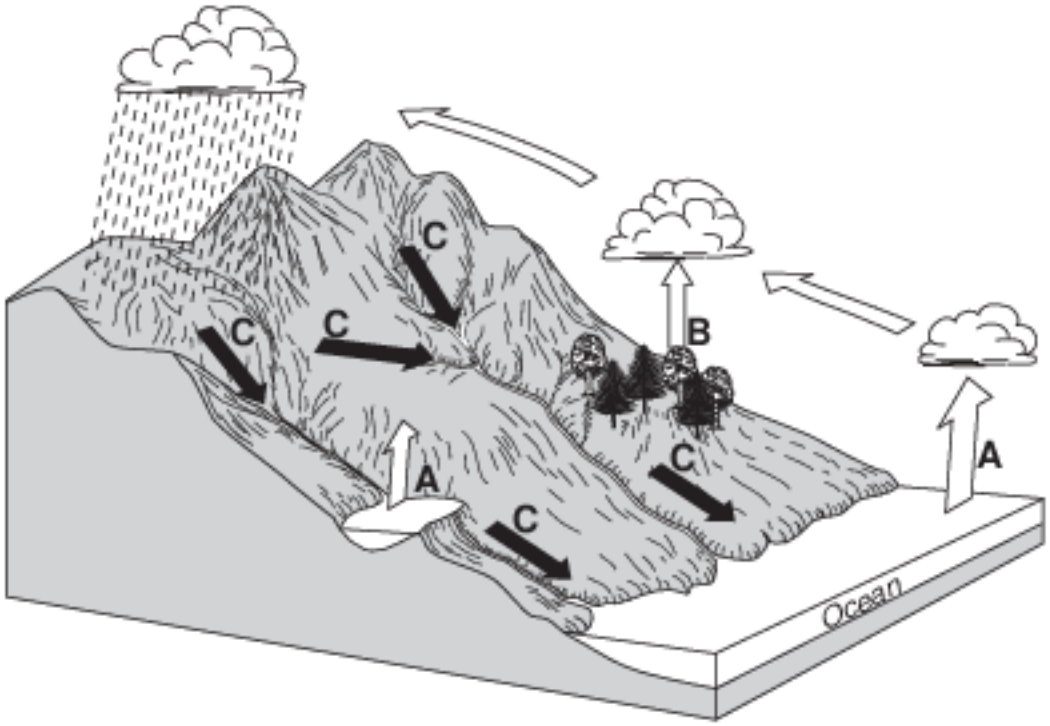
Earth Energy Density And Movement Of Plates

1 Which process of the water cycle occurs when water absorbs 2260 Joules of heat energy per gram?
(1) melting of ice
(2) condensation of water vapor
(3) evaporation of water
(4) freezing of water

2 During which phase change will two grams of water release 668 joules of heat energy?
(1) melting
(2) freezing
(3) vaporization
(4) condensation

Base your answers to questions 3 on the diagram below and on your knowledge of Earth science. The diagram represents the water cycle. Letters A through C represent different processes in the water cycle.



(Not drawn to scale)

3 In order for process A to occur, liquid water must
(1) gain 334 Joules per gram
(2) gain 2260 Joules per gram
(3) lose 334 Joules per gram
(4) lose 2260 Joules per gram

4 Which change in the heat energy content of water occurs when water changes phase from a liquid to a solid?
(1) gain of 334 Joules of heat energy per gram
(2) release of 334 Joules of heat energy per gram
(3) gain of 2260 Joules of heat energy per gram
(4) release of 2260 Joules of heat energy per gram

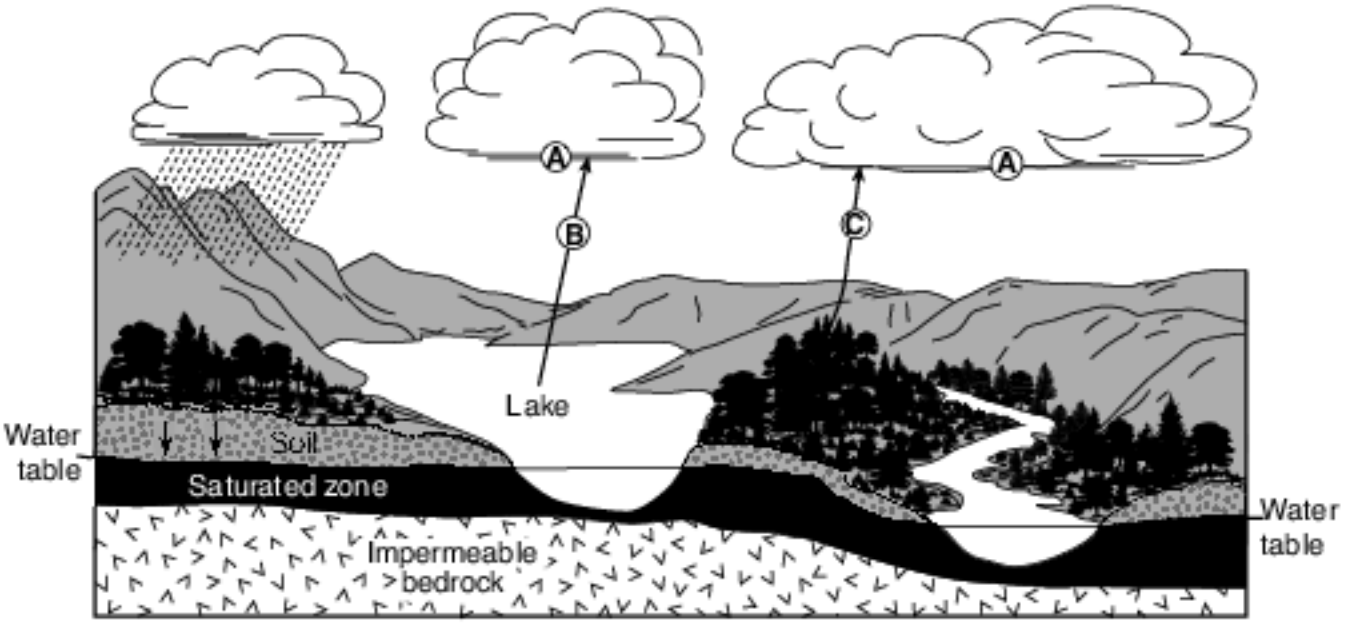
5 When one gram of liquid water at its boiling point is changed into water vapor
(1) 334 J/g is gained from the surrounding environment
(2) 334 J/g is released into the surrounding environment
(3) 2260 J/g is gained from the surrounding environment
(4) 2260 J/g is released into the surrounding environment

6 Which process releases 2260 joules of heat energy per gram of water into the environment?
(1) melting (3) condensation
(2) freezing (4) evaporation

7 Which process releases 334 Joules (J) of energy for each gram of water?
(1) melting (3) vaporization
(2) freezing (4) condensation

8 During the process of condensation, water vapor
(1) releases 334 J/g of heat energy
(2) releases 2260 J/g of heat energy
(3) gains 334 J/g of heat energy
(4) gains 2260 J/g of heat energy

Base your answers to questions 9 on the diagram below and on your knowledge of Earth science. The diagram represents the water cycle. Letters A through C identify water cycle processes. Arrows represent movement of water or water vapor. The level of the water table is indicated.

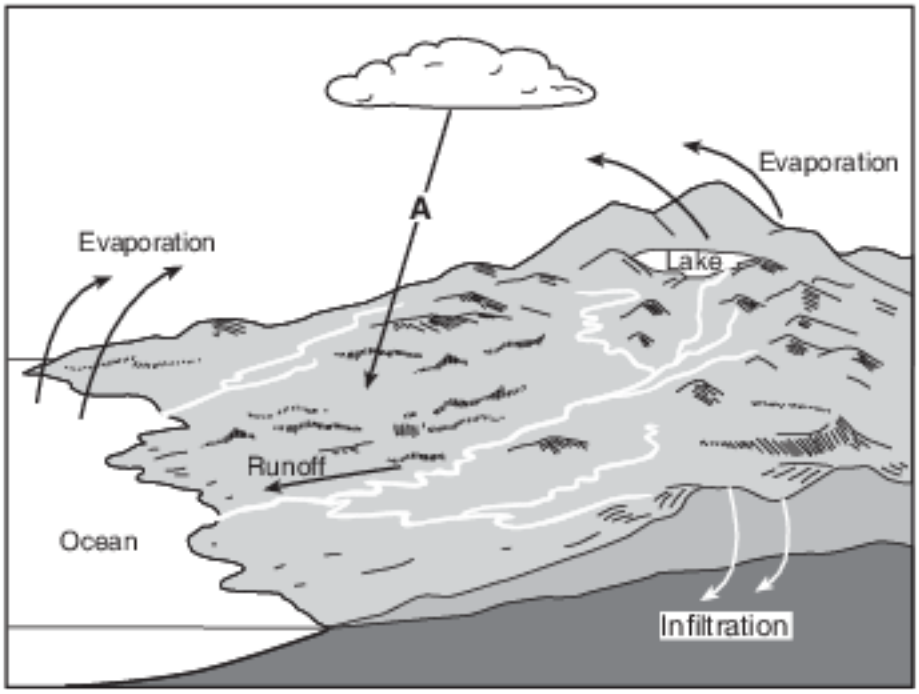


9 Water vapor forms a cloud of liquid droplets at location A. State the number of joules per gram of heat energy that is released into the atmosphere during this process. [1]
J/g

Base your answers to questions 10 on the diagram in image provided and on your knowledge of Earth science. The diagram represents a beaker of water being heated. The curved lines around letters A and B represent convection cells that have developed in the water.

10 State the amount of heat energy gained by each gram of water that evaporates from the surface of the boiling water in the beaker. [1]
J/g

Base your answers to questions 11 on the model below and on your knowledge of Earth science. The model shows the movement of water in the water cycle. Arrow A represents a process within the water cycle.

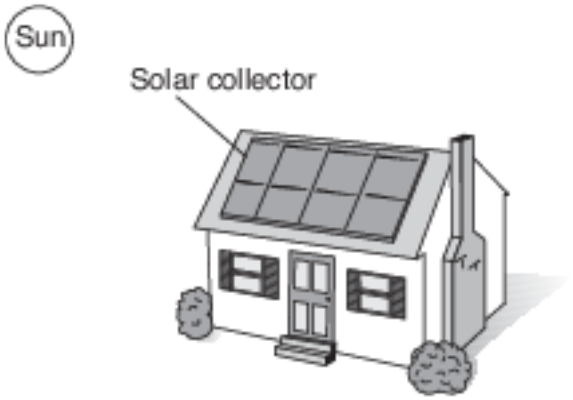


11 How many joules of heat energy are required to evaporate 2 grams of water from the lake surface? [1]
J

Base your answers to questions 12 on the passage and diagram below and on your knowledge of Earth science. The diagram represents a house located in New York State.

Solar Heating

Solar collectors in solar heating systems harness the power of the Sun to provide thermal energy for heating hot water and house interiors. There are several types of solar heating systems. The best system will depend on the geographic location and the intensity of the Sun. A solar heating system saves energy, reduces utility costs, and produces clean energy. The efficiency and reliability of solar heating systems have increased dramatically in recent years.



12 Explain why solar energy can still be collected on cloudy days. [1]

Base your answers to questions 13 on the map in image provided and on your knowledge of Earth science. The map shows an imaginary continent on a planet that has climate conditions similar to Earth. The continent is surrounded by oceans. Points A through D represent locations on the continent.

13 Identify the primary factor that causes location C to have a colder climate than location D. [1]

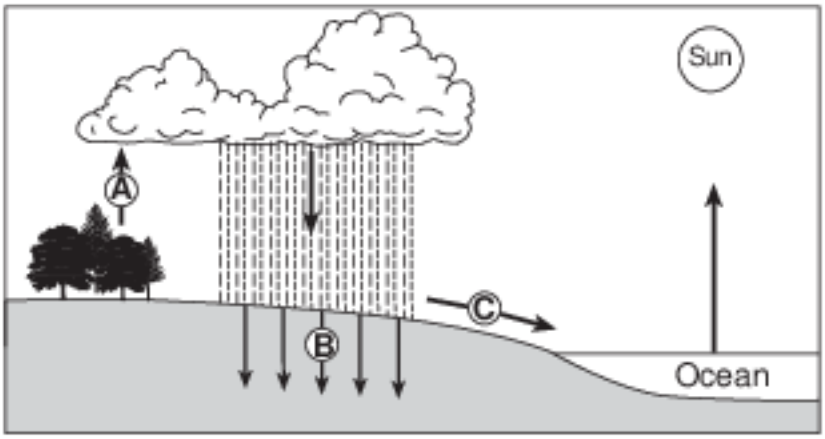
Base your answers to questions 14 on the data table below and on your knowledge of Earth science. The table shows the area, in million square kilometers, of the Arctic Ocean covered by ice from June through November. The average area covered by ice from 1979 to 2000 from June to November is compared to the area covered by ice in 2005 for the same time period.

Data Table

Month	Average Area Covered by Ice 1979–2000 (million km^2)	Area Covered by Ice 2005 (million km^2)
June	12.2	11.3
July	10.1	8.9
August	7.7	6.3
September	7.0	5.6
October	9.3	8.5
November	11.3	10.5

14 Scientists have noted that since 2002, the area of the Arctic Ocean covered by ice during these warmer months has shown an overall decrease from the long-term average (1979–2000). State one way in which this ice coverage since 2002 and the ice coverage shown in the 2005 data above provide evidence of global warming, when compared to this long-term average. [1]

Base your responses to questions 15 on the diagram below and on your knowledge of Earth science. The diagram represents portions of the water cycle. Letters A, B, and C represent processes in the water cycle. Arrows show the movement of water.



15 What is the main source of energy for the water cycle? [1]

Answer Keys

1 3

2 2

3 2

4 2

5 3

6 3

7 2

8 2

9 Allow 1 credit for 2260 J/g.

10 Allow 1 credit for 2260 J/g.

11 Allow 1 credit for 4520 J.

12 Allow 1 credit. Acceptable responses include, but are not limited to:
- — Clouds only reflect some of the Sun’s energy back into space.
- — Some radiation still gets through to Earth’s surface.

13 Allow 1 credit. Acceptable responses include, but are not limited to:
- — elevation
- — altitude
- — height above sea level
- — Location C is on the top of a mountain.
- — Location D is at a lower elevation.
- — C is located in the mountains.

14 Allow 1 credit. Acceptable responses include, but are not limited to:
- — The area covered by ice in 2005 was less than the average area covered by ice from 1979 to 2000.
- — The area covered by ice was less, showing evidence of global warming.
- — More ice melted in 2005 than the average that melted from 1979 to 2000.
- — The ice caps were melting, causing less surface ice in 2005.
- — There was less ice in 2005.

15 Allow 1 credit. Acceptable responses include, but are not limited to:
- — the Sun
- — insolation
- — solar radiation/solar energy
- — sunlight