Power Up: Math ACT Prep, Week 2

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Time Frame 35 minutes

Essential Question(s)

How can I increase my ACT score?

Summary

In this activity, students will focus on how and when to use their calculator. Students will be given several algebraic problems to solve and will reflect on how to use their calculator to efficiently answer ACT-style math questions. This is the second activity in a 10-week "Power Up" series for ACT prep.

Learning Goals

- Understand how to use my calculator.
- Evaluate when to use my calculator.

Attachments

- Activity Slides—Math ACT Prep, Week 2.pdf
- Activity Slides—Math ACT Prep, Week 2.pptx

Materials

- Activity Slides (attached)
- Pencil
- Paper
- Calculators

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.

Introduce the activity using the attached **Activity Slides**. Use the Bell Ringer strategy to begin class. Display **slide 3** and have students get their calculator. Follow regular classroom procedures for this.

Once students have their calculator, move to **slide 4** and have students independently answer the question on a piece of notebook paper or elsewhere if you have a classroom norm for bellwork. After a minute, move to **slide 5** and have students answer the second bell ringer question.

After a minute, show **slide 6** and have students discuss the questions on the slide with a partner. Facilitate a brief discussion on which question they could have answered without a calculator.

Teacher's Note: Guiding the Activity

The purpose of these bell ringers is to help students start to shift their thinking from feeling that they always need a calculator to having confidence and knowing that sometimes the calculator is slowing you down.

It is important that we remember that students are in different places when it comes to mental computations. Note that the main goal of the activity today is to not make a student feel bad for feeling the need to use a calculator, but instead to think about how to efficiently answer questions on the ACT.

Share the essential question on **slide 7** and the learning objectives from **slide 8**.

25 minutes

Activity

Teacher's Note: Purpose and Pacing

During this portion of the activity, students will see six ACT-style questions that will have them practice how to use their calculator and hopefully rethink the habit of using it for every step of every math problem. Coach them to NOT reach for their calculator while reading the question, but instead to try pencil and paper and think before they pick it up. Even if they feel they need it for every question, they should not start with their calculator.

Spend approximately 3-4 minutes on each question. That is one minute for students to answer the question—remember, the ACT has 45 questions to be completed in 50 minutes—and 2-3 minutes to discuss. This will keep the activity on pace. If you are unable to review all six questions during your class period, consider using the extra question(s) as later bellwork.

Show **slide 9** and read the quote from the ACT: "*...all problems may be solved without a calculator.*" Let students know that it is okay to not use a calculator on a question on the ACT. In other words, not using calculator on a question does not mean that students are doing that problem incorrectly.

Transition to **slide 10** and let students know that what is the most important is for them to use a calculator that they are most comfortable with. It does not have to be a fancy, expensive calculator. It is most important that they use a calculator that they know how to use. If they have a calculator that they are unsure of it being allowed on the ACT, share the link on the slide to the ACT's Calculator Policy.

Teacher's Note: Calculator Usage

This activity is designed for you to show students how to use, what is likely, a classroom set of calculators. As you and your students progress through this ACT Prep series, please continue to have students use the same calculator from week to week so that students become familiar with one calculator.

Have students get out a piece of paper if they have not already done so and show **slide 11**. Have students independently solve the question on the slide.

After a minute, move to **slide 12** and ask the class what they think: *Is it faster to solve this problem with or without a calculator?* Facilitate a brief discussion and talk through some of the pros and cons of using a calculator on this question. Then be sure to share the answer: ***E***.

Teacher's Note: Question 1

If students solely rely on their calculator, there is a lot of room for error, and test writers are ready for those common mistakes with their answer choices. Students often forget to put parentheses around negative numbers when taking them to a power in their calculators. So if students typed: 3*–1^4–4*–1^3, they get a result of 1.

If students do type the problem correctly into their calculators: 3*(–1)^4–4*(–1)^3 = 7, then they would get the right answer. Rather than relying on a calculator that could report back an incorrect answer if not used properly, encourage students to think about a negative number to an even power versus a negative number to an odd power. And remind them that they do not need a calculator to multiply 1 by itself. Push students to see that they should be able to look at this problem as 3(1) – 4(–1), and that is the most they should need to put into a calculator. Most students should be able to complete this problem entirely without a calculator.

Remember, demonstrating during this portion of the activity will be helpful to students. Use the technology resources you have available, such as document cameras or software that connects to your calculator to display the buttons pressed.

Move to **slide 13**. Have students independently solve the question on the slide.

After a minute, move to **slide 14** and ask the class what they think about the question: *Is it faster to solve this problem with or without a calculator?* Facilitate a brief discussion and talk through some of the pros and cons of using a calculator on this question. Then be sure to share the answer: ***J***.

Teacher's Note: Question 2

This is a question where students should be using their calculator. Help them see how to type in a percentage on their calculator and how to type an exponent. Here students could expand the scientific notation before typing it in to their calculator to save a little time, but it is not that great of a time waster to type it in as is: .05*4.21*10^5 = 21,050. Again, the goal is how to efficiently answer questions on the ACT.

Move to **slide 15**. Have students independently solve the question on the slide.

After a minute, move to **slide 16** and ask the class what they think about the question: *Is it faster to solve this problem with or without a calculator?* Facilitate a brief discussion and talk through some of the pros and cons of using a calculator on this question. Then be sure to share the answer: ***B***.

Teacher's Note: Question 3

If students solely rely on their calculator, there is room for error. If students need to use the absolute value function of the calculator, use this time to show them how to find the absolute value of a number using their calculator. However, encourage students to avoid typing absolute value symbols into a calculator if they can. For students who need this, it is not recommended that they type in the entire expression as one input. Instead, recommend to those students to use order of operations and use the calculator for the different steps, and to write their results on paper. In the calculator, they might have the following:

3 – 17 = –14

|–14| = 14

|–5| = 5

14 – 5 = 9

Move to **slide 17**. Have students independently solve the question on the slide.

After a minute, move to **slide 18** and ask the class what they think about the question: *Is it faster to solve this problem with or without a calculator?* Facilitate a brief discussion and talk through some of the pros and cons of using a calculator on this question. Then be sure to share the answer: ***J***.

Teacher's Note: Question 4

This is a question where using the calculator can be a great time saver. Show students how to type in fractions. Remind them that "halfway" is the mean, or average, of two numbers. So they can add the fractions then divide by 2 (or multiply by one-half). Depending on the calculator being used, this might be an appropriate time to show students how to use the fraction-to-decimal or decimal-to-fraction button that converts between the two forms.

Move to **slide 19**. Have students independently solve the question on the slide.

After a minute, move to **slide 20** and ask the class what they think about the question: *Is it faster to solve this problem with or without a calculator?* Facilitate a brief discussion and talk through some of the pros and cons of using a calculator on this question. Then be sure to share the answer: ***A***.

Teacher's Note: Question 5

Help students see that they can estimate and possibly not even need their calculator. However, show them how to take the square root of a value, get a decimal approximation, then divide by 5 and see the result is nearest to 2.

Move to **slide 21**. Have students independently solve the question on the slide.

After a minute, move to **slide 22** and ask the class what they think about the question: *Is it faster to solve this problem with or without a calculator?* Facilitate a brief discussion and talk through some of the pros and cons of using a calculator on this question. Then be sure to share the answer: ***F***.

Teacher's Note: Question 6

Help students see that they type one-half as a decimal to increase their likelihood of entering the expression into the calculator correctly. Again, this is a good time for some mental math and paper and pencil:

.5 – 2 = –1.5

2 / –1.5 = –1.333...

Then using the decimal-to-fraction button, they can easily get the right answer.

Optional Addition

If time allows, consider playing the game “Beat the Calculator.” In this game, you would give students algebraic problems, like the ones seen in this activity. Then have one student use a calculator, while the other does not use a calculator and have students race to get to the answer most quickly.

5 minutes

Wrap-Up

Now is the time for students to reflect on their learning. Show **slide 23** and have students get a new piece of paper. Direct students **not** put their name on their paper and to answer the following prompt: *When or how should you use your calculator on the ACT?*

Introduce students to the Commit and Toss strategy and move to **slide 24**. Have students crumple their paper, kindly toss it across the room, pick up someone else's paper, and read it. As time allows, ask for volunteers to share their peer's statements.

Before you dismiss, show **slide 25**: *You Powered Up!* and remind students to practice the action they selected on their Goal Setting handout from week 1.

Research Rationale

Standardized testing in high schools has long stood 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). Aside from admissions, it is also important to keep in mind that standardized test scores can also provide students with scholarship opportunities they wouldn't otherwise have (Klasik, 2013). Though the topic of standardized testing continues to be debated, effective test prep 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. Those 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 time to understand this test including the timing, question types, rigor, and strategies for approaching specific questions can help to 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

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