

PLAN®

ABBREVIATED TEST BOOKLET

Contents

This booklet provides sample test questions from each of the four content areas measured by the PLAN Test:

| | Page |
|------------------------|------|
| English Test..... | 1 |
| Mathematics Test | 4 |
| Reading Test | 10 |
| Science Test..... | 12 |
| Answer Key | 16 |

ACT®

ACT endorses the *Code of Fair Testing Practices in Education*, a statement of guidelines for those who develop, administer, and use educational tests and data. The *Code* sets forth criteria for fairness in four areas: developing and selecting appropriate tests, administering and scoring tests, reporting and interpreting test results, and informing test takers. ACT is committed to ensuring that each of its testing programs upholds the *Code's* standards for appropriate test development practice and use.

A copy of the full *Code* may be obtained free of charge from ACT Customer Services (68), P.O. Box 1008, Iowa City, IA 52243-1008, 319/337-1429.

Visit ACT's website at: **www.act.org**

©2006 by ACT, Inc. All rights reserved.

NOTE: This booklet is covered by Federal copyright laws that prohibit the reproduction of the test questions without the express, written permission of ACT, Inc.

1

ENGLISH TEST

DIRECTIONS: In the passage that follows in this abbreviated version of the test, certain words and phrases are underlined and numbered. In the right-hand column, you will find alternatives for the underlined part. In most cases, you are to choose the one that best expresses the idea, makes the statement appropriate for standard written English, or is worded most consistently with the style and tone of the passage as a whole. If you think the original version is best, choose "NO CHANGE." In some cases, you will find in the right-hand column a question about the underlined part. You are to choose the best answer to the question.

You will also find questions about a section of the passage, or about the passage as a whole. These questions do not refer to an underlined portion of the passage, but rather are identified by a number or numbers in a box.

For each question, choose the alternative you consider best and then circle that answer in the test booklet. Read the passage through once before you begin to answer the questions that accompany it. For many of the questions, you must read several sentences beyond the question to determine the answer. Be sure that you have read far enough ahead each time you choose an alternative.

PASSAGE I

An Extension of My Fingers

I learned to eat with chopsticks when I was seven years old. According to my grandparents, who were brought up in China, I was terribly old to be learning such a basic skill. "Children in China *never* eat with forks," my grandfather said. "Chinese children learn to eat with

chopsticks from the beginning." 2

"Think of the chopsticks as an extension of your fingers," my grandmother advised. "You can learn to control them as well as you control your own fingers."

In my experience, though, the bamboo sticks were nothing like my fingers.

1. A. NO CHANGE
B. skill, "Children
C. skill "Children
D. skill "children
2. The writer is considering adding here the following sentence:
When he told me this, I was in the second grade.
Would this be a relevant addition to make?
F. Yes, because the sentence makes it clear that the narrator was older than most Chinese children are when they start using chopsticks.
G. Yes, because the sentence gives information that is necessary to understanding the paragraph that follows it.
H. No, because the sentence gives information that is similar to what has already been given earlier in the paragraph.
J. No, because the sentence should open the next paragraph, not conclude this paragraph.
3. Three of these choices are acceptable here. Which one is NOT acceptable?
A. NO CHANGE
B. Yet in my experience,
C. However, in my experience,
D. In my experience, therefore,

1

With a certain amount of clumsiness, I would manage to wedge a piece of food between the long, stiff chopsticks.

Then, as I rose the food to my mouth, the chopsticks would suddenly slip or shift beyond

control and that my dinner would land on the table with an embarrassing plop. For a long time, I could not finish a meal without creating greasy blotches around my plate.

As I began to try my new skill in Chinese restaurants, I discovered through necessity the different techniques required to manage the many types of chopsticks available. Each type presenting another challenge.

Bone chopsticks thick, and square, and heavy, were

considered appropriate for formal occasions but definitely were especially difficult for my childish

hands. When complaining to my grandmother, she said that the most difficult chopsticks of all had appeared a

thousand years ago in the emperors court.

4. Which choice would best emphasize the sense that the writer made a serious attempt to learn how to manipulate the chopsticks?
 - F. NO CHANGE
 - G. Through arduous concentration,
 - H. An impatient person,
 - J. Being considerate,
5.
 - A. NO CHANGE
 - B. arose
 - C. raise
 - D. raised
6.
 - F. NO CHANGE
 - G. control in which my dinner landed
 - H. control, and my dinner would land
 - J. control, and landing my dinner
7.
 - A. NO CHANGE
 - B. available, each type presented
 - C. available. Each type presented
 - D. available. Each type having presented
8.
 - F. NO CHANGE
 - G. chopsticks thick and square and heavy
 - H. chopsticks, thick and square and heavy,
 - J. chopsticks, thick square and heavy,
9.
 - A. NO CHANGE
 - B. it was a fact that they were
 - C. it was
 - D. were
10.
 - F. NO CHANGE
 - G. When I complained
 - H. I complained
 - J. Complaining
11.
 - A. NO CHANGE
 - B. year's ago in the emperor's
 - C. years ago in the emperor's
 - D. years' ago in the emperors'

1

“In those ancient times,” my grandmother said, “the test for any woman wanting to marry a prince was to eat a meal of pigeon’s eggs with delicate silver chopsticks.” Managing the slippery, marble-sized eggs with the gleaming, pointed chopsticks required a sensitivity $\frac{1}{12}$ at that of most normal people. I knew then that I did not want to be a princess.

12. F. NO CHANGE
G. toward
H. in
J. beyond

Question 13 asks about the preceding passage as a whole.

13. Suppose the writer had chosen to write a brief essay about a particular experience from childhood that changed the way she viewed her grandparents. Would this essay successfully fulfill the writer’s goal?
- A. Yes, because the writer realized that her grandparents wanted her to experience Chinese culture.
 - B. Yes, because the writer suddenly saw that her grandparents were more strict than her parents.
 - C. No, because the essay indicates that the writer was unable to learn what her grandparents were trying to teach her.
 - D. No, because the essay gives no indication that the relationship between the writer and her grandparents changed in any way.

END OF TEST 1

2

MATHEMATICS TEST

DIRECTIONS: Solve each problem in this abbreviated version of the test, choose the correct answer, and then circle that answer in the test booklet.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose,

but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

-
1. Ten boxes of books were delivered to the school library. There were 50 books in each box, except for the last box, which contained only 40 books. How many books did the library receive in this delivery?

- A. 50
- B. 450
- C. 490
- D. 500
- E. 540

DO YOUR FIGURING HERE.

2. In a 1-week period in St. Louis, Missouri, the high temperatures recorded each day were 72° , 67° , 77° , 66° , 78° , 65° , and 65° , respectively. What was the average of the daily high temperatures during that period, to the nearest whole degree?

- F. 60°
- G. 67°
- H. 70°
- J. 71°
- K. 75°

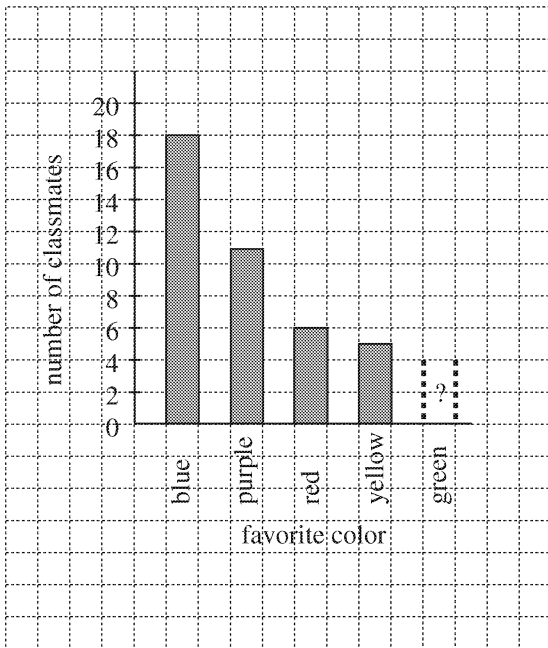
2

3. Robin asked 50 classmates to name their favorite color and gathered the following information.

DO YOUR FIGURING HERE.

| Favorite color | blue | purple | red | yellow | green |
|----------------------|------|--------|-----|--------|-------|
| Number of classmates | 18 | 11 | 6 | 5 | 10 |

Robin decided to display the information in a bar graph on graph paper as shown below. If the bar labeled *blue* is 9 blocks tall, how many blocks tall should the bar labeled *green* be?



- A. $2\frac{1}{2}$
 B. $4\frac{1}{2}$
 C. 5
 D. $5\frac{1}{2}$
 E. 10
4. If $3x + 7 = 28 - 5x$, then $x = ?$
- F. $\frac{21}{8}$
 G. $\frac{35}{8}$
 H. $\frac{23}{10}$
 J. $-\frac{35}{2}$
 K. $-\frac{35}{8}$

2

DO YOUR FIGURING HERE.

5. What is the next term in the following geometric sequence?

$$6, -4, \frac{8}{3}, -\frac{16}{9}, \underline{\quad}$$

- A. $-\frac{8}{3}$
- B. $-\frac{32}{27}$
- C. $\frac{32}{27}$
- D. $\frac{8}{3}$
- E. $\frac{106}{9}$

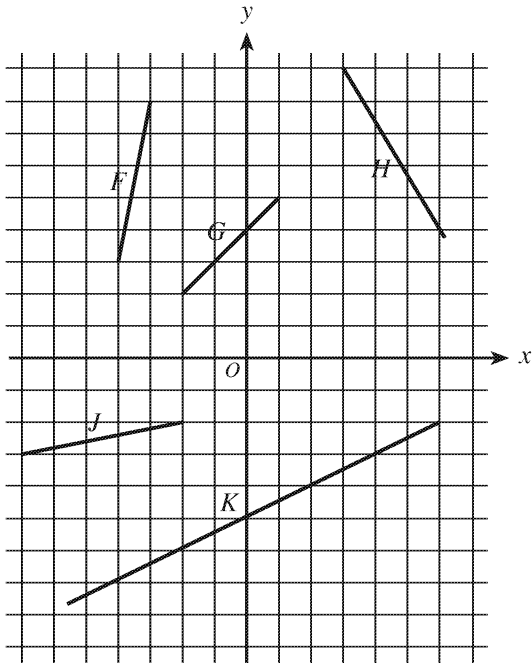
6. What is the sum of the 2 polynomials in the addition problem below?

$$\begin{array}{r} 2x^2 + 3x + 5 \\ + \quad x^2 + 6x - 1 \\ \hline \end{array}$$

- F. $2x^2 + 9x + 4$
- G. $3x^2 + 9x - 5$
- H. $3x^2 + 9x + 4$
- J. $3x^4 + 9x + 4$
- K. $3x^4 + 9x^2 + 4$

DO YOUR FIGURING HERE.

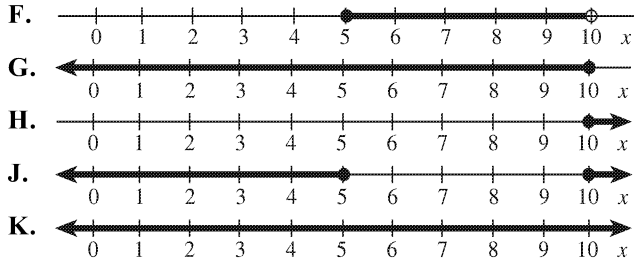
7. Which of the following line segments in the standard (x,y) coordinate plane has the greatest slope?



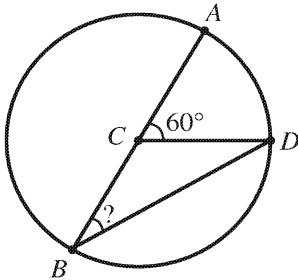
- A. F
 B. G
 C. H
 D. J
 E. K
8. Which of the following lists the fractions $\frac{4}{7}$, $\frac{5}{9}$, and $\frac{2}{3}$ in order from least to greatest?
- F. $\frac{2}{3} < \frac{4}{7} < \frac{5}{9}$
 G. $\frac{4}{7} < \frac{5}{9} < \frac{2}{3}$
 H. $\frac{4}{7} < \frac{2}{3} < \frac{5}{9}$
 J. $\frac{5}{9} < \frac{2}{3} < \frac{4}{7}$
 K. $\frac{5}{9} < \frac{4}{7} < \frac{2}{3}$
9. The coordinates of the endpoints of \overline{RS} on the real number line are 4 and 20. Point M is the midpoint of \overline{RS} . What is the coordinate of M ?
- A. 8
 B. 10
 C. 12
 D. 16
 E. 24

DO YOUR FIGURING HERE.

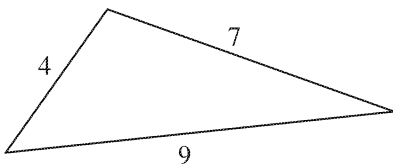
10. Which of the following graphs represents all, and only, the real numbers that satisfy $x - 8 \leq 2$?



11. In the circle centered at C below, \overline{AB} is a diameter, and D lies on the circle. If the measure of $\angle ACD$ is 60° , what is the measure of $\angle ABD$?



- A. 15°
 B. 30°
 C. 40°
 D. 45°
 E. 60°
12. The lengths of the sides in the triangle below are given in centimeters. If you want to construct a similar triangle with a perimeter of 30 centimeters, how many centimeters long should its *longest* side be?

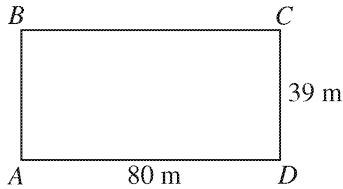


- F. 20.0
 G. 19.0
 H. 16.5
 J. 14.5
 K. 13.5

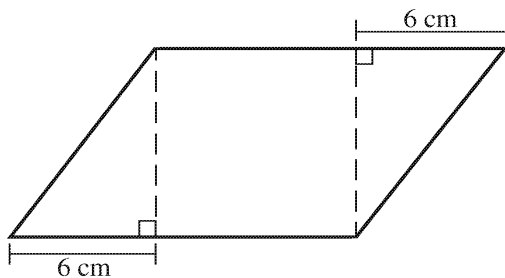
2

DO YOUR FIGURING HERE.

13. The rectangular field shown below is 39 m wide and 80 m long. Frances and Bonita are at point D . Frances walks to point B by walking along the edge of the field through point C . Bonita gets to point B by walking diagonally across the field. About how many meters more does Frances walk than Bonita?



- A. 119
B. 89
C. 41
D. 39
E. 30
14. One of the numbers in the set $\{2, 3, 4\}$ is chosen at random and raised to the power of a different one of these numbers, also chosen at random. What is the probability that the resulting number will be even?
- F. $\frac{1}{6}$
G. $\frac{1}{3}$
H. $\frac{1}{2}$
J. $\frac{5}{9}$
K. $\frac{2}{3}$
15. The figure below shows a parallelogram that is composed of a square and 2 right triangles. The *perimeter* of the square is 32 centimeters, and the lengths of the bases of the triangles are as indicated. What is the *area*, in square centimeters, of the parallelogram?



- A. 112
B. 64
C. 56
D. 48
E. Cannot be determined from the given information

END OF TEST 2

3

READING TEST

DIRECTIONS: There is one passage in this abbreviated version of the test. The passage is followed by several questions. After reading the passage, choose the best answer to each question and circle the answer in the test booklet. You may refer to the passage as often as necessary.

Passage I

SOCIAL SCIENCE: This passage is adapted from an essay by Ellen Goodman that appeared in *Keeping in Touch* (©1985 by The Washington Post Company).

Twenty years ago, when Valentina Tereshkova went into space, she was followed by an appalling trail of words. The Russians' "smiling cosmonette" and "dimpled space sister" had "her feminine curves hidden in a clumsy space suit." You get the idea.

Sally Ride, in turn, suffered some before she went up in the Challenger. Johnny Carson quipped that the launch was being postponed until Sally could find the purse to match her shoes. A *Time* magazine writer asked if she wept when things went wrong.

By lift-off, however, the media were just about as (1) tamed, (2) repressed, or (3) enlightened as we could have hoped. Indeed, it was Sally Ride's name which seemed to provide more twists, puns, and plays on words for headline writers than her sex. To wit: "Ride, Sally Ride," "Sally Rides High," and "Sally's Joy Ride."

Still, what we are witnessing is a classic case of First Womanitis, a social disease that comes with prolonged exposure to the spotlight. Sally Ride, First American Woman in Space, is taking this trip right into history while her male companions are destined for the trivia shows.

She is also, like it or not, joining a large sorority whose ranks include Elizabeth Blackwell, the first woman to be graduated from an American medical school, in 1849, and Ruth Wilson, the first woman hired as a street cleaner by the Philadelphia Sanitation Department, in 1976.

When all is said and done, Sally Ride is just another First Woman.

Ride is luckier than many of the others in this sorority. People are rooting for her, rather than against her. But the initiation rites are by now familiar.

As a First Woman, she is watched and called upon to explain her very existence in a way that her co-travelers are not. She is asked opinions on everything "female"—from fashion to feminism—and everyone offers opinions about her from her fashions to her feminism.

Nearly all of the select have felt this glare of extraordinariness, even in their more earthly pursuits. Nearly all of them have sighed, at some moment, as Ride did, "It may be too bad that our society isn't further along and that this is such a big deal."

But most First Women share something else: a special conflict. There is the desire to be accepted as a self-made woman, a person who was and is judged on individual merit. There is the realization that each carries a load of other women's frustrations and hopes.

Ride has borne the disappointments of women such as those would-be astronauts of 1961, the dozen whose space futures were canceled out because "the times" were not ripe. She has also taken on the hopes of a generation of young girls in search of heroines. When it all gets to be too much, she flips "the switch marked 'oblivious.'" Maybe First Women wear that switch like a sorority pin.

In any case, Ride is now initiated. She's learned the rules. Being a full-fledged First Woman means carrying your self as a second job. Being a First Woman means taking every step for womankind. It's not easy, but the company is fine.

3

1. It may be reasonably inferred from the passage that Sally Ride received from the media:
 - A. more attention than her male counterparts.
 - B. less attention than her male counterparts.
 - C. the same attention as her male counterparts.
 - D. no attention until twenty years later.

2. The passage states that while Sally Ride is taking a trip into history, her male counterparts are destined for:
 - F. future economic success.
 - G. future space trips.
 - H. news headlines.
 - J. trivia shows.

3. It may be reasonably inferred that the information in the second paragraph (lines 6–10) is included by the author to illustrate how:
 - A. enlightened the media has become.
 - B. powerful the media has become.
 - C. society stereotypes women.
 - D. Sally Ride delayed the shuttle launch.

4. The passage indicates that Ride is luckier than many other First Women because:
 - F. she got to travel in space.
 - G. her future was not canceled out.
 - H. the initiation rites were familiar.
 - J. people were on her side.

5. Throughout the passage, being a First Woman is compared to being:
 - A. in a sorority.
 - B. on a ride into space.
 - C. married to the President.
 - D. in search of heroines.

6. The words used to describe Valentina Tereshkova in the first paragraph are presented by the author as examples of language that:
 - F. describes the skills and abilities of women.
 - G. respects the superiority of female attributes.
 - H. claims equality for women in the workplace.
 - J. devalues the role of an accomplished person.

7. As it is used in line 15, the phrase *to wit* most nearly means:
 - A. stereotypically.
 - B. nevertheless.
 - C. that is.
 - D. therefore.

8. Which of the following statements best summarizes the main point of the passage?
 - F. Society has made marked progress in sex-role stereotyping.
 - G. Male-dominated fields should make an effort to recruit more women.
 - H. Women should attempt to expand professionally into more fields.
 - J. Women who pioneer in male-dominated fields carry an unusual burden.

END OF TEST 3

4

SCIENCE TEST

DIRECTIONS: There are two passages in this abbreviated version of the test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and circle the answer in the test booklet. You may refer to the passages as often as necessary.

You are NOT permitted to use a calculator on this test.

Passage I

The *heating rate* is defined as the amount of heat absorbed by a material in a given time period. When a material absorbs heat, its temperature may rise.

For 50 g each of various liquids, initially at 20°C, Table 1 lists the temperature change when each liquid absorbs heat for 10 sec at a heating rate of 60 watts (W).

| Liquid | Mass (g) | Heating rate (W) | Time (sec) | Temperature change (°C) |
|-----------------|----------|------------------|------------|-------------------------|
| Benzene | 50 | 60 | 10 | 6.9 |
| Ethylene glycol | 50 | 60 | 10 | 5.0 |
| Methanol | 50 | 60 | 10 | 4.7 |
| Mercury | 50 | 60 | 10 | 86.3 |

For 50 g or 100 g of water, initially at 20°C, Figure 1 shows the temperature changes that occur when the water is heated for 10 sec at various heating rates, and Figure 2 shows the temperature changes that result for water at a heating rate of 60 W for various amounts of time.

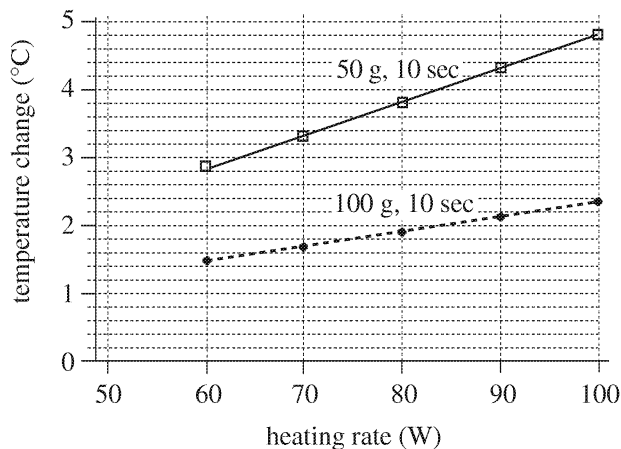


Figure 1

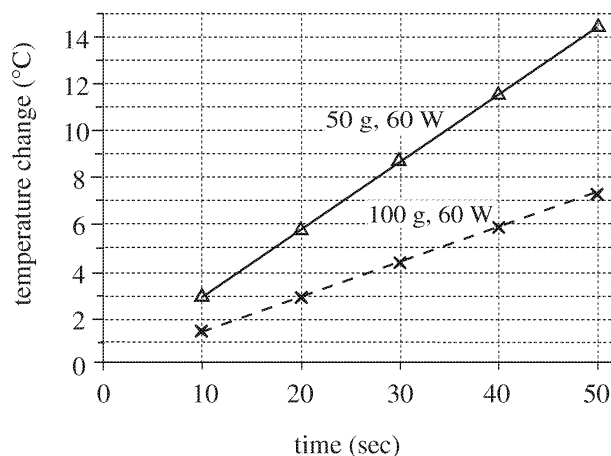


Figure 2

- To produce the data given in Figure 2, different amounts of water were used, most likely to show that the temperature change:
 - for water depended on the rate of evaporation.
 - for water depended on the mass of water used.
 - of 1 g of water depended on water's rate of heat absorption.
 - of 1 g of water depended on time.
- According to Table 1, how much benzene was being heated?
 - 6.9 g
 - 10 g
 - 50 g
 - 60 g

4

3. For both sets of observations graphed in Figure 2, water absorbed heat at a rate of:
- A. 10 W.
 - B. 50 W.
 - C. 60 W.
 - D. 100 W.
4. According to the data in Table 1, which of the following lists ranks the 4 liquids in order of *decreasing* temperature change?
- F. Benzene, ethylene glycol, methanol, mercury
 - G. Ethylene glycol, benzene, mercury, methanol
 - H. Methanol, ethylene glycol, benzene, mercury
 - J. Mercury, benzene, ethylene glycol, methanol
5. According to the data in Figure 1, if 25 g of water were heated at a rate of 60 W for 10 sec, the temperature change of the water would be closest to which of the following values?
- A. 0.7°C
 - B. 1.5°C
 - C. 2.2°C
 - D. 5.7°C
6. Based on the data in Figure 2 for water at a given heating rate, the largest temperature change will be obtained when which of the following amounts of water is heated for how long?
- F. 100 g of water for 100 sec
 - G. 100 g of water for 1,000 sec
 - H. 1,000 g of water for 100 sec
 - J. 1,000 g of water for 1,000 sec

Passage II

Herbicides are chemicals that kill plants. A study was conducted to examine the effects of 2 herbicides (Herbicides A and B) on both crop and weed plant species.

Ten identical 10 m × 10 m plots were established in a field. One row of seeds of each of 5 crop species and 5 weed species was planted in each plot. One herbicide at 1 of 2 concentrations was then added to each plot (see Table 1). Plants were observed 2 weeks after application of the herbicides. Plots 1–5 were used in Experiment 1 and Plots 6–10 were used in Experiment 2.

| Plot | Herbicide | Concentration |
|----------|-----------|---------------|
| 1 and 6 | A | low |
| 2 and 7 | A | high |
| 3 and 8 | B | low |
| 4 and 9 | B | high |
| 5 and 10 | None | — |

Experiment 1

Herbicides were applied to the plots immediately after the seeds were planted (*pre-emergence application*). The results are shown in Table 2.

(Note: [X] indicates that the plants died and [–] indicates that plants were not affected.)

| | Plot | | | | |
|--------------|------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Crops | | | | | |
| corn | – | X | – | – | – |
| cucumber | – | X | X | X | – |
| oats | X | X | – | – | – |
| tomato | – | – | X | X | – |
| wheat | X | X | – | – | – |
| Weeds | | | | | |
| crabgrass | X | X | – | – | – |
| quackgrass | X | X | – | – | – |
| foxtail | – | – | – | – | – |
| ragweed | X | X | X | X | – |
| velvetleaf | – | – | X | X | – |

Experiment 2

The herbicides were applied to the plots only after the plants had emerged from the soil and were 6–12 cm tall (*post-emergence application*). Table 3 presents the results.

(Note: [I] indicates that the plants were injured by the herbicide.)

| | Plot | | | | |
|--------------|------|---|---|---|----|
| | 6 | 7 | 8 | 9 | 10 |
| Crops | | | | | |
| corn | – | X | – | – | – |
| cucumber | I | X | – | I | – |
| oats | X | X | – | – | – |
| tomato | I | I | – | I | – |
| wheat | X | X | – | – | – |
| Weeds | | | | | |
| crabgrass | X | X | – | – | – |
| quackgrass | X | X | – | – | – |
| foxtail | – | – | X | X | – |
| ragweed | I | X | I | X | – |
| velvetleaf | I | X | – | – | – |

At the end of the experiments, all plots were seeded with bluegrass in order to prevent soil erosion.

7. Which of the plots served as the control in Experiment 2?
- A. Plot 7
B. Plot 8
C. Plot 9
D. Plot 10
8. In which of the following ways were the procedures of Experiments 1 and 2 different?
- F. Herbicide concentrations
G. Size of the plots
H. Plant species tested
J. Timing of herbicide application

4

9. Based on the results of Experiment 1, one can conclude that Herbicide A has no effect on which of the following crop species after pre-emergence application?
- A. Cucumber
 - B. Oats
 - C. Tomato
 - D. Wheat
10. The study plots used in the experiments were as identical as possible in order to ensure that the:
- F. environmental conditions in each of the plots was about the same.
 - G. herbicides could be applied at the appropriate time during the growing season.
 - H. crop and weed species would respond to the herbicides.
 - J. number of plants which emerged could be counted.

END OF TEST 4

Abbreviated PLAN Test Answer Key

| English Test | |
|--------------|--------|
| Question | Answer |
| 1 | A |
| 2 | H |
| 3 | D |
| 4 | G |
| 5 | D |
| 6 | H |
| 7 | C |
| 8 | H |
| 9 | D |
| 10 | G |
| 11 | C |
| 12 | J |
| 13 | D |

| Mathematics Test | |
|------------------|--------|
| Question | Answer |
| 1 | C |
| 2 | H |
| 3 | C |
| 4 | F |
| 5 | C |
| 6 | H |
| 7 | A |
| 8 | K |
| 9 | C |
| 10 | G |
| 11 | B |
| 12 | K |
| 13 | E |
| 14 | K |
| 15 | A |

| Reading Test | |
|--------------|--------|
| Question | Answer |
| 1 | A |
| 2 | J |
| 3 | C |
| 4 | J |
| 5 | A |
| 6 | J |
| 7 | C |
| 8 | J |

| Science Test | |
|--------------|--------|
| Question | Answer |
| 1 | B |
| 2 | H |
| 3 | C |
| 4 | J |
| 5 | D |
| 6 | G |
| 7 | D |
| 8 | J |
| 9 | C |
| 10 | F |