

Smartphones, Smart Chemistry

Anticipation Guides

Anticipation guides help engage students by activating prior knowledge and stimulating student interest before reading. If class time permits, discuss students' responses to each statement before reading each article. As they read, students should look for evidence supporting or refuting their initial responses.

Directions: *Before reading*, in the first column, write "A" or "D" indicating your agreement or disagreement with each statement. As you read, compare your opinions with information from the article. In the space under each statement, cite information from the article that supports or refutes your original ideas.

Me	Text	Statement
		1. A low-end smartphone has more computing power than what was available to NASA in the 1960s.
		2. Eighty-four percent of the nonradioactive elements found on the periodic table are found in smartphones.
		3. All smartphones use the same rare-earth metals.
		4. Rare-earth metals are responsible for the bright colors on the screen as well as the vibration of smartphones.
		5. Rare-earth elements are easy to find in nature.
		6. Glass and ceramics are both amorphous (not crystalline).
		7. The glass-ceramic used in a smartphone's display is strengthened by adding potassium ions.
		8. The touchscreens in ATMs and smartphones are basically the same.
		9. When you use a touchscreen, a small amount of electrical current enters your finger.

		10. People take more pictures when their smartphones than with their stand-alone cameras.
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Smartphones, Smart Chemistry

Directions: As you read the article, complete the graphic organizer below to describe the chemistry in smartphones.

Chemical(s)	Examples and chemical elements involved	Why they are used in smartphones
Rare earth metals		
Glass-ceramics		
Resistive touchscreen		
Capacitive touchscreen		

➤ **What idea(s) do you have for improving smartphones in the future?** _____

Video

Corning, Incorporated has produced two videos, providing a brief history of glass that leads up to the development of the various editions of Gorilla Glass™:

- “The Glass Age, Part 1: Flexible, Bendable Glass” (https://www.youtube.com/watch?feature=player_detailpage&v=12OSBJwogFc) and
- “The Glass Age, Part 2: Strong, Durable Glass” (https://www.youtube.com/watch?feature=player_embedded&v=13B5K_IAabw).

These videos star Adam Savage and Jamie Hayneman from the television show *MythBusters*. In their inimitable style they explain the difference between regular soda-lime glass and Gorilla Glass. They discuss compressive strength and show a Prince Rupert drop as a prime example of how Gorilla Glass works.

Questions:

1. Explain what happens during the Prince Rupert drop.
2. Explain the difference between regular soda-lime glass and Gorilla Glass.