

# AP Biology Summer Assignment

Welcome to AP Biology. Completion of this summer assignment will allow us to cover the AP Biology curriculum at a reasonable pace during the school year. The summer assignment consists of Reading Comprehension Sheets (RC Sheets) and edpuzzle videos on 4 chapters from your text. The points from the assignments in the videos will be combined with your written answers of the RC sheets for your total summer assignment grade. The order in which you are to complete the summer assignment components as well as the edpuzzle login information are found on page 3 of this document. The RC sheets are found starting on page 4. Always remember that you are responsible for all information from the assigned reading throughout the year. The chapters that will be covered in this summer assignment include chapters 1 and 52-54. Here are some key points to remember when completing the assignments:

1. Repetition is intentional. DO NOT write “see number 4 above” or “this answer was given in number 7 of part 1” for example.
2. When an assignment is to be handwritten, that is what it means. The RC sheets assigned as part of this summer assignment are to be NEATLY HANDWRITTEN. Not typed. Every student can write legibly if time is invested.
3. All summer assignments will be collected the first day of class. Assignments are not divided during the summer. I encourage you to divide the reading yourself over several weeks. The reading level may be easy, but the volume is large and you are expected to remember the material from these chapters.
4. There will be a quiz on these chapters on the second class session.
5. Any student that does not complete the summer assignment will likely find it impossible to successfully complete the course.

Reading for AP Biology: When I assign “read”, understand that just reading is not studying. You are supposed to internalize and remember the information from the reading. In order to do this, you should produce something while you read – the most common and usually beneficial product is summary notes. While you read do the following:

1. Look at the section headings and pictures in the chapter and predict what you will be learning about.
2. Read the first paragraph in the section and then write a one sentence summary of the material. Do this for each paragraph.
3. At the end of the section, write a brief summary of the entire section.

This is a very condensed version of the SQ5R study technique that is found on the following page. Consider using the full SQ5R throughout the year whenever time allows.

I recommend beginning the assignments in mid-July to have plenty of time and then review the material prior to the start of school so that the information will be fresh in your mind when the year begins.

If you have any questions during the summer, I can be reached at [ekincaid@k12.wv.us](mailto:ekincaid@k12.wv.us).

## SQ5R Study Method

from: <http://www.radford.edu/content/LARC/home/learning-guides/reading-tips.html>

**The SQ5R study method enables you to actively study textbooks and readings.** This method can help you process information actively which in turn leads to higher memory and mastery of the material. SQ5R is an excellent technique to use with textbooks that provide a lot of information and require you to learn material in depth. Textbooks in many disciplines such as biology, psychology, and sociology fall into this category.

**SURVEY** - Before reading the actual chapter, read the introduction and summary (if given). Skim through the chapter paying attention to topic headings, bold-faced words, pictures, charts, and graphs. These can give you an idea of the general structure and content before you begin reading.

**QUESTION** - Set a purpose for your reading by developing questions about the material. Use the topic and heading information you gathered in the survey step to create questions to be answered. Begin asking yourself who, what, where, when, why, and how questions. Questions are most beneficial when they are general, covering main topics and important points.

**READ** - Break the material into sections that will take about 20 minutes to read (often the chapter is already broken into sections which will work just fine). Read the material section by section. Look for answers to your questions, key concepts, and supporting details. Study charts, graphs, tables, and pictures. These can serve to present new information as well as tie together concepts from the reading.

**RESPOND** - After each section, think about the material you have just read and answer the questions you have asked. This can be done at the same time as the reading step, since often response is automatic. The main point of this step is to think about the material and take notice of what is important.

**RECORD** - Go back and underline key concepts and take notes. This can be done on a separate sheet of paper, on note cards, in the margins of the textbook, or any way that works well for you. (Do this after each section.)

**RECITE** - Next, look away from the material and try to recite the key information and ideas. Put the material in your own words and go back and re-read until you feel comfortable with it. This may be frustrating at first, but it will lead to better understanding and save you review time in the long run. (Do this after each section.)

**REVIEW** - After completing the entire chapter, scan back over the reading and review the information aloud or in your head. Talk about the material with a classmate if possible. Try to identify overall themes and relationships between concepts. Make any necessary revisions of your notes or markings so they can be easily understood later.

Now that you know about the **SQ5R method** for reading text books, the next step is to use this strategy while reading your next assignment. You may want to begin by selecting one class for which you will use SQ5R to read every chapter prior to your next test. Below are some additional strategies you may want to implement along with reading the chapter using this method:

- Plan ahead and start early. SQ5R takes time and is not a strategy that can be employed or used effectively the night before a test.
- Plan to read each chapter before it's discussed in class. Doing this will make the class lecture a review. It is also likely to help you to understand the material that is presented in class at a deeper level.

Complete the summer assignment in this order:

1. Read chapter 1 and complete parts 1 and 2 of the RC sheet for chapter 1.
2. Complete the “AP Bio Summer Assignment Video 1” on edpuzzle.

Instructions for Edpuzzle Account Set-up:

1. Go to <https://edpuzzle.com/>
2. If you already have an account, log in. If you do not have an account, click on “sign up”.
3. Click on “sign up as a student”
4. Click on Create an edpuzzle account.
5. Enter the class code: **pucikne**
6. Enter your actual first name and then last name as it appears in schoology.
7. Make a username and password.
8. Click “create your account”.

NOTE: Chrome may have an issue with some of the videos. If you are using a chrome browser and you have a problem watching the videos, do the following:

1. Go to this webpage: `chrome://flags/` (Just copy and paste it into your browser as if it were a normal webpage.)
2. You'll see a search bar at the top, click on it and search for "Hardware-accelerated video decode" (without the quotation marks).
3. The option "Hardware-accelerated video decode" should appear with an "Enabled" blue tab on the right. Click on the blue tab and select "Disabled."
4. It will then ask you to relaunch the browser to apply this change. Click the "Relaunch Now" button at the bottom.
5. Done! Now please check if the video is working when using Chrome.

Please note that this particular issue only applies to Chrome browsers.

If a problem persists, contact the edpuzzle support desk and make me aware of the issue. Edpuzzle is very reliable and you should have no problems accessing the videos. Late assignments (written or electronic) are not accepted so set up the account early to make sure it is working.

(Summer assignment – continued)

3. Complete Part 3 of the RC Sheet for chapter 1.
4. Read chapter 52 and complete the RC sheet.
5. Watch edpuzzle video 2: Ecology intro
6. Read chapter 53 and complete the RC sheet.
7. Watch edpuzzle video 3: Population Ecology
8. Read chapter 54 and complete the RC sheet
9. Watch edpuzzle video 4: Community Ecology
10. Study the summer assignment.

## ***Reading for Comprehension***

## ***Campbell's Biology, Chapter 1***

***Chapter 1 is review information.***

***All answers are to be completed on your own paper, neatly written. Each part is to be clearly separated from the others by written heading. Include your Name, Title, and chapter number on your answer sheet. Late assignments will not be accepted.***

***Directions for part 1: Answer the following questions in complete sentences.***

1. Describe the characteristics of life in your own words – briefly.
2. How would you explain to someone that fire is not alive? Use the specific requirements of life you described in number 1.
3. Explain the levels of organization presented in chapter one and relate this to the requirements of life.
4. Compare and contrast (both) the prokaryotic and the eukaryotic cell.
5. What is meant by the statement that ‘biological systems are much more than the sum of their parts’? Include a description of emergent properties in your answer.
6. Explain the meaning and significance of negative feedback in biological systems.
7. How are organisms classified?
8. Describe the three domains of life.
9. Explain the term natural selection and explain its significance.
10. Examine the themes of biology presented in chapter 1. Prepare a brief one sentence summary of the themes described in your text.

***Directions for part 2: Complete the Scientific Skills Exercise on page 22 of your text.***

***Directions for part 3: Note: Normally you will complete the edpuzzle videos after completing the entire RC sheet. However, in this case, I recommend you complete the Summer assignment video 1 in edpuzzle before completing part 3 of this RC Sheet. Read the following passages and answer the questions that follow. All answers should be complete but brief and concise. Complete sentences are NOT required.***

### ***Part A:***

No one told the parents of 13-year-old Sarita Kudurnula that the teenager was involved in a medical study. The first they knew of it was after she collapsed and died, some days after receiving the injection. The teenager had been part of a study carried out in a remote part of the Indian state of Andhra Pradesh (AP) to test the feasibility of vaccinating large numbers of young women against the Human Papiloma Virus (HPV), which is sexually transmitted and is one of the causes of cervical cancer. The trial, administered in conjunction with the state government, was led by a US-based Non-Government Organization (NGO), Path, which received millions of dollars from the Bill and Melinda Gates Foundation. Samples of an anti-cancer vaccine, Gardasil, produced by US company Merck, were provided free of charge. Officials wished to know whether the vaccine could be introduced as part of a national immunization program.

After Sarita's death both Path and Merck insist that Gardasil is safe. In a sense, though, the cause of Sarita's death is beside the point. What is beyond dispute is that Sarita's father and mother, and the parents of hundreds of other tribal girls, were not

informed that their daughters were taking part in a clinical trial - something that is in breach of bio-ethical guidelines laid down by the Medical Research Council of India, which demands that those participating in trials give "informed consent". When The Independent visited the Government Girls' High the hostel warden confirmed that health officials had come to the hostel and outlined their plan to vaccinate 300 girls. He said that because it was a government project, he had been told he could authorize the trials without parental permission. "We did not show any forms or ask for the signatures of the girls or the parents," he said.

"The most significant deficiency in the implementation of the trial was the obtaining of consent," said one finding. Spokesmen for the Gates foundation, and Merck emphasized that the drugs involved in the studies are safe. On the issue of consent, Gates foundation spokesman Chris William said: "The implementing partner on the ground (the state of AP) made the decision to empower headmasters to provide consent for this licensed vaccine in some special circumstances. We haven't seen anything that would suggest that the decision should be second-guessed."

1. What was the hypothesis that scientists in drug companies were trying to answer?
2. What would you define as the "experimental group" in the study?
3. In an experimental trial, such as the one described above, suggest one thing that you think would make the study more scientific.
4. What bioethics guideline was breached in the above-mentioned trial?

**Part B:**

Many people complained of intestinal cramps after eating chips containing Olestra (fat substitute) and thought that Olestra was at fault. For this activity, act as if you are going to do an experiment to test whether this was true (no you will not actually be designing or conducting the experiment but answer the following based on an experiment you *would* design).

1. What would your hypothesis be?
2. What is your testable prediction?
3. What would your control group be?
4. What would your experimental group be?
5. What would the dependent variable be in this experiment?

**Part C:**

You are conducting an experiment to determine if increased ultraviolet radiation from the decrease in the ozone layer is killing off frog tadpoles. After examining all of the data available in the library, you decide to go with a hypothesis that increased ultraviolet radiation from the sun is killing off the tadpoles.

You design an experiment with a control group and an experimental group. Your control group (group 1) involves 100 tadpoles in a five-gallon container of water that is covered by glass (knowing that the glass will filter out the ultraviolet radiation). The experimental group (group 2) will be set up exactly like group 1, except that instead of being covered with glass, it is covered with an acrylic plexiglass, which will not filter out the U.V. radiation. You then place the groups outside for a period of one month, and record the results shown in the table below.

<b>Results</b>		
	<b>Group 1</b>	<b>Group 2</b>
<b>Number of tadpoles alive at start</b>	<b>100</b>	<b>100</b>
<b>Number of tadpoles alive after 1 month</b>	<b>96</b>	<b>96</b>

Using this information, answer the following questions.

1. What is the experimental variable and what is the dependent variable?
2. Does the information from this experiment support the hypothesis?
3. If no, then what might be causing the decrease in frog populations?
4. Which is the control group, and which is the experimental group?
5. What is the difference between the two groups? Should they be different in any other way?

**Part D:**

Niko Tinbergen (1907-1988) was a Swedish Ethologist (animal behaviorist) famous for studying animals in their native habitats. One of his classic experiments involved a bird called the black-headed gull (*Larus ridibundus*). Black-headed gulls build nests of twigs on the ground and lay light brown eggs that are covered with dark brown spots. However, the inside of the egg is white in color. Tinbergen noticed that adult gulls pick up the eggshells shortly after a chick has hatched and fly them to a location far from the nest, where they are left. Since this behavior required expending energy and time that could have been spent feeding and protecting the chicks, Tinbergen wanted to know why the birds did this so he designed an experiment with the following components.

**Problem:** Why do black-headed gulls remove eggshells from the nest?

**Hypothesis:** The white interior of the shell is not camouflaged and attracts predators to the nest. Therefore, the gulls remove the shells to decrease predation.

**Test:** Tinbergen and his co-workers collected gull eggs and painted 69 of them white and left 68 of them with their natural color. (Statistically, these numbers are close enough to be considered equal.) The researchers then scattered the eggs next to a gull breeding area and observed from a nearby blind. Predation rates were recorded for white versus natural colored eggs.

	<b>Original number of eggs</b>	<b>Eggs taken by predators</b>	<b>Eggs not taken by predators</b>
<b>White Eggs</b>	<b>69</b>	<b>43</b>	<b>26</b>
<b>Natural Eggs</b>	<b>68</b>	<b>13</b>	<b>55</b>

1. Do the results of this experiment support the hypothesis? Why or Why not?
2. Are you 100% sure (without a doubt) that your hypothesis is correct? (Is it proven?)
3. If you were working with Tinbergen, what would you suggest be done next?
4. Identify the experimental and dependent variables.

## **Reading for Comprehension**

## **Campbell's Biology, Chapter 52**

No, this is not a mistake. You are now jumping to the back of the book. We will be completing three chapters on ecology (52-54). Your quiz will be on chapters 1 and 52-54.

***All answers are to be completed on your own paper, neatly written. Each part is to be clearly separated from the others by written heading. Include your name, the title of the assignment, and chapter number on your answer sheet. Late assignments will not be accepted.***

***Directions for part 1:*** Answer the following questions in complete sentences.

1. What is ecology?
2. Explain the meanings of Climate, macroclimate and microclimate.
3. What causes the seasons on Earth? When is earth closer to the sun – during winter in West Virginia or during summer in West Virginia?
4. Explain how bodies of water and mountains can affect weather patterns.
5. What is the difference between biotic and abiotic factors? How do biotic and abiotic factors affect the distribution of biomes?
6. What are some interactions between organisms and their environment that limit their distribution?
7. Describe the vertical stratification of aquatic biomes. Note that this description is for both freshwater and marine biomes.
8. Define detritus. How is it important to an aquatic ecosystem and where does it come from?
9. Explain the difference between natural eutrophication and cultural eutrophication.
10. Why are some biomes richer in species abundance than others?
11. Why is productivity higher in some ecosystems than others?

***Directions for part 2:*** Complete the Test Your Understanding questions (numbers 1-9) at the end of the chapter. After completing the questions, check your answers from the key in the Appendix. After the letter of each correct answer, explain why it was correct. This may entail describing why the other answers are incorrect.

***Directions for part 3:*** Complete the following questions. Answers must be in essay form. Outline form is NOT acceptable. Labeled diagrams may be used to supplement discussion, but in no case will a diagram alone suffice. It is important that you read each question completely before you begin to write.

1. How is population size regulated by abiotic and biotic factors? Describe two abiotic factors and two biotic factors in your explanation and give examples of how each factor affects a specific population.
2. Describe homeostasis (see chapter 40 beginning on page 875) and explain how different organisms maintain homeostasis. Discuss the meanings of regulators and conformers. In your discussion, describe why few organisms can be considered perfect regulators or perfect conformers. How would being a regulator or conformer impact the type of biome that an organism inhabits?

***Directions for part 4:*** Complete the Scientific Skills Exercise on page 1181 of your text.

## Reading for Comprehension

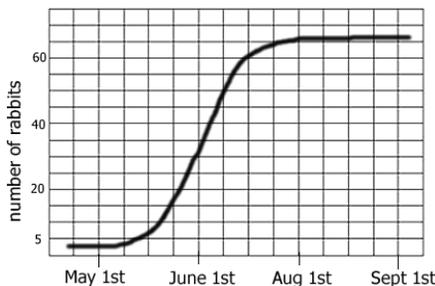
## Campbell's Biology, Chapter 53

All answers are to be completed on your own paper, neatly written. Each part is to be clearly separated from the others by written heading. Include your name, the title of the assignment, and chapter number on your answer sheet. Late assignments will not be accepted.

**Directions for part 1:** Answer the following questions in complete sentences.

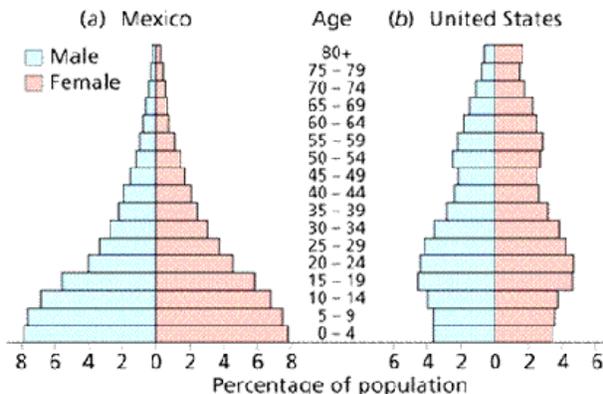
1. Draw the growth curve of a population living under ideal, unlimited conditions. What is the name of this type of growth and what is its distinguishing characteristic? Why is this type of growth rarely if ever observed?
2. Explain how density, dispersion, and demographics can describe a population.
3. Given that the US birth rate is currently at replacement level fertility, why is our population growing?
4. Describe what is likely to happen to a population that exceeds the carrying capacity of its ecosystem. Explain your answer.
5. Distinguish between  $K$  selected and  $r$  selected populations.
6. What general shape of an age structure diagram would lead a person to predict a large population increase?
7. Name and describe three patterns of population dispersion.
8. What are some of the advantages and disadvantages of increased age at first reproduction? Give an example of a species that has a low age at first reproduction and an example of a species that has a high age at first reproduction.
9. Compare and contrast the exponential and logistic models of population growth.
10. Discuss an example of an organism that undergoes regular, periodic cycles in population. Discuss some of the hypotheses as to why these cycles occur.

**Directions for part 2:** Use the graph, table, and age structure diagram to complete the questions below:



Questions for part 2

1. During which months were the rabbits in exponential growth?



2. Based on the age structure diagram, which country is expected to have a more stable population?
3. In Mexico, what percentage of the population is between 0-4 years of age?

Year	Snakes	Mice Born	Mice Died
1960	2	1000	200
1970	10	800	300
1980	30	400	500
1990	15	600	550
2000	14	600	600
2001	15	640	580

4. According to the graph, what is the carrying capacity of the snakes?
5. Which year did the mouse population experience zero population growth?

**Directions for part 3:** Complete the following questions. Answers must be in essay form. Outline form is NOT acceptable. Labeled diagrams may be used to supplement discussion, but in no case will a diagram alone suffice. It is important that you read each question completely before you begin to write.

1. Describe density-dependent and density-independent limiting factors. Discuss two populations, one limited by density-independent factors and the other limited by density-dependent factors.

**Directions for part 4:** Complete the Scientific Skills Exercise on page 1194 of your text.

## ***Reading for Comprehension***

## ***Campbell's Biology, Chapter 54***

***All answers are to be completed on your own paper, neatly written. Each part is to be clearly separated from the others by written heading. Include your Name, Title, and chapter number on your answer sheet. Late assignments will not be accepted.***

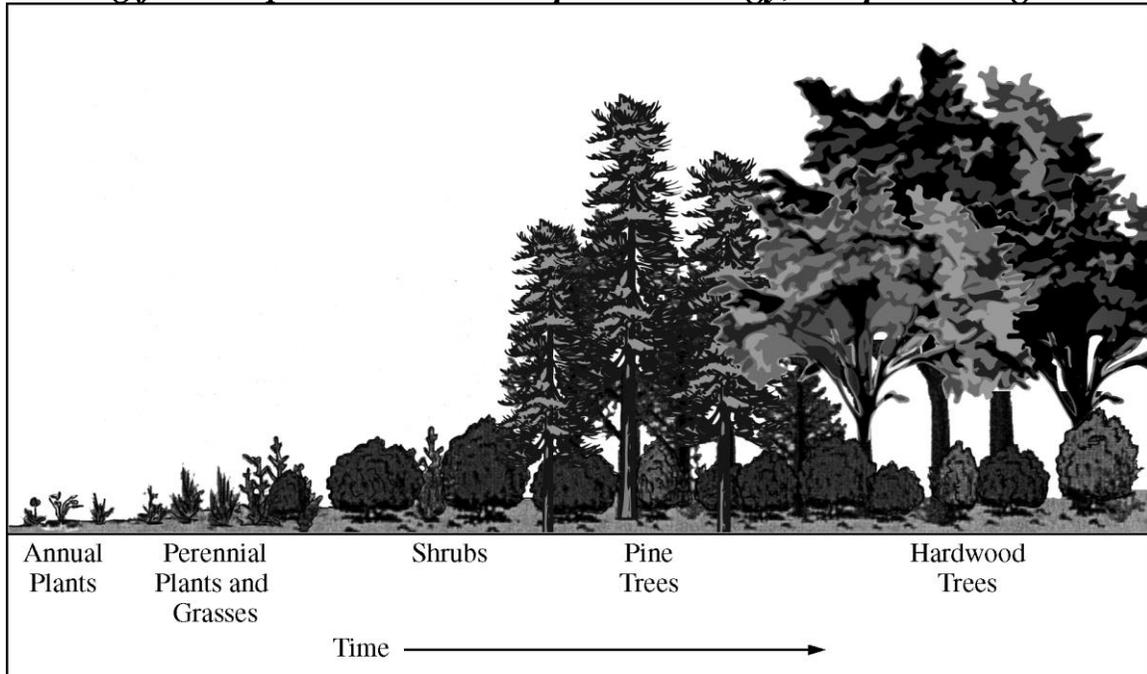
***Directions for part 1:*** Answer the following questions in complete sentences.

1. Describe the following terms: ecological niche, fundamental niche, and realized niche.
2. Distinguish between interspecific and intraspecific interactions.
3. Explain the competitive exclusion principle.
4. What is resource partitioning and how does it impact the competitive exclusion principle?
5. Explain the concept of character displacement.
6. Describe the following interactions: Competition, Predation, Herbivory, Facilitation.
7. What is Symbiosis? Describe the following symbiotic relationships: Parasitism, Mutualism, and commensalism.
8. What is the difference between Batesian mimicry and Mullerian mimicry?
9. Use a specific example to explain how keystone species impact community structure.
10. Why is it difficult to demonstrate the existence and importance of competition?
11. What is Ecological Succession? How is primary succession different from secondary succession?
12. What is biogeography? Explain how the biogeographic factors of latitude and area contribute to species diversity.

***Directions for part 2:*** Complete the Test Your Understanding questions (numbers 1-8) at the end of the chapter. After completing the questions, check your answers from the key in the Appendix. After the letter of each correct answer, explain why it was correct. This may entail describing why the other answers are incorrect.

***Directions for part 3:*** Complete the following questions. Answers must be in essay form. Outline form is NOT acceptable. Labeled diagrams may be used to supplement discussion, but in no case will a diagram alone suffice. It is important that you read each question completely before you begin to write.

1. Describe the effects that interspecific interactions may have on a population's density. For each type of interaction provide a specific example where the interaction is evident.
  2. A volcano forms in the middle of the Pacific Ocean. Over time, the lava hardens, and the volcano becomes dormant. The result is a large island. Describe the initial conditions of this environment. Describe the ecological succession which would be observed at this location. Discuss as many stages as possible. Describe how the immigration of organisms would be possible.
- (Continued on next page)



3. The diagram above shows the succession of communities from annual plants to hardwood trees in a specific area over a period of time.

(a) **Discuss** the expected changes in biodiversity as the stages of succession progress as shown in the diagram above.

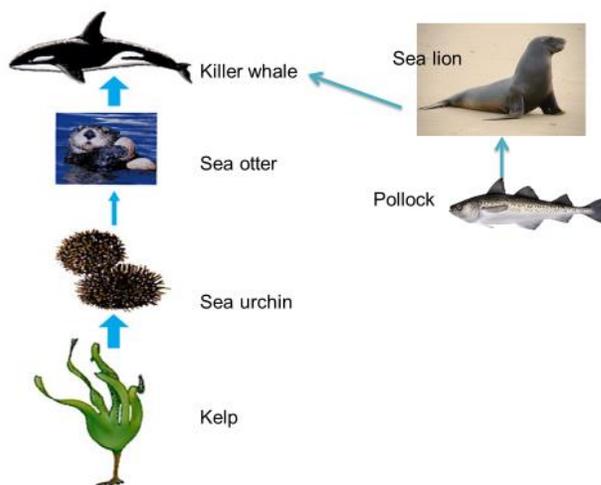
(b) **Describe** and **explain** THREE changes in abiotic conditions over time that lead to the succession, as shown in the diagram above.

(c) For each of the following disturbances, **discuss** the immediate and long-term effects on ecosystem succession.

(i) A volcano erupts, covering a 10-square-kilometer portion of a mature forest with lava.

(ii) A 10- square-kilometer portion of a mature forest is clear-cut.

**Directions for part 4:** Use the food chain and the provided information to answer the questions that follows.



1. Pollock are a type of fish. They are sea lions' primary food source. The preferred prey of killer whales is sea lion. Using the above information and the given food chain, explain how overfishing of pollock lead to a decrease in Kelp AND a decrease in the overall biodiversity of the ecosystem.