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ABSTRACT This appendix to the Mathematical Problem Solving Project "Module Development and Formative Evaluation" contains quizzes for trials 1 and 2 for the module entitled "Using Guesses to Solve Problems." Teachers' comments from these trials are included. (MP)

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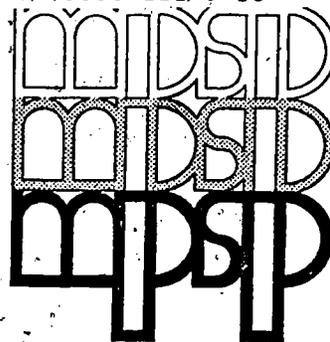
TECHNICAL REPORT III: Module Development and
Formative Evaluation

APPENDIX C - Using Guesses to Solve Problems
Quizzes and Data

BEST COPY AVAILABLE

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**MATHEMATICAL
PROBLEM SOLVING
PROJECT**



A Project of the
MATHEMATICS EDUCATION DEVELOPMENT CENTER

Project Supported by

National Science Foundation Grant PES74-15045

OSF 026 921

Appendix C

1. Teachers' Comments from the 1974-75 Trial in the Oakland County Schools

General Comments

1. Students are much more willing to work and get involved - more industrious, especially when grades are not given.
2. Because of individual teaching styles some teachers tend to skip, emphasize, or feel more comfortable with certain aspects than others. It is partly whether or not the topic is part of the standard curriculum. The grade in which G-T is taught is significant as to content and for assumptions.
3. Too much of the same thing (booklet) as we went farther in the booklet, the kids tended to get bored.
4. Is the point of G-T to "teach guessing?" If so, then all the computation is not necessary. If the point is to teach computation after the guess is made, then we can't do it in this short a time.
5. What is involved in the G-T process? Is it fair to provide students with background information for example?
6. How well would a class do with the cards if they did not have the booklet previously?
7. The problem (questions) in the booklet should be numbered. Also answer space should be provided.
8. Cut down on each session to make total time shorter.
9. Booklet: too lengthy
10. Would rather use some of the booklet activities to stir interest and motivation; not book in its entirety.
11. Perhaps it would have been better if we had started with a module such as the organized list and kept the G-T module which uses many of the skills for later.
12. It would be helpful if we stayed in the metric system throughout the booklet.
13. Kids get tired of the booklet in the 3rd or 4th sessions - they worked each day until the booklet was finished.
14. How about numbering problems to make it easier for students that don't write in the books. (Not everyone will always use these as consumable even if they are intended to be.)
15. Use headings that stand out more to show where one kind or set of problems begins or ends. (See p. 6-7)

16. Answers are too convenient for kids. They don't give themselves enough time to figure out problems before looking in the back of the booklet.
17. Would put the following pages in other booklets: 4, 6-14. The children enjoyed the booklet but the above change would help shorten it.
18. Would add another page of problems to guess and test out, e.g. like problems on page 15.
19. A great deal of assistance is needed. Students expected to discuss the problems.
20. How might 4th graders handle these problems?
21. Became tiring after a while; too much of the same thing.
22. Student: Interesting because it caused me to think.
23. Answers in back - tendency to look at answers rather than solve problems.
24. Often, too much background information is necessary.
25. Everyone felt the booklet became boring: too long; get tired of math; only once a week rather than three times a week.

Session I

26. Good for getting kids to "free up."
27. Kids felt free to disagree with each other.
28. P. 4. To what degree do they "guess" as opposed to "calculate?"
29. Being able to make a guess and to really check out (active, hand-on) were most interesting: p. 3 1,2,3, ...
30. p.1 #1 need units like stories, feet, etc.; #2 "foot steps"; #8 "in hours"; #6 "steer" better.
31. Need more answer space and number the problems (p.6).
32. The children liked page 1.
33. p. 3 #1 Make a guess and test with a stopwatch.
34. p. 4 put this page in another booklet.
35. p. 1, 2 Good page. Give units. Let's keep it metric.
36. p. 3 "According....guesser?" did not stand out so it was overlooked by accident. #1-5 at bottom - had most fun with these.
37. Sessions 1 and 2 were just fine -- not too long.

38. p. 4 #1½ total number of pieces _____. #8 guess or calculate???
39. Fun. p. 2 Easy p. 4 Hard p. 5 #2 easiest #4 hardest.
40. p. 1 #5 After this problem, students anticipated trick questions.
#6 Many thought as trick question -- cow is living.
41. If units were suggested on p. 1, less teacher direction would be needed.
42. p. 2 gives actual answers, not a range.
4. p. 4 Kids enjoyed this!!
44. p. 1 Kids really liked this. Also p. 2, 3.
p. 4 difficult for many kids but were enthusiastic.
p. 5 kids enjoyed.

Session II

45. Organized list too vague to many kids -- need a unit on it.
46. p. 6 six blanks gives answer away -- kids want to know why bother doing it. Use table

N	D	P
---	---	---
47. p. 6 could extend the number of blocks so kids could do a similar problem and possibly find a problem.
48. Could delete session because I don't see it as G-T. However, it was fun and helpful for using the cards.
49. p. 10 #7 #9 are extremely vague.
50. 50-50 some kids did not think interesting.
p. 7 #1, #2 fairly simple - kids liked.
p. 8 #3 a challenge, kids liked.
51. p. 6 layout is difficult to understand.
52. p. 6 Kids figured out number of answer spaces represented the number of combinations and did not bother to do the steps.
53. p. 7 The solution caused trouble, i.e., 10-0 an answer?
54. p. 10 What is the left hand bike supposed to look like? Must one bike be 5?
55. p. 6 Don't see as G-T.
56. p. 6-7 5th graders don't like blocks.
57. p. 10 #7 Some kids thought \$5 and \$75 were the only choices.
58. p. 9 #5 "every other" sounds like some nails should be skipped.
59. Harder than I thought.

60. p. 7 #1 not clear as to acceptability of 10-0 and 0-10.
61. p. 6 Kids filled in blanks without knowing they were making a list. Art might help; needs more direction.
62. p. 7 bottom: why isn't this problem numbered 3?
63. p. 6-7 I think this is a necessary skill and well done, but I'm not sure it belongs in the G-T booklet. I would rather it be left out of the booklet and in one on Organized Lists. I don't really feel you are guessing.
64. Some students missed vital information p. 10 #8: Total increase was 50°C. #9 child weighed 7 lbs. at birth.

Session III

65. Rounding unnecessary for 6th graders.
66. Needed more activity.
67. Did not enjoy p. 13 p. 11-12 too easy
68. Doubtful necessity; least fun -- too much like "math".
69. Would put in a booklet on estimating. However, kids did well and is a necessary skill.
70. p. 15 good set of G-T. Keep this in.
71. p. 11-14 good for rounding and estimating but didn't seem to fit this booklet.
72. p. 13 Could have been more exciting (but don't know how)
73. Forget this session.
74. p. 13 More confusing than helpful. #3: do we use 10 or 100 or either? How do we know?
75. p. 14 needs more answer space. This page does not give any help for p. 15.
76. Excellent session, but not necessary.
77. P. 13 top: error $9 \times 10 = 90$, not 9×90 .
78. p. 15 #5 written poorly; can get answers 11 or 20.
79. p. 15 #1 some simplified: 10 and 2 -- answer 4 and 6
80. p. 15 too easy.
81. Students began to feel, at this point, the booklet was "just math" and much of the initial interest and enthusiasm was lost.

82. Those who knew estimating didn't need it. Those who didn't need more than one lesson.
83. I feel estimation could best be taught as a prerequisite to G-T.
84. p. 13 too traditional to maintain interest.
85. p. 15 Many students enjoyed these problems but felt there was one exact answer. Therefore, it was not guessing or a game.
86. Many students were tired of computation by the time they reached p. 15.
87. Really unnecessary for 6th graders. This work is done in "math" - Children's attitude was poor, and this was tedious for them.
88. p. 15 excellent.
89. Good, not hard (whole session)

Session IV

90. p. 20 test - kids tend to score high.
91. p. 18 need full-size or all in proportion drawings. Not the way they are -- makes guesses too difficult.
92. Flagpole - how was this intended to be done? Do we measure objects in the picture; how much is to be estimated? How are guesses tested?
93. p. 18 Some thought pencil picture was really 18 cm.
94. Moved too fast.
95. p. 20 Test not related to G-T booklet.
96. p. 18 give an actual cm segment picture.
97. p. 18 Assumes metric background.
98. p. 16 good pages.
99. p. 18 need to make clear they are to guess about real world things, not the pictures.
100. p. 16 Kids did not know whether or not they could use a ruler to measure and calculate the relative sizes.
101. Many students thought the tags indicated models of the actual measurement.
102. p. 16 drawing not proportional? but page was fun.
103. Fun but hard.
104. p. 18 #3 answer not realistic.
105. p. 19 Should they estimate or work out?

106. p. 17 #2 trick question?
107. p. 19 #3 Make clear it is the desk referred to in question.
#4 The picture door? not classroom doorknob.
108. I like Dr. Wells' idea about a chart that the kids would fill out by measuring the items themselves; then an example to show how to do the rest of it.

Door length - w - Chalk length - wt - etc.
--

109. Not enough info to estimate bread and pop weights.
110. p. 17-19 we changed from "guess" to "estimate!"

Session V

111. p. 21 #2 Children liked; good problem for guessing.
112. p. 23-25 good problems
113. p. 23 #5 too hard for "A"

Answers

114. p. 28 Session IV p. 20 Test #10 missing

Cards

115. What about "hint" cards?
116. Kids started working at the outset (generally) rather than making a guess and then testing.
117. One problem per card - good psychological impact on kids.
118. - More cards should require guess before working--they see no advantage to guessing before working.
119. Need some easier cards prior to blue - especially for 4th grade level. There aren't enough easy problems.

Appendix C

2. Teachers' Comments, Trial I, 1975-76

Lesson 1

page 1 - Comments to the teachers were good. Kids were very excited.

Very easy, students expected a trick or something.

Numbers 1 & 2 should be separated more.

Majority of children got the idea quickly.

Not clear that only those 4 digits should be used.

Students were able to understand this page.

page 2 - Many gave the same answer as the examples but permuted the numbers.

Not sure where to write their answers.

Confusing format: students thought there were 3 answers for #1.
Tags were not used.

Students did not want to use tags. Very easy and got the students
in the spirit of the booklet.

"You might make more guesses to get the answers" -- Add this.
Instead of "Record your..."-- Use "Do your work here."

No problem--worked well.

Some students reluctant to guess.

page 3 - Worked individually.

Layout is confusing.

Tags were not used. Layout is confusing.

Easy, even for the slow students.

The children loved this page--even the 3rd graders who did not
have multiplication did repeated addition.

Did not use tags.

Some students began to lose interest.

page 4 - A little confusing for them.

OK.

Students did not have 2 digit x 2 digit multiplication yet.
Division with remainder new to them.

Easy.

This page more suited for late 4th and 5th grade. The names confused them.

Time began to drag. Some caught on right away--others had trouble.

page 5 - Did quite well. This is the lowest math group and they're doing great!

Not sure where to mark their answers.

Students are having fun--just the right difficulty level for 5th grade.

Not real clear what her guesses are.

page 6 - Very enjoyable. Did not take too long. Students did not get bored.

#1 needs reworded.

#1 poorly worded.

Bonus question confusing. Students unclear what to do but they enjoyed doing them after they were explained. Good attitudes!

I was surprised that some of the slower students were able to do these. Most students did the bonus problem.

Do bonus problem numbers have to be in order? Do the lengths have to be exact? We've been estimating.

Bonus problem was time-consuming but they enjoyed it.

Lesson 2

page 7 - Students enjoyed this page!

No problems. Students had seen ones like this before. Some missed both conditions.

Very easy.

Some difficulty with the last one--especially in grade 3.

Worked well.

Some were reluctant to guess.

page 8 - 1 - 3 easy; 4 difficult; 5 threw them

"Your answers use..." add 2 and 4

"Your answers use..." -- confusing; #6 too difficult.

2 and 3 had to be done as a class--it was new material. Remainder of the lesson was done independently.

"Your answer..."--confusing. Students were challenged but had fun. 1 - 3 easy, but fun.

#6 wording is difficult.

Students were familiar with an organized list and used this rather than guessing.

Crowded appearance.

"Your answer..."--applies to which one? Difficult for 1/3 of 4th graders. All had trouble with #6.

page 9 - Fatigue and some became discouraged.

Cartoons are confusing.

Good attitudes.

Most students did these orally.

All the drawing made it somewhat confusing.

Did fine on all but the last one--"goofy names."

Hints were clear.

page 10 - Students really enjoyed this page but became restless near the end of the period.

Cartoons are confusing.

Many students needed help with #3.

Fun and easy.

Several children in grades 3 & 4 floundered on this.

Worked well.

page 11 - "Not only restless but a few are falling on the floor." Too much for this group. No time for the last one.

Many students found this page too difficult. Easy problems are needed.

Some difficulty visualizing the situations. Students have had little experience with word problems.

This blew their minds! Students solved only 2 of them. Better students did them all. 1, 2, and 3 are appropriate; 4 more difficult; 5 confusing.

Worked well.

Reword #4.

Lesson 3

page 12 - Most students missed #2.

No problems. Enjoyed it for the most part.

Did a whole class.

Easy.

Worked well.

page 13 - Students enjoyed this page.

Some found it difficult; especially perimeter.

Children loved this page.

#5 had to visualize.

They loved these.

Kids had fun with this.

3 & 4 worked well. Most students needed help with 5.

Interesting to many students.

page 14 - Students enjoyed this page. #1--students gave only 1 answer.

Students enjoyed entire page. Entire page had to be read to the students.

#1--students gave only one answer.

Fun for all ability levels. Chance for slower students to do well.

Proved to be more difficult.

Worked well, but #1 needed considerable explanation.

#1 confusing for some.

page 15 - Confusing diagram. Weren't sure what 2 & 3 were asking.

Hard to illustrate to students--easy to verbalize.

Too much reading for a simple problem. They have done problems like this before which were more difficult.

Too much reading--only the first paragraph is necessary. It took a long time but they solved it.

Had some trouble but loved it.

Confusing diagram. *A boat can't go across alone!

Confusing for many.

page 16 - Students had difficulty checking the correctness of their answers.

Students did not know that #1 was a problem. #2 was difficult; #3--"crossing points was confusing." Few had time or were willing to do the bonus.

Easy.

Students are getting restless.

Difficulty with 2 and 3.

Had fun with it.

#1 worked well; #2--wording not clear; #3--what are "crossing points"? Interest remained high.

#3 interesting but had difficulty getting through.

Lesson 4

page 17 - OK, but perspective on #2 is poor.

#1--difficulty interpreting on the ruler.

Confused about "top of the door." They've had similar problems before.

#2 confusing--They wanted to measure.

Took too much time and the perspective was poor on the entire page.

Worked well.

page 18 - Low interest. Students wanted to measure each others.

Very difficult. Pictures were confusing. Diagram at the top does not smac with those in the middle.

"Terrible," too much time! Could it be eliminated? Scale different at the top of the page and in the middle.

Confusing.

Very confusing. It should be done as a class activity having the students measure their own paces.

Most found this page confusing--too many dimensions. This page should be revised. Especially difficult for 3rd graders.

Very difficult as set up. Too much time required. 4th grade needs more rounding-off experience before doing this.

Where is the initial point of reference?

page 19 - More interest on this page. They used the span for #1 because they looked at the pictures first.

"Span" was new and uncomfortable to use at first.

Confusing, unfamiliar. Individual work better for this page.

Students were very interested in this page.

"Span" was not understood; #3 was confusing.

Worked well but needed much direction. The interest level was lower than previously.

Some found measuring fun.

page 20 - #2--answer given on the next page; #4 and 5--too many different types and students were confused.

Centimeter and gram together was confusing.

Rings, pens, etc. are not unique.

Many students wanted to do this using rulers.

#4 and 5--change--maybe use football.

I skipped this page because those who had tried it said it was not any good.

Difficulty visualizing this.

page 21 - Fine--no confusion.

"Good lesson."

Over 1/2 the class disliked the entire lesson.

Students measured rather than estimated--no problems.

I skipped this page because those who had tried it said it was not any good.

page 22 - Students were frustrated with the diagrams. A live situation would be better.

A live situation would be better.

Use a real situation.

Many did very well on this page.

Many questions.

I skipped this page because those who had tried it said it was not any good.

Lesson 5

page 23 - General Comments:

Good attitudes. The students were excited about getting the right answers.

Excellent--good problems and good length. Interest revived.

Students were tired of the booklet at this point. Good attitudes.

Students were not as frustrated as with previous problems.

- Specific Comments:

Set A

Worked well; #3 difficult, 80% able to do individually.

Set B

Had fun but did terrible.

Worked well.

Set C

Used a calculator and the students loved it.

Found difficult but the students loved it.

Only 3 students in 5th grade did this set.

Comments about the entire lessons:

Lesson 3 - All of this lesson was easy! Some students finished very quickly--others did not get into the swing of things and withdrew completely.

Lesson 4 - This lesson should have ended with page 20.

Lesson 2 - Too long for this group!

Lesson 1 - Students were very eager to begin. 75% wanted to do all of page 6 and go on. In general, the students were able to do the entire lesson with some help from me and also get the correct answers for these pages.

Lesson 2 - The interest was high. Over 85% enjoyed the lesson. Performance level was high.

Lesson 2 - Too long for one session.

Appendix C

3. Teachers' Comments, Trial II, 1975-76

Lesson 1

1. (p.1) - Grammatical error in the picture..Check the word "problem's."
2. (p.3) - Change "Ev" to a more obvious boy's name.
3. (p.4) - The order of the problems should be
 - 1st - problem #3
 - 2nd - problem #2
 - 3rd - problem #1
4. (p.1A) - Place "1A" on each problem in order that the teacher can tell which section the cards are from if the students are working individually.

Lesson 2

1. (p.7) - Problem #3 is very difficult. A picture would be helpful.
2. (p.5) - Place 2 lines for the answers as in the previous problems.

Lesson 3

1. (p-10) - Use a "square" in the example or include a note to the student that a square is a rectangle.
2. (p.11) - Problem #1 - Use common names. Also, the artwork needs to be improved.
3. (p.12) - Include a "hint" ... "All the pieces do not have to be the same size." (This might come with the teacher's notes.)

Lesson 4

1. (p.13) - There are not correct answers for 1 and 2.
 - (b) Since the students have their math text in front of them, have them (1) see how many pages are in their math text, (2) have the teacher show the class a larger text, and (3) have the students guess the number of pages.
2. (p.16) - "Remember" is misspelled in #2 at the top.
3. (p.16) - At the top, #3 was very difficult for the students to understand.

Lesson 5

1. The coloring arrangement in this section does not agree with the deck:

Recommendation: p. 18 - blue

p. 19 - blue

Additional Comments from In-Service

1. The extra problems for each section are a good idea.
2. Include the page number on all "extra" problems at the end of each section.
3. More problems should be included at the end of each section. Perhaps one additional page of "very challenging" problems.
4. Include additional copies of the "extra" problems in the teachers edition. There are now 2 pages, include at least 3.

4. Module Quizzes, Trial I, 1975-76

Name _____

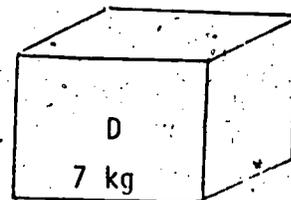
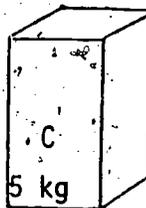
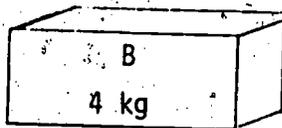
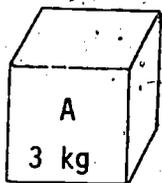
Date _____

Grade _____

Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1.



Three boxes on a scale weigh 16 kg. What three boxes are on the scale?

- A. B, C, and D
- B. C, C, and D
- C. A, B, and C
- D. A, A, A, and D
- E. B, B, and D

2. $5 \{ \} 3 \{ \} 2 = 13$

What goes on the tags: -, x, + ?

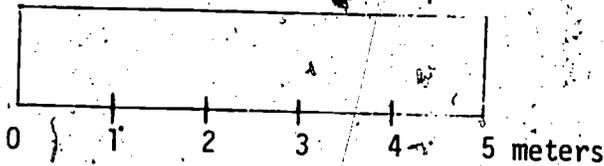
- A. x, x
- B. +, +
- C. +, x
- D. -, +
- E. x, -

3. Joe has 85 marbles and 7 friends. He wants to give away as many marbles as he can, but he wants to be sure each friend gets the same number. How can he do this?
- A. Give each friend 10 marbles, then each would have the same number.
 - B. Give each friend 14 marbles.
 - C. Give 5 friends each 15 marbles and two friends each 5 marbles. That would be 85 marbles.
 - D. Give out only 77 marbles, 7 will not go into 85 evenly.
 - E. Give each friend 12 marbles and keep one himself. 7×12 is very close to 85.
4. Apples cost 15¢ and oranges cost 20¢. Sam spent exactly 50¢ for apples and oranges. How many apples did he buy?
- A. 0
 - B. 1
 - C. 2
 - D. 3
 - E. 4
5. Sara is thinking of two numbers. Their sum is 40 and their difference is 8. What numbers is she thinking of?
- A. 24 and 16
 - B. 48 and 32
 - C. 30 and 10
 - D. 16 and 8
 - E. 20 and 12

6. Tom has 5 coins. Some are dimes and some are nickels. The value of Tom's coins is 35¢. How many dimes does he have?

- A. 4
- B. 1
- C. 3
- D. 2
- E. 0

Joan has a board 5 meters long. She wants to cut the board into two pieces so that one piece is twice the length of the other. Where should she cut the board?



- A. Between 0 and 1
- B. Right on 1
- C. Between 1 and 2
- D. Right on 2
- E. Between 2 and 3

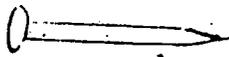
8. Ten pennies are put into 4 piles. Each pile has a different number of pennies in it. How many pennies are in the biggest pile?

- A. 3
- B. 7
- C. 6
- D. 5
- E. 4

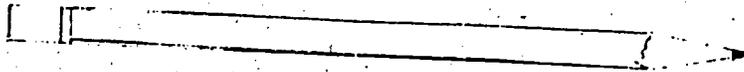
9. Do not work this problem. In the space below draw a diagram that would tell the story of the problem.

John has 3 candy bars. He traded each candy bar for 4 marbles. How many marbles did John get by trading?

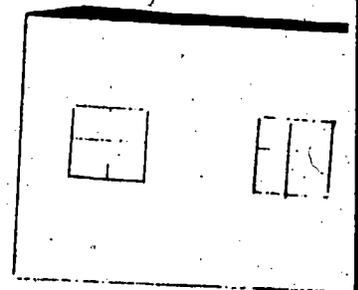
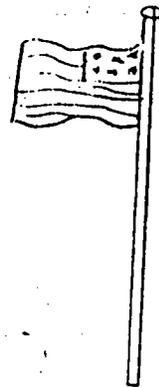
10.



The nail is 3 cm long. Estimate the length of the pencil.



- A. 25 cm
B. 5 cm
C. 20 cm
D. 15 cm
E. 10 cm
11. The height of the flag pole is 10 meters. Estimate the height of the building.
- A. 7 meters
B. 5 meters
C. 3 meters
D. 10 meters
E. 13 meters



12. Estimate the length of your arm.

- A. 90 cm
- B. 30 cm
- C. 120 cm
- D. 50 cm
- E. 150 cm



Please write down on this page your work and tell us as much as you can about how you worked the problem 13.

13. In her piggy bank Vera has 20 coins whose value is \$1.40. She only has dimes and nickels. How many of each does she have?

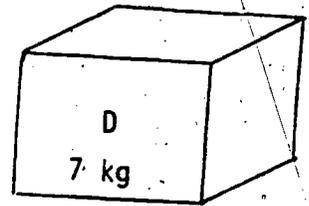
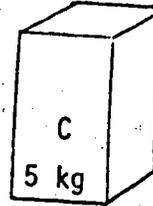
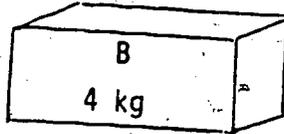
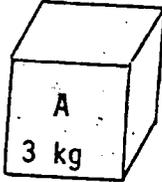
Answer:

Name _____
Grade _____

Date _____
Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1.



Three boxes on a scale weigh 16 kg. What three boxes are on the scale?

- A. A, A, A, and D
- B. A, B, and C
- C. C, C, and D
- D. B, B, and D
- E. B, C, and D

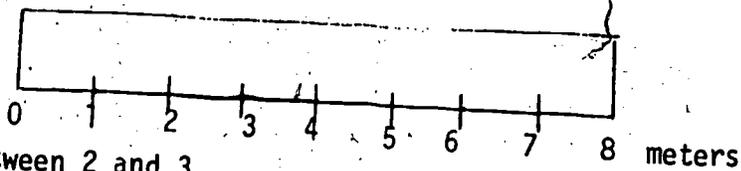
2. $5 \text{ () } 3 \text{ () } 2 = 17$

What goes on the tags: -, x, +?

- A. x, x
- B. +, +
- C. x, -
- D. x, +
- E. +, x

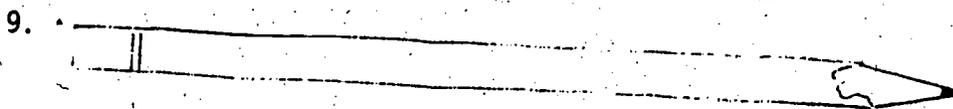
3. Harry only has quarters and dimes. Some kids made guesses about how much money Harry could have. Which guess does not belong?
- A. Lisa guessed 55¢
 - B. Laura guessed 30¢
 - C. Leo guessed 20¢
 - D. Carrie guessed 45¢
 - E. Sam guessed 15¢
4. Pears cost 15¢ and oranges cost 20¢. Sam spent exactly 65¢ for pears and oranges. How many pears did he buy?
- A. 3
 - B. 2
 - C. 4
 - D. 0
 - E. 1
5. Jane is thinking of two numbers. Their sum is 30 and their difference is 6. What numbers is she thinking of?
- A. 36 and 24
 - B. 20 and 10
 - C. 12 and 6
 - D. 22 and 8
 - E. 18 and 12
6. George has 5 coins. Some are dimes and some are nickels. The value of George's coins is 40¢. How many dimes does he have?
- A. 2
 - B. 0
 - C. 3
 - D. 1
 - E. 4

7. Joyce has a board 8 meters long. She wants to cut it into two pieces so that one piece is 2 meters longer than the other. Where should she cut the board?

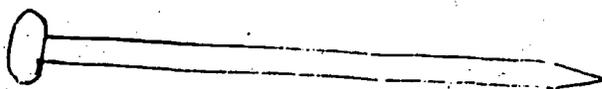


- A. Between 2 and 3
B. Between 3 and 4
C. Right on 3
D. Right on 4
E. Right on 6
8. Ten pennies are put into 3 piles. Each pile has a different number of pennies. The smallest pile has 2 pennies in it. How many are in the biggest pile?

- A. 5
B. 7
C. 4
D. 8
E. 6



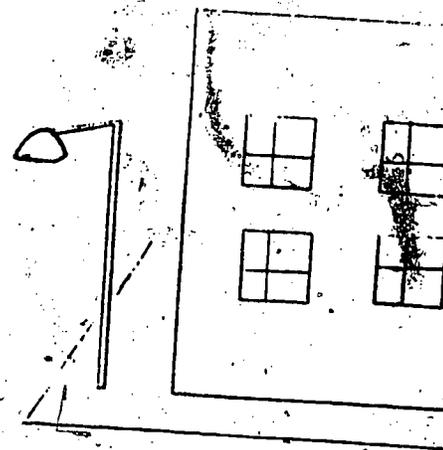
The pencil is 12 cm long. Estimate the length of the nail.



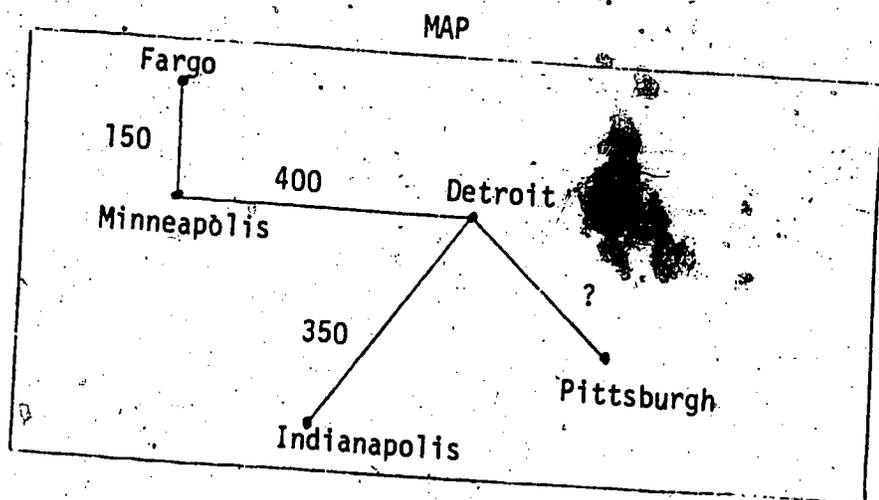
- A. 11 cm
B. 6 cm
C. 4 cm
D. 8 cm
E. 15 cm

10. The building is 10 meters high.
Estimate the height of the street
light.

- A. 3
- B. 10
- C. 12
- D. 7
- E. 5



11.

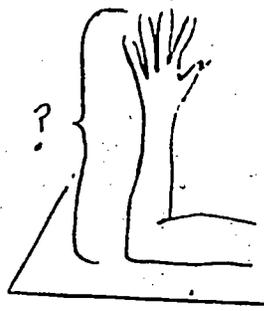


Willy was planning a trip from Fargo to Pittsburgh. The map did not have the number of miles between Detroit and Pittsburgh. Which is the closest estimate to the distance between Detroit and Pittsburgh?

- A. 350 miles
- B. 100 miles
- C. 300 miles
- D. 250 miles
- E. Not enough information given to tell.

12. Estimate the length from your elbow to your finger tips.

- A. 30 cm
- B. 50 cm
- C. 10 cm.
- D. 90 cm
- E. 120 cm



Please write down on this page your work and as much as you can about how you worked problem 13.

13. Kay has 90 golf balls in boxes. The large size box holds 10 golf balls. The small size boxes hold 7 golf balls. All of the boxes Kay has are full. How many small and how many large size boxes does Kay have?

Answer:

Name _____

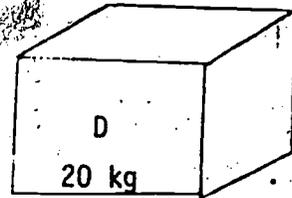
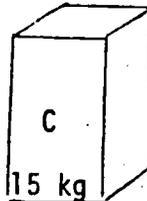
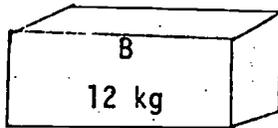
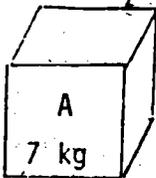
Date _____

Grade _____

Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1.



Three boxes on a scale weigh 42 kg. What three boxes are on the scale?

A. B, B, and C

B. D and D

C. A, C, and D

D. A, A, and C

E. B, C, and D

2. $9 \text{ } \textcircled{-} \text{ } 7 \text{ } \textcircled{-} \text{ } 5 = 7$

What goes on the tags: -, x, +?

A. -, -

B. -, +

C. x, -

D. +, x

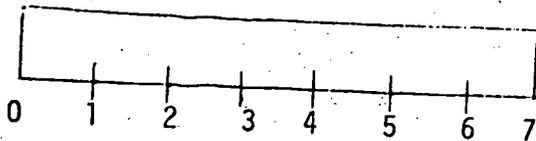
E. +, +

3. Apples cost 14¢ and bananas cost 15¢. Sam spent exactly \$1.30 for apples and bananas. How many bananas did he buy?
- A. 2
 - B. 5
 - C. 4
 - D. 0
 - E. 3
4. Joe has 85 marbles and 7 friends. He wants to give away as many marbles as he can, but he wants to be sure each friend gets the same number. How can he do this?
- A. Give each friend 10 marbles, then each would have the same number.
 - B. Give 5 friends each 15 marbles and two friends each 5 marbles, that would be 85 marbles.
 - C. Give out only 77 marbles, 7 will not go into 85 evenly.
 - D. Give each friend 12 marbles and keep one himself. 7×12 is very close to 85.
 - E. Give each friend 14 marbles.
5. Cathy is thinking of two numbers. Their sum is 68 and their difference is 12. What numbers is she thinking of?
- A. 35 and 23
 - B. 70 and 56
 - C. 40 and 28
 - D. 34 and 22
 - E. 44 and 24

6. Tom has 10 coins. Some are dimes and some are nickels. The value of Tom's coins is 85¢. How many dimes does he have?

- A. 8
- B. 7
- C. 5
- D. 3
- E. 1

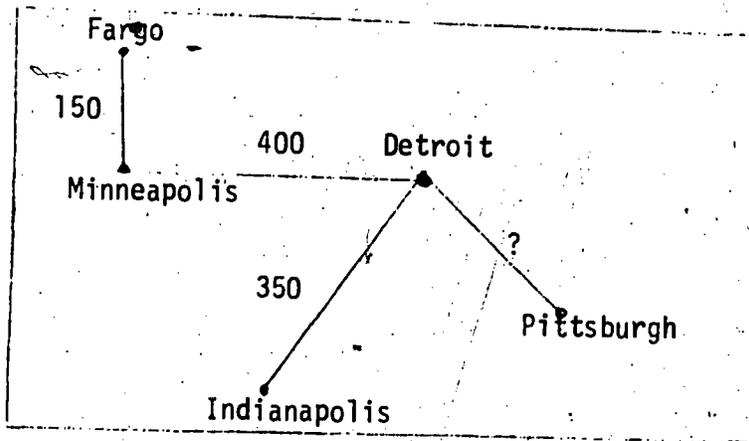
7. Barbara has a board 7 meters long. She wants to cut the board into two pieces so that one piece is twice the length of the other. Where should she cut the board?



- A. Between 1 and 2
 - B. Between 3 and 4
 - C. Between 4 and 5
 - D. Right on 3
 - E. Right on 5
8. 20 pennies are put into 5 piles. Each pile has a different number of pennies in it. How many pennies are in the biggest pile?
- A. 9
 - B. 8
 - C. 7
 - D. 6
 - E. 5

9.

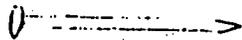
MAP



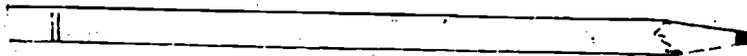
Willy was planning a trip from Fargo to Pittsburgh. The map did not have the number of miles between Detroit and Pittsburgh. Which is the closest estimate to the distance between Detroit and Pittsburgh?

- A. 350 miles
- B. 300 miles
- C. 100 miles
- D. 250 miles
- E. Not enough information given to tell

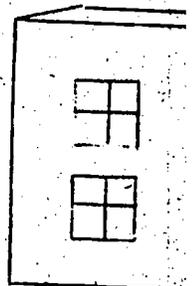
10.



The nail is 3 cm long. Estimate the length of the pencil.

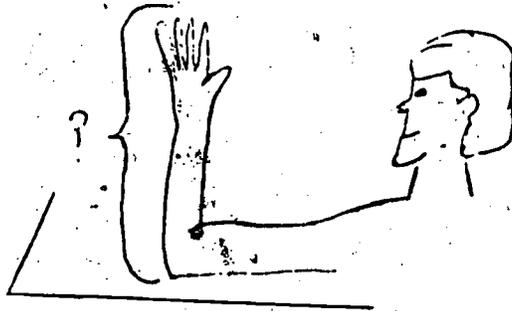


- A. 5 cm
 - B. 8 cm
 - C. 10 cm
 - D. 15 cm
 - E. 20 cm
11. The height of the pole is 15 meters. Estimate the height of the top of the building.
- A. 5 meters
 - B. 8 meters
 - C. 10 meters
 - D. 13 meters
 - E. 15 meters



12. Estimate the length from your elbow to the tips of your fingers.

- A. 20 cm
- B. 30 cm
- C. 50 cm
- D. 90 cm
- E. 100 cm



Please write down on this page all your work and as much as you can about how you worked problem 13.

13. Vera has 12 coins whose value is \$1.40. She only has quarters, dimes and nickels. How many of each does she have?

Answer:

Name _____

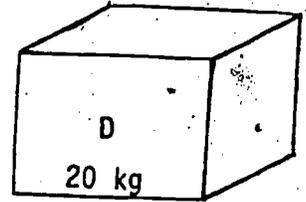
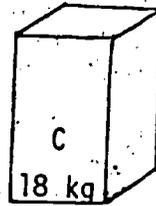
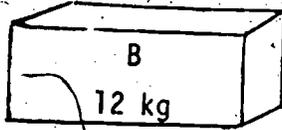
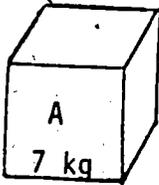
Date _____

Grade _____

Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1.



Three boxes on a scale weigh 39 kg. What three boxes are on the scale?

- A. A, A, A, and C
- B. D and D
- C. A, B, and D
- D. B, B, and A
- E. A, B, and C

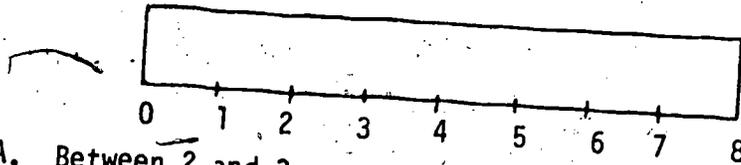
2. $9 \bigcirc 7 \bigcirc 5 = 11$

What goes on the tags: -, x, +?

- A. -, x
- B. +, +
- C. +, -
- D. +, x
- E. -, +

3. Apples cost 14¢ and bananas cost 15¢. Sam spent exactly \$1.00 for apples and bananas. How many bananas did he buy?
- A. 2
 - B. 5
 - C. 4
 - D. 0
 - E. 3
4. Harry only has quarters and dimes. Some kids made guesses about how much money Harry could have. What guess does not belong?
- A. 20¢
 - B. 45¢
 - C. 70¢
 - D. 92¢
 - E. \$1.05.
5. Cathy is thinking of two numbers. Their sum is 76 and their difference is 14. What numbers is she thinking of?
- A. 45 and 31
 - B. 90 and 62
 - C. 40 and 26
 - D. 50 and 26
 - E. 58 and 18
6. Frank has 12 coins. Some are dimes and some are nickels. The value of Frank's coins is 90¢. How many dimes does he have?
- A. 9
 - B. 8
 - C. 7
 - D. 6
 - E. 5

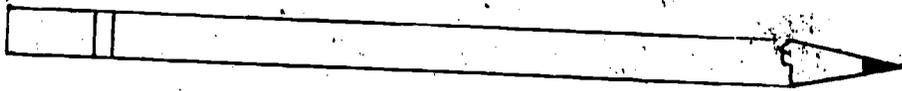
7. Willy has a board 8 meters long. He wants to cut the board into two pieces so that one piece is 3 meters longer than the other. Where should he cut the board?



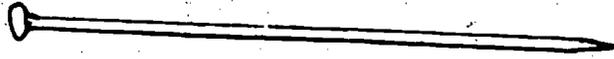
- A. Between 2 and 3
B. Right on 3
C. Between 4 and 5
D. Right on 4
E. Right on 5
8. 20 pennies are put into 4 piles. Each pile has a different number of pennies in it. The smallest pile has 3 pennies. How many pennies are in the biggest pile?
- A. 10
B. 9
C. 8
D. 7
E. 6
9. Do not work this problem. In the space below draw a diagram that tells the story of the problem.

John has 2 candy bars. He traded each candy bar for 5 baseball cards. He then traded each baseball card for 4 marbles. How many marbles did John get by trading?

10.

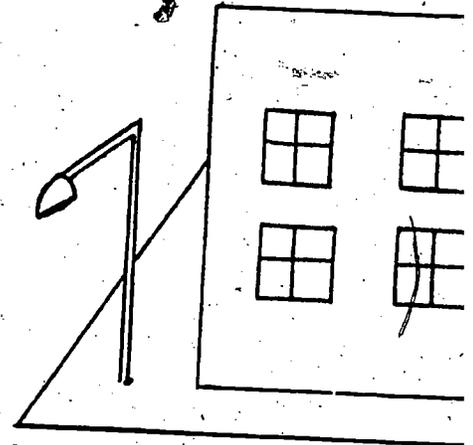


The pencil is 12 cm long. Estimate the length of the nail.



- A. 8 cm
 - B. 6 cm
 - C. 15 cm
 - D. 4 cm
 - E. 11 cm
11. The street light is 10 meters high.
Estimate the height of the building.

- A. 12 m
- B. 17 m
- C. 15 m
- D. 10 m
- E. 5 m



12. Estimate the length of your arm.

- A. 30 cm
- B. 50 cm
- C. 90 cm
- D. 120 cm
- E. 150 cm



Please write down on this page all your work and as much as you can about how you worked problem 13.

13. Patricia has 106 pencils altogether in different colored boxes. Red boxes hold 7 pencils each, blue boxes hold 12 pencils each, and green boxes hold 20 pencils each. Patricia has 10 full boxes of pencils. How many boxes of each color does she have?

Answer:

Name _____

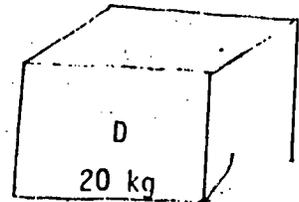
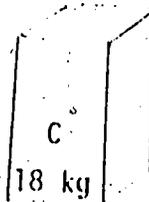
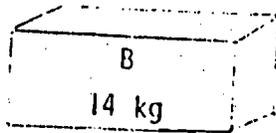
Date _____

Grade _____

Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1.



Three boxes on a scale weigh 52 kg. What three boxes are on the scale?

- A. A, B, B, and B
- B. A, B, and C
- C. B, C, and D
- D. A, B, and D
- E. C, C, and B

2. $7 \heartsuit 5 \heartsuit 4 = 31$

What are on the tags: -, x, +?

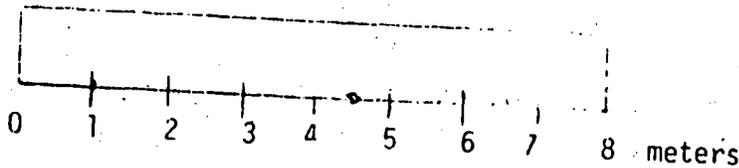
- A. +, +
- B. x, -
- C. +, x
- D. x, +
- E. x, x

3. Pears cost 12¢ and bananas cost 17¢. Sam spent exactly \$1.45 for pears and bananas. How many pears did he buy?
- A. 3
 - B. 5
 - C. 7
 - D. 8
 - E. 10
4. Howard is thinking of a number. If he multiplies the number times itself, he gets the product of 75. Which number is Howard's number closest to?
- A. 6
 - B. 7
 - C. 8
 - D. 9
 - E. 10
5. The number on two basketball players' jerseys when added together equal 30 and when multiplied equal 224. What numbers are they?
- A. 194 and 254
 - B. 10 and 20
 - C. 8 and 28
 - D. 15 and 14
 - E. 16 and 14

6. Tom has 10 coins. Some are dimes and some are nickels. The value of Tom's coins is 85¢. How many dimes does he have?

- A. 3
- B. 8
- C. 7
- D. 1
- E. 5

7. Betty has a board 8 meters long. She wants to cut the board into two pieces so that one piece is 3 meters longer than the other. Where should she cut the board?

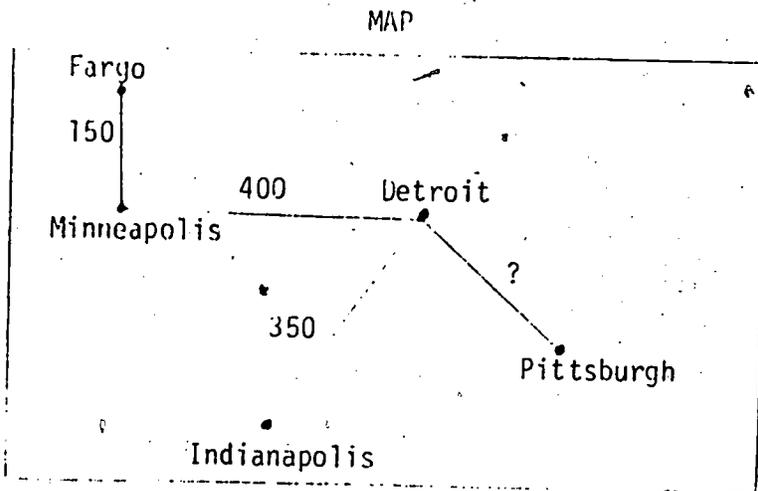


- A. Between 1 and 2
- B. Between 5 and 6
- C. Right on 3
- D. Right on 5
- E. Between 4 and 5

8. 20 pennies are put into 5 piles. Each pile has a different number of pennies in it. How many pennies are in the biggest pile?

- A. 5
- B. 6
- C. 7
- D. 8
- E. 9

9.



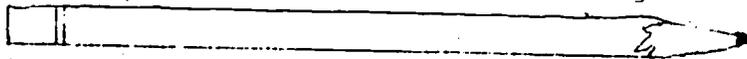
Willy was planning a trip from Fargo to Pittsburgh. The map did not have the number of miles between Detroit and Pittsburgh. Which is the closest estimate to the distance between Detroit and Pittsburgh?

- A. 100 miles
- B. 300 miles
- C. 250 miles
- D. 350 miles
- E. Not enough information given to tell.

10.



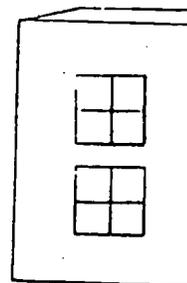
The nail is 3 cm long. Estimate the length of the pencil.



- A. 5 cm
- B. 8 cm
- C. 10 cm
- D. 15 cm
- E. 20 cm

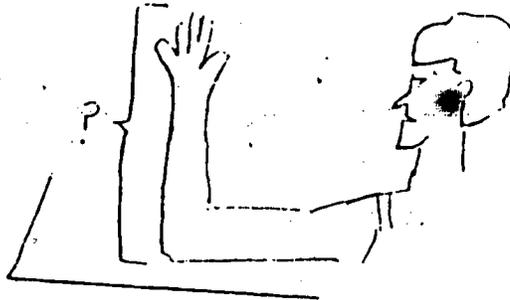
11. The height of the pole is 15 meters. Estimate the height of the top of the building.

- A. 5 meters
- B. 8 meters
- C. 10 meters
- D. 13 meters
- E. 15 meters



12. Estimate the length from your elbow to the tips of your fingers.

- A. 20 cm
- B. 30 cm
- C. 50 cm
- D. 90 cm
- E. 100 cm



Please write down on this page all your work and as much as you can about how you worked problem 13.

13. Vera has 12 coins whose value is \$1.40. She only has quarters, dimes and nickels. How many of each does she have?

Answer:

Name _____

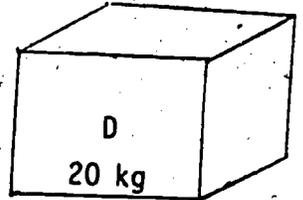
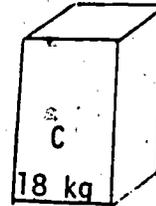
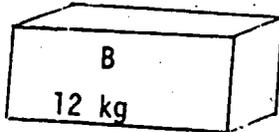
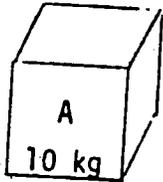
Date _____

Grade _____

Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1.



Three boxes on a scale weigh 38 kg. What three boxes are on the scale?

- A. C and D
- B. B, B, B, and B
- C. A, A, and C
- D. A, B, and C
- E. A, C, and D

2. $7 \text{ } \text{ } 5 \text{ } \text{ } 4 = 39$

What are on the tags: -, x, +?

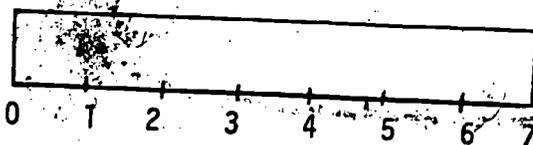
- A. x, +
- B. +, x
- C. x, -
- D. x, x
- E. +, +

3. Pears cost 12¢ and bananas cost 17¢. Sam spent exactly \$1.16 for pears and bananas. How many bananas did he buy?
- A. 2
 - B. 3
 - C. 4
 - D. 5
 - E. 6
4. Mr. Chitwood wants to haul 212 stone blocks to a building site. He wants to be sure the weight will not be too much for his truck to carry. Each block weighs 77 pounds. Which is a good estimate of the total weight of the blocks?
- A. 16,000 pounds
 - B. 20,000 pounds
 - C. 15,000 pounds
 - D. 14,000 pounds
 - E. 10,000 pounds
5. The numbers on two basketball players' jerseys when added together equal 25 and when multiplied equal 126. What numbers are they?
- A. 101 and 151
 - B. 21 and 6
 - C. 18 and 7
 - D. 17 and 8
 - E. 14 and 9

6. Frank has 12 coins. Some are dimes and some are nickels. The value of Frank's coins is 90¢. How many dimes does he have?

- A. 9
- B. 8
- C. 7
- D. 6
- E. 5

7. Betty has a board 7 meters long. She wants to cut the board into two pieces so that one piece is twice the length of the other. Where should she cut the board?



- A. Between 3 and 4
- B. Right on 3
- C. Between 4 and 5
- D. Right on 2
- E. Between 1 and 2

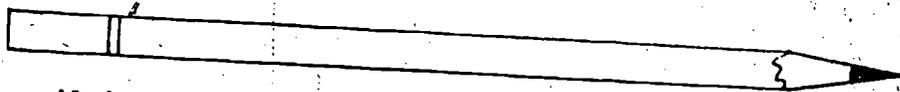
8. 20 pennies are put into 4 piles. Each pile has a different number of pennies in it. The smallest pile has 3 pennies. How many pennies are in the biggest pile?

- A. 6
- B. 7
- C. 8
- D. 9
- E. 10

9. Do not work this problem. In the space below draw a diagram that tells the story of the problem.

John has 2 candy bars. He traded each candy bar for 5 baseball cards. He then traded each baseball card for 4 marbles. How many marbles did John get by trading?

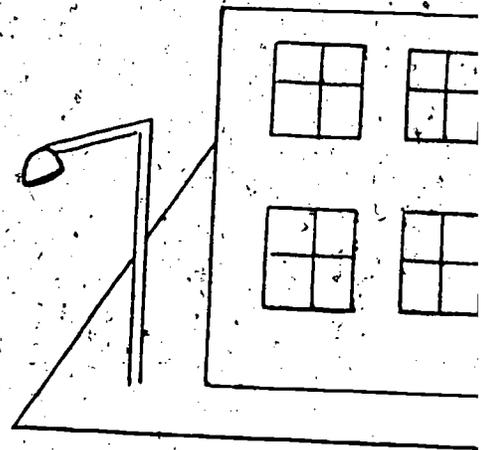
10.



The pencil is 12 cm. long. Estimate the length of the nail.

- A. 8 cm
 - B. 6 cm
 - C. 15 cm
 - D. 4 cm
 - E. 11 cm
11. The street light is 10 meters high. Estimate the height of the building.

- A. 12 m
- B. 17 m
- C. 15 m
- D. 10 m
- E. 5 m



12. Estimate the length of your arm.

- A. 30 cm
- B. 50 cm
- C. 90 cm
- D. 120 cm
- E. 150 cm



Please write down on this page all your work and as much as you can about how you worked problem 13.

13. Patricia has 106 pencils altogether in different colored boxes. Red boxes hold 7 pencils each, blue boxes hold 12 pencils each, and green boxes hold 20 pencils each. Patricia has 10 full boxes of pencils. How many boxes of each color does she have?

Answer:

Appendix C
5. Module Quizzes, Trial II, 1975-76

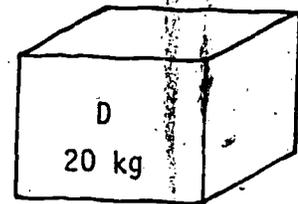
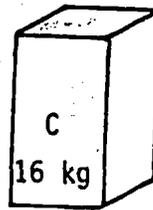
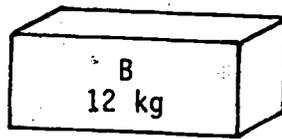
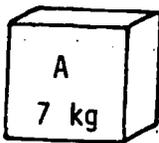
FORM C

Name _____ Date _____

Grade _____ Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1. Three boxes on a scale weigh 40 kg. What three boxes are on the scale?



- A. B, B, and C
- B. D and D
- C. A, C, and D
- D. A, A, and C
- E. B, C, and D

2. $9 \text{ } \text{ } 7 \text{ } \text{ } 5 = 11$

What goes on the tags: -, x, +?

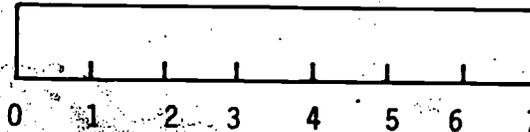
- A. -, x
- B. +, +
- C. +, -
- D. +, x
- E. -, +

3. Apples cost 14¢ and bananas cost 15¢. Sam spent exactly \$1.30 for apples and bananas. How many bananas did he buy?
- A. 0
 - B. 2
 - C. 3
 - D. 4
 - E. 5
4. Joe has 85 marbles and 7 friends. He wants to give away as many marbles as he can, but he wants to be sure each friend gets the same number. How many marbles should each friend get?
- A. 10
 - B. 11
 - C. 12
 - D. 13
 - E. 14
5. Jane is thinking of two numbers. Their sum is 30 and their difference is 6. What numbers is she thinking of?
- A. 36 and 24
 - B. 20 and 10
 - C. 12 and 6
 - D. 22 and 8
 - E. 18 and 12

6. Tom has 10 coins. Some are dimes and some are nickels. The value of Tom's coins is 85¢. How many dimes does he have?

- A. 8
- B. 7
- C. 5
- D. 3
- E. 1

7. Barbara has a board 7 meters long. She wants to cut the board into two pieces so that one piece is twice the length of the other. Where should she cut the board?

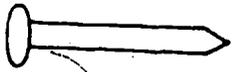


- A. Right on 1
- B. Between 1 and 2
- C. Right on 2
- D. Between 2 and 3
- E. Right on 3

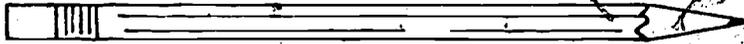
8. Ten pennies are put into 3 piles. Each pile has a different number of pennies. The smallest pile has 2 pennies in it. How many are in the biggest pile?

- A. 4
- B. 5
- C. 6
- D. 7
- E. 8

9.



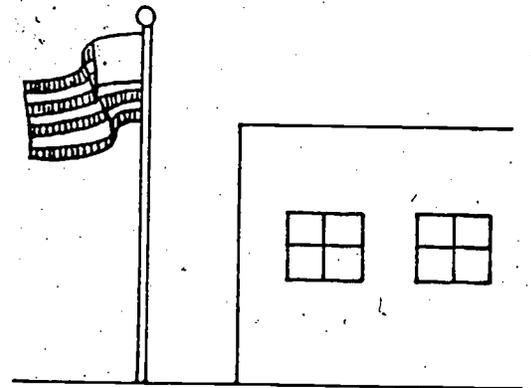
The nail is 3 cm long. Estimate the length of the pencil.



- A. 5 cm
- B. 7 cm
- C. 10 cm
- D. 13 cm
- E. 15 cm

10. The height of the pole is 15 meters. Estimate the height of the building.

- A. 5 meters
- B. 7 meters
- C. 10 meters
- D. 13 meters
- E. 15 meters



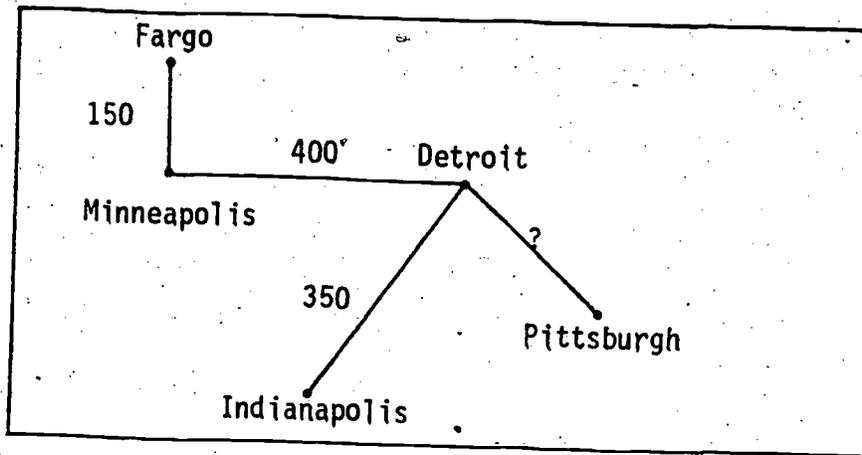
11. Estimate the length from your elbow to your finger tips.

- A. 20 cm
- B. 40 cm
- C. 60 cm
- D. 80 cm
- E. 100 cm



12.

MAP



Willy was planning a trip from Fargo to Pittsburgh. The map did not have the number of miles between Detroit and Pittsburgh. Which is the closest estimate to the distance between Detroit and Pittsburgh?

- A. 100 miles
- B. 250 miles
- C. 300 miles
- D. 350 miles
- E. 400 miles

NAME _____

TEACHER _____

FOR PROBLEM 13, PLEASE SHOW YOUR WORK AND TELL AS MUCH AS YOU CAN ABOUT HOW YOU WORKED IT.

13. In her piggy bank Vera has 20 coins whose value is \$1.40. She only has dimes and nickels. How many of each does she have?

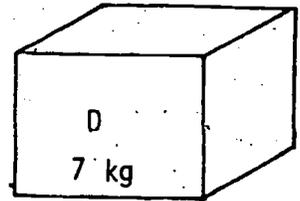
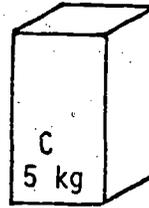
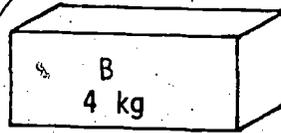
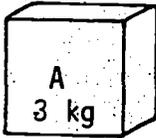
Answer:

Name _____ Date _____

Grade _____ Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1. Three boxes on a scale weigh 16 kg. What three boxes are on the scale?



- A. B, C, and D
 B. C, C, and D
 C. A, B, and C
 D. A, A, A, and D
 E. B, B, and D
2. $5 \square 3 \square 2 = 17$

What goes on the tags: -, x, +?

- A. x, x
 B. +, +
 C. x, -
 D. x, +
 E. +, x

3. Harry only has quarters and dimes. Some kids made guesses about how much money Harry could have. Which guess does not belong?

A. Lisa guessed 55¢

B. Laura guessed 35¢

C. Leo guessed 75¢

D. Carrie guessed 45¢

E. Sam guessed 15¢

4. Pears cost 15¢ and oranges cost 20¢. Sam spent exactly 65¢ for pears and oranges. How many pears did he buy?

A. 4

B. 3

C. 2

D. 1

E. 0

5. Sara is thinking of two numbers. Their sum is 40 and their difference is 8. What numbers is she thinking of?

A. 24 and 16

B. 48 and 32

C. 30 and 10

D. 16 and 8

E. 20 and 12

6. Tom has 5 coins. Some are dimes and some are nickels. The value of Tom's coins is 35¢. How many dimes does he have?

A. 0

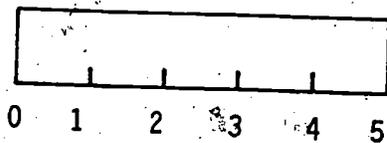
B. 1

C. 2

D. 3

E. 4

7. Joan has a board 5 meters long. She wants to cut the board into two pieces so that one piece is twice the length of the other. Where should she cut the board?



A. Between 0 and 1

B. Right on 1

C. Between 1 and 2

D. Right on 2

E. Between 2 and 3

8. Ten pennies are put into 4 piles. Each pile has a different number of pennies in it. How many pennies are in the biggest pile?

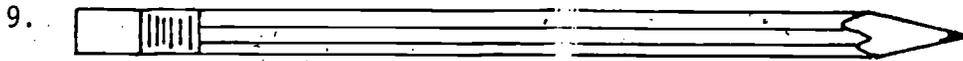
A. 3

B. 4

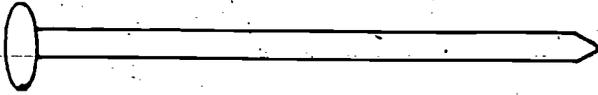
C. 5

D. 6

E. 7



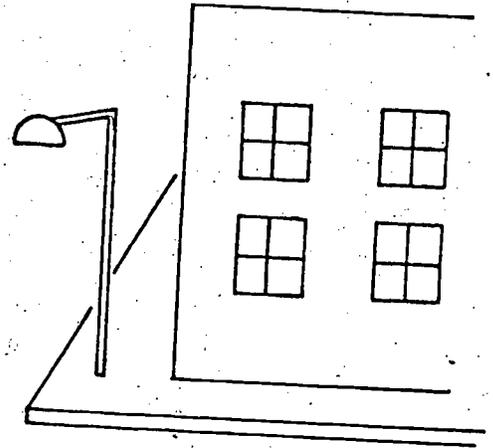
The pencil is 12 cm long. Estimate the length of the nail.



- A. 2 cm
- B. 4 cm
- C. 6 cm
- D. 8 cm
- E. 11 cm

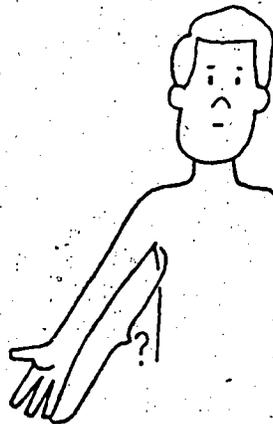
10. The building is 10 meters high. Estimate the height of the street light.

- A. 10 meters
- B. 7 meters
- C. 5 meters
- D. 3 meters
- E. 1 meter



11. Estimate the length of your arm.

- A. 20 cm
- B. 30 cm
- C. 50 cm
- D. 90 cm
- E. 120 cm



Name _____ Teacher _____

In the space below draw a diagram that would tell the story of the problem. Do not work the problem--just draw the diagram.

12. John has 3 candy bars. He traded each candy bar for 4 marbles. How many marbles did John get by trading?

FOR PROBLEM 13, PLEASE SHOW YOUR WORK AND TELL AS MUCH AS YOU CAN ABOUT HOW YOU WORKED IT.

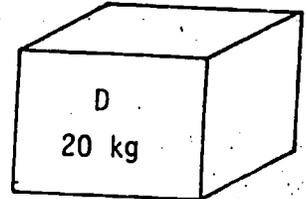
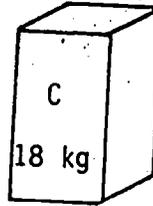
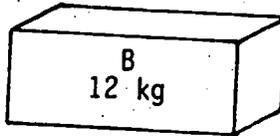
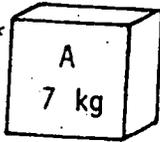
13. Kay has 90 golf balls in boxes. The large size box holds 10 golf balls. The small size box holds 7 golf balls. All of the boxes are full. How many small and how many large size boxes does Kay have?

Answer

Name _____ Date _____
 Grade _____ Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1. Three boxes on a scale weigh 39 kg. What three boxes are on the scale?



- A. A, A, and C
 B. D and D
 C. A, B, and D
 D. B, B, and A
 E. A, B, and C

2. $9 \square 7 \square 5 = 7$

What goes on the tags: -, x, +?

- A. -, -
 B. -, +
 C. x, -
 D. +, x
 E. +, +

3. Apples cost 14¢ and bananas cost 15¢. Sam spent exactly \$1.00 for apples and bananas. How many bananas did he buy?

A. 2

B. 3

C. 4

D. 5

E. 6

4. Harry has only quarters and dimes. Some kids made guesses about how much money Harry could have. What guess does not belong?

A. 45¢

B. 55¢

C. 70¢

D. 92¢

E. \$1.05

5. Cathy is thinking of two numbers. Their sum is 68 and their difference is 12. What numbers is she thinking of?

A. 35 and 23

B. 80 and 56

C. 40 and 28

D. 34 and 22

E. 44 and 24

6. Frank has 12 coins. Some are dimes and some are nickels. The value of Frank's coins is 90¢. How many dimes does he have?

A. 9

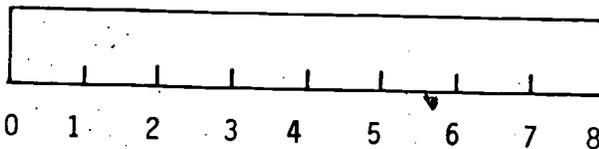
B. 8

C. 7

D. 6

E. 5

7. Willy has a board 8 meters long. He wants to cut the board into two pieces so that one piece is 3 meters longer than the other. Where should he cut the board?



A. Right on 2

B. Between 2 and 3

C. Right on 3

D. Between 4 and 5

E. Right on 4

8. 19 pennies are put into 4 piles. Each pile has a different number of pennies in it. The smallest pile has 3 pennies. How many pennies are in the biggest pile?

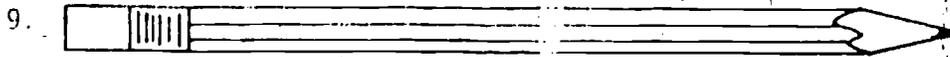
A. 7

B. 8

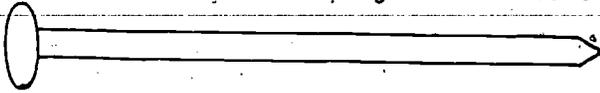
C. 9

D. 10

E. 11



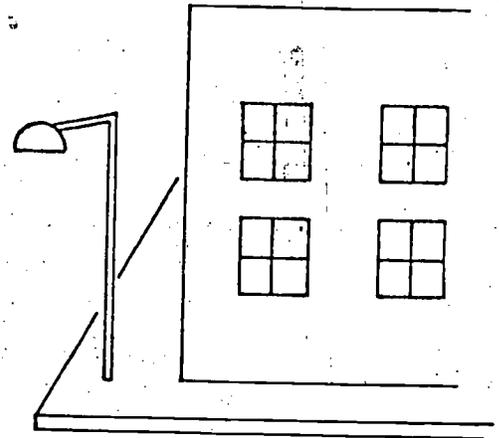
The pencil is 12 cm long. Estimate the length of the nail.



- A. 4 cm
- B. 6 cm
- C. 8 cm
- D. 10 cm
- E. 12 cm

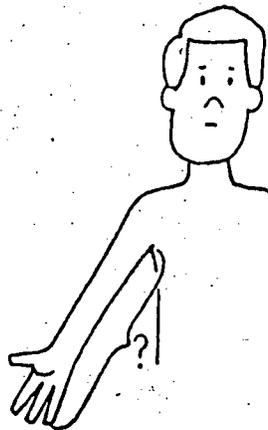
10. The street light is 10 meters high. Estimate the height of the building.

- A. 12 meters
- B. 15 meters
- C. 17 meters
- D. 19 meters
- E. 20 meters



11. Estimate the length of your arm.

- A. 30 cm
- B. 50 cm
- C. 90 cm
- D. 120 cm
- E. 150 cm



Name _____ Teacher _____

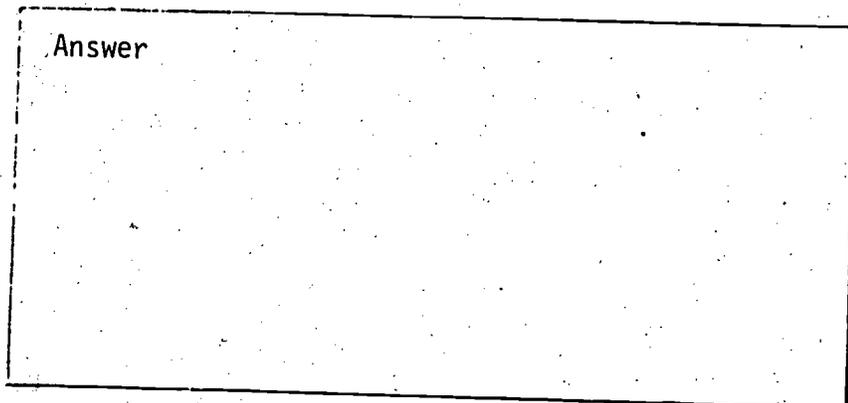
In the space below draw a diagram that would tell the story of the problem. Do not work the problem--just draw the diagram.

12. John had 3 candy bars. He traded each candy bar for 5 baseball cards. He then traded each baseball card for 4 marbles. How many marbles did John get by trading?

FOR PROBLEM 13, PLEASE SHOW YOUR WORK AND TELL AS MUCH AS YOU CAN ABOUT HOW YOU WORKED IT.

13. Patricia has 90 pencils in boxes. The large size box holds 12 pencils. The small size box holds 7 pencils. All of the boxes are full. How many small and how many large size boxes does Patricia have?

Answer



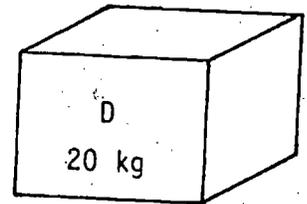
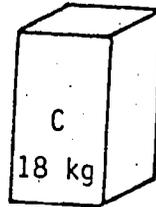
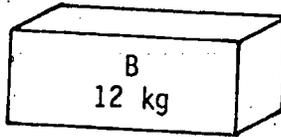
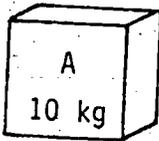
MPSP-E/5

Name _____ Date _____

Grade _____ Teacher _____

Directions: Circle the letter of the best answer. Circle only one letter.

1. Three boxes on a scale weigh 38 kg. What three boxes are on the scale.



- A. C and D
 B. B, B, B, and B
 C. A, A, and C
 D. A, B, and C
 E. A, C, and D

2. $7 \square 5 \square 4 = 31$

What are on the tags: -, x, +?

- A. +, +
 B. x, -
 C. +, x
 D. x, +
 E. x, x

3. Pears cost 12¢ and bananas cost 17¢. Sam spent exactly \$1.45 for pears and bananas. How many pears did he buy?
- A. 3
- B. 5
- C. 7
- D. 8
- E. 10
4. Howard is thinking of a number. If he multiplies the number times itself, he gets the product of 77. Which of these numbers is Howard's number closest to?
- A. 6
- B. 7
- C. 8
- D. 9
- E. 10
5. The number on two basketball players' jerseys when added together equal 30 and when multiplied equal 224. What numbers are they?
- A. 194 and 254
- B. 10 and 20
- C. 8 and 28
- D. 15 and 14
- E. 16 and 14

6. Frank has 12 coins. Some are dimes and some are nickels. The value of Frank's coins is 90¢. How many dimes does he have?

A. 9

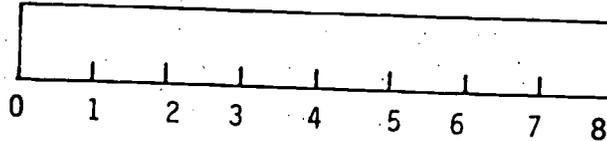
B. 8

C. 7

D. 6

E. 5

7. Betty has a board 8 meters long. She wants to cut the board into two pieces so that one piece is 3 meters longer than the other. Where should she cut the board?



A. Right on 5

B. Between 5 and 6

C. Right on 6

D. Between 6 and 7

E. Right on 7

8. 19 pennies are put into 4 piles. Each pile has a different number of pennies in it. The smallest pile has 3 pennies. How many pennies are in the biggest pile?

A. 7

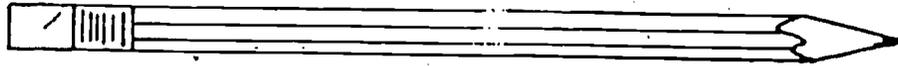
B. 8

C. 9

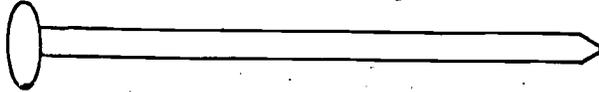
D. 10

E. 11

9.



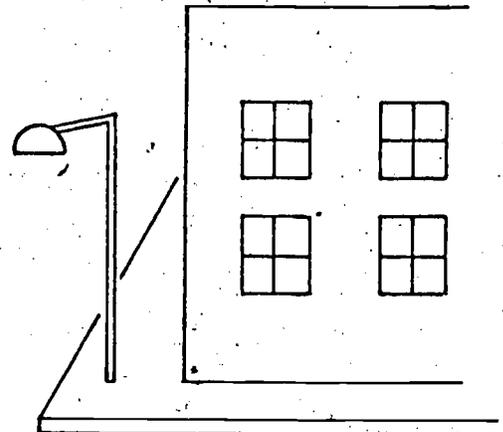
The pencil is 12 cm. long. Estimate the length of the nail.



- A. 4 cm
- B. 6 cm
- C. 8 cm
- D. 10 cm
- E. 12 cm

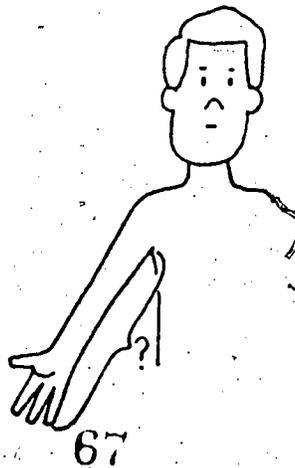
10. The street light is 10 meters high. Estimate the height of the building.

- A. 12 meters
- B. 15 meters
- C. 17 meters
- D. 19 meters
- E. 20 meters



11. Estimate the length of your arm.

- A. 30 cm
- B. 50 cm
- C. 90 cm
- D. 120 cm
- E. 150 cm



67

Name _____ Teacher _____

In the space below draw a diagram that would tell the story of the problem. Do not work the problem--just draw the diagram.

12. John has 2 candy bars. He traded each candy bar for 5 baseball cards. He then traded each baseball card for 4 marbles. How many marbles did John get by trading?

FOR PROBLEM 13, PLEASE SHOW YOUR WORK AND TELL AS MUCH AS YOU CAN ABOUT HOW YOU WORKED IT.

13. Vera has 12 coins whose value is \$1.40. She only has quarters, dimes and nickels. How many of each does she have?

Answer: