NEW HAVEN PUBLIC SCHOOLS

SCIENCE PRACTICE

GRADE 5
DIRECTIONS TO THE STUDENT:
-READ EACH QUESTION CAREFULLY
-THINK OF THINGS YOU HAVE DONE AND LEARNED
-PICK THE BEST ANSWER YOU CAN
-TALK ABOUT YOUR ANSWERS

1. Kristin wants to find out which brand of paper towel holds the most water. She needs to create a fair test. What must she do to make sure her experiment is fair?

A) Use different amounts of water to test each paper towel.
B) Use hot water to test some paper towels and cold water to test other paper towels.
C) Use the same amount of water to test each paper towel.
D) Use maple syrup to test some paper towels and water to test other paper towels.

2. Equal masses of paper towel were used to soak up water from a cup.

<table>
<thead>
<tr>
<th>Paper Towel Brand</th>
<th>Number of Sheets Used</th>
<th>Mass of Dry Paper Towel (g)</th>
<th>Mass of Wet Paper Towel (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>2</td>
<td>4</td>
<td>56</td>
</tr>
<tr>
<td>X</td>
<td>3</td>
<td>4</td>
<td>62</td>
</tr>
<tr>
<td>Y</td>
<td>3</td>
<td>4</td>
<td>70</td>
</tr>
<tr>
<td>Z</td>
<td>2</td>
<td>4</td>
<td>38</td>
</tr>
</tbody>
</table>

Which question can be answered from the information above?

A) Which paper towel is the best buy?
B) Which paper towel is most absorbent?
C) Which paper towel is the most colorful?
D) Which paper towel is safest for the environment?
3. Which of these questions can be answered from the results of this experiment?

A) Do beans need light in order to grow?
B) Can beans grow faster in groups of eight?
C) Does seawater affect bean growth?
D) How much water is needed for beans to grow?

4. Use the Graph to answer the question.

What conclusion can be reached by reading this graph?

A) Every time you move metal paper clips 2cm from the magnet, 2 more metal paper clips are attracted to it.
B) The closer the magnet is to the metal paper clips, the more the metal paper clips will be attracted to it,
C) More metal paper clips are attracted to the magnet at 3cm than at 1 cm.
D) Magnets should be kept 1cm from metal paper clips.
5. The table indicates the amount of time that four different brands of batteries worked in a flashlight.

<table>
<thead>
<tr>
<th>Brand of Battery</th>
<th>Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>350</td>
</tr>
<tr>
<td>M</td>
<td>460</td>
</tr>
<tr>
<td>N</td>
<td>410</td>
</tr>
<tr>
<td>O</td>
<td>380</td>
</tr>
</tbody>
</table>

Which of the following statements is supported by this information?

A) Brand L caused the light to shine farther than the other brands tested.
B) Brand M lasted longer than the other brands tested.
C) Brand N gave off a stronger light than the other brands tested.
D) Brand O was more expensive than the other brands tested.

6. Some students did an experiment to find out which type of paper holds the most water. They repeated the experiment 3 times, counting the number of squares used. Their data are shown in the table below.

<table>
<thead>
<tr>
<th>Type of Paper</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper Napkin</td>
<td>12 squares</td>
<td>13 squares</td>
<td>11 squares</td>
</tr>
<tr>
<td>Paper Towel</td>
<td>6 squares</td>
<td>5 squares</td>
<td>7 squares</td>
</tr>
<tr>
<td>Toilet Paper</td>
<td>10 squares</td>
<td>8 squares</td>
<td>6 squares</td>
</tr>
<tr>
<td>Tissue</td>
<td>10 squares</td>
<td>8 squares</td>
<td>9 squares</td>
</tr>
</tbody>
</table>

What should the students do to answer their question?

A) Show all the numbers in a bar graph
B) Show all the numbers in a pie chart
C) Find the average number of squares for each paper type
D) Find the highest number of squares used in Test 1, 2, or 3
7. If you wanted to be able to look at the stars, the planets, and the Moon more closely, what should you use?

A) Telescope  
B) Periscope  
C) Microscope  
D) Magnifying glass

8. A student thinks that birds eat the same food as squirrels. Which of the following would give her data to answer the question?

A) She counts the numbers of birds and squirrels in a park.  
B) She feeds sugar water to each and records how much they drink.  
C) She observes squirrels and birds and writes down everything they eat.  
D) She puts a squirrel and a bird together in a cage for a week and observes them.

9. Students are testing their reaction time by catching a dropped ruler. The distance the ruler fell before being caught between their fingers was recorded on the table below. Use the table to answer the following questions.

<table>
<thead>
<tr>
<th>Distance Ruler Caught (in centimeters)</th>
<th>Reaction Time (in seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.05</td>
</tr>
<tr>
<td>2</td>
<td>0.07</td>
</tr>
<tr>
<td>3</td>
<td>0.08</td>
</tr>
<tr>
<td>4</td>
<td>0.09</td>
</tr>
<tr>
<td>5</td>
<td>0.10</td>
</tr>
<tr>
<td>10</td>
<td>0.14</td>
</tr>
<tr>
<td>15</td>
<td>0.18</td>
</tr>
<tr>
<td>20</td>
<td>0.20</td>
</tr>
<tr>
<td>25</td>
<td>0.23</td>
</tr>
<tr>
<td>30</td>
<td>0.25</td>
</tr>
</tbody>
</table>

What would your estimate be for the reaction time of a student who caught the ruler at 12cm?

A) 0.06 seconds  B) 0.12 seconds  C) 0.16 seconds  D) 0.19 seconds
10. Two students each set up an experiment to compare the reaction times of boys and girls. For the experiment, they each dropped a ball and measured how fast different students caught it. Below are the results the students found:

Experiment Results
Student 1    The boys caught the ball faster.
Student 2    The girls caught the ball faster.

Since the results are very different, what is the next logical step?

A) throw out the results because they are incorrect
B) look for differences in the ways the experiment was done
C) conclude that neither boys nor girls have fast reaction times
D) conclude that girls and boys actually have the same reaction times

11. The diagram below shows a weather thermometer.

Which of the following is most likely to occur at the temperature shown?
A) rain    B) fog    C) hail    D) snow

12. Mary wants to find the average width of a fifth grader’s hand. Which is the best unit of measurement for her to use?

A) grams    B) meters    C) centimeters    D) kilometers
13. For his school project, Greg measured the height of a plant over an 8-week period. The graph of his results is shown.

![Height of Plant Each Week Graph]

If the trend continues, which is the BEST prediction of the height of the plant at week 10?

A) 5 cm  B) 8 cm  C) 11 cm  D) 20 cm

14. The diagram below shows an incomplete circuit due to a break in the wire at point X.

A student is testing materials to see if they conduct electricity. The student places each item shown at position X, making sure the object is in contact with the loose end of each wire. Which item will electricity flow through, causing the bulb to light?

A. Crayon  B. Plastic comb  C. Notebook paper  D. Penny

15. The unit used to measure the mass of a penny is:
A) grams  B) milliliters  C) centimeters  D) degrees
16. Four rods of equal thickness but made of different metals were tested with equal amounts of weight to see which was most flexible. Which of the following is the best way to report the results of this experiment?
A) a list of each type of rod used
B) a sketch of each rod before testing
C) a table showing how much each rod weighed
D) a bar graph showing how much each rod bent

17. Which of the following tools would be most useful in determining the length and width of a school cafeteria?
A) scale
B) centimeter ruler
C) tape measure
D) thermometer

18. The pans in this balance are at the same height. According to this information, the mass of the rock sample is

A) 170 grams   B) 180 grams   C) 200 grams   D) 230 grams
19) The pictures below show containers with water in them. Which container has 37 milliliters (mL) of water in it?

![Images of four measuring cylinders with different levels of water]

20) To find out whether seeds grow better in the light or dark, you could put some seeds on pieces of damp paper and -
A) keep them in a warm, dark place
B) keep one group in a light place and another in a dark place
C) keep them in a warm, light place
D) put them in a light or dark place that is cool

21) Four children can feel and smell an object inside a bag, but they cannot see it. Which of the following is NOT an observation about the object?
A) “It is flat at one end and round at the other.”
B) “It smells like peppermint.”
C) “It has a bump on it.”
D) “I hope it is candy.”

22) Some children were trying to find out which of three light bulbs was brightest. Which one of these gives the best START toward finding the answer?
A) “One bulb looks brightest to me, so I already know the answer.”
B) “All the bulbs look bright to me, so there cannot be an answer.”
C) “It would help if we had a way to measure the brightness of a light bulb.”
D) “We can take a vote and each person will vote for the bulb he or she thinks is the brightest.”
23) Pat set up four different jars with a burning candle in each jar. He put the lids on jars 1, 2, and 3, as shown in the picture below.

The candle in jar 1 burned for 2 minutes after the lid was put on. The candle in jar 2 burned for 8 minutes. About how long did the candle in jar 3 burn after the lid was put on?

A) 1 minute  
B) 4 minutes  
C) 8 minutes  
D) 10 minutes

24) Students were building electric circuits. They had several D-cell batteries and a small nightlight bulb. They wondered what would happen to the brightness of the light bulb if they used more than one battery. Here are their results:

<table>
<thead>
<tr>
<th># of Batteries</th>
<th>Brightness of Light Bulb</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very dim</td>
</tr>
<tr>
<td>2</td>
<td>Brighter</td>
</tr>
<tr>
<td>3</td>
<td>Brightest</td>
</tr>
</tbody>
</table>

Which of the following is a conclusion based on their data?:

A) Adding batteries makes light bulbs burn brighter.
B) D-cell batteries last longer than C-cell batteries.
C) Some brands of batteries are more powerful than others.
D) D-cell batteries don't have enough energy to light a bulb.
25) While observing birds in the neighborhood, Tim noticed that the birds pecking in the grassy areas had different beaks than the birds feeding at the bird feeder.

Which of the following is a question he can investigate with an experiment?

A) Why do birds fly south in winter?
B) What beak type do most seed-eating birds have?
C) How do birds learn to eat?
D) What material are bird beaks made of?

26) Terry tested four rocks to see how hard they are. He rubbed each of them against hard steel for one minute. He drew pictures of what they looked like before and after he rubbed them. Which rock is the hardest?

27) Julie had four bottles. She wanted to know which bottle could hold the most water.

Julie found the mass of each bottle when it was empty. Then she found the mass of each bottle when it was full of water. She recorded the following results.

<table>
<thead>
<tr>
<th>Bottle</th>
<th>Mass of Empty Bottle (grams)</th>
<th>Mass of Full Bottle (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>800</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>600</td>
</tr>
<tr>
<td>3</td>
<td>500</td>
<td>900</td>
</tr>
<tr>
<td>4</td>
<td>700</td>
<td>900</td>
</tr>
</tbody>
</table>

Which bottle held the most water?
A) 1       B) 2       C) 3       D) 4
28) What property do a penny, nail, paper clip, and a rock all have in common?
A) All have magnetic attraction
B) All sink in water
C) All conduct heat easily
D) All dissolve in water

29) In which container will the water evaporate most quickly?

30) Four glasses of water have 4 different temperature. Which glass is most likely to change to ice when heat is removed?
31) A green tree frog lives in a forest. How does the frog's green color help it to survive?
A) By helping the frog find other frogs
B) By keeping the frog cool
C) By making the frog hard to see when sitting on leaves
D) By allowing the frog to make its own food

32) Raccoons living in cities have learned to open lids of garbage cans. This is an example of an animal
A) Adapting to its environment
B) Inheriting the ability to change its diet
C) Being tamed by humans
D) Becoming a plant eater

33) A student found a piece of metal. What could the student do to determine if the metal contains iron?
A) Heat the metal
B) Place the metal in water
C) Place the metal near a magnet
D) Weigh the metal

34) A volcanic rock is black, glossy, and smooth. How did this rock most likely form?
A) Rapidly, on the Earth’s surface
B) Rapidly, beneath the Earth’s surface
C) Slowly, on the Earth’s surface
D) Slowly, beneath the Earth’s surface

35) Beryl finds a rock and wants to know what kind it is. Which piece of information about the rock will best help her to identify it?
A) The size of the rock
B) The weight of the rock
C) The temperature where the rock was found
D) The minerals the rock contains

36) Which earth materials would NOT be recycled to help make a school notebook?
A) Plastic containers
B) Soda can
C) Paper
D) Glass jars
37) A company collects cans for recycling. Some cans are made of aluminum, and some are made of iron. Which of the following is the best way to separate the two types of cans?

A) Heat the iron cans until they melt  
B) Use scissors to cut the cans  
C) Use a magnet to pick up the iron cans  
D) Float the cans in water

38) A butterfly sitting on a leaf laid some small eggs. The pictures show the changes that took place to the eggs.

![Images of butterfly life cycle]

In what order did the changes take place?
A) 1, 2, 3, 4  
B) 1, 3, 4, 2  
C) 1, 4, 3, 2  
D) 1, 4, 2, 3

39. The eyespots on this butterfly’s wings allow it to:  
A) Stay warm  
B) Locate nectar filled flowers  
C) Fly away quickly  
D) Frighten or confuse enemies
40. During certain stages of a butterfly's life cycle, the butterfly helps plants by pollinating their flowers. At other stages, it hurts plants by eating their leaves. At what stage in the butterfly's life cycle does it eat the most plant leaves?

A) 2  B) 6  C) 1  D) 4

41. A force that slows down or stops the motion of a bicycle is
A) Sound  B) Heat  C) Friction  D) Electricity

42. Which change would make a toy car harder to stop once it is moving?
A) Make it more massive
B) Make it taller
C) Make it with less wheels
D) Make it a different color

43. Which organism from a forest habitat is NOT eaten by another?

A  B  C  D

Grass  Fish  Hawk  Grasshopper

44. When the sun’s energy warms our air, the air will

A) Expand and therefore allow more water vapor to enter the air
B) Contract and therefore force more water vapor out of the air
C) Neither expand or contract
D) Turn into a liquid
45. A student put some sand, clay, and water into a bottle and shook the bottle. Then he put the bottle down. After two hours, the bottle looked like the drawing above. What can the student conclude based on what he sees in the bottle?
A) The water is heavier than the grains of clay and the grains of sand
B) The grains of clay are heavier than the grains of sand and the water.
C) The grains of sand are heavier than the water and the grains of clay.
D) The water, grains of clay, and grains of sand are all of equal weight.

46) Which of the following can prevent erosion?
A) plants  B) wind  C) water  D) waves

47) Which is an example of water condensing?
A) A puddle disappearing on a hot summer afternoon
B) Sweat forming on your forehead after you do a lot of exercise
C) Ice cubes melting when you put them out in the sun
D) Dew forming on plants during a cold night

48) Which letter shows where evaporation is taking place?
A)  B)  C)  D)

49) Which one of the following is caused by fast moving water?
A) large amounts of erosion
B) plains
C) ponds
D) wandering river patterns
50) A strip of land is cleared of trees and bushes to make space for a power line. What impact will this have on birds living in the area?

A) The natural enemies of birds will be eliminated  
B) Weather conditions may change  
C) The rate of erosion will increase  
D) There will be less food and shelter

51) The magnetic fields of any magnet are greatest –

A) Around the middle.  
B) Around the poles.  
C) Around the south poles only.  
D) Around the north poles only.

52) Which of these can most easily produce magnetic fields?

A) Wind Flowing  B) Water  C) Sunlight  D) Electricity

53) Which would change the rate of vibration of a string on a guitar to make it sound higher pitch?

A) Pluck it harder  
B) Make it thicker  
C) Make it longer  
D) Make it tighter

54) There is a thunderstorm close to your house. The windows rattle at the same time that you hear the thunder. What causes the windows to rattle?

A) Sound waves from the thunder  
B) Light from the lightning  
C) Rain from the clouds  
D) The high humidity during the storm

55) John has a red apple in his lunch. Why does the apple look red to him?

A) Only red light waves are absorbed by the apple.  
B) John’s eyes are only able to sense red light waves  
C) Only red light waves are reflected by the apple  
D) Red light waves travel faster so they reach John’s eyes first.

56) When you are riding a bicycle at night, your bicycle’s reflectors help people in cars see your bicycle. How do bicycle reflectors work?

A) They are made of a special material that gives off its own light.  
B) They are hooked up to batteries that allow them to produce light.  
C) They bounce light back from other sources.  
D) They are covered with paint that glows in the dark.
57) What happens to the path of a light ray as it passes from air into water or a glass lens at an angle?

A) Its path widens  
B) Its path bends  
C) Its path becomes shorter.  
D) Its path continues in a straight line.

58) The opening of a camera controls the amount of light allowed in. Which part of the eye does the same job?

A) The lens  
B) The pupil  
C) The retina  
D) The cornea

59) As seagulls fly over the water, they sometimes dive into the water to catch prey. Which of these senses is useful to seagulls that feed in this manner?

A) Sight  
B) Smell  
C) Hearing  
D) Touch

60) Humans interpret seeing, hearing, tasting and smelling in the

A) brain  
B) spinal cord  
C) receptors  
D) Skin

61) The Moon produces no light, and yet it shines at night. Why is this?

A) The Moon reflects the light from the Sun.  
B) The Moon rotates at a very high speed.  
C) The Moon is covered with a thin layer of ice.  
D) The Moon has many craters.

62) Part of the moon is dark because

A) it is covered by clouds.  
B) the sun is between earth and moon.  
C) sunlight is not reflected from the dark part of the moon.  
D) the sun is being blocked by Mars.

63) Which of the following best explains why the Sun appears to move across the sky every day?

A) The Sun rotates on its axis.  
B) Earth rotates on its axis.  
C) The Sun orbits around Earth.  
D) Earth orbits around the Sun.

64) The period of rotation of the Earth is:

A) 29 days  
B) 365 days  
C) 1 hour  
D) 24 hours
1) The diagram shows a way you could hook up a battery, three wires, and a light bulb.

Explain how you could use these things to test an item to see if it is a conductor of electricity.

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

How could you tell?

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
2) Hot water is poured into a pot and covered with a lid. Over time, water droplets begin to form on the inside of the pot lid.

What two processes caused the water droplets to form? Explain how each process occurs.

Process 1:
Explanation:
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

Process 2:
Explanation:
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
Diagram 1 shows a frog’s life cycle with two missing stages. Diagram 2 shows the two stages that are missing from the frog’s life cycle in diagram 1. They are labeled A and B.

Complete the frog’s life cycle in Diagram 1 by writing A in the empty circle where stage A belongs and B in the empty circle where stage B belongs.

Explain why you placed the letters A and B where you did.

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