

Name: \_\_\_\_\_ Pd: \_\_\_\_\_ Date: \_\_\_\_\_

## SCIENCE PSSA PRACTICE

**READ BEFORE YOU BEGIN:** You are now ready to begin. You will be responding to questions about science. For all of these questions, you will choose your answer from among a set of four answer choices. You will record your response to these questions on your answer sheet.

**Are there any questions?**

Now look at the top of this page. Your name, today's date, the period you have science class should be written on the lines provided. If one or all of these do not appear on the line, then write in the required information now.

**Are there any questions?**

Now look at the first box below. It is labeled "Multiple-choice Questions." Read the directions in the first box silently and pretend that Mr. Racchini is reading it aloud but his voice sounds like Ariana Grande.

### Multiple-Choice Questions

Directions: On the following pages are example science questions. These questions will ask you to select an answer from among four choices. These questions will be found in this packet.

For the multiple-choice questions:

- Read each question, and choose the best answer.
- Record your choice on the answer sheet
- Only one of the answers provided is the correct response.

**Are there any questions? No one has any question???**

Now look at the piece of scratch paper that I passed out to you. It's a piece of paper. You can stop looking at now. Seriously, it's just a piece of paper.

**Are there any questions? Are you sure?**

We are now ready to start. Remember to complete questions 1 – 300 in this review packet and to mark only one correct answer for each question on your answer sheet. If you complete this packet early, you may check your work for this packet only. Do not check your neighbor's packet, your Instagram or snapchat accounts, or your email, unless it's the 3<sup>rd</sup> Tuesday of the 5<sup>th</sup> month of an even numbered year. After you have checked your work, make sure you have completely erased wherever you have changed an answer or made a stray mark on your answer sheet. Then stand up, bark like a dog, flap your arms like a bird while you try to run in place, so I know you are finished. You may read, sit quietly, or stare at everyone else and wonder why you were given the "easy test" with fewer questions.

**Are there any questions? I have a question. Why do I have to keep asking if there any questions, when clearly this packet contains lots of questions. So the answer is...yes there are many questions about science. And now...**

**You may begin.**



# Practice Science PSSA Section 1

Use the table below to answer question 1.

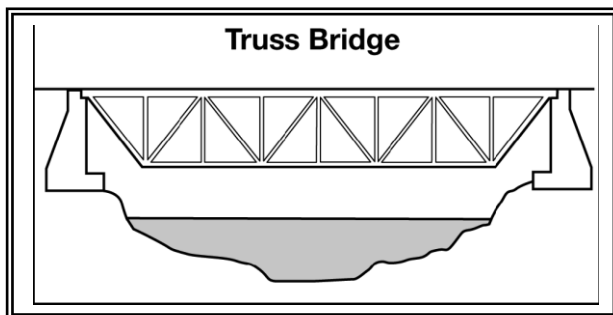
## Laundry Detergent Comparison

Type of Stain	Number of Washes to Remove Stain		
	Detergent X	Detergent Y	Detergent Z
Mud	1	1	1
Ink	2	3	3
Ketchup	1	2	2
Grass	1	2	2

1. Students tested three different types of laundry detergent to determine how effective they were at removing stains. The washing was done with the same washing machine set at the same water temperature. Each type of stain was on the same fabric and was the same size and shape. The students recorded the number of times the fabric had to be washed to completely remove each stain. The students had a null hypothesis: Detergents X, Y, and Z are equally effective at removing stains. Which conclusion is **best** supported by the data?

- A. Detergent X is more effective than both Y and Z at removing these stains.
- B. Detergent Y is more effective than both X and Z at removing these stains.
- C. Detergent X is more effective than Y at removing stains, but equal in effectiveness to Z.
- D. Detergent Z is more effective than X at removing stains, but equal in effectiveness to Y.

Use the drawing below to answer question 2.



2. Which geometric shape is the most basic recurring element in the truss bridge?

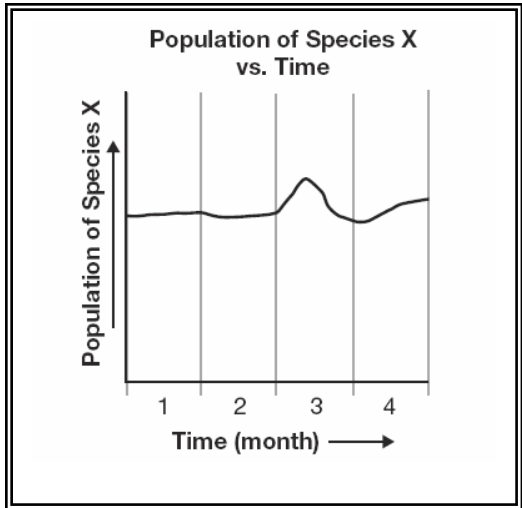
- A. cube
- B. square
- C. trapezoid
- D. triangle

3. Students have observed a flock of birds near the school. They want to do an investigation that involves the birds. What question is a testable question?

- A. Do these birds migrate south every winter?
- B. Why are the birds near the school?
- C. Do the birds like to eat only at one feeder?
- D. How many birds come to a feeder with sunflower seeds?

**Use the graph on the right to answer question 4**

4. Which event explains what **most likely** happened at the beginning of month 3?



- A. More predators of species X were introduced
- B. The prey of species X decreased in number
- C. A disease that affected species X was introduced
- D. A competitor of species X decreased in number

5. A small lake has an algae bloom, and the water is very green. Which change is **most likely** the cause of the algae growth?

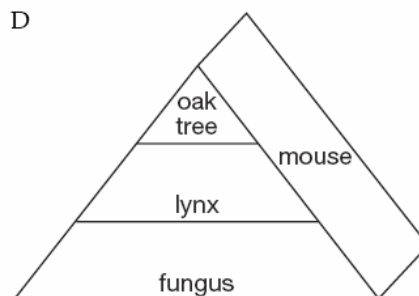
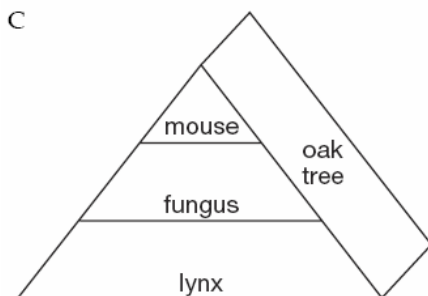
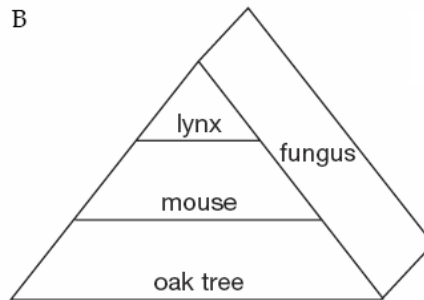
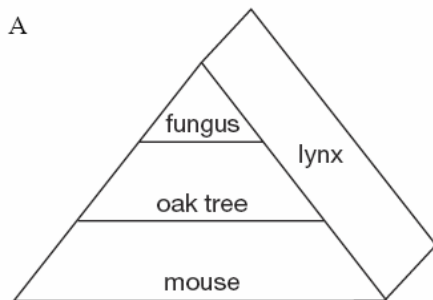
- A. an increase in the amount of fertilizer used near the lake
- B. an increase in the amount of fresh water flowing into the lake
- C. an increase in the number of people fishing in the lake
- D. an increase in the number of boats using the lake

**Use the table below to answer question 6**

**Organisms and Their Energy Sources**

Organism	Energy Source
Fungus	Breaks down dead organisms
Mouse	Eats seeds, fruits, nuts
Oak tree	Conducts photosynthesis
Lynx	Eats other animals

6. In which trophic pyramid are the organisms correctly displayed?



7. Which statement correctly describes an energy source and its effect on the environment?

- A. Fossil fuel, which comes from a continuously renewable resource, generates greenhouse gases.
- B. Solar power, which comes from a continuously renewable resource, generates greenhouse gases.
- C. Nuclear energy, which comes from a nonrenewable resource, generates dangerous waste
- D. Hydroelectric power, which comes from a nonrenewable resource, generates dangerous waste

8. Which statement correctly describes a water cycle process?

- A. Evaporation can occur when water gains energy from the Sun and changes into water vapor
- B. Condensation can occur when liquid water molecules in the clouds lose energy and fall to the Earth.
- C. Transpiration can occur when atmospheric water gains energy and moves higher in the atmosphere.
- D. Precipitation can occur when atmospheric water vapor loses energy and forms liquid water droplets.

Use the table below to answer question 9

**Characteristics of Hematite and Galena**

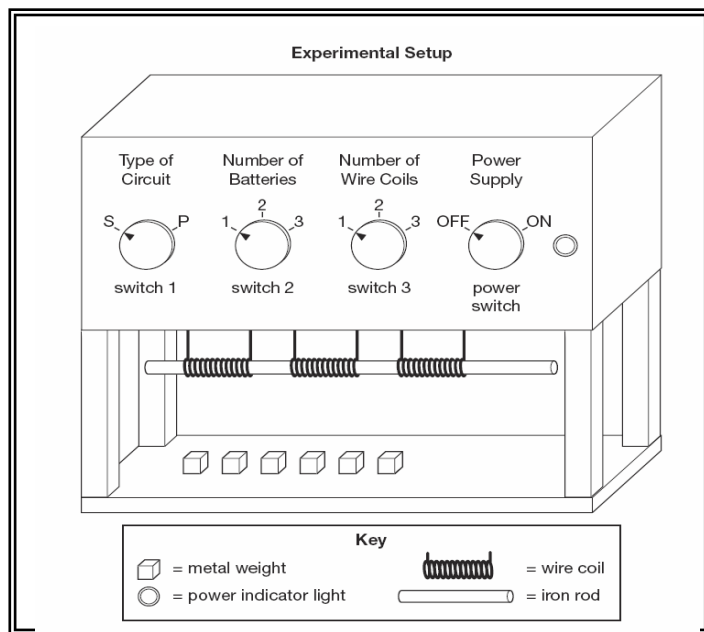
<b>Hematite</b>	<b>Galena</b>
Gray Color Metallic – looking Red streak 4.9 to 5.3 times more dense than water	Gray Color Metallic – looking Dark gray streak 7.4 to 7.6 times more dense than water

9. Two unknown metallic-looking minerals appear gray in color. They of equal size, yet one is heavier than the other. One unknown mineral is Hematite and the other is Galena. According to the characteristics listed in the table, which explanation is correct for mineral samples of equal size?

- A. Galena is the heavier mineral because it is less dense than Hematite and weighs more
- B. Galena is the heavier mineral because it is more dense than Hematite and weighs more
- C. Hematite is the heavier mineral because it is less dense than Galena and weighs more
- D. Hematite is the heavier mineral because it is more dense than Galena and weighs more

Use the diagram below to answer questions 10 – 13.

Students made the device shown in the experimental setup below for testing the effects of different electromagnetic fields of substances. The testing device has three batteries, three coils of insulated copper wire, one iron rod, three adjustable selector switches, and one on/off switch with a power indicator light.



Six metal weights are available for tests; each weight has the same volume and mass. The strength of the electromagnet is measured by counting the number of metal weights that can be suspended from the rod like chain. A description of the functions of the device’s switches is below:

<b>Functions of Adjustable Selector Switches</b>	
•	switch 1: determines whether the batteries are part of a series circuit (S) or a parallel circuit (P)
•	switch 2: determines the number of batteries that are part of the circuit
•	switch 3: determines the number of wire coils that are receiving electrical current

**10.** Which sequence correctly shows the energy conversions that allow the testing device to attract a metal weight with magnetic properties?

- A. battery (chemical to heat) → wire coil (heat to magnetic) → metal weight (magnetic to frictional)
- B. battery (chemical to electrical) → wire coil (electrical to magnetic) → metal weight (magnetic to mechanical)
- C. battery (electrical to magnetic) → wire coil (magnetic to heat) → metal weight (heat to mechanical)
- D. battery (electrical to mechanical) → wire coil (mechanical to magnetic) → metal weight (magnetic to gravitational)

11. Students attempted to use the device and the weights in an investigation. None of the metal weights were attracted to the electromagnet when they were placed near it. The students made sure that the power indicator light was on, then they tried every switch combination. Which system modification and test are necessary to solve the design flaw in the experimental setup?

- A. Use copper metal weights and test the batteries
- B. Use a copper rod and test the batteries
- C. Use smaller metal weights and test the original weights and the smaller weights with a bar magnet
- D. Use a larger iron rod and test the original metal weights with a bar magnet

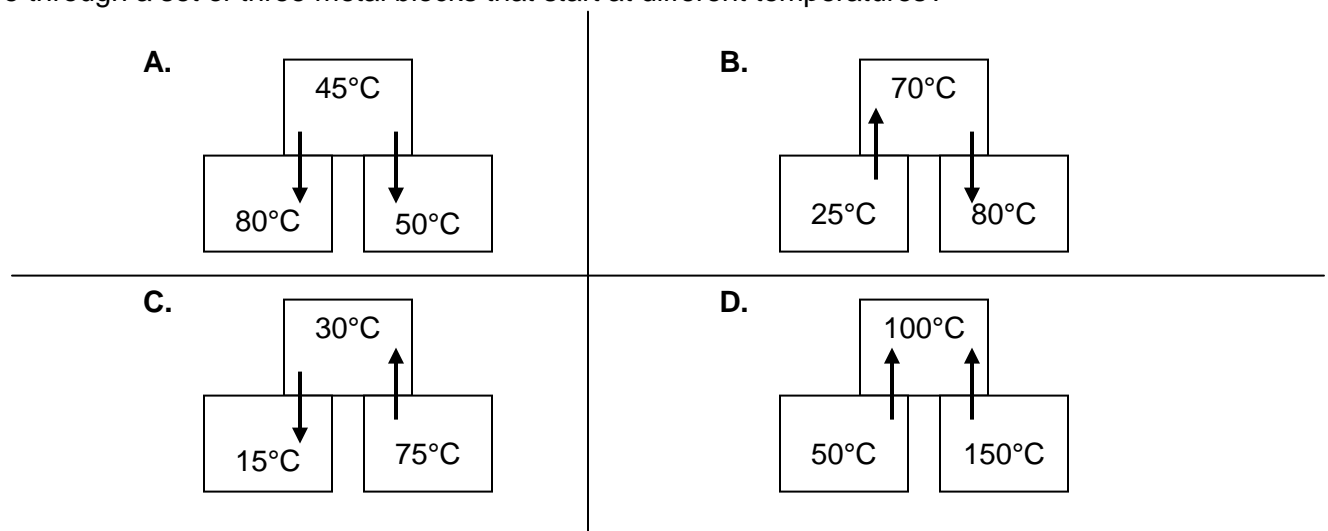
12. Which statement correctly describes the forces acting on the metal weights when the system design prevented them from being attracted to the electromagnet?

- A. The balanced magnetic and gravitational forces were insufficient to overcome the inertia of the metal weight.
- B. The balanced frictional and gravitational forces were insufficient to overcome the momentum of the metal weight
- C. The unbalanced frictional and gravitational forces were insufficient to overcome the inertia of the metal weight
- D. The unbalanced magnetic and gravitational forces were insufficient to overcome the momentum of the metal weight.

13. The power switch is on. Which procedure will BEST determine the type of circuit that makes an electromagnet?

- A. Set switch 1 to S, Change switches 2 and 3 to every combination, observe the motion of the metal weights
- B. Set switch 1 to P. Change switches 2 and 3 to every combination, observe the motion of the metal weights
- C. Set switch 2 to a constant setting, change switches 1 and 3 to every combination, observe the motion of the metal weights
- D. Set switches 2 and 3 to constant settings, change switch 1 from P to S, observe the motion of the metal weights.

14. Dr. Cavendish studies how heat moves through metal. Which of the following shows how heat would move through a set of three metal blocks that start at different temperatures?







15. Use the Chart below to answer this question. What characteristic was used to separate these celestial objects into groups?

GROUP 1	GROUP 2
The Sun	The Moon
Andromeda galaxy	Saturn
The North Star	The asteroid Ceres

- A. the source of light
  - B. the hemisphere where visible
  - C. the distance from the Earth
  - D. the time of year when visible
16. Which of the following is responsible for the phases of the Earth's Moon?
- A. the Moon's rotation about its axis
  - B. the Moon's revolution around the Earth
  - C. the Earth's rotation about its axis
  - D. the Earth's revolution around the sun
17. Dead plant materials can be compressed into rock. This rock gets buried within the Earth. the pressure from the overlying material may turn this rock into anthracite coal. What phases of the rock cycle are involved in the formation of anthracite coal?
- A. Igneous and Sedimentary
  - B. Sedimentary and Metamorphic
  - C. Metamorphic and Igneous
  - D. Igneous, Sedimentary, and Metamorphic
18. In the 1930s, farmers brought a plant species called Lehmann lovegrass from South Africa to the southwestern United States. They did so to reduce soil erosion rates and provide food for livestock. Lehmann lovegrass thrived and spread throughout the southwest. Scientists have observed that when Lehmann lovegrass spreads to an area, the diversity of planet species in the area drops. Which of the following is a reason why the spread of Lehmann lovegrass to a new area could cause such a drop in plant diversity?
- A. Lehmann lovegrass outcompetes other planet species for nutrients
  - B. Lehmann lovegrass is the preferred food of livestock and wild herbivores.
  - C. Lehmann lovegrass cannot find enough water to support its population
  - D. Lehmann lovegrass successfully reduces rates of soil erosion.
19. A doctor wants to test whether a new drug will help heart-attack victims recover more quickly. He gives the new drug to all of his heart-attack patients, and each one of them improves. The doctor's study is flawed. What does it lack?
- A. a control group
  - B. a dependent variable
  - C. a bias
  - D. an independent variable

20. Use the table below to answer the question. While building a highway in the southeastern United States, a construction crew cut through a large hill. As they dug down through layers of rock, they found fossils of organisms that once lived in the area. According to the table, how did this region of the United States change over time?

Epoch	Age of Rock Layer	Type of Fossil
Middle Miocene	15 million years	Oak Tree 
Early Miocene	23 million years	Horse 
Late Eocene	34 million years	Clam 
Middle Eocene	40 million years	Whale 

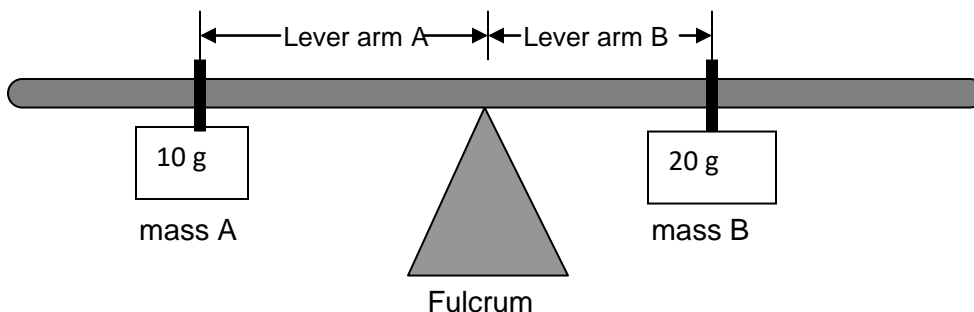
- A. from desert to a forest
- B. from a forest to a grassland
- C. from a shallow freshwater lake to a grassland
- D. from a saltwater sea to a forest



**Use the information presented on this page to answer questions 21-24:**

A class conducted an investigation regarding simple machines. The class took a meterstick and balanced it on a triangular block. The meterstick was a lever, and the triangular block was the fulcrum of the lever. The class then hooked masses A and B at various points along the meterstick. The students prepared a setup like the one shown and wrote down the steps they took. They then recorded their results in the data table.

**Setup for the Investigation**



**Steps Taken in the Investigation**

1. Balanced meterstick on fulcrum
2. Hooked mass A to lever arm A at 20 cm from fulcrum point. Held meterstick level
3. Hooked mass B at different locations along lever arm B until lever became balanced.
4. Recorded distances of masses A and B from fulcrum, then removed masses.
5. Hooked mass A at different location on lever arm. Repeated steps 2 – 4 until four trials complete

**Data from Lever experiment:**

Distance of Mass A from Fulcrum (cm)	Distance of Mass B from fulcrum (cm)
20	10
30	15
36	18
40	20

**21.** Suppose that mass A is replaced with a 40g mass. If the 40 g mass is hung on lever arm A at 10 cm from the fulcrum, then where should mass B be placed on lever arm B to balance the lever?

- A. 2.5 cm from the fulcrum
- B. 5 cm from the fulcrum
- C. 10 cm from the fulcrum
- D. 20 cm from the fulcrum

**22.** Which tool could a student use to measure the amount of force produced by mass A when it is placed at different points along lever arm A?

- A. a mechanical balance
- B. a pulley
- C. a spring scale
- D. a stopwatch

**23.** Which statement explains the relationship being studied in this investigation?

- A. A simple machine can change the size and the direction of a force.
- B. A force is a push or pull that changes the motion of an object.
- C. A force always produces another force that is equal and opposite in direction.
- D. A simple machine increases the amount of work that its user performs

**24.** When the lever is balanced, which force keeps the masses hooked to the lever?

- A. Friction
- B. Gravity
- C. Magnetic
- D. Normal

**25.** Which of the following is an example of an inherited trait?

- A. Bill has blue eyes
- B. Scott has large muscles
- C. Emma speaks French
- D. Hank studies genetics

**26.** Many years ago, scientist classified all living things as either plants or animals. Today, scientists recognize at least five kingdoms of life: animal, bacteria, fungus, plant, and protest. What caused this change in the number of kingdoms of life?

- A. Bacteria, fungus and protest forms of life appeared on the Earth after the classification system was first developed.
- B. Some primitive plants and animals interbred and produced new lifeforms with completely new characteristics.
- C. Scientists were able to travel to far off locations and discover life-forms previously unknown to them.
- D. Scientists learned through observation that some life-forms were neither plant nor animal.

27. Use the diagram below to answer this question.

Suppose that the 20g block is replaced with a 60g block and that all other variables remain constant. What is **most likely** the distance that the car would push the 60g block?

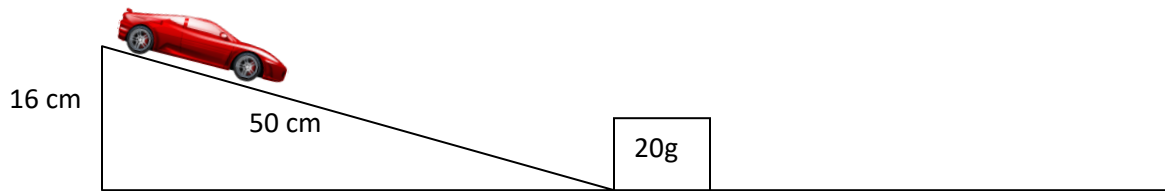


Figure 1

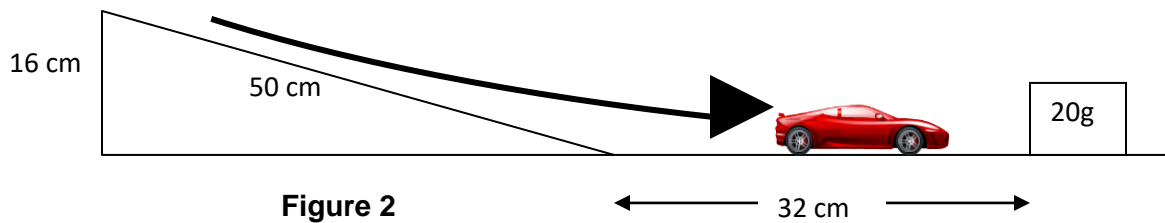
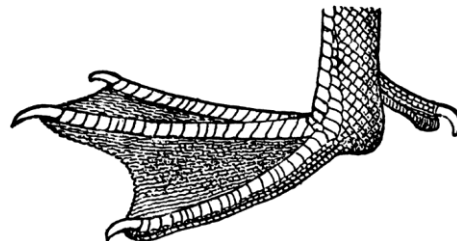


Figure 2

- A. 96 cm
- B. 48 cm
- C. 24 cm
- D. 12 cm

28. Use the picture below to answer this question. Birds' feet have adapted to their functions through the development of various structures. Based only on the foot's structure, what can you infer about this bird?

- A. It is able to fly swiftly
- B. Its diet consists of fish
- C. It migrates for the winter
- D. It spends much time swimming



29. Based on the data in the table below, which conclusion could be accepted?

Altitude (m above sea level)	Temperature (°C)	Air Pressure (mb)
150	19	980
1500	8	850
3000	-5	650
6000	-29	400
9000	-50	250

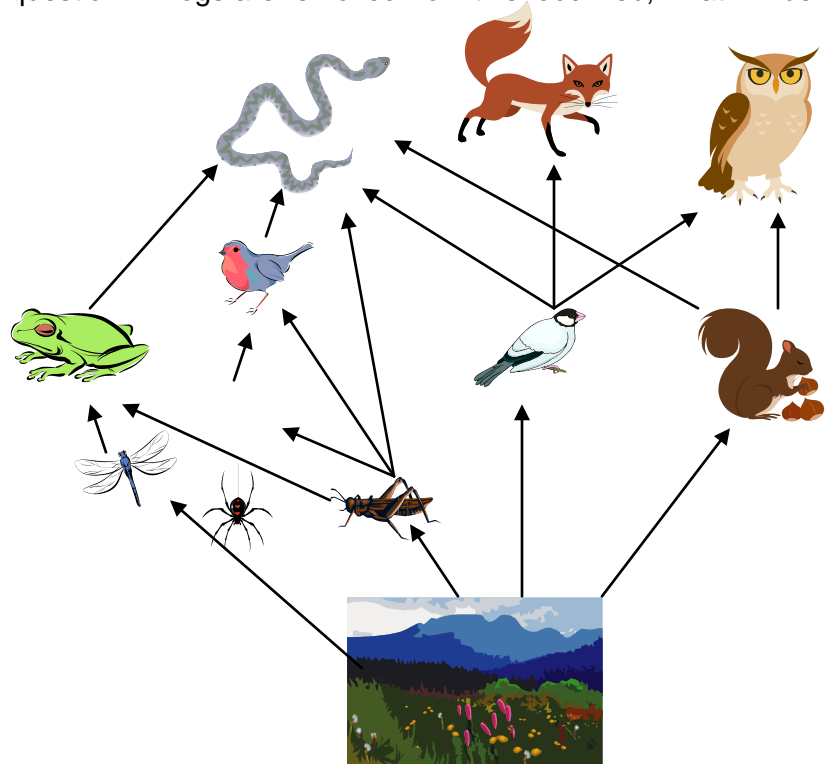
- A. Temperature is unrelated to altitude.
- B. Compression of air molecules causes a loss of heat energy
- C. The temperature of Earth's atmosphere partly depends upon altitude
- D. Temperature is greater over a mountain peak than a coastal plain.

30. A botanist wants to know why a species of rose in Greenhouse A is producing so many more blooms than the same species of rose in Greenhouse B. Which of the following questions would most likely lead to a testable hypothesis?

- A. Should I try growing two different species of rose in Greenhouse A and B?
- B. Are the roses in Greenhouse A naturally better than those in Greenhouse B?
- C. Is there a difference in the growing conditions of Greenhouse A and B?
- D. Why are the roses in Greenhouse A so much prettier than those in Greenhouse B?

31. Use the food web below to answer this question. If frogs are removed from this food web, what will be the MOST probable result?

- A. a decrease in spiders
- B. an increase in insects
- C. an increase in the grass population
- D. a decrease in foxes and owls



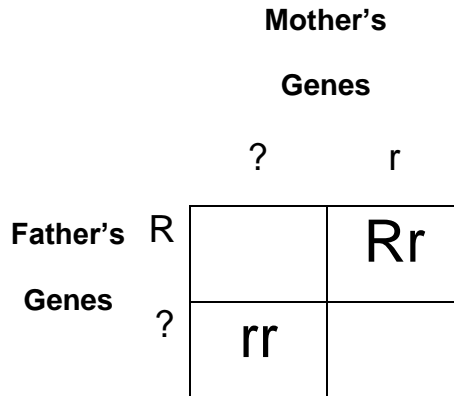
32. Copper Sulfate has a chemical equation of  $\text{CuSO}_4$ . Which of the following correctly lists the proper ratios of this chemical?

- A. 4 copper (Cu), 4 Sulfur (S), and 4 Oxygen (O)
- B. 1 copper (Cu), 4 Sulfur (S), and 4 Oxygen (O)
- C. 1 copper (Cu), 1 Sulfur (S), and 4 Oxygen (O)
- D. 1 copper (Cu), 1 Sulfur (S), and 1 Oxygen (O)

33. Which of the following is a negative particle that makes up an atom?

- A. Proton
- B. Neutron
- C. Electron
- D. Xenon

34. Use the diagram below to answer this question. Which of the following can be concluded about the genes for each parent?

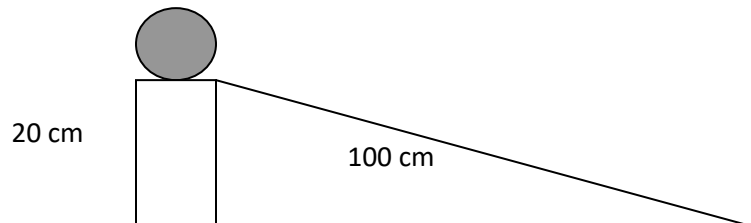


- A. Both parents are homozygous dominant.
- B. Both parents are homozygous recessive
- C. One parent is heterozygous and one parent is homozygous dominant
- D. One parent is heterozygous and one is homozygous recessive

35. A certain biome has hot summers, cold winters, and year-round precipitation. What is this biome?

- A. grassland
- B. savanna
- C. temperate forest
- D. tropical rain forest

36. A ball is about to roll down a ramp. Which of the following describes the energy of the ball when it first reaches the floor?



- A. Maximum gravitational, Maximum potential
- B. Maximum kinetic, Minimum potential
- C. Minimum kinetic, Maximum potential
- D. Maximum mechanical, Minimum gravitational

37. On Earth, water constantly changes between the solid, liquid, and gas phases. Which of the following phase changes absorbs heat energy from the surroundings?

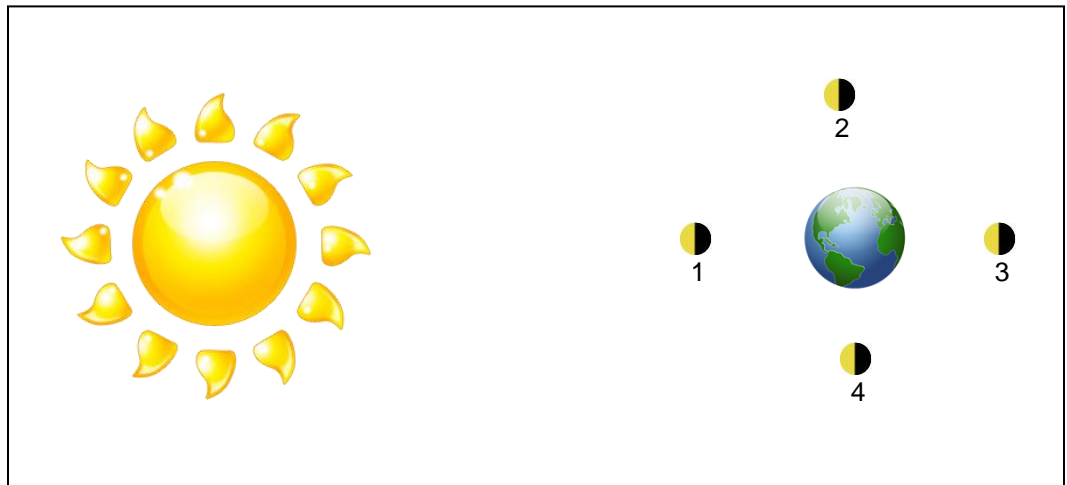
- A. Gas to Liquid
- B. Liquid to Solid
- C. Gas to Solid
- D. Liquid to Gas

38. Which of the following happens to water when salt is dissolved in it?

- A. Its freezing point rises.
- B. Its evaporation point decreases.
- C. It catches fire more easily
- D. It is able to conduct electricity

39. Use the diagram below to answer this question. You read in the newspaper that tomorrow there will be a solar eclipse that will be visible from Pennsylvania. Which spot indicates the position of the Moon for this event?

- A. 1
- B. 2
- C. 3
- D. 4



40. Which of the following orders the organisms from producer to top-level consumer?

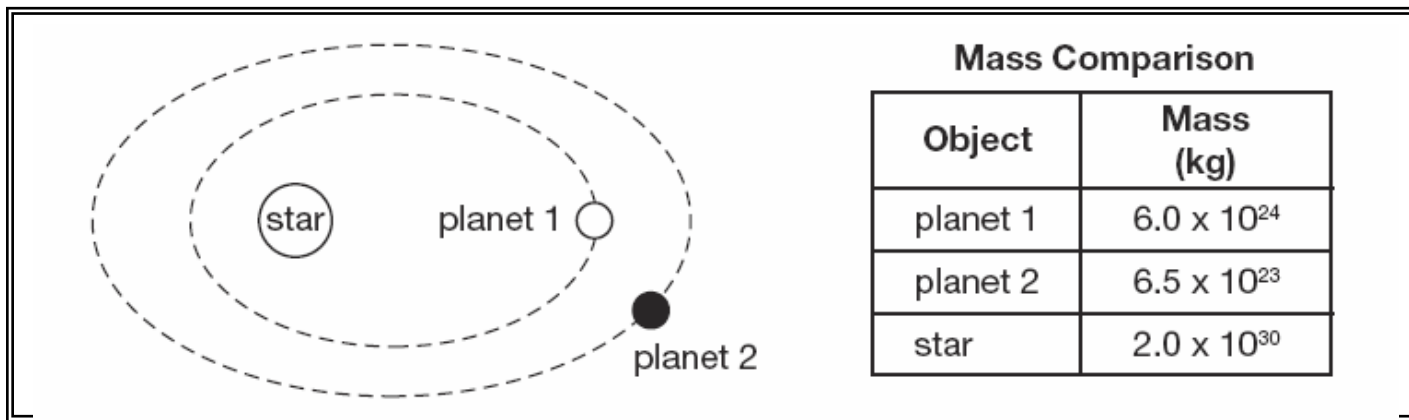
- A. algae → bass → shrimp larvae → crayfish
- B. bass → crayfish → shrimp larvae → algae
- C. shrimp larvae → algae → bass → crayfish
- D. algae → shrimp larvae → crayfish → bass

41. A paint company wants to test whether a new additive will make their paint resist fading. Which test would include an acceptable control group?

- A. Use painted boards from a previous test of this type, but put the new paint on top of the old.
- B. No control group is needed because the results will be obvious.
- C. Use boards painted without the additive and treated the same way
- D. Use a different type of wood for testing the new paint, but use the same paint on all the boards.

OPEN ENDED ITEMS 42 - 45

Use the diagram below to answer question 41



41

**Part A:** How is the movement of planet 1 in this star system influenced by the other two objects in this star system?

Star:

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Planet 2:

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**Part B:** Which part of this star system has the greatest influence on movement of objects within the star system? Explain your answer.

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**43.** The Arctic National Wildlife Refuge in Alaska is over 19 million acres of land. Its unique habitat supports at least 45 species of land and marine animals, 36 species of fish, and 180 species of birds. Some people want to drill for oil in parts of the refuge. Scientists estimate that the total amount of recoverable oil in the refuge is between 5 and 16 billion barrels.

**Part A:** Describe an environmental problem that could be caused by drilling for oil in Alaska.

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**Part B:** Describe a regional benefit of drilling for oil in Alaska

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44. Answer parts A and B below about how a doctor uses microscopes.

**Part A:** Describe one way microscopes are used to help doctors determine whether people are health

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**Part B:** Describe one way a doctor's job would be different if the doctor did NOT have a microscope as a tool for diagnosis.

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45. Use the table below to answer this question. A team of scientist studied the population trends of five species of wildflower living on a plot of land in a forest. Every two years on June 1<sup>st</sup>, the team counted the number of wildflowers in the plot. The table below shows the number of wildflowers the team counted between 1998 and 2006. Throughout the study, the plot was far from human activities such as construction and logging, and weather and animal populations varied within normal limits.

### Population Trends of Wildflowers in Forest Plot

Wildflower Species	Number of Wildflowers in Selected Years				
	1998	2000	2002	2004	2006
Dutchman’s-breeches	89	94	90	51	14
Garlic mustard	0	0	37	113	397
Hepatica	126	119	121	76	26
Spring beauty	168	161	138	92	41
Trillium	113	120	104	64	22

**Part A:** Describe the change to the community of wildflowers between 1998 and 2006

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**Part B:** Given the information in the scenario and the table, identify a probable cause of the change to the wildflower community. Explain how this cause made the change happen.

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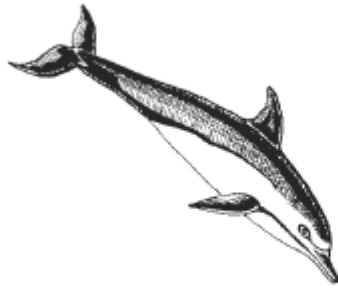
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# Practice Science PSSA Section 2



**Dolphin**



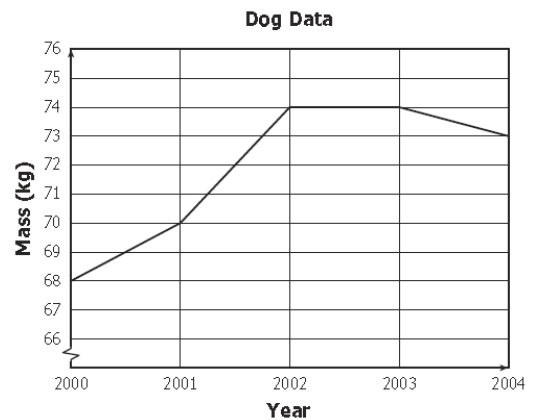
**Jellyfish**



**Crab**

- 1) These animals are grouped together because all of them...
- Live in the water
  - Are fish
  - Are warm-blooded
  - Lay eggs

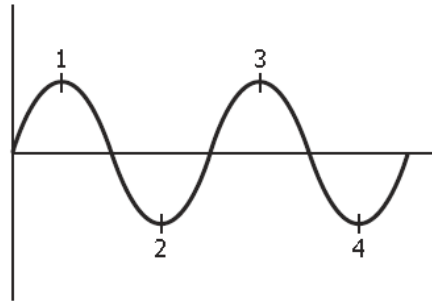
- 2) The Line graph shows five years of data about a dog. What information does the graph show?
- How the mass of the dog changed
  - How much food the dog consumed
  - What kinds of food the dog consumed
  - When the dog was measured each month



## Rubber Band Data

Rubber Band	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
A	3.7 cm	3.9 cm	3.7 cm	3.4 cm	3.6 cm
B	2.5 cm	2.7 cm	2.8 cm	2.7 cm	2.7 cm

- 3) A lab group measured how far two rubber bands stretched when attached to 100-gram masses. Five measurements were made for each rubber band. What is the range of the data collected for rubber band B?
- 0.3 cm
  - 0.5 cm
  - 2.7 cm
  - 2.8 cm



- 4) The illustration shows a wave. The wave's wavelength is the distance between points –
- 1 and 2
  - 1 and 4
  - 2 and 3
  - 2 and 4

- 5) This picture shows a radiometer. It is designed to be placed in a sunny window. One side of each thin blade of the radiometer is painted black, and the other side is painted white. The Sun's rays strike the blades, and the device begins to spin. The device is powered by which kind of energy?
- Wind
  - Solar
  - Electrical
  - Geothermal

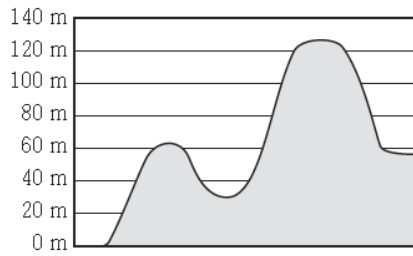


- 6) This data table below shows the results of an investigation. What information should be used for the column headings marked X?
- Trial number
  - Number of seeds
  - Predicted value for the results
  - Average of the data in each column

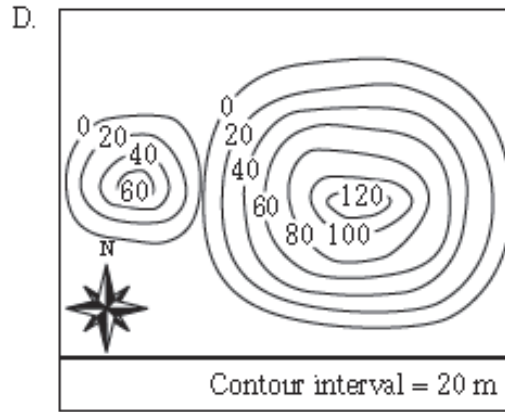
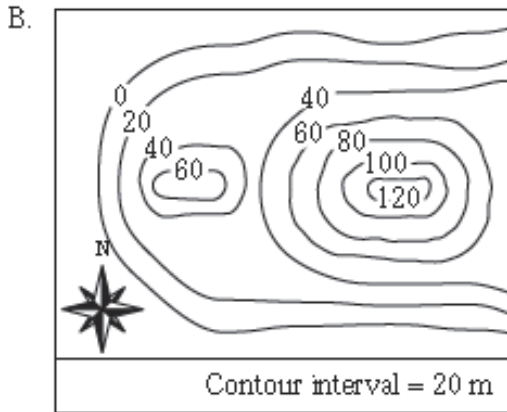
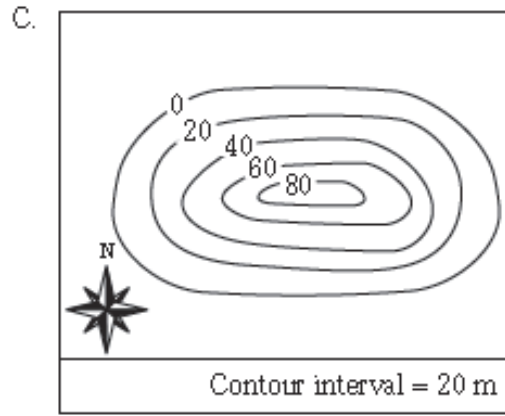
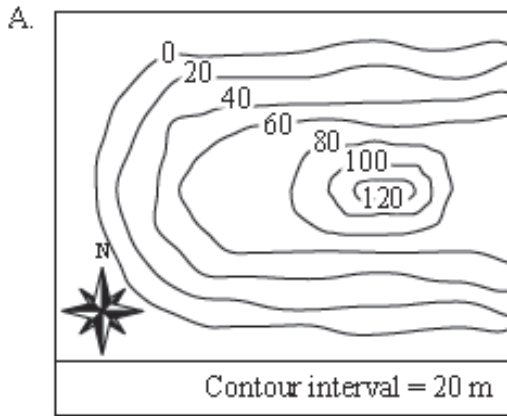
**Effect of Soil Temperature on the Germination Rate of Pumpkin Seeds**

Soil Temperature (°C)	Germination Rate (%)			Average Germination Rate (%)
	X	X	X	
20	60	64	70	65
24	75	78	82	78
28	86	84	83	84
32	69	65	63	66

7) The diagram below shows a side view of a landform with different elevations.

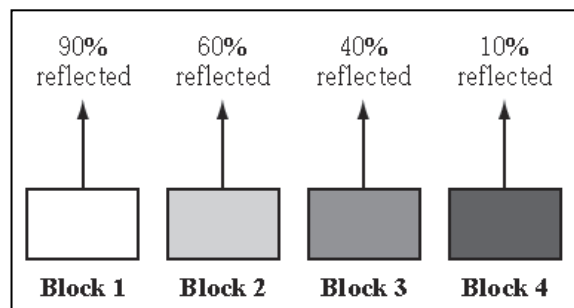


Which of the following topographic maps best represents this landform?



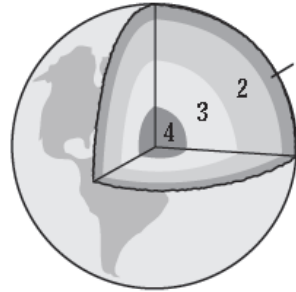
8) Four different-colored blocks are placed outside in bright sunlight. The blocks are identical except for color. The diagram below shows the amount of light reflected from each block. Which block will increase in temperature most rapidly?

- a. Block 1
- b. Block 2
- c. Block 3
- d. Block 4

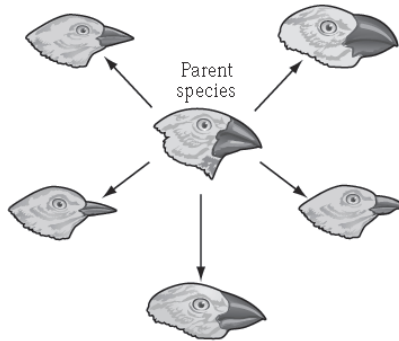


9) The diagram below shows four layers of the Earth. Each layer is identified by a number. Which layer of the Earth is composed primarily of solid iron?

- a. Layer 1
- b. Layer 2
- c. Layer 3
- d. Layer 4



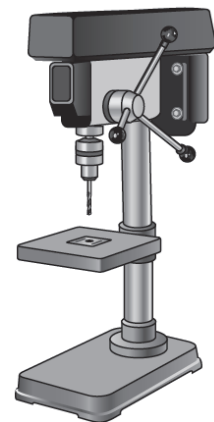
10) The diagram below shows the beaks of five species of birds that developed over time from one parent species. The five species of birds can be found living in the same area. Which of the following best explains why the beak shape of each species of bird developed differently?



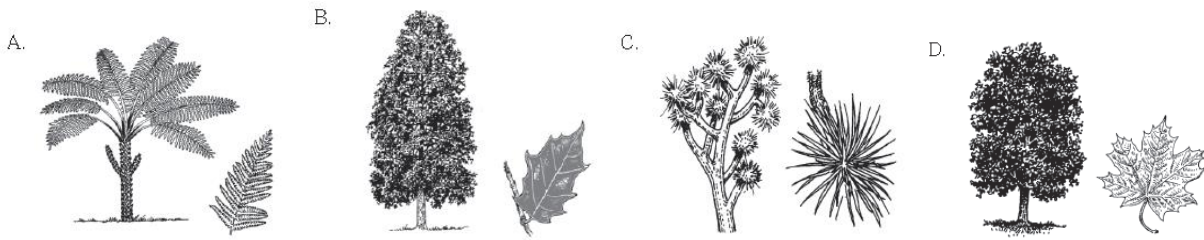
- a. Each beak shape helps the birds to produce different songs.
- b. Each beak shape is an adaptation to a specific source of food.
- c. Each beak shape is designed to construct a different type of nest.
- d. Each beak shape helps protect the birds from a different predator.

11) The picture to the right shows a machine used in a factory to make metal parts for toy cars. What is the most likely purpose of this machine in making the metal parts?

- a. To sand the parts
- b. To make holes in the parts
- c. To fasten the parts together
- d. To measure the size of the parts

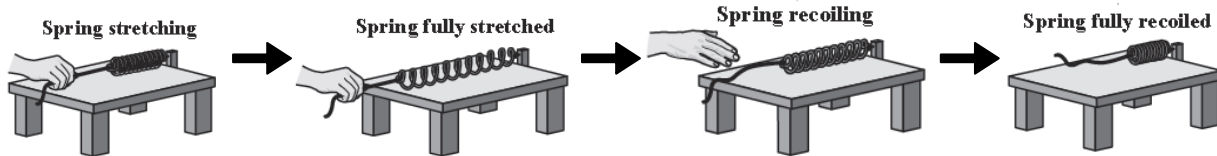


12) One of the most common types of adaptations in plants involves the shape and structure of each plant's leaves. The surface area of leaves is related to the amount of water a plant loses. Based on this information, which of the following plants is probably best adapted for living in a hot, dry climate?

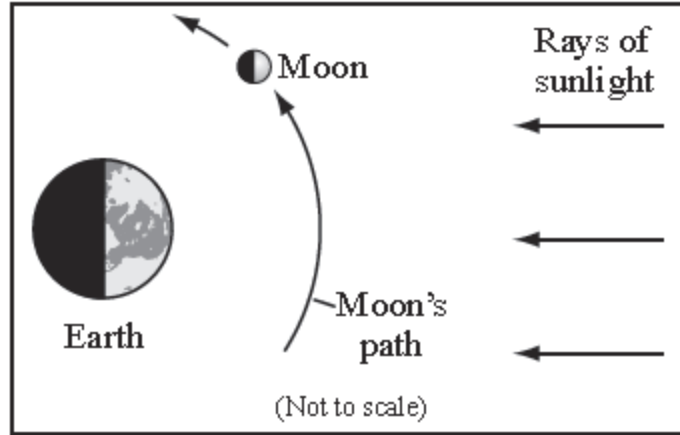


13) As shown below, a student is investigating potential and kinetic energy by stretching a spring across a table. When the student lets go, the spring recoils. At which time is potential energy in the spring being converted into kinetic energy in this system?

- a. When the spring is stretching
- b. When the spring is fully stretched
- c. When the spring is recoiling
- d. When the spring is fully recoiled



14) The diagram below shows the relative positions of Earth and the Moon and rays of sunlight.

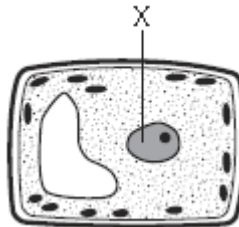


Based on the diagram, which of the following best represents how the Moon would appear as seen from Earth?



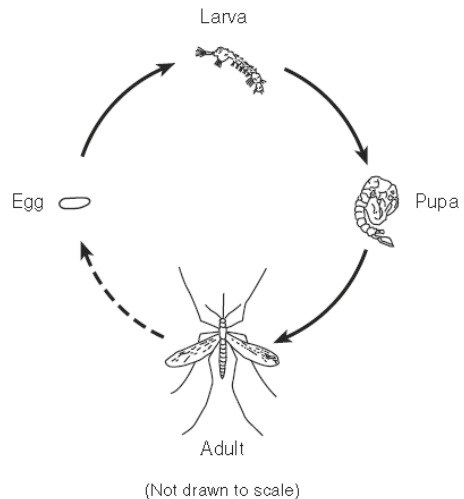
15) The diagram below represents a plant cell. Letter X represents a structure in the cell. Which cell structure is represented by X?

- a. Nucleus
- b. Cytoplasm
- c. Cell wall
- d. Cell membrane



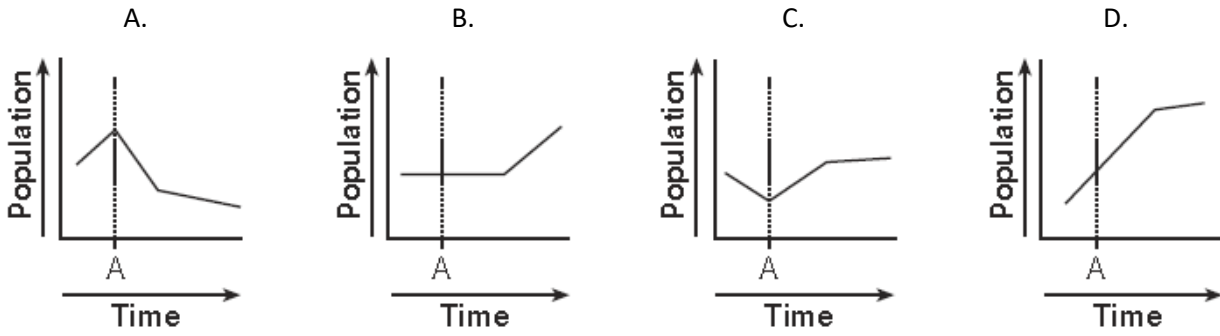
16) The diagram to the right represents the stages of development in a mosquito. Which process is represented by the four stages in this diagram?

- a. Fertilization
- b. Metabolism
- c. Metamorphosis
- d. Succession



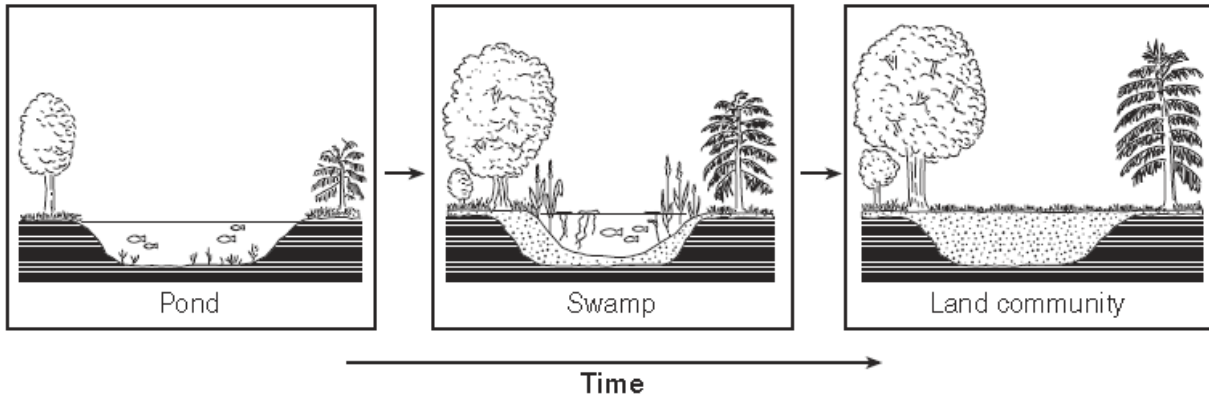


17) Which graph shows what most likely would happen to the population of a certain animal if a new predator were introduced at time A?

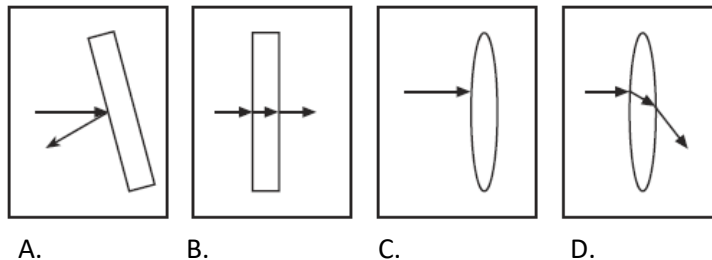


18) The diagrams below represent the same location over a period of many years. The sequence of diagrams best shows that, over time,

- a. Erosion increases
- b. Climates get colder
- c. Communities stay the same
- d. Ecological succession occurs



19) The arrows in the diagrams below represent the path of light as it strikes four different objects. Which diagram best represents the refraction of light?



Base your answers to questions 20-22 on the portion of the Periodic Table of Elements below and your knowledge of science. Four spaces on the table have been labeled a, b, c, and d.

Portion of the Periodic Table of the Elements

Groups						18
13	14	15	16	17	2	
5 <b>B</b> Boron 10.81	6 <b>C</b> Carbon 12.01	7 <b>N</b> Nitrogen 14.01	8 <b>O</b> Oxygen 16.00	9 <b>F</b> Fluorine 18.998	10 <b>He</b> Helium 4.003	
13 <b>Al</b> Aluminum 26.98	14 <b>Si</b> Silicon 28.09	15 <b>P</b> Phosphorus 30.97	16 <b>S</b> Sulfur 32.07	17 <b>Cl</b> Chlorine 35.45	18 <b>Ar</b> Argon 39.95	
<i>a</i>		33 <b>As</b> Arsenic 74.92	34 <b>Se</b> Selenium 78.96	35 <b>Br</b> Bromine 79.90	36 <b>Kr</b> Krypton 83.80	
	<i>b</i>	51 <b>Sb</b> Antimony 121.8	52 <b>Te</b> Tellurium 127.6	53 <b>I</b> Iodine 126.9	54 <b>Xe</b> Xenon 131.3	
	<i>c</i>	<i>d</i>		85 <b>At</b> Astatine (210)	86 <b>Rn</b> Radon (222)	

Key

1 <b>H</b> Hydrogen 1.01	Atomic number
	Element symbol
	Element name
	Atomic mass

20) Information for the element lead (Pb) is shown below. In which labeled space on the portion of the table should the element lead (Pb) be placed?

82 <b>Pb</b> Lead 207.2
----------------------------------

21) Which element from this portion of the table chemically reacts in a way similar to the way the element chlorine (Cl) reacts?

- a. S
- b. O
- c. Ne
- d. Br

22) How many neutrons are found in the nucleus of a Fluorine atom?

- a. 9
- b. 10
- c. 18.998
- d. 19

Base your answers to questions 23-25 on the table below and on your knowledge of science. The table shows some physical properties of four minerals.

**Physical Properties of Four Minerals**

Mineral	Physical Properties				
	Luster	Density	Streak	Color	Hardness
magnetite	metallic	5.2 g/cm <sup>3</sup>	black	black	hard
muscovite mica	nonmetallic	2.8 g/cm <sup>3</sup>	colorless to white	colorless to yellow	soft
pyrite	metallic	5.0 g/cm <sup>3</sup>	greenish black	brassy yellow	hard
sulfur	nonmetallic	2.0 g/cm <sup>3</sup>	white to yellow	yellow to amber	soft

23) Which mineral is hard and has the same color and streak?

- a. Magnetite
- b. Muscovite mica
- c. Pyrite
- d. Sulfur

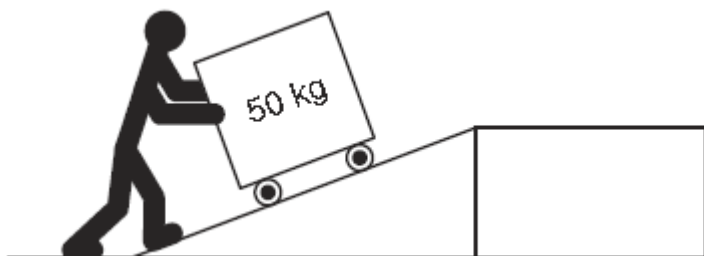
24) The volume of a sample of Sulfur was measured to be 5.0 cm<sup>3</sup>. what is the mass of this sample?

- a. 2.5 grams
- b. 2.0 grams
- c. 5.0 grams
- d. 10.0 grams

25) Which physical property best distinguishes magnetite from pyrite?

- a. Luster
- b. Streak
- c. Color
- d. Hardness

Base your answers to questions 26 and 27 on the diagram below and on your knowledge of science. The diagram represents a person pushing a 50 kg box up a ramp.



26) Which two simple machines are being used in the diagram?

- a. Inclined plane and pulley
- b. Inclined plane and wheel & axle
- c. Lever and pulley
- d. Lever and wheel & axle

27) Which force will decrease if the surface of the ramp is made smoother?

- a. Gravity
- b. Magnetism
- c. Friction
- d. Electricity

The data table below shows times that an observer in Pennsylvania saw the Moon rise during a 5 day period. The only night that data was not collected was Wednesday.

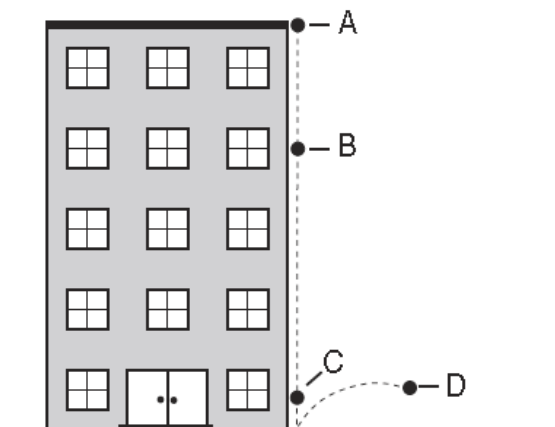
**Time of the Moon Rise for 5 Days**

Day of the Week	Monday	Tuesday	Wednesday	Thursday	Friday
Time of the Moon Rise	9:00 p.m.	9:52 p.m.	???	11:36 p.m.	12:28 a.m.

28) Based on the pattern in the data table, at what time did the Moon rise on Wednesday?

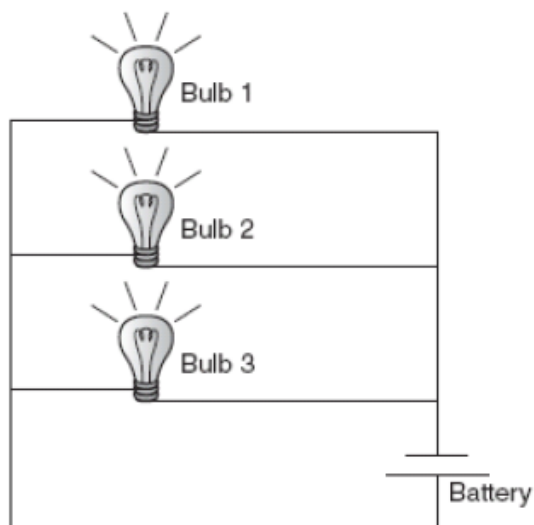
- a. 10:00 pm
- b. 10:44 pm
- c. 11:00 pm
- d. 12:28 pm

29) A ball is dropped from the roof of a building. Points A, B, C, and D in the diagram below represent positions of the ball as it falls.



At which position will the ball have the greatest kinetic energy?

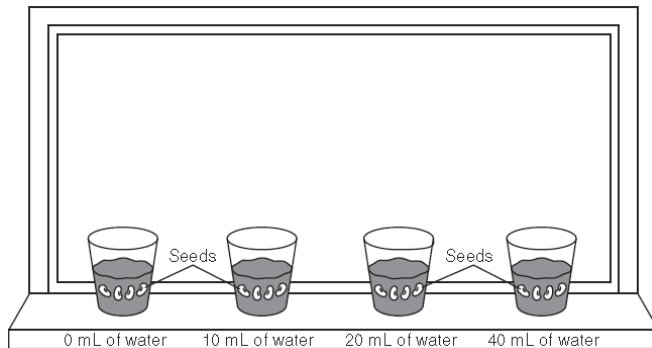
30) Based on the diagram below, if bulb 3 burned out, what would happen to the other bulbs?



- a. Bulbs 1 and 2 would also go out
- b. Bulb 1 would go out, and bulb 2 would remain lit
- c. Bulb 1 would remain lit, and bulb 2 would go out
- d. Bulbs 1 and 2 would remain lit

**31 – 35 SOE (Short Open Ended) Questions:** Record your answers on the space on your answer sheet.

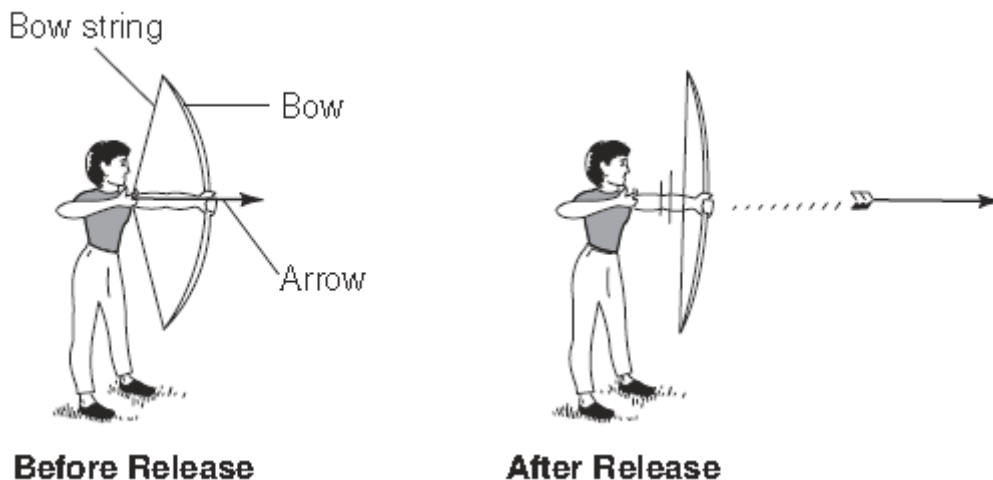
Base your answers to questions 31 and 32 on the diagram below and your knowledge of science. The diagram shows a controlled experiment designed to test how much time it takes for seeds to germinate under four different conditions. Four bean seeds were placed in each of four pots. Each pot contained 100 cubic centimeters ( $\text{cm}^3$ ) of soil. All four pots were placed on the same sunny windowsill. A different amount of water was placed in each pot.



31) Identify the Independent variable in this experiment.

32) Based on the information given to you, identify TWO conditions that were held constant.

Base your answers to questions 33 – 35 on the diagrams below and on your knowledge of science. The diagrams show a student using a bow and arrow. The bow string on the bow is used to propel the arrow forward.



33) State one change the student could make (without changing the angle at which the bow is held), so that the arrow would travel a greater distance.

34) Describe how gravity affects the path of the arrow after it is released.

35) Describe the energy involved both before and after the release.

**THE ANSWER KEY IS POSTED ON  
MR RACCHINI'S WEBSITE PLEASE  
CHECK YOUR ANSWERS ONCE  
YOU HAVE FINISHED AND THEN  
SEE HIM IF YOU REALLY DO HAVE  
ANY QUESTIONS**

<http://www.franklinregional.k12.pa.us/cms/One.aspx?portalId=77387&pageId=238092>