

Released Items

Student Name: _____

Earth/Environmental Science



2016–2017



Public Schools of North Carolina
State Board of Education
Department of Public Instruction
Raleigh, North Carolina 27699-6314

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NC Final Exam



- 1 Cracks in rocks widen as water in them freezes and thaws. How does this affect the surface of the Earth?
- A It reduces the rates of soil formation.
 - B It changes the chemical composition of the rocks.
 - C It exposes rocks to increased rates of erosion and weathering.
 - D It limits the exposure of rocks to acid precipitation.
- 2 How can urbanization affect a local area?
- A It can increase the number of invasive species in an area.
 - B It can decrease the risk of water pollution in an area.
 - C It can increase the risk of flooding in an area.
 - D It can decrease the need for natural resources in an area.
- 3 Which is a farming technique that could improve the soil and the environment?
- A using fueled machines that will turn the soil continuously
 - B creating undisturbed layers of mulch in the soil
 - C placing inorganic chemical fertilizers in the soil
 - D irrigating the soil with salty water



- 4 Subsurface ocean currents continually circulate from the warm waters near the equator to the colder waters in other parts of the world. What is the main cause of these currents?
- A differences in the topography along the ocean floor
 - B differences in density of ocean water
 - C the rotation of Earth on its axis
 - D movement of the jet stream
- 5 What is **most** responsible for the presence of groundwater in an area?
- A the movement of water from a confined aquifer into surface water
 - B the movement of surface water and precipitation through soil and rock
 - C the movement of water from streams and rivers to watersheds
 - D the movement of surface water through impermeable rock
- 6 Which is the **most** common contamination source for freshwater resources?
- A runoff
 - B digging wells
 - C melting of glaciers
 - D lightning



- 7 A community decides to upgrade its water purification and management systems. What lasting impact could this have on available freshwater?
- A It could cause a decrease in water demand.
 - B It could cause a decrease in the water levels.
 - C It could cause an increase in waterborne diseases.
 - D It could cause an increase in the freshwater supply.
- 8 Which storm **most likely** develops as air masses interact with the warm water in the northwest Pacific Ocean?
- A typhoon
 - B tornado
 - C blizzard
 - D monsoon
- 9 Which is associated with an increase of chlorofluorocarbons in the environment?
- A an increase in health risks associated with UV radiation
 - B an increase in levels of methane gas in the atmosphere
 - C an increase in ozone levels in the upper atmosphere
 - D an increase in acid precipitation



- 10 Which natural phenomenon occurs as a result of Earth rotating on its axis?
- A movement of tectonic plates
 - B deep ocean currents
 - C seasonal changes
 - D day and night
- 11 Urban City X has been referred to as an urban heat island because it tends to be warmer than the surrounding rural areas. The report below lists changes that have occurred in one year in Urban City X.

Report for Urban City X:

- Eight roads were repaved.
- The population increased by 20%.
- Public transportation increased by 5%.
- Four new apartment complexes were built.
- Plans were drafted to build a local park.
- A meeting was held about alternative energy sources.

What is the **main** cause of Urban City X being an urban heat island?

- A the planting of trees and other vegetation
- B the building of rooftop gardens
- C the installation of solar panels
- D the construction of parking areas and road systems



- 12 What long-term impact could the destruction of large areas of forests have on Earth?
- A decreased rates of erosion
 - B increased atmospheric carbon dioxide levels
 - C decreased amounts of acid rain
 - D increased atmospheric oxygen levels
- 13 Why is it important to conserve the biodiversity of Earth?
- A to decrease the amount of global predator populations
 - B to decrease the stability of major global ocean currents
 - C to increase the stability of ecosystems during environmental changes
 - D to increase the amount of nonrenewable resources located in the lithosphere
- 14 How does the tilt of the Earth's axis affect the seasons?
- A by changing the amount of direct solar energy reaching the surface of Earth
 - B by influencing the rate of chemical reactions occurring in the atmosphere
 - C by deflecting the harmful rays of radiation emitted by the sun
 - D by changing the speed of the rotation of Earth



- 15 How could the introduction of a nonnative species of plant affect an ecosystem in North Carolina?
- A It could pollinate the native plant species, producing a disease-resistant species.
 - B It could reduce the competition for space and light with native plant species.
 - C It could take over the habitats of the native plant species.
 - D It could cause some insect species to destroy native plant species.
- 16 Which change would **best** aid a farmer in making the transition from conventional farming techniques to more sustainable farming techniques?
- A reduce the ratio of essential elements in the fertilizer
 - B irrigate crops using well water
 - C rotate the types of crops grown
 - D plant only genetically modified crops
- 17 Which would **most likely** cause a reduction in the amount of coal and natural gas on Earth?
- A a continual increase in the amount of pollution in Earth's atmosphere
 - B a continual increase in the number of people on Earth
 - C a continual decrease in the amount of water in Earth's aquifers
 - D a continual decrease in the amount of rain forests on Earth



- 18 Which is an effect of lower levels of solar radiation striking Earth?
- A increased incidences of skin cancer
 - B decreased rates of photosynthesis
 - C increased phytoplankton activity
 - D decreased carbon dioxide levels
- 19 Which will **most likely** form when movement along a plate boundary forces a landmass to be pulled apart?
- A volcanic island arc
 - B continental mountains
 - C continental rift
 - D oceanic trench
- 20 Which will **most likely** occur before a volcanic eruption?
- A an increase in acid rain production
 - B an increase in earthquake activity
 - C an increase in lava flow
 - D an increase in mud flow



- 21 A rural, forested area receives a lot of rain in a short amount of time. What would **most likely** cause potential flooding in the area?
- A if the area has a large uncharged aquifer beneath it
 - B if the water level in the area is below the zone of saturation
 - C if the ground of the area is already saturated with water
 - D if the ground of the area is mostly sandy soil
- 22 Which is the **best** way to conserve worldwide freshwater resources?
- A build more roads and highways for cars and trucks
 - B increase the amount of land used to raise cattle
 - C develop more modern coal-powered plants
 - D use more efficient irrigation techniques
- 23 Which statement **best** describes the ozone layer of Earth?
- A It helps reduce the amount of ultraviolet radiation reaching the surface of Earth.
 - B It prevents the formation of severe storms in the stratosphere of Earth.
 - C It increases the amount of nitrogen in the troposphere of Earth.
 - D It forms a magnetic field in the mesosphere of Earth.



- 24 Which is a biotic factor that could affect an ecosystem?
- A dust storms moving through an ecosystem
 - B bacteria harming the health of organisms in an ecosystem
 - C large amounts of acid rain precipitation seeping into the soil in an ecosystem
 - D high levels of carbon dioxide entering the atmosphere within an ecosystem
- 25 How do weathering and erosion affect Earth's surface?
- A Both force tectonic plates to move across the ocean floor.
 - B Both cause sedimentary rocks to form igneous rocks.
 - C Both cause mountain ranges to become taller.
 - D Both break down rocks and create new soil.
- 26 How can oil and natural gas be extracted from the earth?
- A by digging in areas of volcanoes
 - B by drilling deep beneath the ground
 - C by strip-mining in mountainous areas
 - D by removing limestone deposits from the ground



**Earth/Environmental Science
RELEASED Items¹
2016–2017
Answer Key**

Question Number	Question Type ²	Correct Answer	Percent Correct ³	Objective
1	MC	C	75%	EEn.2.1.3
2	MC	C	31%	EEn.2.2.1
3	MC	B	61%	EEn.2.2.1
4	MC	B	37%	EEn.2.3.1
5	MC	B	58%	EEn.2.3.2
6	MC	A	68%	EEn.2.4.1
7	MC	D	66%	EEn.2.4.1
8	MC	A	53%	EEn.2.5.3
9	MC	A	32%	EEn.2.5.5
10	MC	D	52%	EEn.1.1.2
11	MC	D	76%	EEn.2.6.3
12	MC	B	74%	EEn.2.6.3
13	MC	C	79%	EEn.2.7.2
14	MC	A	81%	EEn.1.1.2
15	MC	C	68%	EEn.2.7.3
16	MC	C	46%	EEn.2.8.2



Question Number	Question Type ²	Correct Answer	Percent Correct ³	Objective
17	MC	B	63%	EEn.2.8.3
18	MC	B	58%	EEn.1.1.4
19	MC	C	50%	EEn.2.1.1
20	MC	B	66%	EEn.2.1.1
21	MC	C	71%	EEn.2.3.2
22	MC	D	84%	EEn.2.4.1
23	MC	A	84%	EEn.2.5.1
24	MC	B	72%	EEn.2.7.1
25	MC	D	81%	EEn.2.1.3
26	MC	B	79%	EEn.2.2.2

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/>.

²This NC Final Exam contains only multiple-choice (MC) items.

³Percent 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.1.1.2

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

EEn.1.1.4

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.2.1.3

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

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 water as 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.2.5.1

Summarize the structure and composition of our atmosphere.

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.2.6.3

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



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.2.8.2

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.

RELEASED