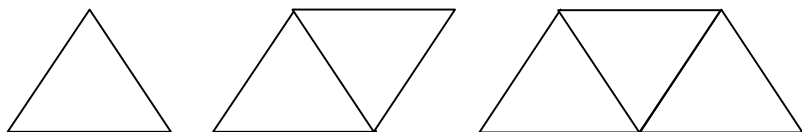


Elementary Task Set: Smith, M. S., Stein, M. K., Arbaugh, F., Brown, C., & Mossgrove, J. (2004). Characterizing the cognitive demands of mathematical tasks: A task sorting activity. In G. Bright & R. Rubenstein (Eds.), *Professional development guidebook for perspectives on teaching of mathematics: Companion to the sixty-sixth yearbook* (pp. 45-72). Reston, VA: National Council of Teachers of Mathematics.

TASK A

Manipulatives/Tools Available: One triangle pattern block

Using the edge of a triangle pattern block as the unit of measure, determine the perimeter of the following pattern-block trains:



TASK B

Manipulatives/Tools Available: Calculator

	Product
2 x 2 =	4
2 x 2 x 2 =	8
2 x 2 x 2 x 2 =	16
2 x 2 x 2 x 2 x 2 =	32

If the pattern shown continues, could 375 be one of the products in this pattern? Explain why or why not.

Taken from Results from the Sixth Mathematics Assessment of the National Assessment of Educational Progress (Kenney, P.A. & Silver, E.A. (Eds.), 1997).

Task C

Manipulatives/Tools Available: None

Think of a real life situation that describes the following problem:

$$287 \div 14 =$$

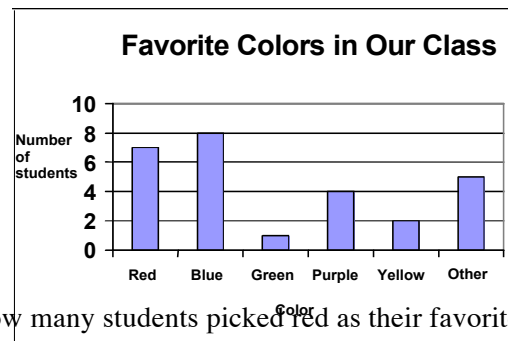
Write the problem and then solve it.

Taken from Investigations in Number, Data, and Space, Dale Seymour, Menlo Park, CA, 1998.

TASK D

Manipulatives/Tools Available: None

Use the graph to answer the questions



- 1) How many students picked red as their favorite color?
- 2) Did more students like blue or purple?
- 3) Which color did only one student choose as a favorite color?

TASK E

Manipulatives/Tools Available: None

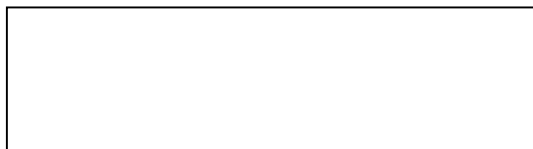
Identify the place value for each of the underlined digits

- a) 351
- b) 76
- c) 4,789
- d) 1.2

TASK F

Manipulatives/Tools Available: None

About how big is $\frac{4}{5}$ of this rectangle? Show your answer by shading in the rectangle.



What other fractions are near $\frac{4}{5}$ in size?

Adapted from Investigations in Number, Data, and Space, Dale Seymour, Menlo Park, CA, 1998.

TASK G

Manipulatives/Tools Available: Calculator

Solve each of the following. Show all your work. Check your answers with a calculator.

- 1. $8\overline{)96}$
- 2. $7\overline{)452}$
- 3. $6\overline{)3288}$
- 4. $5\overline{)3412}$
- 5. $10\overline{)4630}$
- 6. $16\overline{)4952}$

TASK L

Manipulatives/Tools Available: None

Complete the following multiplication facts in one minute or less:

- $2 \times 3 = \underline{\quad}$
- $5 \times 4 = \underline{\quad}$
- $10 \times 6 = \underline{\quad}$
- $4 \times 7 = \underline{\quad}$
- $8 \times 10 = \underline{\quad}$
- $8 \times 4 = \underline{\quad}$
- $9 \times 5 = \underline{\quad}$
- $3 \times 4 = \underline{\quad}$
- $5 \times 5 = \underline{\quad}$
- $6 \times 8 = \underline{\quad}$
- $7 \times 9 = \underline{\quad}$
- $2 \times 6 = \underline{\quad}$
- $3 \times 9 = \underline{\quad}$
- $8 \times 7 = \underline{\quad}$
- $9 \times 2 = \underline{\quad}$

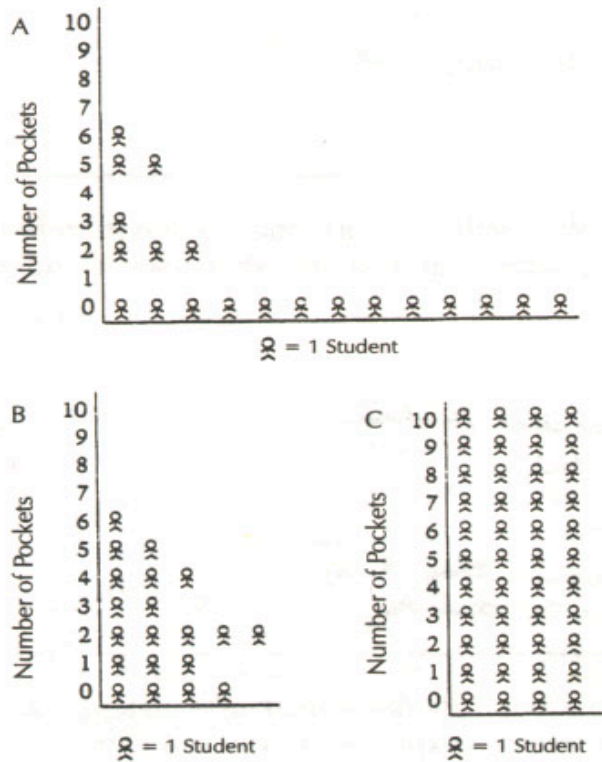
TASK H

Manipulatives/Tools Available: None

There are 20 students in Mr. Pang's class. On Tuesday, most of the students in the class said they had pockets in the clothes they were wearing.

Which of the graphs below most likely shows the number of pockets each child had?

Explain why you chose that graph and why you did not choose the other graphs.



TASK I

Manipulatives/Tools Available: Interlocking cubes, grid paper

Solve the two sets of problems shown below. You can use interlocking cubes or the grid paper to make arrays to help you solve these problems. But try to solve the last problem in each set by thinking about the other problems in the set. You can add problems to the set that help you solve the final problem better. After you solve the problems, write about how you solved the last problem in each set.

$$10 \times 6$$

$$3 \times 6$$

$$6 \times 6$$

$$13 \times 6$$

$$4 \times 6$$

$$4 \times 10$$

$$4 \times 12$$

$$4 \times 30$$

$$4 \times 36$$

Adapted from *Investigations in Number, Data, and Space*, Dale Seymour, Menlo Park, CA, 1998

Taken from *Results from the Sixth Mathematics Assessment of the National Assessment of Educational Progress* (Kenney, P.A. & Silver, E.A. (Eds.), 1997).

TASK J

Manipulatives/Tools Available: None

Think carefully about the following question. Write a complete answer. You may use drawings, words, and numbers to explain your answer. Be sure to show all of your work.

Jose ate $\frac{1}{2}$ of a pizza.

Ella ate $\frac{1}{2}$ of another pizza.

Jose said that he ate more pizza than Ella, but Ella said they both ate the same amount. Use words and pictures to show that Jose could be right.

Taken from Results from the Sixth Mathematics Assessment of the National Assessment of Educational Progress (Kenney, P.A. & Silver, E.A. (Eds.), 1997)

TASK K

Manipulatives/Tools Available: Cubes

Use cubes to model the situations below. Write a number sentence for each problem. Then use words or pictures to explain how you solved each problem.

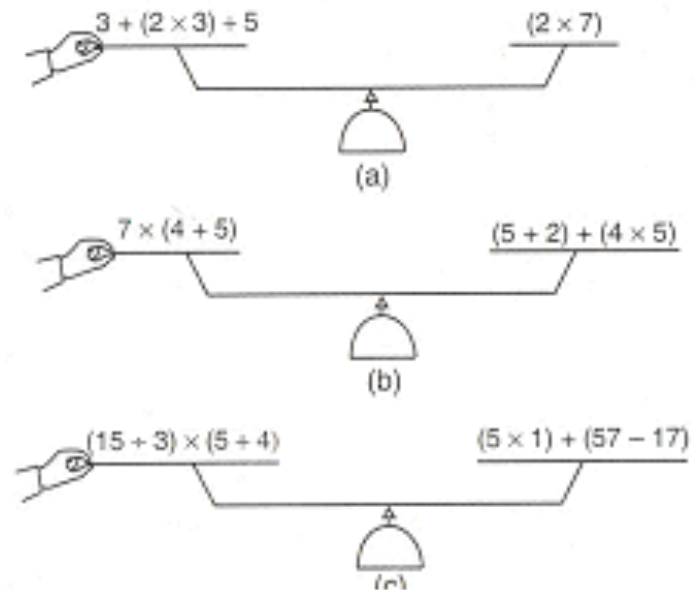
- 1) If each student is to receive 3 pencils, how many students will 15 pencils supply?
- 2) Jamie and Alex baked 48 cookies for the bake sale and packaged them in groups of 6 cookies per bag. How many bags did they pack?
- 3) If 32 cookies are divided equally among 8 students, how many cookies will each student receive?

Adapted from Visual Mathematics, The Math Learning Center, Salem, OR, 1995.

TASK O

Manipulatives/Tools Available: None

Tell if the scale will balance (equation) or tilt (inequality). If it does not balance, please write which side will tilt down. Write a reason for your answer.

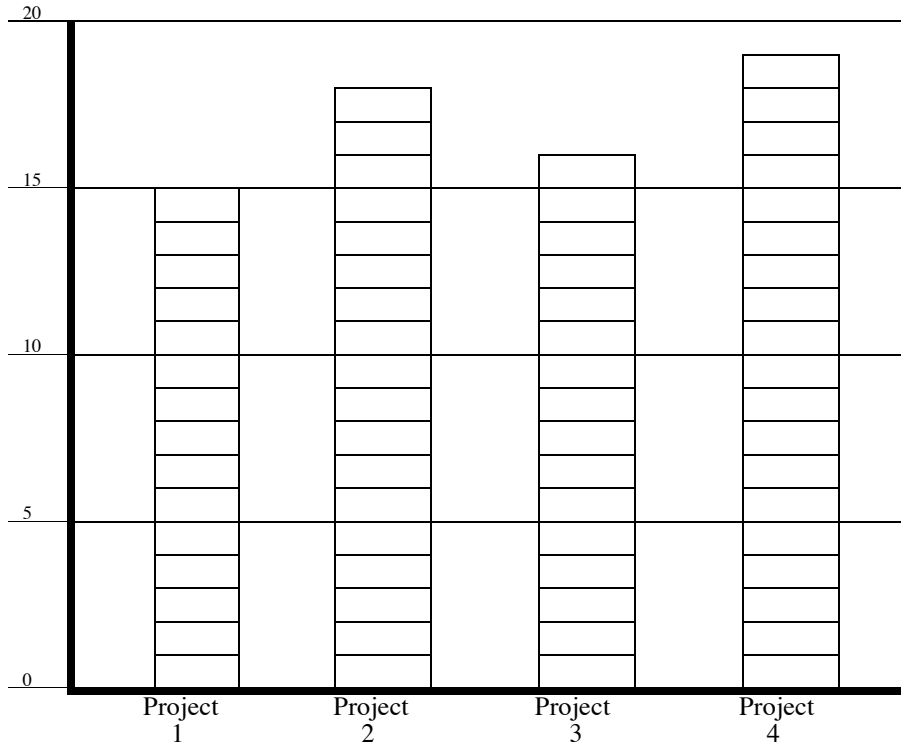


Taken from Navigating through Algebra in Grades 3-5, National Council of Teachers of Mathematics, Reston, VA, 2001.

TASK M

Manipulatives/Tools Available: None

Anita has four 20-point projects for science class. Her scores are shown below. What is her average score? Find the average for Anita's scores by leveling-off the stacks.



Adapted From QUASAR Cognitive Assessment Instrument.

TASK N

Manipulatives/Tools Available: Grid paper, interlocking cubes

1. The kindergarten class is coming to watch a play in our classroom. There are 20 students. In what different ways could we arrange the chairs for them so that all the rows are equal?
2. The two third grade classes are going to watch our play in the cafeteria. There are 49 students all together. In what different ways would we arrange the chairs for them so that all the rows are equal?
3. What do you notice about your solutions for problem 1 and problem 2?

Taken from Investigations in Number, Data, and Space, Dale Seymour, Menlo Park, CA, 1998.

TASK P

Manipulatives/Tools Available: Counters, cubes, grid paper, base-ten blocks

Solve this problem in two different ways:

$$32 - 17$$

After each way, write about how you did it. Be sure to include:

- what materials, if any, you used to solve this problem
- how you solved it
- an explanation of your thinking as you solved it

First Way:

Second Way:

Adapted from Investigations in Number, Data, and Space, Dale Seymour, Menlo Park, CA, 1998.