# ISASP IOWA STATEWIDE ASSESSMENT of STUDENT PROGRESS

## Science – Released Operational Items

Prepared by Iowa Testing Programs

# Released Operational ISASP Science Items—Item Level Data

The percent of Iowa students that answered the item correctly.

The non-keyed responses that attracted Iowa students.

If none listed, all distractors were evenly chosen.

| Grade 5 Review Items | | | | | | |
|---|---|---|---|---|---|---|
| **Item ID** | **Percent Correct** | **Domain** | **DOK** | **Standard** | **Key** | **Primary Distractor(s)** |
| SC210520 | 47 | LS | 2 | 3-LS4-3 | B | A, C |
| SC210524 | 46 | LS | 2 | | A | C |
| SC210525 | 45 | LS | 3 | | D | |

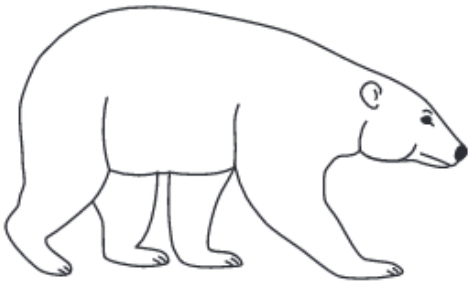
Depth of Knowledge Level

| Science Grade 5 Review Items | | | | | | |
|---|---|---|---|---|---|---|
| **Item ID** | **Percent Correct** | **Domain** | **DOK** | **Standard** | **Key** | **Primary Distractor(s)** |
| SC2105529_4 | 83 | LS | 2 | 3-LS4-3 | D | |
| SC2105522_4 | 84 | LS | 2 | | D | |
| SC2105526_2 | 55 | LS | 2 | | B | C,D |
| SC2105640_2 | 61 | PS | 2 | 5-PS1-3 | B | C |
| SC2105644_3 | 73 | PS | 3 | | C | |
| SC2105641_4 | 67 | PS | 2 | | D | |
| SC2105643_3 | 47 | PS | 2 | | C | A |
| SC2105502_1 | 75 | ES | 3 | 4-ESS2-2 | A | B |
| SC2105503_3 | 49 | ES | 3 | | C | B |
| SC2105506_3 | 38 | ES | 3 | | C | B,D |

PolarBearsandSloths

## Polar Bears and Sloths

A student observed the following pictures of a polar bear and a sloth while researching their characteristics.



The student recorded some of the characteristics in Table 1.

**Table 1. Characteristics of Polar Bears and Sloths**

| Characteristic | Polar Bear | Sloth |
|---|---|---|
| Class | Mammal | Mammal |
| Weight | 1,600 pounds | 8–17 pounds |
| Fur | Thick and clear | Tan or brown |
| Claws | Sharp | Long and curved |
| Food | Meat | Mostly plants |
| Swimmers | Yes | Yes |
| Habitat | Arctic | Tropical forest |

The student then researched features of Arctic and tropical forest habitats. The student recorded the climate of each habitat and "Yes" or "No" for each of the other features in Table 2.

**Table 2. Features of Arctic and Tropical Forest Habitats**

| Features | Arctic | Tropical Forest |
|---|---|---|
| Climate | Cold and icy | Hot and wet |
| Trees | No | Yes |
| Ocean | Yes | No |
| Plants and Animals | No | Yes |

SC2105529_4

After completing her research on polar bears and sloths, the student would most likely agree that mammals live

**A.** in large groups.

**B.** close to the equator.

**C.** near their offspring.

**D.** in different habitats.

SC2105522_4

The student read that a sloth's fur can sometimes be a greenish color from an overgrowth of algae. Why would having greenish-colored fur be an advantage for a sloth?

**A.** It protects the sloth from severe weather.

**B.** It signals predators of the sloth's location.

**C.** It makes the sloth recognizable to its young.

**D.** It helps the sloth blend in with its surroundings.

SC2105526_2

After reading the following definitions, the student claimed that sloths are herbivores.

> An animal that eats mainly plants is called an herbivore.
> An animal that eats mainly meat is called a carnivore.
> An animal that eats plants and meat is called an omnivore.

What information from Table 1 and Table 2 can be used as evidence to support the student's claim?

**A.** A sloth weighs less than a polar bear.

**B.** A sloth's diet consists mainly of plants.

**C.** The tropical forest has more plant species than the Arctic.

**D.** Mammals living in tropical forests eat more plants than meat.

RocksandWater

## Rocks and Water

A student performed an investigation involving rocks and water. The student poured 50 milliliters (mL) of water into each of four marked containers. The student added a different number of rocks to each container. The rocks in each container sunk below the water level. The student recorded the final volume of the water in each container in the following table.

| Container | Starting Volume (mL) | Number of Rocks | Final Volume (mL) |
|---|---|---|---|
| S | 50 | 1 | 72 |
| T | 50 | 2 | 81 |
| U | 50 | 3 | 90 |
| V | 50 | 4 | 102 |

SC2105640_2

Why did the student put rocks in a container of water?

**A.** To change the water into a different substance

**B.** To measure the amount of space the rocks took up

**C.** To determine how much water the container holds

**D.** To see whether the rocks would break up into smaller pieces

SC2105644_3

The student removed the two rocks from Container T. The student dried the rocks and placed them on a scale to find their weight. Why did the student dry the rocks before placing them on the scale?

**A.** To calculate the weight of the water inside the rocks

**B.** To stop the water from chemically reacting with the rocks

**C.** To prevent the water from affecting the weight of the rocks

**D.** To identify the weight of each mineral that makes up the rocks

SC2105641_4

Imagine if the student had started with 100 mL of water in Container S and added the same rock. What would the final volume of the water in Container S most likely be?

**A.** 72 mL

**B.** 78 mL

**C.** 100 mL

**D.** 122 mL

SC2105643_3

The student put three objects in a container with 50 mL of water. Based on the final volume of water in the container, the volume of the three objects was 40 mL. The volume of the three objects was closest to the volume of the rocks in which container?

**A.** Container S

**B.** Container T

**C.** Container U

**D.** Container V

NumberofEarthquakes

## Earthquakes

A student researching earthquakes for a school project gathered earthquake data from around the world. The student used the data to make two tables. Table 1 includes the number of earthquakes in 11 U.S. states in 2015. Table 2 lists the number of earthquakes worldwide registering within four different magnitude ranges. The magnitude is a number that represents the relative size of an earthquake. One scale used to measure an earthquake's magnitude is called the Richter scale, which includes values increasing in size from 0–10. The two tables are shown below.

**Table 1. Number of Earthquakes in 2015**

| Region | State | Number of Earthquakes |
|---|---|---|
| West | Alaska | 1,575 |
| | California | 130 |
| | Hawaii | 53 |
| | Nevada | 172 |
| | Utah | 4 |
| Midwest | Iowa | 0 |
| | Kansas | 60 |
| South | Florida | 0 |
| | Texas | 21 |
| Northeast | Maryland | 0 |
| | Vermont | 0 |

**Table 2. Number of Earthquakes at Certain Magnitudes by Year**

| Magnitude | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| 8+ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 - 7.9 | 0 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | 0 |
| 6 - 6.9 | 2 | 4 | 15 | 9 | 4 | 6 | 4 | 6 | 3 |
| 5 - 5.9 | 64 | 49 | 72 | 62 | 64 | 45 | 100 | 63 | 62 |

SC2105502_1

The student researched the number of earthquakes per year in each state in 2014. How many earthquakes did Florida most likely have in 2014?

**A.** 0

**B.** 50

**C.** 150

**D.** 200

SC2105503_3

The student lives in the Midwest region. Based on the information in the tables, is it likely that there has been a magnitude 9 earthquake in the region in which the student lives?

**A.** Yes, the Midwest region has a magnitude 9 earthquake each year.

**B.** Yes, most of the earthquakes in the Midwest region have a magnitude of 8 or more.

**C.** No, earthquakes in the Midwest region typically register lower on the Richter scale.

**D.** No, earthquakes that occur in the Midwest region are felt in the South region.

SC2105506_3

The student read about the observed effects of earthquakes at certain magnitudes. The student wrote some of them in the following chart.

| Magnitude | Observed Effect |
|---|---|
| 5 | Walls crack |
| 6 | Furniture moves |
| 7 | Some buildings collapse |
| 8 | Many buildings destroyed |
| 9 | Very rare, and could cause extreme damage |

Then the student made the following claim based on the information in the chart and in Table 2.

> Many buildings were destroyed worldwide in the earthquakes that occurred from 1990 to 1998.

What data can be used as evidence to challenge the student's claim?

**A.** Most of the earthquakes that happened could not be felt.

**B.** Some of the world's worst earthquakes occurred during this time.

**C.** There were no magnitude 8 earthquakes recorded during this time.

**D.** The magnitude 5 earthquakes that occurred caused structural damage.

| Science Grade 8 Review Items | | | | | | |
|---|---|---|---|---|---|---|
| **Item ID** | **Percent Correct** | **Domain** | **DOK** | **Standard** | **Key** | **Primary Distractor(s)** |
| SC2108520_3 | 79 | ES | 1 | MS-ESS3-1 | C | |
| SC2108521_4 | 60 | ES | 2 | | D | A |
| SC2108526_4 | 56 | ES | 3 | | D | C |
| SC2108529_3 | 57 | ES | 3 | | C | A |
| SC2108524_1 | 62 | ES | 2 | | A | C |
| SC2108045_3 | 50 | LS | 2 | MS-LS2-1 | C | B,D |
| SC2108038_3 | 66 | LS | 2 | | C | B,D |
| SC2108041_1 | 72 | LS | 2 | | A | |
| SC2108086_3 | 64 | PS | 2 | MS-PS1-1 | C | A |
| SC2108080_1 | 63 | PS | 2 | | A | C |
| SC2108081_3 | 51 | PS | 2 | | C | B |

EarthsResources

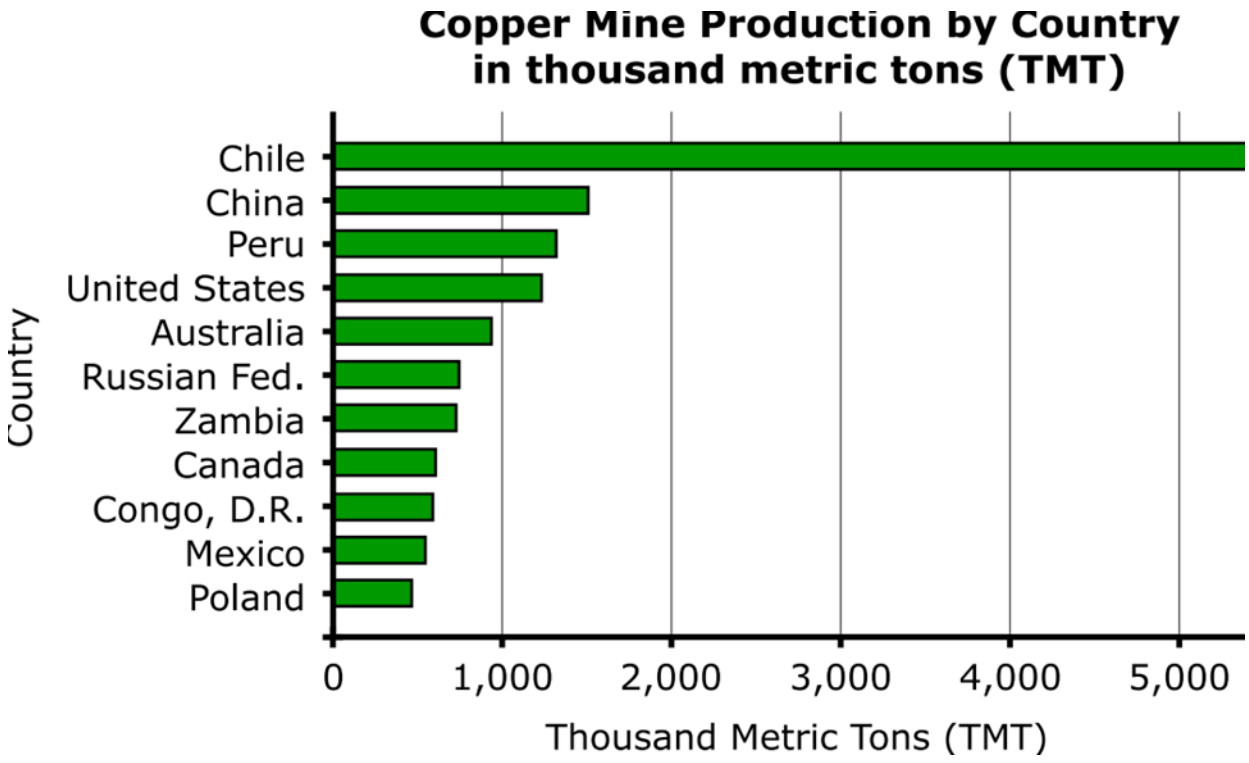
## Earth's Resources

A student read about some of Earth's natural resources including minerals such as gold, copper, and iron; fossil fuels such as coal and petroleum; natural gas; light; and water. The student researched the percentage of coal produced in different countries in 2009 and recorded the percentages in the table.

**Percentage of Coal Produced**

| Country | Percent (%) |
|---|---|
| United States | 25 |
| Russia | 18 |
| China | 13 |
| Australia | 9 |
| India | 7 |
| Germany | 5 |
| Other | 23 |

Then the student researched copper production and made the following bar graph of the top 11 copper-producing countries in 2012. The copper mine production is reported in thousands of metric tons (TMT).


Copper Mine Production by Country
in thousand metric tons (TMT)
Country
Chile
China
Peru
United States
Australia
Russian Fed.
Zambia
Canada
Congo, D.R.
Mexico
Poland
0
1,000
2,000
3,000
4,000
5,000
Thousand Metric Tons (TMT)

SC2108520_3

The student made a claim about the information in the Percentage of Coal Produced table. Which claim did the student most likely make about the information in the table?

**A.** China produced twice as much coal as Australia.

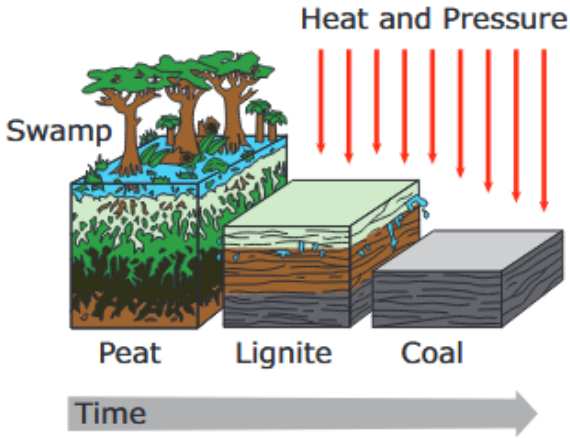
**B.** Several countries produced the same amount of coal.

**C.** Coal was produced in at least seven countries worldwide.

**D.** India used coal as its primary resource for making electricity.

SC2108521_4

The student made the following poster of coal formation. The student included peat and lignite on the poster. Peat is plant remains partly decayed in water and lignite is formed from peat.




Based on the student's poster, coal formation typically begins in an environment with

**A.** dry air, little precipitation, and a lack of vegetation.

**B.** mountains, lava, rock fragments, and rootless mosses.

**C.** cold temperatures, strong winds, and low-growing shrubs.

**D.** saturated soil, standing water, and water-tolerant vegetation.

SC2108526_4

The student claimed that in 2012 the United States produced more copper than any country in the world. What data from the bar graph can be used as evidence to challenge the student's claim?

**A.** The United States produced more copper than Austrailia.

**B.** Four countries each produced more than 1,000 TMT of copper.

**C.** Seven of the countries produced less copper than the United States.

**D.** Chile produced about 4,000 TMT more copper than the United States.

SC2108529_3

What would the student most likely learn in an internet search about the worldwide production of iron ore?

**A.** Chile produces the world's largest supply of iron ore.

**B.** Each country has the same amount of iron ore as it has coal.

**C.** The distribution of iron ore is different from the distribution of coal or copper.

**D.** Iron ore is produced in one country and distributed to other countries around the world.

SC2108524_1

The student wrote the following definitions.

| |
|---|
| Renewable resources – Natural resources that cannot be used up<br>Nonrenewable resources – Natural resources that are used faster than they are formed |

The student made a list of renewable resources based on these definitions. Which natural resources were most likely included in the student's list of renewable resources?

**A.** Air, light, plants, and wind

**B.** Salt, oil, aluminum, and air

**C.** Coal, natural gas, light, and plants

**D.** Plants, water, animals, and diamonds

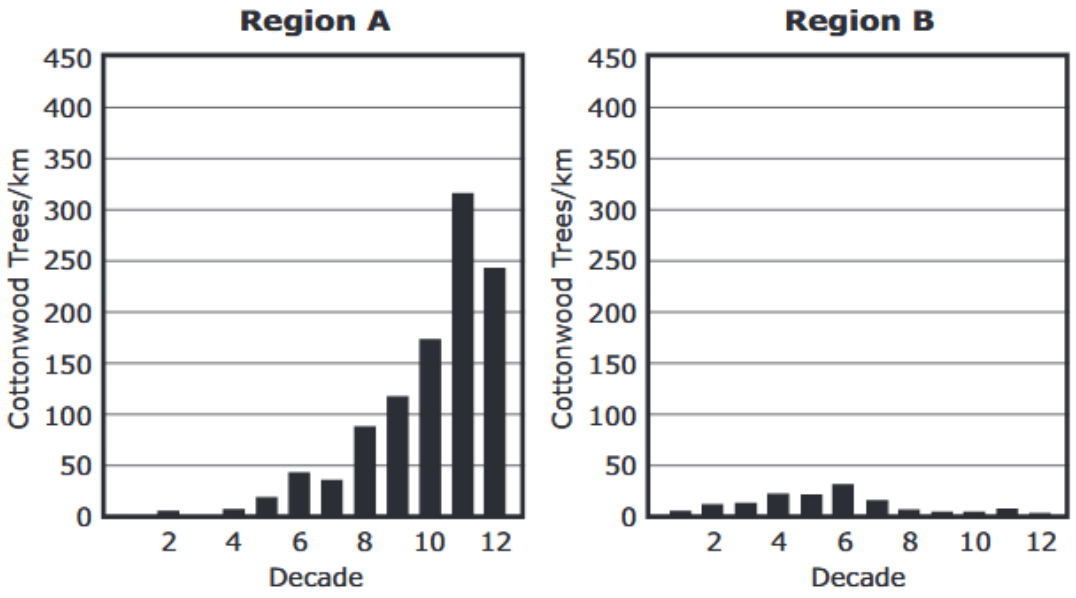
CougarsandCottonwoodTrees

# Cougars and Cottonwood Trees

Researchers reviewed graphs of cottonwood tree data from two similar regions along a river. The data represent the number of full-grown cottonwood trees per kilometer (km) observed during 12 consecutive decades. A common food chain in the two regions is shown in the following model:

Cottonwood Tree → Mule Deer → Cougar

Although cougars once inhabited both regions, the cougar population declined in Region B due to an increase in human activity. The graphs for Region A and Region B are shown below.



SC2108045_3

Which characteristic of cottonwood trees is best supported by evidence from the information provided?

**A.** The leaves of cottonwood trees turn yellow in the fall.

**B.** Young cottonwood trees grow six feet or more each year.

**C.** Cottonwood trees are able to live in or near water-soaked soil.

**D.** The wood of a cottonwood tree is weak and prone to disease.

SC2108038_3

Based on the cottonwood tree data from each region, what were the researchers most likely studying?

**A.** The dependence of mule deer on the nearby river

**B.** The average life expectancy of mule deer and cougars

**C.** The effect of the cougar population on cottonwood trees

**D.** The size of cottonwood trees compared to other tree species

SC2108041_1

Assuming there is no catastrophic change, which mathematical expression would best describe the number of cottonwood trees in Region A and Region B during Decade 13?

**A.** $\text{Cottonwood Trees}_{\text{RegionA}} > \text{Cottonwood Trees}_{\text{RegionB}}$

**B.** $\text{Cottonwood Trees}_{\text{RegionA}} < \text{Cottonwood Trees}_{\text{RegionB}}$

**C.** $\text{Cottonwood Trees}_{\text{RegionA}} \geq \text{Cottonwood Trees}_{\text{RegionB}}$

**D.** $\text{Cottonwood Trees}_{\text{RegionA}} = \text{Cottonwood Trees}_{\text{RegionB}}$

# Molecules

A student obtained a molecular model kit to study the structure of molecules. The kit included color-coded spheres and connecting rods. The spheres represent atoms and the rods represent bonds. The student counted each part in the kit and made the following key.

## Molecular Model Kit Key

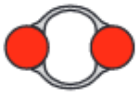
| Part of Kit | | Structure Represented | Number of Parts in Kit |
|---|---|---|---|
| Spheres | White – One Hole  | Hydrogen Atom | 30 |
| | Red – Two Holes  | Oxygen Atom | 10 |
| | Black – Four Holes  | Carbon Atom | 12 |
| Rods |  | Single Bond | 32 |
| |  | Double Bond | 28 |

The student read the following information provided in the kit:

- Molecular models help visualize the shape of molecules.
- The number of holes in each sphere represents the maximum number of bonds an atom forms. For example, a hydrogen atom forms one bond.
- A molecule is a group of one or more atoms bonded together.
- Each molecule is complete and stable when the holes in each sphere are filled and every rod ends in a hole.

The student used the parts of the kit to make models of six molecules. A picture of each molecule is shown below.

**Molecular Models**

| Molecule (Chemical Formula) | Picture of Molecule |
|---|---|
| Hydrogen ($H_2$) |  |
| Oxygen ($O_2$) |  |
| Methane ($CH_4$) |  |
| Methanol ($CH_3OH$) |  |
| Ethane ($C_2H_6$) |  |
| Ethene ($C_2H_4$) |  |

SC2108086_3

The chemical formula of water is $H_2O$. Which parts of the kit should the student use to make a molecular model of $H_2O$?

**A.** One white sphere, two red spheres, and one small rod

**B.** One black sphere, three red spheres, and two large rods

**C.** Two white spheres, one red sphere, and two small rods

**D.** Two black spheres, one red sphere, and one large rod

SC2108080_1

The number of white spheres in the molecular model kit implies that hydrogen is

**A.** present in many molecules.

**B.** interchangeable with oxygen.

**C.** double bonded to other atoms.

**D.** rarely used to build molecules.

SC2108081_3

What is the maximum number of hydrogen molecules the student could build with the molecular model kit?

**A.** 5

**B.** 10

**C.** 15

**D.** 20

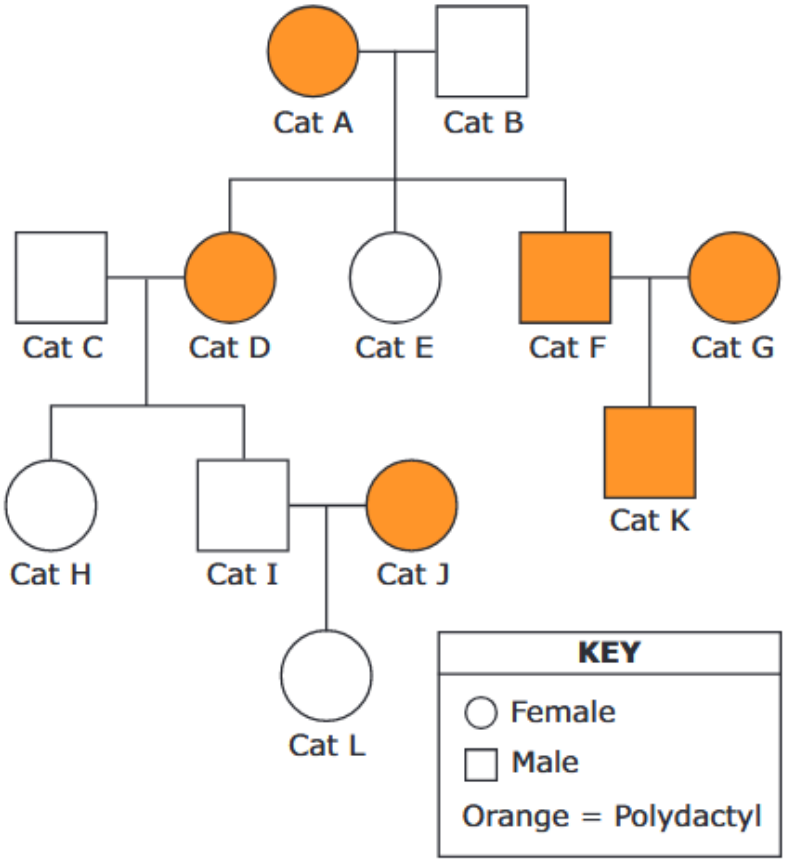
| Science Grade 10 Review Items | | | | | | |
|---|---|---|---|---|---|---|
| **Item ID** | **Percent Correct** | **Domain** | **DOK** | **Standard** | **Key** | **Primary Distractor(s)** |
| SC2110525_2 | 80 | LS | 2 | HS-LS3-1 | B | |
| SC2110522_2 | 71 | LS | 2 | | B | D |
| SC2110526_1 | 80 | LS | 2 | | A | |
| SC2110130_2 | 43 | ES | 3 | HS-ESS1-1 | B | A,D |
| SC2110132_3 | 50 | ES | 2 | | C | B |
| SC2110138_2 | 47 | ES | 3 | | B | A |
| SC2110104_4 | 64 | PS | 2 | HS-PS3-3 | D | |
| SC2110106_3 | 55 | PS | 3 | | C | D |
| SC2110105_4 | 44 | PS | 2 | | D | C |
| SC2110109_2 | 65 | PS | 2 | | B | C |

PolydactylCats

## Polydactyl Cats

Polydactylism is a condition caused by the mutation of a gene that leads to the expression of additional fingers or toes. The mutation is located on a dominant allele, and the degree to which it is expressed in offspring can vary depending on the alleles both parents have for the gene. Some cats can have an extra toe if only one of their parents carries the allele, while other cats can have several extra toes if both parents carry the allele. This type of genetic transfer is known as incomplete dominance. Below is a pedigree for one family of cats from an area known for its polydactyl cats.

### Polydactyl Cat Pedigree



SC2110525_2

The capital letter “P” represents the polydactyl allele and the lowercase letter “p” represents the normal allele. Based on the following Punnett square, what are the chances that a polydactyl (Pp) cat and a non-polydactyl (pp) cat will have an offspring with polydactylism?

| | p | p |
|---|---|---|
| P | Pp | Pp |
| p | pp | pp |

**A.** 1/4

**B.** 2/4

**C.** 3/4

**D.** 4/4

SC2110522_2

Which claim about Cat H and Cat I is best supported by the information presented in the pedigree?

**A.** Cat H has polydactylism and Cat I does not.

**B.** Cat H and Cat I are siblings without polydactylism.

**C.** Cat H has a sibling with polydactylism and Cat I does not.

**D.** Cat H and Cat I can pass the gene for polydactylism on to their offspring.

SC2110526_1

Cat D has polydactylism. Which claim best explains why Cat D has polydactylism?

**A.** Cat D's mother was a polydactyl cat.

**B.** Cat D grew extra toes after it was born.

**C.** Both of Cat D's grandfathers were polydactyl cats.

**D.** Both of Cat D's parents had the allele for polydactylism.

SunLifeSpan

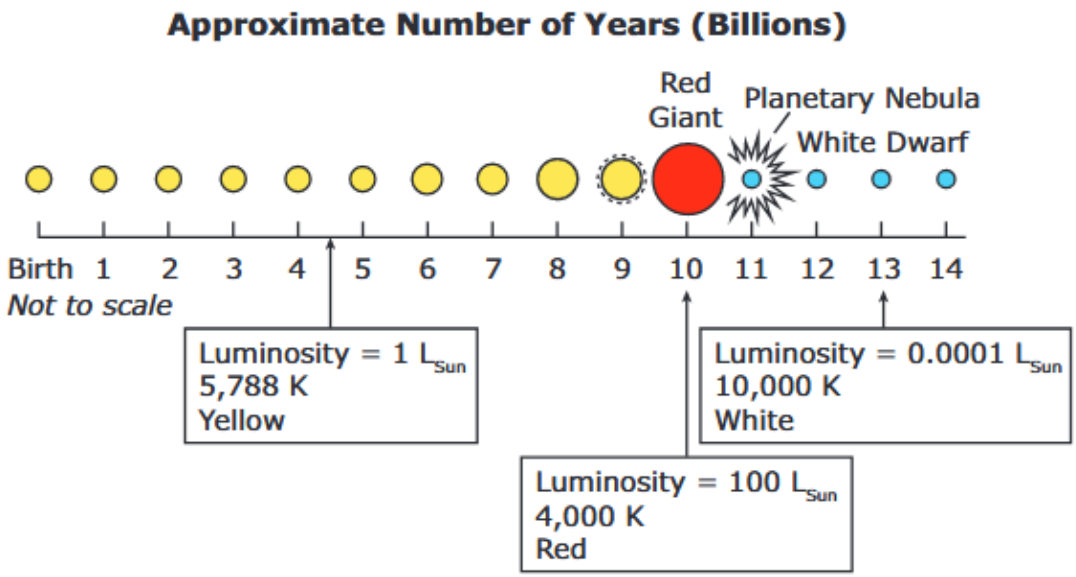
## Stars

Stars are the fundamental building blocks of galaxies. They are extremely hot gaseous bodies made of mostly hydrogen and helium. The types, or classes, of stars differ in mass, temperature, luminosity (brightness), and lifespan as shown in the table below. The values range from the largest, hottest, and brightest Class O stars to the smallest, coolest, and least luminous Class M stars. The Sun is classified as a Class G star, which is somewhere in the middle of this range. In the table, mass and luminosity are expressed in units relative to the Sun. $M_{Sun}$ is one times the mass of the Sun and $L_{Sun}$ is one times the luminosity of the Sun. Surface temperature is measured in Kelvin (K) and lifespan is measured in years.

**Characteristics of Stars**

| Class | Mass ($M_{Sun}$) | Surface Temperature (K) | Luminosity ($L_{Sun}$) | Lifespan (Years) |
|---|---|---|---|---|
| O | >16 | 33,000 | 30,000 | 11 million |
| B | 2.1 – 16 | 10,000 – 33,000 | 25 – 30,000 | 11 million – 1 billion |
| A | 1.4 – 2.1 | 7,500 – 10,000 | 5 – 25 | 1 billion – 2.2 billion |
| F | 1.04 – 1.4 | 6,000 – 7,500 | 1.5 – 5 | 2.2 billion – 10 billion |
| G | 0.8 – 1.04 | 5,200 – 6,000 | 0.6 – 1.5 | 10 billion – 30 billion |
| K | 0.45 – 0.8 | 3,700 – 5,200 | 0.08 – 0.6 | 30 billion – 200 billion |
| M | 0.075 – 0.45 | 2,000 – 3,700 | 0.0001 – 0.08 | 200 billion – 10 trillion |

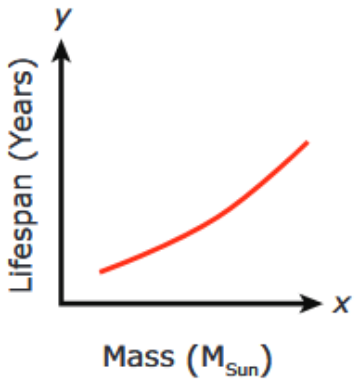
Evidence suggests that the Sun, a main sequence star, is about 4.6 billion years old and close to halfway through its life cycle. In another 5 to 6 billion years, it will likely run out of hydrogen, expand into a red giant with a radius reaching approximately 1 AU (the current distance between the Earth and Sun), and collapse into a white dwarf as illustrated in the diagram below.


Approximate Number of Years (Billions)
Red Giant
Planetary Nebula
White Dwarf
Birth 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Not to scale
Luminosity = 1 L Sun
5,788 K
Yellow
Luminosity = 100 L Sun
4,000 K
Red
Luminosity = 0.0001 L Sun
10,000 K
White

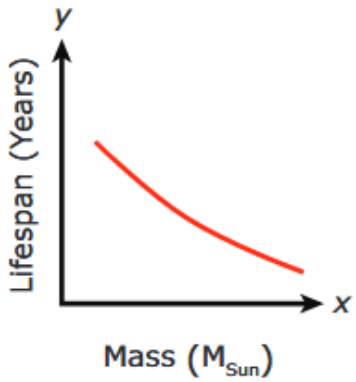
SC2110130_2

Which graph best illustrates the relationship between a star's mass and its expected lifespan?

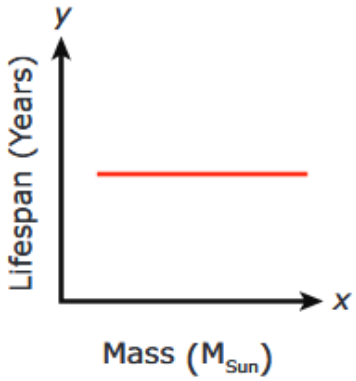
**A.**



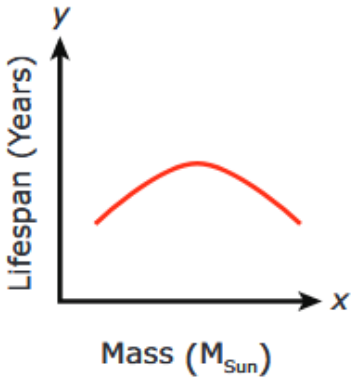

**B.**




**C.**




**D.**



SC2110132_3

Consider the following claim.

| |
|---|
| The smallest stars are the hottest and brightest. |

What information from the table provides supporting evidence that challenges this claim?

**A.** Class M stars are the least massive stars with a lifespan up to 10 trillion years.

**B.** Class B stars are nearly twice as hot as the Sun even though they have a shorter lifespan than the Sun.

**C.** Class O stars have a mass greater than 16 $M_{Sun}$, a surface temperature of at least 33,000 K, and a luminosity of 30,000 $L_{Sun}$.

**D.** Class A stars could be classified as Class F stars if their mass is 1.4 $M_{Sun}$, their surface temperature is 7,500 K, and their luminosity is 5 $L_{Sun}$.

SC2110138_2

The diameter of the Sun is 1,391,020 kilometers (864,340 miles). The diameter of some of the largest stars is about 3,218,688,000 kilometers (2,000,000,000 miles). Compared to the Sun, the lifespan of these stars is about

**A.** twice as long.

**B.** 1,000 times shorter.

**C.** 1,000,000,000,000 years longer.

**D.** shorter by a few hundred years.

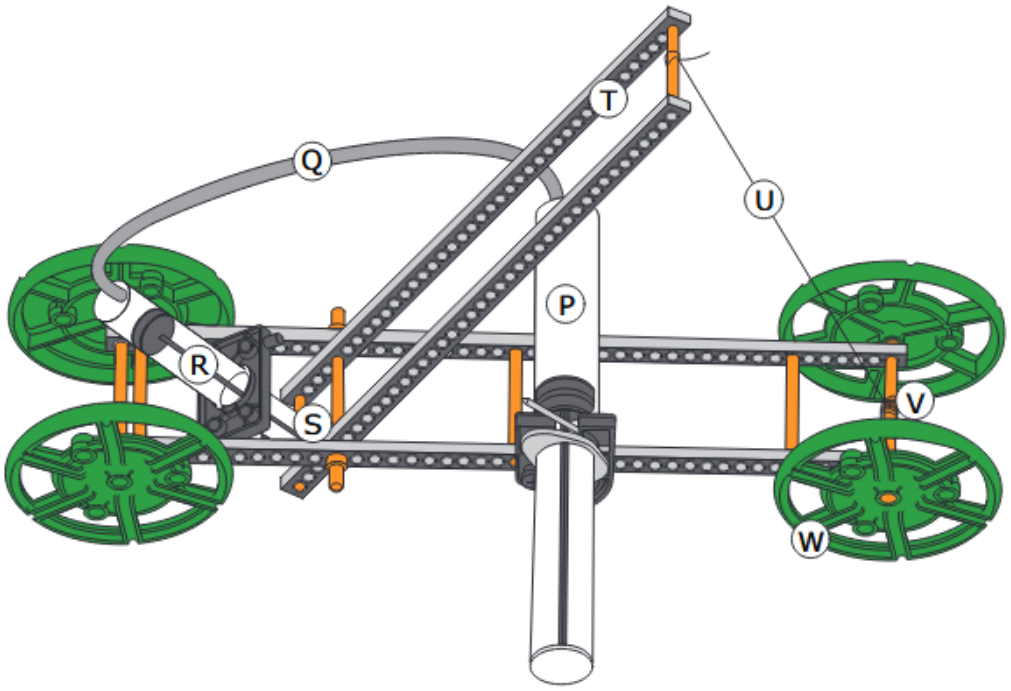
YeastMobile

# Yeast Mobile

A student read about the use of biomass fuels, or biofuels, when researching alternative automobile fuels. The student wrote the following notes about biofuels:

- Biofuels are renewable, organic-based fuels obtained from biomass (plants, animal waste, or leftover residue from mills and processing centers).
- Biomass is converted into biofuels through a chemical process called fermentation.
- During fermentation, certain molecules are broken down anaerobically, or without oxygen ($O_2$).
- The products of fermentation in plants and yeast include ethanol ($C_2H_5OH$) and carbon dioxide ($CO_2$).

Then the student gathered the materials needed to build a yeast mobile, which is a small model on wheels that can move using one of the byproducts of fermenting yeast and sugar.




The student conducted four trials using two brands of yeast and two types of sugar. The student added 1.0 gram (g) of Brand Red yeast and 2.0 g of sucrose to 25 milliliters (mL) of warm water. The student swirled the mixture and quickly added it to Chamber P on the yeast mobile. The student recorded the

distance the yeast mobile moved in meters (m). The student repeated the same procedures using different combinations of Brand Red yeast, Brand Blue yeast, sucrose, and dextrose. The student's results are listed in the table below. When yeast is added to a sugar solution, enzymes in the yeast convert the sugar into ethanol ($C_2H_5OH$) and carbon dioxide ($CO_2$).

| Trial | Brand of Yeast | Type of Sugar | Distance (m) |
|---|---|---|---|
| One | Red | Sucrose | 0.23 |
| Two | Red | Dextrose | 3.4 |
| Three | Blue | Sucrose | 0.45 |
| Four | Blue | Dextrose | 6.2 |

SC2110104_4

Which type of energy transfer occurs in the yeast mobile?

**A.** Light energy → chemical energy

**B.** Electrical energy → thermal energy

**C.** Mechanical energy → nuclear energy

**D.** Chemical energy → mechanical energy

SC2110106_3

Why did the yeast mobile move the farthest in Trial Four?

**A.** The student added more sugar to the water.

**B.** The temperature of the water was the highest.

**C.** The combination of yeast and sugar produced the most $CO_2$.

**D.** The Brand Blue yeast contained more enzymes than the Brand Red yeast.

SC2110105_4

What determines the direction the yeast mobile moves?

**A.** The length of Lever T

**B.** The diameter of Wheel W

**C.** The amount of pressure built up in Chamber P

**D.** The way in which String U is wound around Axle V

SC2110109_2

The student added the following notes about biofuels:

- In the United States, ethanol is made mostly from corn.
- There are advantages and disadvantages of using corn to make ethanol.

Then the student wrote these four statements.

1. Corn can be produced at a rate equivalent to the demand for corn.
2. A significant amount of land is needed to grow enough corn to make ethanol.
3. Production of ethanol is dependent on the quality of the growing season of corn.
4. Using corn to make ethanol can reduce the amount of biomass waste.

Which of these four statements are advantages of using corn to make ethanol?

**A.** 1 and 2 only

**B.** 1 and 4 only

**C.** 2 and 3 only

**D.** 3 and 4 only