BEARCAT DAY 9

GRADE 8
ANDERSON COUNTY SCHOOLS

ANDERSON COUNTY MIDDLE SCHOOL

8TH GRADE BEARCAT DAY 9

LANGUAGE ARTS	ANALYZE INFORMATIONAL TEXTS REVIEW PRACTICE Please go to your Language Arts Google Classroom. Click on the Bearcat Days/NII Days Assignment to enter answers for all of your Language Arts Bearcat Days (NII Days) each day. If you cannot send your Language Arts answers electronically each day, write your answers on notebook paper and bring to school at your earliest convenience. AC staff members will be reaching out to you multiple times a week. Don't hesitate to contact us with questions!
MATH	MULTIPLYING AND DIVIDING WITH SCIENTIFIC NOTATION Read through the Bearcat Day 9 Lesson. Work through the practice problems in the lesson. After completing the lesson, complete the Bearcat Day 9 Google Form that goes with the lesson. This Google Form will be graded and entered into the grade book. Please give your best effort! We have included a Khan Academy video to help you with the content if you are struggling. If you cannot complete the assignment electronically, complete it on notebook paper and return it to the school
SCIENCE	ECOSYSTEMS Students should complete the assignment in their science class' Google Classroom.
SOCIAL STUDIES	THE SLAVERY DEBATE Students should complete the assignment in their social studies' class' Google Classroom. Read the passage. Answer the questions in COMPLETE sentences, restating the questions. Cite line/paragraph from passage.
PE/HEALTH	DREAM JOBS: HEART SURGEON Students should read the article and answer the questions in Mrs. Wells' Google Classroom.
CAREERS	Dream Jobs: Roboticist Let's explore some COOL JOBS! Read the article and answer the questions in Mrs. Beasley's Google Classroom.

Grade 8 Day 9 ELA

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Use the Reading Guide to help you understand the passage.

Saving Our Species

Reading Guide

Summarize the first two paragraphs. What is the main idea of this passage?

What does the first heading reveal about the author's choice of structure for the passage?

What cause-and-effect relationships are explained in this part of the article?

What do the mountain gorilla, bluefin tuna, and hawksbill turtle have in common? They are all endangered species. An endangered species is a group of related living things with such a small population that it risks becoming extinct.

Species have always gone extinct because of climate change, changes in an environment, or disease. Research suggests, however, that the rate of extinction has greatly increased in recent decades because of human activity. Scientists estimate that one to five species die off each year. Because the human population started to explode around 1900, however, the rate is 1,000 to 10,000 times higher. Now dozens of species become extinct every day. In other words, our growing population puts pressure on other living things through habitat loss, pollution, disease, invasive species, and misuse. People around the world, however, hope to reverse these conditions using a variety of approaches.

Scientific Research

Scientists, such as wildlife biologists, ecologists, veterinarians, geneticists, reproductive biologists, and environmentalists, are key in the effort to preserve species. They carry out field and lab research and ecological studies that help explain why a species is endangered and how it can be restored.

Consider how scientists helped rescue the American bald eagle. The number of bald eagles in the United States had dropped during the 1950s. It was not clear why. Then, a scientific investigation found that DDT, a pesticide used on crops, accumulated in the eagles' bodies. The DDT thinned the shells of the eagles' eggs so that they did not hatch properly. This discovery led to a ban on DDT.

Similar research brought about a change in attitude toward wolves. In the 1920s, native wolves in Yellowstone National Park were mostly killed off because they were considered a risk to visitors. No one realized how this change would affect the ecosystem's balance. Soon, trees were overgrazed, and animals that ate the trees were going hungry. Scientists traced the problem back to the missing wolves that had previously thinned these animal herds. Their findings convinced enough people to believe wolves are key to Yellowstone's ecosystem. The wolves were reintroduced in 1995.

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Reading Guide

Identify the key idea in each of the first, second, and third paragraphs on this page.

How does the text make connections between these related ideas? How does it show the ways that the ideas are different?

Why is government intervention essential to the protection of endangered species?

Many scientists work directly with plants and animals to develop products, food, and medicine. Their results help the public see the benefits of preserving biodiversity. It would be a terrible loss if a plant became extinct before its life-saving properties were discovered! Helping animals survive, breed in captivity, or better reproduce also helps endangered species. Many scientists work on these problems to increase the species' survival rates.

Scientists who research extinct species might also contribute to saving endangered ones. The study of the cell structure and DNA of extinct species could add to a general understanding of life on Earth. Any knowledge of how life began, survived, and died can help scientists solve issues of life today.

It is never clear where scientific research will lead. Some of the most practical discoveries started out as pure investigations. Studying extinct species might be "interesting" now but could lead to useful solutions in the future. The connections between extinct species and endangered ones, such as cell structure and DNA, make that possibility even more likely.

Government Action

Government intervention is essential to the protection of species at risk. In 1966, for example, the U.S. Congress passed the Endangered Species Preservation Act. This act listed endangered animals and gave them some protection under the law. In 1969, Congress amended the act to protect endangered species worldwide by banning their importation and sale in the United States. This amendment led to an international meeting in Washington, D.C., at which eighty nations signed the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITIES). This plan monitors or restricts the trade of endangered plant and animals.

Later that same year, Congress passed the Endangered Species Act to implement the CITIES plan and to further protect native species. It now lists about 2,100 species, nearly 1,500 of them in the United States, and makes it illegal to kill, harm, or take a listed species from its habitat. A 2012 report found that 90 percent of the species on the list were improving at an expected pace. Despite that success, though, only one percent of species have been delisted.

Reading Guide

In what ways is the International Union for Conservation like CITIES?

How might monitoring or restricting the trade of endangered species or their parts help save a species?

Environmental Organizations

Private organizations also work to protect endangered species. Many conservation groups, for example, work to maintain worldwide rainforests, which are home to millions of species. Logging and clear-cutting have decimated large numbers of species there in recent decades. Groups help locals earn income from tourism instead of from cutting down trees.

Other groups intervene more directly to save species. The International Union for Conservation of Nature keeps the "Red List" of endangered species. Nations agree to restrict trade of the listed species or their parts, such as elephant tusks. Zoo associations or groups such as the World Wildlife Fund also work directly to save animals. The Smithsonian National Zoo in Washington, D.C., for example, has helped to restore giant pandas, tigers, and cheetahs to the wild.

Public Interest

One key to saving species is to excite people about the effort. Without public interest and cooperation, efforts to preserve species will probably fail. Because people are interested in extinct species, like dinosaurs, species research that captures attention is good for endangered species and humans alike. For example, it was public interest in the American bald eagle that led to the ban on DDT. This chemical was later identified as a cancer-causing agent in humans.

Preserving biodiversity, or the variety of life on Earth, is critical. Each species plays a special role in its ecosystem, and it is impossible to determine the consequences when one disappears. In addition, healthy ecosystems benefit humans. They purify water resources, replenish the oxygen supply, and contribute to climate stability. It requires the efforts of scientists, governments, private organizations, and individuals to preserve this biodiversity. In saving one species, we can better understand and protect the requirements necessary for all life, including our own.

Answer the following questions.

1. Read the sentence from the passage and the directions that follow.

   Some of the most practical discoveries started out as pure investigations.

   Which words are synonyms for the academic vocabulary word practical? Choose **all** that apply.

   A. sensible
   B. useful
   C. unsuitable
   D. helpful
   E. foolish

2. Which of the following statements from "Saving Our Species" is based on speculation?

   A. Scientists estimate that one to five species die off each year.
   B. The DDT thinned the shells of the eagles' eggs so that they did not hatch properly.
   C. Any knowledge of how life began, survived, and died can help scientists solve issues of life today.
   D. Nations agree to restrict trade of the listed species or their parts, such as elephant tusks.

3. In what ways does listing a species as endangered help that species? Cite evidence from the text to support your response.

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Answer the following questions about both passages in this lesson.

4 Which **two** sentences from "Saving Our Species" present reasons or evidence that agree with the information in "Extinction Is Forever"?

A. In other words, our growing population puts pressure on other living things through habitat loss, pollution, disease, invasive species, and misuse.

B. Scientists traced the problem back to the missing wolves that had previously thinned these animal herds.

C. Studying extinct species might be "interesting" now but could lead to useful solutions in the future.

D. Each species plays a special role in its ecosystem, and it is impossible to determine the consequences when one disappears.

5 Read the sentences from the passages and the directions that follow.

from "Extinction Is Forever"

Humans are rapidly destroying natural habitats and forcing many plants and animals out of existence. The loss of even one species disrupts the balance of nature in a habitat. It can result in a domino effect that causes other species to fail. We need to find ways to maintain and restore these habitats so that isolated plant and animal groups have room to grow and flourish.

from "Saving Our Species"

Preserving biodiversity, or the variety of life on Earth, is critical. Each species plays a special role in its ecosystem, and it is impossible to determine the consequences when one disappears. In addition, healthy ecosystems benefit humans. They purify water resources, replenish the oxygen supply, and contribute to climate stability.

Which text better explains the concept of biodiversity, or the balance of nature? Explain your thinking.

Grade 8 Day 9 Math

Unit: Exponents and Scientific Notation
Student Handout 7

Notes

p 1 of 2

MULTIPLYING AND DIVIDING WITH SCIENTIFIC NOTATION

MULTIPLICATION

- To multiply values in scientific notation, rearrange the multiplication problem and apply the laws of exponents.
- For example: $(4.5 \times 10^5)(2 \times 10^3) = (\underline{4.5 \times 2})(\underline{10^5 \times 10^3})$
- Therefore, the final answer in scientific notation would be: $\underline{9 \times 10^8}$

DIVISION

- To divide values in scientific notation, rearrange the division problem and apply the laws of exponents.
- For example: $\frac{8 \times 10^6}{4 \times 10^3} = \underline{\frac{8}{4}} \times \underline{\frac{10^6}{10^3}}$
- Therefore, the final answer in scientific notation would be: $\underline{2 \times 10^3}$

Practice multiplying and dividing with scientific notation. Write solutions in both scientific and standard form.

1. $(3 \times 10^4)(7.2 \times 10^2)$

*This example is a good time to point out to students that the first part of scientific notation needs to be between 1-10. Therefore, they might have to rewrite their answer (21.6×10^3) at times.

Scientific: 2.16×10^7

Standard: 21,600,000

2. $(1.5 \times 10^5)(5 \times 10^3)$

Scientific: 7.5×10^8

Standard: 750,000,000

3. $\frac{9 \times 10^9}{3 \times 10^7}$

Scientific: 3×10^2

Standard: 300

4. $\frac{9.45 \times 10^7}{2.1 \times 10^2}$

Scientific: 4.5×10^5

Standard: 450,000

Grade 8 Day 9 Math

Unit: Exponents and Scientific Notation
Student Handout 7

Practice Set p2of2

MULTIPLYING AND DIVIDING WITH SCIENTIFIC NOTATION

MULTIPLICATION	• To multiply values in scientific notation, rearrange the multiplication problem and apply the laws of exponents. • For example: $(4.5 \times 10^5)(2 \times 10^3) = (\_\_\_\_\_)(\_\_\_\_\_)$ • Therefore, the final answer in scientific notation would be: _____
DIVISION	• To divide values in scientific notation, rearrange the division problem and apply the laws of exponents. • For example: $\frac{8 \times 10^6}{4 \times 10^3} = \_\_\_\_\_ \times \_\_\_\_\_$ • Therefore, the final answer in scientific notation would be: _____

Practice multiplying and dividing with scientific notation. Write solutions in both scientific and standard form.

1. $(3 \times 10^4)(7.2 \times 10^2)$ Scientific: _____ Standard: _____	2. $(1.5 \times 10^5)(5 \times 10^3)$ Scientific: _____ Standard: _____
3. $\frac{9 \times 10^9}{3 \times 10^7}$ Scientific: _____ Standard: _____	4. $\frac{9.45 \times 10^7}{2.1 \times 10^2}$ Scientific: _____ Standard: _____

13.

Grade 8 Day 9 Science

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Chapter 8 • Lesson 39

Ecosystems

Key Words • ecosystem • producer • consumer • decomposer • food web • ecological succession

Getting the Idea

Life on Earth has many different forms. Each species is adapted to thrive in a particular role in its environment, including in its relationships with other organisms. For example, some species must find organisms to eat and avoid being eaten. Ecology is the study of these interactions.

Food Webs and Ecosystems

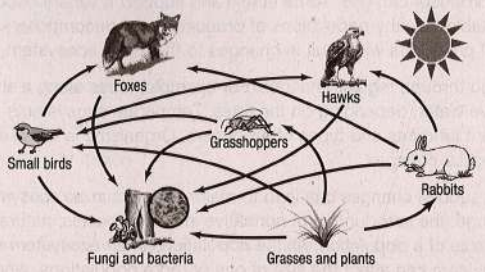
An **ecosystem** is made up of all the populations of organisms in an area and their nonliving environment. Some organisms produce useable forms of matter and energy for the ecosystem, other organisms consume it, and still others help to recycle matter so it can be used by other species.

Recall from Lesson 29 that glucose is a basic nutrient used in cellular respiration. **Producers**, also known as *autotrophs*, are organisms that capture energy and store it in the chemical bonds of glucose and other simple molecules, usually through photosynthesis. Producers use these molecules for energy, to build larger bodies (growth), or to store them for later use. The energy in these molecules originated from sunlight, and the matter came from carbon dioxide and water, as well as nutrients in the soil. Plants, some kinds of bacteria, and algae are producers.

Consumers, also known as *heterotrophs*, are organisms that obtain their energy by eating other organisms. When a consumer eats a producer, energy and matter transfer from the producer to the consumer. Consumers are classified into levels. *Primary consumers* eat producers. *Secondary consumers* eat primary consumers, and *tertiary consumers* eat secondary consumers. All animals and many protists are consumers.

Ecosystems also contain **decomposers**, which get energy from organic wastes, such as fallen leaves or dead organisms. To get the energy they need, decomposers break down complex molecules. Fungi, such as mushrooms, and many soil bacteria are decomposers. Decomposers secrete chemicals that break down the food outside their bodies, and then they absorb the nutrients they need. Decomposition returns unused compounds to soil or water, where producers can take in the compounds again.

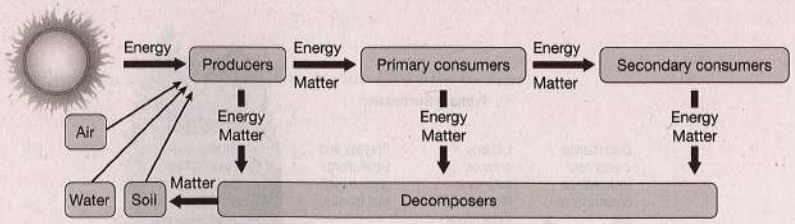
The path of matter and energy from producer to consumer to decomposer is called a *food chain*. All the interconnected food chains in an ecosystem make up a **food web**, which can be shown in a diagram like the one below. The arrows in the diagram point *from* an organism being consumed or decomposed *toward* the organism that consumes or decomposes it.



Energy in Ecosystems

The arrows in the food web diagram show the flow of energy through the ecosystem, from one organism to the next. Energy travels in one direction only. Unlike matter, energy does not return to producers once decomposers have used it.

All the energy in the organisms making up an ecosystem comes from the sun. Producers convert this energy to the chemical energy in matter. They use some of it to carry out life processes and store some of it in their bodies. Some energy is lost as heat. Primary consumers then eat the bodies of producers. They, too, use some of the stored energy for life processes, losing some of it as heat. Secondary consumers ingest the bodies of primary consumers, repeating the process. In this way, energy flows to higher levels of an ecosystem, with some getting "lost" when it is converted to heat at each step because of the second law of thermodynamics. Recall the laws of thermodynamics from Lesson 16.



The producers contain most of the matter and energy in an ecosystem. Populations of producers are generally much larger than populations of consumers. Similarly, populations of primary consumers tend to be larger than populations of secondary or higher-order consumers.

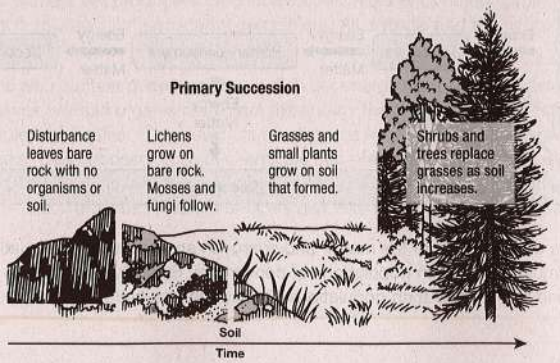
Ecosystem Changes

Although an ecosystem can exist without consumers, no ecosystem can survive without producers and decomposers. The simplest food chain is producer → decomposer. The producer captures the energy that drives the system, and the decomposer breaks down wastes into molecules that the producer can use. To be stable and support a variety of populations, an ecosystem needs stable, healthy populations of producers and decomposers. Changes to the numbers or types of producers will result in changes to the entire ecosystem.

Many ecosystems go through regular changes. For example, areas along a shoreline may be under water or above water, depending on the tides. Temperate ecosystems cycle through seasons with different amounts and types of producers. Organisms in these ecosystems are adapted to these regular changes.

In contrast, large or sudden changes can lead to major changes in an ecosystem. These changes include climate change, the introduction of nonnative invasive species, natural disasters, or a large change in the size of a population. All the populations in an ecosystem are interconnected. Changes in an ecosystem can affect the size of one or more populations, which can in turn affect other populations. Many ecosystem changes are the result of human activity, as you will learn in Lesson 41.

Some ecosystem disturbances are dramatic enough that only soil or bare rock is left behind. Some species may be well adapted to the new conditions and will thrive. Other species may be poorly adapted to the new conditions and will decline. Species from nearby communities may move into the area. **Ecological succession** is a natural process in which one community of organisms gradually replaces another after a disturbance. Primary succession happens after an ecosystem is destroyed, leaving only bare rock. A volcanic eruption might cause such a change. Secondary succession happens when the existing soil is not destroyed, such as after a fire, hurricane, or tornado. The first organisms to colonize a bare environment include lichens, fungi, and mosses, which can live on bare rock. These organisms build new soil as they carry out their life processes. When enough soil has been created, small plants such as grasses start to grow. These may allow animals to begin moving into the ecosystem. In time, shrubs and then trees replace the small plants. Eventually, a stable community is created, and succession slows.



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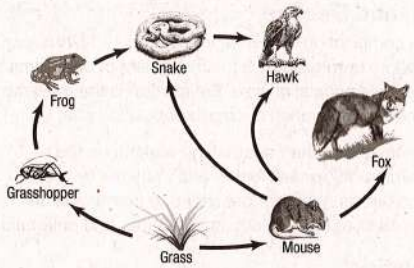
Discussion Question

Describe the different forms energy takes as it travels from the sun to producers and consumers. How does the transfer of energy through an ecosystem relate to the first and second laws of thermodynamics?

Lesson Review

1. Which of the following are essential components of any ecosystem?
   - **A.** producers and consumers
   - **B.** producers and decomposers
   - **C.** decomposers and consumers

Use the food web shown below to answer questions 2 and 3.



2. Which of these organisms in the food web is a primary consumer?
   - **A.** frog
   - **B.** grass
   - **C.** hawk
   - **D.** mouse

3. Which population in the food web is **most likely** the smallest?
   - **A.** fox
   - **B.** grass
   - **C.** hawk
   - **D.** snake

4. What is the role of decomposers in an ecosystem?
   - **A.** Decomposers transfer energy and matter from producers to consumers.
   - **B.** Decomposers recycle energy and matter so that producers can use it.
   - **C.** Decomposers use the energy in dead organisms and return matter to the soil.
   - **D.** Decomposers move unused matter and energy out of the ecosystem.

Duplicating any part of this book is prohibited by law.

Grade 8 Day 9 Social studies

P 1 of 1

The Slavery Debate

As you read in Chapter 10, most white southerners did not think slavery was wrong. They argued that slavery was necessary.

The South Defends Slavery

Many southern slaveholders pointed out that they depended on enslaved people to grow their crops. They argued that slaves were valuable property, like land and farm animals. They said that the Fifth Amendment to the Constitution protected a person's property. Asking a slaveholder to free his enslaved people was like asking him to give away his land.

Many southern whites were not slaveholders. But they still supported slavery. Slavery had been part of southern life for more than 200 years.

A Call for Equality

During the 1830s, some Americans began to call for an end to slavery and for *equality*, or equal treatment, for African Americans.

The attack on slavery was led by a group of reformers called ***abolitionists***. Most abolitionists were northerners. Abolitionists believed that no one had the right to own another person. They worked to *abolish*, or end, slavery.

Abolitionists Speak Out

In the 1830s, abolitionists formed groups such as the American Anti-Slavery Society. They also published their own newspapers and printed articles that attacked slavery.

Abolitionist speakers traveled throughout the North, trying to convince Americans that slavery should be abolished.

The best speakers against slavery were people who had seen slavery up close. Some were former slaves, such as **Frederick Douglass** and **Sojourner Truth**. They helped people understand how it felt to be enslaved.

Other speakers were whites from the South, such as Sarah and Angelina Grimke, sisters from South Carolina. They had grown up hating the way enslaved people were treated on their plantation. Both had left the South and joined the abolitionists.

In 1852, **Harriet Beecher Stowe** wrote a book called *Uncle Tom's Cabin*. The book told stories she had heard from runaway slaves. It helped to turn the North against slavery.

In 1854, many Americans joined with abolitionists to form a new political party. They called it the **Republican Party**. Republican leaders promised to work in Congress to end slavery.

The Debate in Congress

The Missouri Compromise of 1820 banned slavery in the northern half of the Louisiana Territory. That included land that became Kansas Territory.

Then, in 1848, the United States won a war against Mexico. The United States won new territories in the Southwest as a result of the war. In Congress, the question most hotly debated was this: Should slavery be allowed in the new territories?

Looking Back

1. According to southerners, how did the Constitution protect the right to own slaves?
2. How did abolitionists attack slavery?
3. What did leaders of the new Republican Party promise to do?

Health & PE.

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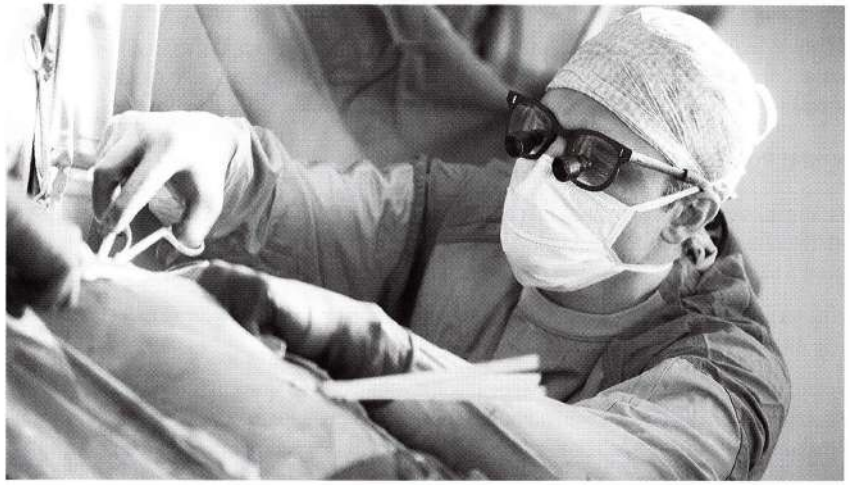
Dream Jobs: Heart surgeon

By Jill Insley, The Guardian, adapted by Newsela staff on 10.18.16
Word Count **831**



A heart surgeon operates. Getty

A 9-month-old baby lies on an operating table. His eyelids are taped shut and a breathing tube has been put into his nose. A line has been drawn on his chest to show the surgeon where to make the cut. Nurses paint his body with antiseptic to protect the baby from infection.

The boy is from Italy and suffers from what is called long segment tracheal stenosis. This means that the breathing tube leading to his only lung is too narrow. He was born with just one lung. The baby has been brought to Great Ormond Street Hospital (GOSH) in London, Engand, to be operated on by Professor Martin Elliott. He is a pediatric cardiothoracic surgeon and is part of one of only four or five teams in the world specializing in this type of operation.

Teamwork Key To Success

Elliott says that right before operating he feels "tense but confident — I'm much more anxious about public speaking — but once I get started I relax."

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Elliott has been at the hospital since 7 a.m. It is now about 9:50 a.m., and the anesthetist has spent just over an hour carefully putting the baby to sleep for the operation. Now it is Elliott's turn.

There are 13 people in the operating room, including two other surgeons, and Elliott calls for the team to be silent so he can run through the details of the operation.

The baby's windpipe is 3 mm (one-eighth of an inch) across, although it should be twice as wide at his age. The problem has not only slowed his growth, but it is also threatening the baby's life. His identical twin brother has grown more quickly.

Machine Pumps Heart

The baby is put on a heart bypass machine that puts oxygen in his blood and pumps his heart. Elliott quietly asks nurses to pass him the surgical instruments. Elliott operates to widen the trachea, explaining each move to his team as he makes it.

It is not easy, since the trachea is about an inch-and-a-half long and the width of a slim pencil. All the surgeons wear "lupes," or special magnifying glasses.

The other surgeons close the wound while Elliott enters details of the operation into a computer. These are sent to the Department of Health and other centers: By sharing the information, the chances are better that doctors will discover ways of making the operation safer and more effective.

Last year, Elliott lost his son, who was in his 20s. He better understands how scary the operation is for parents. "The operation represents four or five hours when they don't know whether their child is coming back."

Anyone considering a career as a surgeon can forget working just 40 hours a week. Elliott works five 12-hour days a week and can be called to the hospital for emergencies. Younger surgeons do even longer hours.

Dedicated Family Makes Job Easier

How do doctors and their families deal with long hours? "It's exciting for the doctor. You've got a very, very important problem to solve — a child's life to save. You go through a long training and have very intense, highly motivated people to work with. But you need a dedicated family behind you as it's very stressful for everyone."

Elliott knows the long hours are necessary, but he said it has really affected his family. His children would say that there was always another, sicker child that would take their father's attention. Elliott said they understand his job and that the sick children need him, too, "but it still hurt to hear it."

Apart from surgery, he spends a lot of time teaching and speaking about the operation around the world. He also operates in other countries when patients are too ill to travel to London.

The baby will be kept quiet for a couple of days to allow the trachea to start healing, but Elliott checked on him after 24 hours; he was doing just fine.

Job Stats

Hours: Although doctors are not supposed to work too many hours, they spend much time on study and research.

Work-life balance: Hard to maintain. Elliott says: "My difficulty is not getting surgeons to work — but making them stop."

Salary: For surgeons in Great Britain, basic pay is £90,200 ($114,000) and average total earnings are £119,800 ($151,000).

Best thing: "It's never boring." There's a huge variety of work: seeing patients, research, writing and lecturing and operating in almost every country of the world.

Worst thing: "Losing a child during or after an operation. You can't help but feel personally responsible."

Overtime

Elliott enjoys listening to music and likes hearing classical or jazz music played in the operating room. He was inspired when watching a Grand Prix race by the similarities between racing teams dealing with pit stops and the medical teams transferring patients from the operating room to intensive care after surgery. GOSH has worked with the Ferrari and McLaren car companies to reduce the risk to patients after surgery.

Quiz

1 Which detail would be MOST important to include in a summary of the article?

(A) Elliott enjoys listening to music when he operates.

(B) Heart surgeons spend a lot of hours working.

(C) The baby's trachea is the width of a small pencil.

(D) The surgical team has to be quiet to hear the details of the operation.

2 Which of the following BEST expresses a MAIN idea from the section "Teamwork Key to Success"?

(A) Heart surgeons work with many people to get the job done.

(B) One important job in a hospital team is the anesthetist.

(C) There is a group of 13 people in the operating room.

(D) Even though Elliott is a respected surgeon, he gets nervous about public speaking.

3 Which answer choice accurately characterizes Elliott's reaction to losing a patient?

(A) He feels personally responsible.

(B) He keeps quiet for a couple of days.

(C) He does research on how to improve the operation.

(D) He spends a lot of time talking about the operation.

4 What is the MOST likely reason the author included the information about how Elliott's family feels about his long hours?

(A) to show that Elliott was not a good father to his children

(B) to show that Elliott regrets his choice of becoming a heart surgeon

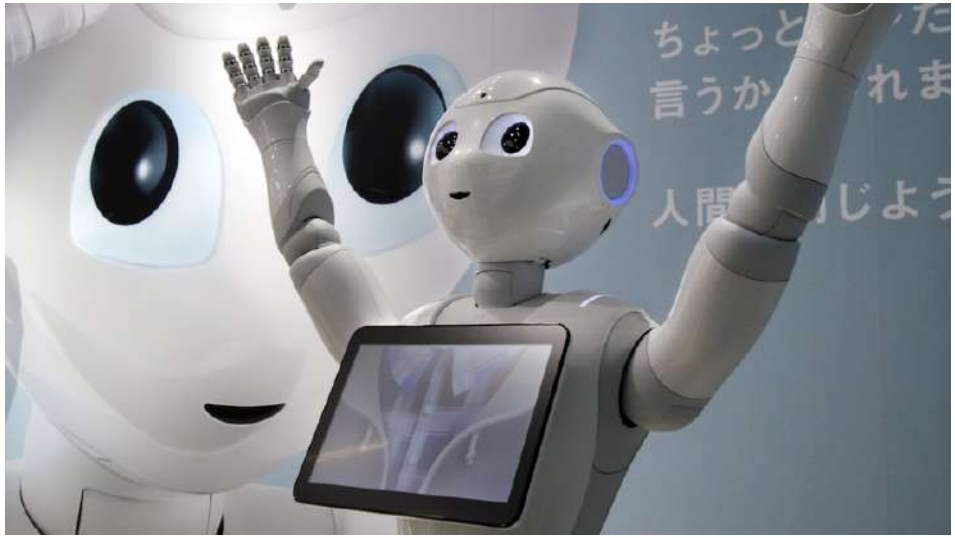
(C) to describe a hard side of the job so the readers have a realistic idea of what it is like

(D) to reveal a negative side of the job so readers will not want to become surgeons someday

5. What search terms might you use to conduct more research to understand some of the topics in this article better? What would you hope to learn in your research?

Dream Jobs: Roboticist

By Murray Shanahan, as told to The Guardian, adapted by Newsela staff on 01.05.17
Word Count **633**
Level **960L**



TOP: Humanoid Robot "Pepper" is an example of a robot with artificial intelligence. Photo: AP Photo/Koji Sasahara. BOTTOM: Ava, the AI robot from the movie "Ex Machina." Photo courtesy of Flickr.

Science fiction stories by Isaac Asimov inspired me to become a roboticist. I was in high school in the late 1970s, and that was the time when home computers were just starting. I began programming and knew immediately that was what I was interested in pursuing as a career. I went to Imperial College to do my computer science degree. In the mid-80s I did a Ph.D. in using logic and symbolic logic for the basis of artificial intelligence at Cambridge University. I returned to Imperial to study electrical engineering and eventually got my first teaching position there.

The Brains Behind Robotics

I want to understand how the human brain can be used in the field of artificial intelligence (AI). We are not really anywhere near the vision of robots that inspired me as a kid, so I decided we needed to understand the brain better and started working more and more on neural networks. At the same time, I became very much interested in the possibility of AI having consciousness. The latter is now a well established area of scientific study.

Raising Consciousness About AI

Creating a conscious AI with human-level intelligence is still a distant dream. In "Ex Machina," we are clearly supposed to believe that the AI character Ava has consciousness. I am not saying that AI wouldn't have consciousness if it had human intelligence, but I am not saying it would either. It could go either way, and you have to separate those two ideas. But how far are we from any of these ideas becoming reality? It is definitely not around the corner.

No Suffering For His Art

We have a moral duty to protect an AI that is capable of suffering. In the film, our sympathies are with Ava. She is conscious, suffering and should be allowed freedom. So, I think it is entirely appropriate to have that concern toward her. However, there are huge limitations to that – firstly, we are nowhere near achieving this aim. It is currently a hypothetical issue that is possibly centuries away. Secondly, it is also possible that we might be able to build human-level AI that is not conscious and doesn't experience suffering. In which case, we wouldn't have a moral responsibility toward it.

The Great Unknowns

AI technology is already here and shaping our modern lives. We see the use of artificial intelligence in the latest self-driving cars or digital personal assistants, such as Apple's Siri. There are other types of AI that have been around for quite a long time, such as computer vision. Then there are the systems that make decisions about mortgages. These types of technology will become increasingly important in the next 5 to 10 years. But none of that compares to human-level intelligence. We really don't know how many breakthroughs we might have to make to get there. It is all unknown unknowns.

Field Of Dreams

If you want a job in robotics and AI, a degree in a science is essential. You should study computer science, mathematics, physics or even neuroscience. Everybody should also learn programming. If you are graduating soon, it is a really good time to be entering this industry. AI is a hot field at the moment in terms of career prospects. There is a lot of interest, particularly in machine learning and computer vision. Those are two areas of AI that have really taken off. There are also lots of AI startups filling a gap in the market by selling expertise in the field to large companies.

Murray Shanahan is professor of cognitive robotics at Imperial College, London, England. He was an official adviser for the science fiction film "Ex Machina," a psychological thriller about a revolutionary new form of artificial intelligence (AI).

This article is available at 5 reading levels at https://newsela.com.

Quiz

1 Read the section "The Great Unknowns."

What conclusion can the reader make based on this section?

(A) We will use artificial intelligence less frequently in the upcoming years.

(B) Some modern conveniences depend on artificial intelligence.

(C) Computer technology is the only way we can use artificial intelligence.

(D) Artificial intelligence with human-level intelligence is likely to be created in 5 to 10 years.

2 Which of the following selections from the article BEST shows how robotics scientists refer to information from other fields of science?

(A) I went to Imperial College to do my computer science degree and in the mid-80s I did a Ph.D. in using logic and symbolic logic for the basis of artificial intelligence at Cambridge University.

(B) We are not really anywhere near the vision of robots that inspired me as a kid, so I decided we needed to understand the brain better and started working more and more on neural networks.

(C) We see the use of artificial intelligence in the latest self-driving cars or digital personal assistants, such as Apple's Siri.

(D) These types of technology will become increasingly important in the next 5 to 10 years. But none of that compares to human-level intelligence.

3 Which answer choice BEST characterizes the author's attitude about creating conscious AI with human-level intelligence?

(A) hopeful, but cautious

(B) terrified, but excited

(C) troubled, but intrigued

(D) interested, but doubtful

4 What is the MAIN reason why the author discusses the movie "Ex Machina"?

(A) "Ex Machina" is an example of how much the author loves science fiction, but encourages the reader to study real robotics instead of fiction stories. .

(B) "Ex Machina" is an example of how robots can be used in every day life, and how robotics can help solve problems.

(C) "Ex Machina" is an example of how robots can be developed to have artificial intelligence, and how scientists should not give up hope.

(D) "Ex Machina" is an example of how science fiction can inspire imaginations, but is not intended to show reality.

Grade 8 Day 9 Careers