

# SCIENCE

## Grade 4 Student Guide

What is science? Science is a tool for problem solving that uses what you already know to find out what you don't know. Science is not a big book of answers but a way to ask questions and design the best methods for getting at the answers. Science happens when we ask “Why?” and discover that there is a strategy for solving the puzzles in the world around us. Because of people who have asked questions and tried to solve problems, we can now explore space, design medicines to treat diseases, use computers, predict weather, and use natural resources more efficiently.

People use science every day in their jobs. Many jobs from farmers to astronauts use science. Even if you're not sure what you want to do when you get older, learning science will provide you with more choices and opportunities. You will discover that science can be a lot of fun!

### ABOUT THE TEST

The science test contains 54 multiple-choice questions. This test is **not** a timed test and you can take as long as you need to do your best. Most of the questions will assess general understanding of science content and problem-solving skills.

## Hints for taking AIMS – Science

- Remember that this is **not** a timed test! Take as long as you need and do your best work.
- All questions are multiple-choice. Look at **all** the choices and choose the **best** one.

# Sample Questions for Science

## What To Expect From This Section

This AIMS Student Guide for Science provides examples of the format and types of questions that will appear on AIMS Science. An attempt has been made to provide a sampling of the types of questions that might be asked; however, not every concept in each strand has a corresponding sample question. An answer key for the sample questions is provided at the end of this guide.

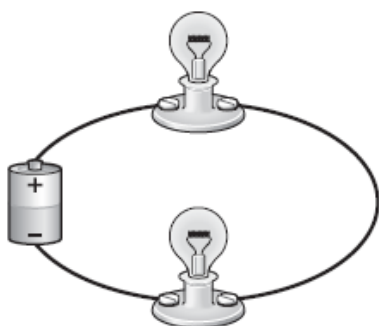
### Strand 1: Scientific Inquiry

#### General concepts you should know:

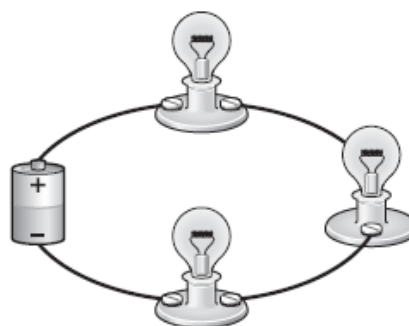
- Observe, ask questions, and make predictions.
- Participate in planning and conducting investigations and recording data.
- Organize and analyze data; compare results to predictions.
- Communicate results of investigations.

1.

A student observed the circuits below and noticed the light bulbs in Circuit 1 were brighter than the light bulbs in Circuit 2.



Circuit 1



Circuit 2

Based on this observation, which of the following is the **best** prediction?

- A** If more bulbs are added to a circuit, then the bulbs will become brighter.
- B** If more bulbs are added to a circuit, then the bulbs will become dimmer.
- C** If longer wires are used in a circuit, then the bulbs will become brighter.
- D** If longer wires are used in a circuit, then the bulbs will become dimmer.

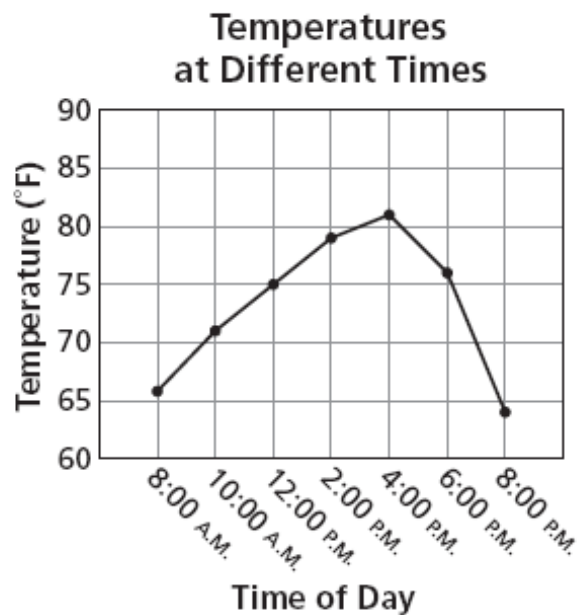
2.

Which statement is an **observation**?

- A The plant has flowers.
- B The plant is very pretty.
- C The plant will grow berries.
- D The plant might be poisonous.

3.

On Monday, students predicted how the temperatures would compare at different times of the day. The graph below shows the measurements the students took to test the predictions.

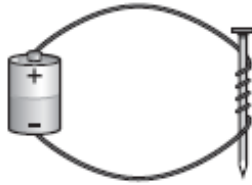


Which prediction is supported by the results in the graph?

- A The temperature will be higher at 12:00 P.M. than at 2:00 P.M.
- B The temperature will be higher at 6:00 P.M. than at 10:00 A.M.
- C The temperature will be higher at 12:00 P.M. than at 6:00 P.M.
- D The temperature will be higher at 10:00 A.M. than at 2:00 P.M.

4.

Students made an electromagnet by wrapping a wire in loops around an iron nail and attaching the wire to a battery, as shown below.



The students conducted a test to learn how the number of wire loops affected the number of paper clips held by the electromagnet. The table below shows the results of the test.

**Number of Paper Clips Held by Electromagnet**

Number of Wire Loops	Number of Paper Clips Held
10	2
20	4
30	7
40	9

Based on the information in the table, which of the following is the **best** conclusion?

- A** Adding more wire loops makes an electromagnet weaker.
- B** Adding more wire loops makes an electromagnet stronger.
- C** Adding more wire loops makes an electromagnet use less electricity.
- D** Adding more wire loops makes an electromagnet use more electricity.

**5.**

Students want to test how the temperature changes each day throughout the year. Which of the following does **not** have to be kept the same during the test?

- A** the place where the temperature is measured
- B** the thermometer used to take the measurement
- C** the person reading the temperature measurement
- D** the time of day when the temperature is measured

## **Strand 2: History and Nature of Science**

**General concepts you should know:**

- Identify individual and cultural contributions to scientific knowledge.
- Understand how science is a process for generating knowledge.

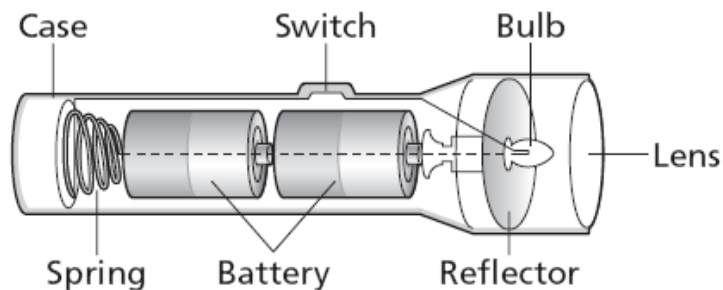
**6.**

Meteorologists study weather. Which of the following should meteorologists know about?

- A** types of fronts
- B** types of fossils
- C** types of circuits
- D** types of adaptations

**Directions:** Use the information below to answer Number 7.

A flashlight is a system of parts that work together, as shown in the diagram below



7.

What part of a flashlight provides energy?

- A battery
- B bulb
- C spring
- D switch

### Strand 3: Science in Personal and Social Perspectives

**General concepts you should know:**

- Describe the interactions between human populations, natural hazards, and the environment.
- Understand the impact of technology.

8.

Which natural event can dry out plants and cause wildfires?

- A drought
- B earthquake
- C flood
- D tornado

**9.**

Which invention has technology that helps people keep food fresh for a long period of time?

- A** dishwasher
- B** refrigerator
- C** electric mixer
- D** microwave oven

### **Strand 4: Life Science**

**General concepts you should know:**

- Understand that basic structures in plants and animals serve a function.
- Understand the relationship among various organisms and their environment.
- Identify plant and animal adaptations.

**10.**

To which group does an animal belong if it lays eggs and has scales and gills?

- A** amphibian
- B** bird
- C** fish
- D** reptile

**11.**

Which of the following does **not** give an example of how sparrows use resources in their environment to survive?

- A** Sparrows breathe air.
- B** Sparrows drink water.
- C** Sparrows use the sun for food.
- D** Sparrows use plants for shelter.

**12.**

Western coral snakes have a striped color pattern and are poisonous. Arizona mountain kingsnakes **look** like western coral snakes but are **not** poisonous.

The color pattern of the Arizona mountain kingsnake is an example of

- A** camouflage.
- B** mimicry.
- C** mutualism.
- D** parasitism.

### **Strand 5: Physical Science**

**General concepts you should know:**

- Investigate different forms of energy.

**13.**

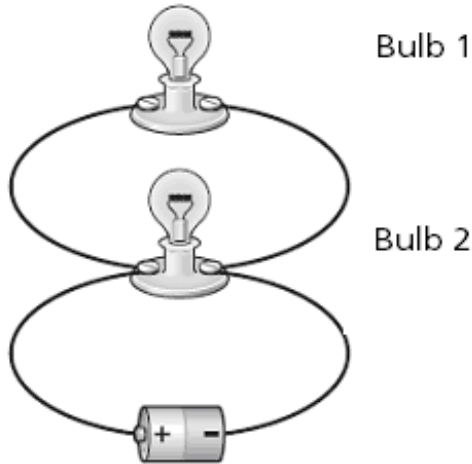
Which statement **best** explains the reason that electrical wires are made of copper?

- A** Copper is strong.
- B** Copper is flexible.
- C** Copper is a conductor.
- D** Copper is an insulator.



14.

Look at the diagram of the circuit below.



Which statement **best** describes what will happen if Bulb 2 burns out?

- A Bulb 1 will also burn out.
- B Bulb 1 will flash on and off.
- C Bulb 1 will stay lit and become brighter.
- D Bulb 1 will stay lit but will become less bright.

15.

Look at the diagram of the bar magnets below.



What will happen to the force between the two magnets if they are pulled farther apart?

- A The force would be weaker.
- B The force would be stronger.
- C The force would stay unchanged.
- D The force would reverse the poles.

## **Strand 6: Earth and Space Science**

### **General concepts you should know:**

- Understand the processes acting on the Earth and their interaction with the Earth systems.
- Understand characteristics of weather conditions and climate.

**16.**

Which of the following can cause erosion?

- A** falling leaves
- B** flowing water
- C** growing grass
- D** rising temperatures

**17.**

Which of the following is a **slow** process that changes Earth's surface?

- A** flooding
- B** earthquake
- C** wind erosion
- D** volcanic eruption

**18.**

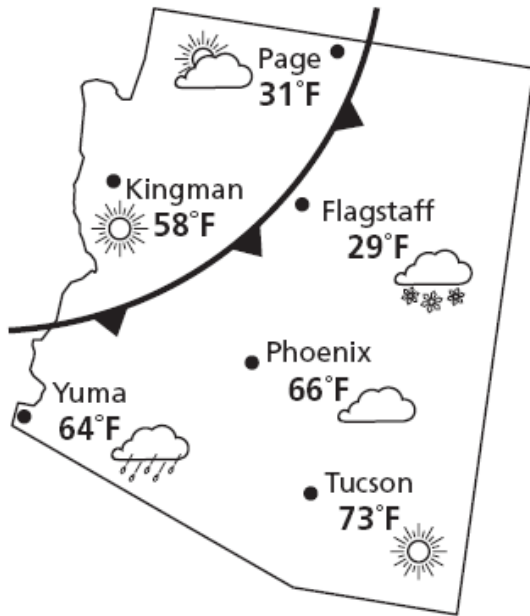
Which of the following contains **salt water**?

- A** oceans
- B** raindrops
- C** groundwater
- D** polar icecaps

**Directions:**

Use the information below to answer Numbers 19 and 20.

The map below shows the weather conditions for some of the cities in Arizona.



Key	
Sunny	Cold front
Partly sunny	Warm front
Cloudy	Occluded front
Rain	Stationary front
Snow	

**19.**

What type of front is moving through Arizona?

- A cold front
- B warm front
- C occluded front
- D stationary front

**20.**

Which city has snow?

- A Flagstaff
- B Kingman
- C Page
- D Phoenix

# Scoring Key and Coding of Items

**Science Key:**      **Strand:**      **Concept:**      **PO**

Question #1:	B	1	1	3
Question #2:	A	1	1	1
Question #3:	B	1	3	4
Question #4:	B	1	3	2
Question #5:	C	1	2	2
Question #6:	A	2	1	2
Question #7:	A	2	2	2
Question #8:	A	3	1	2
Question #9:	B	3	2	1
Question #10:	C	4	1	2
Question #11:	C	4	3	1
Question #12:	B	4	4	2
Question #13:	C	5	3	3
Question #14:	C	5	3	2
Question #15:	A	5	3	4
Question #16:	B	6	2	1
Question #17:	C	6	2	4
Question #18:	A	6	3	2
Question #19:	A	6	3	5
Question #20:	A	6	3	6