

Reporting
Category 3:
Earth and Space

Reporting Category 3: 8th Grade Science Readiness Standards

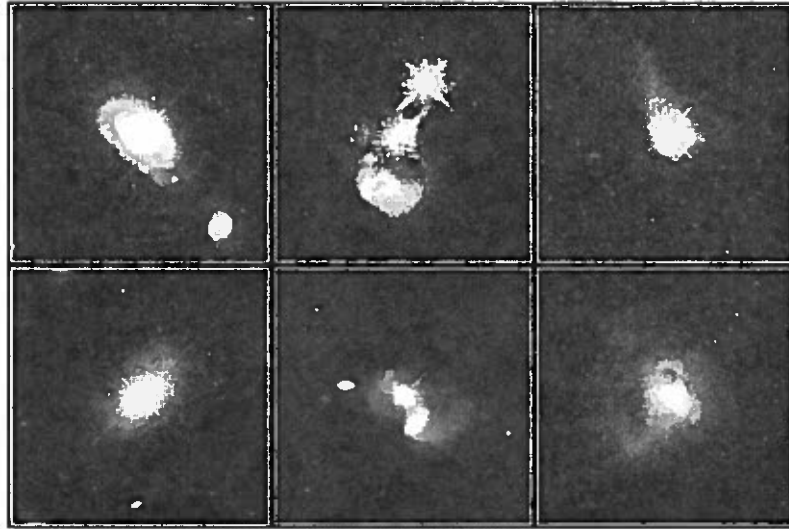
Name _____

Date _____

Class/Grade _____

1 Expectation: 8.8(A)

The photograph below shows six quasars. Quasars are distant objects in our universe that emit a massive amount of light energy.



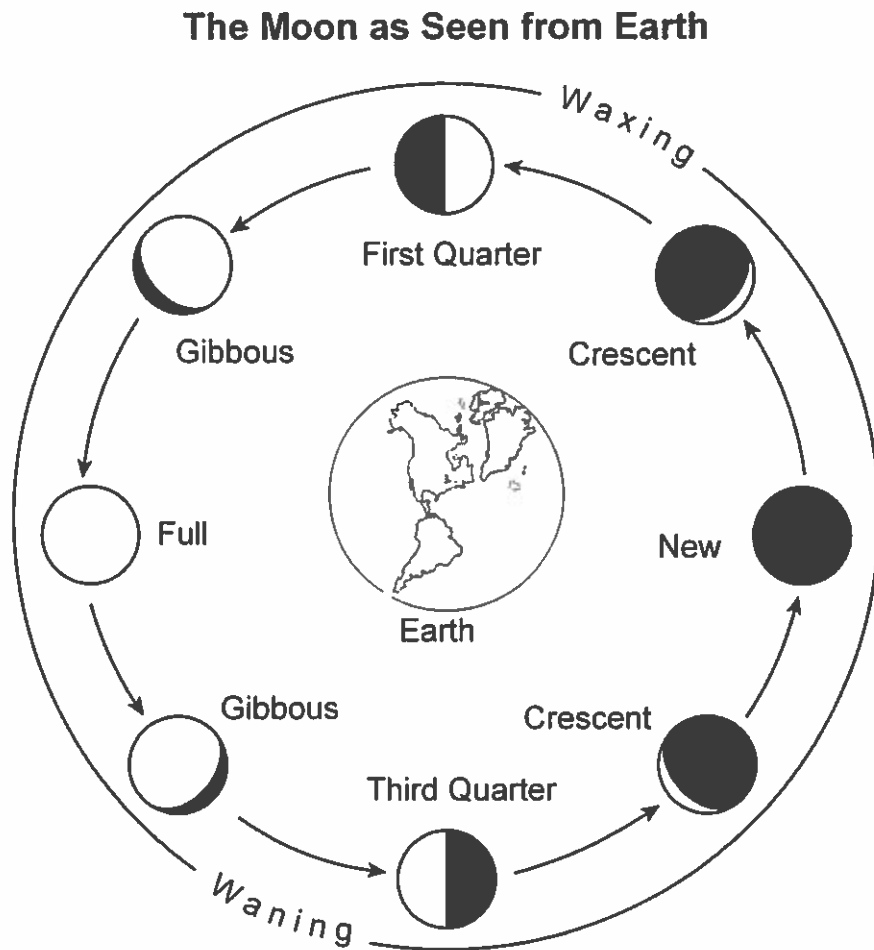
Courtesy of J Bahcall (IAS, Princeton), M. Disney (Univ. Wales), NASA 2011

The photograph shows that —

- A quasars all have the same brightness and shape.
- B quasars vary considerably in brightness and shape.
- C quasars have the same brightnesses and shapes as stars.
- D quasars are always found in pairs.

Reporting Category 3: 8th Grade Science Readiness Standards

Directions: The diagram below shows the phases of the moon as they relate to its orbit around Earth. Use the diagram and your knowledge of science to answer any questions that follow.



Courtesy of NASA, 2011

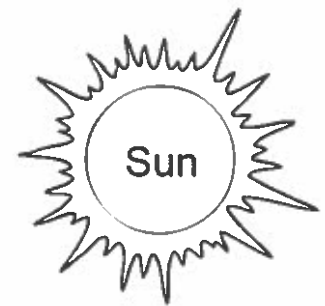


Image not to scale

2 Expectation: 8.7(B)

During the lunar cycle, the moon always —

- F** appears to wax, but not wane.
- G** appears to wax, then wane.
- H** appears neither to wax nor wane.
- J** appears to wane, but not wax.

Reporting Category 3: 8th Grade Science Readiness Standards

3 Expectation: 8.7(B)

It takes the moon about 29 days to complete a full lunar cycle. Since the length is not exactly 30 days, about every three years, there will be —

- A two full moons in one month.
 - B three third quarter moons in one month.
 - C one gibbous moon in one month.
 - D one crescent moon in one month.
-

4 Expectation: 8.7(B)

What is the correct series of phases from a third quarter moon to a first quarter moon?

- F Waning gibbous, full moon, waxing gibbous
 - G Waning crescent, new moon, waxing crescent
 - H Waxing gibbous, full moon, waning gibbous
 - J Waxing crescent, new moon, waning crescent
-

5 Expectation: 8.7(B)

Nearly all of the moon's visible surface is lit following a full moon. What is the name for this phase of the moon?

- A Waning gibbous phase
- B New moon phase
- C Waxing gibbous phase
- D Waning crescent phase

Reporting Category 3: 8th Grade Science Readiness Standards

6 Expectation: 8.7(B)

Before a full moon becomes a new moon, it must —

- F** go through the third quarter and waxing crescent phases.
- G** go through the waning gibbous and waxing crescent stages.
- H** go through the waning gibbous and third quarter stages.
- J** go through the waxing gibbous and waning crescent phases.

Directions: Warm temperatures in northern regions have caused permanently frozen ground in Alaska to thaw. The satellite photograph below shows a location on Alaska's northern coast. Use the photograph and your knowledge of science to answer any questions that follow.



7 Expectation: 8.9(C)

What will happen if temperatures in this area significantly increase?

- A** Water will cause land to collapse, creating more areas of open water.
- B** Water will cause land to freeze, creating more areas of ice.
- C** Water will cause land to solidify, creating more areas that do not contain small lakes.
- D** Water will cause land to become fertile, creating more areas with heavy vegetation.

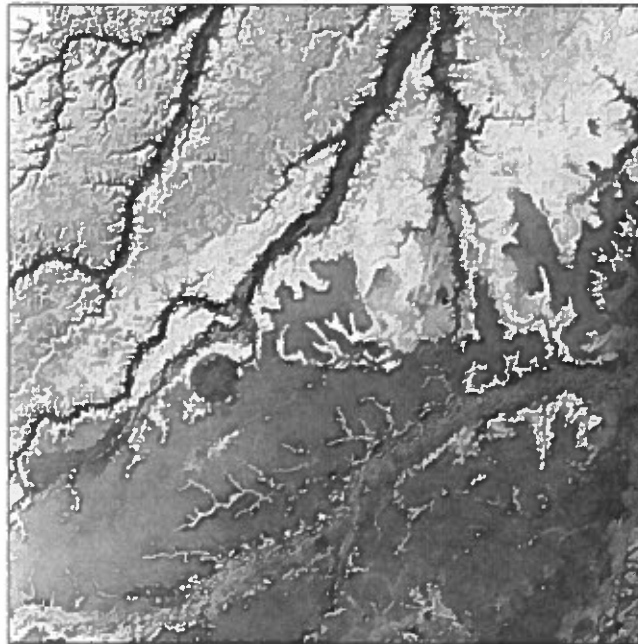
Reporting Category 3: 8th Grade Science Readiness Standards

8 Expectation: 8.9(C)

The light areas are —

- F highways.
- G lakes.
- H eroded land.
- J inland seas.

Directions: There is a 5-mile-wide round crater in an isolated region of the Bolivian jungle. The satellite image below shows the crater. Use the image and your knowledge of science to answer any questions that follow.



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9 Expectation: 8.9(C)

The erosion features represented by branching lines are —

- A glaciers.
- B oceans.
- C inland seas.
- D river valleys.

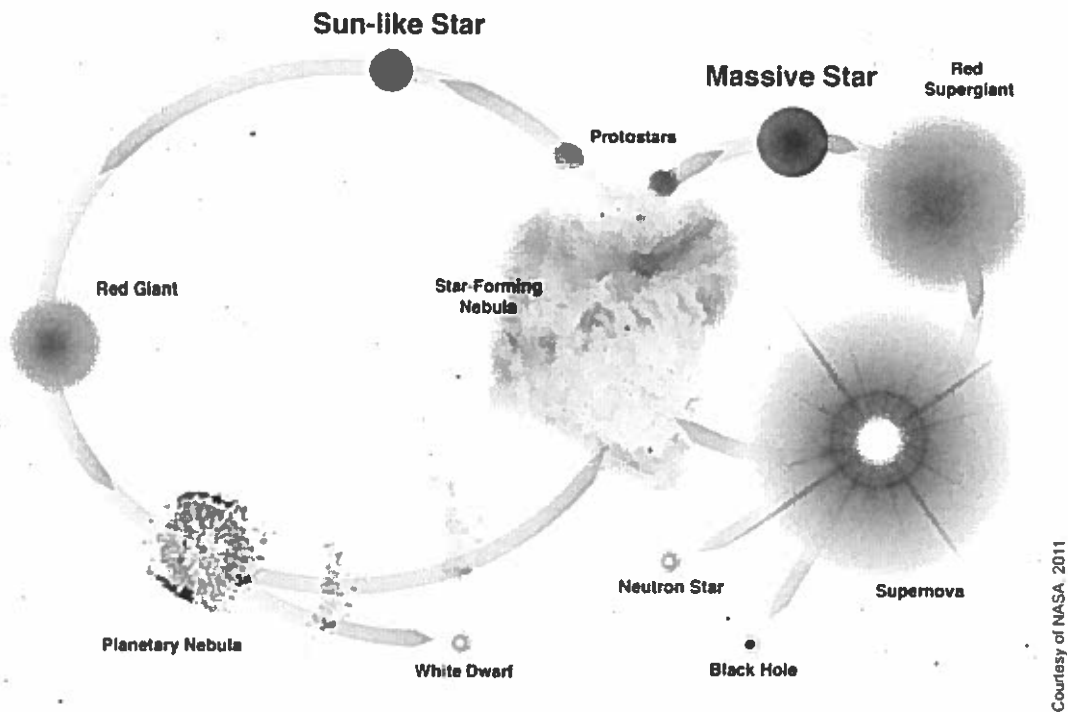
10 Expectation: 8.9(C)

After a heavy rain, what will occur in the crater?

- F Water will collect in the crater, causing the crater to become deeper.
- G Water will drain from the crater, causing the crater to become more shallow.
- H Water will drain from the crater, causing another crater to form.
- J Water will collect in the crater, causing the crater to become an ocean.

Reporting Category 3: 8th Grade Science Readiness Standards

Directions: The diagram below describes the usual processes of star formation and destruction. Use the diagram and your knowledge of science to answer any questions that follow.



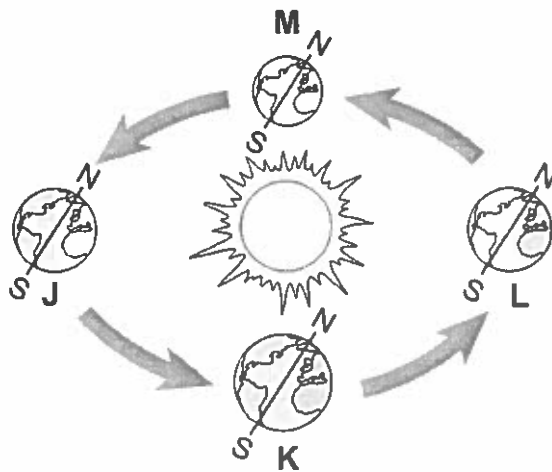
11 Expectation: 8.8(A)

Our universe contains many black holes. Black holes are most likely to arise from the death of —

- A neutron stars.
- B sun-like stars.
- C massive stars.
- D white dwarfs.

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Directions: The diagram below shows Earth's orbit around the sun. Use the diagram and your knowledge of science to answer any questions that follow.



12 Expectation: 8.7(A)

At what position is it winter in the Northern Hemisphere?

- F Position L
- G Position J
- H Position M
- J Position K

13 Expectation: 8.7(A)

At what position is it spring in the Northern Hemisphere?

- A Position J
- B Position K
- C Position L
- D Position M

Reporting Category 3: 8th Grade Science Readiness Standards

14 Expectation: 8.7(A)

At what position is it summer in the Northern Hemisphere?

- F Position M
- G Position J
- H Position K
- J Position L

15 Expectation: 8.7(A)

The diagram indicates that the tilt of Earth's axis and Earth's revolution around the sun cause Earth to experience —

- A rotation around its axis.
- B day and night.
- C seasons.
- D a change in the magnetism of its poles.

Reporting Category 3: 8th Grade Science Readiness Standards

16 Expectation: 8.7(A)

As part of a science project, Jenny has prepared a diagram of Earth and the sun. The diagram is shown below.



Image courtesy of NASA, 2011

Image not to scale

Jenny must now use her diagram to to show the cause of seasons on Earth. Jenny can do this by —

- F** drawing arrows that show how Earth rotates on its axis.
- G** drawing arrows that show how the sun rotates on its axis.
- H** drawing arrows that show how the sun radiates energy.
- J** drawing arrows that show how Earth revolves around the sun.

17 Expectation: 8.8(A)

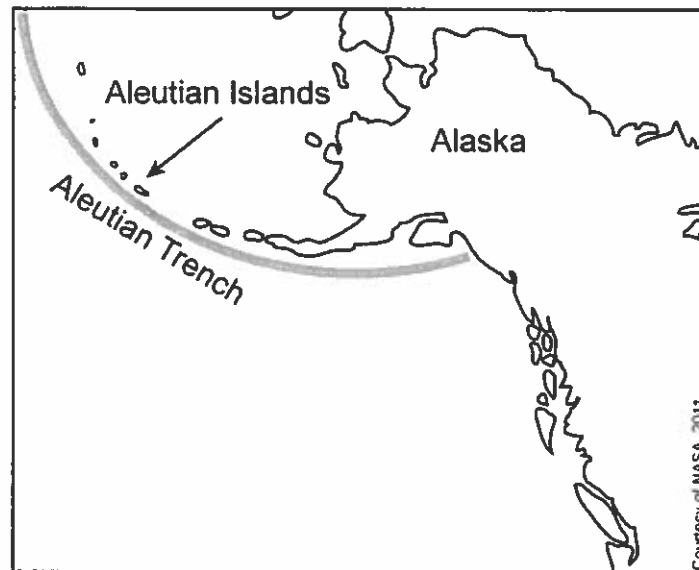
Stars help organize visible matter in our universe by —

- A** drawing moons into their orbits and creating planets.
- B** drawing black holes into their orbits and creating galaxies.
- C** drawing planets into their orbits and creating solar systems.
- D** drawing quasars into their orbits and creating black holes.

Reporting Category 3: 8th Grade Science Readiness Standards

18 Expectation: 8.9(B)

The Aleutian Islands, shown on the map below, are located off the coast of Alaska.



The Aleutian Islands were formed by magma that rose to the surface after —

- F** a downward-traveling plate cooled beneath Earth's crust.
- G** a downward-traveling plate increased in size.
- H** a downward-traveling plate melted.
- J** a downward-traveling plate changed direction and became an upward-traveling plate.

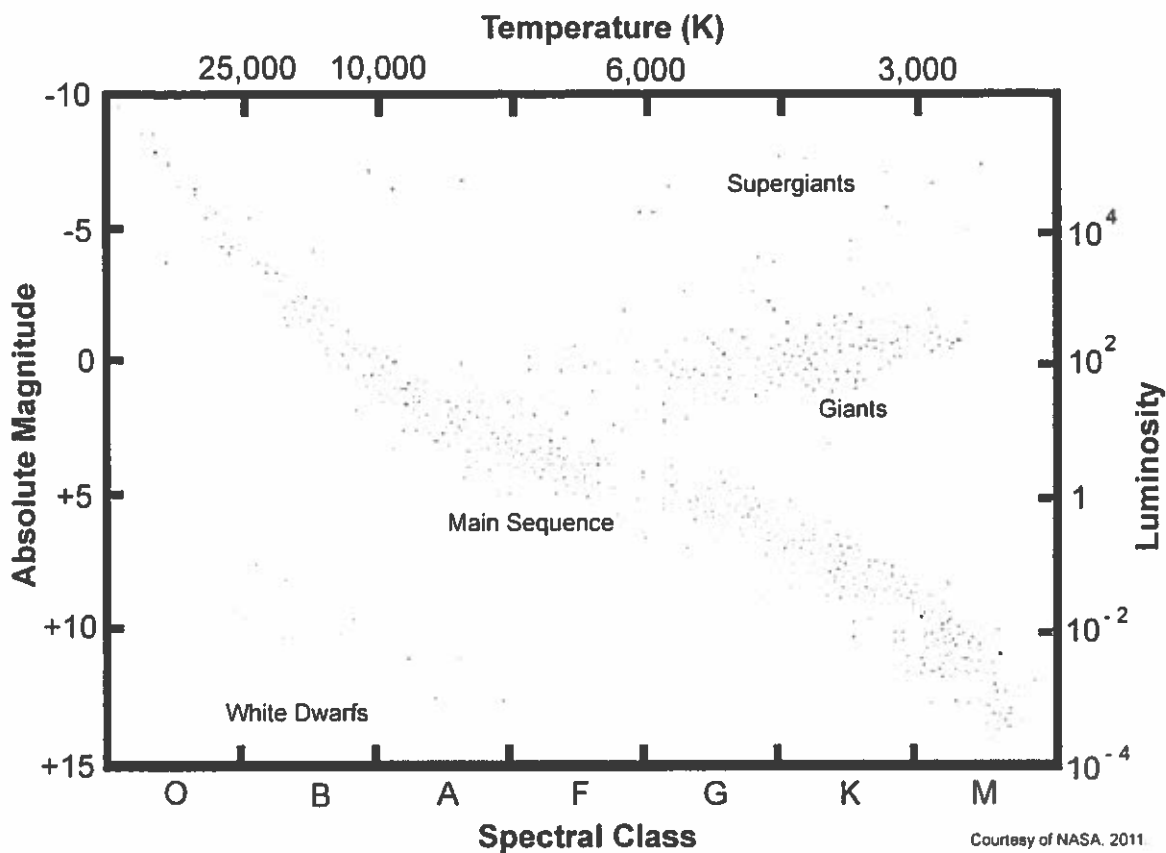
19 Expectation: 8.9(B)

Magma rises to become new oceanic crust where —

- A** two plates separate and move apart from one another.
- B** two plates meet and grind against one another.
- C** two plates meet and collide with one another.
- D** one plate splits into two distinct plates.

Reporting Category 3: 8th Grade Science Readiness Standards

Directions: The Hertzsprung-Russell diagram below displays the temperature and magnitude of thousands of stars in the galaxy. Use the diagram and your knowledge of science to answer any questions that follow.



20 Expectation: 8.8(A)

The star Arcturus is classified as a giant star. Which of the following best describes Arcturus?

- F** Dimmer than most main sequence stars and has a relatively low temperature
- G** Dimmer than most supergiant stars but has a relatively high temperature
- H** Brighter than most main sequence stars but has a relatively low temperature
- J** Brighter than most supergiant stars and has a relatively high temperature

Reporting Category 3: 8th Grade Science Readiness Standards

21 Expectation: 8.8(A)

An astronomer detects a star with a temperature of about 15,000 Kelvin and a luminosity of about 1.0 solar units. Based on the Hertzsprung-Russell diagram, what type of star has the astronomer detected?

- A A giant
 - B A supergiant
 - C A white dwarf
 - D A main sequence star
-

22 Expectation: 8.9(B)

An arc of volcanic islands is formed by magma rising to the surface. Magma usually rises when two plates —

- F collide with one another.
 - G grind against one another.
 - H rest in place against one another.
 - J move apart from one another.
-

23 Expectation: 8.9(B)

Ocean basins are formed under the surface of the water on the sea floor. What process forms an ocean basin?

- A Two crustal plates freezing
- B Two crustal plates colliding
- C Two crustal plates melting
- D Two crustal plates moving apart

Reporting Category 3: 8th Grade Science Readiness Standards

Directions: The Grand Canyon extends for 277 miles through northern Arizona. A satellite image of the Grand Canyon is shown below. Use the image and your knowledge of science to answer any questions that follow.



Courtesy of NASA/GSFC/MIT/ERSDAC/JAROS, and U S /Japan ASTER Science Team, 2011.

24 Expectation: 8.9(C)

The vast network of peaks within the Grand Canyon represents —

- F** mountains formed by a plate boundary that runs along the canyon.
- G** crystal formations left behind by evaporating river water.
- H** rock formations that have been eroded by water and wind for centuries.
- J** piles of hardened sediment left behind by glaciers.

Reporting Category 3: 8th Grade Science Readiness Standards

25 Expectation: 8.9(C)

How will the features of the Grand Canyon most likely be reshaped by weathering and erosion?

- A** The waters of the Colorado River will bring large boulders into the canyon, filling the canyon.
- B** The waters of the Colorado River will remove silt from the sides of the canyon, widening the canyon.
- C** The wind will blow silt into the canyon, filling the canyon.
- D** The wind will blow away sand from inside the canyon, widening the canyon.

Reporting Category 3: 8th Grade Science Readiness Standards

26 Expectation: 8.9(B)

The Himalaya Mountains are depicted on the map below.



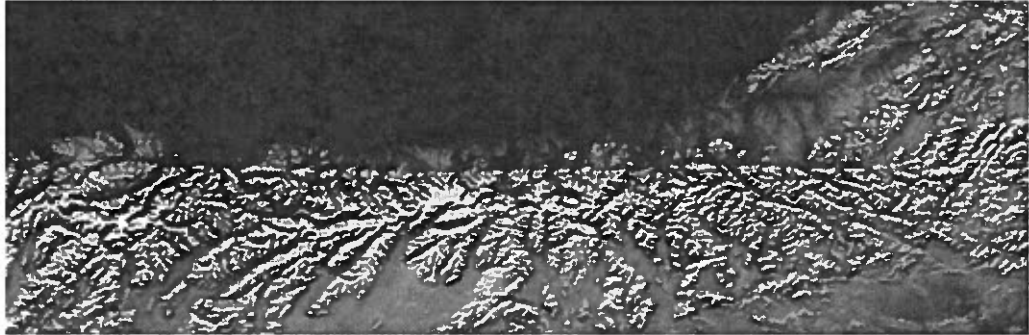
The Himalaya Mountains were created from ancient seabeds that were lifted up by —

- F** a collision between the Indo-Australian and Eurasian plates.
- G** a collision between the Indo-Australian plate and the Indian Ocean.
- H** a reversal in Earth's magnetic field.
- J** volcanic activity in China's southern plateau.

Reporting Category 3: 8th Grade Science Readiness Standards

27 Expectation: 8.9(B)

A topographic image of the Alpine Fault in New Zealand is shown below.



The Alpine Fault is a transform fault where two continental plates, the Indo-Australian plate and Pacific plate, slide against one another. The constant sliding of these plates has —

- A** caused a mountain range to develop.
- B** caused the land to separate into two distinct continents.
- C** caused a series of islands to develop.
- D** caused the land to become flat and even.



Reporting Category 3: 8th Grade Science Readiness Standards

Name _____

Date _____

Class/Grade _____

DIRECTIONS FOR MARKING ANSWER SHEET

Use a #2 pencil only.

Do NOT use ink or ballpoint pens.

Make heavy black marks that fill the ovals completely.

Erase clearly any answer you wish to change.

Make no stray marks on the answer sheet.

- 1 (A) (B) (C) (D)
- 2 (F) (G) (H) (J)
- 3 (A) (B) (C) (D)
- 4 (F) (G) (H) (J)
- 5 (A) (B) (C) (D)
- 6 (F) (G) (H) (J)
- 7 (A) (B) (C) (D)

- 8 (F) (G) (H) (J)
- 9 (A) (B) (C) (D)
- 10 (F) (G) (H) (J)
- 11 (A) (B) (C) (D)
- 12 (F) (G) (H) (J)
- 13 (A) (B) (C) (D)
- 14 (F) (G) (H) (J)

- 15 (A) (B) (C) (D)
- 16 (F) (G) (H) (J)
- 17 (A) (B) (C) (D)
- 18 (F) (G) (H) (J)
- 19 (A) (B) (C) (D)
- 20 (F) (G) (H) (J)
- 21 (A) (B) (C) (D)

- 22 (F) (G) (H) (J)
- 23 (A) (B) (C) (D)
- 24 (F) (G) (H) (J)
- 25 (A) (B) (C) (D)
- 26 (F) (G) (H) (J)
- 27 (A) (B) (C) (D)

Reporting Category 3: 8th Grade Science Readiness Standards

Instructions to read aloud to your students.

When you decide what the answer to a question is, mark your answer on your answer sheet. To do so, find the row of circles with the same number as the question. Then darken in the circle with the same letter as the answer you chose. If you don't know the answer to a question, skip it. You may return to it later if you have time. If you finish the test early, you should go back and check over your work. Do **NOT** fold your answer sheet or make any stray marks.

When marking your answer sheet:

1. Make a heavy mark. The mark should be large enough to fill the circle, but it should not go outside too much. Do not waste time making very neat marks. It is more important to make very dark marks. Be sure to use a #2 pencil.
2. Be sure that your mark for every question is placed in the row with the same number as that question.
3. Make only ONE mark in a row. If you change your mind about an answer, erase your first mark as completely as you can.

1	A	●	C	D
2	F	●	H	J
3	●	B	C	D
4	F	●	H	J
5	●	B	C	D
6	F	G	●	J
7	●	B	C	D

8	F	G	●	J
9	A	B	C	●
10	●	G	H	J
11	A	B	●	D
12	●	G	H	J
13	A	B	C	●
14	F	●	H	J

15	A	B	●	D
16	F	G	H	●
17	A	B	●	D
18	F	G	●	J
19	●	B	C	D
20	F	G	●	J
21	A	B	C	●

22	F	G	H	●
23	A	B	C	●
24	F	G	●	J
25	A	●	C	D
26	●	G	H	J
27	●	B	C	D

Reporting Category 3: 8th Grade Science Readiness Standards

Item Number	Reporting Category	Readiness or Supporting	Content Student Expectation	Process Student Expectation	Correct Answer
1	3	Readiness	8.8(A)	8.2 (E)	B
2	3	Readiness	8.7(B)		G
3	3	Readiness	8.7(B)		A
4	3	Readiness	8.7(B)		G
5	3	Readiness	8.7(B)		A
6	3	Readiness	8.7(B)		H
7	3	Readiness	8.9(C)	8.3 (B)	A
8	3	Readiness	8.9(C)	8.3 (B)	H
9	3	Readiness	8.9(C)	8.3 (B)	D
10	3	Readiness	8.9(C)	8.3 (B)	F
11	3	Readiness	8.8(A)	8.2 (E)	C
12	3	Readiness	8.7(A)		F
13	3	Readiness	8.7(A)		D
14	3	Readiness	8.7(A)		G
15	3	Readiness	8.7(A)		C
16	3	Readiness	8.7(A)		J
17	3	Readiness	8.8(A)		C
18	3	Readiness	8.9(B)		H
19	3	Readiness	8.9(B)	8.3 (B)	A
20	3	Readiness	8.8(A)		H
21	3	Readiness	8.8(A)	8.2 (E)	D
22	3	Readiness	8.9(B)	8.3 (B)	J
23	3	Readiness	8.9(B)		D
24	3	Readiness	8.9(C)	8.3 (B)	H
25	3	Readiness	8.9(C)	8.3 (B)	B
26	3	Readiness	8.9(B)		F
27	3	Readiness	8.9(B)	8.3 (B)	A