension
E. taste

[SC:ES:4:1 - ILOs ESS, B, C, & P:3]

4) Which of these reference sources would be the most help if you wanted to find the current status of Utah's aquifers?

A. Channel 4 weather report.
B. Newspaper article "Utah Water Storage Problems".
✔ Utah Division of Water Resources Report.
D. Encylopedia entry on aquifers.

[SC:ES:4:1 - ILOs ESS, B, C, & P:4]

5) How does the salt content of sea water affect its usefulness to people? The salt

✔ reduces the number of ways people can use it.
B. makes it valuable for farming and aquariums.
C. makes it impossible for living things to survive.
D. makes it as useful as freshwater, just different.

[SC:ES:4:1 - ILOs ESS, B, C, & P:5]

6) Where is the majority of the Earth's water found?

A. In rivers
B. In lakes
✔ In oceans
D. In wetlands

[SC:ES:4:1 - ILOs ESS, B, C, & P:3]

7) What has caused our nation to reduce the pollution in some of its lakes?

✔ Scientific studies showing the effect of pollutants on fish and animal life.
B. The fact that most people who swam in polluted lakes got sick.
C. Boats and water sport vehicles were being damaged by the pollutants.
D. Factories that were polluting lakes developed products that didn't need a water source.

[SC:ES:4:1 - ILOs ESS, B, C, & P:5]

8) Which of the following aspects of stream water would NOT affect the types of life that could live in the stream?

A. temperature
B. turbidity
C. dissolved oxygen content
✔ molecular composition of water
E. stream gradient

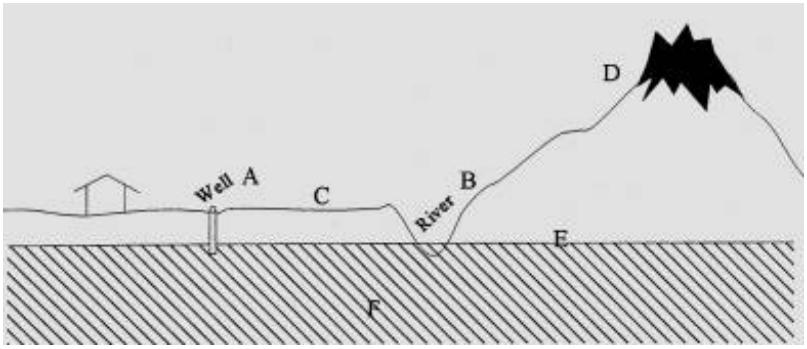
[ILOs ESS, B, C, & P:3 - SC:ES:4:1]

9) Which best describes the future of water use in Southern Utah?

✔ The use of computers will enable us to better recognize water needs and control water distributed to those communities.
B. The decline in growth of cities in Southern Utah will decrease the demand for water in that part of the state.
C. The supply of water in Southern Utah will dry up and the area will become a desert.
D. Meteorologists will be able to predict and control when storms hit Southern Utah.

[SC:ES:4:1 - ILOs ESS, B, C, & P:5]

10) Use this diagram of a cross section of the earth to answer the following question.

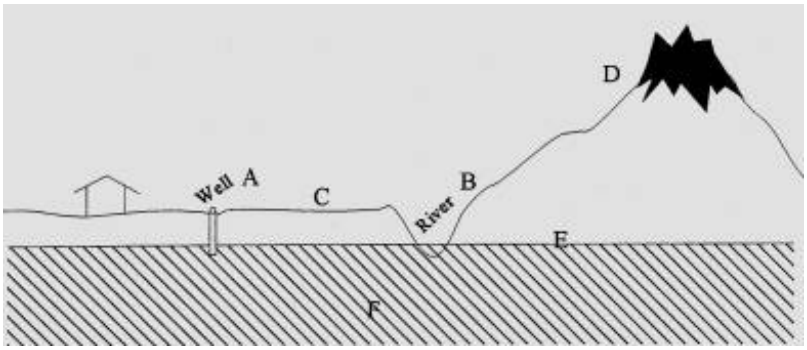


Insecticides sprayed on a field near point "C" are found in the well water. How did they get there?

✔ they were carried by water flowing through the soil
B. they evaporated into the air and were drawn in as the well pumped
C. the well was open when they were sprayed

[ILOs ESS, B, C, & P:1 - SC:ES:4:1]

11) Use this diagram of a cross section of the earth to answer the following question.



The line labeled "E" is called the:

✔ water table
B. watershed
C. recharge area
D. reclamation dam

[ILOs ESS, B, C, & P:3 - SC:ES:4:1]

12) Which of the following is NOT a source of water for people in Utah?

A. ground water
B. streams
C. lakes
✔ glaciers

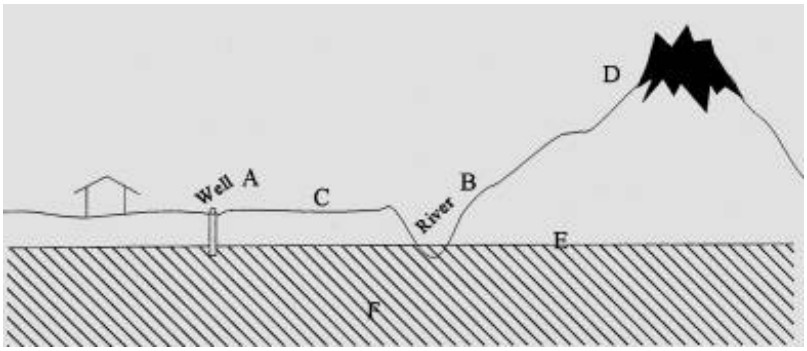
[SC:ES:4:1 - ILOs ESS, B, C, & P:3]

13) Utah is mostly a desert. In much of the state there is not enough water from rain and snow to sustain any major farming. Yet dairy, livestock, hay, and grain production is a major source of income for the State.
How have the people of Utah tried to solve the problem of not enough water for farmers?

A. We use technology to change the climate.
B. The people of Utah save almost all of the water that comes from rain and snow for farming.
C. Farmers only grow plants and animals in the years when there is ample rainfall.
✔ We store water and move it around the state through reservoirs, aqueducts, and pipelines.

[ILOs ESS, B, C, & P:5 - SC:ES:4:1]

14) Use this diagram of a cross section of the earth to answer the following question.

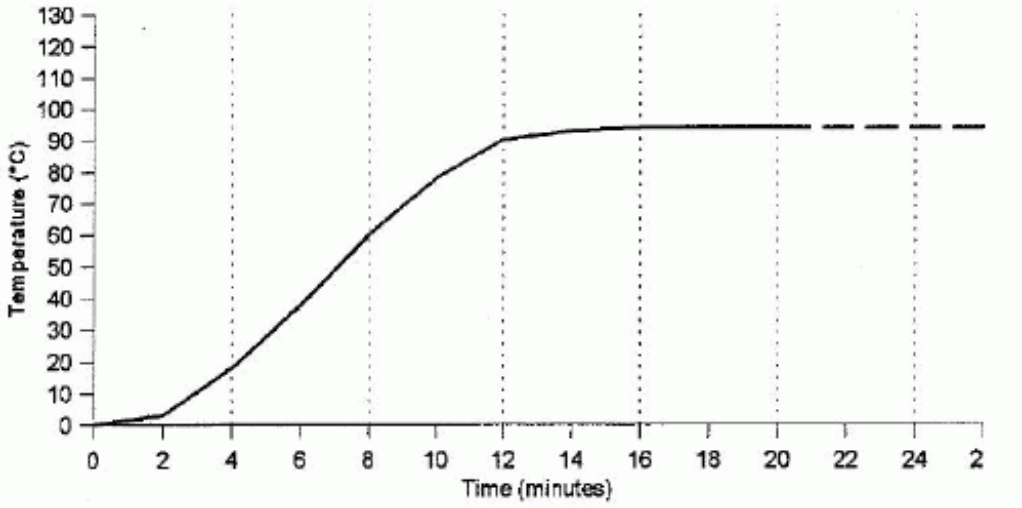


If more wells were built and a great deal of water was pumped from them, what might happen to the river?

A. its flow would increase
✔ its flow would decrease
C. the wells would not affect the river
D. more snow would melt and maintain the balance

[SC:ES:4:1 - ILOs ESS, B, C, & P:1]

15) Water is placed over a burner until it boils. The graph shows the temperature at each two minute interval. The experiment ended at 20 minutes. Yet the fellow extrapolated until 26 minutes. At what Temperature did the water boil?



A. 35
B. 70
✔ 94
D. 100

[ILOs ESS, B, C, & P:1 - SC:ES:4:1]

16) The way to save the most water in your home is to:

✔ use less water in the yard
B. do less cleaning
C. use less in cooking
D. put a brick in the back of the toilet

[SC:ES:4:1 - ILOs ESS, B, C, & P:3]

17) What assumption do people make every time they fill a glass with water from the tap and drink it?

A. It contains nothing but pure water.
B. It came from a pure mountain stream near the town.

✔ It contains approved levels of contaminants.
D. It may make a small percentage of susceptible people sick.

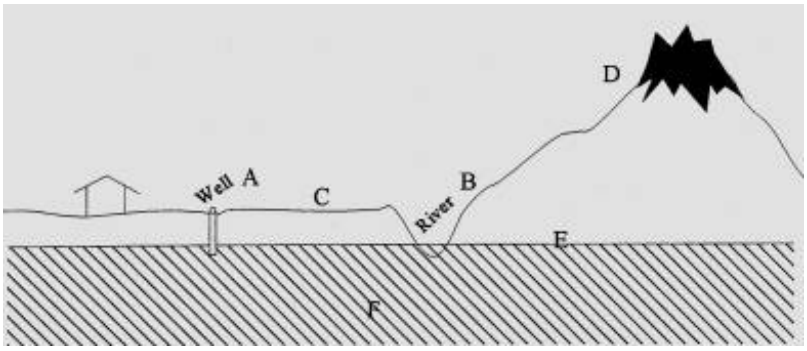
[ILOs ESS, B, C, & P:1 - SC:ES:4:1]

18) Jill wants to measure the stream flow volume (amount of water flowing through a stream) of the stream that flows down a nearby canyon. What aspects of the stream should she measure?

A. The width, length, and depth of the stream
✔ The width, depth, and meters per second flow of the stream
C. The meters per second flow of the stream
D. The length, depth, and meter per second flow of the stream
E. The width and length of the stream

[ILOs ESS, B, C, & P:1 - SC:ES:4:1]

19) Use this diagram of a cross section of the earth to answer the following question.



The water table will remain in the same place if

A. losses at "B" and "C" are greater than gains at "D"
B. losses at "B" and "C" are less than gains at "D"
C. the well at "A" doesn't pump more than "B"
✔ snow and rain from "D" replace the losses at "A" and "B"

[ILOs ESS, B, C, & P:1 - SC:ES:4:1]

20) Water expands when it freezes. What would happen if water did NOT expand when frozen?

✔ Ice would sink, ponds would freeze from the bottom up, and many aquatic plants and animals would die
B. Water would be more dense than wood therefore wood would not float. Beavers would be adversely affected
C. The surface tension would be destroyed. Water striders and other creatures that walk on the water's surface would sink
D. Water would not evaporate therefore clouds would not form. There would be no snow or rain
E. Water would not dissolve many substances. It would be impossible to make root beer or clean bathrooms

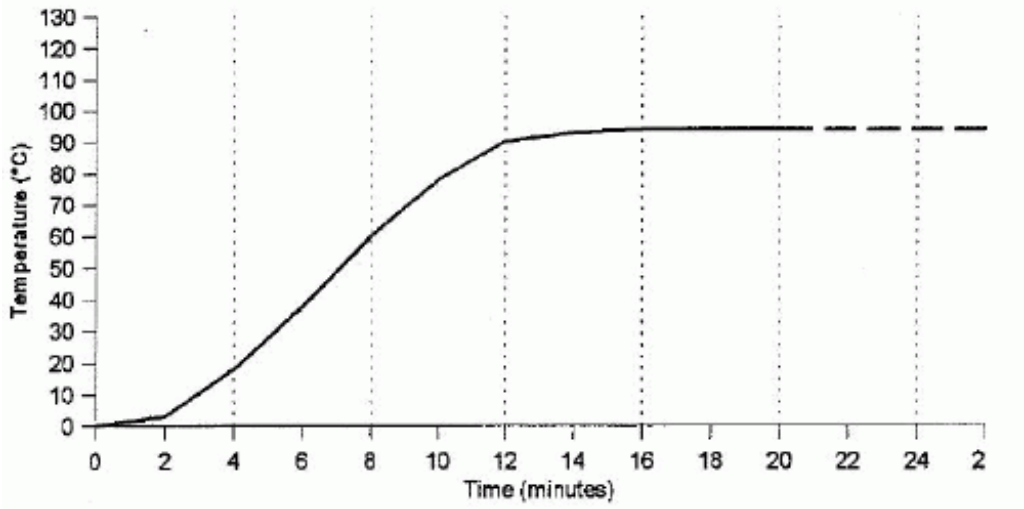
[ILOs ESS, B, C, & P:3 - SC:ES:4:1]

21) Why is water called the universal solvent?

A. it can solve any problem
✔ it can dissolve many substances
C. it is found many places in the universe
D. it is part of most living things

[SC:ES:4:1 - ILOs ESS, B, C, & P:3]

22) Water is placed over a burner until it boils. The graph shows the temperature at each two minute interval. The experiment ended at 20 minutes. Yet the fellow extrapolated until 26 minutes. If the water was left to boil for 1 hour more, how hot would the water get?



A. 32
✔ 96
C. 100
D. 212

[ILOs ESS, B, C, & P:1 - SC:ES:4:1]

23) An oil spill at sea often damages birds and sea mammals but fish are relatively unaffected. What properties of water and oil are responsible for this situation?

✔ oil is less dense than water and floats on the surface
B. oil is darker in color and has a stronger odor
C. water is harmless to sea life, oil is a poison to most things
D. water floats when it freezes, oil sinks when frozen

[SC:ES:4:1 - ILOs ESS, B, C, & P:3]

24) A 9th grade student wants to test the effect of excess fertilizer on algae growth in freshwater versus algae growth in saltwater. The student predicts the saltwater will be more affected. A gram of fertilizer is added to a liter of local pond water in one container and a liter of saltwater from the classroom aquarium in another. Both samples are placed in the same windowsill for a week. Daily observations are recorded. The student's observations are below:

	Saltwater	**Freshwater**
Day 1	Water is cloudy. Some floating organisms	Water is clear. Some floating organisms.
Day 2	No change.	No change.
Day 3	Water is cloudier.	Green algae start to appear.
Day 4	No change.	More algae. It is difficult to see through the water.
Day 5	Water is a little cloudier. Some organisms still floating.	Water is a lot greener than day one. Lots of floating material.

Was the experiment adequate to resolve the student's question?

A. No, the hypothesis was not correct
B. No, careful observations were not made
✔ Yes, if the results are reproducible
D. Yes, he used the correct amount of fertilizer

[SC:ES:4:1 - ILOs ESS, B, C, & P:6]

25) Which best describes the future of water use in Southern Utah?

✔ The use of computers will enable us to better recognize water needs and control water distributed to those communities.
B. The decline in growth of cities in Southern Utah will decrease the demand for water in that part of the state.
C. The supply of water in Southern Utah will dry up and the area will become a desert.
D. Meteorologists will be able to predict and control when storms hit Southern Utah.

[SC:ES:4:1 - ILOs ESS, B, C, & P:5]

26) Which of the following is NOT a problem concerning dams on the Colorado River?

✔ they provide irrigation water and hydroelectric power
B. wildlife habitat has been destroyed
C. water becomes increasingly salty as it moves through the system

D. water no longer reaches Mexico

[SC:ES:4:1 - ILOs ESS, B, C, & P:3]

27) What has caused our nation to reduce the pollution in some of its lakes?

✔ Scientific studies showing the effect of pollutants on fish and animal life.
B. The fact that most people who swam in polluted lakes got sick.
C. Boats and water sport vehicles were being damaged by the pollutants.
D. Factories that were polluting lakes developed products that didn't need a water source.

[ILOs ESS, B, C, & P:5 - SC:ES:4:1]

28) People protect watershed areas in many ways, including placing bans on dogs and horses in the areas near streams. Why?

A. Dogs and horses drink a great deal of water that people need
✔ The animals' wastes can wash into the streams, polluting them
C. More people will visit the area if they can bring their pets
D. Animals frighten wildlife and ruin the natural environment
E. Animals will walk in the water, stirring up mud

[SC:ES:4:1 - ILOs ESS, B, C, & P:3]

29) (1) The Grinnell Glacier in Glacier National Park, Montana has been retreating rapidly. (2) Photographs taken of the glacier document its reduced size in since 1850. (3) Mountain glaciers are excellent monitors of climate change. (4) The worldwide shrinkage of mountain glaciers is thought to be caused by a combination of climate cycles and increased greenhouse gasses. Which sentence has data to support the argument that the glacier is shrinking?

A. 1
✔ 2
C. 3
D. 4

[SC:ES:4:1 - ILOs ESS, B, C, & P:4]

30) Which factor affects the boiling point of water?

✔ the amount of air pressure present
B. the latitude of the water's location
C. the longitude of the water's location
D. the air temperature around the water

[ILOs ESS, B, C, & P:3 - SC:ES:4:1]

31) An oceanographer collected data on the physical properties of the sea in several locations. Then she counted the number of sea snails in the same locations over a period of several days.

Which factor is not easily analyzed with this data?

Location	Temperature (degrees C)	Salinity (parts per thousand)	Depth (meters)	Average number of snails
Site 1	15	31	22	56
Site 2	22	30	7	31
Site 3	16	30	17	49

A. temperature
✔ salinity
C. depth
D. snail populations

[SC:ES:4:2]

32) A student wonders if waves are caused by wind. To test this hypothesis he goes to a beach and measures the wind speed, wind direction and wave height for a week. According to this table of his results, what conclusion best summarizes this experiment?

Day	Wind Speed (mph)	Wind Direction	Average Wave Height (meters)
1	8	S	2.4
2	5	S	1.0
3	16	S	.8
4	22	S	1.0
5	13	SW	1.2
6	9	N	1.3
7	6	N	.5

A. Wave height depends on many factors but not wind speed or direction.
B. Wave height is determined by movements of currents and tides
C. Waves move for no testable reason.
✔ Wave height at the beach does not depend on local winds.

[SC:ES:4:2]

33) Where would you expect the greatest number of living organisms in the ocean?

A. on the surface
✔ in the top 100 meters
C. in the top half mile
D. in the lowest regions

[ILOs ESS, B, C, & P:3 - SC:ES:4:2]

34) Most scientists agree that global warming is taking place, and as a result, sea levels will rise. What do they recommend people do to prevent this?

✔ Reduce fossil fuel consumption.
B. Reduce nuclear energy production.
C. Increase electricity use in order to reduce CO2 emissions.
D. Increase fossil fuel use in order to save electricity.

[ILOs ESS, B, C, & P:5 - SC:ES:4:2]

35) What do organisms living in the inter-tidal zone (area of land between low and high tides) have in common?

A. they eat the same things
B. they like the same temperatures
C. they have few predators
✔ they can survive out of water

[ILOs ESS, B, C, & P:3 - SC:ES:4:2]

36) Fish living far below the oceans' surface are rarely or never displayed at seawater aquariums. Why?

A. They are fast swimmers and hard to catch
B. The types of food they need are not available at aquariums
✔ They have adapted to intense pressures of the deep
D. Aquariums do not think people will pay to see them

[SC:ES:4:2 - ILOs ESS, B, C, & P:3]

37) What is the main cause of waves on the ocean?

A. currents
B. tides
✔ the moon
D. wind

[SC:ES:4:2 - ILOs ESS, B, C, & P:3]

38) An oceanographer collected data on the physical properties of the sea in several locations. Then she counted the number of sea snails in the same locations over a period of several days.

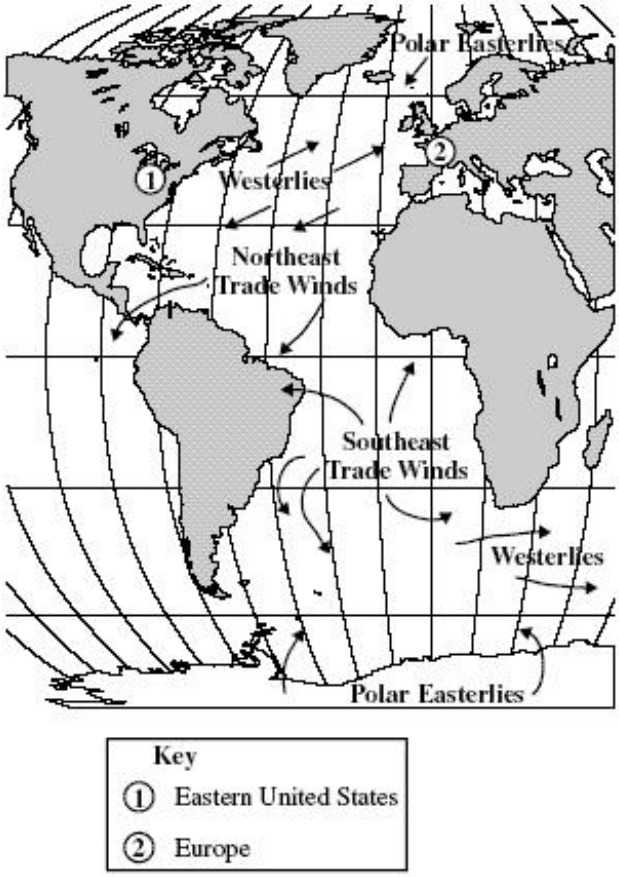
Why did the oceanographer count the snail populations several times and do an average?

Location	Temperature (degrees C)	Salinity (parts per thousand)	Depth (meters)	Average number of snails
Site 1	15	31	22	56
Site 2	22	30	7	31
Site 3	16	30	17	49

✔ to increase the accuracy of her results
B. to make sure she didn't miss any
C. to have more opportunities to see the snails
D. to see if the snails are moving from one place to another

[SC:ES:4:2]

39) The diagram below illustrates the motion of prevailing winds over oceans on Earth.



If a sailboat sailed from the eastern United States to Europe and then back, which of the following winds would **most** directly power the sailboat?

A. Polar Easterlies going and Westerlies returning
B. Northeast Trade Winds going and Westerlies returning
✔ Westerlies going and Northeast Trade Winds returning
D. Southeast Trade Winds going and Northeast Trade Winds returning

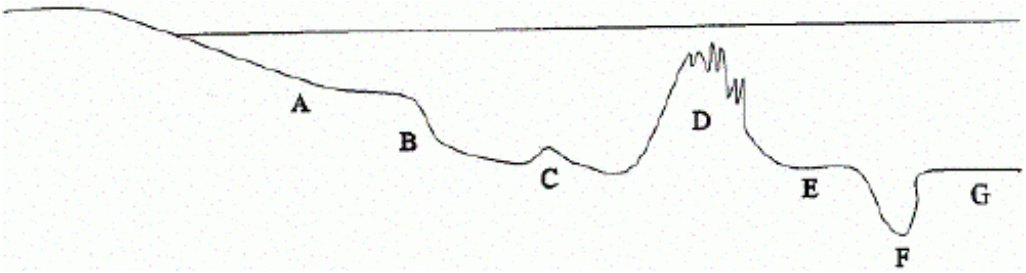
[ILOs ESS, B, C, & P:1 - SC:ES:4:2]

40) While walking along an ocean beach, you and a friend find live barnacles and mussels attached to rocks and hermit crabs in shells. You infer that these organisms can live under water much of their life. What data would support this inference?

✔ A tide chart showing that at high tide the beach is underwater.
B. The barnacles are anchored to some rocks.
C. There are fish swimming in the ocean nearby.
D. All three of the animals found have shells.

[SC:ES:4:2 - ILOs ESS, B, C, & P:4]

41) Use the diagram to answer the following question:



Organisms living at "G" would be adapted to which kind of conditions?

A. high amounts of light, high pressures
B. high amounts of light, low pressures
✔ no light, high pressures
D. no light, low pressures

[ILOs ESS, B, C, & P:3 - SC:ES:4:2]

42) Where in the ocean would large schools of fish most likely be found?

A. in deep water
✔ in areas of up welling
C. near river mouths
D. near undersea volcanoes

[SC:ES:4:2 - ILOs ESS, B, C, & P:3]

43) What is the main cause of ocean tides?

A. currents
✔ the sun and the moon
C. waves
D. wind

[ILOs ESS, B, C, & P:3 - SC:ES:4:2]

44) Ocean organisms have adapted to live in salty water. Chin Li is curious about what range of salinity ocean organisms can tolerate. Which of the following field studies could she conduct to satisfy her curiosity?

✔ Expose sea urchin eggs to saline solutions of varying concentrations and collect data on egg survival rates
B. Expose sea urchin eggs to salt water of varying temperatures and collect data on egg survival rates
C. Expose goldfish eggs to saline of varying concentrations and collect data on egg survival rates
D. Expose sea urchin and goldfish eggs to fresh and salt water and collect data on egg survival rates
E. Expose sea urchin eggs to solutions of varying saline concentrations and temperatures and collect data on egg survival rates

[SC:ES:4:2 - ILOs ESS, B, C, & P:1]

45) Use this map of ocean currents to answer the following question:

A boat sailing across the Atlantic Ocean would take advantage of which current on the journey east?

A. A
B. B
C. C
D. D
✔ E

[ILOs ESS, B, C, & P:1 - SC:ES:4:2]

46) How has technology increased our understanding of the ocean?

✔ Oceanographers use remote sensing satellites to map the ocean floor.
B. Technology has prevented the pollution of ocean waters.
C. Technology has allowed oceanographers to identify plate boundaries and prevent their movement.
D. Oceanographers have used technology to even out the high tides.

[SC:ES:4:2 - ILOs ESS, B, C, & P:5]

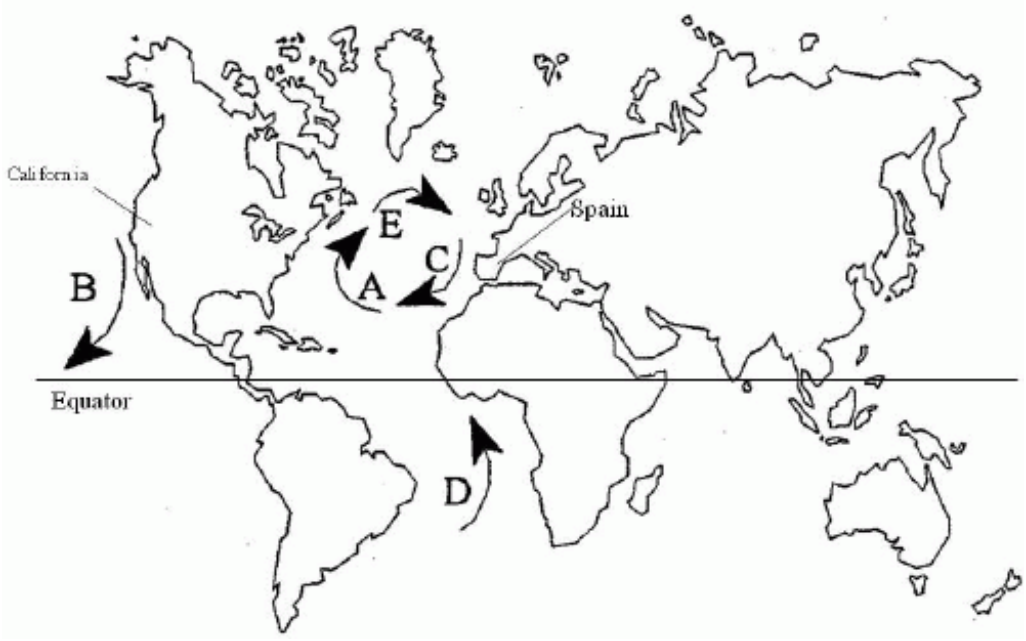
47) A student wonders if waves are caused by wind. To test this hypothesis he goes to a beach and measures the wind speed, wind direction and wave height for a week. According to this table of his results, which of the following hypothesis would be a logical follow-up to this experiment?

Day	Wind Speed (mph)	Wind Direction	Average Wave Height (meters)
1	8	S	2.4
2	5	S	1.0
3	16	S	.8
4	22	S	1.0
5	13	SW	1.2
6	9	N	1.3
7	6	N	.5

A. If waves are not influenced by wind, then nothing else will affect them.
✔ If winds out at sea are strong, wave height will be higher the next day.
C. If waves are not interfered with by coral reefs, then they will be higher.
D. If currents are present, then waves will be smaller.

[SC:ES:4:2]

48) If you had no data other than the map above, what evidence could you supply to support the inference that the coast of Spain has a climate like the coast of California?



A. Spain and California are both on the west side of their continents.
B. Spain and California are both near an ocean.
✔ Ocean currents flowing near Spain and California both flow south.
D. Spain and California are both in the Northern Hemisphere.

[SC:ES:4:2 - ILOs ESS, B, C, & P:4]

49) Use this map of ocean currents to answer the following question:

Which current would be warm?

✔ A
B. B
C. C
D. D

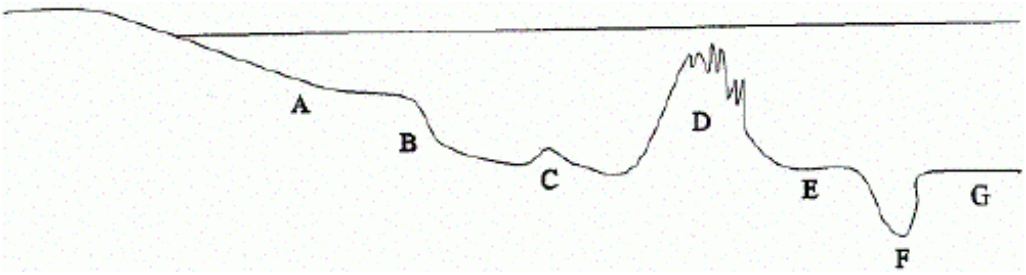
[SC:ES:4:2 - ILOs ESS, B, C, & P:1]

50) What type of changes would you expect as you go down from the ocean's surface to its bottom?

A. Temperature, pressure, light, and density all decrease
B. Temperature and pressure increase; light and density decrease
✔ Temperature and light decrease; pressure and density increase
D. Temperature and density decrease; light and pressure increase

[SC:ES:4:2 - ILOs ESS, B, C, & P:3]

51) Use the diagram to answer the following question:

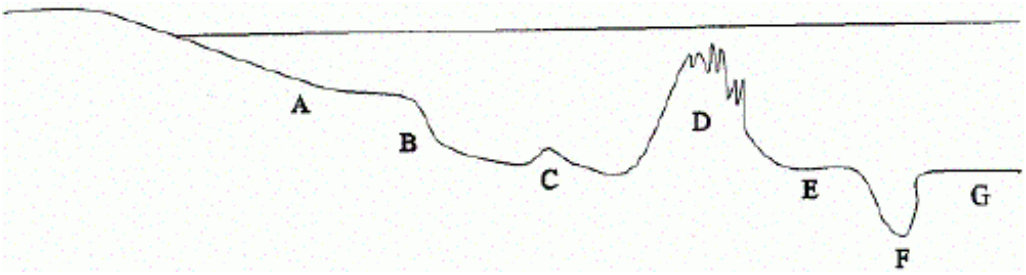


The feature labeled "A" is called the:

A. ridge
B. abyssal plains
✔ continental shelf
D. continental rise

[SC:ES:4:2 - ILOs ESS, B, C, & P:3]

52) Use the diagram to answer the following question:



The greatest number of living things would be found in which area?

✔ A
B. B
C. C
D. E

[SC:ES:4:2 - ILOs ESS, B, C, & P:3]

53) When do areas of upwelling in the ocean occur?

A. When fish gather for feeding
B. When the tides are at their lowest
✔ When surface water is replaced by deep water
D. When the currents collide and form whirlpools

[SC:ES:4:2 - ILOs ESS, B, C, & P:3]

54) A student wonders if waves are caused by wind. To test this hypothesis he goes to a beach and measures the wind speed, wind direction and wave height for a week. According to this table of his results, does wave height appear to be related to wind speed or direction?

Day	Wind Speed (mph)	Wind Direction	Average Wave Height (meters)
1	8	S	2.4
2	5	S	1.0
3	16	S	.8
4	22	S	1.0
5	13	SW	1.2
6	9	N	1.3
7	6	N	.5

A. Yes, the highest waves occurred during a SE wind.
B. Yes, the lowest waves occurred during the lowest wind
✔ No, there is no pattern of wind speed or direction related to wave height.
D. No, the measurements this student took were inaccurate and cannot be used.

[SC:ES:4:2]

55) An oceanographer collected data on the physical properties of the sea in several locations. Then she counted the number of sea snails in the same locations over a period of several days.

Using this data, what relationship appears between depth and temperature?

Location	Temperature (degrees C)	Salinity (parts per thousand)	Depth (meters)	Average number of snails
Site 1	15	31	22	56
Site 2	22	30	7	31
Site 3	16	30	17	49

A. no apparent relationship exists
B. deeper waters are warmer
✔ deeper waters are cooler
D. deeper waters lose heat more rapidly

[SC:ES:4:2]

56) Where would the warmest water in the ocean be found?

A. the poles, on the surface
B. the poles, deep below the surface
C. the equator, deep below the surface
✔ the equator, on the surface

[ILOs ESS, B, C, & P:3 - SC:ES:4:2]

57) What is the main cause of ocean currents?

✔ The prevailing winds
B. The Coriolis effect
C. Waves
D. The sun and the moon

[ILOs ESS, B, C, & P:3 - SC:ES:4:2]

58) Which process returns nutrients and gases collected in deep ocean water to the surface?

A. currents
B. rip tides
✔ up-welling
D. waves

[ILOs ESS, B, C, & P:3 - SC:ES:4:2]

59) What important function do currents, waves and El Nino provide for living things in the sea?

A. Provides a way for living things to move around
✔ Brings nutrients up from deeper water
C. Mixes land and sea organisms
D. Allows Earth to have weather

[SC:ES:4:2 - ILOs ESS, B, C, & P:3]

60) Global warming conditions are causing ice caps and glaciers to melt. The fresh water from the melting ice dilutes the surrounding salt water. Cold, salty water in the North Atlantic Ocean normally sinks to the bottom of the ocean and slowly creeps along until it reaches an area of upwelling. Scientists believe that this process circulates nutrients and heat throughout the world's oceans. Some scientists worry that the melting glaciers will change these salty circulations and therefore change the cycling of nutrients in the ocean, ultimately impacting food sources for animals living in the ocean. Which statement is evidence that causes scientists to believe that the biological environment in the ocean is changing?

✔ Melting ice is diluting salty ocean water.
B. Melting glaciers will change the cycling of nutrients in the ocean.
C. Cold, salty water circulates nutrients and heat throughout the world's oceans.
D. Melting glaciers will change the food sources for animals living in the ocean.

[SC:ES:4:2 - ILOs ESS, B, C, & P:6]

61) An oceanographer collected data on the physical properties of the sea in several locations. Then she counted the number of sea snails in the same locations over a period of several days.

Using this data, which physical properties do sea snails appear to prefer?

Location	Temperature (degrees C)	Salinity (parts per thousand)	Depth (meters)	Average number of snails
Site 1	15	31	22	56
Site 2	22	30	7	31
Site 3	16	30	17	49

✔ Colder, deeper water
B. Colder, shallower water
C. Warmer, deeper water
D. Warmer, shallower water

[SC:ES:4:2]

62) Which of the following is NOT a physical dynamic of oceans?

✔ fish
B. waves
C. ocean currents
D. tides

[ILOs ESS, B, C, & P:3 - SC:ES:4:2]

63) Use this map of ocean currents to answer the following question:

How would current "B" affect the land it runs near?

A. increase temperatures
✔ decrease temperatures
C. would not affect temperatures
D. decrease humidity

[ILOs ESS, B, C, & P:1 - SC:ES:4:2]

64) What does sunlight striking a blacktop highway change into?

A. light
B. electricity
C. motion
✔ heat

[SC:ES:6:1 - ILOs ESS, B, C, & P:3]

65) Kendra's mom is purchasing a car, but cannot decide what color to get. Kendra advises her mom that a car with a black exterior will be uncomfortable in the summer. This observation is correct because dark objects, as compared to lighter colored objects,

A. reduce heat transfer.
B. are generally more dense.
✔ absorb more of the Sun's energy.
D. reflect sunlight more efficiently.

[SC:ES:6:1:C - ILOs ESS, B, C, & P:3:a]

66) What does photosynthesis in plants convert light energy into?

A. mechanical energy
B. motion
✔ chemical energy
D. kinetic energy

[ILOs ESS, B, C, & P:3 - SC:ES:6:1]

67) The cycles of sun spots have been monitored since Galileo's time. Evidence has shown that there may be a relationship between the climate on Earth and solar activity. The evidence shows that an increase in solar activity is associated with warmer than normal climates and that a decrease is associated with colder climates.
Which of the following best describes the importance of understanding the relationship between solar activity and climate?

✔ Variations in solar activity and climate affect many aspects of human life.
B. Solar activity needs further study to see if Galileo's observations were correct.
C. Most climate changes are the direct result of modern human activities.
D. Future climate prediction is essential for scientific investigations to continue.

[ILOs ESS, B, C, & P:5 - SC:ES:6:1]

68) How does energy flow through an ecosystem?

✔ The sun's energy is captured by plants, used by animals, and eventually returns to space as heat
B. Energy from the sun is recycled over and over again in the ecosystem

C. Energy from the sun is captured by animals to make sugars and fats
D. The sun's energy is captured by oxygen molecules, which causes photosynthesis

[SC:ES:6:1 - ILOs ESS, B, C, & P:3]

69) Which of the following is an example of an ethical question raised by science that science cannot answer?

A. Does burning fossil fuels contribute to global warming?
B. What evidence confirms that global warming is occurring?
✔ Should businesses be allowed to clear forests for housing or commercial use?
D. How does the greenhouse effect help keep the earth at a warm temperature?

[ILOs ESS, B, C, & P:6 - SC:ES:6:1]

70) Which of the following is NOT a fossil fuel?

A. coal
B. gas
C. oil
✔ wood

[ILOs ESS, B, C, & P:3 - SC:ES:6:1]

71) Over the last few decades, scientists have indicated an increase in global temperatures. Scientists have been encouraged to investigate what factors are causing these changes. How has this new research about global warming affected human life?

A. Global warming has decreased the amount of fossil fuels used by human activities.
✔ More people are aware of the possible impact their activities have on global warming.
C. Students are required to learn about global warming in all science classes.
D. There has been no significant change in human life due to global warming.

[SC:ES:6:1 - ILOs ESS, B, C, & P:5]

72) Ms. Magnificent, Lance's Earth Systems teacher, gave him an assignment to design and conduct an energy related experiment. Lance decided to compare the amount of energy required to melt ice with the amount of energy required to melt snow.

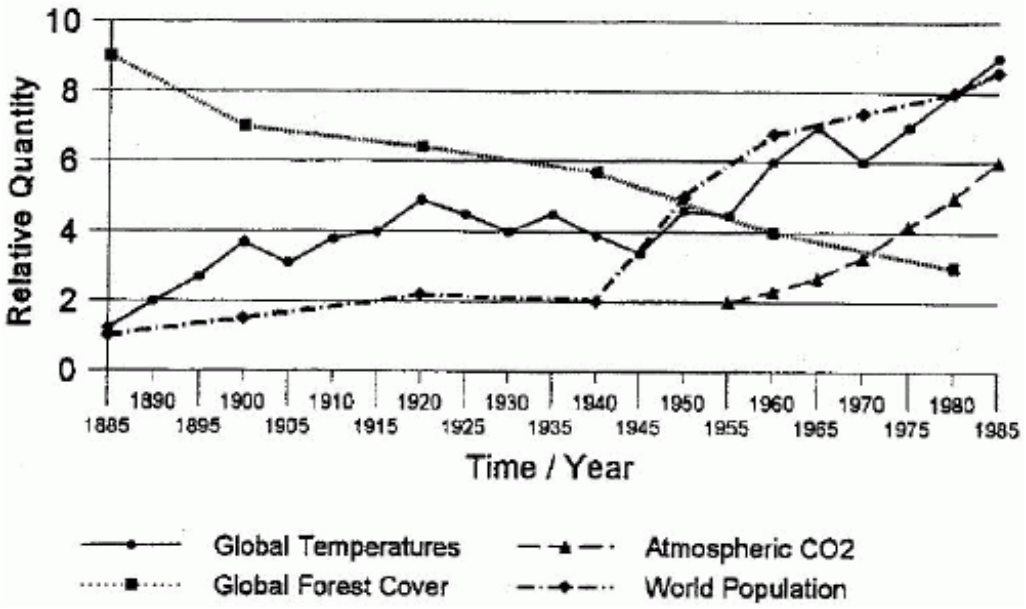
Lance designed an experiment to compare the energy to melt snow with the energy required to melt ice. He put 100 ml of snow in a 250 m; beaker and 2 ice cubes in another 250 ml beaker. He put the beakers at equal distances over a Bunsen burner and measured the amount of time it took for the ice and snow to be completely melted.

Which of the following statements accurately describes Lance's experimental design?

✔ The design was flawed because he did not use equal volumes of snow and ice
B. The design was flawed because he cannot determine how much energy was used to melt the snow and ice by measuring the amount of time each took to melt when placed over a burner
C. The design was flawed because he should have used two different burners
D. The design was valid because he compared the energy required to melt snow with the energy required to melt ice
E. The design was valid because he timed the ice and snow until they were completely melted

[ILOs ESS, B, C, & P:1 - SC:ES:6:1]

73) Between which approximate dates was there a significant change in the rates of the events displayed on the graph?

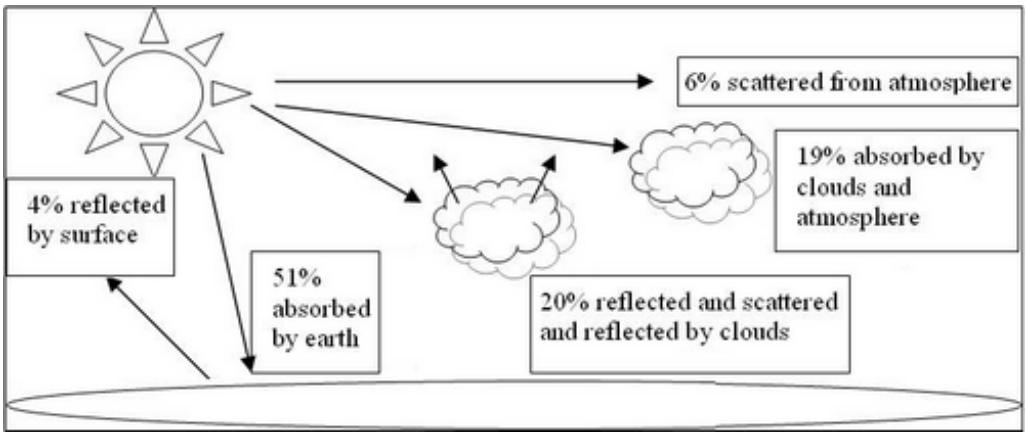


A. 1885 to 1895 AD
B. 1920 to 1940 AD

✔ 1950 to 1960 AD
D. 1980 to 1985 AD

[SC:ES:6:1 - ILOs ESS, B, C, & P:1]

74) Which of the following is the best title for the above diagram?



A. How the Greenhouse Effect Works
B. The Creation of Weather Patterns on Earth
C. The Use of Fossil Fuels on Earth
✔ How Energy is Distributed on Earth

[ILOs ESS, B, C, & P:4 - SC:ES:6:1]

75) The 'greenhouse effect' could cause a number of problems. Which is NOT a problem associated with it?

A. rising sea level
B. changes in weather patterns
C. changes in ocean currents
✔ increased skin cancer

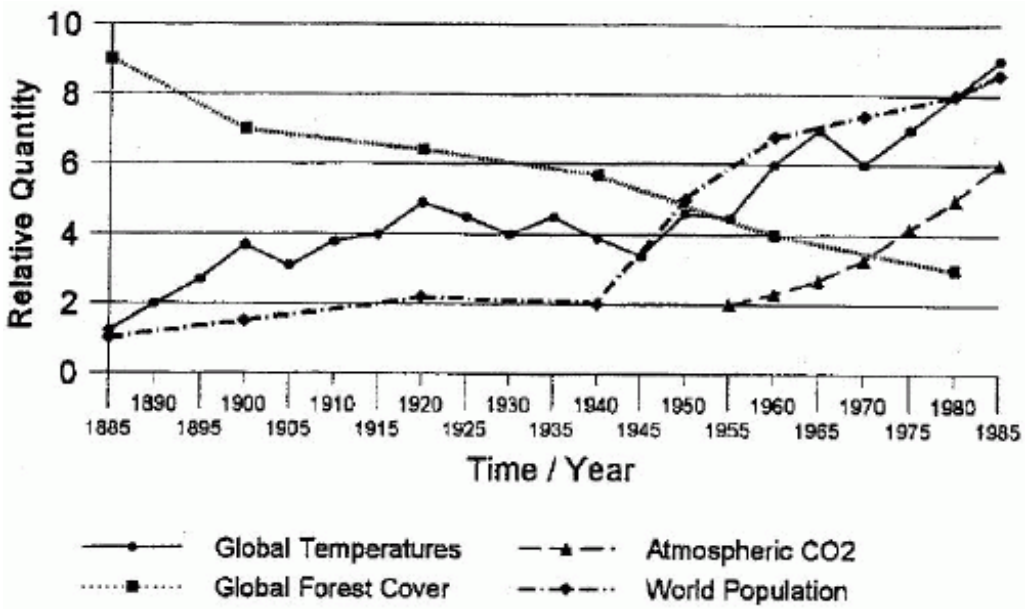
[ILOs ESS, B, C, & P:3 - SC:ES:6:1]

76) Heat is a form of energy. Why?

A. It can be produced in many ways
✔ It can do work
C. It happens to atoms
D. It is found everywhere
E. It can change into other forms

[ILOs ESS, B, C, & P:3 - SC:ES:6:1]

77) Clear-thinking communicators often say "correlation is not necessarily cause." By this they mean that two or more events which are related may occur at the same time or may influence each other, but this does not always mean that one directly causes the other to occur. Choose the combination of graphed global events listed below which most clearly presents this point-- the first event is MOST LIKELY NOT a direct cause of the other.



A. Population and Forestation change
B. CO2 levels and Temperature change

C. Temperature and Ocean volume change
✔ Population and Temperature rise

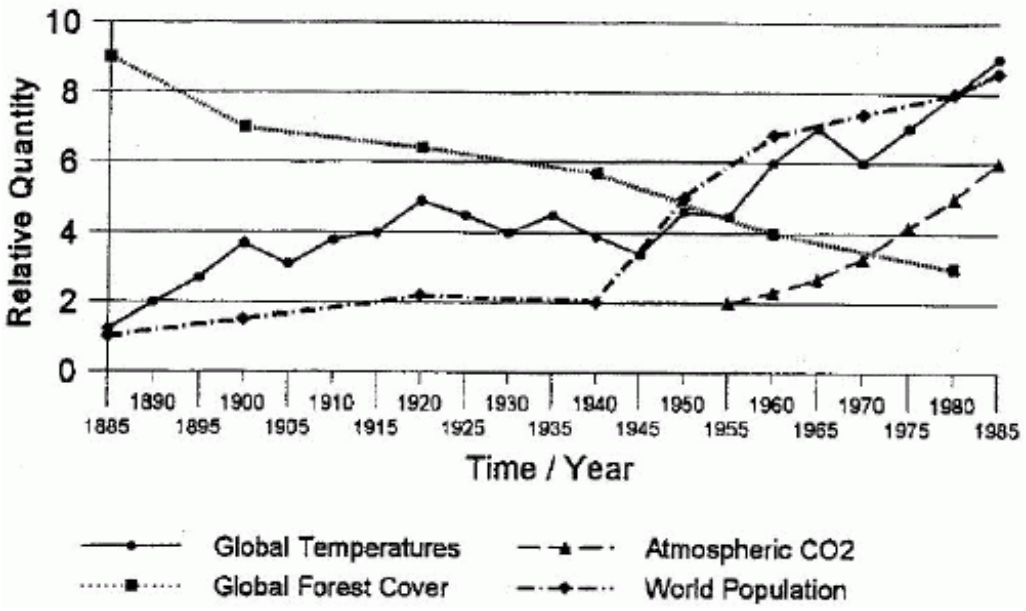
[SC:ES:6:1 - ILOs ESS, B, C, & P:1]

78) The main source of 'greenhouse' gas is

✔ burning of fossil fuels
B. aerosol cans
C. the rainforests
D. methane from rice paddies

[SC:ES:6:1 - ILOs ESS, B, C, & P:3]

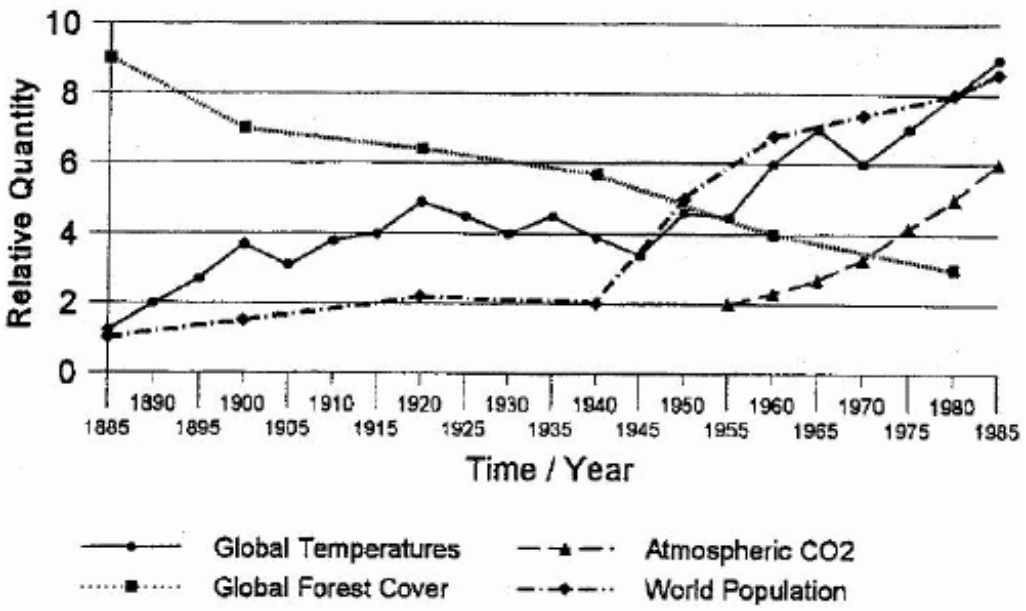
79) Which two of the continuous measurements displayed on the graph show an INVERSE relationship with each other?



✔ Forest and Population
B. CO2 and Temperature
C. CO2 and Population
D. Temperature and Population

[SC:ES:6:1 - ILOs ESS, B, C, & P:1]

80) Clear-thinking communicators often say "correlation is not necessarily cause." By this they mean that two or more events which are related may occur at the same time or may influence each other, but this does not always mean that one directly causes the other to occur. Which two of the global events depicted on the graph are most clearly and directly related?



A. Population and Forestation change
✔ CO2 levels and Temperature change
C. Temperature and Ocean volume change
D. Population and Temperature rise

[ILOs ESS, B, C, & P:1 - SC:ES:6:1]

81) Hans designed an experiment to measure the effect of color on the absorption of solar energy. He put a 3m x 3m black plastic tarp and a 3m x 3m clear plastic tarp over a snow back that was 1m deep. At 4:00 pm each day for a week he measured the amount of snow remaining under the tarps. Which of the following statements accurately describes Hans's experimental design?

A. The design was valid because Hans measured the effect of color on the absorption of solar energy
B. The design is flawed because the results cannot be quantified
C. The design is flawed because it tests two variables
D. The design is flawed because it has two controls
✔ The design is flawed because it has no controls

[ILOs ESS, B, C, & P:1 - SC:ES:6:1]

82) Ms. Magnificent, Lance's Earth Systems teacher, gave him an assignment to design and conduct an energy related experiment. Lance decided to compare the amount of energy required to melt ice with the amount of energy required to melt snow.

Which of the following hypothesis compares the energy required to melt ice with the energy required to melt snow?

A. If salt is applied to snow and ice, then snow will melt faster
B. Ice is 50 more dense than snow
C. If the polar ice caps melted, then how many cities would be flooded?
D. If energy is applied to snow and ice, then it will change water from a liquid to a solid state
✔ If energy is applied to snow and ice, then it will require 50 more energy to melt ice than snow

[SC:ES:6:1 - ILOs ESS, B, C, & P:1]

83) Which of the following best describes this statement? “By increasing the amount of greenhouse gases, it is possible to increase the greenhouse effect.”

A. Superstition
✔ Hypothesis
C. Observation
D. Fact
E. Law

[ILOs ESS, B, C, & P:6 - SC:ES:6:1]

84) Which of the following is NOT considered a 'greenhouse' gas?

A. Carbon dioxide
B. Methane
C. Water vapor
✔ Nitrogen

[SC:ES:6:1 - ILOs ESS, B, C, & P:3]

85) How do plants store energy during photosynthesis?

A. in light energy
✔ in chemical bonds
C. as radiation
D. as motion of molecules

[SC:ES:6:1 - ILOs ESS, B, C, & P:3]

86) You are asked to create a poster that teaches how light energy is converted and stored as chemical energy. You search and find information for your topic on the following websites:
Chemical of the Week
The Biology Project
School of Physics, Department of Physical Optics
Earth Science Energy Education Curriculum Project
Which of the following best explains why information on your topic is found on websites of chemistry, biology, physics and earth science?

A. Most research sources are owned by the same science companies.
✔ Light energy is related to concepts in many different areas of science.
C. All science websites are required to have information on most science topics.
D. Each website must be created by scientists who work in chemistry, biology, physics and earth science.

[ILOs ESS, B, C, & P:6 - SC:ES:6:1]

87) Where would you go to find the most reliable information on the “greenhouse effect”?

A. U.S. News and World Report
✔ American Chemical Society weblog
C. The Greenpeace website
D. Better Homes and Gardens environmental section

[ILOs ESS, B, C, & P:4 - SC:ES:6:1]

88) Tess designed an experiment to measure how color affects the absorption of solar energy. She covered one Styrofoam cup with a black, nylon sock and another Styrofoam cup with a white, cotton sock. She left a third cup uncovered. She filled all three cups with 100 ml of room temperature water and set them in the sun. After 60 minutes, she measured the temperature of each of the cups. Which of the following statements accurately describes Tess's experimental design?

A. The design was valid because Tess measured the absorption of solar energy
B. The design is valid because she used two variables
✔ The design is flawed because she used different materials as well as different colors
D. The design is flawed because water temperature cannot be used as an indicator of the absorption of solar energy
E. The design is flawed because 60 minutes is not long enough to measure the absorption of solar energy

[SC:ES:6:1 - ILOs ESS, B, C, & P:1]