



Indiana Academic Super Bowl

Science Round

2019 – Senior Division Coaches Practice

A Program of the Indiana Association of School Principals



Students:

Throughout this competition, foreign names and words will be used.

If there are any discrepancies between how a word/phrase should be pronounced and what you see on the screen, the screen supersedes what is spoken.

PHYSICS

SD-CP-Sc-1

The Saros cycle is useful in predicting

_____.

- A. the first day of spring
- B. the dates of solar and lunar eclipses
- C. when Jupiter will be at opposition
- D. when the Moon will pass in front of Jupiter

SD-CP-Sc-2

Under the Babylonian calendar,

_____.

- A. the basic time period was one lunar month
- B. the new year started on the vernal equinox
- C. a normal year 12 months
- D. seven extra months were added during every 19 years
- E. all of the above are true

SD-CP-Sc-3

The Babylonians developed a calculation system to determine the motion of _____.

- A. Venus
- B. Mars
- C. Jupiter
- D. Saturn

SD-CP-Sc-4

The length of the Saros cycle is about

_____.

- A. one month
- B. one year
- C. 9 years
- D. 18 years

SD-CP-Sc-5

Mechanical advantage means a machine can be used to reduce the

_____.

- A. work done in lifting an object
- B. time required to lift an object
- C. force required to lift an object
- D. all of the above

SD-CP-Sc-6

Which of the following is NOT a simple machine?

- A. a screw
- B. a lever
- C. a pulley
- D. an automobile

SD-CP-Sc-7

Archimedes developed an odometer that used which simple machine?

- A. screw
- B. lever
- C. wheel and axle
- D. pulley

SD-CP-Sc-8

What is the mechanical advantage of a compound pulley that allows a 10 Newton force to lift a 50 Newton block?

- A. $1/5$
- B. 5
- C. 25
- D. 500

SD-CP-Sc-9

If you want to lift a piano 20 centimeters with a compound pulley system that has a mechanical advantage of 5, how far will you have to pull the rope?

- A. 4 centimeters
- B. 5 centimeters
- C. 20 centimeters
- D. 1 meter

SD-CP-Sc-10

You weigh 600 Newtons and want to raise an 1800 Newton block with a lever by standing on the opposite end of the lever. Where should you place the fulcrum?

- A. one-third the distance from you to the block (closer to you)
- B. one-third the distance from the block to you (closer to the block)
- C. halfway between you and the block
- D. anywhere between you and the block

SD-CP-Sc-11

What mechanical advantage is needed for a 200 Newton force to lift a 2000 Newton engine?

- A. 1/10
- B. 10
- C. 200
- D. 400,000

SD-CP-Sc-12

The Archimedes Screw was developed to lift _____.

- A. ships
- B. rocks
- C. water
- D. sand

SD-CP-Sc-13

If a 50 centimeter diameter wheel completes 10 revolutions without slipping, the wheel will have rolled about how many meters?

- A. 1.6
- B. 3.2
- C. 16
- D. 32

SD-CP-Sc-14

An ant wants to move a rubber tree plant with a lever. If the ant can exert a maximum force of 0.001 Newtons and the rubber tree plant weighs 100 Newtons, what is the ratio of the distances to the fulcrum?

- A. 0.001
- B. 0.1
- C. 100
- D. 100,000

SD-CP-Sc-15

The Great American Eclipse of August 21, 2017 is directly related through the Saros cycle to which of the following solar eclipses?

- A. July 20, 1963
- B. July 31, 1981
- C. August 11, 1999
- D. All of the above

SD-CP-Sc-16

What is the mechanical advantage of a lever when a fulcrum is one-quarter of the way between the load and the person operating the lever?

- A. $\frac{1}{4}$
- B. $\frac{1}{3}$
- C. 3
- D. 4

SD-CP-Sc-17

You want to use a pulley system with a mechanical advantage of 4 to lift a box 1 meter above the starting point. How much rope will you have to pull through your hands?

- A. 25 centimeters
- B. 1 meter
- C. 4 meters
- D. 5 meters

SD-CP-Sc-18

To lift hay bales to the loft in a barn, a single rope passes through a pulley attached to the inside of the roof of the barn. What is the mechanical advantage of this system?

- A. 0
- B. 1
- C. 2
- D. 3

SD-CP-Sc-19

The wheel of an odometer completes 50 turns while rolling 100 meters. What is the diameter of the wheel?

- A. 32 centimeters
- B. 64 centimeters
- C. 100 centimeters
- D. 200 centimeters

SD-CP-Sc-20

The maximum force you can exert is 500 Newtons. What mechanical advantage is needed to lift 2000 Newton block?

- A. $\frac{1}{4}$
- B. 4
- C. 1,000
- D. 1,000,000

SD-CP-Sc-21

What is the mechanical advantage of a screw with 10 threads per inch and a diameter of $\frac{1}{4}$ inch?

- A. 2.5
- B. 3.9
- C. 7.8
- D. 15.6

SD-CP-Sc-22

If the mechanical advantage of a system is 10 and the maximum force you can exert is 400 Newtons, what is the maximum weight that you can lift?

- A. 4 Newtons
- B. 40 Newtons
- C. 200 Newtons
- D. 4,000 Newtons

SD-CP-Sc-23

When will the next solar eclipse in Saros cycle 145 (which included the solar eclipse of August 21, 2017) occur?

- A. April 8, 2024
- B. December 9, 2030
- C. September 2, 2035
- D. September 12, 2053

BIOLOGY

SD-CP-Sc-24

The development of “domesticated” grain crops in the Fertile Crescent & Levant took place mainly during which period?

- A. Paleolithic
- B. Neolithic
- C. Bronze Age
- D. Iron Age

SD-CP-Sc-25

From the list below, which is not considered one of the Neolithic founder crops from the Fertile Crescent?

- A. Emmer
- B. Einkorn
- C. Quinoa
- D. lentils

SD-CP-Sc-26

Which from the list below is one of the common characteristics of the wild versions of the Fertile Crescent grass plants that initially made them difficult for humans to work with as crop plants.

- A. Seed heads tended to shatter when harvested
- B. It took 3 years for wild seeds to sprout after planting
- C. There was typically one seed for each seed head in the wild plants
- D. The plants were largely biennial and seed heads did not develop until the second year of the plants growth

SD-CP-Sc-27

Einkorn is so named because

_____.

- A. the seed head looks just like an ear of maize (or corn)
- B. each seed looks just like a typical kernel of maize (or corn)
- C. this plant was derived from the same parent plant as maize (corn)
- D. there is only a single grain in each spikelet on the head

SD-CP-Sc-28

Which below is not a legume?

- A. Chickpea
- B. Barley
- C. Bitter vetch
- D. lentil

SD-CP-Sc-29

One important agricultural and ecological characteristics of members of the Fabaceae family is that these plants _____.

- A. Have developed symbiotic relationships with nitrogen-fixing bacteria in the soil
- B. Convert carbohydrates in the soil into nitrogen compounds
- C. Produce four (4) plants for every single seed planted
- D. The plants have no natural parasites or disease organisms and very few animals will eat them

SD-CP-Sc-30

A true statement about hexaploid wheats is that _____.

- A. they are all the result of domestication
- B. there are no wild hexaploid wheats
- C. they are all the result of the crossing of a tetraploid domesticated wheat with a wild goat grass
- D. all of the above statements are true

SD-CP-Sc-31

In considering nutrition, we can say that wheat _____.

- A. is the leading source of vegetal protein in the world
- B. is a minor source of plant-based protein in the world
- C. is largely indigestible because of the presence of gluten proteins
- D. provides high quality protein containing all essential amino acids

SD-CP-Sc-32

A difference between domesticated goats and domesticated sheep that made goats somewhat more successful in a greater number of environments and habitats is which below?

- A. goats are monogastric; sheep are ruminants
- B. goats are ruminants, sheep are monogastric
- C. goats are browsers, sheep are grazers
- D. goats are true omnivores, sheep are herbivores

SD-CP-Sc-33

Which group of domesticated animals below is monogastric?

- A. Goats
- B. Sheep
- C. Pig/swine
- D. Cattle

SD-CP-Sc-34

In comparing wild wheats with domesticated wheats, which of the following is true?

- A. all wild wheats are hulled; most modern wheats are unhulled
- B. most wild wheats shatter; most domesticated wheats are free-threshing
- C. all wild wheats can self-pollinate; all domesticated wheats require insect pollination
- D. most wild wheats are diploid; all domesticated wheats are hexaploid

SD-CP-Sc-35

Which below is one of the main perceived advantages of the digestive system of ruminants?

- A. dramatically improved digestion of low-value proteins
- B. ability to consume a greater degree of non-plant food sources
- C. improved digestion of cellulose
- D. improved digestion of cereals

SD-CP-Sc-36

Which of the river groups listed below more or less defines the region of the Fertile Crescent?

- A. Tigris, Indus, Euphrates
- B. Euphrates, Tigris, Nile
- C. Tigris, Euphrates, Amu Darya (aka Oxus)
- D. Indus, Amur, Tigris, Niger

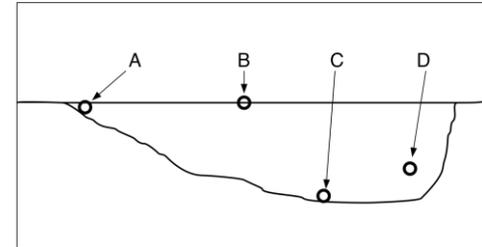
SD-CP-Sc-37

In general, as a river moves from headwaters or source to the river's mouth, we can see the following change in characteristic:

- A. temperature increases
- B. depth decreases
- C. channel width decreases
- D. sediment load decreases

SD-CP-Sc-38

At which labeled point is the velocity of the water the highest (fastest)?



- A. Point A
- B. Point B
- C. Point C
- D. Point D

SD-CP-Sc-39

As you move from source to mouth of a typical long river, _____.

- A. the velocity and discharge of the stream both increase
- B. the velocity increases and the discharge decreases
- C. the width and the discharge both decrease
- D. the velocity decreases and the depth increases

SD-CP-Sc-40

In the diagram shown, where would you expect to find the region of greatest deposition?



- A. Area A
- B. Area B
- C. Area C
- D. Area D

SD-CP-Sc-41

Which of the following stream bed compositions would indicate the stream with the fastest moving water?

- A. mud
- B. gravel
- C. sand
- D. small boulders

SD-CP-Sc-42

The pattern of directional changes a river makes as it courses over the land is generally referred to as _____.

- A. linearity
- B. meandering
- C. limnetics
- D. dendritic

SD-CP-Sc-43

Viewed from high above, the drainage area (or watershed) of a river often takes on a particular pattern known as _____.

- A. limnetic
- B. randomized
- C. stochastic
- D. dendritic

SD-CP-Sc-44

Streams and rivers are considered _____ systems.

- A. lentic
- B. lotic
- C. channelistic
- D. abyssal

SD-CP-Sc-45

The habitat (or sometimes considered an ecosystem) that goes from the banks of a stream to a relatively short distance away from the stream is generally known as _____.

- A. riparian habitat
- B. palustrine habitat
- C. Palestine habitat
- D. aquatic habitat

SD-CP-Sc-46

The land around a river in which waters tend to cover on a seasonal, or at least regular basis, is known as _____.

- A. the *zona pellucida*
- B. the zone of inundation
- C. the plain of confluence
- D. the flood plain

SD-CP-Sc-47

Along the Tigris River, you would expect the river to have the greatest volume, and the surrounding flood plain to be the most fertile in which general location?

- A. close to the headwaters of the river in Anatolia
- B. in the middle courses of the river where it crosses the alluvial plains of Mesopotamia
- C. close to the mouth of the river
- D. the volume, as well as land fertility, remains about the same from the beginning to the end of the river

SD-CP-Sc-48

Agriculture in the Tigris-Euphrates Basin has resulted in relatively widespread occurrence of which of the following?

- A. increases in soil fertility by annual flooding
- B. desertification
- C. soil salination
- D. both B and C

chemistry

SD-CP-Sc-49

Which of the halogens is a solid at room temperature?

- A. chlorine
- B. iodine
- C. phosphorus
- D. silicon

SD-CP-Sc-50

Which elements in the following lists are liquids at room temperature?

- A. bromine and silicon
- B. chlorine and bromine
- C. bromine, mercury, and chlorine
- D. bromine and mercury

SD-CP-Sc-51

Which element below is a halogen?

- A. oxygen
- B. sodium
- C. astatine
- D. phosphorus

SD-CP-Sc-52

The horizontal rows in the periodic table are called _____.

- A. groups
- B. families
- C. periods
- D. associations

SD-CP-Sc-53

The most reactive metals in the periodic table are located in the _____.

- A. lower left hand corner
- B. lower right hand corner
- C. upper left hand corner
- D. lower right hand corner

SD-CP-Sc-54

How many neutrons does an atom with a mass number of 210 and an atomic number of 82 contain?

- A. 82
- B. 210
- C. 292
- D. 128

SD-CP-Sc-55

Which of the following statements was not part of the original atomic theory proposed in the first written atomic theory?

- A. all matter is made of atoms
- B. atoms are made of protons, neutrons, and electrons
- C. atoms of the same element are identical
- D. atoms unite in definite ratios to form compounds

SD-CP-Sc-56

The smallest particle into which an element can be divided and still be the same substance is _____.

- A. an electron
- B. a quark
- C. a molecule
- D. an atom

SD-CP-Sc-57

The mass number of an element provides which of the following information?

- A. the number of neutrons in the nucleus
- B. the total number of neutrons and protons in the nucleus
- C. the number of protons or electrons in the nucleus
- D. the number of atoms in a microgram of the element

SD-CP-Sc-58

Which metal is NOT required to have its charge specified by Roman Numerals in the name of the ionic compounds it forms?

- A. Fe
- B. Mn
- C. Pb
- D. Ca

SD-CP-Sc-59

Which reaction is an example of an oxidation-reduction reaction?

- A. $\text{Cu} + 2 \text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2 \text{Ag}$
- B. $\text{AgNO}_3 + \text{KI} \rightarrow \text{AgI} + \text{KNO}_3$
- C. $2 \text{KOH} + \text{H}_2\text{SO}_4 \rightarrow \text{K}_2\text{SO}_4 + 2 \text{H}_2\text{O}$
- D. $\text{Ba}(\text{OH})_2 + 2 \text{HCl} \rightarrow \text{BaCl}_2 + 2 \text{H}_2\text{O}$

SD-CP-Sc-60

Which of the following are decomposition reactions?

1. $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
2. $\text{CaO} + \text{CO}_2 \rightarrow \text{CaCO}_3$
3. $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$
4. $\text{PbCO}_3 \rightarrow \text{PbO} + \text{CO}_2$

- A. 2 and 3
B. 1 and 4
C. 1, 2, and 3
D. 4 only

SD-CP-Sc-61

The reaction $\text{Ca} + \text{MgSO}_4 \rightarrow \text{CaSO}_4 + \text{Mg}$ would be classified as _____.

- A. synthesis
B. decomposition
C. single replacement
D. double replacement

SD-CP-Sc-62

When butane is burned in the presence of oxygen gas, the products are _____.

- A. $\text{CO}_2 + \text{H}_2$
B. $\text{C} + \text{H}_2$
C. $\text{CH}_2 + \text{H}_2\text{O}$
D. $\text{CO}_2 + \text{H}_2\text{O}$

SD-CP-Sc-63

The reaction $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ would be classified as _____.

- A. decomposition
B. single replacement
C. double replacement
D. combustion

SD-CP-Sc-64

The driving force for a double replacement reaction is usually the formation of _____.

- A. a weak electrolyte
- B. water
- C. a precipitate
- D. all of the above

SD-CP-Sc-65

In a combustion reaction, what elements/compounds can be the reactants?

- A. oxygen gas and a hydrocarbon
- B. oxygen gas and a metal
- C. both A and B are correct
- D. neither A nor B are correct

SD-CP-Sc-66

Which type of reactions cannot have an element as a product?

- A. synthesis
- B. decomposition
- C. single replacement
- D. none of the above is correct

SD-CP-Sc-67

Chemical equations must be balanced to satisfy the _____.

- A. law of definite proportions
- B. law of multiple proportions
- C. law of conservation of mass
- D. law of Avogadro

SD-CP-Sc-68

Which list has the elements listed in order of increasing atomic radius?

- A. Al, B, C, K, Na
- B. K, Na, C, Al, B
- C. C, B, Al, Na, K
- D. K, Al, Na, C, B

SD-CP-Sc-69

Which list has the elements listed in order of increasing atomic radius?

- A. Sr, Ge, P, Rb, Ca
- B. P, Ge, Ca, Sr, Rb
- C. P, Ge, Ca, Rb, Sr
- D. Ge, P, Ca, Sr, Rb

SD-CP-Sc-70

Na has a lower IE_1 than Mg, but Mg has a lower IE_2 than Na because _____.

- A. IE_1 decreases from left to right across a period and IE_2 increases from left to right across a period
- B. IE_1 increases from left to right across a period. However, because Na has only one valence electron, IE_2 for Na involves the removal of a core electron. This requires significantly more energy.
- C. The radius of Na is smaller than that of Mg
- D. IE_1 increases from left to right across a period and IE_2 decreases from left to right across a period

SD-CP-Sc-71

Select the correct formula for a compound formed from strontium and bromine.

- A. SrBr
- B. SrBr₂
- C. Sr₂Br
- D. Sr₂Br₂

SD-CP-Sc-72

Which of the following statements is FALSE regarding atomic trends?

- A. Moving up a column, electronegativity increases due to the shortening distance between the nucleus and valence electron shell.
- B. Moving across a period from left to right, the second ionization energy increases due to increasing nuclear charge
- C. Moving down a column, effective nuclear charge decreases due to increasing number of electron shells
- D. Moving across a period from left to right, ionic radius decreases, then increases, then decreases due to the switch from cations to anions

SD-CP-Sc-73

Which of the following elements has the highest electron affinity?

- A. Neon
- B. Beryllium
- C. Fluorine
- D. Iridium

SD-CP-Sc-74

Which of the following elements has the lowest ionization energy?

- A. Cesium
- B. Bismuth
- C. Nitrogen
- D. Beryllium

SD-CP-Sc-75

Which of the following elements has the smallest atomic radius?

- A. Iron
- B. Potassium
- C. Krypton
- D. Bromine

SD-CP-Sc-76

Compared to the first ionization energy, the second ionization energy for an ion or atom is always _____.

- A. lower
- B. the same
- C. higher
- D. either higher or lower, depending on the family of the element

SD-CP-Sc-77

Going down a family of elements, the atomic radius increases because the atoms have more _____.

- A. mass
- B. protons
- C. energy levels
- D. neutrons

SD-CP-Sc-78

A Te^{2-} ion would have _____.

- A. 52 protons and 52 electrons
- B. 54 protons and 52 electrons
- C. 52 protons and 54 electrons
- D. 54 protons and 54 electrons

SD-CP-Sc-79

Of the elements listed below, which has the largest atomic radius?

- A. Na
- B. Mg
- C. O
- D. P

SD-CP-Sc-80

Why does fluorine have a smaller covalent radius than lithium?

- A. fluorine has more protons
- B. lithium has more energy levels
- C. fluorine has a greater electronegativity
- D. none of the above

SD-CP-Sc-81

Going down a group in the Periodic Table, what trend is observed in covalent radius?

- A. the covalent radius increases, then decreases
- B. the covalent radius decreases, then increases
- C. the covalent radius increases steadily
- D. the covalent radius decreases steadily

SD-CP-Sc-82

The electron affinity of a noble gas is _____.

- A. nearly zero
- B. very high
- C. difficult to predict
- D. variable depending on the conditions

SD-CP-Sc-83

Based on periodic table trends, which of the following elements has the largest atomic radius?

- A. sulfur
- B. fluorine
- C. aluminum
- D. potassium

SD-CP-Sc-84

Which of the following elements has the highest electronegativity?

- A. lithium
- B. potassium
- C. nitrogen
- D. arsenic

SD-CP-Sc-85

As you move down a column of the periodic table (top to bottom), which of the following statements is generally true?

- A. electronegativity increases
- B. atomic radius increases
- C. ionization energy increases
- D. electron affinity becomes more negative

SD-CP-Sc-86

Which statement correctly and completely identifies a trend?

- A. atomic radius decreases across a period and increases down a group
- B. electronegativity decreases across a period and decreases down a group
- C. ionization energy increases across a period and increases down a group
- D. ionic radius increases across a period and decreases down a group

SD-CP-Sc-87

Metallic ions are always _____ than the metal they came from, and non-metallic ions are always _____ than the non-metal they came from.

- A. larger smaller
- B. larger larger
- C. smaller larger
- D. smaller smaller

SD-CP-Sc-88

The element bromine is a period

_____.

- A. 3 alkali metal
- B. 8 noble gas
- C. 4 halogen
- D. 4 transition metal

SD-CP-Sc-89

Which of the following ions would be the largest?

- A. Be^{2+}
- B. N^{3-}
- C. O^{2-}
- D. F^-

SD-CP-Sc-90

Which of the following elements are gases at room temperature?

- A. argon
- B. silicon
- C. radium
- D. bromine

SD-CP-Sc-91

Which of the following elements is not a gas at room temperature?

- A. nitrogen
- B. radon
- C. chlorine
- D. radium

SD-CP-Sc-92

Which element is a liquid at room temperature?

- A. mercury
- B. sodium
- C. iodine
- D. chlorine

SD-CP-Sc-93

The alkali metals family is also called

_____.

- A. Group IA
- B. Group IIA
- C. Group VIIA
- D. Group VIIIA

SD-CP-Sc-94

The modern periodic table is arranged in order of increasing _____.

- A. atomic mass
- B. number of neutrons
- C. atomic number
- D. number of valence electrons

SD-CP-Sc-95

What information in the periodic table indicates the number of protons?

- A. position of the element in its column
- B. the element's atomic number
- C. the element's atomic mass
- D. the element's mass number

SD-CP-Sc-96

Which group contains elements used to make semi-conductors?

- A. metals
- B. non-metals
- C. metalloids
- D. transition metals

SD-CP-Sc-97

Which statement about combustion reactions is FALSE?

- A. hydrocarbons burn to produce carbon dioxide and water
- B. combustion reactions give off energy in the form of heat
- C. the mass of the reactants is always greater than the mass of the products
- D. oxygen gas is always a reactant

SD-CP-Sc-98

The first written atomic theory was proposed by _____.

- A. Anaxagorus
- B. Aristotle
- C. Newton
- D. Dalton

SD-CP-Sc-99

Which group is known as the Alkaline Earth metals?

- A. Group IA
- B. Group IIA
- C. Group IIIA
- D. none of the above

SD-CP-Sc-100

The zig-zag line on the periodic table divides

_____.

- A. alkali metals and transition metals
- B. metals and non-metals
- C. semi-metals and transition metals
- D. noble elements and halogens

SD-CP-Sc-101

An element's properties can be predicted from its _____.

- A. number of isotopes
- B. number of electrons
- C. location on the periodic table
- D. atomic mass

SD-CP-Sc-102

Which element is the most similar to strontium in chemical and physical properties?

- A. At
- B. Rb
- C. Ba
- D. Cs

SD-CP-Sc-103

Which of the following is a decomposition reaction?

- A. $\text{NH}_4\text{Cl} \rightarrow \text{NH}_3 + \text{HCl}$
- B. $2 \text{Mg} + \text{O}_2 \rightarrow 2 \text{MgO}$
- C. $2 \text{CH}_4 + 4 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$
- D. $\text{Cd}(\text{NO}_3)_2 + \text{Na}_2\text{S} \rightarrow \text{CdS} + 2 \text{NaNO}_3$

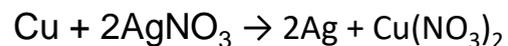
SD-CP-Sc-104

Which equation represents the decomposition reaction of ammonia?

- A. $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$
- B. $\text{NH}_3 \rightarrow \text{N} + \text{H}$
- C. $\text{NH}_3 \rightarrow \text{N}_2 + \text{H}_2$
- D. $\text{NH}_3 + \text{H}_2 \rightarrow \text{N}_2$

SD-CP-Sc-105

The reaction



would be classified as _____

- A. synthesis
- B. decomposition
- C. single replacement
- D. double replacement

SD-CP-Sc-106

An acid-base reaction is considered to be what type of reaction?

- A. synthesis
- B. single replacement
- C. decomposition
- D. double replacement

SD-CP-Sc-107

The decomposition of metal carbonates always result in the formation of _____.

- A. chlorides
- B. oxides
- C. carbon dioxide
- D. free metals

SD-CP-Sc-108

What best describes a single replacement reaction?

- A. a free metal replaces an ion in a soluble compound
- B. an insoluble precipitate is formed
- C. two soluble ionic compounds are formed
- D. a gas is formed

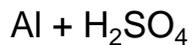
SD-CP-Sc-109

What substance is always present during combustion reactions?

- A. carbon dioxide
- B. oxygen
- C. metals
- D. water

SD-CP-Sc-110

What will be a product of this reaction?



- A. $\text{Al}(\text{SO}_4)_2$
- B. H_2
- C. $\text{Al}(\text{OH})_3$
- D. H_2O

SD-CP-Sc-111

Which type of reaction cannot have an element as a reactant?

- A. combustion
- B. decomposition
- C. synthesis
- D. single replacement

SD-CP-Sc-112

When copper metal shavings are placed in a beaker containing silver nitrate, what is the substance that forms at the bottom of the beaker?

- A. copper ions
- B. silver metal
- C. water
- D. hydrogen gas

SD-CP-Sc-113

What is the only reliable evidence that a chemical reaction has taken place?

- A. a change in temperature
- B. a change of state
- C. disappearance of one or more reactants
- D. formation of a new substance

PURDUE
UNIVERSITY

End of Science Round

2018 Senior Super Bowl Area Contest
April 17, 2018



SD Science Coaches Practice Answer Key

Physics

- 1. B
- 2. E
- 3. C
- 4. D
- 5. C
- 6. D
- 7. C
- 8. B
- 9. D
- 10. B
- 11. B
- 12. C
- 13. C
- 14. D
- 15. D
- 16. C
- 17. C
- 18. B
- 19. B
- 20. B
- 21. C
- 22. D
- 23. C

Biology

- 36. B
- 37. A
- 38. D
- 39. A
- 40. C
- 41. D
- 42. B
- 43. D
- 44. B
- 45. A
- 46. D
- 47. C
- 48. D
- 24. B
- 25. C
- 26. A
- 27. D
- 28. B
- 29. A
- 30. D
- 31. A
- 32. C
- 33. C
- 34. B
- 35. C

SD Science Coaches Practice Answer Key

Chemistry

49. B	61. C	71. B	81. C	91. D	101. C	111. B
50. D	62. D	72. B	82. A	92. A	102. C	112. B
51. C	63. D	73. C	83. D	93. A	103. A	113. D
52. C	64. D	74. A	84. C	94. C	104. C	
53. A	65. C	75. C	85. B	95. B	105. C	
54. D	66. A	76. C	86. A	96. C	106. D	
55. B	67. C	77. C	87. C	97. C	107. C	
56. D	68. C	78. C	88. C	98. D	108. A	
57. B	69. B	79. A	89. B	99. B	109. B	
58. D	70. B	80. A	90. A	100. B	110. B	
59. A						
60. D						