Power Up: Science ACT Prep, Week 8

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Published by *K20 Center*

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Time Frame 35

Essential Question(s)

How can I increase my ACT score?

Summary

In this eighth science ACT prep activity, students review independent and dependent variables and analyze how they are addressed in the Science ACT as constants and variables. First, students explore how ACT super scores work by leaving some sub-scores constant while varying other scores in the ACT super score calculator. Next, they identify the variable and constant in a series of experiment descriptions using the Chat Stations Strategy. Students then independently apply the skills they have been learning across the series of activities to two ACT-style passages and question sets. This is the eighth activity in a 10-week "Power Up" series for ACT Prep.

Learning Goals

- Identify the constants and variables in an experiment.
- Evaluate experiments based on a knowledge of constants and variables.

Attachments

- Activity Slides—Science ACT Prep, Week 8.pdf
- Activity Slides—Science ACT Prep, Week 8.pptx
- Chat Stations—Science ACT Prep, Week 8 - Spanish.docx
- Chat Stations—Science ACT Prep, Week 8 - Spanish.pdf
- Chat Stations—Science ACT Prep, Week 8.docx
- Chat Stations—Science ACT Prep, Week 8.pdf
- Practice Passages (Teacher Guide)—Science ACT Prep, Week 8.docx
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- Practice Passages—Science ACT Prep, Week 8.docx
- Practice Passages—Science ACT Prep, Week 8.pdf

Materials

- Activity Slides (attached)
- Constants and Variables Chat Stations (attached; 1 copy)
- Practice Passage (attached; 1 per student)
- Practice Passage (Teacher Guide) (attached; for teacher use)
- pen/pencil
- sticky notes (4 per student)

10 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.

Teacher's Note

The superscore calculator can be shown as a demonstration rather than by students themselves if time is an issue or students lack access to devices. In that case, display the calculator and go through testing what happens when different scores change as a class. If connectivity is an issue, **slides 7-9** are hidden slides that can be used to display screenshots of different superscore scenarios.

Use the attached **Activity Slides** to introduce the activity. **Slides 1-4** include the title for the activity and can be used to share the essential question and learning objectives. Next, move to **slide 5**. This slide has a link for the ACT superscore calculator. Explain to students that for the ACT, their superscore reflects their best performance from each of the sub tests. After students have had time to access the calculator, show **slide 6**. Review the terms “constant” and “variable.” Remind students that they may have used the term control or independent variable rather than constant but that these are used in the same way. Explain that they will explore what happens to the superscore when some scores remain constant and others vary. Let them know they can ignore the field for test date in the superscore calculator, and have them input the first line of scores from the slide. Next, have them hold all other tests constant but vary the science score as shown on line 2 of the slide. Ask what happens to the superscore in the bottom right corner when the science score increases. Next, have them put in the new science score from line 3 from the slide and ask what happens to the superscore when the other subscores are held constant but the science score decreases. Make sure students note that the superscore continues to use the best science score, even when the most recent test score was lower. Explain that this is why it can help to take the ACT more than once. They can work to increase their score in one area without worrying the others will go down. If time allows, have students use their goal sheet to add an action to experiment with the superscore calculator using their own scores outside of class.

10 minutes

Activity

Teacher's Note

Prior to class, post the Chat Stations hangouts around the room, one page in each area. These stations include experiments the students have seen in prior lessons but are now identifying the variables and constants for the examples.

Show **slide 10**. Explain to students that they will be exploring constants and variables as they apply to ACT-style questions. Number off students 1-4. Hand out four sticky notes for each student to record their answers. They will start at the Chat Station for their assigned number. Have them move to their number station. At each station there is a passage, graph, or table with constants and variables. They need to discuss the data to identify the constants and variables and share how they know.

Teacher's Note

It is important to emphasize that with constants and variables, context matters. What may be a constant for one experiment could be a variable in another. That is why we do not ignore passages entirely but skim them for the information we need.

Give students a few minutes at each station, or if they need longer, limit how many stations they visit to give time to talk and write down their answers. After they have visited the stations, have them return to their desks. Ask volunteers to share what they thought were the constants and variables for each station using **slides 11-14** to review and clarify any misconceptions as time allows.

Sample Student Responses

Station 1: Constants—burner, tripod, crucible; Variables—amount of magnesium

Station 2: Constants—battery, ammeter, voltmeter, wires; Variables—number of resistors

Station 3: Constants—stand, weight; Variables—number of pulleys

Station 4: Constants—stand, buret, flask; Variables—acid solution

15 minutes

Wrap Up

Let students know that for the last 15 minutes of class, they will be working independently to practice the skills they have been learning for the Science section of the ACT. Give them time to return to their desks. Explain that they will have 15 minutes to read and answer questions about two different passages. Explain that they are working on building testing stamina in order to keep a pace similar to what they will have on the test, so they have more questions this week than last week. Share that you will give a two-minute warning. At that time they should first fill in a guess on any unanswered questions, and then return to those questions and try to find the answers if they have time. Explain that this is a good ACT strategy for when they hear the five-minute warning because the ACT does not lower your score for incorrect answers. That means it is always better to guess rather than leave a question blank. Provide each student with the **Practice Passages** handout. Show **slide 15** and start the 15-minute timer. Watch the timer and give a verbal two-minute warning. At the end of the time, collect the papers as a formative assessment. Use the attached **Practice Passages (Teacher Guide)** document, as needed. Display **slide 16** to celebrate unlocking another achievement.

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).
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- 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
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