

RESEARCHING SKILLS

Identifying Bias

Suppose that while researching nutrition, you run across the following:

Vitamin A is an important nutrient. It is used to make rhodopsin, a pigment in our eyes. Thus, Vitamin A is necessary for healthy vision. People can develop night blindness if they do not get enough of it. Carrots are an excellent source of vitamin A. Carrots should be a part of your daily diet.

At first, this paragraph seems to offer good information. Would you be more skeptical if you learned that it was written by people who grow carrots commercially? How would your opinion change? Explain your answer below.

Bias Is Everywhere

Bias is a subjective way of thinking that tells only one side of a story, sometimes leading to inaccurate information or a false impression. When you research, it is crucial that you identify the level of bias in potential sources. Below are some possible sources of bias.

- The writer is relying on incomplete information.
- The writer is trying to deceive the reader.
- The writer wants to believe what he or she is saying.
- The writer’s past experience is influencing his or her thinking.
- The writer is trying to persuade the reader.

In the passage above, the writer does not mention that ingesting too much vitamin A can make people sick. The writer fails to tell the reader that eggs and sweet potatoes are also good sources of vitamin A.

Bias Rating

When reading information, think about what possible bias might be distorting the facts. You might use a scale such as the following:

- 1 = almost totally unbiased; highly objective; accurate
- 2 = mostly unbiased; fairly reliable
- 3 = somewhat biased; accuracy is questionable
- 4 = fairly biased; distorted; probably unreliable
- 5 = totally biased; highly subjective; inaccurate

Identifying Bias, continued

Bias Begone!

As you read the following paragraphs, determine the kind of bias being used. Explain your reasoning.

1. Returning wolves to their native habitats is critically important. The wolf is an original top predator in the natural ecosystems of North America. If these ecosystems are out of balance, they may collapse. If that happens, millions of organisms will go extinct. Even humans are in danger if we do not do something soon. We must make sure that there are wolves in all of North America's remaining natural areas.

2. Scientists use powerful computers to study the Earth's atmosphere. These computers help scientists predict changes in world climate. For instance, scientists use computers to study what might happen if pollution increases or decreases. Computers can also help scientists make recommendations to businesses, individuals, and other polluters. Eventually, we will know enough about climate changes to be able to control them.

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TROUBLESHOOTING

When reading a passage, ask yourself, "Will the writer benefit if I believe what is being told to me?" If the answer is yes, then the passage is likely to be biased.

TRY THIS!

Debaters often use bias intentionally to strengthen their position. Select one of the topics above, and have a debate with your classmates. Do your research, choose your position, gather your evidence, and have a vigorous debate!

33. Galileo's Vision by David White

A ¹It was a clear night in 1610 when Galileo Galilei looked through his telescope and saw the four closest moons of Jupiter. ²They were only dots in the sky, but they were there.

B ³It was quite a discovery. ⁴In fact, the moons Galileo saw were the first moons other than our own moon that anyone had ever seen.

C ⁵Now, Galileo didn't invent the telescope. ⁶Hans Lippershey of Holland did in 1608. ⁷He designed it so people could look at things far away. ⁸But Galileo was the first to use a telescope to look at stars and planets.

D ⁹Using the telescope, Galileo also discovered that our moon was not the perfect, mysterious sphere everyone thought it was. ¹⁰He proved that the moon was filled with craters. ¹¹He also proved that the light that seemed to be coming from the moon was actually a reflection of light coming from the sun.

E ¹²Galileo was also the first scientist to prove a theory by testing it and recording results. ¹³Until that time, scientists would prove their theories by making arguments without giving evidence.

F ¹⁴Galileo was the first to provide visual evidence in support of the theory that Earth revolves around the sun. ¹⁵A man named Copernicus of Poland had written in 1543 that Earth was not the center of the universe. ¹⁶He had said that the sun was the center of what we call the solar system and that Earth circled the sun. ¹⁷Not many people believed



him. ¹⁸Teachings until that time had placed Earth firmly at the center of the universe, with everything else revolving around it.

¹⁹Galileo, night after night, saw the moons of Jupiter at different points in the sky. ²⁰It was clear that they were circling Jupiter, not Earth. ²¹What Galileo saw helped prove Copernicus's theory.

G ²²Astronomy has come a long way since 1610. ²³We now know that Jupiter has at least 16 moons. ²⁴We know that our own solar system has nine planets. ²⁵We know that seven of those planets have moons. ²⁶We know that the universe contains other solar systems like ours. ²⁷We have telescopes searching the night sky for signs of life. ²⁸Thousands of people now do what one man started on a hill in Italy almost 400 years ago.

DIRECTIONS: Choose or write the best answer to each of the following questions using the evidence presented in the passage. When required, list specific sentence numbers or paragraph letters from the story to support your answer.

- 1. Which of these best explains why people before Galileo hadn't seen moons around Jupiter?
 - A. They hadn't looked in the right place.
 - B. They hadn't turned the telescope toward the night sky.
 - C. They thought Jupiter didn't have moons.
 - D. They thought Earth was the center of the universe.

Give the number of the sentence that best supports your answer. ____

- 2. Which of these words best describes the process that Galileo introduced to scientific theory?
 - A. visualization
 - B. determination
 - C. argumentation
 - D. experimentation

Give the number of the sentence that best supports your answer. ____

- 3. The author's purpose in writing this passage was probably
 - A. to discuss modern astronomy.
 - B. to show how to use a telescope.
 - C. to prove Galileo's theories about the universe.
 - D. to show Galileo's contributions to science.
- 4. Scientists before Galileo proved theories by making arguments. This kind of proof can best be described as
 - A. theoretical.
 - B. historical.
 - C. natural.
 - D. technical.

- 5. Compare the two scientific theories described in paragraph F.

- 6. Explain one way that Galileo changed the way people thought about the Moon.

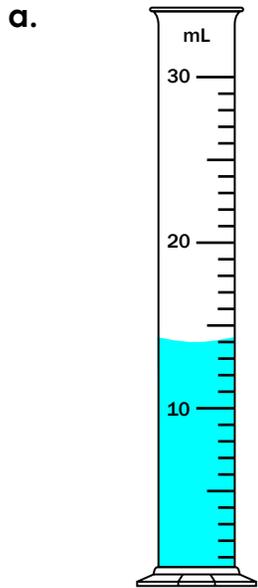
Give the letter of the paragraph that best supports your answer. ____

- 7. Which of these statements about the passage is an opinion?
 - A. The moon is filled with craters.
 - B. Galileo put the telescope to good use.
 - C. Galileo discovered four moons of Jupiter.
 - D. People didn't believe Copernicus's theory at first.

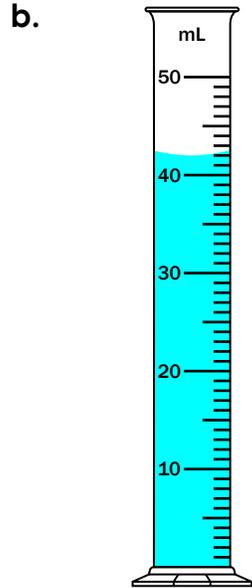
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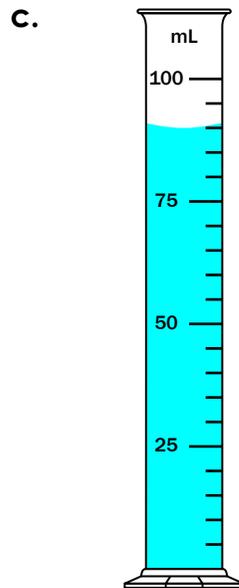
Graduated Cylinders

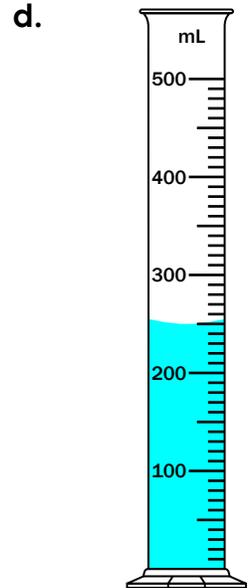
Read each graduated cylinder and write the amount. Be sure to include **mL** in your answer.

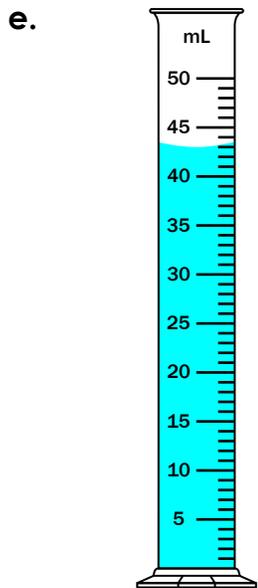


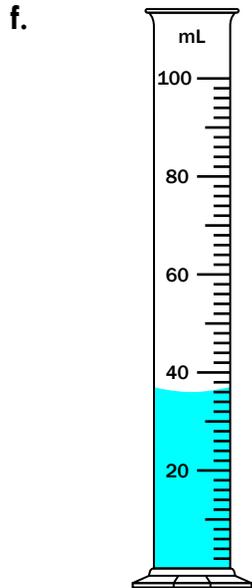
14 mL

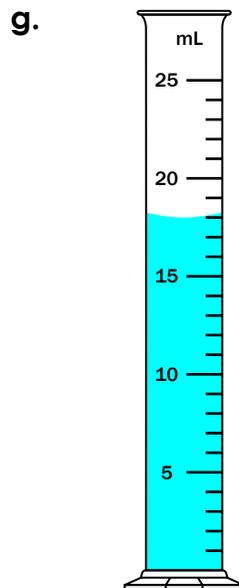


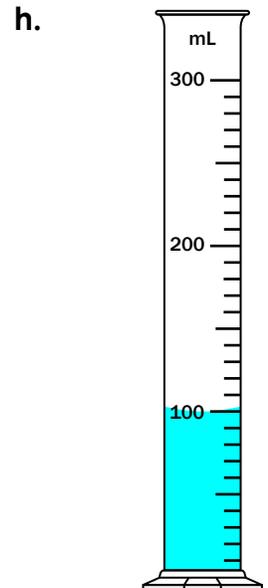












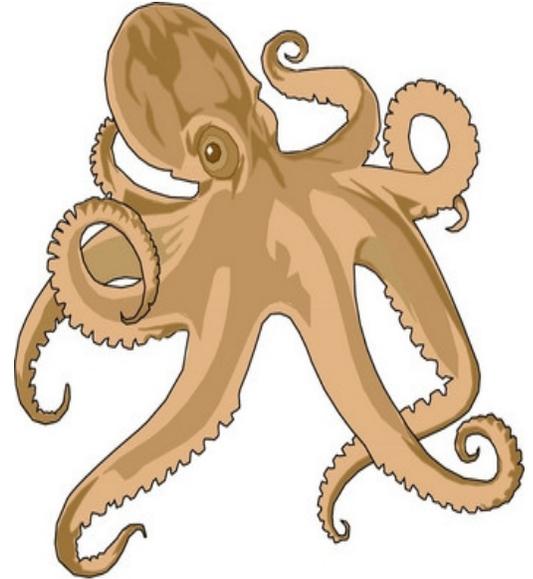
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MAGICIAN OF THE SEA

by Kelly Hashway

What do three hearts, eight arms, and one huge brain add up to? An octopus, a creature that can do amazing things.

Octopuses are extremely intelligent. They can learn new things just like humans. They've even learned a few tricks to get them out of sticky situations. If an octopus is threatened by a predator, such as a shark or bird, it can



use some pretty incredible skills to get away. Octopuses don't have teeth or sharp claws to defend themselves. Instead, they use more clever ways to fool their attackers. Octopuses like to hide themselves in the sand on the bottom of the ocean floor. How you ask? Well, the octopus is like a chameleon because it can change the color of its skin to match the sand. And this color change, or camouflage, happens in less than a minute.

Some octopuses like to stay in more shallow water where there are rocks and coral. Because octopuses are invertebrates, meaning they don't have backbones, they can squeeze themselves into small spaces between the rocks to get out of reach of their predators. Another way an octopus can hide is by shooting ink. An octopus uses a part of its body called a siphon to shoot ink into the water. The ink forms a cloud that hides the octopus. By the time the ink clears and the predator can see again, the octopus has swum away or hidden. It's very much like a magician doing a vanishing act.

If you think that's a neat trick, then you'll love what else these creatures have up their sleeves. If an octopus is being attacked, it can actually make itself look like a venomous sea snake. It will bury itself in the sand, keeping two arms visible. It will change the color of those arms to match a sea snake. But what if there's no time to hide? If an octopus is in trouble, it can break off one of its arms. The arm will then change colors and squirm around in the water to distract the predator while the octopus swims away to safety. Don't worry though. The octopus's arm will grow back.

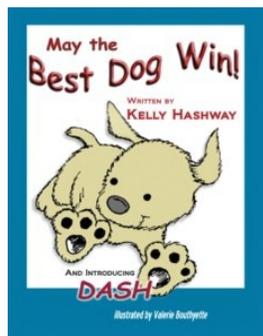
There is one kind of octopus that has venom to use in defense. The blue-ringed octopus is tiny; it could fit in the palm of your hand. Predators might think this size makes the octopus a great snack, but they know to stay away. The blue-ringed octopus is very poisonous and can



kill predators much larger than itself, including humans.

So the next time you see an octopus in the aquarium or while you're snorkeling, remember that inside that oversized head is a very large brain, making them a clever addition to the sea.

About the Author



Kelly Hashway's latest book, *May the Best Dog Win*, is now available!

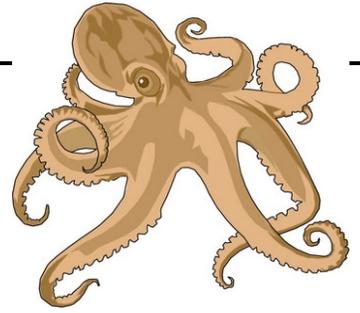
Dash has the perfect life until the Super Sweeper 5000 shows up. Sweeper runs all over the house sucking up the leftover food scraps, and he even gets his own room! But Dash won't give up his place as the favorite dog without a fight.

Hashway, Kelly. *May the Best Dog Win*. ISBN: 9780984589081

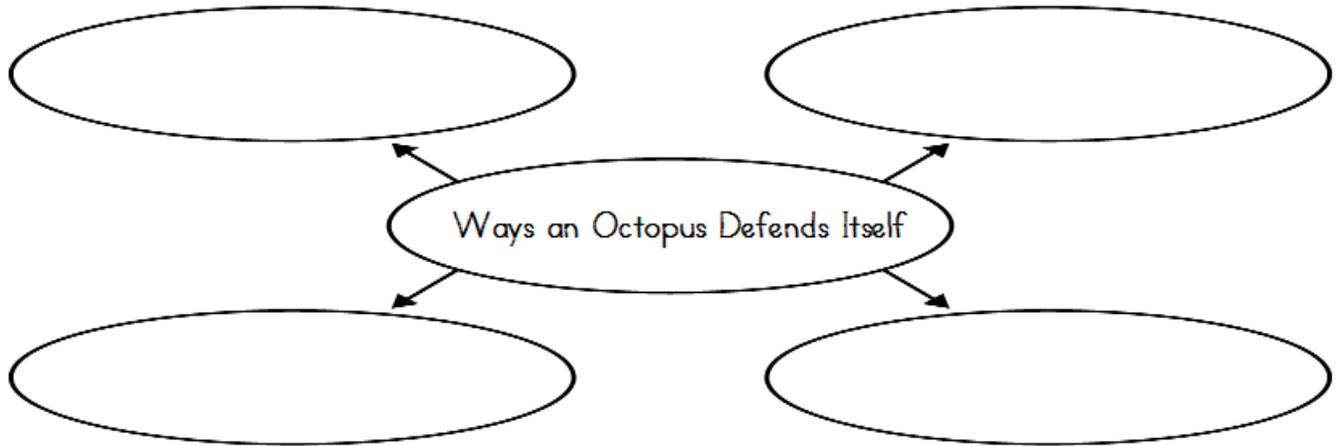
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Magician of the Sea

by Kelly Hashway



1. Complete the graphic organizer.



2. How are an octopus and a chameleon alike?

- a. They both like to hide on the ocean floor.
- b. They can both change the color of their skin.
- c. They are both invertebrates.
- d. They both use their arms to kill predators.

3. Explain how shooting ink helps an octopus to escape from predators.

4. What happens to an octopus if it loses one of its eight arms?

- a. It will grow a new one.
- b. It will die.
- c. It is no longer poisonous.
- d. It can swim faster.

5. What is the author's purpose for writing this article.

- a. to explain how octopuses eat, live, and play
- b. to show how dangerous octopuses are
- c. to describe the physical characteristics of octopuses
- d. to explain how octopuses protect themselves

Name: _____

Magician of the Sea

Vocabulary Activity

The scrambled words below are vocabulary words from the article. Unscramble each word and write it on the line. Please be sure each word is spelled correctly.



1. _____

t i e e g t l l n n

hint: smart; brainy

2. _____

m u a f c l o e g a

hint: ability to blend in

3. _____

r i b n e v e t a e r t

hint: animal without a backbone

4. _____

b e i s v i l

hint: in sight; able to be seen

5. _____

t e s o r d p a r

hint: animals that hunt other animals

6. _____

r o k s e n g n i l

hint: diving under water with a breathing tube

7. _____

n i m a c g i a

hint: person who performs tricks