TAKS
Texas Assessment of Knowledge and Skills

SCIENCE
Grade 10

2008 Released Items

1 A student wearing goggles, gloves, and an apron begins a simple activity to determine the pH of corrosive solutions. Before the activity begins, what other safety measure should the student follow?

A Identify the locations of eye wash, shower, and fire equipment

B Check and set clocks and record the beginning time

C Review the proper method of fire-polishing glass tubing

D Arrange the equipment in the work area alphabetically

Hypothesis: When environmental conditions become unfavorable, the bacterium *E. coli* forms Protein Q.

2 Which process indicates a proper step in testing this hypothesis?

A Establish that Protein Q is present in higher-level organisms

B Produce a test for the presence of Protein Q

C Determine that Protein Q can be artificially produced

D Test for the types of chemical bonds found in Protein Q

Balance	Range (kg)	Precision
W	0–5	0.001
X	0–15	0.003
Y	0–25	0.005
Z	0–50	0.010

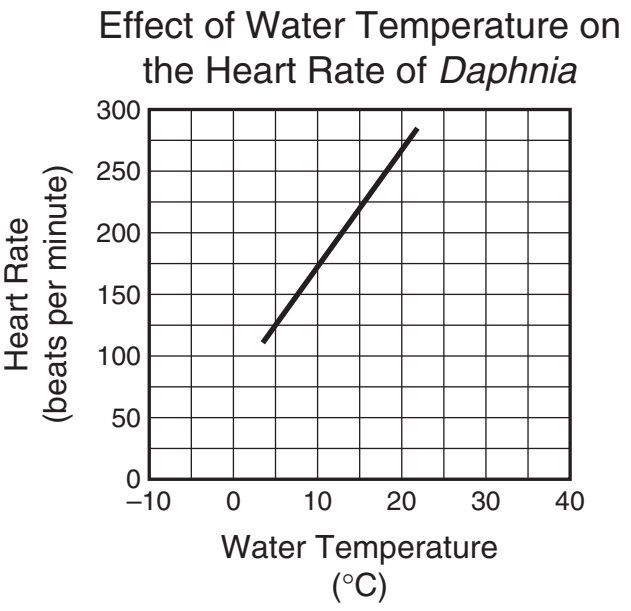
3 Four balances are available for students to use for their laboratory experiment. The table shows the range and precision of each balance. The students want to mix 0.100 kilogram of salt with 2.20 kilograms of water. Which balance would provide the greatest precision?

A W

B X

C Y

D Z



4 The graph shows how the heart rate of *Daphnia*, a water flea, is affected by water temperature. Which statement is best supported by these data?

A *Daphnia* do well in freezing water.

B *Daphnia* have healthy hearts.

C The pulse of *Daphnia* can double.

D The rate of mutation in *Daphnia* varies with temperature.

1 Which of the following organelles is involved in storing material in a plant cell?

A Vacuole

B Mitochondrion

C Golgi body

D Cell membrane

2 A segment of nucleic acid is analyzed to see whether it is DNA or RNA. The nucleic acid can be identified as DNA if it contains —

A phosphate groups

B nucleotide bases

C deoxyribose sugars

D hydrogen bonds

3 The ability to roll the tongue is thought to be controlled by a dominant allele (R). What percent of offspring from two heterozygous (Rr) parents are most likely to have the tongue-rolling trait?

A 25%

B 50%

C 75%

D 100%

4 In which kingdom would a multicellular, heterotrophic, motile organism be classified?

A Eubacteria

B Fungi

C Plantae

D Animalia

5 The nervous system directs muscles to move. The muscular system produces movements. Which of the following systems, working with the two systems mentioned, determines the types of movements a person's body can make?

A Immune system

B Skeletal system

C Respiratory system

D Endocrine system

1 Bacteria are present in the digestive tract of some herbivores. The bacteria break down plant cellulose, making it possible for the herbivore to digest plant material. These bacteria live in a stable environment with sufficient food and water. The herbivore and the bacteria in this relationship —

A benefit each other

B compete for survival

C are producers

D are secondary consumers

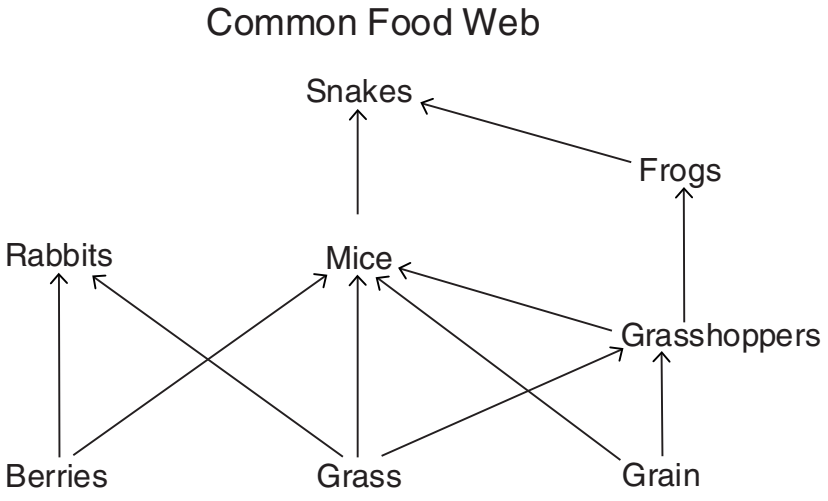
2 Within a certain community, crows actively eat brightly colored beetles. Which interaction is being displayed between the population of crows and the population of beetles?

A Commensalism

B Mutualism

C Parasitism

D Predation



3 According to this food web, which of the following are omnivores?

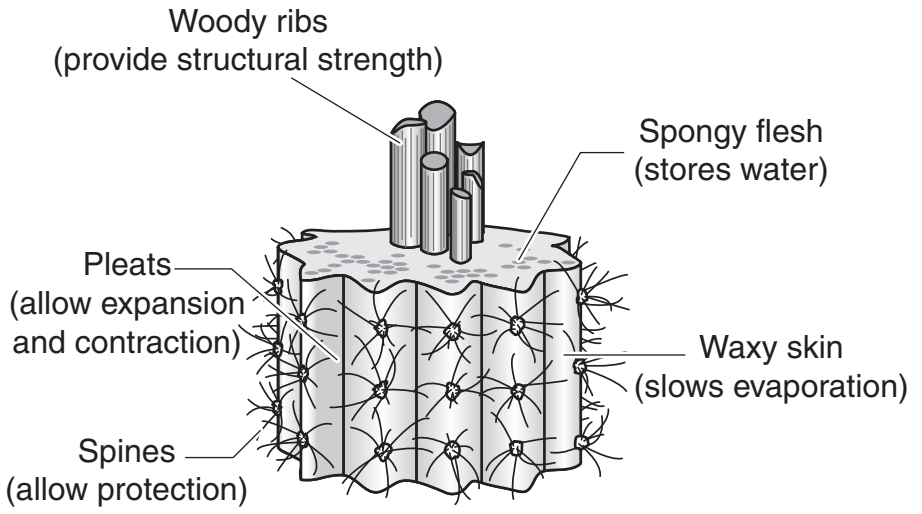
A Snakes

B Rabbits

C Mice

D Grasshoppers

Cross Section of a Plant Trunk



4 The picture shows a certain plant's adaptations. In which environment would these adaptations be most beneficial?

A Tropical forest

B Desert region

C Northern tundra

D Coastal area

1 Salt is added to a beaker of water and stirred until it is completely dissolved. The salt in this mixture can be separated by —

A chromatography

B chemical means only

C passing the water through filter paper

D allowing the water to evaporate slowly

2 All of these represent a change in state of matter except —

A melting an ice block

B evaporating alcohol

C sublimating dry ice

D digesting a sugar cube

$$4Fe + 3O_2 \rightarrow 2Fe_2O_3$$

62.5 g

3 If 43.7 g of iron is completely used in the reaction above, how many grams of oxygen are involved in the reaction? Record and bubble in your answer to the nearest tenth on the answer document.

1 Two ice hockey players are skating directly at each other. The first has a mass of 87 kg and is skating at a constant speed of 2.6 m/s. The second skater has a mass of 78 kg. How fast must the second skater be skating in order to have a momentum similar to the first skater?

A 2.3 m/s

B 2.9 m/s

C 3.4 m/s

D 5.2 m/s

2 In the event of an accident, air bags and seat belts may help reduce injury to a passenger by decreasing the force that stops the passenger's motion. The force is reduced because the seat belts or air bags decrease the —

A mass of the passenger

B acceleration of the passenger

C reaction time of the driver

D speed of the vehicle

3 A surfer wishing to ride a big wave is most interested in a wave's —

A rarefaction

B compression

C amplitude

D wavelength

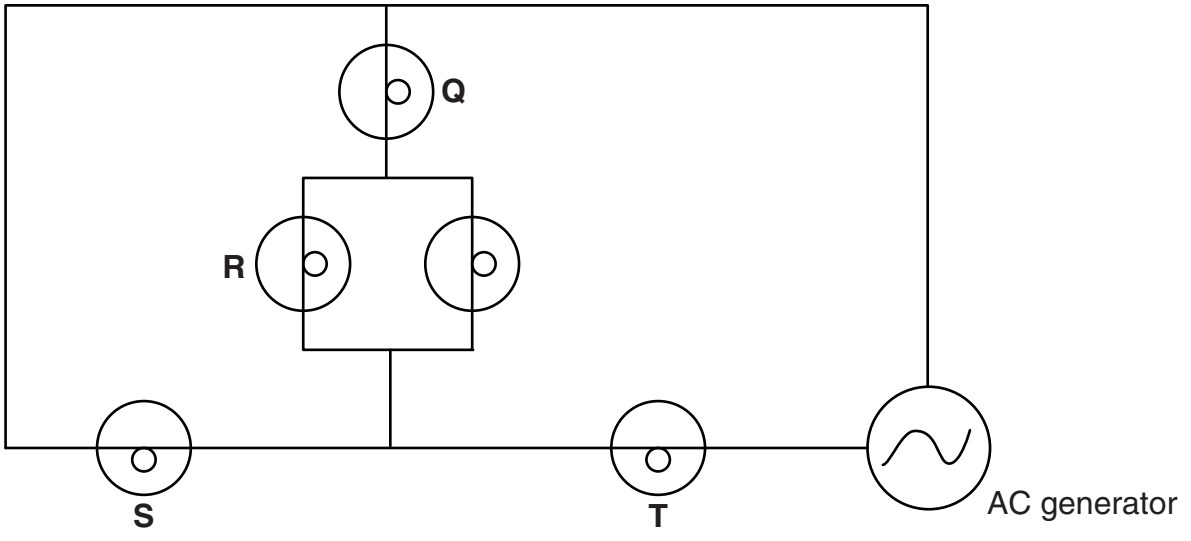
4 Mud at the bottom of a fishpond has a temperature of 15°C. After a week of colder air temperatures, the mud temperature drops to 12°C. Which of the following methods of heat transfer is most responsible for the change in the mud temperature?

A Water convection

B Air conduction

C Water reflection

D Ground radiation



5 Removal of which lightbulb will interrupt the circuit and cause all the other lightbulbs to fail to glow?

A Lightbulb Q

B Lightbulb R

C Lightbulb S

D Lightbulb T

Use the information below and your knowledge of science to answer questions 1–4.

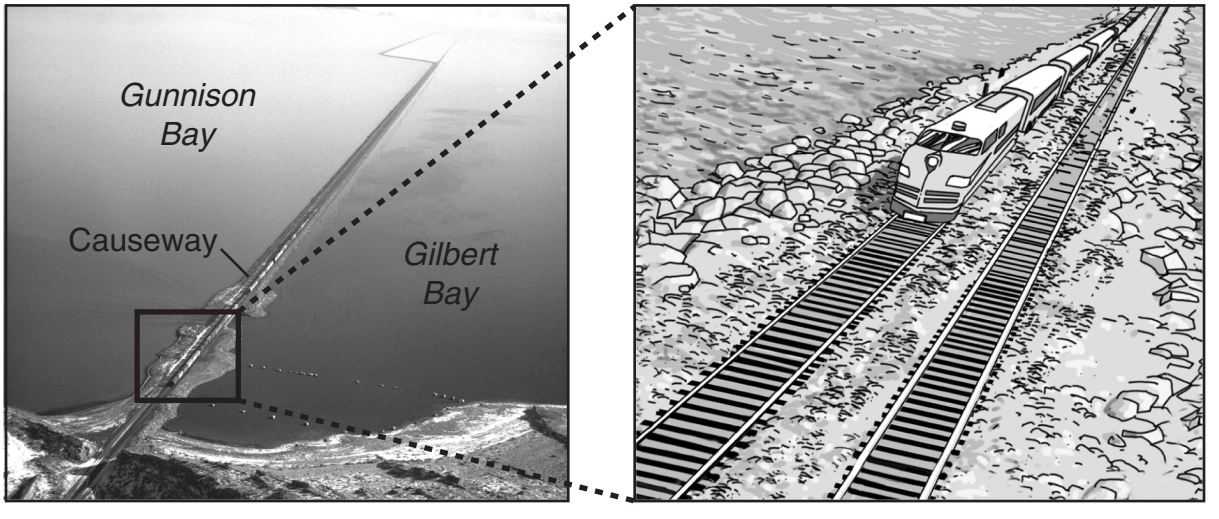
The Great Salt Lake

The Great Salt Lake is a large inland lake. It is very unusual because it is made up of saltwater. In 1959 a railroad causeway was built across the lake. The causeway, made from rocks and cement, divides the lake into two bays, Gilbert Bay and Gunnison Bay. Although the material in the causeway is tightly packed, the causeway is porous, allowing for the exchange of water between the two bays.

Over time, as fresh surface water flows into the Great Salt Lake, the depth of each bay and the composition of the water can vary. More freshwater flows into Gilbert Bay than into Gunnison Bay. Therefore, the water in Gunnison Bay is saltier than the water in Gilbert Bay. When the difference in salt composition is great, some of the saltier water from Gunnison Bay flows into Gilbert Bay through the causeway. Some properties of both bays were measured in 1998 and are shown in the table below.

Properties of the Great Salt Lake's Bays (1998)

Property	Gunnison Bay	Gilbert Bay
Color of water	Rose-purple	Blue-green
Elevation (m)	1280.6	1280.9
Density (g/mL)	1.193	1.057
Salt concentration	22.5%	8.4%



1 If heavy rainfall causes the water elevation of Gilbert Bay to rise above 1280.9 meters, which of these is the most likely result?

A The density of the water in Gunnison Bay will increase.

B The salinity of the water in Gilbert Bay will decrease.

C The salt concentration of Gilbert Bay will increase.

D The mass of sodium ions in Gunnison Bay will decrease.

2 A population of brine shrimp from Gilbert Bay is to be transplanted to Gunnison Bay. Which of these is the most likely effect on these transplanted brine shrimp?

A The shrimp with a high salt tolerance will increase in number.

B The shrimp will change their method of obtaining nutrients.

C The shrimp will alter their method of reproduction.

D The shrimp accustomed to lower salt levels will develop salt-removing filters.

3 From the data in the table, what would be the mass of a 3.0 L sample of water collected from Gunnison Bay?

A 2515 g

B 3171 g

C 3579 g

D 4193 g

4 After studying salinity in the bays of the Great Salt Lake, students prepared two samples of water having different salinity. Sample A contained 10% salt, and Sample B contained 25% salt. Both samples were the same size. After leaving the samples in the freezer for the same amount of time, the students discovered that a layer of ice had formed in each sample. Which layer in the samples probably contained the most salt?

A The ice layer in Sample A

B The liquid layer in Sample A

C The ice layer in Sample B

D The liquid layer in Sample B

Item Number	Student Expectation	Correct Answer
OBJECTIVE 1		
1	B.1 (A)	A
2	B.2 (A)	B
3	B.2 (B)	A
4	B.2 (C)	C
OBJECTIVE 2		
1	B.4 (B)	A
2	B.6 (A)	C
3	B.6 (D)	C
4	B.8 (C)	D
5	B.10 (A)	B
OBJECTIVE 3		
1	B.4 (D)	A
2	B.12 (B)	D
3	B.12 (E)	C
4	B.13 (A)	B
OBJECTIVE 4		
1	I.7 (E)	D
2	I.8 (A)	D
3	I.8 (C)	18.8
OBJECTIVE 5		
1	I.4 (A)	B
2	I.4 (B)	B
3	I.5 (A)	C
4	I.6 (B)	A
5	I.6 (F)	D
CLUSTER		
1 (Objective 1)	B.2 (D)	B
2 (Objective 3)	B.7 (B)	A
3 (Objective 4)	I.7 (A)	C
4 (Objective 4)	I.9 (D)	D