The Applied Mathematics assessment measures skills people demonstrate when they use mathematical reasoning and problem-solving techniques to solve work-related problems. Employees may use calculators and conversion tables to help with the problems, but they still need to use math skills to think the problems through.

The WorkKeys Applied Mathematics assessment contains five scoring levels, with the questions becoming more complex as the level increases from 3 to 7. For example, at Level 5, employees need to use skills from Levels 3, 4, and 5. Examples are included with each level description.

A calculator and formula sheet may be used to complete the assessment.

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**Level 3 Applied Mathematics**

**Sample Item**
In your job as a cashier, a customer gives you a $20 bill to pay for a can of coffee that costs $3.84. How much change should you give back?

A. $15.26  
B. $16.16  
C. $16.26  
D. $16.84  
E. $17.16

*Why this is a Level 3 item:*
- Examinees must perform a single subtraction operation.
- Numbers are presented in the logical order ($20 – $3.84).
- Number of dollars must be converted to a decimal (dollars and cents: $20.00).

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**Level 4 Applied Mathematics**

**Sample Item**
Over the last 5 days, you made the following number of sales calls: 8, 7, 9, 5, and 7. On average, how many calls did you make each day?

A. 5.8  
B. 7.0  
C. 7.2  
D. 9.0  
E. 36.0

*Why this is a Level 4 item:*
- Examinees must perform more than one step of logic and calculation.
- Examinees must divide using positive numbers.
- Examinees must determine averages.
Level 5 Applied Mathematics

Sample Item
Quik Call charges 18¢ per minute for long-distance calls. Econo Phone totals your phone usage each month and rounds the number of minutes up to the nearest 15 minutes. It then charges $7.90 per hour of phone usage, dividing this charge into 15-minute segments if you used less than a full hour. If your office makes 5 hours 3 minutes worth of calls this month using the company with the lower price, how much will these calls cost?

A. $39.50
B. $41.48
C. $41.87
D. $54.00
E. $54.54

Why this is a Level 5 item:
- Examinees must perform several steps of logic and calculation.
- Examinees must perform calculations using mixed numbers.
- Examinees must compare their answers with two sets of calculations to determine the best deal.

Level 6 Applied Mathematics

Sample Item
You are preparing to tile the floor of a rectangular room that is 15½ feet by 18½ feet in size. The tiles you plan to use are square, measuring 12 inches on each side, and are sold in boxes that contain enough tile to cover 25 square feet. How many boxes of tiles must you order to complete the job?

A. 11
B. 12
C. 34
D. 59
E. 287

Why this is a Level 6 item:
- Examinees must perform multiple steps of logic, calculations or conversion.
- Examinees must use mixed numbers.
- Examinees must eliminate unnecessary information.
- Examinees must find the area of a basic shape and use the result in further calculations.
Sample Item
The farm where you just started working has a vertical cylindrical oil tank that is 2.5 feet across on the inside. The depth of the oil in the tank is 2 feet. If 1 cubic foot of space holds 7.48 gallons, about how many gallons of oil are left in the tank?

A. 37
B. 59
C. 73
D. 230
E. 294

Why this is a Level 7 item:
- Examinees must perform multiple steps of calculation.
- Examinees must look up and use the formula for the volume of a cylinder.
- Examinees must convert from cubic feet to gallons.
LOCATING INFORMATION

The WorkKeys Locating Information assessment measures the skills people demonstrate when they use workplace graphics such as charts, graphs, tables, forms, flowcharts, diagrams, floor plans, maps, and instrument gauges. Employees use this skill both when they find information in a graphic, and also when they insert information into a graphic. They also use it when they compare, summarize, and analyze information found in related graphics.

The WorkKeys Locating Information assessment contains four scoring levels, with the questions becoming more complex as the level increases from 3 to 6. At each new level, employees use more demanding skills in addition to the skills used at the previous levels. For example, Level 5 includes the skills used at Levels 3, 4, and 5.

Level 3 Locating Information

Sample Item
You regularly check the pressure gauge on a large tank. According to the gauge shown, what is the current pressure (in PSI)?

A. 30  
B. 35  
C. 40  
D. 45  
E. 100

Why this is a Level 3 item:
• The problem contains an elementary workplace graphic.  
• Examinees find one piece of information.
Level 4 Locating Information

Sample Item
You must sort clothes in a dry cleaning establishment according to the customer's instructions. According to the form shown, how should this customer's shirt be treated?

A. Dry clean it, add light starch, and fold it.
B. Dry clean it, add light starch, and place it on a hanger.
C. Launder it with no starch and place it on a hanger.
D. Launder it with light starch and place it on a hanger.
E. Launder it with medium starch and fold it.

Why this is a Level 4 item:
- The problem contains a straightforward graphic.
- Examinees must summarize information.
Sample Item
As an airplane pilot, you need to determine the crosswind component of the wind speed to ensure safe takeoffs and landings. According to the graph shown, if the reported wind speed is 45 knots at a $20^\circ$ angle, what is the crosswind component, in knots?

A. 15  
B. 25  
C. 43  
D. 45  
E. 65

Why this is a Level 5 item:
- The problem uses a graph with a less common format.
- Examinees must sort through distracting information in a complicated graph using three scales.
You are a road contractor, and you have analyzed a soil that you want to use for road fill. Your analysis shows that the soil contains 15% sand, 65% silt, and 20% clay. You need to know what the shrink-swell potential is for the soil because it will affect the durability of the road. Based on the diagram and table shown, what is the shrink-swell potential at a 30-inch depth for this soil?

A. Low 
B. Low to moderate 
C. Moderate 
D. Moderate to high 
E. High

Why this is a Level 6 item:
The problem is based on complicated, detailed graphics in a challenging format.
- Examinees must notice the connections between graphics.
- Examinees must apply the information to a specific situation.
- Examinees must use the information to draw conclusions.
Reading for Information

Reading for Information is the skill people use when they read and use written text in order to perform a job. Texts in this assessment include memos, letters, directions, notices, bulletins, policies, and regulations. These communications are not necessarily well written or targeted to the appropriate audience. Reading for Information materials do not include information presented graphically (e.g., charts, forms, or blueprints).

The WorkKeys Reading for Information assessment contains five scoring levels, with the questions becoming more complex as the level increases from 3 to 7. At each level, employees use more demanding skills in addition to the skills used at the previous levels. For example, Level 5 includes the skills used at Levels 3, 4, and 5.

Level 3 Reading for Information

Sample Item

ATTENTION CASHIERS:
All store employees will now get 20% off the price of clothes they buy here. Please follow the new directions listed below.

Selling clothes to employees

- Ask to see the employee’s store identification card.
- Enter the employee’s department code number into the cash register.
- Use the cash register to take 20% off the price. Then push the sales tax button.
- Write your initials on the sales receipt.
- Sell clothes to employees during store hours only.

Accepting clothing returns from employees

- Employees receive store credit certificate for clothes they return to the store.
- Store credit certificates are next to the gift certificates.
- Employees may not get a cash refund for clothes they return to the store.

You are a cashier. According to the notice shown, what should you write on a store employee’s receipt?

A. The employee’s identification number
B. The employee’s department number
C. The amount of sales tax
D. The 20% discount price
E. Your initials

Why this is a Level 3 sample item:

- Sentences are simple and direct.
- Text contains short paragraphs and short sentences.
- Text contains direct instructions for simple tasks.
- Vocabulary includes common everyday words.
- Individuals identify a clearly stated detail without drawing any conclusions.
Level 4 Reading for Information

Sample Item

INSTRUCTIONS TO SORTING DEPARTMENT:
SPECIAL PROJECT TO FIX ORDER #888

Five long blue plastic bins have been placed by the overhead door. Piled on the other side of this room, near the time clock, are several thousand steel rods of varying lengths. All of those rods must be sorted by length and placed in the bins

    Bin “1” is for rods that are four to five meters long.

    Bin “2” is for rods that have a length of over five meters, up to six meters.

    Bin “3” is for rods that have a length of over six meters, up to eight meters.

    Bin “4” is for rods that have a length of over eight meters, up to ten meters.

    Bin “5” is for warped or unsmoothed rods. These will not be accepted.

If these rods are not all sorted correctly, the customer will reject the order. We cannot afford to let that happen again. Work as quickly as you can because Friday is the deadline for delivery of the order.

According to the instructions shown, what is a condition for project success other than delivery on time?

A. All rods must be sorted by both length and diameter.
B. Rods eleven meters long must be leaned against the overhead door.
C. The customer does not want rods that are warped.
D. The five-meter rods must go in Bin 2.
E. The ten-meter-long rods must arrive at the customer in Bin "4."

Why this is a Level 4 item:
- Sentences are longer, although still straightforward.
- Sentence structure is varied and some introductory phrases are used.
- Text contains a number of details.
- Individuals must identify the best choice based on varying conditions.
Goldberg's Auto Parts is served by more than fifty different accounts, each with its own sales representative, company name, corporate address, and shipping address. As a shipping and receiving clerk at Goldberg's, you are required to return defective merchandise to the manufacturer.

Standard procedure for returning an item begins with your written request to the company for authorization. Always send the request to the corporate address, not to the shipping address. Unless the company file folder contains a form for this procedure, write a business letter to the manufacturer supplying the item's stock number, cost, and invoice number; the date it was received; and the reason for its return. The manufacturer's reply will include an authorization number from the sales representative, a sticker for you to place on the outside of the box to identify it as an authorized return, and a closing date for the company's acceptance of the returned item. If you do not attach the provided sticker, your returned box will be refused by the manufacturer as unauthorized, and you will need to obtain a new letter, authorization, sticker, and closing date. Always send a returned box to the shipping address, not to the company's corporate address.

According to the policy shown, what should you do if you lose an authorization sticker?

A. Send a request for a return authorization along with the rejected part directly to the manufacturer's shipping address.
B. Send a request for return authorization along with the rejected part directly to the manufacturer's corporate address.
C. Repeat the standard procedure to obtain a new letter, authorization, sticker, and closing date.
D. Use a sticker from another company's folder.
E. Send the rejected part to your sales representative.

Why this is a Level 5 item:
- Sentences are longer and more complex.
- Text contains several steps to be followed and details to be considered.
- Vocabulary includes some jargon and specialized terms.
- Instructions include conditionals.
- Individuals must apply straightforward instructions to a new situation similar to the one described.
Level 6 Reading for Information

Sample Item

From: J. Kimura, Senior Vice President of Molten Metals, Inc.
To: All e-mail users at Molten Metals, Inc.

To permit our employees to communicate directly with one another as well as with vendors and customers, Molten Metals, Inc. provides a network of e-mail accounts. Access to e-mail is at the sole discretion of Molten Metals, Inc., and we will determine who is to be so empowered. Under President Duarte's leadership, all messages sent and received (even those intended as personal) are treated as business messages.

Molten Metals, Inc. has the capability to and reserves the right to access, review, copy, and delete any messages sent, received, or stored on the company e-mail server. Molten Metals, Inc. will disclose these messages to any party (inside or outside the company) it deems appropriate. Employees should treat this server as a constantly reviewed, shared file stored in the system.

Due to the reduced human effort required to redistribute electronic information, a greater degree of caution must be exercised by employees transmitting MM, Inc. confidential information using company e-mail accounts. Confidential information belonging to MM, Inc. is important to our independence and should never be transmitted or forwarded to persons or companies not authorized to receive that information. Likewise, it should not be sent or forwarded to other employees inside the company who do not need to know that information.

MM, Inc. strongly discourages the storage of large numbers of e-mail messages for a number of reasons. First, because e-mail messages frequently contain company confidential information, it is good to limit the number of such messages to protect the company's information. Second, retention of messages fills up large amounts of storage space on the e-mail server and personal hard disks, and can slow down the performance of both the network and individual personal computers. Finally, in the event that the company needs to search the network server, backup tapes, or individual hard disks for genuinely important documents, the fewer documents it has to search through, the more economical the search will be. Therefore, employees are to delete as soon as possible any e-mail messages they send or receive.

Based on the memo shown, personal messages transmitted or received using Molten Metals, Inc., e-mail accounts will be

A. automatically deleted upon detection.
B. avoided by server staff to save company time.
C. forwarded to private, personal accounts.
D. grounds for personnel action.
E. treated no differently from other messages.

Why this is a Level 6 item:

- Material is taken from a regulatory document.
- Sentences are formal and complicated.
- Paragraphs and sentences are filled with details and information.
- Sentences are long and varied.
- Less common vocabulary and meanings are used.
- Examinees must apply complicated instructions to new situations.
You are a manager in the New Enterprise Division preparing a budget request for $1.5 million for a new project. Based on the notice shown, you must demonstrate in your request all of the following EXCEPT

A. a competitive threat to the company.
B. a potential for an increase in companywide sales.
C. acquiescence to governmental rules.
D. data that shows that the product will sell well.
E. the profitability to the company.
Why this is a Level 7 item:
- Sentences are longer, denser, and more complex.
- The document uses a complex writing style.
- The paragraphs and sentences are filled with details and information.
- Less common meanings of words are used.
- Individuals must apply the principles of complicated instructions to new situations.