

SCIENCE TIME MASTERY

Time Management Strategies for the ACT Science Test

The Science Sprint

The ACT Science test can be likened to the end of a long marathon.

We call it the *Science Sprint*.

For many students, the Science test is as much an assessment of endurance as it is of skill in scientific reasoning. Science is always the last assessment on the ACT, so students tend to be tired, if not exhausted, going into it.

Some students run hard throughout the ACT marathon only to walk it in at the end. Peers who these students were out-performing the entire time will beat them in the final leg of the race.

Other students, the *sprinters*, have known that the Science test was coming since the very beginning. They are mentally prepared. After the Reading test is complete, they stand up, stretch, and clear their minds. They focus on the task at hand. For these students, the test has only begun. It all comes down to this. Even if they have fallen a little behind their target score, they aren't discouraged. They know they can close the distance in Science.

Of all the ACT sections, Science tends to be the one where the largest score gains (or losses) are made.

It's easier to sprint if you slept well the night before. It's easier to sprint if you had a good breakfast, brought a healthy snack for the break between Math and Reading, and have practiced full-length ACT tests before.

Just getting your students into the *sprinter* mindset can create a small lift in their scores. There is a moment of truth for every student when they could either expend the extra effort and work out a problem or just guess C. Sprinters expend the energy. Walkers Charlie out.

In the end, the ACT is a competitive test. Students are competing for limited spots in colleges and scholarship dollars. Other students across the country are taking the test at the same time, trying to win the same prize. Encourage your students to keep this in mind during the Science test so they can *sprint* to gain the competitive edge.

Students who are prepared for the *Science Sprint* have the best shot at maximizing their scores.

4-7 Minutes Per Passage

Science tests usually include six passages. They used to always have seven passages, but that has changed in the past few years, and there's evidence to suggest that the ACT has made a permanent switch. However, we need to see a few more tests before we can make that pronouncement. Students should plan on spending 4–7 minutes on each passage. There are three major passage types that appear on the ACT, and each type requires a different amount of time. You'll learn more about these passage types later in the Time Mastery section.

DATA REPRESENTATION	4-5 minutes
RESEARCH SUMMARY	5-6 minutes
CONFLICTING VIEWPOINTS	6-7 minutes

Students must be very disciplined about how they spend their time on each passage. Science questions are not sorted by difficulty in the same way the math questions are. The last Science questions might include some gimmes, and the first questions might be the most difficult. Students have to give themselves enough time to consider every question, even if it means *marking and moving* past the last question on a particularly time-consuming passage.

Refer to Science question #37 on page 51 of *Preparing for the ACT 2015-16*.

Most students assume that question #37 is one of the most difficult on the test, since it appears at the end. And many students *do* miss this question. However, it's not because it is difficult, but rather because they run out of time.

Actually, question #37 is arguably the easiest question on the entire ACT Science test. The text above Figure 2 states that temperature is read every five seconds. Since there are 60 seconds in a minute, all students must do is divide 60 by five to find that the sensor took 12 readings per minute.

When you introduce the concept of pacing to your students, show them this question to make the point that even the last passage has questions that can be answered if students give themselves enough time.

Below is the basic pacing summary for Science.

ACT SCIENCE
40 Questions 6 Passages 35 Minutes Pace: 7 minutes per passage

Data Representation

Data representation passages provide students with a valuable opportunity to pick up time and points. Unlike research summaries and conflicting viewpoints passages, data representation questions are almost entirely dependent upon tables and graphs.

Students can usually spot a data representation passage by noticing that the text does not have italicized headers (e.g., *Study 1*, *Experiment 2*, etc.). Furthermore, data representations focus on presenting data and tend to be unconcerned with explaining the methods used to obtain the data.

Another giveaway of a data representation is the number of questions that accompany the passage. On Science tests with six passages, the two data representation passages have the shortest question sets, with six questions each. On Science tests with seven passages, there are three data representation passages with five questions each (also the shortest question sets).

The sequence in which data representation passages appear is relatively random, which means that all of them could be stacked at the end of the test. This is part of the reason why it is so important for students to stay disciplined with their pace and give themselves sufficient time for each question.

Refer to Science Passage III on pages 44–45 of *Preparing for the ACT 2015-16*.

Passage III is an excellent example of a data representation. The passage makes no mention of the experimental methods that were used to collect the data. Rather, the text serves as a glorified key to the graphs. Furthermore, this test has six passages, and this particular passage has six questions. There are no italicized text headers.

On a data representation such as this, students can safely *skip* the text and go straight to reading the graphs before finally settling on answering the questions. Students will find that they can usually answer all or all but one of the questions in a data representation passage without any reference to the text.

Refer to Science question #15 on page 45 of *Preparing for the ACT 2015-16*.

Question #15 is a classic example of a data representation question. Students only need to reference the figure to find their answer. Once they find the x-axis point that corresponds to 8,000 years, they can find the height of the solar radiation line on the y-axis, and there's the answer. Not only is the text unhelpful in this situation, it can only serve to slow the student down.

Refer to Science question #20 on page 45 of *Preparing for the ACT 2015-16*.

Question #20 breaks the rule of data representation passages; the *text* helps answer the question. The first sentence in the text allows two answers to be eliminated immediately. The format of the question and its answers (and how different they are compared to the rest of the items) should be a strong clue to students that they need to shift gears and look for information beyond what they find in the graphs.

Refer to Passage IV on pages 46-47 of *Preparing for the ACT 2015-16*.



Check Your Understanding: What type of passage is Passage IV? What features tell you this is the case? Answer the questions without reading the text. After you finish, review the text. Were there any questions in this passage where the text would have helped your students?

Research Summaries

Research summary passages strike a middle ground between the graph-obsessed *data representation* passages and the text-focused *conflicting viewpoints* passages.

There are always three research summaries on any ACT Science test.

The usual tell on a research summary is the italicized headers above the text. It typically (but not always) describes a series of experiments or studies. The questions tend to focus on experimental design and scientific investigation.

When the Science test is comprised of seven passages, each research summary has six questions. When the Science test is made up of six passages, the research summaries each have seven questions, just like the conflicting viewpoints passage.

Students must be able to understand the rationale behind experiments and think scientifically in order to succeed on research summary passages. Students should expect to use the text in conjunction with the graphs and tables in order to answer the questions.

When students first encounter a research summary, they should focus their efforts on *understanding* the experiment. They do not need to remember facts or details about the experiment; this is an open-book test, so memorization is unnecessary. However, students should be able to answer the following questions after they finish reading the passage, graphs, and tables:

- What happened in the experiment series?
- What were the scientists trying to prove or understand?
- What changed from experiment to experiment?
- How did those major changes help the scientists understand something?

This very basic, functional understanding of the passage is necessary for students to answer research summary questions. This fact is what separates research summaries from their simpler *data representation* cousins.

Consider asking students these questions after each research summary mini-test you provide. Students who internalize the above questions are more likely to answer research summary questions quickly and correctly.

Refer to Science Passage I on pages 40-41 of *Preparing for the ACT 2015-16*.

Passage I is an example of a research summary. It has italicized headers, describes a series of studies, and does not describe conflicting points of view. Because this Science test has six passages, this research summary has seven questions. All of these clues point to the fact that the test begins with a research summary passage. The text and the graphs are both necessary to answer the questions.

Refer to Science question #7 on page 41 of *Preparing for the ACT 2015-16*.

Question #7 is a typical research summary question. To answer correctly, students must be able to identify the essential features of each study as described in the text. They must also be able to infer that the 5% SY medium represents a *reduced calorie diet*, which for some students may not be immediately apparent.

Even students who did not fully understand the experiments as they read can answer this question by comparing the studies. However, those students who build an understanding as they read will think more sharply and move more quickly.