DC Science

The District of Columbia Assessment of the Next Generation Science Standards

Practice Test Answer and Alignment Document

DC Science – Grade 8

The following pages include the answer key for all machine-scored items.

Unit 1

Item Number	Answer Key	Performance Expectations
1	D	
2	B. Lionfish have no natural predators. C. Lionfish have a fast reproductive rate.	
3	Lionfish first appeared in Bank 1 of the sanctuary in **2010.** Their numbers increased until **2015** when **capture** began. If control measures had not been implemented, and the same population growth rates were maintained, then scientists could have expected about **850** sightings in the Bank 2 of the sanctuary in 2017. In fact, in 2017, there were **zero** sightings of lionfish in the sanctuary.	
4	The lionfish is a(n) **invasive** predator in the Atlantic Ocean. Lionfish disrupt ecosystems by reducing the amount of **biodiversity** because of its consumption of over 100 prey fish species. This reduction of prey fish can lead to a lack of food for **native** predators. To help return **biodiversity** to these ecosystems, humans have begun lionfish population control measures.	MS-LS2-2 MS-LS2-5
5	Atlantic Ocean: Prey do not recognize lionfish or avoid them; Predators do not recognize lionfish as prey; Lionfish population is controlled by humans. Pacific Ocean: Predators recognize lionfish and eat them; Ecosystems are more likely to have high biodiversity; Fishing harvests likely are high because of stable ecosystems; Prey recognize lionfish and avoid them.	
6	See Rubric	
7	A. The added heat increases the motion of the water molecules. B. The added heat increases the motion of the ethanol molecules. D. The added heat causes ethanol molecules to change state before water molecules change state.	
8	D	MS-PS1-3 MS-PS1-4
9	Left Box: Lesser particle motion; Lower rate of ethanol evaporation. Right Box: Heat is absorbed by ethanol; Greater particle motion; Greater rate of ethanol evaporation.	
10	Column A: Kinetic energy increases; Ethanol begins at a lower temperature than the apparatus; Heat is absorbed by ethanol.	

	Column B: Kinetic energy decreases; Ethanol beings at a higher temperature than the apparatus; Heat is released by ethanol.
11	It is likely that **molecule X** could also be used for hand sanitizer, because this molecule **has similar chemical groups** as ethanol.
12	See Rubric

Item	Answer Key	Performance Expectations
13	B. the Sun C. gravity D. the plants	
14	C	
15	The order of steps in the model should be: Water in the lake is heated by the Sun, evaporating and leaving phosphate minerals behind. **Water vapor condenses in the atmosphere forming clouds.** **Clouds become heavy and precipitation falls.** **Precipitation falls, weathering rocks and carrying rocks sediment as it flows downhill.** **Water collects into larger streams that flow into the river and into the lake.**	
16	Likely: A sedimentary rock from Salt Lake Not Likely: An igneous rock from Weber; An igneous rock from Daggett; A sedimentary rock from Summit	MS-ESS2-4 MS-ESS3-1
17	Gravity: Phosphate in the mountain is weathered and eroded; The river deposits dissolved phosphate in the lake; Snow falls at high altitudes in the mountains. The Sun: Trees release water from their leaves into the atmosphere; Water evaporates and condenses to form clouds.	
18	See Rubric	

Unit 2

Item Number	Answer Key	Performance Expectations
19	C	
20	D	
21	The information received by the eye is transferred to the groups of cells comprising the **brain**, which is part of the **nervous system** that relays **information** to the **muscular system.**	
22	Fish engages muscles to change direction: Nervous System and Muscular System. The fish engages muscles and salivary glands to eat food: Digestive system and Muscular System.	MS-LS1-3

23	Step 1: Light hits the photoreceptor Step 2: Information is passed from the eye through the optic nerve Step 3: Information reaches the brain Step 4: Information is processed Step 5: The muscles receive a signal from the brain Step 6: The fish moves toward the food	MS-LS1-8
24	See Rubric	
25	D	MS-PS2-1 MS-PS2-2
26	B. The force of the push. D. The mass of each astronaut.	
27	It is likely the results will show that Car X traveled **less** than 0.75 m and Car Y traveled about **2.0 m**. The force which caused motion was **the same for both cars**	
28	Increases distance both cars travel: Oil the wheels; Use a stiffer spring. Decreases distance both cars travel: Increase surface friction.	
29	Each activity demonstrates **a force** producing motion. In both activities **an action-reaction** force affects motion.	
30	See Rubric	
31	D	MS-ESS1-3 MS-ESS1-1
32	D	
33	Although the Moon is held in a stable orbit around the Earth by **gravity**, the Moon's orbit is **non-circular**. The Moon appears to become larger in the sky as it approaches **perigee**. The Moon appears to decrease in size as its orbit approaches **apogee**.	
34	Although the Moon **rotates** as it orbits the Earth, only one side of the Moon is visible from Earth. This occurs because the Moon **rotates** on its axis at the same rate that it **revolves** around the Earth so that one side of the Moon always faces the **Earth**.	
35	In the positions shown in Figure 4, the **near** side of the Moon reflects light from the Sun and a **full** Moon appears. If aligned correctly in the position shown, the Earth's shadow can cover the **Moon** and a **lunar** eclipse occurs, which causes a darkening of the moon.	
36	See Rubric	

Unit 3

Item Number	Answer Key	Performance Expectations
37	A	MS-LS4-3 MS-LS4-4
38	B. At what stage do differences start to become noticeable? E. In what way do mammals, fish, and reptiles become different as they develop?	
39	The **tail** is a feature that all of the embryos have in common at Stage 1. This trait is eliminated from **humans** but is retained by all of the other species in Figure 1. Adult **fish** and salamanders both live in aquatic environments. They share common structures because these structures **increase** their probability of survival in their similar environments.	
40	Stage 1: Eyes begin to form. Stage 2: Limbs begin to form. Stage 3: Some tails are eliminated; Toes begin to form.	
41	Increases Probability of Survival: Claws that scratch the ground; Red comb that regulates body temperature. Does Not Increase Probability of Survival: White feathers that are easy to see in the habitat; Waste that is used as fertilizer.	
42	See Rubric	
43	C. Temperature D. time	MS-PS3-3 MS-PS3-4
44	A. the state of the matter B. the mass of the matter C. the density of the matter	
45	As the cooker works, the food particles gain **kinetic energy**. This can be measured by using a **thermometer** to determine the rise in **temperature**.	
46	Aluminum foil: reflect energy Black paper: absorb energy Plastic wrap: trap energy	
47	The newspaper will act as a(n) **insulator** to prevent the energy from **leaving** the solar cooker. The newspaper will improve the design based on the principle that energy will spontaneously transfer from a **hotter** area to a **colder** one.	
48	See Rubric	
49	A. the Sun E. the phytoplankton	MS-LS2-1

Item Number	Answer Key	Performance Expectations
50	C	MS-LS2-3
51	Increases population: Water temperature increases; Large fish produce more egg clouds; Sharks migrate into the area. Decreases population: Water temperature decreases.	
52	The model **does not show** all of the organisms in the ecosystem. The model **does not show** how non-living factors can disrupt the ecosystem. The model **does not show** how chemical reactions affect energy in the ecosystem. The model **shows** the movement of matter through the ecosystem. The model **shows** the movement of energy through the ecosystem.	
53	The amount of oxygen in the reef ecosystem **cycles** throughout a year. This happens naturally as the **temperature** of the water changes. The normal level of dissolved oxygen is around **6** mg/L. In late 2009 and late 2015, scientists noticed large numbers of dead fish in the reef ecosystem. This indicates that dissolved oxygen levels **lower** than **2** mg/L are harmful to many fish.	
54	See Rubric	

Unit 4

Item Number	Answer Key	Performance Expectations
55	C	MS-PS3-3 MS-ETS1-3
56	B	
57	The foam has a **lower** density because of the gas. If there were no bubbles in the material, there would be a **higher** density. The thermal conductivity would be **higher**.	
58	If dairy farmers test the same thickness of fiberglass and foam, the mass of fiberglass would be **less** than foam based on its density. Farmers would need to use **more** fiberglass to slow the flow of heat to the same extent.	
59	Three layers of foam: Best insulator; Best for inside building. Fiberglass between two layers of foam: Lightest.	
60	See Rubric	
61	B	MS-LS2-5 MS-ETS1-3
62	C. Encourage people to harvest sea urchins for food. D. Encourage people to plant more kelp in kelp forests. E. Encourage people to introduce otters to the kelp forests.	
63	A healthy ecosystem contains a **larger** variety of species than an	

	unhealthy ecosystem. Every species has a role in the ecosystem, and if one species is lost, then it can affect all of the ecosystem. Not only must there be enough healthy kelp to maintain the food web, but the kelp also provides a **habitat** for many different species.
64	Solution Meets Criteria: Hold contests to see how many sea urchins can be captured by divers; Gather signatures for a petition to pass laws that encourage kelp farming.
65	Harvesting the kelp will have a **large** effect on the kelp forest ecosystem. Sea urchin, abalone, and herring populations will **decrease**. Then, sea bass and sea otter populations will **decrease**. The biodiversity of the sea kelp forest will **decrease**.
66	See Rubric

67	B. Groups of healthy trees that live among trees with leaf spot. D. Groups that have shown sustained growth through the last several years of less rain than usual.	
68	B	
69	The scientists performed **artificial** selection by only taking cuttings from trees that had desirable traits. All of the trees selected exhibited the trait of good rooting ability, because these trees would likely be more resistant to **drought**. All of the trees selected also exhibited the trait of not showing the symptoms of leaf spot, because these trees would likely be more resistant to **disease**. However, not all 3 groups of trees showed the same **survival** rates. The trees of Group A likely have more **genetic** influence over the traits of interest than the other groups.	MS-LS1-5 MS-LS4-5
70	The results in Table 1 show that **artificial selection** has been used successfully by lumber companies. But the results in Table 2 show that **genetic engineering** could be used as well. Both of these technologies can improve outcomes by selecting for **genetic** factors that are passed on through reproduction from **parent** to **offspring**.	
71	Genetic: Resistance to leaf spot fungus; Ability to utilize nitrate; Rooting Ability. Environmental: Nitrate amounts in soil; Hours of sunlight; Centimeters of rain; Presence of leaf spot fungus.	
72	See Rubric	