

Released Items

Student Name: _____

Earth/Environmental Science



2018–2019



Public Schools of North Carolina
Department of Public Instruction | State Board of Education
Division of Accountability Services/North Carolina Testing Program

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NC Final Exam



- 1 Some constellations are more prominent in the night sky of North Carolina in winter, while other constellations are more prominent in the night sky in summer. Which **best** explains why this occurs?
- A because of Earth's rotation on its axis
 - B because of stars revolving around Earth
 - C because of Earth revolving around the sun
 - D because of the change in the barycenter of Earth
- 2 What is **most likely** to occur when the sun, moon, and Earth are aligned in a relatively straight line?
- A a decrease in global wind patterns
 - B an increase in temperature near the equator
 - C more earthquakes near the equator and fewer at the poles
 - D a larger-than-normal height difference between low tide and high tide
- 3 How does the energy produced by the sun travel to Earth?
- A by the magnetic fields between the sun and Earth
 - B by the convection of heat through particles in space
 - C by the radiation of electromagnetic waves through space
 - D by the process of conduction of heat between the sun and Earth



- 4 Which **best** describes how energy from the sun helps to maintain life on Earth?
- A It heats Earth's atmosphere and surface, which helps stabilize temperatures on Earth and creates environments more favorable for life to exist.
 - B It forms the ocean's water and the oxygen in the atmosphere that organisms need for life functions.
 - C It prevents the destruction of the magnetic field around Earth that protects all life forms.
 - D It is absorbed by Earth's mantle, which drives plate tectonics to form new land masses for organisms to live.
- 5 Which of these statements **best** explains the shape of Earth?
- A Because of its rotation about its axis, Earth has a greater circumference around the equator than around the Prime Meridian.
 - B Because of its revolution around the sun, Earth has a greater circumference around the equator than around the Prime Meridian.
 - C Because of its rotation about its axis, Earth has a greater circumference around the Prime Meridian than around the equator.
 - D Because of its revolution around the sun, Earth has a greater circumference around the Prime Meridian than around the equator.
- 6 Which geographic features form as a result of continental-continental convergent plates?
- A rift valleys
 - B volcanic islands
 - C oceanic trenches
 - D mountain ranges

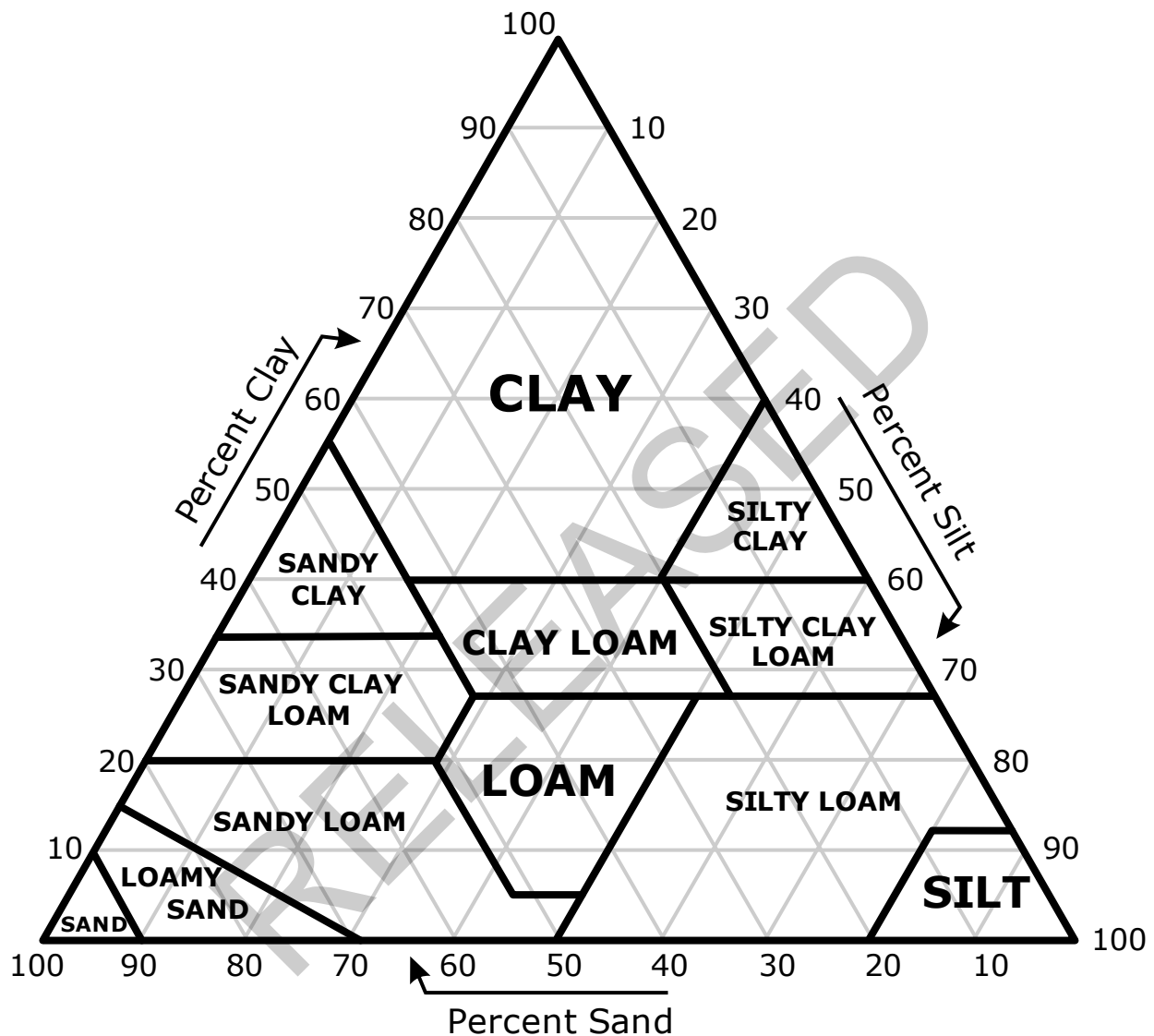


- 7 Where are most volcanoes located?
- A at divergent boundaries, transform boundaries, and hot spots
 - B at convergent boundaries, divergent boundaries, and hot spots
 - C at convergent boundaries, hot spots, and transform boundaries
 - D at divergent boundaries, convergent boundaries, and transform boundaries

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- 8 This is a diagram of a soil texture triangle. Farmers can use this chart to identify the type of soil found on their land and determine the likelihood of erosion and other important factors.



What type of soil does a farmer have if the soil contains 40% sand, 40% silt, and 20% clay?

- A clay
- B loam
- C silty loam
- D sandy loam



- 9 What would be **most effective** in minimizing the potential damage caused by an earthquake?
- A installing sirens in areas prone to earthquakes
 - B building structures that withstand ground vibrations
 - C increasing the amount of concrete during road building
 - D requiring the recycling of metal and wood products
- 10 Bedrock that is closer to oceanic ridges is younger in age than bedrock that is farther away. What can **best** be concluded from this information?
- A The shape of Earth's lithosphere is continually changing.
 - B The movement of continental plates is caused by volcanic eruptions.
 - C The oceans are becoming deeper and warmer as more rocks are produced.
 - D The rocks on the ocean floor are producing tectonic plates that are converging.
- 11 Which is one way poor use of fertilizers in agriculture can affect the environment?
- A It can increase the ability of many species to find suitable habitats.
 - B It can cause pollution of water in lakes and rivers.
 - C It can cause an increase in greenhouse gases.
 - D It can reduce the amount of sediment in the local waterways.



- 12 Nuclear power and drilling for oil can both negatively affect ecosystems. Which negative impact can only be caused by nuclear power?
- A air pollution
 - B water contamination
 - C exposure to uranium
 - D spread of invasive vegetation
- 13 What is an effect of deforestation?
- A decrease in biodiversity
 - B decrease in rainwater runoff
 - C decrease in carbon dioxide in the atmosphere
 - D decrease in the amount of water on Earth
- 14 How are surface mining and peat harvesting similar in the way they affect an ecosystem?
- A Both increase air pollution, causing acid rain.
 - B Both flood the area with water, decreasing soil erosion.
 - C Both release carbon dioxide, decreasing global temperatures.
 - D Both remove vegetation in the area, destroying habitats.



- 15 Guatemala is a mountainous country in Central America. Each year, more than 350 square kilometers of forests are removed for building materials and to make more room for crops. If this rate of deforestation continues, what will **most likely** result over the next several years?
- A The number of earthquakes across the country will decrease.
 - B The amount of fertile soil across the country will increase.
 - C The risk of landslides across the country will increase.
 - D The average rainfall for the country will increase.
- 16 What will **most likely** happen if a warm ocean current travels north or south from the equator?
- A The current will become warmer, causing it to become more dense and rise.
 - B The current will become cooler, causing it to become less dense and rise.
 - C The current will become cooler, causing it to become more dense and sink.
 - D The current will become warmer, causing it to become less dense and sink.
- 17 In the hydrologic cycle, which process contributes to a decrease in groundwater levels?
- A infiltration
 - B evaporation
 - C precipitation
 - D condensation



- 18 If people in an area have limited access to freshwater resources, what will **most likely** result?
- A an increase in the number of aquifers supplying water to the area
 - B a decrease in sanitation and increase in disease in the area
 - C a decrease in weathering and erosion in the area
 - D an increase in biodiversity in the area
- 19 Which is one way surface water may become groundwater?
- A condensation
 - B evaporation
 - C infiltration
 - D runoff
- 20 Which result is **most likely** to occur after excessive withdrawal of groundwater in coastal areas?
- A increased reliance on irrigation because of drier soil conditions
 - B dilution of brackish water in estuarine ecosystems
 - C reduced efficiency of local desalination facilities
 - D intrusion of salt water into the water table



- 21 Which will cause an increase in runoff and infiltration in an area?
- A contouring farmland
 - B a drought
 - C digging wells
 - D excessive rain
- 22 What is a possible consequence of the destruction of a marsh?
- A decreased flooding
 - B decreased filtering of water
 - C increased types of plant life
 - D increased habitat for organisms
- 23 Temperature increases as altitude increases in both the stratosphere and the thermosphere. What is the main difference between these two layers?
- A The temperature increases in the stratosphere because of aurora borealis, and in the thermosphere because of the jet stream.
 - B The temperature increases in the stratosphere because of the jet stream, and in the thermosphere because of aurora borealis.
 - C The temperature increases in the stratosphere because of direct exposure to the sun, and in the thermosphere because ozone absorbs ultraviolet radiation.
 - D The temperature increases in the stratosphere because ozone absorbs ultraviolet radiation, and in the thermosphere because of direct exposure to the sun.



- 24 What would **most likely** result if more farms were developed along river basins in North Carolina?
- A an increase in water pollution
 - B an increase in average rainfall
 - C an increase in nonnative species
 - D an increase in severe weather events
- 25 Which is **most often** a result of a warm air mass moving over a cooler air mass?
- A a decrease in wind speed
 - B a decrease in cloud cover
 - C an increase in precipitation
 - D an increase in air pressure
- 26 Which has the **greatest** influence on wind speed?
- A differences in the density of adjacent air masses
 - B differences in atmospheric nitrogen concentrations
 - C differences in atmospheric carbon dioxide concentrations
 - D differences in ozone levels in the stratosphere



- 27 Which is a major source of air pollution?
- A planting more trees in forest areas
 - B building dams for hydroelectric plants
 - C the production of energy using solar and nuclear power
 - D small farms raising large numbers of animals such as cows and pigs
- 28 Joan picked up a brochure on North Carolina and learned the facts listed below.
- It may experience either hot, humid summer conditions or more moderate summer conditions.
 - The annual rainfall across the state ranges from 37 to 90 inches.

Which aspect of North Carolina was Joan focusing on from the brochure?

- A weather in North Carolina
 - B climate of North Carolina
 - C ecosystems in North Carolina
 - D biomes of North Carolina
- 29 Which is **least likely** to cause changes in global climate?
- A a tsunami event
 - B an El Niño event
 - C a volcanic eruption
 - D radiation from solar flares



- 30 Which could increase the amount of greenhouse gases in the atmosphere?
- A planting trees in areas that have been deforested
 - B reducing the use of gasoline-powered vehicles
 - C burning coal to produce electricity
 - D creating wind farms in desert areas
- 31 What will **most likely** influence global sea levels?
- A an increase in global temperatures
 - B an increase in global atmospheric nitrogen
 - C an increase in cyclone events around the globe
 - D an increase in earthquake events around the globe
- 32 Which interaction of a biotic and an abiotic factor can help stabilize a forest area in North Carolina?
- A increased precipitation, reducing soil erosion in the area
 - B increased decaying organic material, adding nutrients to soil in the area
 - C decreased water salinity, reducing biodiversity of animals in the area
 - D decreased number of predators, allowing the number of prey to increase in the area



- 33 How could a global decrease in plant diversity affect the biosphere?
- A It could cause an increase in the amount of oxygen gas available for plants and animals.
 - B It could cause an increase in animal diversity in the biosphere.
 - C It could cause a decrease in animal populations in the biosphere.
 - D It could cause a decrease in the amount of water available for plants and animals.
- 34 Two farmers decide to plant fewer types of corn in their fields. How will changing the biodiversity of the corn crop affect the fields?
- A Predator species that eat corn will lose their food source.
 - B Planting fewer types of corn will add more nutrients to the soil.
 - C The introduction of invasive plant pathogens will increase the crop yield.
 - D Planting fewer types of corn will make the corn more vulnerable to plant pathogens.
- 35 Which action will **most likely** cause a negative impact on the biodiversity of a small region?
- A planting native species in a bare field to attract wildlife
 - B draining a wetland for the development of a new park
 - C reducing the amount of pesticides and fertilizers used
 - D having a controlled burn to remove undergrowth of a forest



- 36 If fossil fuel usage were unlimited, what effect would this have on Earth's biosphere?
- A It would create more nutrient-rich soil, which would increase the biodiversity on Earth.
 - B It would pollute natural habitats, which would decrease the biodiversity on Earth.
 - C It would add more oxygen to the atmosphere, which would cause plants to increase their rates of photosynthesis.
 - D It would produce warmer climates, which would cause fewer plants to live in the polar regions.
- 37 What would **most likely** happen if coastal North Carolina increased implementation of wind energy?
- A Investment costs to taxpayers would decrease.
 - B The production of greenhouse gases would decrease.
 - C Turbines could be built in highly populated areas because of low noise pollution.
 - D The energy output would be consistent because wind patterns are always predictable.
- 38 Which would be the **best** way to reduce the environmental impact of conventional agricultural practices?
- A increase pesticide use
 - B decrease crop rotation
 - C decrease fertilizer usage
 - D increase use of nonnative species



- 39 What effect would uncontrolled population growth have on land?
- A increased soil fertility and decreased erosion
 - B increased soil fertility and increased erosion
 - C decreased soil fertility and decreased erosion
 - D decreased soil fertility and increased erosion
- 40 What effect does reusing or recycling municipal waste have on environmental resources?
- A introduction of pollutants into water systems
 - B increased deforestation of local areas
 - C increased use of fossil fuels
 - D preservation of raw materials

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This is the end of the Earth/Environmental Science Released Items.

Directions:

- 1. Look back over your answers for the test questions.**
- 2. Make sure all your answers are entered on the answer sheet. Only what is entered on your answer sheet will be scored.**
- 3. Put all of your papers inside your test book and close the test book.**
- 4. Stay quietly in your seat until your teacher tells you that testing is finished.**
- 5. Remember, teachers are not allowed to discuss items from the test with you, and you are not allowed to discuss with others any of the test questions or information contained within the test.**

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**Earth/Environmental Science
RELEASED Items¹
2018–2019
Answer Key**

Question Number	Question Type	Correct Answer	Percent Correct ²	Objective
1	MC	C	40%	EEn.1.1.1.
2	MC	D	78%	EEn.1.1.2
3	MC	C	75%	EEn.1.1.3
4	MC	A	82%	EEn.1.1.4
5	MC	A	49%	EEn.1.1.2
6	MC	D	59%	EEn.2.1.1
7	MC	B	35%	EEn.2.1.2
8	MC	B	60%	EEn.2.1.3
9	MC	B	84%	EEn.2.1.4
10	MC	A	37%	EEn.2.1.1
11	MC	B	74%	EEn.2.2.1
12	MC	C	56%	EEn.2.2.2
13	MC	A	69%	EEn.2.2.1
14	MC	D	65%	EEn.2.2.2
15	MC	C	70%	EEn.2.2.1
16	MC	C	51%	EEn.2.3.1



Question Number	Question Type	Correct Answer	Percent Correct ²	Objective
17	MC	B	75%	EEn.2.3.2
18	MC	B	53%	EEn.2.4.1
19	MC	C	65%	EEn.2.3.2
20	MC	D	40%	EEn.2.4.1
21	MC	D	77%	EEn.2.3.2
22	MC	B	67%	EEn.2.4.2
23	MC	D	60%	EEn.2.5.1
24	MC	A	79%	EEn.2.4.2
25	MC	C	45%	EEn.2.5.2
26	MC	A	76%	EEn.2.5.3
27	MC	D	45%	EEn.2.5.5
28	MC	B	76%	EEn.2.6.1
29	MC	A	34%	EEn.2.6.2
30	MC	C	68%	EEn.2.6.3
31	MC	A	44%	EEn.2.6.4
32	MC	B	70%	EEn.2.7.1
33	MC	C	66%	EEn.2.7.2
34	MC	D	59%	EEn.2.7.3



Question Number	Question Type	Correct Answer	Percent Correct ²	Objective
35	MC	B	69%	EEn.2.7.2
36	MC	B	44%	EEn.2.7.3
37	MC	B	64%	EEn.2.8.1
38	MC	C	61%	EEn.2.8.2
39	MC	D	69%	EEn.2.8.3
40	MC	D	70%	EEn.2.8.4

¹These released items were administered to students during a previous test administration. This sample set of released items may not reflect the breadth of the standards assessed and/or the range of item difficulty found on the NC Final Exam. Additional information about the NC Final Exam is available in the *Assessment Specification* for each exam located at <http://www.ncpublicschools.org/accountability/common-exams/specifications/>.

²Percent correct is the percentage of students who answered the item correctly during a previous administration.



Clarifying Objectives Descriptions

Only clarifying objective descriptions addressed by the released items in this document are listed below. A complete list of North Carolina *Essential Standards* for Science may be reviewed at <http://www.ncpublicschools.org/curriculum/science/scos/support-tools/#standards>.

EEn.1.1.1

Explain the Earth's motion through space, including precession, nutation, the barycenter, and its path about the galaxy.

EEn.1.1.2

Explain how the Earth's rotation and revolution about the Sun affect its shape and is related to seasons and tides.

EEn.1.1.3

Explain how the sun produces energy which is transferred to the Earth by radiation.

EEn.1.1.4

Explain how incoming solar energy makes life possible on Earth.

EEn.2.1.1

Explain how the rock cycle, plate tectonics, volcanoes, and earthquakes impact the lithosphere.

EEn.2.1.2

Predict the locations of volcanoes, earthquakes, and faults based on information contained in a variety of maps.

EEn.2.1.3

Explain how natural actions such as weathering, erosion (wind, water and gravity), and soil formation affect Earth's surface.

EEn.2.1.4

Explain the probability of and preparation for geohazards such as landslides, avalanches, earthquakes and volcanoes in a particular area based on available data.

EEn.2.2.1

Explain the consequences of human activities on the lithosphere (such as mining, deforestation, agriculture, overgrazing, urbanization, and land use) past and present.

EEn.2.2.2

Compare the various methods humans use to acquire traditional energy sources (such as peat, coal, oil, natural gas, nuclear fission, and wood).

EEn.2.3.1

Explain how water is an energy agent (currents and heat transfer).

EEn.2.3.2

Explain how ground water and surface water interact.

EEn.2.4.1

Evaluate human influences on freshwater availability.

**EEn.2.4.2**

Evaluate human influences on water quality in North Carolina's river basins, wetlands and tidal environments.

EEn.2.5.1

Summarize the structure and composition of our atmosphere.

EEn.2.5.2

Explain the formation of typical air masses and the weather systems that result from air mass interactions.

EEn.2.5.3

Explain how cyclonic storms form based on the interaction of air masses.

EEn.2.5.5

Explain how human activities affect air quality.

EEn.2.6.1

Differentiate between weather and climate.

EEn.2.6.2

Explain changes in global climate due to natural processes.

EEn.2.6.3

Analyze the impacts that human activities have on global climate change (such as burning hydrocarbons, greenhouse effect, and deforestation).

EEn.2.6.4

Attribute changes in Earth systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc.).

EEn.2.7.1

Explain how abiotic and biotic factors interact to create the various biomes in North Carolina.

EEn.2.7.2

Explain why biodiversity is important to the biosphere.

EEn.2.7.3

Explain how human activities impact the biosphere.

EEn.2.8.1

Evaluate alternative energy technologies for use in North Carolina.

EEn.2.8.2

Critique conventional and sustainable agriculture and aquaculture practices in terms of their environmental impacts.

EEn.2.8.3

Explain the effects of uncontrolled population growth on the Earth's resources.

EEn.2.8.4

Evaluate the concept of "reduce, reuse, recycle" in terms of impact on natural resources.