

Contingency Tables and Coding Guides for Items in the International Reliability Study

Spent Fraction of Total Money

Item M1

Mr. Lewis had \$360. He spent $\frac{7}{9}$ of it. How much money did he have left?

| | FREQUENCIES OF MATCHED CODES | | | | | | | | | ROW SUM |
|----|------------------------------|-----|-----|-----|----|-----|------|----|-----|---------|
| | 10 | 70 | 71 | 72 | 73 | 75 | 79 | 90 | 99 | |
| 10 | 3525 | 0 | 8 | 0 | 7 | 0 | 22 | 0 | 7 | 3569 |
| 70 | | 148 | 0 | 0 | 0 | 0 | 27 | 0 | 0 | 175 |
| 71 | | | 225 | 0 | 0 | 0 | 34 | 0 | 0 | 259 |
| 72 | | | | 204 | 0 | 0 | 20 | 0 | 0 | 224 |
| 73 | | | | | 36 | 0 | 13 | 0 | 0 | 49 |
| 75 | | | | | | 101 | 10 | 0 | 0 | 111 |
| 79 | | | | | | | 4072 | 43 | 10 | 4125 |
| 90 | | | | | | | | 89 | 76 | 165 |
| 99 | | | | | | | | | 473 | 473 |

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| TOTAL VALID COMPARISONS | 9150 |
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Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | 80 |
| Incorrect Response | |
| 70 | 2/9 |
| 71 | 40 |
| 72 | 120 |
| 73 | 180 |
| 74 | 28 |
| 75 | 300 |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Pattern of Boxes: Fraction Black

Item M2B

Two boxes of square-shaped cardboard pieces are available to make a larger pattern. There are 4 small squares in each piece.

All pieces in Box 1 look like:



All pieces in Box 2 look like:



In the required pattern, for every piece from Box 2 there are 2 pieces from Box 1.

- If 60 pieces from Box 2 are used in the required pattern, how many pieces will be needed altogether?
- What fraction of the small squares in the required pattern will be black?

| FREQUENCIES OF MATCHED CODES - M2B | | | | | | | | | | | |
|------------------------------------|------|-----|------|------|-------|------|-------|------|-----|------|---------|
| | 10 | 19 | 70 | 71 | 72 | 73 | 74 | 79 | 90 | 99 | ROW SUM |
| 10 | 5892 | 123 | 44 | 15 | 72 | 0 | 16 | 156 | 31 | 0 | 6349 |
| 19 | | 191 | 3 | 0 | 36 | 0 | 167 | 45 | 0 | 0 | 442 |
| 70 | | | 1795 | 4 | 646 | 0 | 15 | 82 | 24 | 60 | 2626 |
| 71 | | | | 2638 | 108 | 44 | 16 | 32 | 0 | 0 | 2838 |
| 72 | | | | | 10505 | 0 | 15 | 156 | 9 | 0 | 10685 |
| 73 | | | | | | 1516 | 15 | 18 | 0 | 0 | 1549 |
| 74 | | | | | | | 10315 | 1032 | 123 | 39 | 11509 |
| 79 | | | | | | | | 4796 | 364 | 34 | 5194 |
| 90 | | | | | | | | | 494 | 599 | 1093 |
| 99 | | | | | | | | | | 3765 | 3765 |

TOTAL VALID COMPARISONS **46050**

Codes for Fraction Black

Coding Guide - M2B

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | 1/3 |
| 19 | A fraction or percent equivalent to 1/3. |
| Incorrect Response | |
| 70 | 1/4 OR both 1/4 and 1/2. |
| 71 | 3/8 or equivalent. |
| 72 | 1/2 or equivalent. |
| 73 | 3/4 or equivalent. |
| 74 | Any INTEGER. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Chemist Mixes Solution

Item M3

A chemist mixes 3.75 milliliters of solution A with 5.625 milliliters of solution B to form a new solution. How many milliliters does this new solution contain?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | |
|------------------------------|------|----|-----|-----|-----|------|----|-----|---------|
| | 10 | 19 | 70 | 71 | 72 | 79 | 90 | 99 | ROW SUM |
| 10 | 9366 | 0 | 0 | 43 | 0 | 17 | 0 | 8 | 9434 |
| 19 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | | | 568 | 0 | 0 | 8 | 0 | 0 | 576 |
| 71 | | | | 542 | 0 | 105 | 0 | 0 | 647 |
| 72 | | | | | 685 | 14 | 0 | 0 | 699 |
| 79 | | | | | | 1074 | 20 | 0 | 1094 |
| 90 | | | | | | | 6 | 8 | 14 |
| 99 | | | | | | | | 136 | 136 |

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| TOTAL VALID COMPARISONS | 12600 |
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Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | 9.375 |
| 19 | Other responses equivalent to 9.375 |
| Incorrect Response | |
| 70 | 8.700 OR 8.7 |
| 71 | Contains one miscalculated digit. |
| 72 | One of the following: 6, 60, 600 OR 6000 |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Time To Bake a Cake

Item M4

A cake is put in the oven at 7:20. If the cake takes three quarters of an hour to bake, at what time should it be taken out of the oven?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | |
|------------------------------|-------|----|-----|-----|-----|-----|-----|------|-----|-----|---------|
| | 10 | 19 | 70 | 71 | 72 | 73 | 74 | 79 | 90 | 99 | ROW SUM |
| 10 | 36008 | 74 | 0 | 21 | 16 | 47 | 0 | 174 | 4 | 0 | 36344 |
| 19 | | 36 | 0 | 0 | 0 | 0 | 0 | 27 | 2 | 0 | 65 |
| 70 | | | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 120 |
| 71 | | | | 940 | 0 | 0 | 0 | 45 | 6 | 0 | 991 |
| 72 | | | | | 786 | 0 | 0 | 0 | 0 | 0 | 786 |
| 73 | | | | | | 961 | 0 | 0 | 0 | 0 | 961 |
| 74 | | | | | | | 393 | 28 | 0 | 0 | 421 |
| 79 | | | | | | | | 5758 | 107 | 15 | 5880 |
| 90 | | | | | | | | | 2 | 15 | 17 |
| 99 | | | | | | | | | | 465 | 465 |

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| TOTAL VALID COMPARISONS | 46050 |
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Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | 8:05 |
| 19 | Responses equivalent to 8:05. |
| Incorrect Response | |
| 70 | 7:50 |
| 71 | 8:00 |
| 72 | 8:10 |
| 73 | 8:15 |
| 74 | 8:35 |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Area of a Rectangle

Item M5

The length of a rectangle is 6 cm, and its perimeter is 16 cm. What is the area of the rectangle in square centimeters?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | |
|------------------------------|-------|------|------|-----|------|------|------|-----|------|---------|
| | 10 | 70 | 71 | 72 | 73 | 74 | 79 | 90 | 99 | ROW SUM |
| 10 | 19485 | 16 | 50 | 0 | 16 | 22 | 203 | 1 | 0 | 19793 |
| 70 | | 3310 | 15 | 14 | 32 | 0 | 112 | 0 | 0 | 3483 |
| 71 | | | 2442 | 0 | 0 | 0 | 0 | 0 | 0 | 2442 |
| 72 | | | | 648 | 0 | 0 | 1 | 0 | 0 | 649 |
| 73 | | | | | 1554 | 0 | 15 | 0 | 16 | 1585 |
| 74 | | | | | | 5489 | 328 | 5 | 0 | 5822 |
| 79 | | | | | | | 9639 | 63 | 114 | 9816 |
| 90 | | | | | | | | 127 | 186 | 313 |
| 99 | | | | | | | | | 2082 | 2082 |

TOTAL VALID COMPARISONS 45985

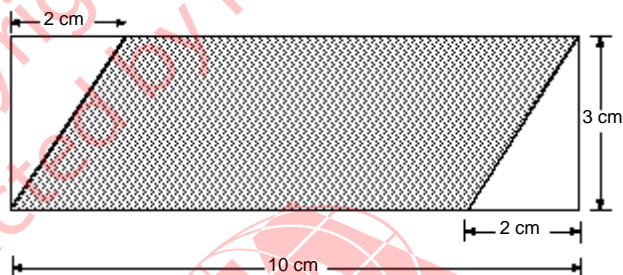
Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | 12 |
| Incorrect Response | |
| 70 | 22 |
| 71 | 24 |
| 72 | 48 |
| 73 | 60 |
| 74 | 96 or indication of 6x16 |
| 79 | Other incorrect |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Area of Parallelogram

Item M6

The figure show a shaded parallelogram inside a rectangle.



What is the area of the parallelogram?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | |
|------------------------------|------|-----|------|-----|-----|-----|------|----|-----|---------|
| | 10 | 70 | 71 | 72 | 73 | 74 | 79 | 90 | 99 | ROW SUM |
| 10 | 5313 | 9 | 3 | 0 | 1 | 0 | 73 | 0 | 0 | 5399 |
| 70 | | 185 | 0 | 0 | 1 | 0 | 36 | 0 | 0 | 222 |
| 71 | | | 1217 | 0 | 0 | 0 | 59 | 0 | 0 | 1276 |
| 72 | | | | 277 | 0 | 0 | 46 | 0 | 0 | 323 |
| 73 | | | | | 685 | 0 | 20 | 0 | 0 | 705 |
| 74 | | | | | | 137 | 22 | 0 | 0 | 159 |
| 79 | | | | | | | 4154 | 64 | 28 | 4246 |
| 90 | | | | | | | | 13 | 6 | 19 |
| 99 | | | | | | | | | 251 | 251 |

| | |
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| TOTAL VALID COMPARISONS | 12600 |
|--------------------------------|--------------|

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | 24 |
| Incorrect Response | |
| 70 | 10 |
| 71 | 18 |
| 72 | 26 |
| 73 | 30 |
| 74 | 60 |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Degrees of Angle

Item M7

In the figure, the measure of $\angle AOB$ is 70° , the measure of $\angle COD$ is 60° , and the measure of $\angle AOD$ is 100° .

What is the measure of $\angle COB$?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | |
|------------------------------|------|-----|-----|------|-----|-----|-----|------|-----|-----|---------|
| | 10 | 70 | 71 | 72 | 73 | 74 | 75 | 79 | 90 | 99 | ROW SUM |
| 10 | 5396 | 0 | 0 | 0 | 0 | 16 | 0 | 61 | 11 | 0 | 5484 |
| 70 | | 100 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 108 |
| 71 | | | 732 | 0 | 0 | 0 | 0 | 96 | 0 | 0 | 828 |
| 72 | | | | 1092 | 0 | 23 | 0 | 9 | 0 | 8 | 1132 |
| 73 | | | | | 368 | 7 | 0 | 65 | 0 | 0 | 440 |
| 74 | | | | | | 818 | 8 | 22 | 0 | 8 | 856 |
| 75 | | | | | | | 390 | 14 | 6 | 8 | 418 |
| 79 | | | | | | | | 2451 | 122 | 29 | 2602 |
| 90 | | | | | | | | | 166 | 145 | 311 |
| 99 | | | | | | | | | | 421 | 421 |

TOTAL VALID COMPARISONS 12600

| Coding Guide | |
|---------------------------|--|
| Code | Response |
| Correct Response | |
| 10 | 30 |
| Incorrect Response | |
| 70 | 20 |
| 71 | 35 |
| 72 | 40 |
| 73 | 45 |
| 74 | 50 |
| 75 | 60 OR 70 |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Decimal as a Fraction in Lowest Terms

Item M8

Write 0.28 as a fraction reduced to its lowest terms.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | |
|------------------------------|------|-----|-----|-----|-----|----|------|-----|------|---------|
| | 10 | 70 | 71 | 72 | 73 | 74 | 79 | 90 | 99 | ROW SUM |
| 10 | 5813 | 45 | 1 | 0 | 0 | 0 | 66 | 6 | 0 | 5931 |
| 70 | | 607 | 43 | 0 | 0 | 32 | 68 | 9 | 5 | 764 |
| 71 | | | 138 | 15 | 0 | 17 | 69 | 3 | 0 | 242 |
| 72 | | | | 318 | 0 | 39 | 69 | 1 | 0 | 427 |
| 73 | | | | | 926 | 0 | 60 | 0 | 0 | 986 |
| 74 | | | | | | 87 | 248 | 2 | 0 | 337 |
| 79 | | | | | | | 2337 | 45 | 21 | 2403 |
| 90 | | | | | | | | 167 | 280 | 447 |
| 99 | | | | | | | | | 1063 | 1063 |

**TOTAL VALID
COMPARISONS** 12600

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | 7/25 |
| Incorrect Response | |
| 70 | 28/100 OR 14/50 |
| 71 | Any fractions other than 28/100 with 28 as numerator. |
| 72 | Any fractions with 28 as denominator. |
| 73 | 2/8 OR 1/4 |
| 74 | Any expression which mixes decimal notation into the fraction. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Amount Sue Paid

Item M9

Peter bought 70 items and Sue bought 90 items. Each item cost the same and the items cost \$800 altogether. How much did Sue pay?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | |
|------------------------------|------|----|-----|-----|-----|-----|------|-----|-----|---------|
| | 10 | 70 | 71 | 72 | 73 | 74 | 79 | 90 | 99 | ROW SUM |
| 10 | 3143 | 0 | 7 | 0 | 14 | 21 | 62 | 2 | 0 | 3249 |
| 70 | | 26 | 0 | 0 | 15 | 0 | 38 | 0 | 0 | 79 |
| 71 | | | 732 | 0 | 0 | 0 | 39 | 0 | 0 | 771 |
| 72 | | | | 183 | 0 | 0 | 8 | 0 | 0 | 191 |
| 73 | | | | | 539 | 0 | 65 | 0 | 7 | 611 |
| 74 | | | | | | 414 | 72 | 10 | 0 | 496 |
| 79 | | | | | | | 2881 | 64 | 16 | 2961 |
| 90 | | | | | | | | 122 | 109 | 231 |
| 99 | | | | | | | | | 561 | 561 |

TOTAL VALID COMPARISONS 9150

| Coding Guide | |
|---------------------------|--|
| Code | Response |
| Correct Response | |
| 10 | 450 |
| Incorrect Response | |
| 70 | 5 |
| 71 | 400 |
| 72 | 420 |
| 73 | 500 |
| 74 | 600 |
| 79 | Other incorrect |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Recording Songs: Estimate of Time

Item M10A

Teresa wants to record 5 songs on tape. The length of time each song plays for is shown in the table.

| Song | Amount of Time |
|------|----------------------|
| 1 | 2 minutes 41 seconds |
| 2 | 3 minutes 10 seconds |
| 3 | 2 minutes 51 seconds |
| 4 | 3 minutes |
| 5 | 3 minutes 32 seconds |

- a) ESTIMATE to the nearest minute the total time taken for all five songs to play.
b) Explain how this estimate was made.

| FREQUENCIES OF MATCHED CODES - M10A | | | | | | | | | | |
|-------------------------------------|-------|------|------|------|------|-----|------|-----|------|---------|
| | 10 | 11 | 70 | 71 | 72 | 73 | 79 | 90 | 99 | ROW SUM |
| 10 | 16532 | 407 | 7 | 5 | 114 | 0 | 425 | 14 | 0 | 17504 |
| 11 | | 9518 | 0 | 71 | 13 | 0 | 94 | 32 | 0 | 9728 |
| 70 | | | 1042 | 0 | 7 | 0 | 214 | 1 | 0 | 1264 |
| 71 | | | | 3044 | 13 | 14 | 276 | 2 | 0 | 3349 |
| 72 | | | | | 1435 | 0 | 508 | 0 | 0 | 1943 |
| 73 | | | | | | 501 | 44 | 0 | 0 | 545 |
| 79 | | | | | | | 9848 | 245 | 16 | 10109 |
| 90 | | | | | | | | 12 | 0 | 12 |
| 99 | | | | | | | | | 1484 | 1484 |

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| TOTAL VALID COMPARISONS | 45938 |
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Codes for Total Estimate

Coding Guide - M10A

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | 15 minutes. |
| 11 | 16 minutes. |
| Incorrect Response | |
| 70 | 13 minutes. |
| 71 | 14 minutes. |
| 72 | 15 min. 14 sec. |
| 73 | 17 minutes. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Recording Songs: Explanation of Estimate

Item M10B

Teresa wants to record 5 songs on tape. The length of time each song plays for is shown in the table.

| Song | Amount of Time |
|------|----------------------|
| 1 | 2 minutes 41 seconds |
| 2 | 3 minutes 10 seconds |
| 3 | 2 minutes 51 seconds |
| 4 | 3 minutes |
| 5 | 3 minutes 32 seconds |

- a) ESTIMATE to the nearest minute the total time taken for all five songs to play.
b) Explain how this estimate was made.

| FREQUENCIES OF MATCHED CODES - M10B | | | | | | | | | | | |
|-------------------------------------|------|----|------|------|------|-----|-----|------|------|------|---------|
| | 10 | 11 | 12 | 13 | 19 | 70 | 71 | 79 | 90 | 99 | ROW SUM |
| 10 | 2624 | 44 | 2549 | 85 | 360 | 87 | 39 | 198 | 56 | 124 | 6166 |
| 11 | | 49 | 342 | 22 | 174 | 19 | 2 | 185 | 4 | 0 | 797 |
| 12 | | | 8873 | 870 | 2057 | 280 | 188 | 3487 | 388 | 59 | 16202 |
| 13 | | | | 1805 | 677 | 47 | 166 | 722 | 31 | 27 | 3475 |
| 19 | | | | | 788 | 79 | 63 | 1207 | 72 | 15 | 2224 |
| 70 | | | | | | 63 | 27 | 531 | 11 | 36 | 668 |
| 71 | | | | | | | 718 | 960 | 3 | 37 | 1718 |
| 79 | | | | | | | | 9487 | 1063 | 198 | 10748 |
| 90 | | | | | | | | | 140 | 217 | 357 |
| 99 | | | | | | | | | | 3695 | 3695 |

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| TOTAL VALID COMPARISONS | 46050 |
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Codes for Explanation

Coding Guide - M10B

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | Each amount of time is correctly rounded to whole minutes before adding. |
| 11 | Each amount of time is correctly rounded to nearest 5,10,15 or 30 seconds. |
| 12 | No calculation shown. Statements may include "rounded off to nearest minute", "rounded the numbers up and down" or similar expressions. |
| 13 | Adds correctly and then rounds off from 15 min. 14 sec. |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | Each amount of time is rounded off, but one or more rounding is incorrect. |
| 71 | Rounds off from 14 min. 34 sec. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Apples in Box: Answers

Item M11A

a) There are 54 kilograms of apples in two boxes. The second box of apples weighs 12 kilograms more than the first. How many kilograms of apples are in each box?

b) Show your work.

| FREQUENCIES OF MATCHED CODES - M11A | | | | | | | | | | |
|-------------------------------------|------|----|-----|------|-----|----|------|-----|-----|---------|
| | 20 | 10 | 11 | 70 | 71 | 72 | 79 | 90 | 99 | ROW SUM |
| 20 | 4668 | 7 | 17 | 16 | 16 | 0 | 8 | 0 | 8 | 4740 |
| 10 | | 13 | 49 | 0 | 0 | 0 | 30 | 0 | 0 | 92 |
| 11 | | | 216 | 0 | 12 | 0 | 206 | 8 | 12 | 454 |
| 70 | | | | 1960 | 0 | 0 | 104 | 5 | 3 | 2072 |
| 71 | | | | | 483 | 12 | 185 | 25 | 8 | 713 |
| 72 | | | | | | 16 | 14 | 0 | 6 | 36 |
| 79 | | | | | | | 3386 | 214 | 155 | 3755 |
| 90 | | | | | | | | 55 | 38 | 93 |
| 99 | | | | | | | | | 637 | 637 |

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| TOTAL VALID COMPARISONS | 12592 |
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Codes for Correctness

| Coding Guide - M11A | |
|---------------------------|--|
| Code | Response |
| Correct Response | |
| 20 | 33 kg AND 21 kg. |
| Partial Response | |
| 10 | Follows the right steps but makes a small arithmetic error resulting in an incorrect answer. |
| 11 | Either 33 kg OR 21 kg, with or without another incorrect weight. |
| Incorrect Response | |
| 70 | 15 kg AND 39 kg. |
| 71 | One of the answers is 42 kg. |
| 72 | 15 kg AND 27 kg. |
| 79 | Other incorrect |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Apples in Box: Method

Item M11B

a) There are 54 kilograms of apples in two boxes. The second box of apples weighs 12 kilograms more than the first. How many kilograms of apples are in each box?

b) Show your work.

| FREQUENCIES OF MATCHED CODES - M11B | | | | | | | | | | |
|-------------------------------------|------|-----|------|----|-----|------|------|-----|-----|---------|
| | 10 | 11 | 12 | 19 | 70 | 71 | 79 | 90 | 99 | ROW SUM |
| 10 | 1148 | 23 | 78 | 30 | 0 | 61 | 8 | 8 | 0 | 1356 |
| 11 | | 722 | 112 | 40 | 6 | 171 | 38 | 21 | 1 | 1111 |
| 12 | | | 2198 | 35 | 0 | 125 | 8 | 6 | 0 | 2372 |
| 19 | | | | 72 | 47 | 32 | 20 | 7 | 5 | 183 |
| 70 | | | | | 108 | 56 | 81 | 28 | 86 | 359 |
| 71 | | | | | | 3117 | 1748 | 113 | 20 | 4998 |
| 79 | | | | | | | 1286 | 120 | 69 | 1475 |
| 90 | | | | | | | | 46 | 37 | 83 |
| 99 | | | | | | | | | 663 | 663 |

| | |
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| TOTAL VALID COMPARISONS | 12600 |
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Codes for Method

Coding Guide - M11B

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | An equation with an unknown variable explicitly shown. |
| 11 | Method: divide 54 by 2, then add 6 to 27 to get 33 and subtract 6 from 27 to get 21. [Addition and subtraction of 6 need not be shown if student has arrived at the correct solution]. |
| 12 | Method: subtract 12 from 54 to obtain 42, then divide by 2 to obtain 21kg and then add 12 to get 33 kg. [Addition of 12 to obtain 33 need not be shown if student arrived at the correct solution]. |
| 19 | Other fully satisfactory solution including "guess and check" with justification that $21 + 33 = 54$. |
| Incorrect Response | |
| 70 | No method is shown. |
| 71 | Method shown is inadequate, but begins in appropriate manner. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Rounded versus Actual Weight**Item M12**

Rounded to the nearest 10 kg the weight of a dolphin was reported as 170 kg. Write down a weight that might have been the actual weight of the dolphin.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | |
|------------------------------|------|-----|------|-----|----|-----|-----|----|------|----|-----|---------|
| | 10 | 11 | 12 | 13 | 70 | 71 | 72 | 73 | 79 | 90 | 99 | ROW SUM |
| 10 | 6450 | 8 | 24 | 86 | 50 | 8 | 8 | 5 | 207 | 0 | 0 | 6846 |
| 11 | | 473 | 15 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 503 |
| 12 | | | 1704 | 8 | 18 | 0 | 16 | 7 | 8 | 0 | 0 | 1761 |
| 13 | | | | 208 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 234 |
| 70 | | | | | 51 | 0 | 15 | 4 | 91 | 0 | 0 | 161 |
| 71 | | | | | | 801 | 24 | 19 | 43 | 0 | 0 | 887 |
| 72 | | | | | | | 493 | 11 | 12 | 0 | 0 | 516 |
| 73 | | | | | | | | 18 | 134 | 1 | 0 | 153 |
| 79 | | | | | | | | | 1280 | 7 | 0 | 1287 |
| 90 | | | | | | | | | | 74 | 28 | 102 |
| 99 | | | | | | | | | | | 150 | 150 |

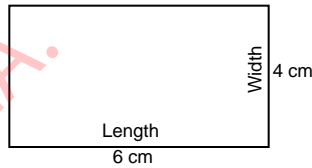
| | |
|--------------------------------|--------------|
| TOTAL VALID COMPARISONS | 12600 |
|--------------------------------|--------------|

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | Number within the interval $165 < X < 170$. |
| 11 | 170 |
| 12 | Number within the interval $170 < X < 175$. |
| 13 | Two or more numbers within the interval $165 < X < 175$. |
| Incorrect Response | |
| 70 | Number within the interval $175 < X < 180$. |
| 71 | 150 OR 200 |
| 72 | 160 OR 180 |
| 73 | Result of converting 170 kg to other units. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Draw New Rectangle

Item M13A



- a. In the space below, draw a new rectangle whose length is one and one half times the length of the rectangle above, and whose width is half the width of the rectangle above. Show the length and width of the new rectangle in centimeters on the figure.
- b. What is the ratio of the area of the new rectangle to the area of the first one? Show your work.

| FREQUENCIES OF MATCHED CODES - M13A | | | | | | | | | | | | |
|-------------------------------------|------|----|-----|-----|-----|-----|------|-----|------|----|-----|---------|
| | 20 | 10 | 11 | 70 | 71 | 72 | 73 | 74 | 79 | 90 | 99 | ROW SUM |
| 20 | 3819 | 82 | 510 | 0 | 0 | 0 | 4 | 12 | 10 | 0 | 0 | 4437 |
| 10 | | 42 | 18 | 0 | 0 | 0 | 7 | 0 | 0 | 1 | 0 | 68 |
| 11 | | | 638 | 4 | 0 | 0 | 25 | 4 | 8 | 3 | 0 | 682 |
| 70 | | | | 274 | 0 | 0 | 253 | 0 | 55 | 4 | 0 | 586 |
| 71 | | | | | 162 | 0 | 45 | 0 | 15 | 0 | 0 | 222 |
| 72 | | | | | | 834 | 52 | 0 | 56 | 0 | 0 | 942 |
| 73 | | | | | | | 1162 | 16 | 220 | 38 | 8 | 1444 |
| 74 | | | | | | | | 846 | 130 | 10 | 8 | 994 |
| 79 | | | | | | | | | 2354 | 90 | 28 | 2472 |
| 90 | | | | | | | | | | 64 | 126 | 190 |
| 99 | | | | | | | | | | | 563 | 563 |

TOTAL VALID COMPARISONS 12600

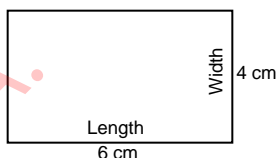
Codes for Drawing

Coding Guide - M13A

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 20 | 9 cm and 2 cm. Correct drawing shown. |
| Partial Response | |
| 10 | 9 cm and 2 cm. Drawing is incorrect or missing. |
| 11 | The length and/or width is not given or is incorrect. Correct drawing is shown. |
| Incorrect Response | |
| 70 | 15 cm and 2 cm. Explicitly written or implicit from the drawing. |
| 71 | 7.5 cm and 2 cm. Explicitly written or implicit from the drawing. |
| 72 | 3 cm and 2 cm. Explicitly written or implicit from the drawing. |
| 73 | 2 cm width and a length equal to any other numbers except those given above. Explicitly written or implicit from the drawing. |
| 74 | 9 cm length and a width equal to any other numbers than those given above. Explicitly written or implicit from the drawing. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Ratio of Rectangle Areas

Item M13B



- a) In the space below, draw a new rectangle whose length is one and one half times the length of the rectangle above, and whose width is half the width of the rectangle above. Show the length and width of the new rectangle in centimeters on the figure.
- b) What is the ratio of the area of the new rectangle to the area of the first one? Show your work.

| FREQUENCIES OF MATCHED CODES - M13B | | | | | | | | | | | | | |
|-------------------------------------|------|-----|-----|-----|-----|-----|----|----|-----|------|-----|------|---------|
| | 20 | 21 | 10 | 11 | 12 | 13 | 14 | 19 | 70 | 79 | 90 | 99 | ROW SUM |
| 20 | 1527 | 18 | 136 | 134 | 6 | 4 | 1 | 10 | 7 | 53 | 1 | 0 | 1897 |
| 21 | | 316 | 18 | 31 | 0 | 281 | 40 | 5 | 25 | 189 | 19 | 5 | 929 |
| 10 | | | 592 | 87 | 9 | 13 | 10 | 0 | 12 | 29 | 6 | 0 | 758 |
| 11 | | | | 230 | 46 | 10 | 16 | 13 | 3 | 39 | 1 | 0 | 358 |
| 12 | | | | | 128 | 0 | 7 | 0 | 0 | 4 | 0 | 0 | 139 |
| 13 | | | | | | 194 | 52 | 6 | 24 | 234 | 4 | 2 | 516 |
| 14 | | | | | | | 33 | 0 | 20 | 65 | 2 | 0 | 120 |
| 19 | | | | | | | | 0 | 1 | 13 | 0 | 0 | 14 |
| 70 | | | | | | | | | 232 | 904 | 45 | 31 | 1212 |
| 79 | | | | | | | | | | 3074 | 488 | 290 | 3852 |
| 90 | | | | | | | | | | | 138 | 222 | 360 |
| 99 | | | | | | | | | | | | 2437 | 2437 |

| | |
|-------------------------|-------|
| TOTAL VALID COMPARISONS | 12592 |
|-------------------------|-------|

Codes for Ratio and Areas

Coding Guide - M13B

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 20 | 3:4, 3/4 or equivalent. The areas are 18 cm ² and 24 cm ² . |
| 21 | The ratio is NOT 3:4 but areas and ratio of part (b) are consistent with response in part (a). |
| Partial Response | |
| 10 | 4:3 or equivalent. (Ratio is reversed.) The areas are 18 cm ² and 24 cm ² . |
| 11 | An incorrect ratio or no ratio is given. The areas are 18 cm ² and 24 cm ² . |
| 12 | The difference between the areas, 6, is given instead of the ratio. The areas are 18 cm ² and 24 cm ² . |
| 13 | Areas are NOT 18 cm ² and 24 cm ² but are consistent with response in part a) and an incorrect ratio or no ratio is given. |
| 14 | Areas are NOT 24 cm ² and 18 cm ² but are consistent with response in part a) and a difference consistent with those areas is given instead of the ratio. |
| Incorrect Response | |
| 70 | Focuses exclusively on the ratios of lengths and widths between the given rectangle and No areas are shown. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Cheaper Office Rental

Item M14

The following two advertisements appeared in a newspaper in a country where the units of currency are *zeds* .

BUILDING A
Office space available

85-95 square meters
475 *zeds* per month

100 - 120 square meters
800 *zeds* per month

BUILDING B
Office space available

35-260 square meters
90 *zeds* per square meters
per year

If a company is interested in renting an office of 110 square meters in that country for a year, at which office building, A or B, should they rent the office in order to get the lower price? Show your work.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | | | | |
|--------------------------------|------|-----|-----|-----|-----|-----|-----|-----|----|------|------|-----|-----|--------------|---------|
| | 30 | 39 | 20 | 21 | 10 | 11 | 12 | 16 | 19 | 70 | 71 | 79 | 90 | 99 | ROW SUM |
| 30 | 2351 | 223 | 94 | 58 | 17 | 0 | 14 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 2769 |
| 39 | | 0 | 36 | 3 | 16 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 |
| 20 | | | 794 | 23 | 192 | 21 | 98 | 8 | 3 | 3 | 0 | 2 | 4 | 0 | 1148 |
| 21 | | | | 211 | 3 | 0 | 42 | 0 | 15 | 17 | 1 | 0 | 0 | 0 | 289 |
| 10 | | | | | 991 | 108 | 4 | 118 | 37 | 13 | 4 | 57 | 22 | 3 | 1357 |
| 11 | | | | | | 398 | 0 | 42 | 27 | 0 | 0 | 2 | 23 | 69 | 561 |
| 12 | | | | | | | 812 | 0 | 0 | 223 | 19 | 34 | 20 | 0 | 1108 |
| 16 | | | | | | | | 45 | 16 | 4 | 4 | 6 | 0 | 0 | 75 |
| 19 | | | | | | | | | 1 | 1 | 1 | 0 | 3 | 1 | 7 |
| 70 | | | | | | | | | | 1145 | 382 | 201 | 18 | 0 | 1746 |
| 71 | | | | | | | | | | | 1134 | 136 | 37 | 126 | 1433 |
| 79 | | | | | | | | | | | | 151 | 84 | 16 | 251 |
| 90 | | | | | | | | | | | | | 153 | 179 | 332 |
| 99 | | | | | | | | | | | | | | 1467 | 1467 |
| TOTAL VALID COMPARISONS | | | | | | | | | | | | | | 12600 | |

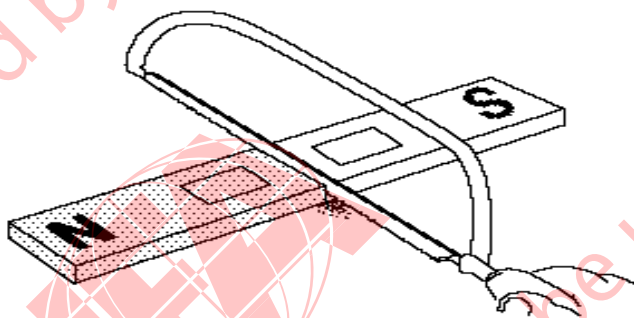
Coding Guide

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 30 | Building A. Correct calculation of rents for both buildings. 9600/800 AND 9900/825, OR 825 to compare with the 800 given. |
| 39 | Other correct. |
| Partial Response | |
| 20 | Building A. Correct calculation of rent for Building A OR B but not both. |
| 21 | Building B OR building is not named. Correct calculation of rents for both buildings. |
| Minimal Response | |
| 10 | Building A. Calculations or explanation are incorrect or inadequate. |
| 11 | Building A. No work shown. |
| 12 | Building B, OR building is not named. Correct calculation of rent for Building A OR B but not both. |
| 16 | Building A. Explanation is given only in the form of extracts from the advertisements. |
| 19 | Other minimal. |
| Incorrect Response | |
| 70 | Building B. Incorrect or inadequate calculations. |
| 71 | Building B. No work shown. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Magnets

Item S1

A bar magnet is cut in two with a hacksaw. Write an "N" or an "S" in each box on the diagram to show the polarity of the cut ends.



| FREQUENCIES OF MATCHED CODES | | | | | | | | | |
|------------------------------|------|----|------|----|----|-----|----|-----|---------|
| | 10 | 19 | 70 | 71 | 72 | 79 | 90 | 99 | ROW SUM |
| 10 | 5466 | 0 | 42 | 0 | 0 | 0 | 0 | 20 | 5528 |
| 19 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | | | 2459 | 24 | 0 | 0 | 0 | 8 | 2491 |
| 71 | | | | 57 | 0 | 0 | 0 | 0 | 57 |
| 72 | | | | | 21 | 0 | 0 | 0 | 21 |
| 79 | | | | | | 181 | 22 | 15 | 218 |
| 90 | | | | | | | 19 | 36 | 55 |
| 99 | | | | | | | | 708 | 708 |

TOTAL VALID COMPARISONS 9078

| Coding Guide | |
|---------------------------|--|
| Code | Response |
| Correct Response | |
| 10 | S - N are written in the open boxes in this order. |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | N - S are written in the open boxes in this order. |
| 71 | N - N are written in the open boxes. |
| 72 | S - S are written in the open boxes. |
| 79 | Other incorrect: Including a single N or S. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Jose's Influenza

Item S2

Jose caught influenza. Write down one way he could have caught it.

| | | FREQUENCIES OF MATCHED CODES | | | | | | | |
|----|------|------------------------------|------|-----|------|------|-----|------|---------|
| | 10 | 11 | 12 | 19 | 70 | 79 | 90 | 99 | ROW SUM |
| 10 | 5183 | 2258 | 500 | 576 | 198 | 211 | 6 | 13 | 8945 |
| 11 | | 6400 | 3275 | 398 | 114 | 623 | 8 | 0 | 10818 |
| 12 | | | 7984 | 160 | 190 | 624 | 30 | 55 | 9043 |
| 19 | | | | 170 | 89 | 783 | 20 | 1 | 1063 |
| 70 | | | | | 7677 | 930 | 58 | 80 | 8745 |
| 79 | | | | | | 3259 | 328 | 68 | 3655 |
| 90 | | | | | | | 295 | 462 | 757 |
| 99 | | | | | | | | 3009 | 3009 |

TOTAL VALID COMPARISONS 46035

Coding Guide

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | Refers explicitly to transmission of germs. |
| 11 | Refers implicitly to transmission of germs by sneezing/coughing or close contact. |
| 12 | States only that he got it from someone (who had the flu). |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | Refers to being too cold. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Melting Ice Cubes

Item S3

A glass of water with ice cubes in it has a mass of 300 grams. What will the mass be immediately after the ice has melted? Explain your answer.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | |
|------------------------------|------|-----|----|------|----|------|----|-----|-----|------|---------|
| | 20 | 10 | 11 | 70 | 71 | 72 | 73 | 79 | 90 | 99 | ROW SUM |
| 20 | 2824 | 431 | 34 | 76 | 0 | 10 | 0 | 1 | 0 | 5 | 3381 |
| 10 | | 154 | 28 | 18 | 0 | 19 | 0 | 24 | 2 | 1 | 246 |
| 11 | | | 82 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 89 |
| 70 | | | | 1847 | 66 | 74 | 2 | 121 | 9 | 0 | 2119 |
| 71 | | | | | 72 | 0 | 0 | 29 | 0 | 0 | 101 |
| 72 | | | | | | 1212 | 49 | 102 | 7 | 0 | 1370 |
| 73 | | | | | | | 73 | 25 | 8 | 0 | 106 |
| 79 | | | | | | | | 331 | 107 | 0 | 438 |
| 90 | | | | | | | | | 123 | 112 | 235 |
| 99 | | | | | | | | | | 1065 | 1065 |

| | |
|--------------------------------|-------------|
| TOTAL VALID COMPARISONS | 9150 |
|--------------------------------|-------------|

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 20 | 300 g with a good explanation. |
| Partial Response | |
| 10 | 300 g. Explanation is inadequate. |
| 11 | 300 g. No explanation. |
| Incorrect Response | |
| 70 | More than 300 grams with explanation. |
| 71 | More than 300 g. No explanation. |
| 72 | Less than 300 g. With explanation. |
| 73 | Less than 300 g. No explanation. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

How Computers Help

Item S4

Write down one example of how computers help people do their work.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | | |
|------------------------------|------|-----|------|-----|-----|------|----|-----|----|-----|----|-----|---------|
| | 10 | 11 | 12 | 13 | 14 | 19 | 70 | 71 | 76 | 79 | 90 | 99 | ROW SUM |
| 10 | 1622 | 25 | 128 | 67 | 277 | 712 | 4 | 62 | 2 | 130 | 12 | 1 | 3042 |
| 11 | | 520 | 18 | 59 | 109 | 190 | 0 | 20 | 0 | 40 | 4 | 7 | 967 |
| 12 | | | 3716 | 149 | 583 | 433 | 0 | 88 | 5 | 69 | 0 | 7 | 5050 |
| 13 | | | | 111 | 91 | 81 | 1 | 19 | 3 | 26 | 2 | 0 | 334 |
| 14 | | | | | 664 | 290 | 1 | 7 | 0 | 17 | 1 | 0 | 980 |
| 19 | | | | | | 1288 | 18 | 134 | 15 | 170 | 18 | 3 | 1646 |
| 70 | | | | | | | 1 | 2 | 0 | 3 | 1 | 0 | 7 |
| 71 | | | | | | | | 52 | 22 | 49 | 4 | 1 | 128 |
| 76 | | | | | | | | | 3 | 3 | 0 | 0 | 6 |
| 79 | | | | | | | | | | 41 | 7 | 4 | 52 |
| 90 | | | | | | | | | | | 0 | 23 | 23 |
| 99 | | | | | | | | | | | | 365 | 365 |

TOTAL VALID COMPARISONS 12600

Coding Guide

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | Refers to writing OR editing text. |
| 11 | Refers to doing calculations OR doing them faster. |
| 12 | Refers to computer storing or retrieving information (promptly). |
| 13 | Refers to using computers for instruction. |
| 14 | Response refers to any combination of two or more of codes 10-13. |
| 19 | Other correct: |
| Incorrect Response | |
| 70 | Playing games such as Nintendo. |
| 71 | Vague references to "everything" or some similar expression. |
| 76 | Merely repeats information in the stem. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Life on Another Planet

Item S5

Jane and Mario were discussing what it might be like to live on other planets. Their science teacher gave them data about the earth and an imaginary planet, Athena. The table shows these data.

| | Earth | Athena |
|--|---|---|
| Atmospheric Conditions | 21% oxygen 0.03% carbon dioxide 78% nitrogen ozone layer | 10% oxygen 80% carbon dioxide 5% nitrogen no ozone layer |
| Distance from a star Like the Sun | 148,640,000 km | 103,600,000 km |
| Rotation on Axis | 1 day | 200 days |
| Revolution Around Sun | 365 1/4 days | 200 days |

Write down one important reason why it would be difficult for humans to live on Athena if it existed.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | |
|------------------------------|-----|------|-----|------|-------|-----|-----|------|-----|------|---------|
| | 10 | 11 | 12 | 13 | 14 | 19 | 70 | 79 | 90 | 99 | ROW SUM |
| 10 | 883 | 134 | 61 | 1 | 456 | 131 | 22 | 333 | 19 | 0 | 2040 |
| 11 | | 9092 | 19 | 251 | 2214 | 298 | 13 | 596 | 37 | 0 | 12520 |
| 12 | | | 159 | 37 | 113 | 74 | 42 | 260 | 11 | 0 | 696 |
| 13 | | | | 7506 | 1529 | 130 | 77 | 793 | 231 | 0 | 10266 |
| 14 | | | | | 15490 | 312 | 52 | 782 | 40 | 0 | 16676 |
| 19 | | | | | | 184 | 162 | 381 | 12 | 0 | 739 |
| 70 | | | | | | | 55 | 102 | 1 | 0 | 158 |
| 79 | | | | | | | | 1246 | 129 | 22 | 1397 |
| 90 | | | | | | | | | 67 | 24 | 91 |
| 99 | | | | | | | | | | 1467 | 1467 |

TOTAL VALID COMPARISONS **46050**

Coding Guide

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | States that there would be too much carbon dioxide. |
| 11 | States that there would be too little oxygen to breathe. |
| 12 | Refers to bound rotation, that is, the periods of revolution around the planet's own axis and rotation around its sun are the same. Hence, one side of the planet is always facing the sun and therefore is hot while the other side is always dark and cold. |
| 13 | States that there is no ozone. |
| 14 | Any combination of above codes, 10-13. |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | States that it is too close to a star, without further explanation. |
| 79 | Other incorrect or seriously incomplete. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

How Air Exists

Item S6

Air is colorless, odorless, and tasteless. Describe one way that air can be shown to exist.

| | | FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | |
|----|-------|------------------------------|------|------|-----|-----|-----|------|------|----|------|-----|------|---------|
| | 10 | 11 | 12 | 13 | 14 | 15 | 19 | 70 | 72 | 76 | 79 | 90 | 99 | ROW SUM |
| 10 | 11119 | 337 | 28 | 204 | 151 | 90 | 533 | 538 | 153 | 42 | 977 | 134 | 0 | 14306 |
| 11 | | 405 | 0 | 0 | 0 | 2 | 27 | 19 | 2 | 0 | 55 | 5 | 0 | 515 |
| 12 | | | 1043 | 240 | 12 | 14 | 193 | 32 | 34 | 0 | 51 | 0 | 16 | 1635 |
| 13 | | | | 3566 | 99 | 25 | 225 | 172 | 45 | 0 | 133 | 18 | 0 | 4283 |
| 14 | | | | | 346 | 43 | 185 | 32 | 0 | 0 | 184 | 35 | 0 | 825 |
| 15 | | | | | | 867 | 244 | 68 | 111 | 0 | 176 | 3 | 0 | 1469 |
| 19 | | | | | | | 204 | 664 | 128 | 4 | 513 | 23 | 0 | 1536 |
| 70 | | | | | | | | 8893 | 497 | 3 | 833 | 26 | 17 | 10269 |
| 72 | | | | | | | | | 2524 | 0 | 271 | 9 | 0 | 2804 |
| 76 | | | | | | | | | | 14 | 116 | 22 | 6 | 158 |
| 79 | | | | | | | | | | | 2531 | 325 | 51 | 2907 |
| 90 | | | | | | | | | | | | 148 | 265 | 413 |
| 99 | | | | | | | | | | | | | 4930 | 4930 |

TOTAL VALID COMPARISONS 46050

Coding Guide

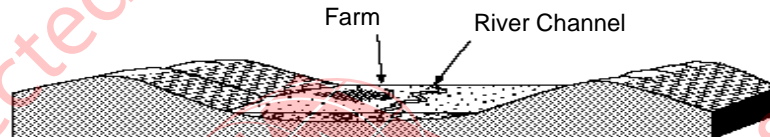
| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | Mentions that you can feel or see effects of air movement. |
| 11 | Mentions that (light) things fall slowly. |
| 12 | Refers to the fact that air can be weighed. |
| 13 | Mentions that balloons or tires, etc. can be filled with air. |
| 14 | Refers to air pressure. |
| 15 | Refers to being able to 'see' air. |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | We can breathe air. |
| 71 | Refers only to the need of oxygen or air for life and other processes. |
| 72 | Refers to seeing water vapor. |
| 76 | Merely repeats information in the stem. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

River on Plain: Good Place

Item S7A

The diagram shows a river flowing through a wide plain. The plain is covered with several layers of soil and sediment.

- Write down one reason why this plain is a good place for farming.
- Write down one reason why this plain is NOT a good place for farming.



Frequencies of Matched Codes - S7A

| | 10 | 11 | 12 | 19 | 70 | 76 | 79 | 90 | 99 | ROW SUM |
|----|------|------|-----|-----|----|-----|-----|----|-----|---------|
| 10 | 2437 | 758 | 147 | 219 | 4 | 243 | 113 | 37 | 0 | 3958 |
| 11 | | 2723 | 118 | 256 | 8 | 101 | 104 | 3 | 0 | 3313 |
| 12 | | | 805 | 112 | 12 | 9 | 87 | 7 | 0 | 1032 |
| 19 | | | | 120 | 17 | 0 | 167 | 8 | 0 | 312 |
| 70 | | | | | 0 | 2 | 31 | 2 | 0 | 35 |
| 76 | | | | | | 43 | 23 | 19 | 0 | 85 |
| 79 | | | | | | | 130 | 30 | 2 | 162 |
| 90 | | | | | | | | 11 | 10 | 21 |
| 99 | | | | | | | | | 232 | 232 |

TOTAL VALID COMPARISONS 9150

Codes for Good Place

Coding Guide - S7A

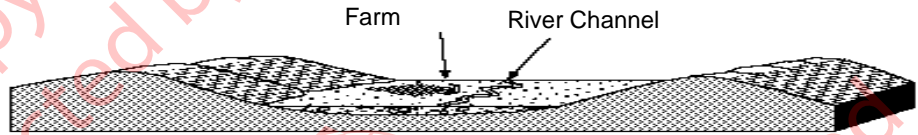
| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | Mentions that the soil is fertile (good), abundant. |
| 11 | Mentions that there is a river (for irrigation, water for animals). |
| 12 | Mentions that there is plenty of space or flat areas for farm land. |
| 19 | Other correct: |
| Incorrect Response | |
| 70 | Does not address the issue of farming. |
| 76 | Merely repeats information in stem. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

River on Plain: Bad Place

Item S7B

The diagram shows a river flowing through a wide plain. The plain is covered with several layers of soil and sediment.

- a. Write down one reason why this plain is a good place for farming.
- b. Write down one reason why this plain is NOT a good place for farming.



| Frequencies of Matched Codes - S7B | | | | | | | | | | | | |
|------------------------------------|------|-----|-----|----|----|-----|-----|----|-----|----|-----|---------|
| | 10 | 11 | 19 | 70 | 71 | 72 | 73 | 76 | 79 | 90 | 99 | ROW SUM |
| 10 | 4294 | 154 | 160 | 6 | 32 | 70 | 11 | 22 | 199 | 11 | 0 | 4959 |
| 11 | | 447 | 23 | 0 | 2 | 38 | 3 | 0 | 37 | 5 | 0 | 555 |
| 19 | | | 201 | 49 | 18 | 122 | 39 | 7 | 280 | 15 | 0 | 731 |
| 70 | | | | 58 | 27 | 6 | 0 | 2 | 55 | 4 | 0 | 152 |
| 71 | | | | | 31 | 25 | 0 | 14 | 115 | 4 | 0 | 189 |
| 72 | | | | | | 274 | 14 | 20 | 97 | 3 | 0 | 408 |
| 73 | | | | | | | 572 | 74 | 138 | 5 | 0 | 789 |
| 76 | | | | | | | | 22 | 83 | 10 | 0 | 115 |
| 79 | | | | | | | | | 630 | 93 | 2 | 725 |
| 90 | | | | | | | | | | 54 | 32 | 86 |
| 99 | | | | | | | | | | | 441 | 441 |

TOTAL VALID COMPARISONS 9150

Codes for Bad Place

| Coding Guide - S7B | |
|---------------------------|---|
| Code | Response |
| Correct Response | |
| 10 | Mentions the possibility of flooding, or that the soil will be too wet. |
| 11 | Mentions the possibility of wind or water erosion. |
| 19 | Other correct: |
| Incorrect Response | |
| 70 | Mentions that it is an undesirable place to live: boring/lonesome/ugly. |
| 71 | Does not address the issue of farming. |
| 72 | Refers to problems due to surrounding mountains. |
| 73 | Refers to sediment, soil, being rocky and negative. |
| 76 | Merely repeats information in stem. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Ozone Layer

Item S8

Write down one reason why the ozone layer is important for all living things on Earth.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | | | |
|------------------------------|-------|------|------|-----|-----|------|------|------|-----|----|------|-----|------|---------|
| | 10 | 11 | 12 | 19 | 70 | 71 | 72 | 73 | 74 | 76 | 79 | 90 | 99 | ROW SUM |
| 10 | 11590 | 254 | 182 | 88 | 47 | 81 | 59 | 45 | 14 | 0 | 104 | 0 | 0 | 12464 |
| 11 | | 6135 | 1044 | 376 | 201 | 1320 | 842 | 24 | 70 | 0 | 425 | 24 | 0 | 10461 |
| 12 | | | 1820 | 80 | 35 | 697 | 254 | 34 | 3 | 0 | 148 | 18 | 0 | 3089 |
| 19 | | | | 14 | 24 | 185 | 197 | 2 | 2 | 1 | 74 | 7 | 0 | 506 |
| 70 | | | | | 296 | 561 | 127 | 8 | 50 | 2 | 379 | 24 | 0 | 1447 |
| 71 | | | | | | 2564 | 703 | 64 | 81 | 4 | 442 | 12 | 0 | 3870 |
| 72 | | | | | | | 2322 | 360 | 195 | 58 | 1321 | 38 | 0 | 4294 |
| 73 | | | | | | | | 3015 | 616 | 2 | 726 | 9 | 0 | 4368 |
| 74 | | | | | | | | | 452 | 4 | 564 | 11 | 0 | 1031 |
| 76 | | | | | | | | | | 4 | 37 | 41 | 3 | 85 |
| 79 | | | | | | | | | | | 2020 | 192 | 23 | 2235 |
| 90 | | | | | | | | | | | | 227 | 78 | 305 |
| 99 | | | | | | | | | | | | | 1775 | 1775 |

| | |
|--------------------------------|--------------|
| TOTAL VALID COMPARISONS | 45930 |
|--------------------------------|--------------|

Coding Guide

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | Refers to protection against the UV radiation from the sun. |
| 11 | Refers to protection against dangerous or too strong radiation from the sun but does not mention UV. |
| 12 | Mentions that the ozone layer protects humans so we do not get sunburned/skin cancer. NOTE: If UV is mentioned, code 10. |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | Confuses the effect of the ozone layer with the greenhouse effect. |
| 71 | Confuses protection against heat. |
| 72 | Refers only vaguely to protection. |
| 73 | Refers to or confuses oxygen, O ₂ with ozone, O ₃ . |
| 74 | Sees the ozone layer as a barrier for the atmosphere. |
| 76 | Merely repeats information in the stem. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Digestion in the Mouth

Item S9

What digestive substance is found in the mouth? What does it do?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | | |
|------------------------------|------|------|-----|-----|------|----|-----|-----|------|------|-----|------|---------|
| | 20 | 21 | 22 | 29 | 10 | 11 | 19 | 70 | 71 | 79 | 90 | 99 | ROW SUM |
| 20 | 8334 | 3025 | 137 | 625 | 1971 | 1 | 218 | 0 | 122 | 53 | 48 | 8 | 14542 |
| 21 | | 5871 | 393 | 299 | 980 | 6 | 77 | 31 | 82 | 22 | 12 | 0 | 7773 |
| 22 | | | 512 | 57 | 32 | 38 | 12 | 0 | 3 | 2 | 0 | 0 | 656 |
| 29 | | | | 81 | 738 | 6 | 130 | 8 | 31 | 101 | 1 | 16 | 1112 |
| 10 | | | | | 5576 | 1 | 427 | 41 | 134 | 156 | 83 | 33 | 6451 |
| 11 | | | | | | 0 | 3 | 0 | 1 | 8 | 0 | 0 | 12 |
| 19 | | | | | | | 205 | 4 | 69 | 243 | 12 | 0 | 533 |
| 70 | | | | | | | | 692 | 15 | 20 | 0 | 0 | 727 |
| 71 | | | | | | | | | 6607 | 921 | 22 | 15 | 7565 |
| 79 | | | | | | | | | | 1214 | 77 | 12 | 1303 |
| 90 | | | | | | | | | | | 178 | 202 | 380 |
| 99 | | | | | | | | | | | | 4996 | 4996 |

TOTAL VALID COMPARISONS 46050

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 20 | Names saliva and explains that it makes the food moist or soft [Mechanical process]. |
| 21 | Names saliva and explains that it breaks down the starch or food. [Chemical process]. |
| 22 | Names enzymes and explains that they break down the starch or food. [Chemical process]. |
| 29 | Other correct: Names a substance and provides a reasonable explanation. |
| Partial Response | |
| 10 | Names saliva but with no description or with an incorrect description of what it does. |
| 11 | Names enzymes but with no description or with an incorrect description of what they do, such as it digests starch. |
| 19 | Other partially correct. |
| Incorrect Response | |
| 70 | Acid. With or without description. |
| 71 | Teeth, tongue, etc. With or without description. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Size of Sun and Moon

Item S10

The Sun is bigger than the Moon, but they appear to be about the same size when you look at them from the Earth. Why is this?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | |
|--------------------------------|------|----|-----|----|-----|-----|-----|----|-----|----|-----|-------------|
| | 20 | 29 | 10 | 11 | 19 | 70 | 71 | 76 | 79 | 90 | 99 | ROW SUM |
| 20 | 5402 | 36 | 227 | 0 | 85 | 3 | 29 | 0 | 57 | 5 | 10 | 5854 |
| 29 | | 0 | 16 | 0 | 4 | 0 | 0 | 0 | 2 | 0 | 0 | 22 |
| 10 | | | 889 | 10 | 125 | 26 | 4 | 0 | 527 | 8 | 0 | 1589 |
| 11 | | | | 40 | 0 | 1 | 2 | 0 | 22 | 0 | 0 | 65 |
| 19 | | | | | 12 | 6 | 8 | 0 | 76 | 0 | 0 | 102 |
| 70 | | | | | | 401 | 16 | 5 | 109 | 1 | 0 | 532 |
| 71 | | | | | | | 131 | 0 | 64 | 0 | 0 | 195 |
| 76 | | | | | | | | 3 | 24 | 0 | 0 | 27 |
| 79 | | | | | | | | | 551 | 20 | 7 | 578 |
| 90 | | | | | | | | | | 10 | 0 | 10 |
| 99 | | | | | | | | | | | 176 | 176 |
| TOTAL VALID COMPARISONS | | | | | | | | | | | | 9150 |

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 20 | Mentions that the sun is farther away than the moon. Comparative language is used. |
| 29 | Other correct comparing apparent sizes. |
| Partial Response | |
| 10 | Refers to distance, but response is general, not specified. |
| 11 | Refers to the sun being higher up than the moon. |
| 19 | Other acceptable but incomplete or slightly erroneous responses. |
| Incorrect Response | |
| 70 | Response includes some reference to the light. |
| 71 | States that the sun is closer than the moon. |
| 76 | Merely repeats the information in the stem. |
| 79 | Other incorrect: |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Carbon Dioxide Fire Extinguishers

Item S11

Carbon dioxide is the active material in some fire extinguishers. How does carbon dioxide extinguish a fire?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | |
|------------------------------|------|-----|-----|-----|-----|------|-----|-----|---------|
| | 10 | 11 | 19 | 70 | 71 | 79 | 90 | 99 | ROW SUM |
| 10 | 3508 | 297 | 340 | 2 | 42 | 542 | 18 | 0 | 4749 |
| 11 | | 490 | 116 | 29 | 59 | 365 | 1 | 0 | 1060 |
| 19 | | | 43 | 3 | 16 | 165 | 4 | 0 | 231 |
| 70 | | | | 296 | 10 | 126 | 3 | 0 | 435 |
| 71 | | | | | 265 | 286 | 10 | 0 | 561 |
| 79 | | | | | | 1086 | 89 | 0 | 1175 |
| 90 | | | | | | | 111 | 36 | 147 |
| 99 | | | | | | | | 764 | 764 |

TOTAL VALID COMPARISONS 9122

Coding Guide

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | Mentions that carbon dioxide keeps oxygen away; response includes explicit reference to oxygen. |
| 11 | Mentions that carbon dioxide keeps "air" away. |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | Mentions that carbon dioxide cools down the fire. |
| 71 | Refers to a material in carbon dioxide. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Thirsty on a Hot Day

Item S12

Write down the reason why we get thirsty on a hot day and have to drink a lot.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | | |
|------------------------------|------|-------|-----|------|-----|------|------|------|-----|------|-----|-----|---------|
| | 10 | 11 | 12 | 13 | 19 | 70 | 71 | 72 | 76 | 79 | 90 | 99 | ROW SUM |
| 10 | 1273 | 632 | 519 | 223 | 95 | 97 | 25 | 10 | 2 | 31 | 13 | 0 | 2920 |
| 11 | | 11322 | 119 | 5761 | 644 | 199 | 1255 | 299 | 44 | 242 | 4 | 5 | 19894 |
| 12 | | | 281 | 136 | 94 | 292 | 32 | 11 | 2 | 34 | 1 | 0 | 883 |
| 13 | | | | 4129 | 500 | 277 | 1661 | 327 | 74 | 467 | 39 | 62 | 7536 |
| 19 | | | | | 111 | 229 | 556 | 48 | 15 | 155 | 3 | 2 | 1119 |
| 70 | | | | | | 2210 | 567 | 76 | 178 | 525 | 49 | 27 | 3632 |
| 71 | | | | | | | 4244 | 139 | 127 | 763 | 26 | 14 | 5313 |
| 72 | | | | | | | | 2030 | 27 | 418 | 12 | 0 | 2487 |
| 76 | | | | | | | | | 181 | 266 | 8 | 0 | 455 |
| 79 | | | | | | | | | | 1050 | 103 | 17 | 1170 |
| 90 | | | | | | | | | | | 2 | 31 | 33 |
| 99 | | | | | | | | | | | | 488 | 488 |

| | |
|--------------------------------|--------------|
| TOTAL VALID COMPARISONS | 45930 |
|--------------------------------|--------------|

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | Refers to perspiration and its cooling effect and the need to replace lost water. |
| 11 | Refers to perspiration and only replacement of lost water. |
| 12 | Refers to perspiration and only its cooling effect. |
| 13 | Refers to perspiration only. |
| 19 | Other acceptable explanation. |
| Incorrect Response | |
| 70 | Refers to body temperature (being too hot) but does not answer why we get thirsty. |
| 71 | Refers only to drying of the body. |
| 72 | Refers to getting more energy by drinking more water. |
| 76 | Merely repeats the information in the stem. |
| 79 | Other incorrect: |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Advantage of Two Eyes**Item S13**

What is the advantage of having two eyes to see with rather than one?

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | |
|------------------------------|------|-------|------|------|------|-----|------|----|------|---------|
| | 10 | 11 | 12 | 19 | 70 | 71 | 79 | 90 | 99 | ROW SUM |
| 10 | 1827 | 1410 | 41 | 729 | 83 | 45 | 854 | 33 | 17 | 5039 |
| 11 | | 23115 | 1057 | 2987 | 2041 | 186 | 2755 | 56 | 0 | 32197 |
| 12 | | | 1340 | 387 | 35 | 58 | 60 | 0 | 0 | 1880 |
| 19 | | | | 582 | 352 | 54 | 1579 | 26 | 0 | 2593 |
| 70 | | | | | 643 | 19 | 492 | 12 | 0 | 1166 |
| 71 | | | | | | 135 | 115 | 0 | 0 | 250 |
| 79 | | | | | | | 1553 | 60 | 0 | 1613 |
| 90 | | | | | | | | 0 | 0 | 0 |
| 99 | | | | | | | | | 1296 | 1296 |

**TOTAL VALID
COMPARISONS 46034**

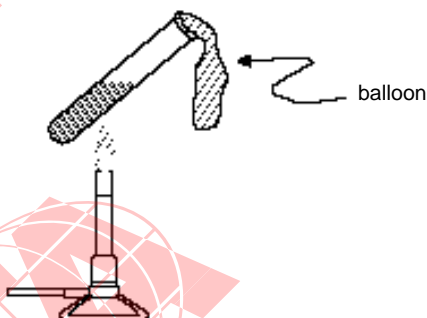
Coding Guide

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | Mentions that two eyes allow depth perception or better perception of distance. |
| 11 | Mentions that two eyes allow seeing more or a wider field of vision. |
| 12 | Mentions that with two eyes one is still working if one eye is damaged. |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | Mentions seeing twice as much. |
| 71 | Refers to energy or effort. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Heating Tube with Balloon Over It

Item S14

The water in a tube is heated, as shown in the diagram. As the water is heated, the balloon increases in size. Explain why.


FREQUENCIES OF MATCHED CODES

| | 10 | 11 | 19 | 70 | 71 | 76 | 79 | 90 | 99 | ROW SUM |
|----|-----|------|-----|-----|-----|----|------|----|-----|---------|
| 10 | 156 | 296 | 176 | 48 | 37 | 0 | 161 | 2 | 0 | 876 |
| 11 | | 2676 | 469 | 189 | 58 | 0 | 488 | 6 | 3 | 3889 |
| 19 | | | 134 | 226 | 170 | 15 | 429 | 6 | 1 | 981 |
| 70 | | | | 339 | 65 | 13 | 327 | 7 | 0 | 751 |
| 71 | | | | | 112 | 12 | 221 | 2 | 0 | 347 |
| 76 | | | | | | 37 | 180 | 7 | 2 | 226 |
| 79 | | | | | | | 1608 | 91 | 5 | 1704 |
| 90 | | | | | | | | 68 | 34 | 102 |
| 99 | | | | | | | | | 274 | 274 |

| | |
|--------------------------------|-------------|
| TOTAL VALID COMPARISONS | 9150 |
|--------------------------------|-------------|

Coding Guide

| Code | Response |
|---------------------------|---|
| Correct Response | |
| 10 | Mentions explicitly that expansion is due to increased pressure of air/gas/water vapor when tube is heated. |
| 11 | States that the water evaporates. |
| 19 | Other correct. |
| Incorrect Response | |
| 70 | Mentions that hot air [or gas] always rises. |
| 71 | Mentions that air particles [or molecules] expand when heated. |
| 76 | Merely repeats information in the stem. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

Diagram: Rain from Another Place

Item S15

Draw a diagram to show how the water that falls as rain in one place may come from another place that is far away.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | |
|------------------------------|-------|------|------|-----|-----|------|------|-----|------|---------|
| | 20 | 10 | 11 | 12 | 19 | 70 | 79 | 90 | 99 | ROW SUM |
| 20 | 16095 | 1046 | 2238 | 370 | 553 | 461 | 288 | 71 | 18 | 21140 |
| 10 | | 3355 | 175 | 90 | 296 | 3082 | 770 | 105 | 1 | 7874 |
| 11 | | | 777 | 16 | 159 | 277 | 235 | 32 | 0 | 1496 |
| 12 | | | | 102 | 26 | 30 | 48 | 5 | 0 | 211 |
| 19 | | | | | 28 | 273 | 225 | 20 | 0 | 546 |
| 70 | | | | | | 6439 | 1925 | 441 | 14 | 8819 |
| 79 | | | | | | | 1293 | 240 | 1 | 1534 |
| 90 | | | | | | | | 322 | 252 | 574 |
| 99 | | | | | | | | | 3856 | 3856 |

TOTAL VALID COMPARISONS 46050

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 20 | Response includes the three following steps: i. Evaporation of water from a source. ii. Transportation of water as vapor/clouds to another place. iii. Precipitation in other places. |
| Partial Response | |
| 10 | As in code 20 but response does not mention evaporation. |
| 11 | As in code 20, but response does not mention transportation. |
| 12 | As in code 20, but response does not mention precipitation. |
| 19 | Other partially correct. |
| Incorrect Response | |
| 70 | Response indicates precipitation only; it may use vertical or diagonal lines. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

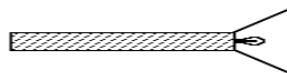
Flashlight with Reflector

Item S16

Jim and Sandy each make a flashlight from identical batteries and bulbs. Sandy's flashlight contains a reflector, while Jim's does not.



Jim's flashlight



Sandy's flashlight

Which flashlight shines more light on a wall 5 meters away, Jim's or Sandy's? Explain your answer.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | | |
|------------------------------|------|----|-----|------|----|-----|-----|-----|-----|------|----|-----|---------|
| | 10 | 11 | 12 | 19 | 70 | 71 | 72 | 73 | 76 | 79 | 90 | 99 | ROW SUM |
| 10 | 1489 | 68 | 360 | 1014 | 13 | 16 | 10 | 6 | 256 | 1132 | 19 | 0 | 4383 |
| 11 | | 53 | 221 | 44 | 4 | 6 | 7 | 0 | 2 | 53 | 1 | 0 | 391 |
| 12 | | | 981 | 118 | 4 | 25 | 15 | 0 | 16 | 280 | 7 | 0 | 1446 |
| 19 | | | | 347 | 6 | 5 | 3 | 7 | 196 | 1105 | 16 | 0 | 1685 |
| 70 | | | | | 52 | 54 | 102 | 0 | 9 | 38 | 2 | 0 | 257 |
| 71 | | | | | | 152 | 202 | 8 | 1 | 71 | 4 | 0 | 438 |
| 72 | | | | | | | 162 | 4 | 5 | 116 | 12 | 0 | 299 |
| 73 | | | | | | | | 468 | 33 | 75 | 3 | 0 | 579 |
| 76 | | | | | | | | | 690 | 301 | 9 | 0 | 1000 |
| 79 | | | | | | | | | | 1892 | 85 | 0 | 1977 |
| 90 | | | | | | | | | | | 1 | 0 | 1 |
| 99 | | | | | | | | | | | | 144 | 144 |

TOTAL VALID COMPARISONS 12600

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 10 | Sandy's. The reflector reflects all the light towards the wall. |
| 11 | Sandy's. In Jim's flashlight the light shines in all directions. |
| 12 | Any combination of codes 10, 11. |
| 19 | Sandy's. Other correct explanations. |
| Incorrect Response | |
| 70 | Jim's. |
| 71 | Jim's but with an explanation that belongs to Sandy's. |
| 72 | Jim's with another explanation. |
| 73 | Jim's or Sandy's, with no explanation. |
| 76 | Merely repeats information in stem. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |

New Species in Area

Item S17

What could be the unwanted consequences of introducing a new species to a certain area? Give an example.

| FREQUENCIES OF MATCHED CODES | | | | | | | | | | | | |
|------------------------------|-----|-----|----|------|-----|-----|-----|-----|-----|-----|------|---------|
| | 20 | 21 | 29 | 10 | 11 | 12 | 19 | 70 | 79 | 90 | 99 | ROW SUM |
| 20 | 112 | 271 | 44 | 131 | 65 | 29 | 52 | 17 | 20 | 2 | 0 | 743 |
| 21 | | 275 | 53 | 242 | 170 | 22 | 106 | 63 | 53 | 3 | 0 | 987 |
| 29 | | | 26 | 111 | 39 | 65 | 63 | 24 | 39 | 2 | 0 | 369 |
| 10 | | | | 1495 | 57 | 467 | 508 | 80 | 380 | 37 | 2 | 3026 |
| 11 | | | | | 65 | 43 | 55 | 47 | 69 | 6 | 0 | 285 |
| 12 | | | | | | 389 | 142 | 106 | 115 | 9 | 0 | 761 |
| 19 | | | | | | | 105 | 44 | 280 | 18 | 0 | 447 |
| 70 | | | | | | | | 156 | 90 | 13 | 0 | 259 |
| 79 | | | | | | | | | 517 | 181 | 9 | 707 |
| 90 | | | | | | | | | | 70 | 94 | 164 |
| 99 | | | | | | | | | | | 1381 | 1381 |

TOTAL VALID COMPARISONS 9129

Coding Guide

| Code | Response |
|---------------------------|--|
| Correct Response | |
| 20 | States that the natural (ecological) balance will be upset. A realistic example of a species is given. |
| 21 | States that the new species may take over and gives examples. |
| 29 | Other correct responses with examples. |
| Partial Response | |
| 10 | Adequate explanation (as in codes 20, 21), but no concrete and realistic example is given. |
| 11 | Only the realistic example is given, but no explanation. |
| 12 | States the new species cannot live here. |
| 19 | Other partially correct. |
| Incorrect Response | |
| 70 | Only an unrealistic example is given. |
| 79 | Other incorrect. |
| Nonresponse | |
| 90 | Crossed out/erased, illegible, or impossible to interpret. |
| 99 | BLANK |