Power Up: Science ACT Prep, Week 3

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Published by *K20 Center*

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Time Frame 30

Essential Question(s)

How can I increase my ACT score?

Summary

In this third science ACT prep activity, students learn strategies for interpreting graphs, particularly for when they are unfamiliar with the content in the science passages. First, students focus on the components of tables and graphs that convey key information through Categorical Highlighting. Next, students practice using what they see in a graph, table, or diagram to answer a question in order to understand when they need the context of a science passage and when they do not in answering questions. This is the third activity in a 10-week "Power Up" series for ACT Prep.

Learning Goals

- Understand the pacing of the science test.
- Analyze components of figures and tables to understand what information they convey.

Attachments

- Activity Slides—Power Up Science ACT Prep, Week 3.pdf
- Activity Slides—Power Up Science ACT Prep, Week 3.pptx
- Spying Out Specifics—Science ACT Prep, Week 3 - Spanish.docx
- Spying Out Specifics—Science ACT Prep, Week 3 - Spanish.pdf
- Spying Out Specifics—Science ACT Prep, Week 3.docx
- Spying Out Specifics—Science ACT Prep, Week 3.pdf

Materials

- Activity Slides (attached)
- Spying Out Specifics (attached; one per student)
- pen/pencil
- highlighters or colored pencils
- Anchor Chart from Week 2 (optional)
- Goal Sheet from Week 1 (optional)

5 minutes

Introduction

Teacher's Note: ACT Enhancements

The following resource has been updated to better align with the test changes that began in April 2025 for the online test and in September 2025 for the paper-pencil test. Some outside resources linked are based on the previous version of the ACT. Learn more about enhancements to the ACT in 2025.

Use **slides 2-4** to introduce the lesson, essential question, and objectives. Show students **slide 5**. This graph is missing a title. As a class, discuss clues on the graph that could help us identify what the data could be indicating.

Sample Student Response

Note that the x axis shows time while the y axis shows questions. Students may suggest the graph could indicate questions answered over time or questions asked in a class period, etc.

Ask students if they know what is happening to the questions over time. Then move to **slide 6**. This shows the title Science ACT Questions Answered.

Ask students what the maximum time on the graph is (40) and what the maximum number of questions are (40). Use the graph to ask specific questions about how many problems should be finished at certain points in the test. (ex. *How many at 5, 13, 17, or 30 minutes*). Call on students to share their answers and how they know.

Share that the ACT science test is 40 minutes long and has 40 questions. This graph shows the average number of questions a student has completed after each minute if using all 40 minutes to take the test. Ask students how the graph might change if someone took less time to finish. Next, ask them what should be done with any extra time.

Remind students they should make the most of their time, so if they finish early, they should go back to any questions they found to be confusing or check their work on other problems. Additionally, remind students that they get a five-minute warning. If they are running short on time, they may want to first bubble in all blank answers and go back to finding correct answers after that. This is because on the ACT, students are not penalized for incorrect answers, rather they are rewarded for correct answers. It is a good strategy to always at least have a guess in place. It could be the right answer! Leaving questions blank gives up what could be possible points. Of course, guessing isn't the best strategy, but it is better to guess than to leave questions unanswered.

Teacher's Note

If students are not using the vocabulary of the x- and y-axis or how they relate to dependent and independent variables, highlight the names and meanings of these terms as they are sharing.

20 minutes

Activity

Let students know that much of the science content in the ACT science test is shared through figures and tables. Students are expected to be able to interpret these to find answers. Point out that interpretation is what they just did with the science question graph. Remind students that in the last test prep lesson we talked about the vocabulary of the science test and reminded them not to be intimidated when encountering new words. Today, they will explore what they often find after the text in the science exam: figures and tables. Many questions ask about what you see in figures and tables so it is important to read these as thoroughly, or more thoroughly, than you do the text.

Previewing a table can make the questions less intimidating. Let students know that on the test, these tables will be paired with something to read about an experiment or science concept. Today, they will just focus on all that can be learned and questions that can be answered depending on the tables and figures themselves.

Provide each student with the **Spying Out Specifics** handout. Show **slide 7,** which has the Categorical Highlighting key. For each table and figure, they will use the key to highlight any titles, legends, or evidence of variables that they see. They will then write what each tells us. Give students a few minutes to highlight and annotate the three tables and figures. Then, show the first question on **slide 8**.

Teacher's Note

If highlighters are not available for the categorical highlighting activity, students can underline in different colors using colored pencils.

The question asks about Table 2. Ask students how they know which table or figure to look at (title). Then ask how they know where to look on the table for the answer to their question (wavelength column).

Sample Student Response

I looked at column 3 for the wavelength they asked for and then followed that row to the column for color.

Point out that we do not know what the experiment was about or what some of the terms on the table mean, but by using our table reading skills, we can still find the right answer.

Repeat this process with **slides 10-13,** pointing out each time how the items they highlighted help in answering the questions.

Show **slide 14**. Ask students if they have any strategies for the science test to add to the Anchor Chart that was started in week 2. Record any new ideas on the chart.

5 minutes

Wrap-Up

Remind students that we always want to do our best to read thoroughly, but if we are short on time, or feeling stumped, it is important to remember the value of our table and figure reading skills. Sometimes, these skills can be more important than knowing about the science content itself.

As an Exit Ticket**,** challenge students to apply their table and figure knowledge to the description on **slide 15**. This slide describes a graph. It tells what the title, axis titles, and trend are on the graph. On a piece of paper have students sketch out what this would look like if they saw it on a page of the science test. Have them turn it in and use it as a tool to evaluate if they understand where the components are located on a graph and if they know what a trend would look like based on a description. Trends are discussed in week 5 of the science ACT prep, so this piece of the exit ticket can help in understanding any misconceptions that may need to be highlighted in future lessons.

Research Rationale

Standardized testing in high schools has long been used as a metric for assessing college readiness and school accountability (McMann, 1994). While there has been debate surrounding the accuracy of such metrics, as well as concerns regarding fairness, many institutions of higher education continue to make these scores part of the admissions process (Allensworth & Clark, 2020; Black et al., 2016; Buckley et al., 2020). In addition to admissions, it is important to keep in mind that standardized test scores can also provide students with scholarship opportunities they would not otherwise have (Klasik, 2013). Although the topic of standardized testing continues to be debated, effective test preparation can ensure that our students are set up for success.

With several benefits to doing well on college admissions tests, it is important to consider how best to prepare students for this type of high-stakes test. Students from groups that may historically struggle to find success, such as those in poverty or first-generation college students, especially stand to benefit from effective test preparation (Moore & San Pedro, 2021). The American College Test (ACT) is one option students have for college admissions testing that is provided both at national centers and school sites. Taking the time to understand this test, including the timing, question types, rigor, and strategies for approaching specific questions, can help prepare students to do their best work on test day and ensure their score is a more accurate representation of what they know (Bishop & Davis-Becker, 2016).

Resources

- Allensworth, E. M., & Clark, K. (2020). High school GPAs and ACT scores as predictors of college completion: Examining assumptions about consistency across high schools. *Educational Researcher*, 49(3), 198-211.
- Bishop, N.S. & Davis-Becker, S. (2016). Preparing examinees for test taking: Guidelines for test developers and test users. 2nd edition. Crocker, L. (Ed). In *Handbook of test development* (pp. 129-142). Routledge.
- Black, S. E., Cortes, K. E., & Lincove, J. A. (2016). Efficacy versus equity: What happens when states tinker with college admissions in a race-blind era? *Educational Evaluation and Policy Analysis*, 38(2), 336–363. http://www.jstor.org/stable/44984542
- Buckley, J., Baker, D., & Rosinger, K. (2020). Should state universities downplay the SAT?. *Education Next*, 20(3).
- K20 Center. (n.d.). Anchor chart. Strategies. https://learn.k20center.ou.edu/strategy/58
- K20 Center. (n.d.). Bell ringers and exit tickets. Strategies. https://learn.k20center.ou.edu/strategy/125
- K20 Center (n.d.). Categorical highlighting. Strategies. https://learn.k20center.ou.edu/strategy/192
- Klasik, D. (2013). The ACT of enrollment: The college enrollment effects of state-required college entrance exam testing. *Educational Researcher*, 42(3), 151–160. http://www.jstor.org/stable/23462378
- McMann, P. K. (1994). The effects of teaching practice review items and test-taking strategies on the ACT mathematics scores of second-year algebra students. Wayne State University. https://www.monroeccc.edu/sites/default/files/upward-bound/McMannP.-the-effects-of-teaching-practice-review-items-ACT-mathematics-second-year-algebra.pdf
- Moore, R., & San Pedro, S. Z. (2021). Understanding the test preparation practices of underserved learners. *ACT Research & Policy*. Issue Brief. ACT, Inc. https://files.eric.ed.gov/fulltext/ED616526.pdf