

TIMES PAST



TIMELINE
U.S. SPACE PROGRAM

1958

In response to the Soviet Union's launch of *Sputnik*, Congress creates NASA (National Aeronautics and Space Administration) to jump-start America's space program.

1961

In a speech to Congress, President John F. Kennedy *(above)* acknowledges the Soviet lead in space and sets the goal of "landing man on the moon and returning him safely to Earth" by the end of the decade.

1962

Astronaut John Glenn *(above)* becomes the first American to orbit the Earth, a year after Soviet cosmonaut Yuri Gagarin.

THE SPUTNIK SATELLITE was only as big as a basketball, but it caused a near panic in the U.S.

1957

Sputnik Launches the Space Race

At the height of the Cold War, the by jump-starting its space program,

It weighed 184 pounds and was about as big as a basketball. But as historian Daniel J. Boorstin would later write, "Never before had so small and so harmless an object created such consternation." The object was *Sputnik*, a small aluminum sphere with spiky antennas, and the first artificial satellite sent into orbit around Earth.

It was launched 50 years ago, on Oct. 4, 1957, by the Soviet Union, shocking the United States at the height of the Cold War and triggering a "space race" with the Soviets, little more than half a century after the first airplane flight.

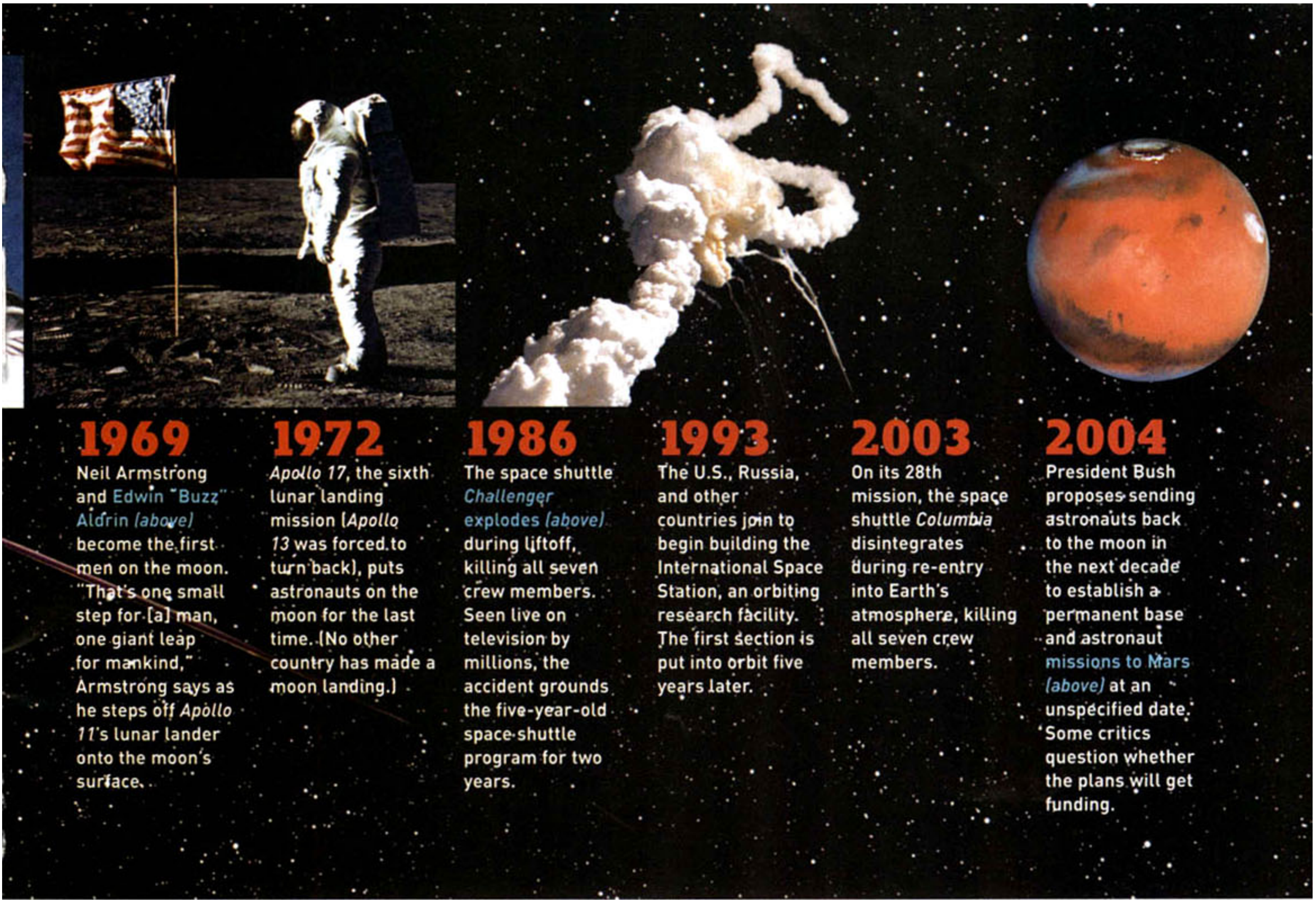
Sputnik was the space shot heard around the world. It emitted a pulsating beep as it orbited the Earth every 98 minutes—a piercing propaganda coup for the Soviets and an alarming wake-up call to the U.S., which feared it was falling behind its Communist adversary technologically.

It even affected our language. Before *Sputnik*, "satellite" generally referred to the Eastern European countries under the iron-fisted control of the Soviet Union.

It's hard to imagine today, but *Sputnik's* launch



LEFT TO RIGHT: LEFT PAGE: NASA; BETTMANN/CORBIS; AP IMAGES; RIGHT PAGE: NASA (3)



1969

Neil Armstrong and Edwin "Buzz" Aldrin (*above*) become the first men on the moon. "That's one small step for [a] man, one giant leap for mankind," Armstrong says as he steps off Apollo 11's lunar lander onto the moon's surface.

1972

Apollo 17, the sixth lunar landing mission (Apollo 13 was forced to turn back), puts astronauts on the moon for the last time. (No other country has made a moon landing.)

1986

The space shuttle *Challenger* explodes (*above*) during liftoff, killing all seven crew members. Seen live on television by millions, the accident grounds the five-year-old space-shuttle program for two years.

1993

The U.S., Russia, and other countries join to begin building the International Space Station, an orbiting research facility. The first section is put into orbit five years later.

2003

On its 28th mission, the space shuttle *Columbia* disintegrates during re-entry into Earth's atmosphere, killing all seven crew members.

2004

President Bush proposes sending astronauts back to the moon in the next decade to establish a permanent base and astronaut missions to Mars (*above*) at an unspecified date. Some critics question whether the plans will get funding.

Soviet Union sent the first satellite into space. A stunned America reacted leading to the historic moon landing 12 years later. **By Sam Roberts**

practically caused a panic. Eyes and ears were trained skyward as *Sputnik* circled the Earth, and tough questions were asked in Washington: Why hadn't America been first? How long would it take to catch up? And the most frightening question of all: If the Russians could send a satellite into space, could they also launch missiles at Chicago, Seattle, or Atlanta?

'IT'S UP'

Scientists from around the world had been meeting throughout 1957—which had been designated the International Geophysical Year—to discuss their research on satellites and other topics. Ironically, a week of meetings was capped by a reception at the Soviet embassy in Washington on October 4. The *Times*'s chief science reporter, Walter Sullivan, was there, until he got a call from his editors that the Soviets had just announced *Sputnik*'s launch in Moscow. After whispering "It's up" to an American scientist, he raced back to the bureau to write his story for the front page of the next day's paper.

Sputnik dominated news coverage around the nation. Not only were the Soviets first, but with *Sputnik* at nearly 200

pounds, the planned U.S. contender, at under four pounds, seemed a lightweight by comparison. Less than a month later, the Soviets launched *Sputnik 2* weighing 1,120 pounds—and with a passenger on board named Laika, a mixed-breed dog who was used to test the physiological effects of space travel. (She died of overheating and stress within hours.)

Sputnik (its name translated roughly as "fellow traveler") would fall from the sky after less than three months. But the repercussions of the Soviets' achievement—political, military, and scientific—lasted much longer.

Stung by the launch, President Dwight D. Eisenhower told Americans that Communist dictatorships might be capable of achievements like *Sputnik*, but its citizens did not enjoy the freedoms that Americans did.

In Washington, lawmakers saw what was at stake.

"It took them four years to catch up to our atomic bomb and nine months to catch up to our hydrogen bomb," said George Reedy, an aide to Senate Majority Leader (and

Sam Roberts is urban affairs correspondent for The New York Times.



AMERICAN STUDENTS practice "duck and cover" in case of a Soviet nuclear attack, in the early 1950s. *Sputnik* raised fears that the U.S. was vulnerable militarily.



A POSTAGE STAMP from Albania honors Laika, the dog who rode in *Sputnik 2*.

SOVIET PREMIER Nikita Khrushchev (*right*) gives President Eisenhower a replica of a Soviet satellite in 1959.



later President) Lyndon B. Johnson. "Now we are trying to catch up to their satellite."

The U.S. would not only catch up, but forge ahead.

Three months later, in January 1958, the Army successfully launched the *Explorer*, America's first satellite, from Cape Canaveral, Florida. Unlike *Sputnik*, the *Explorer* carried instruments, however crude, that produced valuable scientific information, including the discovery of what became known as the Van Allen radiation belts.

Proceeding rapidly, the U.S. created the National Aeronautics and Space Administration (NASA) to plan for human space exploration. Concerned that American students weren't getting the preparation they needed to allow the U.S. to compete technologically, Congress passed the National Defense Education Act, which funneled federal money to schools and colleges to improve teaching and research and encouraged students to study science, math, and foreign languages.

In May 1961, astronaut Alan B. Shepard became the first American in space. That same month, President John F. Kennedy ambitiously announced to a joint session of Congress his goal of "landing a man on the moon and returning him safely to Earth" before the end of the decade.

Five years later, the Soviets succeeded in sending an unmanned spacecraft to the moon. But in July 1969, with millions around the globe watching live on television, America claimed the biggest prize in the space race, as astronaut Neil Armstrong became the first man to walk on the moon.

The Soviets showed Armstrong and fellow astronaut Edwin "Buzz" Aldrin's moon walk at least three times on government-run TV that day, according to Bernard Gwertzman, then a *Times* correspondent in Moscow. "For a day or two, there was a pleasant truce in the Cold War," wrote Gwertzman.

Since then, there have been ups and downs in the space

program. In 1976, the U.S. landed the first space probe on Mars and six years later it sent the first spacecraft beyond the outer fringes of the solar system. Scientists discovered more moons circling planets and rings around Uranus, and made flybys or landings on planets and comets.

With the Soviet Union's collapse in 1991, the space race evolved into the sort of partnership envisioned by scientists before *Sputnik* and symbolized by the International Space Station, where American astronauts and Russian cosmonauts have worked side by side.

But NASA has faced other challenges. Seven astronauts died when the space shuttle *Challenger* exploded during takeoff in 1986. In 2003, the space shuttle *Columbia* disintegrated while re-entering Earth's atmosphere and seven more astronauts died.

Some scientists have questioned the value of the space shuttle and space station programs and critics of NASA have complained in recent years that the agency lacks direction and the space program is adrift.

WHAT'S THE PURPOSE OF THE SPACE PROGRAM IN THE 21ST CENTURY?

ASTRONAUTS TO MARS?

In 2004, President George W. Bush set new goals for the space program—a return to the moon and an astronaut mission to Mars. "The desire to explore and understand is part of our character," he said.

Some critics remained skeptical. Others hailed the bold vision of discovery, however belated.

"After years of spending our nation's space budget building an orbiting space station of questionable utility, serviced by an operationally expensive space shuttle of unsafe design, NASA has set a new direction for the future of human spaceflight," Carolyn Porco, a planetary scientist, wrote earlier this year. "Once again, we have our sights on the moon and beyond. We are finally, bodily, going to make our way into space, this time to stay." 🍌

IRAQ: STOLEN FUTURES

STOLEN FUTURES
When they started college four years ago, Iraq's brightest had big ambitions. By graduation day, their dreams of a successful life—of least in Iraq—had been shattered.

LESSON PLAN 3

brighter futures after college if the U.S. succeeds in stabilizing the country.)

WRITING PROMPT

Assign students to write five-paragraph essays in which they explain why the U.S. should or should not grant visas to recent Iraqi college graduates to come to this country for further study or for work.

DISCUSSION QUESTIONS

Do you believe the American military had a special obligation to protect Iraq's universities, as some of the recent graduates argue?

- How might universities and other "moderate" institutions have helped contain extremism, as some students say?
- What arguments do you think Iraq's Minister of Higher Education could make

to help persuade university professors to remain in the country?

FAST FACT

Iraq is a very young country, with 39 percent of its population age 14 or less. This compares with 20 percent in the U.S. and 27 percent worldwide.

CRITICAL THINKING

Ask students to suggest reasons why insurgents in Iraq might target universities and professors. More than 200 professors have been killed and many more kidnapped since the war began. (One possible answer: the absence of an educated class

could make it easier for extremists to seize power.)

The article says most Iraqi college students do not participate in attacks against U.S. and allied forces. Ask students to explain why they think this would be the case. (One possible answer: middle-class Iraqis may feel they have

WEB WATCH

www.mnf-iraq.com

Official news site of the U.S.-led multinational force in Iraq.

1957: SPUTNIK & THE SPACE RACE

1957
Sputnik Launches the Space Race

LESSON PLAN 4

knowledge gained from space travel and the technology it requires benefits everything from medical devices to computers, which improve the lives of everyone on Earth.

INTERVIEW/REPORT

Assign students to ask their grandparents or other older adults what their reaction was when they learned about *Sputnik*. Were they shocked? Concerned? Fearful? Use interview results to spur further student discussion.

DISCUSSION QUESTIONS

President Bush has proposed a return to the moon and astronaut missions to Mars. Explain why you agree or disagree with this proposal.

Do you think the U.S. would have embarked on the moon-landing mission in the 1960s if there had been no Cold War?

FAST FACTS

In April 1961, Russian Yuri Gagarin became the first man in space and the first to orbit the Earth. In June 1963, Russian Valentina Tereshkova became the first woman in space, orbiting the Earth 48 times.

CRITICAL THINKING

One of the ongoing debates about space exploration is whether it is worth the cost. Ask students to listen to the following two arguments and then write five-paragraph essays in which they explain why they agree with one argument or the other.

→ We should first solve problems like poverty, disease, and illiteracy on Earth before spending billions of dollars on space travel and research.

→ Exploring space is part of human development. The

WEB WATCH

<http://history.nasa.gov/sputnik>

NASA provides background on *Sputnik*. See links on the left and the link to audio of *Sputnik's* beeping at the top of the page.

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① Briefly explain why the *Sputnik* launch aroused fear in the United States.

② American schools and colleges were beneficiaries of the space race as a result of

- a students' hopes for high-paying jobs in science and engineering.
- b new courses on space travel.
- c the National Defense Education Act.
- d U.S.-Soviet student exchanges.

③ A major advance in space exploration occurred in 1969 when the

- a the first American went into space.
- b the first Russian went into space.
- c the U.S. landed astronauts on the moon.
- d the first woman went into space.

④ In 2004, President Bush proposed sending astronauts back to the moon to establish a permanent base. He also proposed a long-term program to

- a send astronauts to Mars.
- b set up American military bases in space.
- c mine for minerals on the moon and other extra-terrestrial bodies.
- d bring other countries into the U.S. space research program.

⑤ One of the recent criticisms of NASA has been that

- a the U.S. is not spending enough on space exploration.
- b the Russians have retaken the lead in space.
- c the agency has lost direction and the space program is adrift.
- d it has not included scientists and astronauts from other countries in its efforts.

IN-DEPTH QUESTIONS

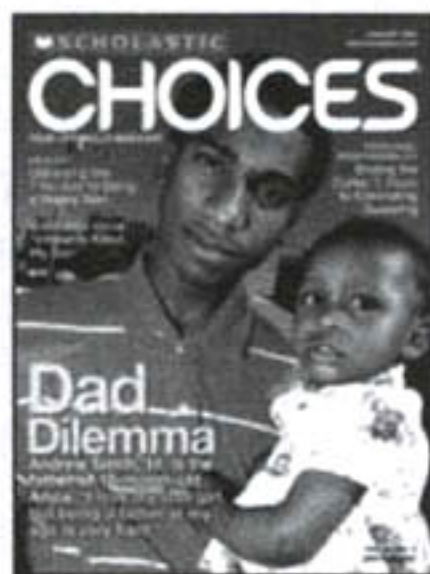
① Explain why you believe, or don't believe, that there should be some kind of international body regulating space exploration.

② Explain why you believe, or don't believe, that humans will someday live in permanent settlements in space. Also explain why you would, or would not, want to live in space.

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GAME SHOW

● **USE** with articles identified.

The statements are answers to questions (modeled after the TV show *Jeopardy!*).

Students must answer in the form of questions.

● **DIVIDE** the class into teams.

● **READ** the statements.

● **CALL** on the first team with a hand raised.

CORRECT ANSWER = 10 points

WRONG ANSWER = -10 points

(And another team may respond for the same chance to gain or lose 10 points.)

STATEMENTS TO READ

CORRECT RESPONSE

HOT TOPIC: CLIMATE CHANGE

1 Where polar bears roam.	What is the Arctic?
2 Animals that contribute to global warming.	What is livestock (cows)?
3 They rose by 6-9 inches in the 20th century.	What are sea levels?
4 Country where the air can be so polluted that some people wear face masks.	What is China?
5 Carbon dioxide in the atmosphere is 35 percent higher than at the start of this in 1750.	What is the Industrial Revolution?

1957: SPUTNIK AND THE SPACE RACE

1 U.S. President when <i>Sputnik</i> was launched.	Who was Dwight D. Eisenhower?
2 Passenger on <i>Sputnik 2</i> .	What was a dog (Laika)?
3 First American to orbit the Earth.	Who is John Glenn?
4 Agency that oversees U.S. space exploration (abbr.).	What is NASA?
5 President Bush proposes that the U.S. someday send astronauts to this planet.	What is Mars?

ANSWER KEY

QUIZ 1 ▷ PAGE TE 5

- 1 [d] balance high standards for student speech with students' right to free expression.
- 2 [c] schools that allow clubs not related to the curriculum must allow religious clubs.
- 3 [a] the school did not use a racial quota system.
- 4 [a] the Constitution does not protect children from their parents.

QUIZ 2 ▷ PAGE TE 5

- 1 [b] it doesn't have the same sectarian conflicts as the rest of Iraq.
- 2 Tensions were kept in check by Saddam's authoritarian government.
- 3 [a] World War I.
- 4 [d] has not protected universities and other moderate institutions that might have helped contain extremists.
- 5 [b] ordered a surge in the number of troops.

QUIZ 3 ▷ PAGE TE 6

- 1 If the Soviets could launch a satellite, people feared, they could also launch missiles at the U.S.
- 2 [c] the National Defence Education Act.
- 3 [c] the U.S. landed astronauts on the moon.
- 4 [a] send astronauts to the planet Mars.
- 5 [c] the agency has lost direction and the space program is adrift.

GRAPH EXERCISE ▷ PAGE TE 4

- 1 [c] 5.6
- 2 [a] 8 billion tons
- 3 [a] 280 million tons
- 4 [c] 218
- 5 Netherlands
- 6 Jamaica
- 7 Answers will vary.