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ABSTRACT

This volume provides documentation and selected data for the exercises used by the National Assessment of Educational Progress (NAEP) in nationwide surveys to measure changes in science achievement of young Americans at four age levels: 9-year-olds, 13-year-olds, 17-year-olds, and adults ages 26-35. The exercise documentation includes a copy of the complete exercise, cross-reference identification numbers, the objectives an exercise measured, timing information, and description of the exercise by format, scoring requirements, and administration mode. (NH)

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**CHANGES IN SCIENCE
PERFORMANCE, 1969-1973:
Exercise Volume**

2

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NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

A Project of the Education Commission of the States

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Roy Forbes, Director, National Assessment

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1973-74 Assessment

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NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

A Project of the Education Commission of the States

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NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

CHANGES IN SCIENCE PERFORMANCE, 1969-1973:

Exercise Volume

Science Report No. '04-S-20

December 1975

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

Roy H. Forbes,
Director

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Associate Director

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PREFACE

When the United States Office of Education was founded in 1867, one charge set before its commissioner was to determine the nation's progress in education. Only recently has that century-old charge been addressed in a systematic way. The work is being done by the National Assessment of Educational Progress (NAEP).

Each year since 1969 NAEP has gathered census-like information about levels of educational achievement across the country and reported its findings to the nation. During the first five years of its endeavors, National Assessment has interviewed and tested more than 400,000 representative young Americans. Baseline data on the achievement levels of young Americans in eight learning areas -- science, social studies, music, literature, reading, writing, mathematics and citizenship -- have been collected and reported.

Each assessment is the product of several years work by a great many educators, scholars and lay persons from all over the country. Initially, these people design objectives for each area, proposing general goals that they feel Americans should be achieving in the course of their education. These goals are reviewed by more people and then passed along to developers of tests, whose task it is to create measurement tools appropriate to the objectives.

When the exercises prepared by the test developers have passed extensive reviews by subject-matter specialists and measurement experts, they are administered to probability samples of various populations. The people who

compose those samples are chosen in such a way that the results of their assessment can be generalized to an entire national population. That is, on the basis of the performance of about 2,500 9-year-olds on a given exercise, we can generalize about the probable performance of all 9-year-olds in the nation. Approximately 100,000 persons participate annually.

After assessment data have been collected, scored and analyzed, National Assessment publishes reports to present the results as accurately as possible. Not all exercise results are released for publication. Because National Assessment will administer some of the same exercises again in the future to determine whether the performance level of Americans has improved or declined, it is essential that they be kept secret in order to preserve the integrity of the study. Approximately one-third of the repeated exercises were retained for use in the third cycle of science assessment and, therefore, are not printed here. Five of these released, repeated exercises required written responses that had to be specially scored and analyzed. These data do not appear in this volume.

This volume provides documentation and selected data for the exercises measuring change in science achievement that have now been released. The exercise documentation includes a copy of the complete exercise, cross-reference identification numbers, the objectives an exercise measured, timing information and description of the exercise by format, scoring requirements and administration mode. Researchers who need detailed information and state and local school districts that want to use individual NAEP exercises in their own assessment programs will find this documentation most useful. A brief general summary of the results can be found in *National Assessments of Science, 1969 and 1973: A Capsule Description of Changes in Science Achievement*,

Science, Report 04-S-03, 1972-73 Assessment (Washington, D.C.: Government Printing Office, 1975).

National Assessment also publishes a general information yearbook that describes all major aspects of the assessment process. This volume defines the categories by which results are reported and elaborates on the scientific procedures utilized. The reader who desires more detailed information about how National Assessment defines its groups, prepares and scores its exercises, designs its sample and analyzes and reports its results, should consult *General Information Yearbook, Report 03/04-GIY*, which is available, as are all NAEP reports, through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

INTRODUCTION

In the first National Assessment of Educational Progress (NAEP) study in 1969-70, 9-year-olds, 13-year-olds and 17-year-olds attending school (age levels that mark the end of primary, intermediate and secondary education) were asked a variety of questions designed to measure achievement of four broad educational objectives in science. These objectives were (1) that Americans should know some fundamental facts and principles of science; (2) that they should possess some abilities and skills needed to engage in the process of science; (3) that they should understand the investigative nature of science; and (4) that they should have some attitudes about science and appreciate its role in the culture. Approximately one-half of the questions asked in 1969-70 were repeated in 1972-73. Using the same exercises again in a controlled manner, National Assessment was able to measure the increase or decline in attainment between the two science assessments. This volume provides documentation and selected data for the released exercises measuring change in science achievement.

Several types of information are produced on each exercise documentation page, as illustrated below.

SAMPLE DOCUMENTATION PAGE

I. EXERCISE IDENTIFICATION SYSTEMS

72-73 Rpt. #: RP104

The 1972-73 identification system for all exercises released after the second assessment begins with an "R."

RP104

The second letter designates the type of science being assessed: physical (P), biological (B) or unclassified (U).

RP104

The three numbers are simply a sequence number.

69-70 Rpt. #: U632, U708

The 1969-70 identification system follows the same general pattern. However, in most cases the exercises were unreleased, and the identifier begins with a "U." A few exercises which were released after the first assessment were then repeated in the second assessment. Therefore, in a few instances the 1969-70 identifier begins with an "R." In the first assessment, report numbers were assigned by age level. Exercises, like the sample used here, that were administered at two age levels, had two report numbers.

NAEP #: 101069

The NAEP number serves as a cross-reference and is used more than other identifiers by the NAEP staff. The 1972-73 objective and subobjective are coded in the first and third digits from the left in the NAEP number. In this volume, exercises are ordered by NAEP number and, therefore, by 1972-73 objective and subobjective.

II. OBJECTIVES AND SUBOBJECTIVES

72-73 Objective:

Subobjective:

I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
A. Know facts and simple concepts.

69-70 Objective:

I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Each exercise was written to measure one of the 1969-70 objectives. Once the objectives were revised for the 1972-73 assessment, the repeated exercises were matched with the new objectives and subobjectives. Subobjectives were not assigned to exercises in 1969-70. Booklets describing the two sets of objectives and their development are available from the U.S. Government Printing Office.

III. ADMINISTRATION AND SCORING DESCRIPTORS

Exercise Type:

Multiple choice

Most of the exercises presented in this volume are multiple-choice questions; a few have, in addition, a short-answer part.

Scoring Type: Machine

The multiple-choice exercises were scored by machine, an optical scanner. The open-ended questions were scored by hand by a staff of specially trained personnel.

Administration Mode: Group

Most of the exercises in this report were administered to groups of respondents. Others were administered individually, that is, one at a time, to respondents.

It should be noted that the administration and scoring characteristics of the exercises in this volume are not representative of the entire pool of exercises used in 1972-73. Many of the new exercises had open-ended parts which had to be scored by hand. Several were administered to respondents one at a time. However, most of these exercises were not repeated from the first assessment; they were newly developed for the second and will be reported some time in the future.

IV. PACKAGING INFORMATION

Age	9	13
22-73 Package-Exercise:	03-05	04-33
69-70 Package-Exercise:	02-06	07-03

This information tells how exercises were grouped into booklets or packages for each administration. Each respondent took only one package of exercises.

V. ADMINISTRATION TIMES

RP104	RP104	RP104
Timing: (in seconds)	Stimulus:	9
	Response:	11
	Grand Total:	31

Those researchers planning to reassess the National Assessment exercises will need to know their exact administration times. The tape recordings used in each group administration were timed in order to arrive at the figures presented in this report. The *stimulus* time is the time required to read on the tape the entire exercise including the alternative responses. The *response* time is the period of silence on the tape allowed for respondents to record their answers. The *grand total* is the total elapsed time required to administer an exercise. The total time is almost always greater than the sum of the stimulus and response times. After the response time, in multiple-choice parts of exercises, there is a five-second interval during which respondents are told "If

you do not know the answer, please fill in the oval beside 'I don't know.'" After that, there is a six-second pause before the announcer goes on to the next exercise.

On open-ended exercises, much longer response times were used to allow respondents ample time to respond to the exercise.

SAMPLE EXERCISE PAGE

I. COMPLETE EXERCISE

Each year the Earth moves once around

- Mars.
- Venus.
- the Sun.
- the Moon.
- all of the other planets.
- I don't know.

This is a copy of the exercise (NAEP #101069) as it appeared to the respondents. Each exercise was on a separate page in a package.

II. PERCENTAGE OF RESPONDENTS CHOOSING EACH RESPONSE

RESP	AGE 9		AGE 13	
	1970	1973	1969	1972
1	2.5	2.0	0.8	1.4
2	2.2	1.8	0.9	1.0
3*	66.5	66.7	82.5	75.5
4	17.9	16.6	9.3	10.3
5	6.5	8.3	3.6	4.8
IDK	4.1	4.5	2.7	4.5

These data tell us, first, that the exercise was given to both 9 and 13-year-olds in both science assessments. The table gives the percent of students at each age level choosing each of the alternative responses. The responses (under the heading "RESP") are numbered to correspond to the order in which they appear in the exercise. In this example, "Mars" is response 1; "Venus," 2; and so forth. The correct response is indicated by an asterisk. "IDK" denotes the "I don't know" response. From this table we see that in 1969 82.5% of the 13-year-olds correctly said each year the Earth moves once around the Sun. That percentage dropped to 75.5% in 1972. We can also note that the second most popular response, "the Moon," attracted more 9 than 13-year-olds.

The dates in the tables refer to the years in which each age level was assessed. The actual administration dates were:

9-year-olds	Jan.-Feb., 1970	Jan.-Feb. 1973
13-year-olds	Oct.-Dec., 1969	Oct.-Dec. 1972
17-year-olds	March-May 1969	March-May 1973

III. SELECTED GROUP DATA

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	3.8	-10.9	3.5	0.8	2.4	-2.8	-24.3	4.6
	1973	7.4	-5.4	-3.1	1.2	3.7	-3.9	-25.8	5.5
13	1969	4.5	-6.5	2.5	-2.8	2.8	-2.6	-17.1	3.3
	1972	7.1	-3.7	2.4	-6.7	3.1	-3.3	-18.3	4.5

Selected group data on the percent responding correctly to each exercise are also presented. Data are presented for the following groups:

Region	NE	Northeast
	SE	Southeast
	C	Central
	W	West
Sex	M	Male
	F	Female
Color	B	Black
	W	White

Each number in these tables is a group difference, the difference between the percent responding correctly in each group and in the nation. A negative difference means the group is performing below the national level; a positive difference means it is above. For example, in 1970 Southeastern 9-year-olds answered this exercise correctly 10.9% less

often than the nation as a whole. In 1973, Southeastern 9-year-olds were correct 5.4% less often than the nation. Although they are still below the national level, this group improved its standing relative to the nation.

Definitions of the groups can be found in the *General Information Yearbook, Report 03/04-GIY*.

EXERCISES AND DOCUMENTATION

72-73 Rpt. #: RB101
 69-70 Rpt. #: U607

NAEP #: 101064

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 03-10
 69-70 Package-Exercise: 01-02

Timing: (in seconds)
 RB101 Stimulus: 9
 RB101 Response: 41
 RB101 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.8	-8.4	2.2	0.9	2.6	-3.0	-19.8	3.7
	1973	0.1	-6.6	2.6	2.8	2.1	-2.2	-15.5	-3.0

Which of these birds CANNOT fly?

A



Duck

B



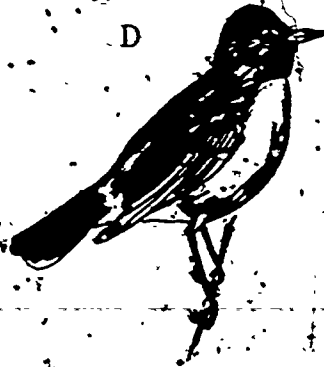
Sparrow

C



Penguin

D



Robin

A

B

C

D

I don't know.

AGE 9

RESP

1970

1973

1

5.1

4.4

2

0.5

0.3

3*

92.0

91.6

4

0.6

0.5

IDK

0.4

0.2

72-73 Rpt. #: RP102
69-70 Rpt. #: U648

NAEP #: 401067

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 07-07
69-70 Package-Exercise: 01-13

Timing: (in seconds)
RP102 Stimulus: 7
RP102 Response: 42
RPT02 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	7.0	-6.2	0.4	3.2	3.0	-3.4	-12.8	5.1
	1973	8.5	-5.5	-3.1	-0.0	3.0	-3.0	-17.7	4.5

Chemistry is often called the study of

- animals.
- matter.
- plants.
- soil.
- I don't know.

AGE 9

RESP	1970	1973
1	11.2	9.5
2	37.6	41.0
3	15.6	18.8
4	21.2	16.3
IDK	14.2	14.1

72-73 Rpt. #: RB103
69-70 Rpt. #: R134

NAEP #: 101068

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 02-27
69-70 Package-Exercise: 02-04

Timing: (in seconds)
RB103 Stimulus: 10
RB103 Response: 39
RB103 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-3.4	-2.2	2.6	2.4	1.8	-2.1	-10.5	2.0
	1973	-7.0	6.3	2.1	-1.0	3.9	-3.8	-15.5	4.0

Which of the following insects spread serious human diseases?

Ants

Honeybees

Houseflies

Moths

I don't know.

AGE * 9

RESP	1970	1973
1	4.8	6.1
2	17.9	21.4
3	46.0	45.5
4	21.2	20.4
IDK	9.8	6.2

72-73 Rpt. #: RP104
 69-70 Rpt. #: U632, U708

NAEP #: 101069

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		9	13
72-73 Package-Exercise:		03-05	04-33
69-70 Package-Exercise:		02-06	07-03

Timing: (in seconds)

RP104	Stimulus:	9	9
RP104	Response:	40	11
RP104	Grand total:	60	31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	3.8	-10.9	3.5	0.8	2.4	-2.8	-24.3	4.6
	1973	7.6	-5.4	-3.1	1.2	3.7	-3.9	-25.8	5.5
13	1969	4.5	-6.5	2.5	-2.8	2.8	-2.6	-17.1	3.3
	1972	7.1	-3.7	2.4	-6.7	3.1	-3.3	-18.3	4.5

Each year the Earth moves once around

- Mars.
- Venus.
- the Sun.
- the Moon.
- all of the other planets.
- I don't know.

RESP	AGE 9		AGE 13	
	1970	1973	1969	1972
1	2.5	2.0	0.8	1.4
2	2.2	1.8	0.9	1.0
3*	66.5	66.7	82.5	75.5
4	17.9	16.6	9.3	10.5
5	6.5	8.3	3.6	4.8
IDK	4.1	4.5	2.7	4.5

72-73 Rpt. #: RB105

69-70 Rpt. #: U628

NAEP #: 101070

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.

Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

Administration Mode: Group

Age: $\frac{9}{}$

72-73 Package-Exercise: 02-12

69-70 Package-Exercise: 02-16

Timing: (in seconds)

RB105 Stimulus: 15

RB105 Response: 35

RB105 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.4	-2.6	4.5	-5.6	1.4	-1.6	-8.8	2.1
	1973	-3.5	-7.1	8.9	1.4	1.4	-1.4	-17.0	3.9

Sometimes seeds stick to animals and are carried to new places where they will later grow. Which of these seeds would most likely be spread this way?

A.



Maple Seed

B.



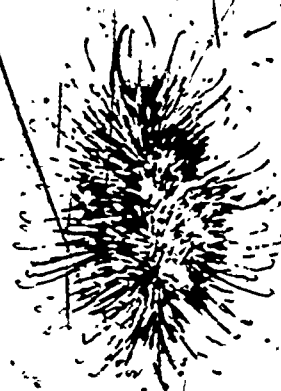
Bean Pod

C.



Acorn

D.



Cocklebur

A

B

C

D

I don't know.

AGE 9

RESP	1970	1973
1.	9.8	12.7
2.	9.4	12.8
3.	7.5	9.4
4*	69.5	61.9
IDK	3.6	2.7

72-73 Rpt. #: RP106
 69-70 Rpt. #: U603
 NAEP #: 101071

72-73 Obj.: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj.: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 06-06
 69-70 Package-Exercise: 03-01

Timing: (in seconds)
 RP106 Stimulus: 6
 RP106 Response: 67
 RP106 Grand total: 84

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-2.3	-5.9	1.0	0.8	-0.4	0.4	-12.9	2.6
	1973	1.4	-2.9	0.7	0.8	0.8	-0.8	-7.3	1.7

Which of the following is hottest?

- Earth
- Mars
- The Moon
- The Sun

- I don't know.

	* AGE 9	
RESP	1970	1973
1	0.7	1.1
2*	1.1	1.5
3*	1.2	1.3
4*	95.1	95.4
IDK	1.5	0.7

72-73 Rpt. #: RP107
 69-70 Rpt. #: U646

NAEP #: 101072

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:
 72-73 Package-Exercise: 03-15
 69-70 Package-Exercise: 03-03

Timing: (in seconds)
 RP107 Stimulus: 9
 RP107 Response: 40
 RP107 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	7.6	-11.9	-0.0	1.4	0.2	-0.2	-11.0	1.8
	1973	3.0	-5.4	0.9	1.0	2.4	-2.6	-11.0	1.7



Physics is the study of

- war and peace.
- wood and cloth.
- energy and matter.
- plants and animals.

- I don't know.

AGE 9

RESP	1970	1973
1	16.0	10.8
2	4.1	3.1
3*	38.6	37.8
4	16.3	29.4
IDK	24.8	18.7

72-73 Rpt. #: RP108
69-70 Rpt. #: U635

NAEP #: 101073

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 07-25
69-70 Package-Exercise: 03-04

Timing: (in seconds)
RP108 Stimulus: 9
RP108 Response: 40
RP108 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-8.6	-9.0	8.7	4.8	0.8	-0.8	-13.6	3.1
	1973	-3.2	-6.3	2.4	7.5	2.1	-2.1	-12.3	3.3

The tiny grams of sand on the beach are

- pieces of rock.
- drops of water.
- crystals of salt.
- splinters of wood.
- I don't know.

	AGE 9	
RESP	1970	1973
1*	61.9	53.9
2	3.9	3.7
3	28.5	35.7
4	2.1	3.5
IDK	3.4	3.1

72-73 Rpt. #: RP109
 69-70 Rpt. #: U609

NREP #: 101074

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 06-17
 69-70 Package-Exercise: 03-12

Timing: (in seconds)
 RP109 Stimulus: 10
 RP109 Response: 39
 RP109 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.6	-7.6	1.3	1.6	-0.3	0.3	-22.3	4.3
	1973	0.5	-4.3	3.0	0.4	0.8	-0.9	-17.6	4.6

You could measure the distance from your home to the school in yards or in

- dozens.
- feet.
- pounds.
- quarts.
- I don't know.

	AGE 9	
RESP	1970	1973
1	3.9	4.8
2*	89.1	85.6
3	2.4	2.2
4	2.3	2.9
IDK	2.2	4.2

72-73 Rpt. #: RP110
 69-70 Rpt. #: U616

NAEP #: 101076

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 03-31
 69-70 Package-Exercise: 03-16

Timing: (in seconds)
 RP110 Stimulus: 10
 RP110 Response: 40
 RP110 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	5.8	-14.2	4.2	-0.1	-3.0	3.1	-31.0	6.8
	1973	5.7	-8.1	1.8	-0.2	-1.9	2.0	-28.5	6.4



Electricity can be used for all of the following EXCEPT

- taking walks.
- cooking food.
- heating homes.
- lighting rooms.
- I don't know.

	AGE 9	
RESP	1970	1973
1*	80.3	76.6
2	5.3	4.2
3	3.7	4.3
4	9.0	11.0
IDK	1.4	3.4

72-73 Rpt. #: RP111
 69-70 Rpt. #: U636
 NAEP #: 101077

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 03-28
 69-70 Package-Exercise: 03-17

Timing: (in seconds)
 RP111 Stimulus: 9
 RP111 Response: 41
 RP111 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	0.5	-6.4	-0.5	5.0	1.9	-1.9	-20.1	3.3
	1973	4.8	-2.5	-0.7	-1.4	0.3	-0.3	-17.0	3.2

Putting sand and salt together makes

- a chemical.
- a compound.
- an element.
- a mixture.
- a solution.
- I don't know.

AGE 9

RESP	1970	1973
1	10.6	8.1
2	8.4	6.8
3	4.1	3.3
4*	61.5	61.7
5	6.7	9.8
EDK	8.5	10.3

72-73 Rpt. #: RB112
69-70 Rpt. #: U610

NAEP #: 101078

72-73 Obj.: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj.: I. KNOW FUNDAMENTAL FACTS, AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 03-19
69-70 Package-Exercise: 04-01

Timing: (in seconds)
RB112 Stimulus: 7
RB112 Response: 43
RB112 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.7	-1.6	-2.9	3.1	0.9	-0.9	-6.5	1.2
	1973	-2.1	-0.1	-0.3	2.4	1.2	-1.3	-7.1	1.6

Which animal eats only plants?

- Cat
- Dog
- Lion
- Rabbit
- I don't know.

AGE 9

RESP	1970	1973
1	0.2	0.2
2	0.5	0.3
3	8.1	5.5
4*	87.7	92.7
IDK	3.0	1.2

72-73 Rpt. #: RB113
 69-70 Rpt. #: U541
 NAEP #: 101079

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 03-23
 69-70 Package-Exercise: 04-04

Timing: (in seconds)
 RB113 Stimulus: 14
 RB113 Response: 36
 RB113 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	0.2	-2.7	-1.6	3.8	0.1	-0.1	-10.0	3.0
	1973	-1.3	0.0	2.1	-1.1	0.6	-0.7	-1.7	0.6



Germs sometimes cause disease in man because germs

- make poisons.
- keep the blood from moving.
- use up all of the water in the body.
- dislike people and want to hurt them.
- I don't know.

AGE 9

RESP	1970	1973
1*	49.2	47.6
2	17.4	20.7
3	6.9	10.5
4	13.6	13.1
IDK	12.8	7.9

43

72-73 Rpt. #: RB114
 69-70 Rpt. #: U615

NAEP #: 101081

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

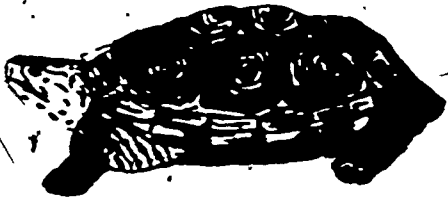
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 05-02
 69-70 Package-Exercise: 04-09

Timing: (in seconds)
 RB114 Stimulus: 9
 RB114 Response: 40
 RB114 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	.0.0	-2.3	2.6	-1.5	2.0	-1.9	-10.6	3.2
	1973	-2.8	-3.2	6.0	-0.5	1.7	-1.7	-12.5	4.8

Which of the following animals has scales over most of its body?



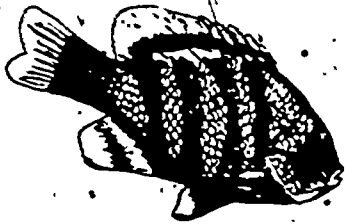
A

Turtle



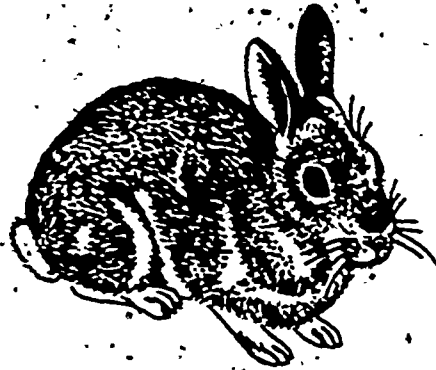
B

Frog



C

Fish



D

Rabbit

- A
- B
- C
- D
- I don't know.

	AGE 9	
RESP	1970	1973
1	11.0	10.6
2	3.8	3.7
3*	80.9	75.7
4	12.5	4.2
IDK	1.5	2.5

45

72-73 Rpt. #: RB115
69-70 Rpt. #: U611

NAEP #: 101083

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 02-20
69-70 Package-Exercise: 05-01

Timing: (in seconds)
RB115 Stimulus: 9
RB115 Response: 40
RB115 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.0	-7.0	3.3	0.0	0.8	-0.8	-24.3	4.6
	1973	2.1	-6.3	2.4	1.4	1.9	-1.8	-20.9	4.4

Which of the following animals usually hunts for food only at night?

- Bat
- Dog
- Horse
- Hummingbird
- I don't know.

RESP	AGE 9	
	1970	1973
1*	87.2	86.9
2	3.6	3.7
3	0.8	0.5
4	5.0	6.7
IDK	2.9	1.8

47

72-73 Rpt. #: RB116
 69-70 Rpt. #: B655

NAEP #: 101085

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: $\frac{9}{07-14}$
 72-73 Package-Exercise: 07-14
 69-70 Package-Exercise: 05-14

Timing: (in seconds)
 RB116 Stimulus: 14
 RB116 Response: 35
 RB116 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-0.7	-0.6	-0.7	2.3	1.0	-1.0	2.4	-0.3
	1973	-0.3	2.5	-4.8	3.9	3.1	-3.1	1.3	0.0

What is the main way that sweating helps your body?

- It helps cool your body.
- It keeps your skin moist.
- It keeps you from catching cold.
- It gets rid of the salt in your body.

- I don't know.

	AGE 9	
RESP	1970	1973
1*	14.5	15.5
2	34.8	30.2
3	12.0	11.5
4	30.0	35.1
IDK	8.6	7.6

72-73 Rpt. #: RP117
 69-70 Rpt. #: U657
 NAEP #: 101087

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: $\frac{9}{06-29}$
 72-73 Package-Exercise: 06-29
 69-70 Package-Exercise: 06-05

Timing: (in seconds)
 RP117 Stimulus: 9
 RP117 Response: 40
 RP117 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.5	-2.3	1.1	-1.9	2.6	-2.7	0.4	-0.2
	1973	2.9	-2.0	-0.6	-0.5	1.5	-1.6	-3.7	0.6



Atoms are NOT a part of

- compounds.
- electrons.
- elements.
- matter.
- molecules.
- I don't know.

AGE 9

RESP	1970	1973
1	19.5	15.5
2*	11.6	12.5
3	5.8	6.5
4	18.9	18.4
5	45.9	16.4
IDK	27.9	30.3

51

35

72-73 Rpt. #: RP118
 69-70 Rpt. #: 0622
 NAEP #: 101091

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: $\frac{9}{02-75}$
 72-73 Package-Exercise: 02-75
 69-70 Package-Exercise: 07-01

Timing: (in seconds)
 RP118 Stimulus: 10
 RP118 Response: 40
 RP118 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.2	-5.8	3.0	0.6	-0.7	0.7	-18.9	4.2
	1973	3.4	-7.1	2.6	0.6	0.8	-0.8	-23.4	5.7

Iron is most likely to rust when it is

- damp.
- dry.
- painted.
- covered with soap.
- covered with grease.
- I don't know.

AGE 9

RESP	1970	1973
1*	75.3	66.3
2	8.3	11.4
3	2.5	3.7
4	3.0	5.9
5	4.6	8.9
IDK	4.9	3.6

72-73 Rpt. #: RP119
 69-70 Rpt. #: U619

NAEP #: 101093

72-73 Obj.: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj.: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 07-06
 69-70 Package-Exercise: 07-06

Timing: (in seconds)
 RP119 Stimulus: 9
 RP119 Response: 40
 RP119 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	7.0	-12.0	5.1	-2.3	-3.0	3.2	-20.0	4.5
	1973	8.3	-14.8	6.5	-2.2	-0.2	0.2	-29.7	6.2

Water falls from the sky as all of the following EXCEPT

- hail.
- rain.
- smoke.
- snow.

- I don't know..

	AGE 9	
RESP	1970	1973
1	3.6	3.2
2	12.7	17.7
3*	77.8	74.2
4	3.4	3.0
IDK	1.9	1.4

72-73 Rpt. #: RB120
69-70 Rpt. #: U601

NAEP #: 101094

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 04-02
69-70 Package-Exercise: 07-12

Timing: (in seconds)
RB120 Stimulus: 7
RB120 Response: 42
RB120 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.2	-1.5	-0.4	0.7	-0.2	0.2	-7.0	1.1
	1973	-1.7	0.6	0.3	0.7	-0.7	0.7	-9.2	1.9

56

40

Which of the following animals do NOT lay eggs?

- Chickens
- Dogs
- Frogs
- Turtles

- I don't know.

AGE 9

RESP	1970	1973
1	1.2	1.7
2*	95.8	90.4
3	1.0	1.3
4	1.0	1.1
IDK	0.4	1.0

72-73 Rpt. #: RP121
 69-70 Rpt. #: 8605
 NAEP #: 101096

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 06-33
 69-70 Package-Exercise: 08-01

Timing: (in seconds)

RP121 Stimulus: 8
 RP121 Response: 41
 RP121 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.6	-1.2	2.2	-3.3	1.0	-1.0	-11.7	2.8
	1973	0.4	-2.2	1.5	0.1	0.9	-0.9	-15.6	4.4

Which of the following can be weighed on a scale?

- Fish
- Freedom
- Friendship
- Fun
- I don't know.

AGE 9

RESP	1970	1973
1*	92.9	89.2
2	1.2	2.2
3	2.3	4.1
4	0.2	1.9
IDK	2.9	2.5

50

72-73 Rpt. #: RP122
 69-70 Rpt. #: U624, U703
 NAEP #: 101097

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		9	13
72-73 Package-Exercise:		04-22	02-14
69-70 Package-Exercise:		08-02	04-14

Timing: (in seconds)			
RP122	Stimulus:	10	11
RP122	Response:	39	9
RP122	Grand total:	60	31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-2.2	-10.6	5.4	6.0	3.6	-3.6	-28.4	4.7
	1973	1.0	-8.9	2.2	5.3	2.1	-2.0	-19.3	4.1
13	1969	-0.6	-2.8	2.8	0.2	0.7	-0.5	-10.0	2.2
	1972	-0.6	-1.6	0.7	1.3	-1.1	1.0	-13.4	2.6



How many stars are there in the universe?

- 12
- 893
- About a million
- More than have been counted
- I don't know.

1

RESP	AGE 9		AGE 13	
	1970	1973	1969	1972
1	1.4	1.7	0.3	0.4
2	3.6	3.8	0.5	0.4
3	10.5	12.6	2.8	3.6
4*	73.9	75.6	93.7	89.9
IDK	10.3	6.1	2.5	5.5

72-73 Rpt. #: RP123
 69-70 Rpt. #: 0639

NAEP #: 101099

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 02-04
 69-70 Package-Exercise: 08-05

Timing: (in seconds)
 RP123 Stimulus: 8
 RP123 Response: 41
 RP123 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-0.0	-1.8	-0.8	2.6	4.4	-4.4	-25.1	4.6
	1973	3.2	-5.1	2.4	-1.2	4.7	-4.6	-16.7	3.3

Most of the Earth's surface is

- cities and towns.
- farm land.
- solid rock.
- water.
- yellow.

- I don't know.

AGE 9

RESP	1970	1973
1	21.7	26.3
2	4.4	6.2
3	13.0	13.2
4*	54.4	41.2
5	1.0	1.5
IDK	5.4	11.0

72-73 Rpt. #: RB124
69-70 Rpt. #: U647

NAEP #: 101100

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 02-32
69-70 Package-Exercise: 08-08

Timing: (in seconds)
RB124 Stimulus: 13
RB124 Response: 38
RB124 Grand total: 62

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	0.6	-7.6	-1.1	-7.7	3.2	-3.2	-14.0	2.0
	1973	2.2	-4.7	1.5	0.8	4.3	-4.1	-5.5	1.0

The bones and shells of sea animals that lived millions of years ago can be found in the

- ocean water.
- ice on a pond.
- trunks of trees.
- rocks in the ground.
- I don't know.

	AGE 9	
RESP	1970	1973
1	58.4	54.0
2	0.8	1.3
3	1.4	1.8
4*	36.8	38.7
IDK	2.6	3.3

72-73 Rpt. #: \ RB125
 69-70 Rpt. #: U718

NAEP #: 101102

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 02-11
 69-70 Package-Exercise: 01-04

Timing: (in seconds)
 RB125 Stimulus: 12
 RB125 Response: 8
 RB125 Grand total: 32

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-3.2	2.4	7.1	-6.6	0.8	-0.7	-20.3	5.3
	1972	3.2	-1.7	2.2	-4.0	0.9	-0.9	-20.6	4.9

Green plants make sugar by the process called

- digestion.
- evaporation.
- osmosis.
- photosynthesis.
- respiration.
- I don't know.

AGE 13

RESP	1969	1972
1	5.2	5.4
2	5.6	6.7
3	10.0	9.5
4*	61.7	62.0
5	3.5	4.9
IDK	13.9	11.4

67

72-73 Rpt. #: RB126
69-70 Rpt. #: U727

NAEP #: 101103

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 13
72-73 Package-Exercise: 02-18
69-70 Package-Exercise: 02-02

Timing: (in seconds)
RB126 Stimulus: 15
RB126 Response: 20
RB126 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	2.3	-3.5	-1.0	1.6	0.0	0.2	-26.6	4.7
	1972	2.0	-4.6	3.3	-1.5	2.4	-2.3	-23.4	5.1

An average serving of which of the following foods would provide the most protein for building and repairing body tissues?

- Boiled potatoes
- Green beans
- Lean meat
- Oatmeal
- White bread

- I don't know

AGE 13

RESP	1969	1972
1	4.8	4.6
2	15.1	20.5
3*	53.2	49.3
4	7.2	7.9
5	11.0	7.8
IDK	8.2	9.4

60.

53

72-73 Rpt. #: RB127
 69-70 Rpt. #: 0711

NAEP #: 101105

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 04-05
 69-70 Package-Exercise: 03-08

Timing: (in seconds)
 RB127 Stimulus: 12
 RB127 Response: 22
 RB127 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	5.7	0.4	1.2	-8.4	1.7	-1.6	-11.4	2.6
	1972	2.6	0.6	-1.6	-1.3	1.6	-1.7	-14.6	-3.6

When a person sees something, what carries the message from the eyes to the brain?

Arteries

Glands

Muscles

Nerves

Veins

I don't know.

AGE 13

RESP	1969	1972
1	7.8	6.2
2	4.6	5.4
3	3.0	2.6
4*	76.9	78.2
5	3.1	3.8
IDK	4.5	3.7

71

72-73 Rpt. #: RB128
 69-70 Rpt. #: U706

NAEP #: 101108

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 08-01
 69-70 Package-Exercise: 04-03

Timing: (in seconds)
 RB128 Stimulus: 14
 RB128 Response: 21
 RB128 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	1.4	-2.9	2.8	-1.7	2.4	-2.1	-9.4	2.6
	1972	3.1	-1.6	1.0	-2.4	2.9	-2.9	-13.1	3.2

What is the most important thing that the lungs do?

- Hold the chest out
- Protect against germs
- Move different parts of the body
- Pump the blood through the body
- Provide a place for oxygen to enter the blood

- .I don't know.

AGE 13

RESP	1969	1972
1	1.1	0.7
2	1.8	1.0
3	1.0	1.2
4	9.2	11.4
5*	85.7	84.2
IDK	1.0	1.5

73

57

72-73 Rpt. #: RB129
 69-70 Rpt. #: U731

NAEP #: 101109

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 09-04
 69-70 Package-Exercise: 04-07

Timing: (in seconds)
 RB129 Stimulus: 19
 RB129 Response: 32
 RB129 Grand total: 62

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	2.1	-4.9	3.9	-1.6	3.8	-3.5	-21.8	5.0
	1972	0.8	-6.3	3.4	1.6	5.6	-6.0	-22.3	3.9



Green plants are important to animals because the plants

- consume both food and oxygen.
- consume food and give off oxygen.
- consume food and give off carbon dioxide.
- produce food and give off oxygen.
- produce food and give off carbon dioxide.

- I don't know.

AGE 13

RESP	1969	1972
1	12.8	10.9
2	11.3	13.9
3	7.0	6.0
4*	49.7	51.1
5	15.1	13.4
IDK	3.9	4.3

75

72-73 Rpt. #: RP130
 69-70 Rpt. #: 07:10
 NAEP #: 101110

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 02-09
 69-70 Package-Exercise: 05-03

Timing: (in seconds)
 RP130 Stimulus: 13
 RP130 Response: 7
 RP130 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	0.3	-5.6	1.6	2.6	3.3	-3.1	-11.0	2.6
	1972	3.1	-4.3	1.2	-0.6	1.6	-1.6	-12.1	3.5

What is needed to move cars, heat hamburgers, and light rooms?

- Conservation
- Efficiency
- Energy
- Friction
- Magnetism

- I don't know.

AGE 13

RESP	1969	1972
1	1.4	1.2
2	1.9	2.6
3*	79.2	81.6
4	10.8	7.3
5	2.6	3.7
IDK	4.0	3.5

72-73 Rpt. #: RP131
 69-70 Rpt. #: 0742

NAEP #: 101111

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 08-20
 69-70 Package-Exercise: 05-05

Timing: (in seconds)
 RP131 Stimulus: 13
 RP131 Response: 7
 RP131 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	4.2	-5.5	3.3	-4.1	3.0	-2.8	-18.1	4.2
	1972	6.6	-0.7	-0.2	-5.3	1.4	-1.5	-10.2	2.6

If a neutral atom loses an electron, which of the following is formed?

- A gas
- An ion
- An acid
- A radical
- A molecule.

- I don't know.

AGE 13

RESP	1969	1972
1	8.6	9.4
2*	28.4	21.8
3	5.0	4.5
4	5.8	6.5
5	29.4	25.8
IDK	22.7	31.8

72-73 Rpt. #: RB132
 69-70 Rpt. #: U713
 NAEP #: 101114

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts:

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package+Exercise: 09-19
 69-70 Package-Exercise: 06-01

Timing: (in seconds)
 RB132 Stimulus: 9
 RB132 Response: 11
 RB132 Grand total: 32

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	4.7	-8.9	2.9	-0.5	1.6	-1.4	-26.0	4.7
	1972	5.1	-7.1	0.7	1.0	-0.4	0.4	-31.0	4.7

Seeds come from which of the following parts of a plant?

- Bark
- Flower
- Leaf
- Root
- Stem

- I don't know.

AGE 13

RESP	1969	1972
1	1.1	1.4
2*	74.4	68.4
3	3.6	5.0
4	11.5	12.8
5	7.5	9.6
IDK	1.6	2.5

72-73 Rpt. #: RB133
 69-70 Rpt. #: U743, U820

NAEP #: .101116

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE:
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		13	17
72-73 Package-Exercise:		03-31	11-24
69-70 Package-Exercise:		06-06	07-01

Timing: (in seconds)			
RB133	Stimulus:	19	17
RB133	Response:	16	18
RB133	Grand total:	46	42

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-0.7	-5.5	1.7	3.7	-0.1	0.1	-15.0	3.2
	1972	8.3	-6.2	2.9	-5.8	0.6	-0.6	-14.1	3.6
17	1969	3.8	-6.9	-3.5	5.3	0.8	-0.8	-31.8	3.5
	1973	-1.2	-6.2	4.1	0.8	-1.0	1.1	-31.6	5.6



Of the following, cancer is best described as

- a disease of the aged.
- an inherited disease.
- a consequence of infection.
- uncontrolled cell division.
- a disease of the blood which then spreads to other parts of the body.
- I don't know

	AGE 13		AGE 17	
RESP	1969	1972	1969	1973
1	2.9	1.7	1.2	0.9
2	6.3	5.6	1.7	1.9
3	16.9	16.5	13.6	15.7
4*	29.0	26.1	61.6	57.1
5	38.7	37.7	18.7	19.4
IDK	6.2	7.7	3.1	3.9

83

67

72-73 Rpt. #: RP134
 69-70 Rpt. #: U735

NAEP #: 101117

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 09-06
 69-70 Package-Exercise: 06-07

Timing: (in seconds)
 RP134 Stimulus: 12
 RP134 Response: 8
 RP134 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	SW	W	M	F	B	W
13	1979	3.4	-7.6	5.8	-4.2	3.6	-3.1	-17.3	3.9
	1972	7.6	0.1	-1.3	-5.8	6.6	-7.2	-16.6	3.3

84

What does an electric power company sell in units of kilowatt-hours?

- Atoms
- Electrons
- Energy
- Radiation
- Time

- I don't know.

AGE 13

RESP	1969	1972
1	2.1	2.4
2	23.2	22.1
3*	45.5	41.9
4	6.6	5.1
5	6.5	6.8
IDK	15.9	21.5

72-73 Rpt. #: RP135
 69-70 Rpt. #: U705

NAEP #: 101118

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 05-01
 69-70 Package-Exercise: 06-08

Timing: (in seconds)
 RP135 Stimulus: 9
 RP135 Response: 11
 RP135 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	1.1	-4.3	1.0	1.6	-1.3	1.2	-10.4	1.9
	1972	3.4	-1.3	-1.0	-0.8	-0.2	0.2	-10.0	1.7



The only star you usually see in the daytime is

- Venus
- the Sun
- the Moon
- the Pole Star
- Alpha Centauri

- I don't know

AGE 13

RESP.	1969	1972
1	1.4	1.8
2*	93.2	93.5
3	1.8	2.1
4	1.5	1.0
5	0.8	0.2
IDK	1.3	1.2

87

71

72-73 Rpt. #: RP136
 69-70 Rpt. #: U715

NAEP #: 101119

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 06-20
 69-70 Package-Exercise: 07-01

Timing: (in seconds)
 RP136 Stimulus: 14
 RP136 Response: 6
 RP136 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	8.2	-4.6	1.1	-6.9	-1.1	0.7	-10.0	3.0
	1972	1.7	-3.9	2.8	-1.4	-2.8	2.6	-24.2	3.9

When one sees a powder made up of both white specks and black specks,
one is able to conclude that he has

- sugar
 - pepper
 - a mixture
 - an element
 - a pure compound
-
- I don't know

AGE 13

RESP	1969	1972
1	0.5	0.9
2	23.1	14.0
3*	69.7	70.0
4	1.6	3.0
5	2.7	7.5
IDK	2.0	4.4

72-73 Rpt. #: RP137
69-70 Rpt. #: U723

NAEP #: 101120

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: — 13
72-73 Package-Exercise: 03-06
69-70 Package-Exercise: 08-01

Timing: (in seconds)
RP137 Stimulus: 15
RP137 Response: 19
RP137 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W*
13	1969	-2.1	-0.2	6.7	-0.4	3.0	-3.4	-23.3	4.4
	1972	4.2	-8.1	0.8	2.0	2.1	-1.9	-20.3	4.2

60

The time it takes the Moon to go from new moon to full moon and back
to new moon is about

- $\frac{1}{2}$ day.
- 1 day
- 14 days.
- 28 days
- 365 days

- I don't know

AGE 13

RESP	1969	1972
1	0.8	2.3
2	8.6	7.4
3	16.0	17.1
4*	58.5	50.3
5	8.2	13.4
IDK	7.7	9.5

91

72-73 Rpt. #: RB138
 69-70 Rpt. #: U707

NAEP #: 101122

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 04-23
 69-70 Package-Exercise: 08-05

Timing: (in seconds)
 RB138 Stimulus: 12
 RB138 Response: 9
 RB138 Grand total: 32

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	G	W	M	F	B	W
13	1969	4.1	-4.7	-0.2	-0.4	-1.1	1.1	-25.4	5.1
	1972	6.4	-3.3	2.3	-6.2	-1.6	1.7	-25.8	5.7

92

Which of the following diseases is known to be transmitted by an insect?

- Cancer
- Diabetes
- Malaria
- Measles
- Polio

- I don't know.

AGE 13

RESP.	1969	1972
1	2.0	1.5
2	5.0	5.4
3*	84.6	77.0
4	1.6	2.9
5	3.8	6.9
IDK	2.9	5.6

93

72-73 Rpt. #: RP139
 69-70 Rpt. #: U747, U843

NAEP #: 101123

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		<u>13</u>	<u>17</u>
72-73 Package-Exercise:		03-21	06-22
69-70 Package-Exercise:		08-06	04-09

Timing: (in seconds)

RP139	Stimulus:	16	16
RP139	Response:	19	20
RP139	Grand total:	46	46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	0.2	0.8	0.6	-1.6	0.3	-0.3	2.0	-0.8
	1972	-0.7	2.4	-1.1	-0.2	1.6	-1.5	7.7	-1.4
17	1969	0.8	-6.0	3.0	-0.2	5.1	-4.8	-4.0	1.0
	1973	1.8	0.4	-2.1	0.2	4.2	-3.8	1.8	-0.2

Which of the following is produced when a candle burns?

- Carbon atoms in the same crystal form as diamonds
- Hydrogen gas
- Nitrogen gas
- Oxygen gas
- Water vapor
- I don't know

	AGE 13		AGE 17	
RESP	1969	1972	1969	1973
1	13.1	11.2	14.3	14.8
2	22.6	23.8	21.8	22.0
3	19.8	19.7	16.6	17.1
4	18.0	18.4	11.4	11.1
5*	8.1	8.0	15.3	10.4
IDK	18.4	18.0	20.4	24.3

72-73 Rpt. #: RP140
 69-70 Rpt. #: U725
 NAEP #: 101124

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 02-05
 69-70 Package-Exercise: 08-12

Timing: (in seconds)
 RP140 Stimulus: 9
 RP140 Response: 12
 RP140 Grand total: 32

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	0.1	-5.2	1.0	3.0	3.9	-4.4	-16.5	3.3
	1972	3.5	-5.6	0.8	0.7	2.7	-2.6	-18.6	4.8



From which of these can all kinds of matter be formed?

- Atoms
- Compounds
- Mixtures
- Protons
- I don't know

AGE 13

RESP	1969	1972
1*	58.2	61.4
2	10.4	12.2
3	18.6	17.2
4	5.5	3.2
IBK	7.2	5.8

97

81

72-73 Rpt. #: RB141
 69-70 Rpt. #: 0720
 NAEP #: 101125

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 09-14
 69-70 Package-Exercise: 09-02

Timing: (in seconds)
 RB141 Stimulus: 12
 RB141 Response: 8
 RB141 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	2.4	-7.0	1.6	2.0	1.2	-0.8	-22.8	5.7
	1972	-0.5	-3.5	4.4	-0.7	4.7	-5.1	-21.1	4.6

Which of the following have probably been on Earth the shortest time?

- Alligators
- Dragonflies
- Fish
- Men
- Snails

- I don't know.

AGE 13

RESP	1969	1972
1	4.3	5.8
2	13.6	14.1
3	3.5	2.6
4*	61.6	64.2
5	6.8	7.8
IDK	9.7	5.2

53

72-73 Rpt. #: RB142
 69-70 Rpt. #: U736

NAEP #: 101126

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 04-29
 69-70 Package-Exercise: 09-03

Timing: (in seconds)
 RB142 Stimulus: 17
 RB142 Response: 18
 RB142 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	W	C	M	F	B	W
13	1969	0.3	-10.0	4.7	3.6	-0.3	0.5	-10.6	2.8
	1972	-0.9	1.1	1.4	-1.5	0.6	-0.7	-12.1	3.2

What is the main way that sweating helps your body?

- It keeps your skin moist.
- It keeps you from catching cold.
- It rid's your body of extra water.
- It gets rid of the salt in your body.
- It aids in controlling body temperature.
- I don't know.

AGE 13

RESP	1969	1972
1	7.0	6.1
2	1.2	2.0
3	17.4	13.9
4	24.4	27.4
5*	44.3	43.4
IDK	5.6	5.0

101

72-73 Rpt. #: RP143
 69-70 Rpt. #: 0739
 NAEP #: 101128

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 07-28
 69-70 Package-Exercise: 09-08

Timing: (in seconds)
 RP143 Stimulus: 13
 RP143 Response: 7
 RP143 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	2.4	-1.6	3.3	-4.6	0.4	-0.9	-10.6	3.4
	1972	2.2	-3.6	3.2	-2.5	0.9	-0.8	-17.5	3.8



Atoms of all the elements have

- the same mass.
- nuclei in them
- the same weights.
- an attraction for electrons.
- the same number of charged particles.
- I don't know.

AGE 13

RESP	1969	1972
1	6.7	7.8
2*	38.7	34.8
3	3.7	3.7
4	21.2	16.4
5	12.4	7.1
FBK	17.2	27.9

103

72-73 Rpt. #: RP144
 69-70 Rpt. #: 0717

NAEP #: 101129

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 08-05
 69-70 Package-Exercise: 09-11

Timing: (in seconds)
 RP144 Stimulus: 19
 RP144 Response: 15
 RR144 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	7.4	-11.6	1.4	1.0	8.2	-7.9	-27.8	6.3
	1972	6.0	-2.9	4.5	-7.5	7.7	-7.8	-30.5	6.3

Which of the following helps to account for the fact that a compass can be used to find north on Earth?

- Earth has only one moon.
- Earth has a magnetic field.
- Earth reflects the Sun's light.
- Most of Earth is covered by water.
- Earth's temperature is not constant.
- I don't know.

AGE 13

RESP.	1969.	1972
1	7.4	7.2
2*	63.1	62.2
3	8.1	9.1
4	5.7	4.8
5	4.7	3.8
IDK	10.9	12.9

105

72-73 Rpt. #: RB145-
 69-70 Rpt. #: 0814

NAEP #: 101131

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 01-05
 69-70 Package-Exercise: 02-01

Timing: (in seconds)

RB145	Stimulus:	9
RB145	Response:	11
RB145	Grand total:	30

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	0.3	-0.4	-4.3	5.3	2.8	-2.5	-18.5	2.5
	1973	1.7	2.4	-2.1	-1.5	3.9	-3.8	-19.4	3.5

Which of the following animals is a vertebrate?

- Clam
- Frog
- Octopus
- Spider
- Starfish
- I don't know

AGE 17

RESP	1969	1973
1	2.6	2.3
2*	72.4	71.0
3	3.2	3.5
4	4.1	3.7
5	10.6	11.3
IDK	6.6	7.6

107

91

72-73 Rpt. #: RB146
 69-70 Rpt. #: U804
 NAEP #: 101133

72-73 Obj: I.. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 11-03
 69-70 Package-Exercise: 04-01

Timing: (in seconds)
 RB146 Stimulus: 8
 RB146 Response: 11
 RB146 Grand total: 30

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	1.4	-3.5	2.2	-1.7	-0.3	0.3	-11.6	2.5
	1973	-1.8	-0.9	4.9	3.5	0.4	-0.4	-10.3	1.9

Which of the following is an animal?

- Bacterium
- Lizard
- Moss
- Snapdragon
- Toadstool

- I don't know.

AGE 17

RESP	1969	1973
1	5.8	4.7
2*	87.7	85.7
3	0.5	0.3
4	2.1	4.2
5	1.3	2.6
IDK	2.2	2.4

100

72-73 Rpt. #: RB147
 69-70 Rpt. #: U826
 NAEP #: 101134

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 03-17
 69-70 Package-Exercise: 04-05

Timing: (in seconds)
 RB147 Stimulus: 11
 RB147 Response: 23
 RB147 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B'	W'
17	1969	2.3	-14.0	4.9	1.8	-6.0	5.6	-13.5	2.1
	1973	10.3	-4.4	10.7	-23.5	-8.8	8.9	-13.1	3.5



The human embryo normally develops in the

abdominal cavity

ovary

oviduct

uterus

vagina

I don't know.

AGE 17

RESP	1969	1973
1	14.9	10.6
2	18.7	13.6
3	4.7	3.6
4*	46.7	52.2
5	7.2	4.4
IDK	7.8	6.9

72-73 Rpt. #: RB148
 69-70 Rpt. #: 0809
 NAEP #: 101135

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 08-15
 69-70 Package-Exercise: 05-13

Timing: (in seconds)
 RB148 Stimulus: 11
 RB148 Response: 23
 RB148 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B.	W
17	1969	7.4	-7.9	2.0	-3.5	-3.0	3.2	-22.3	3.2
	1973	5.6	-3.8	4.1	-7.4	-3.3	3.0	-21.4	4.5

112

Which of the following is used in the treatment of diabetes?

- Estrogen
- Insulin
- Iodine
- Penicillin
- Thyroxine

- I don't know

AGE 17

RESP	1969	1973
1	2.1	0.9
2*	76.8	79.8
3	2.2	0.8
4	6.1	6.9
5	4.7	1.8
IDK	7.8	8.9

72-73 Rpt. #: RP149
 69-70 Rpt. #: U847

NAEP #: 101136

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subbbjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	<u>17</u>
72-73 Package-Exercise:	06-07
69-70 Package-Exercise:	06-02

Timing: (in seconds)		
RP149 Stimulus:		15
RP149 Response:		19
RP149 Grand total:		45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	0.8	-4.1	4.6	-3.8	2.5	-2.4	-5.3	0.8
	1973	0.9	-1.3	-1.0	1.4	3.2	-2.9	-2.2	0.5

The two elements that make up the greatest part of the mass of the Earth's crust are:

- aluminum and iron
- iron and copper
- oxygen and silicon
- oxygen and hydrogen
- sodium and chlorine

- I don't know

AGE 17

RESP	1969	1973
1	6.4	6.8
2	23.0	25.6
3*	13.6	8.4
4	36.3	38.7
5	4.6	2.9
IDK	16.0	17.5

113

72-73 Rpt. #: RP150
 69-70 Rpt. #: U817

NAEP #: 101137

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 09-29
 69-70 Package-Exercise: 06-05

Timing: (in seconds)
 RP150 Stimulus: 15
 RP150 Response: 6
 RP150 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	4.8	-5.0	3.6	-6.0	2.5	-2.4	-14.8	1.9
	1973	5.1	2.5	2.7	-11.1	1.6	-1.5	-16.5	4.4

One example of oxidation is the

- setting of concrete.
- burning of wood in air.
- neutralizing of an acid.
- dissolving of CO_2 in water.
- forming of ice from water.

- I don't know.

AGE 17

RESP	1969	1973
1	1.3	1.6
2*	68.6	56.1
3	4.6	6.1
4	10.8	11.1
5	6.7	7.2
IDK	8.0	16.6

ii7

72-73 Rpt. #: RP151
 69-70 Rpt. #: U822

NAEP #: 101138

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 11-12
 69-70 Package-Exercise: 06-06

Timing: (in seconds)
 RP151 Stimulus: 10
 RP151 Response: 10
 RP151 Grand total: 30

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	6.3	-9.2	-1.2	1.2	7.4	-7.2	-16.5	1.1
	1973	7.9	-2.2	-1.4	-4.2	5.7	-6.0	-14.0	2.6

Chemistry is a study principally concerned with the properties of

- acids
- actions
- energy
- living things
- matter
- I don't know.

AGE 17

RESP	1969	1973
1	14.6	17.1
2	7.8	13.2
3	13.5	14.6
4	2.8	4.2
5*	57.9	45.7
IDK	3.3	5.1

119

72-73 Rpt. #: RP152
 69-70 Rpt. #: U816

NAEP #: 101139

72-73 Obj.: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj.: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 10-05
 69-70 Package-Exercise: 06-09

Timing: (in seconds)
 RP152 Stimulus: 9
 RP152 Response: 11
 RP152 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	4.8	-0.6	-1.3	-2.7	10.1	-9.8	-19.6	2.5
	1973	-3.3	2.1	2.2	-1.0	14.1	-12.8	-10.8	2.9

What device changes the voltage of an electric power supply?

- Alternator
- Battery
- Rectifier
- Transformer
- I don't know.

AGE 17

RESP	1969	1973
1	17.0	19.7
2	6.2	7.4
3	5.8	3.6
4*	61.4	47.1
IDK	9.6	22.1

121

105

72-73 Rpt. #: PP153
 69-70 Rpt. #: 0832

NAEP # 101142

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: 2. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 06-15
 69-70 Package-Exercise: 07-13

Timing: (in seconds)
 RP153 Stimulus: 14
 RP153 Response: 21
 PP153 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	2.2	-0.2	-3.5	2.1	11.9	-11.3	-18.3	1.6
	1973	-1.0	-2.9	-1.1	5.1	10.1	-9.2	-16.4	2.7

If a sudden change took place on the surface of the Sun, the change could first be observed on Earth after about

- 1 second.
- 10 seconds.
- 30 seconds.
- 8 minutes.
- 1 hour.

- I don't know.

AGE 17

RESP	1969	1973
1	8.5	12.7
2	8.7	11.4
3	8.0	7.7
4*	30.9	27.5
5	10.5	9.0
IDK	33.4	31.4

123

72-73 Rpt. #: RP154
 69-70 Rpt. #: U806

NAEP #: 101146*

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	17
72-73 Package-Exercise:	02-15
69-70 Package-Exercise:	08-14

Timing: (in seconds)		
RP154	Stimulus:	.18
RP154	Response:	.17
RP154	Grand total:	47

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	0.1	-2.5	-0.5	2.3	0.9	-0.7	-14.1	1.3
	1973	3.6	0.9	-0.4	-4.6	0.2	-0.2	-13.5	3.7

The particles that make up atoms are usually said to be

- protons and electrons only
- protons and neutrons only
- protons, neutrons, and electrons.
- alpha, beta, and gamma rays.
- alpha particles and beta particles only.

- I don't know.

AGE 17

RESP	1969	1973
1	3.7	4.4
2	5.6	5.4
3*	84.6	84.2
4	1.7	1.2
5	0.4	0.4
IDK	3.7	4.4

72-73 Rpt. #: RP155
 69-70 Rpt. #: R337

NAEP #: 101147

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple Choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 02-03
 69-70 Package-Exercise: 09-02

Timing: (in seconds)
 RP155 Stimulus: 9
 RP155 Response: 11
 PP155 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	0.3	-1.0	1.0	-0.9	2.0	-1.8	0.1	-0.0
	1973	0.2	-0.3	-0.5	-0.6	1.5	-1.2	1.8	-0.4

Metal cans for holding foodstuffs are chiefly made of

copper.

iron.

nickel.

tin.

I don't know.

AGE 17

RESP	1969	1973
1	1.5	1.0
2*	3.0	2.4
3	1.4	1.0
4	93.3	94.5
IDK	0.6	1.0

72-73 Rpt. #: RB156
 69-70 Rpt. #: R330
 NAEP #: 101148

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 08-19
 69-70 Package-Exercise: 09-08

Timing: (in seconds)
 RB156 Stimulus: 14
 RB156 Response: 21
 RB156 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	3.4	-2.8	-2.2	1.4	-6.2	5.6	-0.1	0.6
	1973	13.8	-3.5	0.7	-12.2	-7.0	6.4	0.8	0.9

On the average, in human females, the egg is released how many days after menstruation begins?

- 2 days
- 9 days
- 14 days
- 20 days
- 24 days

- I don't know.

AGE 17

RESP	1969	1973
1	25.7	19.3
2	10.9	9.8
3*	29.0	27.8
4	4.0	3.8
5	11.2	9.8
IDK	18.5	19.1

129

72-73 Rpt. #: RP157
 69-70 Rpt. #: U823
 NAEP #: 101150

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.
 69-70 Obj: E. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		17
72-73 Package-Exercise:		07-20
69-70 Package-Exercise:		10-06

Timing: (in seconds)		
RP157 Stimulus:		12
RP157 Response:		8
RP157 Grand total:		30

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	10.8	-1.2	-3.9	4.3	3.0	-2.7	-18.0	2.5
	1973	6.4	-0.4	-2.5	-4.1	3.6	-3.2	-10.5	2.5

The particles most directly involved in forming chemical bonds are

- electrons.
- neutrons.
- photons.
- positrons.
- protons.

- I don't know.

AGE 17

RESP	1969	1973
1*	51.7	50.7
2	11.0	14.3
3	1.3	1.2
4	1.1	1.3
5	9.4	13.2
IDK	25.4	17.8

131

72-73 Rpt. #: RP158
69-70 Rpt. #: U802

NAEP #: 101151

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 17
72-73 Package-Exercise: 09-05
69-70 Package-Exercise: 10-12

Timing: (in seconds)

RP158	Stimulus:	11
RP158	Response:	8
RP158	Grand total:	30

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	0.3	-1.3	2.0	-1.8	0.1	-0.1	-5.4	1.0
	1973	2.4	-1.9	0.6	-1.6	1.4	-1.2	-4.6	1.4

A weather map usually shows, all of the following EXCEPT

- lows.
- highs.
- cold fronts.
- areas where it is raining.
- mileages between major cities.

- I don't know.

AGE 17

RESP	1969	1973
1	0.0	0.1
2	0.1	0.2
3	0.7	0.6
4	2.4	3.1
5*	96.1	95.2
IDK	0.6	0.9

72-73 Rpt. #: RP159
 69-70 Rpt. #: U844

NAEP #: 101152

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 02-28
 69-70 Package-Exercise: 11-05

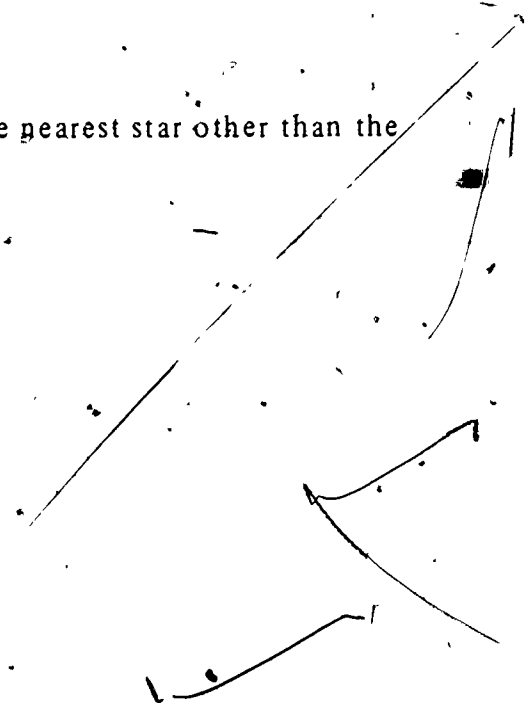
Timing: (in seconds)
 RP159 Stimulus: 13
 RP159 Response: 21
 RP159 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	0.6	-1.5	-0.4	1.0	2.8	-2.6	-9.2	1.2
	1973	0.1	0.3	-0.6	0.4	2.9	-2.5	-4.4	1.2

About how long does it take for light from the nearest star other than the Sun to reach the Earth?

- 1 week
- 1 month
- 1 year
- 5 years
- 100 years

- I don't know.



	AGE 17	
RESP	1969	1973
1	4.9	8.5
2	2.6	3.9
3	8.6	9.4
4*	17.2	10.4
5	22.9	17.1
IDK	43.6	46.9

72-73 Rpt. #: RP160
 69-70 Rpt. #: U828

NAEP #: 101153

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:
 72-73 Package-Exercise:
 69-70 Package-Exercise:

17
 03-27
 11-07

Timing: (in seconds)

RP160	Stimulus:	-12
RP160	Response:	22
RP160	Grand total:	45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	2.8	-3.9	6.3	-8.3	7.0	-6.6	-17.9	3.1
	1973	2.4	-3.7	2.5	-2.9	6.7	-6.8	-21.3	4.3

A refrigerator keeps its contents cool by

- freshening food.
- transferring heat.
- destroying energy.
- keeping ice from melting
- producing electric charges.
- I don't know.

AGE 17

RESP	1969	1973
1	6.2	5.2
2*	44.8	40.9
3	3.9	5.6
4	12.7	11.7
5	14.9	19.0
IDK	17.4	17.2

72-73 Rpt. #: RJ162
 69-70 Rpt. #: U867

NAEP #: 101159

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: A. Know facts and simple concepts.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 10-16
 69-70 Package-Exercise: 01-07

Timing: (in seconds)
 RU102 Stimulus: 27
 RU102 Response: 22
 RU162 Grand total: 59

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	-0.9	-1.2	1.3	0.1	2.9	-3.0	-7.6	1.1
	1973	-0.5	-3.9	1.2	2.4	0.4	-0.4	-5.8	0.4

A scientific model is best described as

- a small copy of a larger, more complicated piece of equipment.
- a person who always thinks and acts in a very scientific manner.
- an assortment of laboratory apparatus designed for a single purpose.
- a scheme that guides one's thinking about something not completely known.
- the leader of a group of scientists who are all working on the same problem.
- I don't know.

AGE 17

RESP	1969	1973
1	59.8	61.5
2	2.7	1.9
3	11.0	10.0
4*	17.5	18.0
5	3.5	2.0
IDK	5.4	6.3

139

72-73 Rpt. #: RP163
 69-70 Rpt. #: U819
 NAEP #: 102023

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: B. Know laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

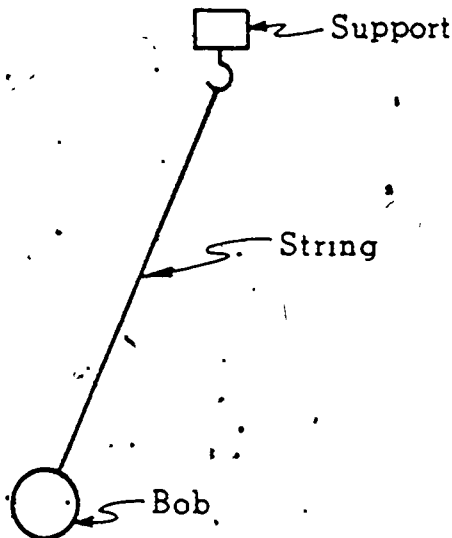
Age: 17
 72-73 Package-Exercise: 06-29
 69-70 Package-Exercise: 05-01

Timing: (in seconds)
 RP163 Stimulus: 21
 RP163 Response: 28
 RP163 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	-0.1	-0.8	0.0	0.6	6.8	-7.2	-17.7	3.1
	1973	-1.1	-2.1	0.5	2.5	5.7	-5.2	-21.6	3.9



The length of time required for a pendulum bob like that shown below to make one complete swing depends primarily upon the



AGE 17

RESP	1969	1973
1	10.0	13.4
2	1.5	1.3
3*	61.5	51.1
4	7.1	6.8
5	15.1	18.6
IDK	4.7	8.1

- mass of the bob.
- temperature of the air.
- length of the pendulum string.
- material of which the bob is made.
- angle through which the bob swings.
- I don't know.

141

72-73 Rpt. #: RB164
 69-70 Rpt. #: U740
 NAEP #: 102030

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: B. Know laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 07-06
 69-70 Package-Exercise: 03-01

Timing: (in seconds)
 RB164 Stimulus: 11
 RB164 Response: 9
 RB164 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	0.4	-4.6	4.8	-2.7	4.0	-3.5	-12.9	2.4
	1972	-7.4	1.4	5.9	-0.1	6.2	-6.1	-14.1	3.2



The density of the human body is most nearly equal to the density of

- air.
- cork.
- hydrogen.
- iron.
- water.

- I don't know.

AGE 13

RESP	1969	1972
1	15.3	15.3
2	7.2	8.6
3	14.4	11.8
4	7.2	6.0
5*	37.0	32.9
IDK	18.7	25.3

143

72-73 Rpt. #: RU165
 69-70 Rpt. #: U677

NAEP #: 105009

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: E. Know the scientific enterprise.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: $\frac{9}{07-18}$
 72-73 Package-Exercise: 07-18
 69-70. Package-Exercise: 06-07

Timing: (in seconds)
 RU165 Stimulus: 12
 RU165 Response: 37
 RU165 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.8	6.2	-5.6	-1.1	-1.4	1.4	-2.0	-0.2
	1973	-0.2	-0.4	-0.9	1.5	-2.2	2.3	1.3	-0.1

144

How do we get scientific laws?

- Scientists vote on them.
- They are made by the police.
- They are passed by Congress.
- They come from many experiments.
- I don't know.

AGE 9

RESP.	1970	1973
1	13.6	13.8
2	15.8	16.6
3	28.8	35.3
4*	33.4	26.0
IDK	7.9	8.2

145

129

72-73 Rpt. #: RU166
 69-70 Rpt. #: U678

NAEP #: 105010

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: E. Know the scientific enterprise.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	<u>9</u>
72-73 Package-Exercise:	05-21
69-70 Package-Exercise:	07-15

Timing (in seconds)

RU166	Stimulus:	8
RU166	Response:	41
RU166	Grand total:	60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-2.2	2.4	0.8	-0.9	-3.5	3.8	-2.6	1.2
	1973	-1.6	-1.4	2.4	0.4	-2.3	2.3	-11.5	3.0

146

What topic do scientists know everything about?

- Clouds
- Stars
- Trees
- No topic
- I don't know.

	AGE 9	
RESP	1970	1973
1	12.8	14.1
2	23.2	30.2
3	29.1	24.0
4*	25.9	24.6
IDK	8.8	6.7

147

72-73 Rpt. #: RU167
69-70 Rpt. #: U772

NAEP #: 105012

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
Subobjective: E. Know the scientific enterprise.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF
SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF
SCIENCE THAT STEM FROM ADEQUATE
UNDERSTANDINGS.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 13
72-73 Package-Exercise: 07-04
69-70 Package-Exercise: 06-13

Timing: (in seconds)

RU167	Stimulus:	7
RU167	Response:	13
RU167	Grand total:	31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-1.4	-0.3	1.2	0.3	2.2	-1.9	-2.8	0.6
	1972	-0.7	-1.7	0.7	1.6	0.6	-0.6	-3.4	0.9

148

132

Most scientists have gone to school for many years.

- I believe this statement.
- I don't believe this statement.
- I don't know.

AGE 13

RESP	1969	1972
1*	92.0	93.9
2	6.3	4.9
IDK	1.7	1.0

72-73 Rpt. #: RU168
 69-70 Rpt. #: U674

NAEP #: 105015

72-73 Obj: I. KNOW THE FUNDAMENTAL ASPECTS OF SCIENCE.
 Subobjective: E. Know the scientific enterprise.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: $\frac{9}{03-12}$
 72-73 Package-Exercise: 03-12
 69-70 Package-Exercise: 02-07

Timing: (in seconds)
 RU168 Stimulus: 10
 RU168 Response: 39
 RU168 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.0	-4.0	2.4	-2.0	-0.8	0.9	-7.9	2.1
	1973	2.7	-3.0	-0.5	0.6	0.8	-0.9	-14.8	3.3

130

134

If you saw many scientists at work, a number of them would be

- selling soap.
- cooking meals.
- painting walls.
- doing experiments.
- I don't know.

	AGE 9	
RESP	1970	1973
1	0.7	0.7
2	1.5	1.5
3	2.6	2.1
4*	93.8	93.8
IDK	1.3	1.8

72-73 Rpt. #: RP169
 69-70 Rpt. #: U614

NAEP #: 201055

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 87-30
 69-70 Package-Exercise: 01-16

Timing: (in seconds)
 RP169 Stimulus: 12
 RP169 Response: 37
 RP169 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	3.6	-0.8	-0.2	-3.0	-0.3	0.3	-16.0	2.9
	1973	3.4	-4.9	0.4	0.7	0.6	-0.6	-10.9	2.7

When it is raining, which of the following must be true?

- It is spring.
- The Sun is shining.
- The wind is blowing.
- There are clouds in the sky.

- I don't know.

	AGE 9	
RESP	1970	1973
1	5.9	5.7
2	1.7	2.6
3	9.2	7.6
4*	81.4	81.8
IDK	1.6	2.4

72-73 Rpt. #: RP170
69-70 Rpt. #: U631

NAEP #: 201056

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 02-14
69-70 Package-Exercise: 02-08

Timing: (in seconds)
RP170 Stimulus: 12
RP170 Response: 37
RP170 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	5.2	-6.4	4.2	-6.1	4.5	-5.2	-21.2	5.5
	1973	6.3	-2.9	-3.1	-0.9	6.5	-6.3	-26.1	5.8

Which of the following will speed up the burning of a campfire?

- Blow on the fire.
- Cover the fire with sand.
- Sprinkle dirt on the fire.
- Sprinkle water on the fire.
- I don't know.

	AGE 9	
RESP	1970	1973
1*	67.3	63.3
2	9.6	11.2
3	4.6	7.4
4	15.6	15.6
IDK	2.7	2.4

72-73 Rpt. #: RP171
 69-70 Rpt. #: U645
 NABP #: 201061

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN. A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: A. Understand and apply facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 06-03
 69-70 Package-Exercise: 04-03

Timing: (in seconds)
 RP171 Stimulus: 7
 RP171 Response: 41
 RP171 Grand total: 59

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	6.7	-10.7	-4.5	7.0	0.8	-0.9	-12.7	2.3
	1973	2.2	-6.4	0.6	4.1	1.4	-1.4	-13.6	3.2



Which of the following dissolves LEAST in water?

Glass

Salt

Soap

Sugar

I don't know

AGE 9

RESP	1970	1973
1*	40.2	39.4
2	17.2	21.4
3	21.8	18.3
4	13.1	15.2
IDK	7.5	5.6

157

141

72-73 Rpt. #: RP172
 69-70 Rpt. #: U612

NAEP #: 201063

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 06-10
 69-70 Package-Exercise: 04-10

Timing: (in seconds)
 RP172 Stimulus: 11
 RP172 Response: 38
 RP172 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	4.0	-5.2	0.3	-0.4	1.0	-1.0	-11.6	2.8
	1973	0.4	-3.6	4.0	-1.7	1.1	-1.1	-12.4	3.0

Which of the following could cause a rainbow?

- Fog and smog
- Rain and snow
- Clouds and ice
- Sunshine and rain
- I don't know.

	AGE 9	
RESP.	1970	1973
1	2.2	2.9
2	7.5	8.0
3	2.6	2.4
4*	56.6	85.7
IDK	1.0	1.0

159

143

72-73 Rpt. #: RP173
 69-70 Rpt. #: U654
 NAEP #: 201065

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 07-12
 69-70 Package-Exercise: 05-16

Timing: (in seconds)
 RP173 Stimulus: -10
 RP173 Response: 39
 RP173 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.2	-5.0	-0.6	4.1	6.2	-6.0	-10.1	2.0
	1973	1.8	-3.7	-3.3	6.1	2.5	-2.5	-9.8	2.1

Of the following, which is smallest?

- A bit of iron
- An atom of iron
- A particle of iron
- A molecule of iron

- I don't know.

AGE 9

RESP	1970	1973
1	23.7	29.8
2*	20.8	17.4
3	15.3	12.7
4	30.2	31.3
IDK	10.0	8.7

161

145

72-73 Rpt. #: RB174
 69-70 Rpt. #: U625

NAEP #: 201066

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 03-25
 69-70 Package-Exercise: 06-10

Timing: (in seconds)
 RB174 Stimulus: 11
 RB174 Response: 39
 RB174 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	3.1	-4.0	1.7	-1.8	-1.7	1.8	-16.1	3.3
	1973	3.5	-5.4	-0.1	1.6	0.3	-0.3	-10.5	3.3

162

When an animal breathes faster and its heart beats faster, the animal is most likely

- cold.
- frightened.
- resting.
- sleeping.

- I don't know

	AGE 9	
RESP	1970	1973
1	7.7	8.8
2*	73.3	70.2
3	11.0	13.0
4	4.9	5.9
IDK	2.7	2.0

72-73 Rpt. #: RP175
 69-70 Rpt. #: R141
 NAEP #: 201067

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 04-05
 69-70 Package-Exercise: 07-05

Timing: (in seconds)
 RP175 Stimulus: 23
 RP175 Response: 27
 RP175 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W.	M	F	B	W.
9	1970	1.8	-2.8	0.5	0.1	1.1	-1.2	1.5	0.0
	1973	0.2	-0.4	-0.5	0.9	0.6	-0.6	1.5	-0.8

104

A pint of water at a temperature of 50° Fahrenheit is mixed with a pint of water at 70° Fahrenheit. The temperature of the water just after mixing will be about

- 20° F
- 50° F
- 60° F
- 70° F
- 120° F

- I don't know.

AGE 9

RESP	1970	1973
1	4.0	4.0
2	2.3	2.5
3*	7.1	6.4
4	4.7	4.4
5	69.3	71.8
IDK	12.3	10.6

165

72-73 Rpt. #: RP176
69-70 Rpt. #: U650

NAEP #: 201068

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 02-29
69-70 Package-Exercise: 07-10

Timing: (in seconds)
RP176 Stimulus: 8
RP176 Response: 42
RP176 Grand total: 61

AGE.	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	4.2	-6.0	-1.9	3.5	1.1	-1.2	-4.7	0.8
	1973	4.1	-4.7	3.0	-3.4	0.7	-0.7	-9.3	1.8

All of the following can be called matter EXCEPT

- ice.
- ideas
- shoes.
- water
- I don't know.

	AGE 9	
RESP	1970	1973
1	11.7	40.2
2*	36.0	38.9
3	30.7	25.4
4	5.7	7.9
IDK	15.7	16.6

167

151

72-73 Rpt. #: RP177
 69-70 Rpt. #: 0651
 NAEP #: 201069

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: A. Understand and apply facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 05-31
 69-70 Package-Exercise: 08-16

Timing: (in seconds)
 RP177 Stimulus: 21
 RP177 Response: 29
 RP177 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	0.9	-3.3	1.9	-0.2	-0.7	0.7	-14.9	2.4
	1973	-0.8	-3.4	5.2	-1.2	2.4	-2.4	-2.8	0.7

163



Evaporation takes place in all of the following cases EXCEPT

- A wet chalkboard dries.
- Dewdrops disappear from a leaf.
- Water disappears from a birdbath.
- The outside of a cold glass gets wet.
- A swimmer sits in the sun after he leaves the water.

- I don't know.

AGE 9

RESP	1970	1973
1-	10.5	16.6
2	8.3	8.4
3	12.5	14.2
4*	34.3	24.4
5	20.0	21.7
IDK	14.1	14.6

169

72-73 Rpt. #: RP178
 69-70 Rpt. #: 0732

NAPP #: 201070

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 07-10
 69-70 Package-Exercise: 06-03

Timing: (in seconds)

RP178	Stimulus:	21
RP178	Response:	14
RP178	Grand total:	46

AGE	YEAR	REGION					SEX		COLOR	
		NE	SE	C	W	M	F	B	W	
13	1969	2.2	-13.2	6.3	1.9	4.6	-4.0	-19.3	3.9	
	1972	-2.3	-3.8	4.5	1.0	4.1	-4.0	-22.2	5.0	

1.0

Which of the following CANNOT be seen directly by the human eye using an ordinary-light microscope or telescope?

- Moons of Jupiter
- A single atom of carbon
- The craters on the Moon
- A one-celled animal from pond water
- Holes through which gases enter a leaf
- I don't know.

AGE 13

RESP	1969	1972
1	17.1	16.8
2*	49.5	46.6
3	7.0	6.9
4	5.8	6.0
5	10.4	11.8
IDK	8.9	7.6

171

72-73 Rpt. #: RB179
 69-70 Rpt. #: U730
 NAEP #: 201071

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 05-25
 69-70 Package-Exercise: 06-09

Timing: (in seconds)
 RB179 Stimulus: 24
 RB179 Response: 10
 RB179 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-0.8	-8.3	5.2	2.1	1.1	-0.9	-26.0	5.3
	1972	-4.1	-0.8	1.7	2.4	4.4	-4.4	-25.2	5.0

If all green plants died, what would be the most important effect on man?

- He would have to eat meat only.
- Sooner or later man would die of starvation.
- Man would get a little sick because he couldn't get vitamins.
- Man couldn't build houses because there would be no lumber.
- The land would be bare and not very pretty for man to look at.

- I don't know

AGE 13

RESP	1969	1972
1	9.7	10.5
2*	50.6	42.5
3	30.5	31.2
4	2.7	4.6
5	4.4	7.6
IDK	2.1	3.2

173

72-73 Rpt. #: RP180
 69-70 Rpt. #: R206

NAEP #: 201072

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 05-05
 69-70 Package-Exercise: 06-11

Timing: (in seconds)
 RP180 Stimulus: 20
 RP180 Response: 14
 RP180 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	1.9	-9.0	3.7	1.6	3.6	-3.0	-28.4	6.6
	1972	-0.8	-3.8	-1.1	5.4	4.7	-4.7	-29.6	5.5

174



Fanning can make a campfire burn better because the fanning

- raises the atmospheric pressure.
- warms materials to their kindling points.
- increases the supply of material that can burn.
- increases the supply of oxygen for the burning.
- provides the energy needed to keep the fire going.

- I don't know

	AGE 13 ⁰	
RESP	1969	1972
1	3.8	3.4
2	2.1	2.4
3	2.4	2.9
4*	78.5	74.5
5	10.4	12.7
IDK	2.7	4.0

175

72-73 Rpt. #: RP181
 69-70 Rpt. #: U746, U830
 NAEP #: 201073

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: A. Understand and apply facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		<u>13</u>	<u>17</u>
72-73 Package-Exercise:		08-15	02-18
69-70 Package-Exercise:		08-11	10-07

Timing: (in seconds)			
RP181	Stimulus:	.23	22
RP181	Response:	11	13
RP181	Grand total:	45	46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-0.7	-4.0	3.0	0.6	3.2	-3.6	-9.6	1.6
	1972	1.8	2.4	-1.4	-2.7	3.2	-3.2	-13.3	2.6
17	1969	3.5	-7.2	-3.2	5.5	9.4	-8.6	-19.0	3.0
	1973	-2.6	-3.7	3.2	2.5	8.2	-7.1	-12.1	2.8



Suppose that a rubber balloon filled with air does not leak and that it is taken from Earth to the Moon. One can be sure that on the Moon, the balloon will have the same

- size as on Earth.
- mass as on Earth.
- weight as on Earth.
- rate of fall as on Earth.
- ability to float as on Earth.
- I don't know.

	AGE 13		AGE 17	
RESP	1969	1972	1969	1973
1	36.0	39.4	34.8	46.8
2*	21.2	21.5	35.6	26.8
3	3.8	4.1	2.2	1.8
4	4.1	2.5	2.0	0.8
5	28.6	25.1	19.2	15.5
IDK	6.4	7.2	6.2	7.4

177

72-73 Rpt. #: RP182
 69-70 Rpt. #: U840

NAEP #: 201075

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 11-07
 69-70 Package-Exercise: 02-08

Timing: (in seconds)

RP182	Stimulus:	21
RP182	Response:	28
RP182	Grand total:	59

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	-0.6	6.7	-4.0	1.2	0.9	-0.8	-2.2	0.0
	1973	2.2	-1.6	-2.1	1.6	2.3	-2.4	1.8	0.0

173

A catalyst in a chemical system may do all of the following EXCEPT

- speed up the reaction.
- change the principal product.
- make a reaction economically important.
- change the temperature used for the reaction.
- change the amounts of products and reactants present at equilibrium.
- I don't know.

AGE 17

RESP	1969	1973
1	2.9	5.2
2	29.1	23.5
3	10.9	17.6
4	7.2	6.3
5*	21.8	21.2
IDK	28.0	26.1

72-73 Rpt. #: RP183
69-70 Rpt. #: U846

NAEP #: 201078

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 17
72-73. Package-Exercise: 10-14
69-70 Package-Exercise: 08-15

Timing: (in seconds)
RP183 Stimulus: 22
RP183 Response: 12
RP183 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	-0.2	-3.1	-0.5	3.0	4.7	-4.0	-7.6	1.3
	1973	0.9	-0.8	-1.0	0.8	2.5	-2.2	-6.3	1.4

The Earth is classified as a planet for all of the following reasons EXCEPT

- it revolves around the Sun.
- its orbit is nearly circular.
- it has a natural satellite, the Moon.
- it is too cold to give off light of its own.
- its mass is several times that of the most massive asteroid.
- I don't know.

AGE 17

RESP	1969	1973
1	3.2	3.3
2	11.5	8.5
3*	13.2	12.4
4	29.1	27.3
5	34.8	34.2
IDK	8.1	14.1

181

165

72-73 Rpt. #: EP184
 69-70 Rpt. #: U813

NAEP #: 201079

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 03-09
 69-70 Package-Exercise: 09-01

• Timing: (in seconds)
 RP184 Stimulus: 15
 RP184 Response: 20
 RP184 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	1.9	-1.6	0.7	-1.6	4.8	-4.4	-27.0	4.0
	1973	2.6	-2.5	1.1	-2.2	7.0	-7.1	-16.9	3.6

In hot climates, the advantage of buildings with white surfaces is that white surfaces effectively

- absorb light.
- diffract light.
- reflect light.
- refract light.
- transmit light.
- I don't know.

AGE 17

RESP	1969	1973
1	5.5	6.5
2	12.7	13.3
3*	72.1	67.6
4	5.4	6.9
5	1.3	2.0
IDK	2.7	3.6

163

72-73 Rpt. #: RB185
 69-70 Rpt. #: U812

NAEP #: 201080

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		17
72-73 Package-Exercise:		05-17
69-70 Package-Exercise:		09-13

Timing: (in seconds)		
RB185	Stimulus:	15
RB185	Response:	20
RB185	Grand total:	45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	-0.2	-7.0	-0.0	4.7	1.1	-1.0	-6.7	1.0
	1973	4.8	-6.4	-1.8	2.4	0.9	-0.8	-7.8	2.1

184

All of the following have been found in rock. Which one is NOT a fossil?

- Brachiopod shells
- Dinosaur footprints
- Fish bones
- Raindrop imprints
- Worm trails

I don't know.

AGE 17

RESP	1969	1973
1	4.2	4.8
2	2.9	2.6
3	6.5	7.4
4*	71.8	72.0
5	10.2	8.8
IDK	4.4	3.9

72-73 Rpt. #: RP188
 69-70 Rpt. #: U673

NAEP #: 201085

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

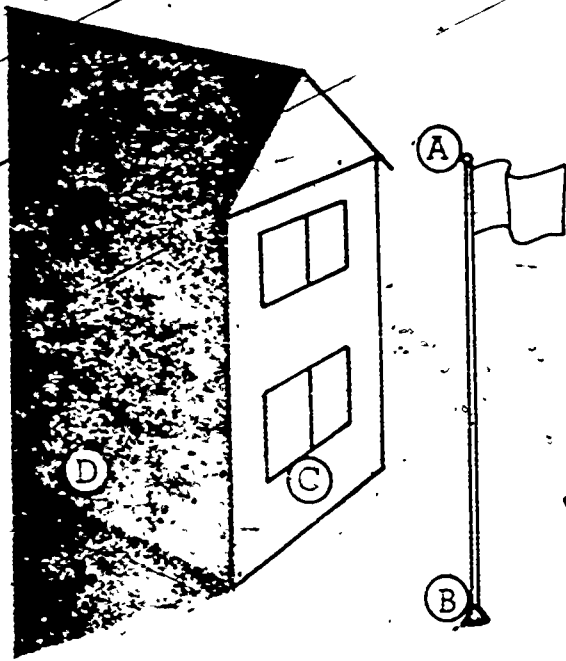
69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: $\frac{9}{}$
 72-73 Package-Exercise: 04-32
 69-70 Package-Exercise: 06-11

Timing: (in seconds)
 RP188 Stimulus: 13
 RP188 Response: 36
 RP188 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.8	-0.2	-1.2	-1.2	1.3	-1.3	3.3	-0.9
	1975	1.9	1.0	-2.3	-0.1	-0.5	0.5	4.2	-1.2



To find the temperature of the air outdoors: it would be best to put the thermometer at which of the places marked in the picture?

- A
- B
- C
- D
- I don't know

	AGE 9	
RESP	1970	1973
1	19.4	35.4
2	2.7	3.1
3	62.8	50.8
4*	11.8	8.2
IDK	2.8	2.4

107

.171

72-73 Rpt. #: RP189
 69-70 Rpt. #: U726
 NAEP #: 201086

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: A. Understand and apply facts and simple concepts.
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

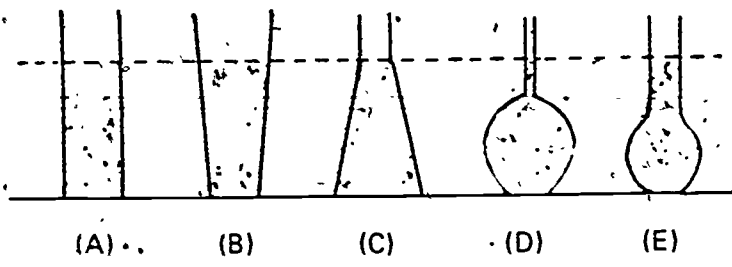
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 08-17
 69-70 Package-Exercise: 08-02

Timing: (in seconds)
 RP189 Stimulus: 24
 RP189 Response: 11
 RP189 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	2.1	-10.9	7.0	-1.4	5.1	-5.8	-17.4	3.8
	1972	3.1	-4.0	4.2	-3.4	3.7	-3.7	-18.2	4.4

183
 172



A quart of water at room temperature (70° Fahrenheit) is poured into each of the five containers as shown above. When the water in all five is heated to 150° Fahrenheit, the water level will be highest in container.

- A.
- B.
- C.
- D.
- E.
- I don't know.

AGE 13

RESP	1969	1972
1	8.5	10.2
2	8.9	9.7
3	9.3	8.2
4*	56.5	52.9
5	6.8	8.0
IDK	9.9	11.0

173

72-73 Rpt. #: FB190
 69-70 Rpt. #: R225

NAEP #: 201104

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: A. Understand and apply facts and simple concepts.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 01-08
 69-70 Package-Exercise: 09-06

Timing: (in seconds)
 RB190 Stimulus: 17
 RB190 Response: 32
 RB190 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	3.2	-7.7	-0.5	4.0	-2.7	-2.3	-15.4	3.3
	1972	2.0	-5.3	2.8	-1.1	1.3	-1.3	-14.4	3.0

100

174

Which of the following should you do when a person faints?

- 1. Tightly bandage him.
- 2. Lay him down and keep him warm.
- 3. Hold him up and apply hot packs.
- 4. Hold him up and apply cold packs.
- 5. Lay him down and apply cold packs.
- 6. I don't know.

AGE 13

RESP	1969	1972
1	0.2	0.4
2*	31.5	33.7
3	1.0	1.3
4	12.4	13.5
5	47.6	45.1
IDK	7.2	5.8

72-73. Rpt. #: RP191
 69-70. Rpt. #: U620
 NAEP #: 202078

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 02-10
 69-70 Package-Exercise: 03-19

Timing: (in seconds)
 RP191 Stimulus: 11
 RP191 Response: 40
 RP191 Grand total: 62

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.4	-9.3	1.0	4.5	0.0	-0.0	-22.2	4.6
	1973	1.9	-5.0	3.4	-0.8	-1.2	1.1	-13.0	3.2

192

It is most likely to snow when the weather is

- warm and clear.
- warm and foggy.
- cold and clear.
- warm and cloudy.
- cold and cloudy.
- I don't know.

AGE 9

RESP	1970	1973
1	2.3	1.9
2	1.6	1.4
3	15.7	14.8
4	2.5	2.5
5*	76.7	78.8
IDK	1.0	0.5

153

177

72-73 Rpt. #: RP192
 69-70 Rpt. #: U629.

NAEP #: 202080.

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS:

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

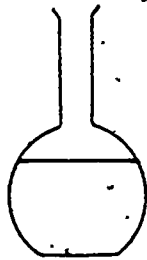
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 94-19
 69-70 Package-Exercise: 05-10

Timing: (in seconds)
 RP192 Stimulus: 20
 RP192 Response: 30
 RP192 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-0.7	-7.4	3.1	3.5	1.1	-1.1	-23.1	4.4
	1973	-2.0	-5.9	4.8	2.0	0.6	-0.5	-22.0	5.2

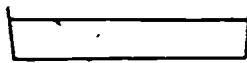
A pint of water is poured into each of the containers shown below and they are left uncovered in a warm room.



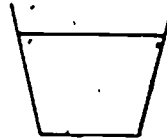
A



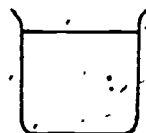
B



C



D



E

After a day, which container will have the LEAST amount of water left in it?

- A
- B
- C
- D
- E

I don't know.

AGE 9

RESP	1970	1973
1	9.7	13.4
2	8.0	10.5
3*	69.0	61.7
4	5.2	5.7
5	0.0	4.3
IDK	0.0	4.3

195

72-73 Rpt. #: RP193
 69-70 Rpt. #: U626

NAEP #: 202081

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: 2. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

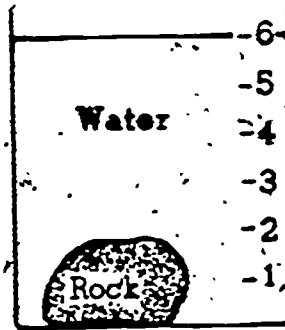
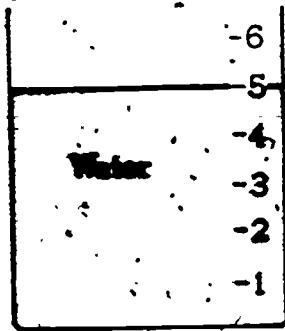
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 06-24
 69-70 Package-Exercise: 07-11

Timing: (in seconds)
 RP193 Stimulus: 22
 RP193 Response: 27
 RP193 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	9.3	-14.5	4.7	-1.9	0.6	-0.6	-27.3	5.0
	1973	6.1	-9.1	-0.2	3.1	2.6	-2.7	-31.0	7.6





A rock is put into a pail that has some water in it. Before the rock is put into the pail, the water is at the 5-pint line. After the rock is added, the water rises to the 6-pint line. The space taken up by the rock is

- 1 pint.
- 5 pints.
- 6 pints.
- 11 pints.
- I don't know.

AGE 9

RESP	1970	1973
1*	72.5	64.7
2	4.1	5.7
3	11.4	20.8
4	9.5	5.0
IDE	2.4	3.7

72-73 Rpt. #: RP194
 69-70 Rpt. #: U716

NAEP #: 202083

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 03-33
 69-70 Package-Exercise: 07-05

Timing: (in seconds)
 RP194 Stimulus: 20
 RP194 Response: 15
 RP194 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	3.3	-0.4	0.5	-4.0	1.0	-0.4	-8.2	2.1
	1972	3.5	0.4	0.7	-4.4	3.2	-3.0	-11.1	2.3



It would take the most work to stop which of the following cars?

- A light car going 20 miles per hour
- A light car going 40 miles per hour
- A heavy car going 10 miles per hour
- A heavy car going 20 miles per hour
- A heavy car going 40 miles per hour

I don't know

AGE 13

RESP	1969	1972
1	3.6	3.5
2	20.4	20.9
3	4.7	5.2
4	0.5	1.0
5*	68.0	60.9
IDK	2.7	3.6

193

72-73 Rpt. #: RB195
 69-70 Rpt. #: R228

NAEP #: 202084

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 05-13
 69-70 Package-Exercise: 09-07

Timing: (in seconds)
 RB195 Stimulus: 27
 EB195 Response: 8
 RB195 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-0.2	-6.1	5.4	0.0	3.4	-3.4	-15.0	3.4
	1972	1.8	-5.5	2.0	0.7	4.0	-4.0	-15.5	3.0

200
 1984

A fossil of an ocean fish was found in a rock outcrop on a mountain. This probably means that

- fish once lived on the mountain.
- the relative humidity was once very high.
- the mountain was raised up after the fish died.
- fish used to be amphibians like toads and frogs.
- the fossil fish was probably carried to the mountain by a great flood.
- I don't know.

AGE 13

RESP	1969	1972
1	2.7	3.4
2	3.1	4.7
3*	25.9	26.1
4	9.4	8.0
5	53.4	51.8
IDK	5.3	6.1

201

72-73 Rpt. #: RB196
 69-70 Rpt. #: U824
 NAEP #: 202085

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: B, Understand and apply laws (principles).
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 09-13
 69-70 Package-Exercise: 01-04

Timing: (in seconds)
 RB196 Stimulus: 36
 RB196 Response: 27
 RB196 Grand total: 74

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	4.7	-1.2	-2.8	-0.4	-0.2	0.2	-19.0	2.0
	1973	5.7	-0.9	-4.3	-0.2	-2.0	1.8	-11.4	2.5

In guinea pigs, fur color is dependent on only one pair of genes and black is dominant over white. If no mutations occur, what will happen if a purebred black guinea pig is crossed with a white guinea pig?

- $\frac{1}{2}$ of the offspring will be black; $\frac{1}{2}$ will be white.
- $\frac{3}{4}$ of the offspring will be black; $\frac{1}{4}$ will be white.
- $\frac{9}{16}$ of the offspring will be black; $\frac{7}{16}$ will be white.
- All of the offspring will be black.
- All of the offspring will be white.
- I don't know.

AGE 17

RESP	1969	1973
1	8.7	9.9
2	34.3	33.2
3	3.4	2.6
4*	48.0	44.2
5	0.7	0.8
IDK	4.8	9.2

72-73 Rpt. #: RB197
 69-70 Rpt. #: U845

NAEP #: 202087

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	<u>17</u>
72-73 Package-Exercise:	10-09
69-70 Package-Exercise:	02-02

Timing: (in seconds)	
RB197 Stimulus:	29
RB197 Response:	20
RB197 Grand total:	60

AGE	YEAR	REGION:				SEX		COLOR	
		NE	SE	C	W	M	F	B.	W
17	1969	1.4	1:0	0.2	-2.2	5.9	-5.2	-4.6	0.4
	1973	-0.8	0.6	1:0	-0.9	1.4	-1.3	-0.7	-0.1

If a large amount of mineral fertilizer is placed around a house plant, the plant is likely to wilt and die. The best explanation for this is that

- the plant ages more rapidly.
- the plant weakens and dies of disease.
- the amount of water in the roots has been decreased.
- the plant cannot produce food because its chlorophyll has been destroyed.
- the fertilizer uses up the carbon dioxide needed by the plant to make its own food.
- I don't know.

AGE 17

	1969	1973
ESP		
1	1.9	2.8
2	1.6	2.2
3*	16.4	15.4
4	13.6	11.2
5	52.2	55.1
IDK	14.0	15.2

205

72-73 Rpt. #: RP198

69-70 Rpt. #: U811

NAEP #: 202088

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

Administration Mode: Group

Age:

72-73 Package-Exercise:

69-70 Package-Exercise:

17
09-19
05-02

Timing: (in seconds)

RP198

RP198

RP198

Stimulus:

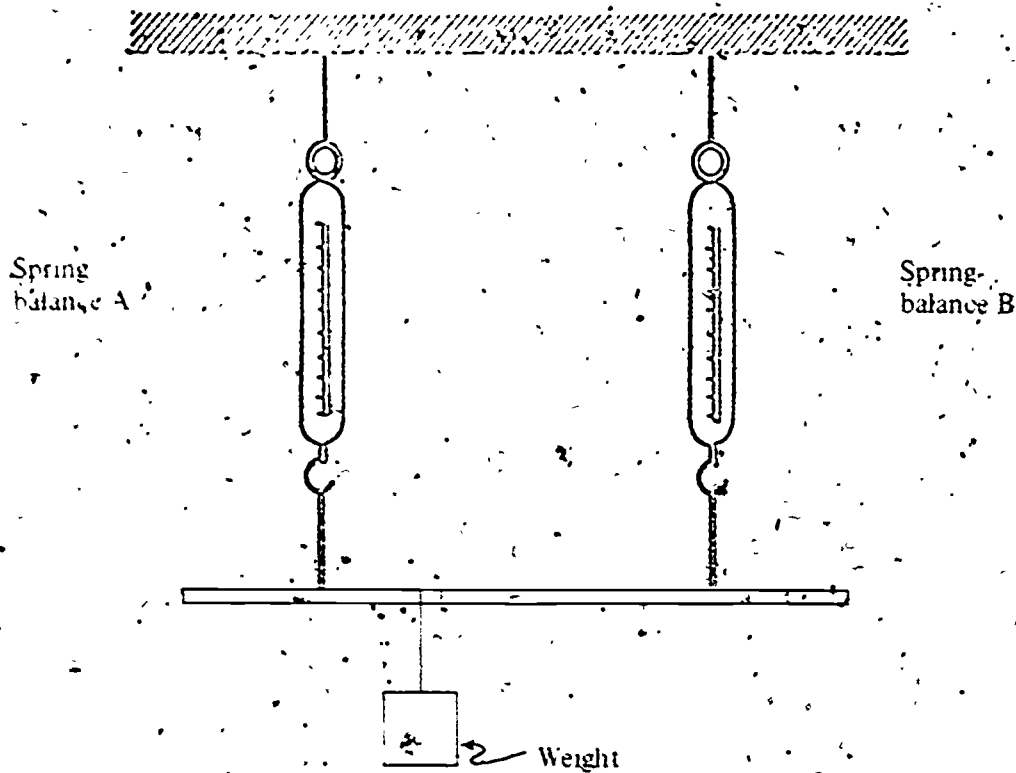
Response:

Grand total:

17
33
61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	-0.6	-4.7	0.7	3.1	8.6	-9.0	-15.7	2.2
	1973	2.9	-3.0	-0.7	0.4	8.0	-7.3	-21.1	4.0

Two identical spring balances are arranged as shown. Which spring balance will show the higher reading?



- A.
- B.
- Both spring balances will show the same reading.
- One cannot predict which spring balance will show the higher reading.
- I don't know.

AGE 17

RESP	1969	1973
1*	74.8	74.7
2	8.2	9.2
3	8.6	6.8
4	4.9	6.0
IDK	3.6	3.1

72-73 Rpt. #: RP199
 69-70 Rpt. #: U849

NAEP #: 202089

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

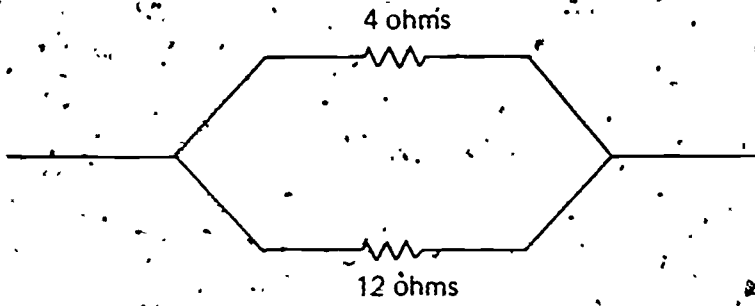
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 03-26
 69-70 Package-Exercise: 05-04

Timing: (in seconds)
 RP199 Stimulus: 14
 RP199 Response: 36
 RP199 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	3.7	0.7	-1.8	-1.8	3.2	-3.4	-1.6	-2.9
	1973	1.8	0.3	-1.0	-1.2	1.6	-1.4	-2.6	0.5

The resistance of the parallel connection of the two resistors shown below will be most nearly



- 3 ohms.
- 8 ohms.
- 12 ohms.
- 16 ohms.
- 48 ohms.
- I don't know.

AGE 17

RESP	1969	1973
1*	8.7	8.8
2	17.7	23.3
3	1.6	2.0
4	23.9	26.5
5	6.9	10.2
IDK	40.2	28.2

200

72-73 Rpt. #: RP200
 69-70 Rpt. #: U851

NAEP #: 202090

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles):

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 08-07
 69-70 Package-Exercise: 05-09

Timing: (in seconds)
 RP200 Stimulus: 44
 RP200 Response: 35
 RP200 Grand total: 89

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	2.9	-0.5	-2.1	0.2	1.6	-1.6	0.3	0.1
	1973	1.2	0.2	-0.6	-0.8	-0.0	0.0	0.8	-0.0

2.0

During an electrolysis, 1.0 faraday of electrons (1 mole of electrons) can produce which of the following?

- 1.0 mole of H_2 from H_2SO_4 solution
- 1.0 mole of O_2 from H_2SO_4 solution
- 1.0 mole of Cl_2 from NaCl solution
- 1.0 gram-atom (1 mole of atoms) of Cu from $CuSO_4$ solution
- 1.0 gram-atom (1 mole of atoms) of Ag from $AgNO_3$ solution
- I don't know.

AGE 17

RESP	1969	1973
1	12.2	9.7
2	4.5	3.9
3	6.3	5.1
4	4.7	3.5
5*	4.1	2.2
IDK	68.1	75.3

211

72-73 Rpt. #: RP201
 69-70 Rpt. #: U836

NAEP #: 202091

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 10-21
 69-70 Package-Exercise: 08-02

Timing: (in seconds)
 RP201 Stimulus: 25
 RP201 Response: 25
 RP201 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	2.9	-3.9	-1.0	1.0	1.5	-1.3	-15.4	1.8
	1973	-0.8	-1.2	1.5	0.1	5.5	-5.0	-12.8	2.6

212



An object starts from rest and moves with constant acceleration. If the object has a speed of 10 meters per second after 5 seconds, the acceleration of the object is

1 m/sec²

2 m/sec²

5 m/sec²

10 m/sec²

50 m/sec²

I don't know

AGE 17

RESP	1969	1973
1	2.0	2.5
2*	26.2	22.7
3	10.1	10.0
4	11.1	11.5
5	32.8	23.8
IDK	17.7	28.9

213

72-73 Rpt. #: RB202
 69-70 Rpt. #: U801
 NAEP #: 202092

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: B. Understand and apply laws (principles).
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 06-05
 69-70 Package-Exercise: 08-03

Timing: (in seconds)
 RB202 Stimulus: 18
 RB202 Response: 16
 RB202 Grand total: 44

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	0.1	-0.6	0.7	-0.6	-1.2	1.0	-3.6	0.7
	1973	0.8	-0.5	-0.0	-0.5	-0.9	0.8	-6.0	1.4



A meal consists of milk, bread and butter, meat, and cake. To satisfy the rules of good nutrition, what should be added to this meal?

- A green or yellow vegetable
- Baked beans
- Cheese
- Coffee or tea
- Pickles and olives
- I don't know.

AGE 17

RESP	1969	1973
1*	98.2	97.2
2	0.2	0.3
3	0.3	0.6
4	0.5	0.7
5	0.1	0.6
IDK	0.6	0.5

72-73 Rpt. #: BP203
 69-70 Rpt. #: U838

NAEP #: 202093

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:

72-73 Package-Exercise:
 69-70 Package-Exercise:

17
 04-17
 10-08

Timing: (in seconds)

RP208 Stimulus:
 RP203 Response:
 RP208 Grand total:

426
 22
 59

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	0.2	-0.5	-1.5	2.0	6.6	-6.1	-4.1	0.7
	1973	-0.3	-0.5	0.2	0.4	8.8	-9.0	2.9	0.0

A copper wire carrying an alternating current is placed near the north pole of a magnet, and the wire vibrates. The wire would NOT vibrate

- if the wire were made of iron.
- if the wire were connected to a direct-current source.
- if the temperature of the wire were raised.
- if the magnet were moved closer to the wire.
- if the magnet were reversed so that the south pole would be close to the wire.

- I don't know.

AGE 17

RESP	1969	1973
1	7.2	7.6
2*	23.0	23.7
3	1.6	1.5
4	7.3	7.1
5	30.6	34.6
IDK	30.1	24.9

217

72-73 Rpt. #: RP205
 69-70 Rpt. #: R232

NAEP #: 202102

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: B. Understand and apply laws (principles).

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

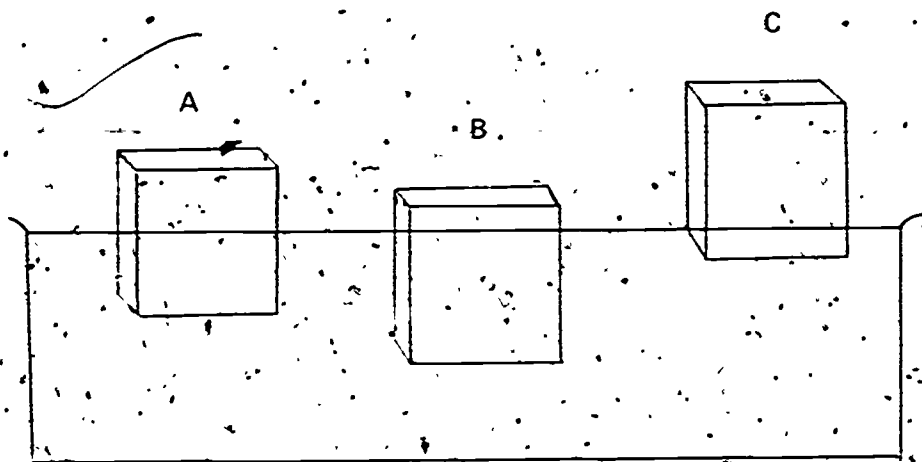
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 01-05
 69-70 Package-Exercise: 05-13

Timing: (in seconds)
 RP205 Stimulus: 20
 RP205 Response: 30
 RP205 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	2.2	-2.6	0.8	-1.2	2.2	-1.5	-10.9	2.2
	1972	0.1	-2.1	4.3	-3.9	2.0	-2.1	-9.0	2.5





The three solid objects shown above have the same volume. If they float as shown in the diagram, which one weighs the most?

- Object A
- Object B
- Object C
- They all weigh the same.
- It is impossible to tell without additional information.
- I don't know.

AGE 13

RESP	1969	1972
1	0.4	0.3
2*	75.1	82.9
3	3.9	3.3
4	6.4	4.3
5	13.4	8.2
IDK	0.8	1.0

72-73 Rpt. #: RP206
 69-70 Rpt. #: R135
 NAEP #: 202106

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: B. Understand and apply laws (principles).
 69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

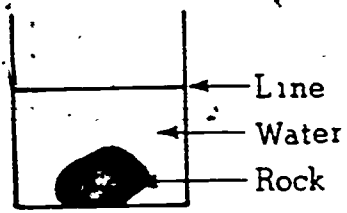
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 01-21
 69-70 Package-Exercise: 02-09

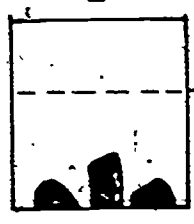
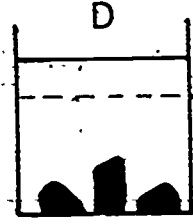
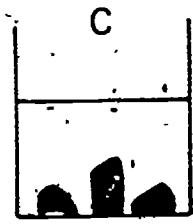
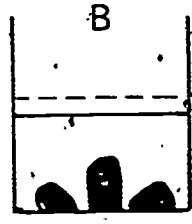
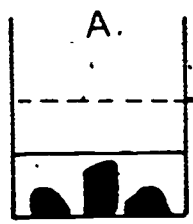
Timing: (in seconds)
 RP206 Stimulus: 21
 RP206 Response: 28
 RP206 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	AW
9	1970	-4.2	-5.1	5.4	2.1	2.5	-2.9	-8.3	2.0
	1973	0.2	-2.4	-1.7	3.6	2.6	-2.6	-10.9	2.3





When a rock is put into a pail of water, the water comes up to the line as the picture above shows. If the rock is broken into three pieces, which of the following pictures shows how high the water is?



- A
- B
- C
- D
- E
- I don't know.

	AGE 9	
RESP	1970	1973
1	11.6	10.3
2	10.2	9.9
3*	38.2	33.7
4	16.2	20.6
5	13.8	15.9
IDK	9.6	8.5

72-73 Rpt. #: RB207
 69-70 Rpt. #: E222, R314

NAEP #: 203022

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: C. Understand and apply conceptual schemes.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		<u>13</u>	<u>17</u>
72-73 Package-Exercise:		07-14	07-24
69-70 Package-Exercise:		08-08	06-04

Timing: (in seconds)			
RB207 Stimulus:		41	39
RB207 Response:		23	25
RB207 Grand total:		75	75

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-7.9	0.6	7.0	0.1	-1.2	1.3	0.3	-0.3
	1972	-2.8	-2.9	0.3	-5.4	-0.0	0.0	-4.7	1.3
17	1969	3.5	-7.6	0.7	0.5	2.5	-2.5	-11.2	1.2
	1973	1.9	-4.8	-2.6	4.7	2.1	-1.9	-13.0	2.7

222

206

In terms of the theory of natural selection, what is the explanation of why giraffes have come to have such long necks?

- Stretching to get food in high trees has made their necks longer.
- There is something inside of giraffes which keeps making longer necks.
- Giraffe food contained vitamins which caused the vertebrae to lengthen.
- Giraffe necks have gotten longer and longer as time has gone on, but nobody has any idea why this is.
- Giraffes born with the longest necks have been able to stay alive when food was scarce and have passed this trait on to their offspring.
- I don't know.

RESP	AGE 13		AGE 17	
	1969	1972	1969	1973
1	8.0	7.3	11.7	11.7
2	2.4	2.8	1.2	1.7
3	11.5	7.6	5.6	5.6
4	27.6	22.9	10.9	14.7
5*	38.4	44.2	60.2	55.1
IDK	12.0	15.0	10.2	10.3

223

207

72-73 Rpt. #: RP208
 69-70 Rpt. #: U734

NAEP #: 203023

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: C. Understand and apply conceptual schemes.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

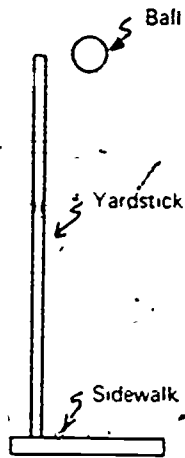
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 02-16
 69-70 Package-Exercise: 08-13

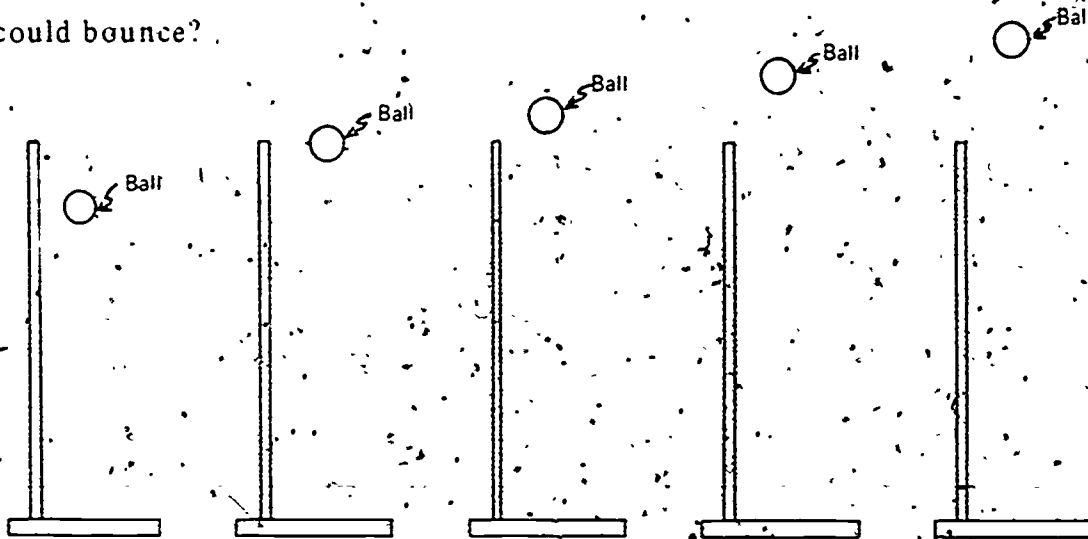
Timing: (in seconds)

RP208	Stimulus:	19
RP208	Response:	17
RP208	Grand total:	47

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	1.3	-6.1	1.4	1.8	11.6	-13.2	-23.1	4.2
	1972	-4.4	-0.1	3.5	0.5	10.4	-10.2	-16.6	3.7



A ball is dropped on the sidewalk from a height of one yard as the picture above shows. Which of the following pictures shows how high the ball could bounce?



- A
- B
- C
- D
- E
- I don't know.

AGE 15

RESP	1969	1972
1*	47.5	40.5
2	18.8	19.2
3	5.4	5.3
4	3.6	2.6
5	18.7	24.6
IDK	6.0	7.8

72-73 Rpt #: RP209
 69-70 Rpt #: U712

NAEP #: 204073

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 05-03
 69-70 Package-Exercise: 04-12

Timing: (in seconds)
 RP209 Stimulus: 13
 RP209 Response: 21
 RP209 Grand total: 45

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-0.4	-6.9	5.4	1.0	5.2	-4.7	-22.9	4.2
	1972	-1.6	-4.7	3.4	1.5	6.1	-6.1	-22.5	4.4

To get the salt out of saltwater, one could

- cool the water.
- add more water.
- boil away the water.
- dissolve air in the water.
- remove all of the air from the water.

- I don't know.

AGE 13

RESP.	1969	1972
1	2.1	1.8
2	5.2	6.5
3*	76.0	72.6
4	3.7	5.0
5	6.2	4.1
IDK	6.7	10.0

227

72-73 Rpt. #: RP210
 69-70 Rpt. #: U841

NAEP #: 204075

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: I. KNOW FUNDAMENTAL FACTS AND PRINCIPLES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 05-03
 69-70 Package-Exercise: 08-09

Timing: (in seconds)
 RP210 Stimulus: 18
 RP210 Response: 31
 RP210 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	4.5	5.7	-4.0	-3.6	0.8	-0.7	19.8	-2.2
	1973	-1.6	2.6	1.5	-2.3	-0.7	0.6	6.9	-1.7

223

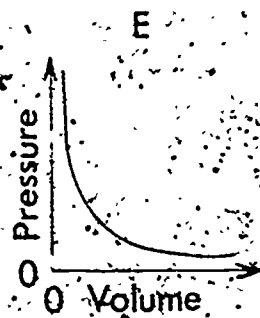
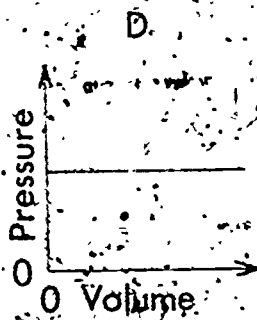
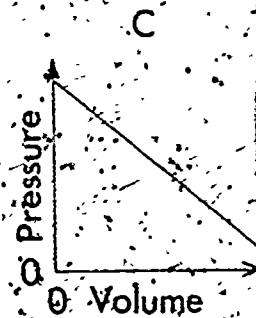
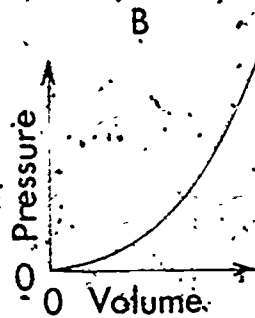
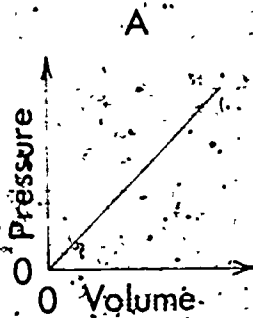


Assume that temperature does not change. Which one of the graphs below best shows how the pressure of a sample of gas changes as its volume changes?

- A
- B
- C
- D
- E
- I don't know.

AGE 17

RESP	1969	1973
1	16.0	20.4
2	19.4	27.2
3	11.0	9.6
4	9.6	13.1
5*	18.6	15.2
IDK	25.2	14.2



200

213

72-73 Rpt. #: RB211
 69-70 Rpt. #: U660
 NAEP #: 204076

72-73 Obj: LI. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

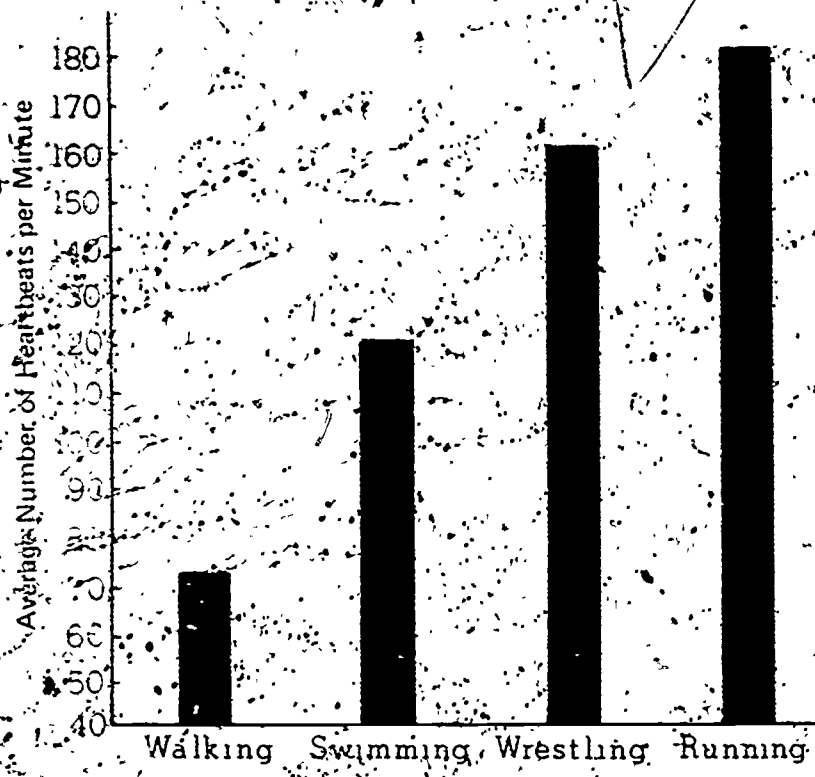
69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 07-21
 69-70 Package-Exercise: 01-05

Timing: (in seconds)
 RB211 Stimulus: 10
 RB211 Response: 39
 RB211 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.2	3.0	2.5	-1.7	0.6	-0.7	3.0	2.6
	1973	1.2	-5.1	2.7	0.7	0.5	-0.5	-4.7	1.1



According to the graph above, your heart probably beats fastest when you are

- walking
- swimming
- wrestling
- running
- I don't know

AGE 9

RESP	1970	1973
1	1.3	1.4
2	1.5	2.0
3	4.6	4.3
4*	91.1	91.4
LDK	1.4	0.7

231

235

72-73 Rpt. #: RP212

69-70 Rpt. #: U664

NAEP #: 204077

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

Administration Mode: Group

Age: 9
72-73 Package-Exercise: 05-24
69-70 Package-Exercise: 01-07

Timing: (in seconds)

RP212 Stimulus: 17
RP212 Response: 32
RP212 Grand total: 60

Table with columns: AGE, YEAR, REGION (NE, SE, C, W), SEX (M, F), COLOR (B, W). Data points for 1970 and 1973 across various demographic groups.

Which of the following would be easiest to measure with a ruler that is 12 inches long?

- The length of a pencil
- The thickness of a sheet of paper
- The distance from your home to the school
- The distance from your home to the nearest grocery store
- I don't know.

AGE 9

RESP	1970	1973
1*	74.3	70.2
2	16.5	17.2
3	2.0	3.8
4	2.8	4.1
IDK	4.2	4.2

253

217

72-73 Rpt. #: RP213

69-70 Rpt. #: U672

NAEP-#: 204078

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

Administration Mode: Group


Age: 9.
72-73 Package-Exercise: 07-09
69-70 Package-Exercise: 01-14


Timing: (in seconds)


RP213	Stimulus:	41
RP213	Response:	33
RP213	Grand total:	85

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	0.9	-3.0	3.7	-2.7	0.8	-0.9	-3.4	1.0
	1973	3.6	-3.2	-0.3	-0.5	1.4	-1.4	-8.4	2.1

A class decided to show the temperature on each of 3 days. They used the following symbols:

 for over 80° F

















 for 60° - 80° F


 for 40° - 60° F

The temperatures on each of three days were:

	Monday	Tuesday	Wednesday
Temperature	85°	84°	55°

Which of the following shows the temperatures?

	<u>Mon.</u>	<u>Tues.</u>	<u>Wed.</u>
			
			
			
			

 I don't know.

	AGE 9	1970	1973
RESP			
1		30.2	29.0
2*		19.3	19.1
3		7.2	6.0
4		6.3	5.8
IDK		34.7	34.8

255

72-73 Rpt. #: BP214
 69-70 Rpt. #: U671

NAEP #: 204081

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

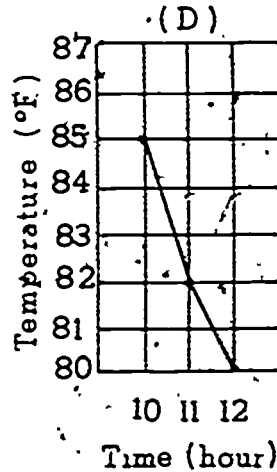
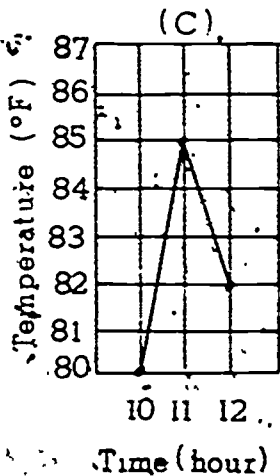
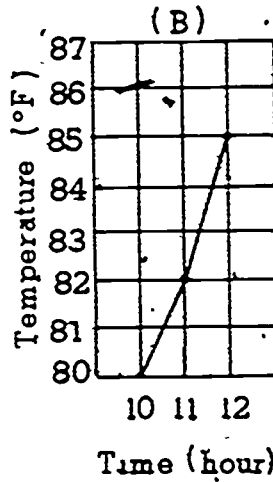
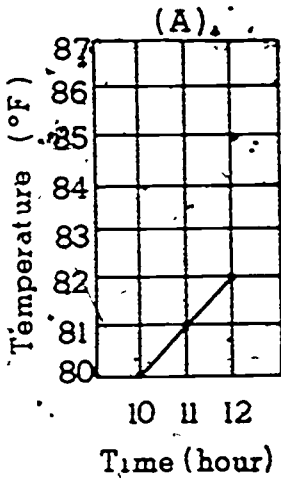
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 05-12
 69-70 Package-Exercise: 03-18

Timing: (in seconds)
 RP214 Stimulus: 23
 RP214 Response: 25
 RP214 Grand total: 59

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.8	-10.3	6.0	-2.3	3.7	-3.8	-8.5	2.2
	1973	-1.5	-3.4	6.8	-2.2	1.3	-1.3	-9.2	2.3

Some children found that the temperature was 80° F at 10 o'clock, 82° F at 11 o'clock, and 85° F at 12 o'clock. Which of the following is the best record of their findings?



- A
 B
 C
 D
 I don't know.

AGE 9

RESP	1970	1973
1	11.4	12.1
2*	31.3	26.2
3	20.1	21.4
4	19.6	23.4
IDK	17.2	16.2

257

72-73 Rpt. #: RP215
 69-70 Rpt. #: U663

NAEP #: 204083

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

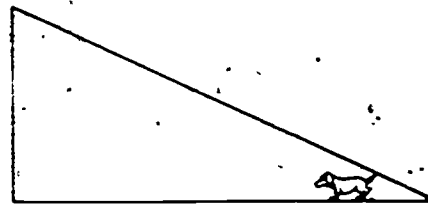
Exercise type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: J4-16
 69-70 Package-Exercise: 04-05

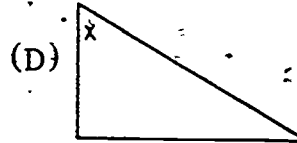
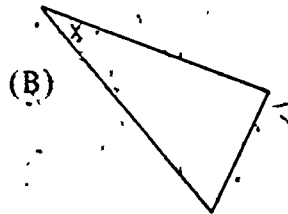
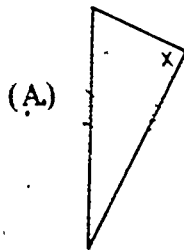
Timing: (in seconds)
 RP215 Stimulus: 17
 RP215 Response: 32
 RP215 Grand total: 59

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.6	-5.9	2.2	-0.8	1.7	-1.7	-18.6	4.7
	1973	2.4	-5.1	3.1	-1.1	-1.6	1.5	-19.4	4.7

253



Above is a picture John drew of a dog in a yard. Which of the following pictures shows an x in the same place in the yard as the dog in John's picture?



- A
- B
- C
- D
- I don't know.

AGE 9

RESP	1970	1973
1	5.3	3.9
2*	76.2	82.7
3	2.9	1.9
4	13.2	10.0
IDK	2.0	1.0

72-73 Rpt. #: RP216
 69-70 Rpt. #: U668

NAEP #: 204084

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D; Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 02-34
 69-70 Package-Exercise: 05-07

Timing: (in seconds)
 RP216 Stimulus: 24
 RP216 Response: 25
 RP216 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	4.6	-12.0	5.0	-0.3	-0.8	0.8	-27.8	6.0
	1973	6.7	-7.2	-1.0	0.8	0.4	-0.4	-25.3	5.2

Clouds may be high, middle, or low.

High clouds are above 20,000 feet.

Middle clouds are between 6,000 and 20,000 feet.

Low clouds are between the ground and 6,000 feet.

A cloud at 10,000 feet is a

- low cloud.
- middle cloud.
- high cloud.
- I don't know.

	AGE 9	
RESP	1970	1973
1	12.1	10.9
2*	63.7	58.6
3	21.2	24.6
IDK	2.8	5.0

72-73 Rpt. #: RU217

69-70 Rpt. #: U661

NAEP #: 204086

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

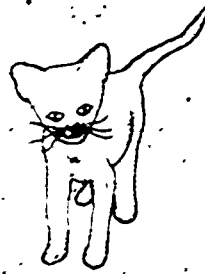
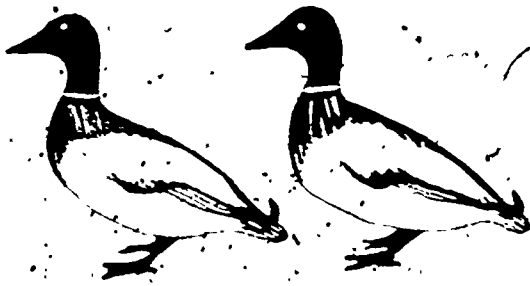
Administration Mode: Group

Age: .9
72-73 Package-Exercise: 04-26
69-70 Package-Exercise: 05-15

Timing: (in seconds)
RU217 Stimulus: 16
RU217 Response: 33
RU217 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.7	-8.2	2.7	-1.1	-0.4	0.4	-22.9	4.3
	1973	1.5	-3.2	1.4	-0.0	-1.4	1.3	-15.1	3.8

212



If D stands for duck and C stands for cat, which of the following best represents the picture?

- D, C, C
- D, G, D
- D, D, C
- D, D, D
- I don't know.

	AGE 9	
RESP	1970	1973
1	2.6	1.5
2	2.6	2.4
3*	87.1	89.9
4	5.4	4.6
IDK	2.1	1.5

243

72-73 Rpt. #: RB218
 69-70 Rpt. #: U658
 NAEP #: 204087

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: D. Understand and apply inquiry skills.
 69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: $\frac{9}{06-35}$
 72-73 Package-Exercise: 06-35
 69-70 Package-Exercise: 07-07

Timing: (in seconds)
 RB218 Stimulus: 13
 RB218 Response: 36
 RB218 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.1	-3.7	1.0	0.1	-1.1	1.1	-11.5	1.8
	1973	-2.3	-1.8	2.4	1.9	-0.8	0.8	-8.1	2.7

Which of the following is the surest sign that a dog is sick?

- Its fur is clean.
- It sleeps at night.
- It is very playful.
- It has not eaten its food for two days.
- I don't know.

	AGE 9	
RESP	1970	1973
1	0.8	1.1
2	1.2	1.8
3	1.3	3.2
4*	95.6	90.3
IDK	0.9	3.4

245

229

72-73 Rpt. #: RB219

69-70 Rpt. #: R151

NAEP #: 204088

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

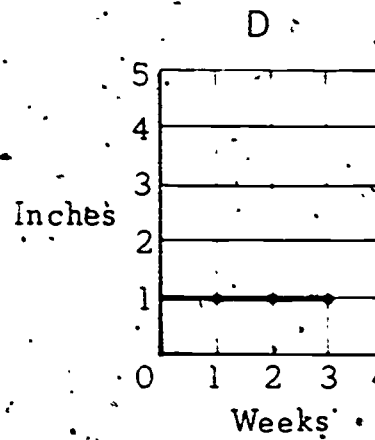
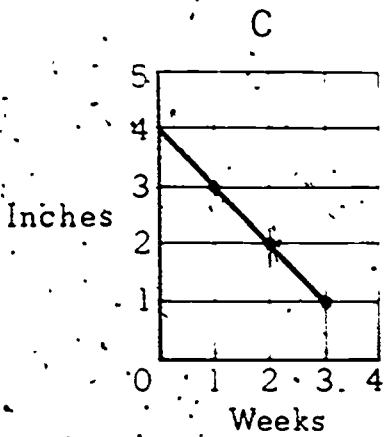
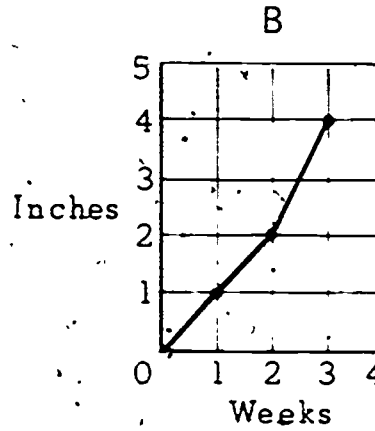
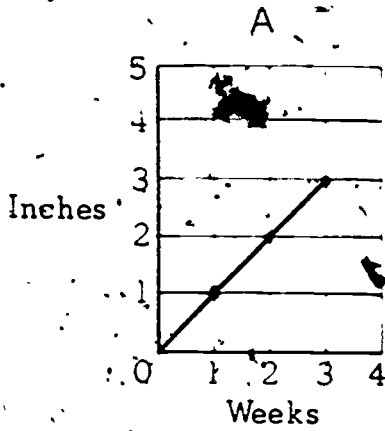
Administration Mode: Group

Age: 9
72-73 Package-Exercise: 06-11
69-70 Package-Exercise: 08-04

Timing: (in seconds)
RB219 Stimulus: 20
RB219 Response: 28
RB219 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	3.5	-5.1	-0.7	1.8	3.2	-3.2	-20.5	3.3
	1973	2.4	-6.0	2.4	0.8	1.1	-1.2	-12.4	2.5

A plant grows this way. The first week it is 1 inch high. The second week it is 2 inches high. The third week it is 4 inches high. Which of the following graphs shows this growth?



- A
- B
- C
- D
- I don't know.

AGE 9

RESP	1970	1973
1	10.9	9.9
2*	54.4	55.5
3	12.7	14.4
4	8.0	10.3
IDK	13.6	9.2

247

72-73 Rpt. #: RP220
 69-70 Rpt. #: U669

NAEP #: 204089

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	9
72-73 Package-Exercise:	07-16
69-70 Package-Exercise:	08-07

Timing: (in seconds)			
RP220	Stimulus:		12
RP220	Response:		36
RP220	Grand total:		59

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	8.5	1.3	-0.5	-9.7	-1.5	1.5	-8.8	2.3
	1973	6.6	-4.2	0.6	-4.0	-2.0	2.0	-14.3	3.2

In most of the United States, a noon temperature of 30° F is most likely in

January.

May.

June.

July.

I don't know.

AGE 9

RESP	1970	1973
1*	52.7	62.8
2	13.3	13.7
3	11.2	8.2
4	12.8	10.6
IDK	10.0	4.5

243

233

72-73 Rpt. #: RU221
69-70 Rpt. #: R147

NAEP #: 204090

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: $\frac{9}{05-07}$
72-73 Package-Exercise: 05-07
69-70 Package-Exercise: 08-09

Timing: (in seconds)
RU221 Stimulus: 37
RU221 Response: 37
RU221 Grand total: 85

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	0.4	-8.2	7.5	-1.6	-0.4	0.4	-26.1	4.5
	1973	0.0	-8.2	4.6	3.4	-0.7	0.7	-10.9	2.0

250'

234

Someone said that if you mix salt and sugar with water and let the mixture stand you get saltwater taffy--a kind of candy. Which of the following would be the best way for you to test this idea?

- Take a vote among your friends.
- Buy some saltwater taffy and see if it has salt in it.
- Find out if salt and sugar have the same chemicals in them.
- Grind up some saltwater taffy to see if you get salt, sugar, and water.
- Try to mix salt, sugar, and water, let them stand, and see what happens.
- I don't know.

AGE 9

RESP	1970	1973
1	2.7	3.1
2	11.1	8.8
3	6.0	8.3
4	6.3	7.1
5*	68.9	68.7
IDK	4.7	3.5

231

72-73 Rpt. #: RB222
 69-70 Rpt. #: 8665

NAEP #: 204091

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	9
72-73 Package-Exercise:	06-22
69-70 Package-Exercise:	08-12

Timing: (in seconds)			
RB222	Stimulus:		17
RB222	Response:		32
RB222	Grand total:		60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	3.1	-7.5	5.4	-2.7	-1.3	1.3	-27.3	5.4
	1973	6.2	-9.9	5.9	-4.3	-0.5	0.5	-24.4	6.1

If you want to find out how much a person grew in 1 year, which of the following must you know about the person?

- His age
- The type of food he eats
- His height at the start of the year
- The height of his mother and father

- I don't know.

AGE 9

RESP	1970	1973
1	12.5	12.9
2	9.8	11.6
3*	70.3	66.4
4	3.8	5.5
IDK	3.5	3.5

72-73 Rpt. #: RP223
 69-70 Rpt. #: U757

NAEP #: 204092

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

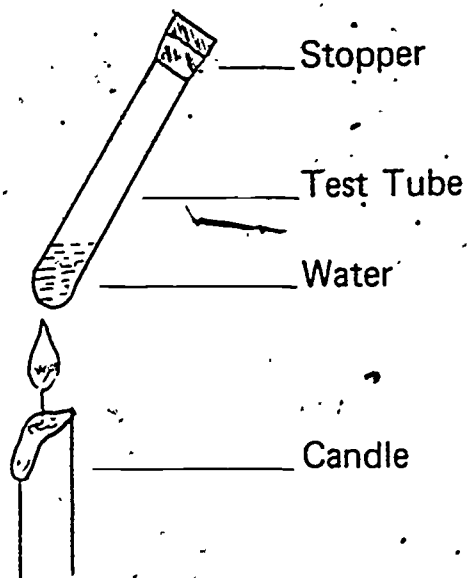
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 06-02
 69-70 Package-Exercise: 01-06

Timing: (in seconds)
 RP223 Stimulus: 27
 RP223 Response: 38
 RP223 Grand total: 76

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-0.4	-3.9	2.0	1.2	7.5	-7.7	-10.0	2.4
	1972	0.7	-0.1	-1.9	1.6	7.3	-6.8	-16.4	2.3

204



Water is heated as shown in the diagram above. If the stopper pops out, which of the following is most important in accounting for this?

- The stopper gets hot and expands.
- Some of the water is changed to steam.
- The air in the test tube absorbs heat.
- The glass test tube gets very hot and starts to melt.
- The glass test tube expands more than the stopper.
- I don't know.

AGE 13

RESP	1969	1972
1	19.2	22.3
2*	52.2	51.2
3	10.1	8.5
4	1.6	3.2
5	12.2	10.3
IDK	4.4	4.3

255

72-73 Rpt. #: RB224
 69-70 Rpt. #: U750

NAEP #: 204095

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	13
72-73 Package-Exercise:	04-01
69-70 Package-Exercise:	03-03

Timing: (in seconds)		
RB224	Stimulus:	18
RB224	Response:	17
RB224	Grand total:	46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	5.5	-9.5	-0.1	2.6	-3.5	3.0	-25.9	5.1
	1972	9.2	-7.7	3.2	-6.3	-2.6	2.8	-31.0	7.8



Which of the following statements is an opinion rather than a fact about cats?

- Cats eat mice.
- Cats have fur.
- Cats have tails.
- Cats are related to tigers.
- Siamese cats are prettier than other cats.

- I don't know.

AGE 13

RESP	1969	1972
1	4.2	6.8
2	2.2	3.5
3	1.2	2.6
4	11.4	13.2
5*	79.3	70.8
IDK	1.3	1.8

237

241

72-73 Rpt. #: RP225
 69-70 Rpt. #: U751

NAEP #: 204096

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	13
72-73 Package-Exercise:	08-13
69-70 Package-Exercise:	04-08

Timing: (in seconds)		
RP225	Stimulus:	33
RP225	Response:	32
RP225	Grand total:	76

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	3.9	-2.8	-3.2	1.8	4.2	-4.0	-8.3	2.5
	1972	-1.1	0.5	0.5	0.0	1.9	-2.0	-12.6	3.4

A boy notices that water puddles of the same size last longer in winter than in summer. Which of the following is the best explanation?

- Water evaporates faster on hot days.
- Cold water is thick and doesn't run very quickly.
- Water can sink into the ground only in the winter.
- There are fewer winds in summer to interfere with drying up puddles.
- The heat of the summer sun changes water to hydrogen and oxygen gases.
- I don't know.

AGE 13

RESP	1969	1972
1*	73.4	71.3
2	2.7	3.4
3	0.6	1.2
4	2.4	2.8
5	19.1	19.2
IDK	1.6	2.1

259

72-73 Rpt. #: RU226
 69-70 Rpt. #: U759

NAEP #: 204097

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		13
72-73 Package-Exercise:		06-16
69-70 Package-Exercise:		04-11

Timing: (in seconds)		
RU226	Stimulus:	22
RU226	Response:	13
RU226	Grand total:	46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	4.5	-9.6	2.8	1.2	6.5	-6.2	-29.9	6.3
	1972	5.1	-4.5	6.1	-7.9	3.6	-3.3	-27.0	4.5

Of 929 plants, 705 had red flowers and 224 had white flowers. The ratio of red to white flowers is about

- 700 : 1
- 4 : 1
- 3 : 1
- 2 : 1
- 1.480

- I don't know

AGE 13

RESP	1969	1972
1	5.0	7.8
2	16.2	16.8
3*	47.0	42.8
4	5.8	6.0
5	7.4	6.9
IDK	18.2	19.2

261

72-73 Rpt. #: PP227

69-70 Rpt. #: U754

NAEP #: 204100

72-73 Obj; II. UNDERSTAND, AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

Administration Mode: Group

Age:

72-73 Package-Exercise:

69-70 Package-Exercise:

13
03-27
09-09

Timing: (in seconds)

PP227	Stimulus:	16
PP227	Response:	19
PP227	Grand total:	46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	8.0	-6.9	-0.6	-1.6	1.8	-1.7	-24.8	5.8
	1972	8.8	-3.6	2.3	-3.5	1.0	-1.0	-25.4	5.4

202

To determine the average height of 13-year-olds it would be most important to have a large number of

- scales
- yardsticks
- 13-year-olds
- people doing the measuring
- observers of each measurement

- I don't know

AGE 13

RESP	1969	1972
1	5.9	8.2
2	7.3	9.7
3*	63.0	59.0
4	6.2	4.7
5	13.6	11.2
IDK	3.8	3.5

203

72-73 Rpt. #: RU228
 69-70 Rpt. #: U858

NAEP #: 204102

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:	17
72-73 Package-Exercise:	06-70
69-70 Package-Exercise:	02-06

Timing: (in seconds)	
RU228 Stimulus:	34
RU228 Response:	44
RU228 Grand total:	88

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	4.3	-8.6	-2.3	4.5	3.5	-3.1	-19.2	2.0
	1973	2.9	-3.9	2.1	-2.6	1.7	-1.5	-18.0	3.6



Which of the following is a model rather than an observation?

- The center of the Earth is liquid.
- A ship can start from a point, sail around the Earth, and return to the same point.
- The temperature at the bottom of a very deep well is higher than the temperature at the surface.
- The average temperature of the South Pole is lower than the average temperature at the Tropic of Capricorn.
- The top of the sail is the last portion of a ship that can be seen from the shore as the ship sails away from the shore.
- I don't know.

AGE 17

RESP	1969	1973
1*	56.2	50.2
2	11.9	15.6
3	6.0	6.0
4	6.7	4.8
5	8.4	11.5
IDK	10.5	11.6

205

72-73 Rpt. #: RU229
 69-70 Rpt. #: U855

NAEP #: 204103

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 08-29
 69-70 Package-Exercise: 04-02

Timing: (in seconds)
 RU229 Stimulus: 27
 RU229 Response: 22
 RU229 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	3.1	-7.4	2.7	-1.3	3.8	-3.6	-23.2	4.7
	1973	4.4	-3.5	0.0	-1.6	4.7	-4.3	-16.0	3.6

Four of the following are statements of fact. Which statement is a hypothesis?

- The boiling point of water is 100° C.
- A gallon of water weighs about 8 pounds.
- Hydrogen was first prepared by Cavendish in 1766.
- The Empire State Building is more than 50 stories high.
- The rings of Saturn were formed from a moon that exploded.
- I don't know.

	AGE 17	
RESP	1969	1973
1	7.4	5.4
2	11.8	12.4
3	4.1	3.2
4	3.8	3.0
5*	66.3	61.3
IDK	6.4	12.5

207

72-73 Rpt. #: RP230
 69-70 Rpt. #: U853
 NAEP #: 204105

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.
 Subobjective: D. Understand and apply inquiry skills.
 69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

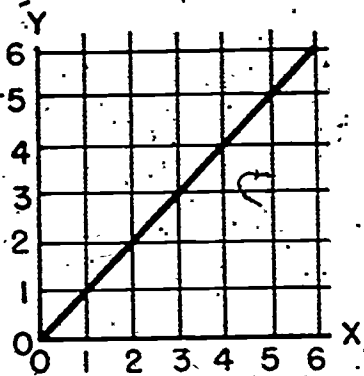
Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:
 72-73 Package-Exercise: 17
 69-70 Package-Exercise: 09-15
 06-14

Timing: (in seconds)
 RP230 Stimulus: 19
 RP230 Response: 44
 RP230 Grand total: 74

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	3.7	-5.1	1.0	-1.7	2.4	-2.4	-18.6	2.1
	1973	4.5	-4.3	-1.2	0.4	2.2	-2.0	-12.8	2.4

Which of the following equations represents the graph below?



- $Y = X$
- $Y = aX^2$
- $Y = .2X$
- $YX = 1$
- $X^2 + Y^2 = 1$
- I don't know.

AGE 17

RESP	1969	1973
1*	73.4	70.8
2	1.3	1.4
3	1.8	0.8
4	3.0	3.0
5	5.2	4.5
IDX	14.6	19.3

269

72-73 Rpt. #: RP231

69-70 Rpt. #: U864

NAEP #: 204106

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

Administration Mode: Group

Age:

72-73 Package-Exercise:

17
08-13

69-70 Package-Exercise:

07-02

Timing: (in seconds)

RP231

Stimulus:

20

RP231

Response:

29

RP231

Grand total:

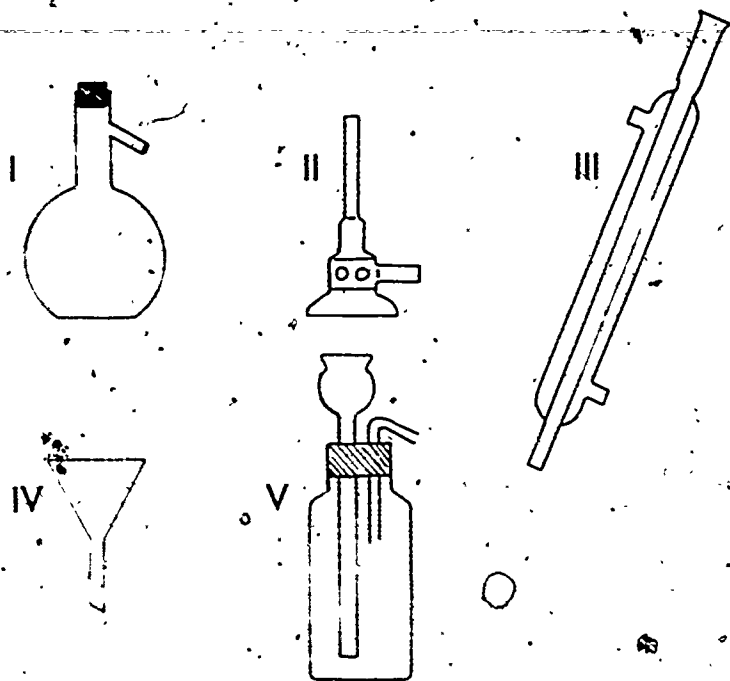
60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C.	W	M	F	B	W
17	1969	4.4	-1.4	-3.3	0.4	11.0	-10.5	-6.9	0.6
	1973	0.4	0.1	-0.7	0.3	7.0	-6.5	-10.7	1.5

210

254

Pictured below are pieces of laboratory equipment.



To obtain pure water from salt water, which of the pieces shown above would be most useful?

- II and V
- III and V
- I, II, and III
- I, IV, and V
- III, IV, and V
- I don't know.

AGE 17

RESP	1969	1973
1	18.3	23.3
2	13.5	13.9
3*	26.1	20.5
4	11.7	13.4
5	7.8	9.7
IDK	22.6	18.4

271

72-73 Rpt. #: RP250
 69-70 Rpt. #: U881

NAEP #: 204109

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Short answer
 Scoring Type: Professional
 Administration Mode: Individual

Age: 17
 72-73 Package-Exercise: 04-29
 69-70 Package-Exercise: 09-20

Timing: (in seconds)
 RP250 Stimulus: 9
 RP250 Response: 477
 RP250 Grand total: 486

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	-2.8	-4.1	4.9	-0.6	7.2	-6.5	-25.6	4.3
	1973	1.7	-8.2	-2.4	7.9	5.0	-5.1	-25.3	4.1

212

29. Describe a way to test whether it pays to buy premium gasoline for a second-hand car.

AGE 17		
RESP	1969	1973
1*	49.0	35.0
2	45.5	51.3
IDK	2.1	9.7

For the Scoring Guide used in 1969 and 1973, see Appendix, page 299.

213

257

72-73 Rpt. #: RB232
 69-70 Rpt. #: R347

NAEP #: 204111

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

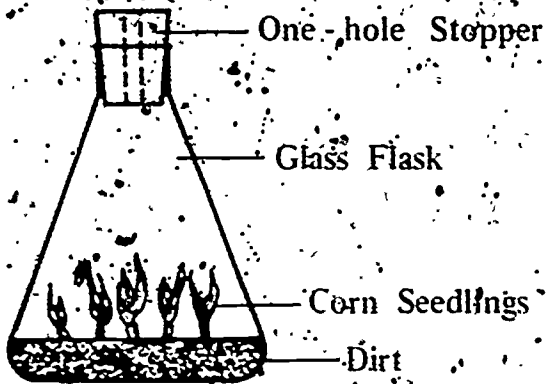
Age:
 72-73 Package-Exercise: 17
 69-70 Package-Exercise: 07-08
 1-1-03

Timing: (in seconds)
 RB232 Stimulus: 39
 RB232 Response: 24
 RB232 Grand total: 74

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
17	1969	4.0	-2.8	0.4	-2.6	2.2	-2.1	-9.8	1.5
	1973	1.2	-3.1	1.5	-0.4	2.3	-2.0	-7.0	1.4

274

Corn is planted in a flask as shown below. The flask is weighed each day for three weeks. The flask shows a daily weight loss. Which of the following is the best explanation of this loss of weight?



- The original water evaporates within the first day.
- Carbon dioxide is lighter in weight than ordinary air.
- Seed material is changed to leaves and roots that weigh less.
- The seedlings use starch in the seeds and give off gases that escape.
- Dry air enters through the stopper and replaces the moist air in the flask.
- I don't know.

AGE 17

RESP	1969	1973
1	16.2	19.2
2	11.5	14.6
3	7.7	12.0
4*	19.6	20.0
5	15.4	19.2
IDK	29.4	14.7

72-73 Rpt. #: R8233
69-70 Rpt. #: U676

NAEP #: 204113

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: $\frac{9}{01-25}$
72-73 Package-Exercise: 01-25
69-70 Package-Exercise: 04-08

Timing: (in seconds)
RU233 Stimulus: 30
RU233 Response: 19
RU233 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	6.9	-2.8	-3.8	-0.1	-0.1	0.2	-11.4	2.4
	1973	2.2	-5.5	2.3	0.3	-0.8	0.8	-13.6	3.5

213

260

Some children were trying to find out which of three light bulbs was brightest. The children said the following things. Which of these gives the best start toward finding the answer?

- One bulb looks brightest to me so I already know the answer.
- All the bulbs look bright to me so there can't be an answer.
- It would help if we had a way to find the brightness of a light bulb.
- Let's take a vote; each person will vote for the bulb he thinks is the brightest.
- I don't know.

	AGE 9	
RESP	1970	1973
1	14.8	8.4
2	12.1	14.2
3*	41.7	37.2
4	25.6	28.9
IDK	5.6	10.4

217

72-73 Rpt. #: RP234
 69-70 Rpt. #: R146

NAEP #: 204124

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 01-06
 69-70 Package-Exercise: 02-01

Timing: (in seconds)
 RP234 Stimulus: 24
 RP234 Response: 25
 RP234 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	5.4	-9.2	4.1	-3.6	1.9	-2.2	-18.8	4.5
	1973	1.6	-4.0	2.3	-0.5	2.3	-2.3	-19.4	4.6

213

John has a flat tire on his bicycle. He pumps the tire up with an air pump and begins to ride. In a few minutes the tire is flat again. To fix his tire, John must find

- a better air pump.
- whether the tire is made of rubber.
- where the air leaks out of the tire.
- how many minutes it takes the tire to go flat.
- I don't know.

AGE 9

RESP.	1970	1973
1	14.1	5.9
2	3.0	2.2
3*	75.7	87.8
4	2.7	2.2
IDK	3.8	1.7

279

72-73 Rpt. #: RB235

69-70 Rpt. #: R148

NAEP #: 204128

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice

Scoring Type: Machine

Administration Mode: Group

Age:	9
72-73 Package-Exercise:	06-20
69-70 Package-Exercise:	07-13

Timing: (in seconds)

RB235	Stimulus:	27
RB235	Response:	22
RB235	Grand total:	60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	5.6	-1.0	-3.2	-1.6	-2.1	2.2	-11.7	2.3
	1973	0.8	-6.0	3.5	1.3	-1.8	1.9	-14.1	3.5

A doctor kept records of breathing rates of people when they were resting.
 He made the chart below.

BREATHING RATES	
Person	Breaths in a minute
Baby boys	38
7-yr.-old girls	25
7-yr.-old boys	25
10-yr.-old boys	20
Mothers	16

The chart suggests that

- boys breathe faster than girls.
- girls breathe faster than boys.
- older people breathe faster than younger people.
- younger people breathe faster than older people.
- I don't know.

	AGE 9	
RESP.	1970	1973
1	11.5	12.0
2	1.5	1.8
3	15.2	14.3
4*	67.0	66.2
IDK	6.6	5.4

72-73 Rpt. #: RB236
69-70 Rpt. #: R133

NAEP #: 204137

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: D. Understand and apply inquiry skills.

69-70 Obj: II. POSSESS THE ABILITIES AND SKILLS NEEDED TO ENGAGE IN THE PROCESSES OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

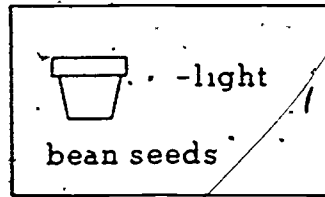
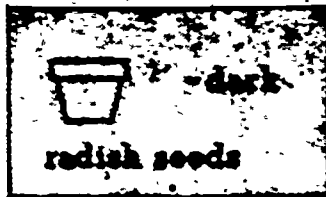
Age: 9
72-73 Package-Exercise: 01-23
69-70 Package-Exercise: 02-15

Timing: (in seconds)
FB236 Stimulus: 37
FB236 Response: 13
FB236 Grand total: 61

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	6.2	-17.2	3.4	-1.8	2.4	-2.8	-11.1	2.6
9	1973	5.4	-6.2	0.8	-0.8	0.3	-0.3	-8.4	2.7

252

Tom wanted to find out whether plants can grow better in the dark or in the light. He put a pot with 6 radish seeds in a dark room and a pot with 6 bean seeds on the window sill.



He added the same amount of water to both pots. The bean seeds grew better than the radish seeds, so Tom said his plants grow best in the light.

To be able to say this, he should have

- watered both pots more.
- watered the radish seeds more.
- put the same kind of seeds in both pots.
- grown the seeds in water instead of soil.
- I don't know.

AGE 9

RESP	1970	1973
1	12.6	41.3
2	15.5	17.4
3	46.2	41.5
4	10.6	12.3
EDK	15.0	16.4

263

267

72-73 Rpt. #: RU237
 69-70 Rpt. #: U675

NAEP #: 205016

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: E. Understand and apply the scientific enterprise.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 57-04
 69-70 Package-Exercise: 01-12

Timing: (in seconds)
 RU237 Stimulus: 10
 RU237 Response: .39
 RU237 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	1.1	-4.6	4.2	-2.3	-2.1	2.4	-26.9	7.0
	1973	6.3	-6.6	1.5	-2.3	-0.3	0.3	-22.8	5.6

234

268

Which of the following is a scientist NOT likely to do while he is at work?

- Think
- Read books
- Sell tickets
- Plan experiments
- I don't know.

	AGE 9	
RESP	1970	1973
1	4.9	4.2
2	8.1	8.0
3*	75.1	70.3
4	9.7	12.5
IDK	1.9	4.3

265

269

72-73 Rpt. #: RU238
 69-70 Rpt. #: R157, R242

NAEP #: 205018

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: E. Understand and apply the scientific enterprise.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age:		9	13
72-73 Package-Exercise:		J4-12	Q2-24
69-70 Package-Exercise:		W6-03	O2-01

Timing: (in seconds)

RU38	Stimulus:	16	17
RU238	Response:	33	18
RU238	Grand total:	60	46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-1.0	-2.4	3.0	-0.7	0.8	-0.8	-14.5	3.2
	1973	3.4	-5.4	2.7	1.5	0.5	-0.4	-18.3	4.2
13	1969	4.0	-8.4	0.2	2.6	0.8	-0.6	-22.3	4.9
	1972	2.4	-3.2	1.4	-1.0	0.7	-0.7	-24.6	5.9

233

270

Scientists would have most trouble testing which of these?

- I have a fever.
- I weigh 101 pounds.
- I am 62 inches tall.
- I can lift a 20-pound box.
- My dog is better than your dog.
- I don't know.

RESP	AGE 9		AGE 13	
	1970	1973	1969	1972
1	11.5	16.2	6.4	7.8
2	6.6	8.3	4.1	5.3
3	13.8	13.5	1.7	1.3
4	13.1	11.6	7.9	5.4
5*	39.4	40.5	72.5	74.5
IDK	15.2	9.4	7.2	5.6

287

271

72-73 Rpt. #: RU239
 69-70 Rpt. #: U769

NAEP #: 205021

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: E. Understand and apply the scientific enterprise.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 03-02
 69-70 Package-Exercise: 03-09

Timing: (in seconds)
 RU239 Stimulus: 26
 RU239 Response: 9
 RU239 Grand total: 46

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-2.9	-1.0	0.9	2.9	-2.2	1.9	-2.2	0.3
	1972	1.1	-2.0	1.7	-1.2	-3.2	2.9	-3.6	0.8

233

272

When a scientist takes many measurements during an experiment and studies the results carefully, what is he probably doing?

- Changing a theory into a law
- Changing a law into a theory
- Making work for a computer to prevent its being idle
- Trying to correct a mistake he has made in arithmetic
- Seeking for relationships among the measurements he has obtained
- I don't know.

	AGE 13	
RESP	1969	1972
1	14.9	12.5
2	2.0	3.6
3	2.4	2.8
4	4.3	7.5
5*	66.6	62.1
IDK	9.6	11.3

289

273

72-73 Rpt. #: RU240
69-70 Rpt. #: R159

NAEP #: 205027

72-73 Obj: II. UNDERSTAND AND APPLY THE FUNDAMENTAL ASPECTS OF SCIENCE IN A WIDE RANGE OF PROBLEM SITUATIONS.

Subobjective: E. Understand and apply the scientific enterprise.

69-70 Obj: III. UNDERSTAND THE INVESTIGATIVE NATURE OF SCIENCE.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: $\frac{9}{}$
72-73 Package-Exercise: 01-17
69-70 Package-Exercise: 05-12

Timing: (in seconds)
RU240 Stimulus: 14
RU240 Response: 35
RU240 Grand total: 60

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	-1.6	-4.9	3.8	1.2	-0.5	0.5	-13.1	3.3
	1973	2.3	-5.1	-1.1	3.3	-0.2	0.2	-11.3	2.1

200

276

In science one is LEAST likely to do which of the following things with an apple?

- Weigh it
- Measure its size
- Describe its color
- Write a poem about it
- Find how many seeds it has

- I don't know

AGE 9

RESP	1970	1973
1	15.9	21.0
2	10.2	11.0
3	11.0	9.7
4*	23.0	18.7
5	30.7	29.0
IDK	9.0	10.2

291

275

72-73 Rpt. #: RU268.
 69-70 Rpt. #: U780

NAEP #: 301009

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: B. Appreciate inquiry skills.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice plus short answer
 Scoring Type: Machine plus hand
 Administration Mode: Group

Age: 13.
 72-73 Package-Exercise: 05-29
 69-70 Package-Exercise: 04-17

Timing: (in seconds)

RU268	- Part A Stimulus:	8
RU268	Response:	6
RU268	Total:	14
RU268	Part B Stimulus:	10
RU268	Response:	90
RU268	Total:	100
RU268	Grand total:	114

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-0.9	2.2	1.2	-2.1	6.5	-6.1	0.1	0.8
	1973	-1.6	0.6	2.0	-1.5	5.7	-5.7	-2.1	0.6

252

29. A. Do you find science topics interesting?

- Often
- Sometimes
- Never

33. If so, what kind of topics?

AGE 13

RESP	1969	1972
1*	24.2	19.8
2	68.1	69.3
3	6.9	9.1

NOTE: Because of the differences in the scoring procedures used in the two assessments, change data for the open-ended part of this exercise is not being released.

For the 1972 Scoring Guide to Part B, see Appendix, page 308.

72-73 Rpt. #: RU241
69-70 Rpt. #: U774

NAEP #: 301010

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: A. Appreciate facts and simple concepts, laws (principles) and conceptual schemes.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice plus short answer
Scoring Type: Machine plus hand
Administration Mode: Individual

Age: 13
72-73 Package-Exercise: 12-07
69-70 Package-Exercise: 13-09

Timing: (in seconds)
RU241 Stimulus: *
RU241 Response: *
FU241 Grand total: *

*Time not limited by paced tape.

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	1.2	4.3	-3.0	-1.2	6.4	-6.9	0.1	0.0
	1972	-1.3	2.3	0.1	-0.9	1.6	-1.5	4.6	-0.7

201

278

A. Outside of school, how often do you read stories or articles about science or scientists, often, sometimes, or never?

Often (Go to B)

Sometimes (Go to B)

Never (End the exercise).

B. What have you read most recently?

NOTE: Because of the differences in the scoring procedures used in the two assessments, change data for the open-ended part of this exercise is not being released.

For the 1972 Scoring Guide to Part B, see Appendix, page 310.

AGE 13

RESP	1969	1972
1*	19.0	11.4
2	64.3	60.3
3	16.7	28.3

72-73 Rpt. #: RU242
 69-70 Rpt. #: U869

NAEP #: 301011

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: A. Appreciate facts and simple concepts, laws (principles), and conceptual schemes.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice plus short answer
 Scoring Type: Machine plus hand
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 01-07
 69-70 Package-Exercise: 05-17

Timing (in seconds)		
RU242	Part A Stimulus:	7
RU242	Response:	6
RU242	Total:	13
RU242	Part B Stimulus:	7
RU242	Response:	98
RU242	Total:	105
EU242	Grand total:	118

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	NW
17	1969	3.2	-0.9	-1.5	-0.5	3.8	-4.0	-2.1	0.5
	1973	0.2	0.6	-0.7	-0.0	2.8	-2.8	-2.4	0.2

A. Do you read science articles in magazines?

- Often
- Sometimes
- Never

AGE 17

RESP	1969	1973
1*	9.2	8.0
2	68.9	59.6
3	21.8	32.3

B. If so, what article have you read most recently?

NOTE: Because of the differences in the scoring procedures used in the two assessments, change data for the open-ended part of this exercise is not being released.

For the 1973 Scoring Guide to Part B, see Appendix, page 312.

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72-73 Rpt. #: PB243
69-70 Rpt. #: U686

NAEP #: 302014

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: B. Appreciate inquiry skills.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Individual

Age: 9
72-73 Package-Exercise: 10-01
69-70 Package-Exercise: 11-13

Timing: (in seconds)
RB243 Stimulus: *
RB243 Response: *
RB243 Grand total: *

*Time not limited by paced tape.

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.5	-5.2	3.4	-2.5	2.3	-2.3	-7.6	1.8
	1973	-0.5	0.1	-0.1	0.6	2.2	-2.0	-7.6	1.7

203

282

How often have you watched bees, squirrels, birds, or other animals to see what they eat or where they live; often, sometimes, or never?

<input checked="" type="radio"/>	Often
<input type="radio"/>	Sometimes
<input type="radio"/>	Never

	AGE 9	
RESP.	1970	1973
4*	43.8	32.8
2	53.1	53.8
3	3.0	13.4

72-73 Rpt. #: RB244
 69-70 Rpt. #: J771

NAEP #: 302015

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: B. Appreciate inquiry skills.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 02-20
 69-70 Package-Exercise: 09-15

Timing: (in seconds)

RB244	Stimulus:	10
RB244	Response:	10
RB244	Grand total:	30

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	-0.5	-2.3	1.5	1.0	-0.8	1.1	-6.6	1.4
	1972	0.2	-2.0	1.8	-0.6	-1.2	1.2	-6.2	1.3

300

284

Planting seeds and finding out how fast they grow could be a science experiment.

I believe this statement.

I don't believe this statement.

I don't know.

AGE 13

RESP	1969	1972
1*	93.4	93.5
2	5.4	4.9
IDK	1.1	1.4

301

285

72-73 Rpt. #: RU245
69-70 Rpt. #: U684

NAEP #: 308085

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: C. Appreciate the scientific enterprise.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: $\frac{9}{05-34}$
72-73 Package-Exercise: 05-34
69-70 Package-Exercise: 04-16

Timing: (in seconds)

RU245 Stimulus: 6
RU245 Response: 9
RU245 Grand total: 25

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	4.7	-8.8	-1.7	4.1	0.6	-0.5	-11.6	3.1
	1973	2.0	-3.7	1.2	0.4	0.4	-0.4	-14.1	3.4

Do you think that all scientists wear uniforms?

Yes

No

I don't know.

	AGE 9	
RESP	1970	1973
1.	34.4	28.3
2*	62.5	68.7
IDK	3.0	2.9

303

287

72-73 Ept. #: RU246
 69-70 Ept. #: U682
 NAEP #: 303087

72-73 Obj.: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: C. Appreciate the scientific enterprise.

69-70 Obj.: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 9
 72-73 Package-Exercise: 06-01
 69-70 Package-Exercise: 06-17

Timing: (in seconds)
 RU246 Stimulus: 5
 RU246 Response: 15
 RU246 Grand total: 30

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
9	1970	2.5	-6.8	5.0	-0.4	2.4	-2.5	-21.0	4.4
	1973	4.0	-8.8	4.3	-0.6	2.4	-2.5	-20.3	4.5

304
 288

Do you think that breaking a mirror brings bad luck?

- Yes
- No
- I don't know.

AGE 9

RESP	1970	1973
1	25.6	26.1
2*	72.0	70.3
IDK	1.9	3.4

305

289

72-73 Rpt. #: RU247
 69-70 Rpt. #: U773

NAEP #: 303089

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: C. Appreciate the scientific enterprise.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 12
 72-73 Package-Exercise: 04-25
 69-70 Package-Exercise: 01-07

Timing: (in seconds)
 RU247 Stimulus: 7
 RU247 Response: 13
 PU247 Grand total: 31

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	4.7	-12.0	5.4	-1.9	3.5	-3.7	-14.6	3.9
	1972	9.3	-10.0	4.9	-6.4	3.3	-3.5	-16.4	4.9

303



Most scientists today are working on space projects.

- I believe this statement.
- I don't believe this statement.
- I don't know.

AGE 13

RESP	1969	1972
1	59.3	49.2
2*	37.9	44.8
IDK	2.9	4.1

307

72-73 Rpt. #: RU258
 69-70 Rpt. #: U775

NAEP #: 303090

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: C. Appreciate the scientific enterprise.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT SPEN FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice
 Scoring Type: Machine
 Administration Mode: Group

Age: 13
 72-73 Package-Exercise: 07-16
 69-70 Package-Exercise: 03-18

Timing: (in seconds)

RU258	Part A Stimulus:	14
RU258	Response:	6
RU258	Total:	20
RU258	Part B Stimulus:	11
RU258	Response:	90
RU258	Total:	101
RU258	Grand total:	121

AGE	YEAR	REGION				SEX		COLOR	
		NE	SE	C	W	M	F	B	W
13	1969	1.8	-0.6	0.8	-2.4	2.3	-2.1	0.2	0.0
	1972	-1.3	0.4	0.8	0.1	2.6	-2.6	-2.3	0.6

303

292

A. Have you done science experiments outside of school, such as those suggested in a chemistry or microscope set?

Often

Sometimes

Never

B. If so, what experiment have you done most recently?

AGE 13

RESP	1969	1972
1*	5.3	5.1
2	40.0	40.7
3	54.3	54.1

NOTE: Because of the differences in the scoring procedures used in the two assessments, change data for the open-ended part of this exercise is not being released.

For the 1972 Scoring Guide to Part B, see Appendix, page 313.

309

72-73 Rpt. #: RU248
 69-70 Rpt. #: U870

NAEP #: 303092

72-73 Obj: III. APPRECIATE THE KNOWLEDGE AND PROCESSES OF SCIENCE, THE CONSEQUENCES AND LIMITATIONS OF SCIENCE, AND THE PERSONAL AND SOCIAL RELEVANCE OF SCIENCE AND TECHNOLOGY IN OUR SOCIETY.

Subobjective: C. Appreciate the scientific enterprise.

69-70 Obj: IV. HAVE ATTITUDES ABOUT AND APPRECIATIONS OF SCIENTISTS, SCIENCE, AND THE CONSEQUENCES OF SCIENCE THAT STEM FROM ADEQUATE UNDERSTANDINGS.

Exercise Type: Multiple choice plus short answer
 Scoring Type: Machine plus hand
 Administration Mode: Group

Age: 17
 72-73 Package-Exercise: 04-07
 69-70 Package-Exercise: 10-14

Timing: (in seconds)

RU248	Part A Stimulus:	8
RU248	Response:	5
RU248	Total:	13
RU248	Part B Stimulus:	8
RU248	Response:	9
RU248	Total:	17
RU248	Grand total:	30

AGE	YEAR	NE	REGION			SEX		COLOR	
			SE	C	W	M	F	B	W
17	1969	-0.5	3.1	-0.7	-0.8	2.1	-2.0	1.8	-0.2
	1973	-1.8	2.0	-1.5	2.4	1.8	-1.9	4.1	-0.7

310



A. Do you read books about science or scientists?

- Often
- Sometimes
- Never

B. If so, what book have you read most recently?

	AGE 17	
RESP	1969	1973
1*	5.4	5.8
2	45.6	46.0
3	48.6	47.9

NOTE: Because of the differences in the scoring procedures used in the two assessments, change data for the open-ended part of this exercise is not being released.

For the 1973 Scoring Guide to Part B, see Appendix, page 316.

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APPENDIX

Scoring Guides for Open-Ended Exercises

Notes on the Use of National Assessment
Science Scoring Guides

The National Assessment of Educational Progress (NAEP) categorizes responses to open-ended questions according to a very simple scheme. Responses to most open-ended questions are given a two-digit score. Acceptable responses are categorized in the teens; up to 10 categories (10-19) are possible. Unacceptable responses are scored in the 20s. When more than 10 acceptable or unacceptable categories are anticipated, three-digit codes are used. In that case, 100s are acceptable; 200s are unacceptable. When only the simplest scheme is needed, one digit suffices. In this case, acceptable responses are 1s; unacceptable responses are 2s.

If an ordering of acceptability is possible with two- or three-digit codes, lower numbers in the teens or 100s are more acceptable than higher numbers. This ordering is often rather arbitrary and sometimes breaks down. For example, once scoring is under way, we occasionally find a highly acceptable response and make a new category following the old ones, that is, with a larger number. Unacceptable responses generally are not ordered. A "no response" is coded 0, 00 or 000. "I don't know" is coded 9, 39 or 399.

Acceptability of responses is not absolutely fixed. The scoring guides were reviewed by science experts whose comments were incorporated in the present versions of the guides. If the need arises, we can treat as unacceptable any category in the teens or as acceptable any in the 20s, although we are a bit hesitant to make drastic changes after scoring.

Examples under the categories are taken from actual sample responses. The original spelling and phrasing of the responses have been retained to illustrate the variety of the written responses.

Exercise 204109

Describe a way to test whether it pays to buy premium gasoline for a second-hand car.

00 = no response

First Column of Ovals

Experimental Ideas

1. Measure compression or compression ratio.
2. Look for damage to motor: damage in combustion chamber (spark plug life, valves, etc.)
3. Check performance: engine starting, acceleration, spark, plug detonation (ping, knock)
4. Measure mileage.
5. Check engine characteristics: size, number of cylinders, etc. (except compression)
6. Other tests

Nonexperimental Tests

7. Ask someone or look it up (car dealer, mechanic, manual, previous owner)
8. Expresses opinion without mentioning or inferring test.

9 = Other responses

(I don't know = 99)

Second Column of Ovals

Quality of Response

1. High-quality answer including cost factors.
 - Mentions test
 - Tells how to test it
 - Mentions controlling conditions in mileage
 - Relates results to cost
2. High-quality answer but no discussion of cost factors.
(Same as #1 without cost.)
3. Correct answer but incomplete, including cost factors.
4. Correct answer but incomplete, does not consider cost.
5. Very incomplete answer. Mentions idea only with no detail.
Ex: "Check the mileage."
"Check the performance of your car with regular."
"Check the size of the motor."
"See if regular gasoline damages your motor."
6. Some parts of answer incorrect or confused.
7. Nonsense or no information (ex. NR)

Exercise 204109 (cont.)

NOTE: After scoring the exercise using the two-column method as outlined on the previous page, the following changes were made to the category numbers, making a three-digit category system.

00 changed to 000 (no response)

Acceptable

11-14 changed to 101-104

21-24 changed to 105-108

31-34 changed to 109-112

41-44 changed to 113-116

71-74 changed to 117-120

Unacceptable

15-17 changed to 250-252

25-27 changed to 253-255

35-37 changed to 256-258

45-47 changed to 259-261

51-57 changed to 262-268

61-67 changed to 269-275

75-77 changed to 276-278

81-87 changed to 279-285

91-97 changed to 286-292

99 changed to 399

The following examples of responses are based on the original two-digit category system.

High-Quality Response (category 1 or 2)

Compression: Check the compression of your motor. To do this you take out the spark plug and insert a compression gauge in one of the openings. Turn

Exercise 204109 (cont.)

on the starter and read the gauge.

Measure the compression ratio of the engine. This could be done by measuring the volume of a cylinder at the bottom and the top of its stroke and taking the ratio.

Damage to motor:

This response will probably never occur.

Performance:

If it knocks when you accelerate (or go up a hill) with regular in the tank, but not with premium, you should use premium gas.

Mileage:

Fill your car with a tank of premium gas and see how many miles you go on it. Then fill your car with a tank of regular and check how many miles you get. Be sure to do the same kind of driving in each case (highway or in-town).

Try equal amounts of regular and premium gasoline (for example, 1 gallon) in your car and see how far you can go before you run out. You have to do the same kind of driving in each case.

Engine characteristics:

Will probably never occur.

Correct Answer but Incomplete (category 3 or 4)

Compression: Check the compression. If it is high, it takes premium gasoline.

Measure compression.

Measure the compression ratio of the car.

Damage to motor:

Look for damage to the valves when you use regular.

Performance:

See if it knocks with regular.

If it knocks when you're going up a hill when you have regular in the tank, you should use premium.

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Exercise 204109 (cont.)

Mileage: Check the mileage with regular and with premium and compare.

Fill your tank with regular and measure the mileage. Then fill your car with a tank of premium and measure the mileage.

Engine characteristics:

Check size of the motor. If it is V-8 it probably takes premium, if it is a 6 cylinder it probably takes regular.

Some Parts of Answer Incorrect or Confused (category 6)

Damage to motor: See if premium damages your engine. If so, use regular.

Performance: See if it runs good with premium.

Mileage: Take two cars. Put premium in one and regular in the other. See which gets the best mileage.

Engine characteristics: Check the type of motor in your car. V-8's always take premium and 6 cylinders take regular.

Additional Examples

1 = Measure compression or compression ratio

12 Take a compression tester and check how high compression each cylinder has by pulling the plugs and cranking the engine 10 times. If the gauge reads a high level it would be best to use premium gas if it's a bomb burn anything.

2 = Look for damage to motor: damage in combustion chamber (spark plug life, valves, etc.)

24 You can tell by whether the spark plugs get gummed up on either kind. It really won't hurt a car for a while so you can try both kinds. When you put in regular and it clogs up the spark plugs you need to use premium.

25 You could read owners manual whether or not you could use high octane. You could ask a competent

Exercise 204109 (cont.)

mechanic whether or not it is plausible. You could tear the engine apart and look at the valves, rings, and pistons, and see if they are carboned up and then determine if they need to be using a higher octane in order to burn cleaner and more effeciently.

3 = Check performance: engine starting, acceleration, spark plug, detonation (ping, knock)

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1. Use all the gas in the car.
2. Fill the tank with premium gas.
3. Drive the car & measure its performance in terms of miles driven/gal, pinging, acceleration, ease of starting, etc.
4. Repeat steps 2 & 3 until performance is well known, i.e., until performance measurements are consistent.
5. Repeat steps 1 thru 4 with a lower grade of gas.
6. Compare the measured performances & decide if there is an increased performance with premium that justifies its cost. If, for example, miles/gal is the only measure compare the cost of driving a mile in both cases & choose the gas with the lower operating cost.

32

Put regular gasoline in the car and take it out for a run. If on fairly hard pulls it "pings" with a slight valve noise and doesn't seem to have all the power it should, try premium gasoline. If under the same circumstances, there is no "ping" with the premium gas, it would pay to buy the premium.

34

From my point of view the only way to test which kind of gasoline to use is try each one of them for a while. Have a check up after running each kind of gas for a certain amount of time. If the car runs smother and better with premium I would suggest that. If the car runs approx. the same I would suggest burning regular.

34

First fill your tank with reg. gasoline & ride in it, then fill your tank with premium gasoline & compare the performances. If the pick up & sound of engine & smoothness is ride changes at all you will know if it pays or not.

Exercise 204109 (cont.)

35 First, I'd try at least a gallon, than I would drive and see how the milage is good on it. I'd see if it made the engine run better or smoother,, and if everything went find I'd try more.

35 Try the premium to see if your car's performance is better.

36 Go and buy the premium gas and, put it in second hand car and see how it runs.

4. Measure mileage

41 By finding how far the car will go on one kind of gasoline per gal. and then finding how far it goes on premium gasoline under the same conditions. Then find the price per mile for each. Just to be sure that premium is cheaper this test should be tried for several different kinds of gasoline.

42 Fill up the car with premium gasoline and take down the mileage on the what the car registers at that time. Then drive the car, until it reaches empty and take down this mileage on what the car registers. Subtract the first mileage from the second mileage and you find how far it took you. Then fill the car with another type of gas and repeat this procedure. Compare the files travelled with premium gas with the miles travelled with another type of gas. Which ever gasoline took you further is the gas to buy. But driving conditions for each type of gasoline must be the same.

43 Start out with an empty tank, check the miles on your car, and go fill it up with premium. When it runs out, figure out how many miles you got to the gallon. Do the same with regular gasoline. If you get slightly more with premium, figure out how much money it cost you to go a set distance with premium, then with regular. It might be cheaper to buy regular even though you don't get quite as many miles.

44 Buy premium gas and take the average mileage on a 1/2 of tank. Then buy another type of gas and take the average milage on a 1/2 of tank. The one with the highest average is the most economical.

Exercise 204109 (cont.)

44 I would buy a full tank of premium gas and watch my mileage for that tank. I would then buy regular gas and do the same. If I found that I got many more miles per gallon for premium gas, I would buy it. But if there wasn't much difference I would use regular.

44 Put premium gas in the used car and check milage against non premium.

45 See how many miles you get to the gallon..

45 I would ask the past owner what type of gas he used. It is best to use the same type usually. If there wasn't anyway of finding out what the past type was I would experiment to see if I got good mileage & a clean engine. Also, if I got engine trouble I could guess that it's maybe the premium gas, or not.

46 Keep track of how much the gas costs and how many miles you get per gallon. Compare this to another car that is second - hand in pretty much the same condition that is running on regular and compare the two.

5 = Check engine characteristics: size, number of cylinders, etc. (except compression)

55 It depends on what type of engine & size of engine involved whether it would be sufficient or profitable to use a premium gas.

55 Depending on type of car and how the carbtorator is set for the car to run best.

56 This would depend on the size of the engine and how much equipment is run by the engine. Normally a car would perform better and longer with premium gas which costs more - but in the long run would possibly save on repairs.

56 It would depend on the size of the engine and how worn the engine is.

6 = Other tests

65 Try each of the gasoline in the car which one sounds and rides the best in the one.

Exercise 204109 (cont.)

- 65 Fill it up with regular and push the gas pedal to the floor.
- 67 By testing it on your own car and by buying a second-hand car similar to your first, you can determine how the premium you is going to work.
- 67 If smoke comes from the tail pipe you do not need premium gasoline because it is running too rich.

7 = Ask someone or look it up (car dealer, mechanic, manual, previous owner)

- 74 Check with the manufacturer to learn the compression ratio of the engine. This will determine whether a higher octane gas is required.

- 75 Find out what the person who owned it first used.

- 77 Call up the company and ask.

8 = Express opinion without mentioning or inferring test

- 86 I pays to buy a premium gasoline for a second hand car because it needs it. You shouldn't buy the most expensive. The car is not worth it.

- 86 Your car will be in better conditions. It will run smoother and last longer. But it also depends if the second-hand car is running in good conditions. People often say that premium is better than regular gasoline.

- 86 It will make a cheap car run better.

- 86 Premium gas is better for any kind of car.

- 87 I think it does pay to buy premium gasoline for a second-hand car, because it may be in good condition that it might need maybe a more expensive gas.

- 87 Because if a car is used, than it should be given a gas that would make it run better. When a car has been taken more miles than new.

Exercise 204109 (cont.)

one and you need more power to keep the used car going for a new car you want it to get used to running. Premium goes is good for a used car because it has more natural elements in it than the other gases.

9 = Other responses

99

I'm sorry but I didn't understand the last question. Because there are some words I don't know and the meaning is hard to understand for me.

99

I have no idea.

99 = I don't know.

322

307

Exercise 301009

- A. Do you find science topics interesting?
B. If so, what kind of topics?

00 = no response

Acceptable

10 = Astronomy

When there to do with the stars and the moon.

About Space or Planets About Ecology About Air:

The solar System, stars, environment..

About the rotation of planets.

11 = Space exploration

About what they have learned about in space and under the sea.

12 = Geology; rocks; earth science; oceanography (except life forms); weather

When studying about rock, living things, how they get their food.

Earth Science (some of it) prehistoric times (dinosaurs, etc.).

13 = Biology; cells; microorganisms; plants; animals

Topics about reptiles.

Study frogs and other kinds of animal.

Life Science, Earth Science, Science on the Sea (goes with the 1st one).

Studying animals and doing experiments with chemicals.

Biology, Zoology sometimes Earth science, Oceanography. Maybe Chemistry.

14 = Human body; medicine; disease

Topics on the living body & parts ocean life, animal life.

Mostly things that have to do with the human body and life it's self and things that have to do with human reproduction and the course of life.

Exercise 301009 (cont.)

15 = Evolution; genetics; archaeology; fossils
Prehistoric topics fossils rocks atoms.

Topics on prehistoric finds like fossils and bones, and things in ice. Also things having to do with animals of all kinds.

Dinosaurs.

16 = Chemistry; physics; electricity; mechanics
Machines, or simple machines.

Chemicals, and animals.

Electrons, Electricity, Sound, molecules, light.

17 = Science fiction; new discoveries; things in the future
Interesting Topics such as Science Fiction STORIES OR shows.

Topics were you can find interesting information and more modern updated topics which scientist are working on now.

18 = About scientists; historical scientific events
No examples

19 = Other acceptable: environment; pollution
Such as - the things that are going on in the world today:-
over population, pollution and so on.

Metric System Weighing stuff and I don't like other stuff either.

Unacceptable

20 = Unacceptable
Well something of science of the world.

ABOUT THE WAY WE LIVE.

Experiments.

39 = I don't know

Exercise 301010

A. Outside of school, how often do you read stories or articles about science or scientists; often, sometimes or never?

B. What have you read most recently?

00 = no response

Acceptable

10 = Space exploration and astronomy
Popular Science - Moon landing.

About solar system - sun and stars.

11 = Geology
Articles on rocks and minerals.

Why the Mole (sic) Hole.

12 = Weather
About hurricanes.

About how you make rain, clouds and stuff in jars.

13 = Animals and plant life
Article on insects.

Looked up the hermit crab in the encyclopedia.

14 = Medicine and drugs
Heart transplant.

About drugs people take.

15 = Weapons, cars, machines, mechanical inventions
About building a mechanical nose.

The jet and how it works.

New vehicles - Honda 750.

16 = Chemistry
...and chemistry in the encyclopedia.

17 = Science fiction

18 = About scientists and their lives

19 = Other acceptable

Exercise 301010 (cont.)

Unacceptable

20 = Names a general science magazine or general book (only).
Popular Science.

21 = Other unacceptable

39 = I don't know.

326

311

Exercise 301011

A. How often do you read science articles in magazines?

B. What article have you read most recently:

00 = No response

Acceptable

10 = Astronomy; space exploration

11 = Environment; ecology; pollution; overpopulation

12 = Geology; rocks; earth science; oceanography (ex. life forms);
weather

13 = Biology; cells; microorganisms; plants; animals

14 = Human body; medicine; disease; reproduction (human);
nutrition

15 = Evolution; genetics; archaeology; fossils

16 = Chemistry; physics; electricity; mechanics

17 = Science fiction; new discoveries; things in the future

18 = About scientists; historical scientific events

19 = Other acceptable

Unacceptable

20 = Sociology; psychology (considered acceptable by some consultants)

21 = Economics; other math topics

22 = Technical manuals (if article described is acceptable, code under an acceptable category)

23 = Gives source but not description of article

24 = (not used)

25 = Other unacceptable

39 = I don't know.

Exercise 303090

A. Have you done science experiments outside of school, such as those suggested in a chemistry or microscope set?

B. If so, what experiment have you done most recently?

00 = no response; have done none recently.

Acceptable

10 = Experiments with pure chemicals alone
Made a little fire cracker with a chemistry set.

Mixing iron filings and sulfur.

We have experimented with sulfur.

See how sulfur burns:

Burnt sugar in a spoon under a candle.

Making hydrogen with zinc and Hydro-chloric Acid.

We did a stick and smoke bomb.

11 = Experiments with chemicals and something else
Rubberized egg with vinegar.

See if things are acid or base.

Put bacon in acid and see what happens.

12 = Electrical experiments
Tested battery cells.

Electrical conduction of metals.

Hydrolysis of water.

13 = Experiments demonstrating physical principles
I saw if the mass of ice and water were different, just because they have a different volume. It wasn't. Also fooled with the microscope at home.

Finding if salt in water affects it's freezing point.

I tried an experiment to show how friction can be reduced.

Making an egg go into a pop bottle by a match.

Exercise 303090 (cont.)

In chemistry set they gave me a rocket. I filled the rocket with Alka-Seltzer and water. The pressure building inside the rocket made it shoot upward.

- 14 = Geological, weather or astronomy experiments
Study the locations of stars at different times of the year.

Look at the moon and stars and at Jupiter through a telescope.

We did a balloon to see what the temperature would be.

Made erosion happen.

- 15 = Examination of life forms, examination of non-living things
I examined a sample of blood through a microscope.

I looked at a lot of slides through microscopes. I dissected a few frogs.

Look at pond water with a microscope.

Look at what a bee stinger looks like through a microscope.

Put bugs in a box and let them all live together and see how many babies they have.

Used plaster of paris and made different kinds of fossils.

- 16 = Experiments on plants and animals
Tested growth of plants in sun and in the dark, with food and without food.

Effect of heat on seeds.

Tested alcoholic effect on chick embryos.

- 17 = Other acceptable
Doing a test about thermal pollution around the city.

Unacceptable

- 20 = Vague reference to a science experiment
Rock experiment.

About mice.

I found a fossil once.

Exercise 303090 (cont.)

The environment.

About one cell animals.

21 = Other unacceptable

I've mixed milk, marshmallows, cocoa and coconut to see how it tastes - a food experiment.

In school, we went outside of school and searched for many types of insects.

Surveying spring creek park in Science.

39 = I don't know.

330

315

Exercise 303092

A. How often do you read books about science or scientists?

B. What book about science or scientists have you read most recently?

00 = no response

Acceptable

10 = Astronomy; space exploration

11 = Environment; ecology; pollution; overpopulation

12 = Geology; earth science; weather; oceanography (excluding life forms)

13 = Biology; cells; microorganisms; plants; animals

14 = Human body; medicine; disease; reproduction (human); nutrition

15 = Evolution; genetics; archaeology; fossils

16 = Chemistry; physics; electricity; mechanics

17 = Science fiction; new discoveries; things in the future

18 = About scientists; historical scientific events

19 = Other acceptable (Scorers: Do not use this category any more than necessary)
Includes general science textbooks.

Unacceptable

20 = Sociology, psychology (considered acceptable by some consultants)

21 = Economics; other math topics

22 = Technical manuals -- if the one mentioned is not acceptable.

23 = Names a science article in either a magazine or general reference book

24 = Names a science reference book: Merck Index, Handbook of Physics and Chemistry, etc.

Exercise 303092 (cont.)

25 = Other unacceptable

39 = I don't know.

332

317