

LEVEL 1 – RECALL & REPRODUCTION

Curricular elements that fall into this category involve basic tasks that require students to recall or reproduce knowledge and/or skills. The subject matter content at this particular level usually involves working with facts, terms and/or properties of objects. It may also involve use of simple procedures and/or formulas. There is little transformation or extended processing of the target knowledge required by the tasks that fall into this category. Key words that often denote this particular level include: list, identify and define. A student answering a Level 1 item either knows the answer or does not; that is, the answer does not need to be “figured out” or “solved.”

POSSIBLE PRODUCTS

| | | | | |
|------------|-----------------|---------------|----------------------|--------------------|
| Quiz | List | Collection | Podcast | Social bookmarking |
| Definition | Workbook | Explanation | Categorizing/Tagging | Searching |
| Fact | Reproduction | Show and Tell | Commenting | Googling |
| Worksheet | Vocabulary Quiz | Outline | Bulleting | |
| Test | Recitation | Blog | Highlighting | |
| Label | Example | Wiki | Social networking | |

ROLES

TEACHER

Directs
Shows
Questions
Demonstrates
Compares
Examines

Tells
Examines
Evaluates
Listens
Contrasts

STUDENT

Responds
Remembers
Memorizes
Explains
Restates
Interprets
Absorbs
Recognizes
Describes
Translates
Demonstrates

POTENTIAL ACTIVITIES

- Develop a concept map showing a process or describing a topic.
- Make a timeline
- Write a list of keywords you know about...
- Make a chart showing...
- Recite a fact related to...
- Write in your own words...
- Cut out, or draw a picture that illustrates an event, process, or story.
- Report or present to the class.
- Make a cartoon strip showing the sequence of an event, process, or story.
- Write and perform...
- Write a brief outline and explain the event, process, or story.
- Write a summary report of the event
- Prepare a flow chart that illustrates the sequence of events.
- Paraphrase a chapter in the book
- Retell in your own words
- Outline the main points

- Recall, restate, remember, or recognize a fact, term, or property (Recognizing, listing, describing, identifying, retrieving, naming, locating, finding)
- Using basic calculation tasks involving only one step (i.e. addition, subtraction, etc), complete the following...
- Locate or retrieve information in verbatim form.
- Straight-forward recognition tasks related to identifying features, objects and/or steps that don't vary greatly in form (i.e. recognizing features of basic tools).
- Writing tasks that involve applying a standard set of conventions and or criteria that should eventually be automated (i.e. using punctuation, spelling, etc)
- Basic measurement tasks that involve one step (i.e. using a ruler to measure length)
- Use this simple formula where at least one of the unknowns are provided to...
- Locating information in maps, charts, tables, graphs, and drawings

Level 2 – Working with Skills & Concepts

Level 2 includes the engagement of some mental processing beyond recalling or reproducing a response. This level generally requires students to contrast or compare people, places, events and concepts; convert information from one form to another; classify or sort items into meaningful categories; describe or explain issues and problems, patterns, cause and effect, significance or impact, relationships, points of view or processes. A Level 2 “describe or explain” would require students to go beyond a description or explanation of recalled information to describe or explain a result or “how” or “why.” The learner should make use of information in a context different from the one in which it was learned.

Elements found in a curriculum that fall in this category involve working with or applying skills and/or concepts to tasks related to the field of study in a laboratory setting. The subject matter content at this particular level usually involves working with a set of principles, categories, heuristics, and protocols. At this level students are asked to transform/process target knowledge before responding. Example mental processes that often denote this particular level include: summarize, estimate, organize, classify, and infer.

POSSIBLE PRODUCTS

| | | | |
|---------------|--------------|------------------------|----------------------|
| Photograph | Presentation | Reverse-Engineering | Blog Commenting |
| Illustration | Interview | Cracking Codes | Blog Reflecting |
| Simulation | Performance | Linking | Moderating |
| Sculpture | Dairy | Mashing | Testing (Alpha/Beta) |
| Demonstration | Journal | Relationship Mind Maps | Validating |

ROLES

TEACHER

| | |
|-----------|-------------|
| Shows | Facilitates |
| Observes | Evaluates |
| Organizes | Questions |

STUDENT

| | |
|-----------------|-------------------------------|
| Solves problems | Demonstrates use of knowledge |
| Calculates | Compiles |
| Completes | Illustrates |
| Constructs | |

POTENTIAL ACTIVITIES

- Classify a series of steps
- Construct a model to demonstrate how it looks or works
- Practices a play and perform in class
- Make a diorama to illustrate an event
- Write a diary/blog entry
- Make a scrapbook about the area of study
- Make a topographic map
- Make up puzzle or game about the topic
- Write an explanation about this topic for others
- Make a model...
- Routine application tasks (i.e. applying a simple set of rules or protocols to a laboratory situation the same way each time)
- Explaining the meaning of a concept and/or explaining how to perform a particular task
- Stating relationships among a number of concepts and or principles

- More complex recognition tasks that involve recognizing concepts and processes that may vary in how they “appear”
- More complex calculation tasks (i.e. multi-step calculations such as standard deviation)
- Research projects and writing activities that involve locating, collecting, organizing and displaying information (i.e. writing a report with the purpose to inform; meeting all steps of the writing process)
- Measurement tasks that occur over a period of time and involve aggregating/organizing the data collected in to basic presentation forms such as a simple table or graph

LEVEL 3 – SHORT-TERM STRATEGIC THINKING

Items falling into this category demand a short-term use of higher order thinking processes, such as analysis and evaluation, to solve real-world problems with predictable outcomes. Stating one's reasoning is a key marker of tasks that fall into this particular category. The expectation established for tasks at this level tends to require coordination of knowledge and skill from multiple subject-matter areas to carry out processes and reach a solution in a project-based setting. Key processes that often denote this particular level include: analyze, explain and support with evidence, generalize, and create.

POSSIBLE PRODUCTS

| | | | | |
|-------------|----------|---------------|------------|------------|
| Graph | Survey | Debate | Conclusion | Podcast |
| Spreadsheet | Database | Panel | Program | Publishing |
| Checklist | Mobile | Report | Film | Wiki-ing |
| Chart | Abstract | Evaluating | Animation | |
| Outline | Report | Investigation | Video cast | |

ROLES

TEACHER

Probes
Observes
Acts as a resource
Organizes
Clarifies
Guides

Guides
Evaluates
Questions
Dissects
Accepts

STUDENT

Discusses
Debates
Examines
Judges
Assesses
Justifies

Uncovers
Thinks deeply
Questions
Disputes
Decides

Argues
Tests
Calculates
Compares
Selects

POTENTIAL ACTIVITIES

- Use a Venn Diagram that shows how two topics are the same and different
- Design a questionnaire to gather information
- Survey classmates/industry members to find out what they think about a particular topics
- Make a flow chart to show the critical stages.
- Classify the actions of the characters in book
- Prepare a report about an area of study
- Conduct an investigation to produce information to support a view
- Write a letter to the editor after evaluation product
- Prepare and conduct a debate
- Prepare a list of criteria to judge
- Write a persuasive speech arguing for/against...
- Make a booklet about five rules you see as important. Convince others.
- Form a panel to discuss viewpoints on...
- Write a letter to... advertising on changes needed.
- Prepare a case to present your view about

- Short-term tasks and projects placing a strong emphasis on transferring knowledge to solve predictable problems
- Explaining and/or working with abstract terms and concepts
- Recognition tasks when the environment observed is real-world and often contains extraneous information which must be sorted through
- Complex calculation problems presented that draw upon multiple processes
- Writing and or explaining tasks that require altering a message to “fit” an audience
- Creating graphs, tables and charts where students must reason through and organize the information with instructor prompts
- Identifying a research question and/or designing investigations to answer a question
- Tasks that involve proposing solutions or making predictions

Level 4 – Extended Strategic Thinking

Curricular elements assigned to this level demand extended use of higher order thinking processes such as synthesis, reflection, assessment and adjustment of plans over time. Students are engaged in conducting investigations to solve real-world problems with unpredictable outcomes. Employing and sustaining strategic thinking processes over a longer period of time to solve the problem is a key feature of curricular objectives that are assigned to this level. Key strategic thinking processes that denote this particular level include: synthesize, reflect, conduct, and manage.

POSSIBLE PRODUCTS

| | | | |
|-------|---------|----------|---------------|
| Film | Project | New Game | Newspaper |
| Story | Plan | Song | Media Product |

ROLES

TEACHER

| | |
|-------------|----------|
| Facilitates | Extends |
| Reflects | Analyses |
| Evaluates | |

STUDENT

| | | |
|-------------|------------|---------|
| Designs | Formulates | Plans |
| Takes risks | Modifies | Creates |
| Proposes | | |

POTENTIAL ACTIVITIES

- Applying information to solve ill-defined problems in novel situations
- Tasks that require a number of cognitive and physical skills in order to complete
- Writing and/or research tasks that involve formulating and testing hypotheses over time
- Tasks that require students to make multiple strategic and procedural decisions as they are presented with new information throughout the course of the event
- Tasks that require perspective taking and collaboration with a group of individuals
- Creating graphs, tables, and charts where students must reason through and organize the information without instructor prompts
- Writing tasks that have a strong emphasis on persuasion
- Devise a way to...
- Develop a menu for a new restaurant using a variety of healthy foods
- Sell an idea
- Write a jingle to advertise a new product
- Conduct an internship in industry where students are faced with real-world, unpredictable problems

**Table 1: Sample Depth-of-Knowledge Level Descriptors for Reading
(Based on Webb and Wixson, K. Hess, Center for Assessment/NCIEA, 2004)**

| Level 1 Recall of Information | Level 2 Basic Reasoning | Level 3 Complex Reasoning | Level 4 Extended Reasoning |
|---|---|---|--|
| <ul style="list-style-type: none"> a. Read words orally in isolation b. Read words orally in connected text c. Read multi-syllabic words d. Locate or recall facts or details explicitly presented in text e. Identify or describe characters, setting, sequence of events f. Use language structure (pre/suffix) or word relationships (synonym/antonym) to determine meaning of words g. Select appropriate words to use in context (e.g., content-specific words, shades of meaning) when intended meaning is clearly evident | <ul style="list-style-type: none"> a. Use context cues or resources to identify the meaning of unfamiliar words b. Predict a logical outcome based on information in a reading selection c. Make basic inferences or draw basic conclusions about information presented in text (e.g., According to this report, what caused ___?) d. Recognizing appropriate generalizations about text (e.g., possible titles, main ideas) e. Identify and summarize the major events, problem, solution, conflicts in a literary text f. Determine whether a text is fact or fiction g. Distinguish between fact and opinion h. Describe the characteristics or features of various types of text i. Obtain information using text features of informational text (e.g., Table of Contents, sidebar, chart) j. Organize information presented in informational text using mapping, charting, or summarizing k. Locate information to answer questions related to explicit or implicit central ideas in informational texts l. Identify use of literary devices (e.g., imagery, idioms, exaggeration, alliteration, etc.) | <ul style="list-style-type: none"> a. Explain, generalize, or connect ideas, using supporting evidence from the text or from other sources b. Draw inferences about author's purpose, author's message or theme (explicit or implied) c. Make and support inferences about implied causes and effects d. Describe how word choice, point of view, or bias affects the interpretation of a reading selection e. Summarize or compare information within and across text passages f. Analyze interrelationships among elements of the text (plot, subplots, characters, setting) g. Analyze or interpret use of author's craft (literary devices) to analyze or critique a literary text | <ul style="list-style-type: none"> a. Compare or analyze multiple works by the same author, including author's craft b. Compare or analyze multiple works from the same time period or from the same genre c. Gather, analyze, organize, and interpret information from multiple (print and non print) sources for the purpose of drafting a reasoned report d. Evaluate the relevancy and accuracy of information from multiple (print and non print) sources (e.g., verifying factual information or assertions with other sources; researching the source of information) |