USING THE PRINCETON REVIEW APPROACH TO CRACK THE SYSTEM

We mentioned earlier that our approach is strategy-based. As you're about to see, many of these strategies are based on common sense—for example, using mnemonics like "ROY G. BIV." (Remember that one? It's the mnemonic for red, orange, yellow, green, blue, indigo, violet— the colors of the spectrum.) Others are not so common-sensical. In fact, we're going to ask you to throw out much of what you've been taught when it comes to taking standardized tests.

There are eight strategies that we'll ask you to apply come test time:

- Strategy 1: Pace Yourself
- Strategy 2: The Three-Pass System
- Strategy 3: Process of Elimination
- Strategy 4: Aggressive Guessing
- Strategy 5: Word Associations
- Strategy 6: Mnemonics
- Strategy 7: Identify EXCEPT Questions
- Strategy 8: The Art of the ETS Essay

Let's take a look at the Princeton Review approach.

Strategy 1: Pace Yourself

When you take a test in school, how many questions do you answer? Naturally, you try to answer all of them. You do this for two reasons: (1) Your teacher told you to, and (2) if you left a question blank, your teacher would mark it wrong. However, that's not the case when it comes to the AP Biology Exam. In fact, finishing the test is the worst thing you can do. Before we explain why, let's talk about timing.

One of the main reasons that taking the AP Biology Exam is so stressful is the time constraint we discussed above—45 seconds per multiple-choice question and 22 minutes per essay. If you had all day, you would probably do much better. We can't give you all day, but we can do the next best thing: We can give you more time for each question. How? By having you slow down and answer fewer questions.

Slowing down, and doing well on the questions you do answer, is the best way to improve your score on the AP Biology Exam. Rushing through questions in order to finish, on the other hand, will always hurt your score. When you rush, you're far more likely to make careless errors, misread, and fall into traps. Keep in mind that for every wrong answer choice you pick in Section I, you lose one-quarter of a point. Blank answers, on the other hand, are not counted against you.

By now you're asking yourself, "How do they know this works?" Don't take our word for it. We'll walk you through an example to prove our point. But before we do so, let's take a look at how the AP Biology Exam is scored.

The AP Translation Game

The maximum number of points you can earn on the AP Biology Exam is 100 points for the multiple-choice questions in Section I and 40 points for the four essay questions in Section II. These "raw scores" are translated to "composite scores." ETS has set up the test so that Section I, with its 100 questions,

counts for 60 percent of your overall grade, while Section II, with its four essays, counts for only 40 percent of your grade. These composite scores are then further translated to numbered grades ranging from 1 to 5. Here's how it's done.

For Section I, ETS takes the number of questions you answered incorrectly, divides it by four, and subtracts the result from the number of questions you answered correctly:

(Raw score for Section I) = (Number answered correctly) - (Number wrong ÷ 4)

Next, ETS takes that raw score and converts it to a composite score by multiplying it by 0.75:

(Composite score for Section I) = 0.75 x (Raw score for Section I)

If you got every question right on this portion of the test, you would have a raw score of 100. The highest composite score, therefore, is 75 (i.e., 100 x 0.75 = 75).

For Section II, you can earn up to 10 points for each essay question for a total of 40 points:

(Raw score for Section II) = (Points for Essay 1) + (Points for Essay 2) + (Points for Essay 3) + (Points for Essay 4)

Your raw score is then multiplied by 1.5 to yield a composite score:

(Composite score for Section II) = 1.5 x (Raw score for Section II)

If you wrote perfect essays, you would get the perfect raw score of 40. The highest number of points you can get, therefore, would be 60 (i.e., 40 x 1.5 = 60).

Remember that on Section I, our maximum was 75 points. Combined with the maximum total of 60 for Section II, we get a combined maximum of 135 points. ETS adds up the total composite scores for both sections and converts their sum into a simple, single-digit grade:

THE ETS GRADING SYSTEM		
Composite Score	AP Grade	Comment
82-135	5	Extremely well qualified
63-81	4	Well qualified
47-62	3	Qualified
29-46	2	Possibly qualified
0-28	1	No recommendation

Seems terribly complicated, doesn't it? Fortunately, you don't need to memorize how ETS computes your score. You only need to know how to apply these conversions when determining your score on the practice test.

What's a decent score? Naturally, you'd like to get a 3 or better. Many schools will accept a score of 3 or above as equivalent to a year of college biology. However, the top colleges only accept a 4 or 5. According to past exams, roughly two-thirds of the students who take the AP Biology Exam receive a grade of 3 or above. This means that in order to "pass" this test, you need to be somewhere in that top two-thirds. What do you need to do in order to get there?

Ms. C. Darwin takes an AP test

Suppose that a random student—we'll call her C. Darwin—took the AP Biology Exam and left about half of Section I blank. That means she did 57 questions and left out 43 questions. Let's say that out of the 57 she did, she missed 20. Keep in mind that you lose one-quarter point for each wrong answer. That gives Ms. Darwin:

37 right - (20 wrong ÷ 4) = 32 raw points

This may not sound like a great performance. On a regular test, it would be an all-out flop, wouldn't it? A score of 32 points out of 100 is not the kind of grade Ms. Darwin is likely to stick on the refrigerator door. After all, it's only 33 percent. Let's see what happens here.

Her raw score for Section I would have been a 32. We multiply this raw score by 0.75 to get a composite score:

$$0.75 \times 32 = 24$$

For Section II, let's assume she answered all four essays and got 5 points for each question—once again, that's only half the total potential! Altogether, that gives us a total of 20 points for Section II. To obtain the composite score for Section II, we multiply the raw score by 1.5:

$$1.5 \times 20 - 30$$

Taking the two composite scores, we can figure out Ms. Darwin's total composite score:

Section I: 24 points
Section II: 30 points
Total: 54 points

Using the table on page 9, you can see that a total composite score of 54 translates to a grade of 3 on the AP Biology Exam. Take a look back. Ms. Darwin got a 3, a passing grade, even though she blew off half of Section I and received only half credit on the essays! Not bad!

What All this Means for You

The bottom line is this: There's absolutely no reason to answer every question on the test, even if you're shooting for a score higher than a 3. This is particularly true of Section I, though we'll soon see how the same thinking applies to Section II. It may be surprising to think of test taking in this way, but it really works. By the way, the conversions we've provided are based on ETS's own calculations, the same ones they provide in their materials. Why don't they let you know that you can skip half the test and still get a decent grade? Hmmm....

But what if you're shooting for something higher than a 3? To reach that goal, you may have to answer a few more questions. But even if you're aiming for a 4 or a 5, there's absolutely no reason to finish the test. Simply slow down so that you can do better on the questions with which you're comfortable. Which ones are those? Obviously, the ones you know!

Strategy 2: The Three-pass System

According to the pacing chart, even those who want a perfect score do not have to answer all the questions on the test. The rest of us have even more leeway: We can leave up to half the test blank and get a 3, as we saw from Ms. Darwin's test. But which questions should we skip? The answer is pretty simple:

Skip the questions you don't like.

The AP Biology Exam covers a broad range of topics. There's no way, even with our extensive review, that you will know everything about every topic in biology. So what should you do?

Do the Easiest Questions First

The best way to rack up points is to focus on the easiest questions first. Many of the questions asked on the test will be straightforward and require little effort. If you know the answer, nail it and move on. Others, however, will not be presented in such a clear, simple way. As you read each question, decide if it's easy, medium, or hard. During a first pass, do all the easy questions. If you come across a problem that seems time-consuming or completely incomprehensible, skip it. Remember:

> Easier questions count just as much as harder ones, so your time is better spent on shorter, easier questions.

Save the medium questions for the second pass. These questions are either time-consuming or require that you analyze all the answer choices (i.e., the correct answer doesn't pop off the page). If you come across a question that makes no sense from the outset, save it for the last pass. You're far more likely to fall into a trap or settle on a silly answer.

Watch Out for Those Bubbles!

Since you're skipping problems, you need to keep careful track of the bubbles on your answer sheet. One way to accomplish this is by answering all the questions on a page and then transferring your choices to the answer sheet. If you prefer to enter them one by one, make sure you double-check the number beside the ovals before filling them in. We'd hate to see you lose points because you forgot to skip a bubble!

So then, what about the questions you don't skip?

Strategy 3: Process of Elimination (POE)

On most tests, you need to know your material backward and forward to get the right answer. In other words, if you don't know the answer beforehand, you probably won't answer the question correctly. This is particularly true of fill-in-the-blank and essay questions. We're taught to think that the only way to get a question right is by knowing the answer. However, that's not the case on Section I of the AP Biology Exam. You can get *a* perfect score on this portion of the test without knowing a single right answer...provided you know all the wrong answers!

What are we talking about? This is perhaps the single most important technique in terms of the Multiple-Choice section of the exam. Let's take a look at an example on the next page.

I. The structures that act as the sites of gas exchange in a woody stem are the

(A) lungs
(B) gills
(C) lenticels
(D) ganglia
(E) lentil beans

Now if this were a fill-in-the-blank-style question, you might be in a heap of trouble. But let's take *a* look at what we've got. You see "woody stem" in the question, which leads you to conclude that we're talking about plants. Right away, you know the answer is not (A), (B), or (D) because plants don't have lungs, gills, or ganglia. Now we've got it down to (C) and (E). Notice that (C) and (E) are very similar. Obviously, one of them is a trap. At this point, if you don't know what "lentil beans" are, you have to guess. However, even if we don't know precisely what they are, it's safe to say that most of us know that lentil beans have nothing to do with plant respiration. Therefore, the correct answer is (C), lenticels.

Although our example is a little goofy and doesn't look exactly like the questions you'll be seeing on the test, it illustrates an important point:

Process of Elimination is the best way to approach the multiple-choice questions.

This is true of all three portions of Section I. Even when you don't know the answer right off the bat, you'll surely know that two or three of the answer choices are not correct. What then?

Strategy 4: Aggressive Guessing

ETS tells you that random guessing will not affect your score. This is true. In other words, if you guess on five problems, odds are you'll get one right. For the correct answer you'll receive one point, while for the four wrong answers, you'll lose one point (4 x [-1/4 point for each wrong answer] = *A* point). Net gain? Nothing!

However, the moment you've eliminated a couple of answer choices, your odds of getting the question right, even if you guess, are far greater. If you can eliminate as many as two answer choices, your odds improve enough that it's in your best interest to guess. How so? Let's look at an example.

Imagine that you've got three problems. On each problem, you've managed to eliminate two answer choices. If you guess on these three problems, you're bound to get one right, statistically speaking. For the correct answer you receive one point, while for the two wrong answers, you lose one-half a point:

(2 x [-1/4 point for each wrong answer] = -1/2 point).

Net gain? One-half a point.

This may not seem like much, but if you do it aggressively throughout the Multiple-Choice section of the test, it could add as many as 10 to 15 points to your overall score. The difference between a decent test taker and an ace test taker is just this kind of aggressive approach.

Strategy 5: Word Associations

Another way to rack up the points on the AP Biology Exam is by using word associations in tandem with your POE skills. Make sure that you memorize the words in the Key Words lists throughout this book. Know them backward and forward. As you learn them, make sure you group them by association, since ETS is bound to ask about them on the AP Biology Exam. What do we mean by "word associations"? Let's take the example of mitosis and meiosis.

You'll soon see from our review that there are several terms associated with mitosis and meiosis. *Synapsis, crossing-over,* and *tetrads,* for example, are words associated with meiosis but not mitosis. We'll explain what these words mean in Chapter 7, in which we discuss reproduction. For now, just take a look:

2. Which of the following typifies cytokinesis during mitosis?

(A) Crossing-over
(B) Formation of the spindle
(C) Formation of tetrads
(D) Synapsis
(E) Division of the cytoplasm

This might seem like a difficult problem. But let's think about the associations we just discussed. The question asks us about mitosis. However, answer choices (A), (C), and (D) all mention events that we've associated with meiosis. Therefore, they are out. Without even racking your brain, you've managed to get this down to two answer choices. Not bad! For the record, the correct answer would then be (E), division of the cytoplasm.

Once again, don't worry about the science for now. We'll review it later. What is important to recognize is that by combining the associations we'll offer throughout this book and your aggressive POE techniques, you'll be able to rack up points on problems that might have seemed difficult at first.

Strategy 6: Mnemonics - or the Biology Name Game

One of the big keys to simplifying biology is the organization of terms into a handful of easily remembered packages. The best way to accomplish this is by using mnemonics. Biology is all about names: the names of chemical structures, processes, theories, etc. How are you going to keep them all straight? A mnemonic, as you may already know, is a convenient device for remembering something.

For example, one important issue in biology is taxonomy, that is, the classification of life forms, or organisms. Organisms are classified in a descending system of similarity, leading from kingdoms (the broadest level) to species (the most specific level). The complete order runs: kingdom, phylum, class, order, family, genus, and species. Don't freak out yet. Look how easy it becomes with a mnemonic:

King Philip of Germany decided to walk to America. What do you think happened?

King	->	Kingdom
Philip	->	Phylum
Came	->	Class
Over	-»	Order
From	-»	Family
Germany	->	Genus
Soaked	->	Species

Learn the mnemonic and you'll never forget the science!

Mnemonics can be as goofy as you like, so long as they help you remember. Throughout this book, we'll give you mnemonics for many of the complicated terms we'll be seeing. Use ours, if you like them, or feel free to invent your own. Be creative! Remember: The important thing is that you remember the information, not how you remember it.

Strategy 7: Identifying EXCEPT Questions

About 10 percent of the multiple-choice questions in Section 1 are EXCEPT/NOT/LEAST questions. With this type of question, you must remember that you're looking for the *wrong* (or the least correct) answer. The best way to go about these is by using POE.

More often than not, the correct answer is a true statement, but is wrong in the context of the question. However, the other four tend to be pretty straightforward. Cross off the four that apply and you're left with the one that does not. Here's a sample question:

17. All of the following are true statements about gametes EXCEPT:

(A) They are haploid cells.
(B) They are produced only in the reproductive structures.
(C) They bring about genetic variation among offspring.
(D) They develop from polar bodies.
(E) They combine to produce cells with the diploid number of chromosomes.

If you don't remember anything about gametes and gametogenesis, or the production of gametes, this might be a particularly difficult problem. We'll see these again later on, but for now, remember that gametes are the "sex cells" of sexually reproducing organisms. As such, we know that they are haploid and are produced in the sexual organs. We also know that they come together to create offspring.

From this very basic review, we know immediately that (A), (B), and (E) are not our answers. All three of these are accurate statements, so we eliminate them. That leaves us with (C) and (D). If you have no idea what (D) means, focus on (C). In sexual reproduction, each parent contributes one gamete, or half the genetic complement of the offspring. This definitely helps vary the genetic makeup of the offspring. Answer choice (C) is a true statement, so it can be eliminated. The correct answer is (D).

Don't sweat it if you don't recall the biology. We'll be reviewing it in detail soon enough. For now, remember that the best way to answer these types of questions is: Spot all the right statements and cross them off. You'll wind up with the wrong statement, which happens to be the correct answer.

Strategy 8: The Art of the ETS Essay

You're given four essay questions to answer in 90 minutes. As we said already, that's only 22 minutes a question! The best way to rack up points on this section is to give the essay readers what they're looking for. Fortunately, we know precisely what that is.

The ETS essay reviewers have a checklist of key terms and concepts that they use to assign points. We like to call these "hot button" terms. Quite simply put, for each hot button that you include in your essay, you will receive a predetermined number of points. For example, if the essay question deals with the function of enzymes, the ETS graders are instructed to give 2 points for a mention of the "lock-and-key theory of enzyme specificity."

Naturally, you can't just compose a "laundry list" of scientific terms. Otherwise, it wouldn't be an essay. What you can do, however, is organize your essay around a handful of these key, or hot button, points. The most effective and efficient way to do this is by using the 10-minute reading period to brainstorm and come up with the scientific terms. Then outline your essay before you begin to write, using your hot buttons as your guide.

Brainstorm and Outline

During the 10-minute preview, read each question twice and brainstorm the terms and concepts you want to cover with regard to each question. Once you've jotted down as many as you can, draft an outline that will help you organize them into some logical order.

Although the ETS graders do not grade you on your overall organization, a poorly organized essay tends to be less convincing than a well-organized one. The best way to avoid any problems with organization is to draw up a clear, simple outline. This can be done during the 10-minute reading period.

On average, you need to write one or two paragraphs for each part of the question. If the question asks for two examples, give just that—two examples. If you present more than two examples, the reviewers may not even count them toward your score. Make sure you read carefully and give them what they want!

Label Diagrams and Figures

Sometimes it's easier to present a diagram or figure as part of your essay. If you choose to do this, make sure you label your diagram or figure properly. Otherwise, the ETS graders will give you no more than partial credit for your work.

Review Laboratory Experiments Covered in Your AP Course

At least one of the four questions will be experimentally based. Sometimes questions will refer back to a laboratory experiment conducted in your AP class. Consequently, the laboratory component of your course is an integral part of this exam. Don't forget that. In Chapter 15, we'll review some of the laboratory experiments (including equipment) that you're responsible for on the AP test.

Sample Essays

Chapter 14 goes into far greater detail about the free-response questions. Take a look at it after you've reviewed the biology in the first part of this book.

There are sample essays as well as a checklist just like the one the ETS essay graders use when correcting your essay. Use them as guidelines when writing your own free-response essays for the practice test.

Correcting the essays isn't as clear-cut as correcting the multiple-choice questions. Nevertheless, by following our instructions, you'll be able to give yourself a rough idea of how you perform on this portion of the test.

LET'S GET CRACKING!

Along the wav, we'll highlight what's important in each area, from cell structure to genetics to evolution. By helping you at each step, we take all the guesswork out of preparing for the test. In addition, as you'll soon see, we don't need to be dull and long-faced when it comes to biology. We can have some fun learning. Given the many advances that are being made in genetics, cell biology, and immunology, all this stuff is actually very interesting if it's looked at the right way. You may not believe it now, but by the end of this book, we're certain that you'll agree. (Especially when you see your test scores!)

We've done our work: We've taken the AP Biology Exam apart, pulled out the pieces you need to know, and presented them in an easy, accessible format. Now it's time for you to do your share. Follow along closely and answer all the questions at the end of each chapter. Answers to the quizzes and explanations for all the questions are found in Chapter 16 in the back of the book. If you learn the material on these pages, you're sure to improve your score.

Before we get started, let's look at a quick summary of the strategies you need to remember for the test:

- **Pacing:** Know your pacing chart! Spend more time answering fewer questions.
- **The Three-Pass System:** Focus your energy on the easy questions first—save the rest for later.
- **Process of Elimination:** Use POE to answer questions. Remember you don't need to know the right answers to get the questions right.
- **Aggressive Guessing:** Guess after you've eliminated two or more answer choices— it's in your best interest.
- **Word Associations:** Learn the lists at the end of each chapter. Know which words should be grouped together.
- **Mnemonics:** Use ours or make your own.
- **Identifying Question Types:** Look out for EXCEPT questions.
- **The Art of the ETS Essay:** Brainstorm, outline, write—and make sure you touch upon those "hot button" terms.

If you're comfortable with these strategies come test day your score is bound to improve. Before we get there, however, we need to review the biology you'll see on the test. Without any further ado, let's get moving!