FIGURE 1.3. Sample tasks that have been used in a sorting activity.

TASK A
Manipulatives/Tools: Counters

For homework Mark's teacher asked him to look at the pattern below and draw the figure that should come next.

Mark does not know how to find the next figure.
A. Draw the next figure for Mark.
B. Write a description for Mark telling him how you knew which figure comes next.

QUASAR Project - QUASAR Cognitive Assessment Instrument - Release Task

TASK B
Manipulatives/Tools: None

Part A: After the first two games of the season, the best player on the girl's basketball team had made 12 out of 20 free throws. The best player on the boy's basketball team had made 14 out of 25 free throws. Which player had made the greater percent of free throws?

Part B: The "better" player had to sit out the third game due to an injury. How many baskets out of an additional 10 free throw "tries" would the other player need to make in order to take the lead in terms of greatest percentage of free throws?

Adapted from *Investigating Mathematics*. Glencoe Macmillan/McGraw-Hill. New York, New York, 1994.

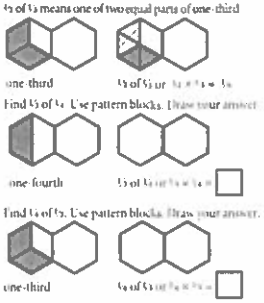
TASK C
Manipulatives/Tools: Calculator

Your school's science club has decided to do a special project on nature photography. They decided to take a little over 300 outdoor photos in a variety of natural settings and in all different types of weather. Eventually they want to organize some of the best photos into a display and enter the state nature photography contest. The club was thinking of buying a 35mm camera, but someone in the club suggested that it might be better to buy disposable cameras instead. The regular camera with autofocus and automatic light meter would cost about $40.00 and film would cost $3.98 for 24 exposures and $5.95 for 36 exposures. The disposable cameras could be purchased in packs of three for $20.00 with two of the three taking 24 pictures and the third one taking 27 pictures. Single disposables could be purchased for $8.95. The club officers have to decide which would be the best option and they have to justify their decisions to the club advisor. Do you think they should purchase the regular camera or the disposable cameras? Write a justification that clearly explains your reasoning.

TASK D
Manipulatives/Tools: None

The cost of a sweater at J. C. Penney's was $45.00. At the "Day and Night" sale it was marked 30% off of the original price. What was the price of the sweater during the sale? Explain the process you used to find the sale price.

TASK E
Manipulatives/Tools: Pattern Blocks

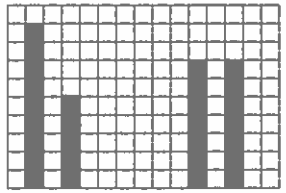


TASK F
Manipulatives/Tools: Square Pattern Tiles

Using the side of a square pattern tile as a measure, find the perimeter (i.e., distance around) of each train in the pattern block figure shown below.

TASK G
Manipulatives/Tools: Grid Paper

The pairs of numbers in a-d below represent the heights of stacks of cubes to be leveled off. On grid paper, sketch the front views of columns of cubes with these heights before and after they are leveled off. Write a statement under the sketches that explains how your method of leveling off is related to finding the average of the two numbers.



a) 14 and 8 b) 16 and 7 c) 7 and 12 d) 13 and 15

By taking 2 blocks off the first stack and giving them to the second stack, I've made the two stacks the same. So the total # of cubes is now distributed into 2 columns of equal height. And that is what average means.

Taken from *Visual Mathematics* (Bennett & Foreman, 1989).

TASK H
Manipulatives/Tools: None

Give the fraction and percent for each decimal.

.20 = ____ = ____
.25 = ____ = ____
.33 = ____ = ____
.50 = ____ = ____
.66 = ____ = ____
.75 = ____ = ____

FIGURE 1.4. Cognitive demands and features of the eight sample tasks shown in Figure 1.3.

Task	Level of Cognitive Demand	Explanation of Categorization	Features
A	Doing mathematics	There is no pathway suggested by the task. The focus is on looking for the underlying mathematical structure.	• Requires an explanation • Uses manipulatives • Involves multiple steps • Uses a diagram • Is symbolic/abstract • Is "textbook-like"
B	Procedures with connections	The task focuses attention on the procedure for finding percents, but in a meaningful context.	• Has "real-world" context • Involves multiple steps • Is "textbook-like"
C	Doing mathematics	There is no predictable pathway suggested by the task and it requires complex thinking.	• Requires an explanation • Has "real-world" context • Involves multiple steps • Uses a calculator • Is "textbook-like"
D	Procedures without connections	The task requires the use of a well-established procedure for finding the sales price. There is no connection to meaning.	• Requires an explanation • Has "real-world" context • Involves multiple steps • Is "textbook-like"
E	Procedures with connections	The task provides a procedure for taking a fraction of a fraction but connects the procedure to meaning.	• Uses manipulatives • Involves multiple steps • Uses a diagram • Is symbolic/abstract
F	Procedures without connections	The task provides a procedure for finding the perimeter but requires no connection to meaning.	• Uses manipulatives • Uses a diagram • Is symbolic/abstract
G	Procedures with connections	The task provides a procedure for finding the average that focuses on the underlying meaning of average.	• Requires an explanation • Involves multiple steps • Uses a diagram • Is symbolic/abstract
H	Memorization	The task requires the recall of previously learned information. No understanding is required.	• Is "textbook-like"

Method 7: Completing the square.