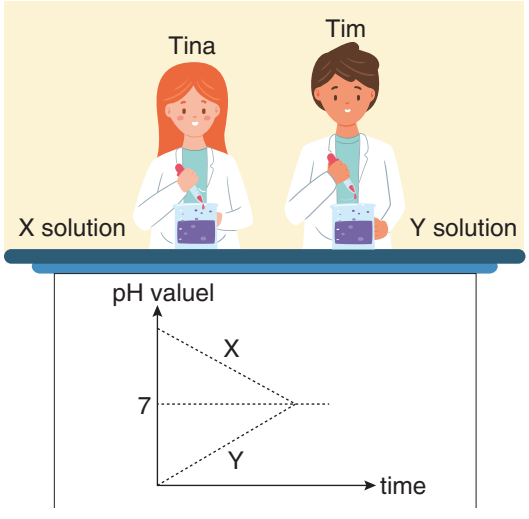
POPULAR SCIENCE CATEGORY - MIDDLE GROUPS (Grades 7-8-9)

1. When Tim and Tina add liquids to containers with X and Y solutions, the change in pH values of the solutions is as in the graph.



Which of the following are wrong?

I. Tim could have added baking soda to his solution.

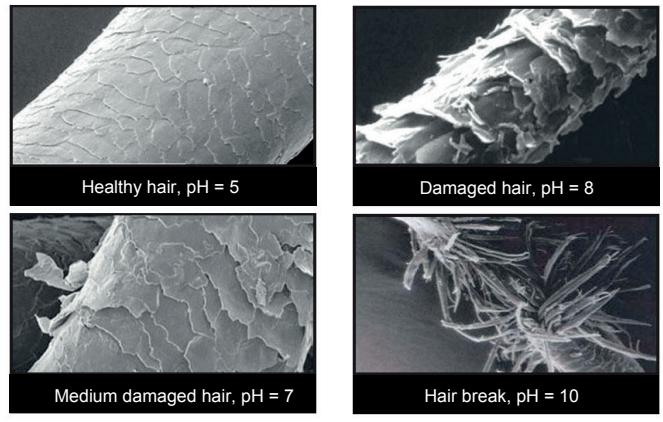
II. X is acid, Y is basic (alkaline) solution.

III. Tina could have added lemon juice to the X solution.

IV. Tina and Tim added pure water only to their solutions.

A) I and II
B) I and III
C) II and IV
D) I, II and IV

2.



Hair and skin pH scale

Realizing that her hair is getting worn out and her scalp grows fungus, Kristina thinks that this may be related to the shampoo she recently used. When she examined the label on the shampoo box, she saw that the pH value was not found.

Since the pH value of the shampoo that Kristina used before was 5.5, which of the following comments cannot be made?

A) The change in pH value affects the health of the hair and skin.

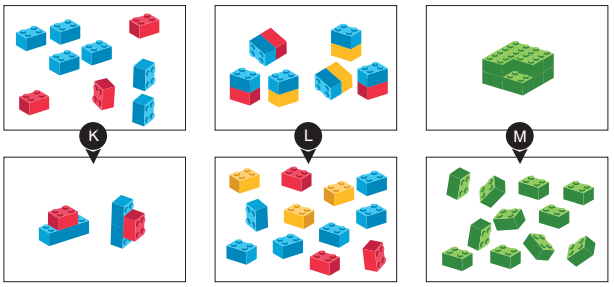
B) Kristina's new shampoo won't affect the red litmus paper.

C) Kristina's newly bought shampoo may have a pH value of 8.

D) The acidic quality of the scalp and hair structure prevents the formation of fungus and bacteria on the scalp.

Middle Groups (Grades 7-8-9)

3.



Katrin prepared the K, L and M models by using each piece of lego with different colors to represent different atoms in order to show the physical and chemical changes of substances.

Which of the comments about the above modeling is wrong?

A) Katrin modeled the melting of iron with the M mechanism.

B) The K event may be modeling the formation of sodium chloride.

C) The number and variety of atoms are preserved in the L mechanism.

D) Katrin modeled chemical change with L and M mechanisms.

4.

The Statue of Liberty, which stands out at the entrance of New York Harbor with its green-blue color, is 135 years old.

The Statue of Liberty, made of copper, was presented to the USA by France for its 100th anniversary.

When the Statue of Liberty was first built, it had a red / brown color. Over time, it turned into the green color we know today. The reason for this situation is ....

A) the erosion of the copper used in the sculpture by the wind.

B) the sun's rays fading the paint of the statue

C) the oxidation of the copper material used in the sculpture over time.

D) a large number of lightning strikes over the year

Middle Groups (Grades 7-8-9)

5

Solar Fields

Solar fields in Germany have the most energy generating systems in the world. One of the most important countries in the world in terms of renewable energy resources production, Germany broke a record in solar energy production thanks to the Coronavirus disease in 2020.

By means of the which of the following factors may have the Coronavirus epidemic contributed positively to the solar energy production?

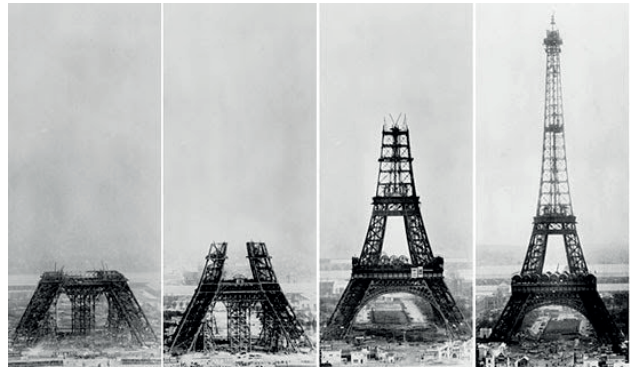
I. With the decrease in air pollution, the light coming to the solar panels has increased.

II. Due to the corona virus epidemic, solar panel production has decreased.

III. Dust and sludge formed on the panels as a result of the decrease in air pollution has decreased.

A) Only I B) I and II C) I and III D) I, II ve III

6. The Eiffel Tower was built between 1887 and 1889 by the firm of Gustave Eiffel as the entrance gate of the Expo 1889 Paris fair, which was organized as part of the centennial celebrations of the French Revolution.



The Eiffel Tower, which is made entirely of metal, can stretch up to 15 centimeters due to the summer heat, which may disrupt the balance of the tower. How could engineer Gustave Eiffel solve this problem?

A) With special expansion connections between metal

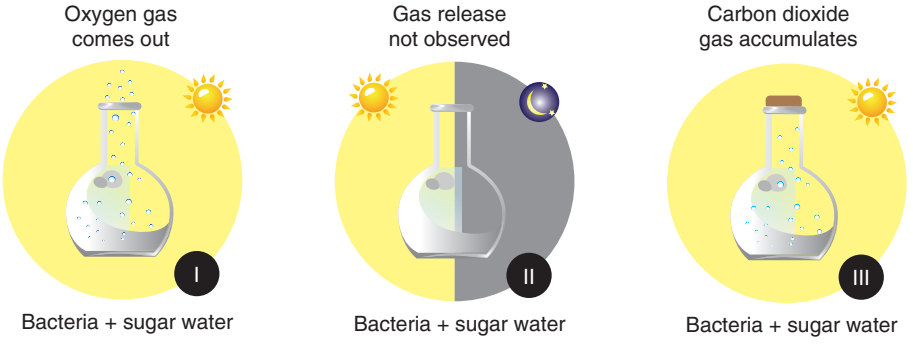
B) Using 10 thousand tons of iron and stee

C) By the design shape of the Iron Tower and the stretching of the material.

D) By building the Eiffel Tower in 3 floor

Middle Groups (Grades 7-8-9)

7.



The increase in the number of bacteria was observed over time in the three separate experimental setups above.

Which of the following facts about the bacteria used in the experiments is wrong?

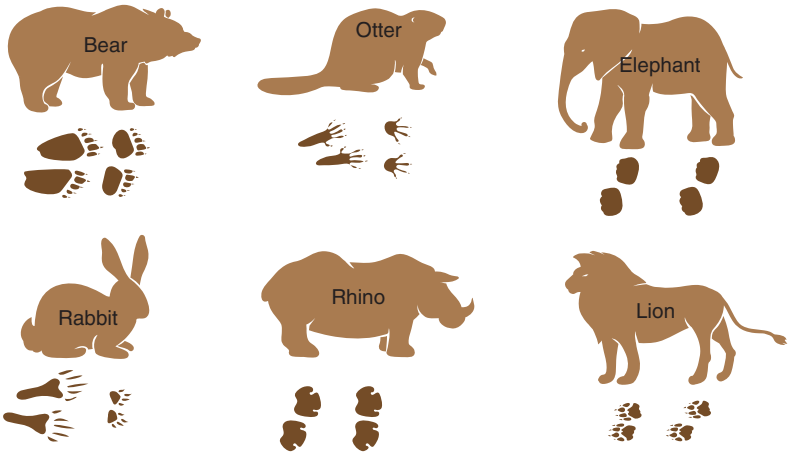
A) Bacteria in the first pot contain chlorophyl

B) The bacteria in the second pot may be lactic (lacto-) bacteri

C) Bacteria in the third bowl convert glucose into ethyl alcoho

D) Bacteria in the first and third vessels can use light energ

8. The foot structures of some living things are shown below.



Which of the following comments cannot be made by looking at these foot structures?

A) The wide soles of creatures such as rhinos and elephants prevent th from sinking into the sand.

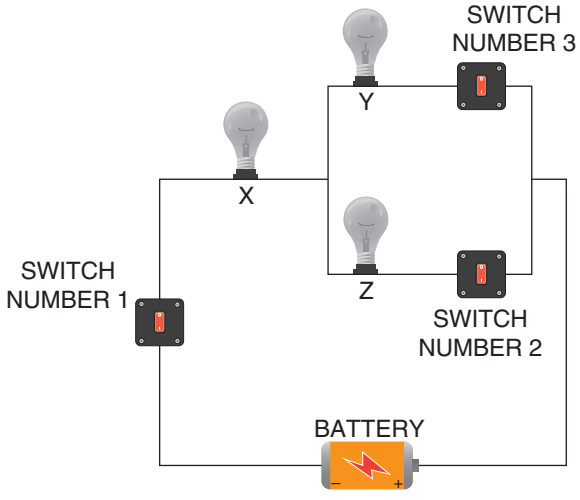
B) The paw structures of the bear and the lion are adapted for feedin

C) Since rabbit and otter are members of the same species, their fo structures are similar.

D) The appearance of similar foot structures in different species may due to their living in the same ecosystem.

Middle Groups (Grades 7-8-9)

9. Peter prepares the following circuit from identical bulbs. Initially, all switches are open (circuit closed) and none of the lamps are lit.



Peter closes the switches in the circuit, in order of their numbers, on the condition that they are not opened again.
Which of the following information is wrong?

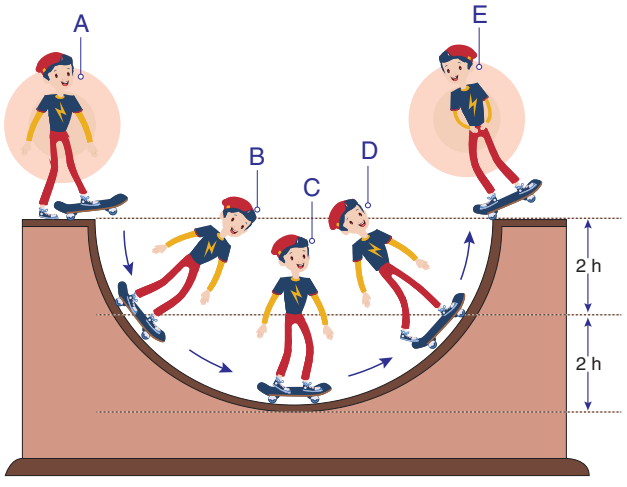
A) None of the bulbs turn on when the switch number one is closed.

B) When the switch number two is closed, X and Z light, Y does not light.

C) X and Z light up in the same brightness when the switch number two is closed.

D) When the switch number three is closed, all bulbs turn on at the same brightness.

10. Thomson glides on the skate track where friction is neglected as follows.



Which of the following is wrong about Thomson's movements on the skate track?

A) Thomson's potential energies at positions A and E are equal.

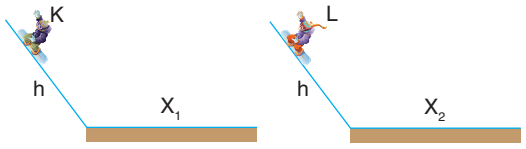
B) Mechanical energy is conserved throughout its movement on the skateboard track.

C) Thomson's speed at position D is greater than his speed at position C.

D) Thomson has the most kinetic energy at point C.

Middle Groups (Grades 7-8-9)

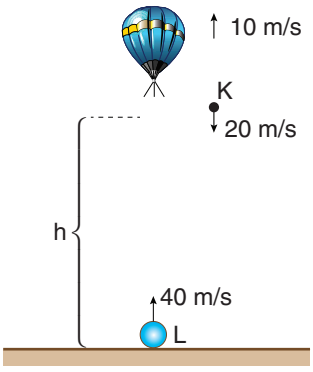
11. Two skiers, K and L, are starting to ski from the same height (h) in the absence of any external force towards right on a frictionless inclined platform. The skiers encounter a horizontal surface on which they coast to a stop after a while.



According to the information provided above, if the weights of skiers K and L are 30 N and 50 N, respectively, what is the ratio of horizontal distances each skier takes, $\frac{X_1}{X_2}$?

A) 1 B) $\frac{3}{5}$ C) $\frac{5}{3}$ D) 2

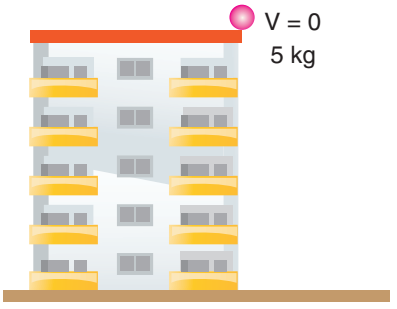
12.



In an environment where air friction is insignificant, the object K is thrown downwards with a speed of 20 m/s with respect to the balloon rising at a constant speed of 10 m/s. At the same time, object L is launched with a vertical velocity of 40 m/s. Since the objects, K and L, meet after 2 seconds, what is the height of the balloon from the ground when the object L is launched?

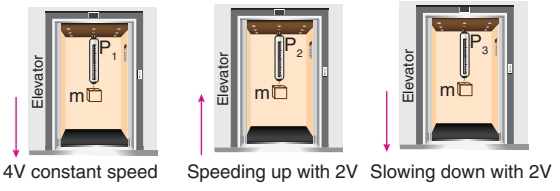
A) 60 m B) 85 m C) 100 m D) 120 m

13. An object with a mass 5kg is dropped from the top of a building. If the object falls from 95th floor to 65th between 2nd and 4th seconds of its falling, what is the height of each floor? (assume g = 10 m/s^2)



A) 2 B) 3 C) $\frac{5}{2}$ m D) 4

14. John is weighing 3 equal masses by using spring scales attached to the ceiling of three different elevators. Based on the values that John weighs W_1, W_2 and W_3, which one(s) is/are always true?



I. $W_2 > W_1$

II. $W_1 > W_3$

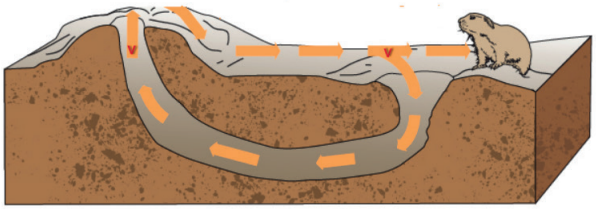
III. $W_2 = W_3$

A) Only I B) Only II

C) Only III D) 1 and 3

Middle Groups (Grades 7-8-9)

15.



Prairie dogs build one entrance of their tunnel higher than the other because the wind speed increases with increasing altitude. This slight pressure difference between the two exits of their tunnel causes the air to flow through the tunnel.

Which of the following can be given as an example of the physics principle mentioned in the text above?

I. If we stand very close to railway track in the platform, when a fast train passes us, we get pulled towards the track

II. When the airplane takes off on the runway

III. During heavy winds, roofs of the houses are lifted and blown away sometimes

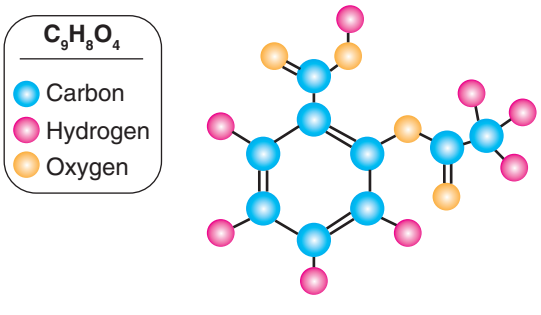
A) II and III B) I and II

C) I and III D) I, II and III

16.

Aspirin, also known as acetylsalicylic acid, is one of the most preferred medicines. In addition to its pain reducing properties, it is also frequently used in the treatment of inflammation and fever.

What is the relative molecular weight of aspirin according to the structural formula given below. (C:12, H:1, O:16)



A) 1 B) 1 C) 2 D) 1

17.

Scandium is used in alloys for sporting goods such as bicycle frames and fishing rods and in high-intensity metal halide lamps.

According to the electron configuration of the $_{21}Sc^{+}$ ion;

I. There are 10 full orbitals.

II. There is no half-filled orbital.

III. The largest head quantum number is 4.

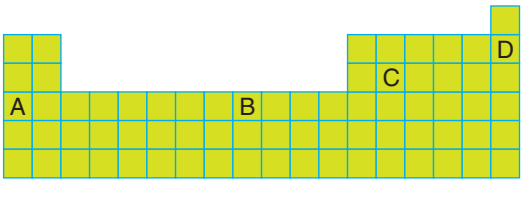
Which of the statements is/are correct?

A) Only III B) I and II

C) I and III D) I, II and III

18.

In the following outline of the Periodic Table, the letters A to D are not the symbols of the elements but they do represent elements..

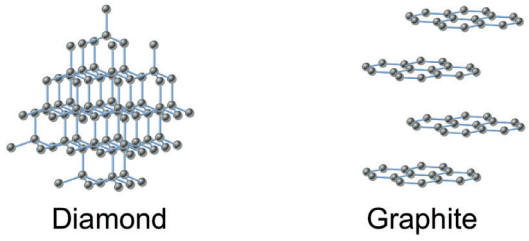


Which letter symbolises the element which is a nonmetal with a high melting and boiling point?

A) A B) B C) C D) D

Middle Groups (Grades 7-8-9)

19.



Allotropes are different structural forms of the same element arranged differently in space.

Regarding diamond and graphite;

I. Bond energies

II. Electrical conductivity

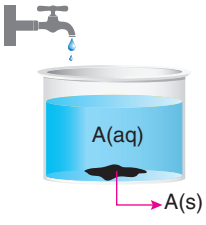
III. Conductivity of heat

IV. Hardness

Which of the features above are common for both diamond and graphite?

A) None
B) I and IV
C) III and IV
D) I, III and IV

20.



Some water, which is not enough to completely dissolve the solid at the bottom, is added to the system in the figure at the same temperature.

Regarding the solution above;

I. It is saturated.

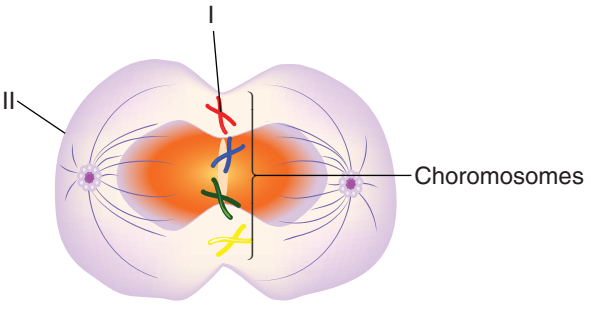
II. Addition of hot water changes the solubility of A.

III. The solubility of A increases.

which of the statements above is/are correct?

A) Only I
B) I and II
C) I and III
D) I, II and III

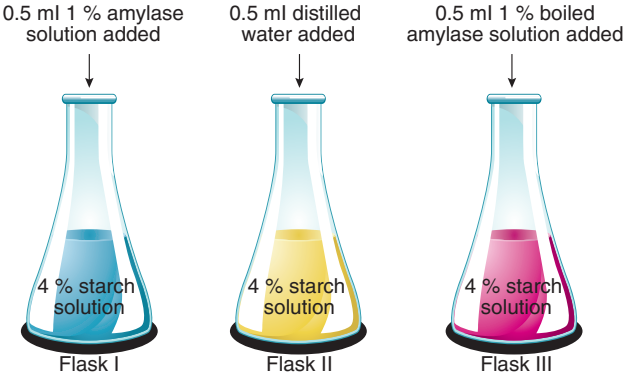
21. **The image depicts a cell during mitosis.**



What are the stage of mitosis and labeled structures?

	Stage of mitosis	Structure I	Structure II
A)	metaphase	chromatid	nuclear membrane
B)	anaphase	centromere	plasma membrane
C)	anaphase	chromatid	nuclear membrane
D)	metaphase	centromere	plasma membrane

22. The activity of the enzyme amylase was analyzed by preparing the three flasks shown below. The substances indicated above each flask were added at time zero.



Which flask(s) could show evidence for the hypothesis that heat denatures enzymes?

A) Flasks I and II after 15 minut

B) Flasks II and III after 15 minut

C) Flasks I and III after 15 minut

D) Flask III at time zero and again after 15 minut

Middle Groups (Grades 7-8-9)

23. **Where is absorption of digested food carried out?**

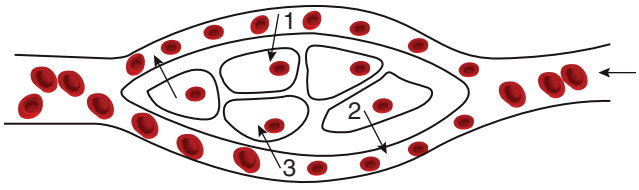
I. Villi

II. Pancreas

III. Small intestine

A) I only
B) I and II only
C) I and III only
D) I, II and III

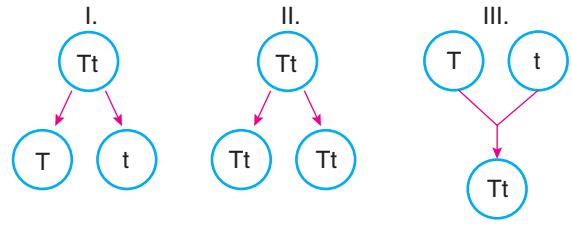
24. **Red blood cells and tissue cells are depicted in the diagram below.**



Arrow 3 indicates diffusion of oxygen from blood cells to tissue cells. Which molecules are shown to diffuse with arrows 1 and 2?

	Arrow 1	Arrow 2
A)	carbon dioxide	urea
B)	water	glucose
C)	glucose	carbon dioxide
D)	fatty acids	amino acids

25. **Which of the diagram(s) show(s) a process that represents asexual reproduction?**



A) I on
B) II on
C) III on
D) I, II and I