

Taxonomy

Adapted from: Dimensions of Learning (Marzano & Pickering); The New Taxonomy of Educational Objectives (Marzano & Kendall)

USING KNOWLEDGE: Generating & Testing Hypotheses to...						
...Address Situations & Issues			...Clarify Phenomena & Events			
Decision Making Select from among seemingly equal alternatives	Situational Problem Solving Accomplish a goal for which obstacles exist	Invention Develop a new product/process that fulfills a perceived need	Experimental Inquiry Offer and test explanations for what is observed	Investigation Historical-Projective-Definitional Resolve confusions related to concepts or events	Systems Analysis Explore parts of a system and how changing one part influences others	
<ul style="list-style-type: none"> • Select the best alternative • Generate criteria to select • What is the best way • Which has the most suitable 	<ul style="list-style-type: none"> • Figure out a way to • Given the conditions/ obstacles, how will you reach your goal 	<ul style="list-style-type: none"> • Create a new way to • Devise something that will • Change the way • Improve this situation with a new 	<ul style="list-style-type: none"> • If....then... • What can be predicted • What would happen if • How would you determine if • How can this be explained 	<ul style="list-style-type: none"> • What actually happened when • What would have happened if • Resolve the confusion about • What will happen if • Construct a definition of 	<ul style="list-style-type: none"> • Explain purpose of system • Describe how parts affect each other • What would happen if this part changes 	
ANALYZING KNOWLEDGE: Examining & Generating....						
...Similarities & Differences			...Arguments & Assertions			
Comparing Identify similarities & differences among items and ideas	Classifying Group items according to similarities	Analogical Thinking Show similar relationships for items across domains	Analyzing Perspectives Identify reasons & logic for perspectives on an issue	Constructing Support Build support for assertions or opinions	Analyzing Errors in Reasoning Identify logical or factual errors	
<ul style="list-style-type: none"> • Compare • Contrast • Differentiate • Discriminate • Distinguish 	<ul style="list-style-type: none"> • Sort • Categorize • Organize 	<ul style="list-style-type: none"> • Create an analogy for • Identify the logic behind • Find out why someone might think • Show the same pattern in both 	<ul style="list-style-type: none"> • Clarify the reasons for • Identify the logic behind • Find out why someone might think 	<ul style="list-style-type: none"> • Take a position on • Defend your position on • Explain your reasons • Offer arguments for 	<ul style="list-style-type: none"> • Question the validity of • Listen to insure • Assess • Expose fallacies in 	
COMPREHENDING KNOWLEDGE						
Symbolizing: Construct symbolic representations of information			Integrating: Identify basic elements/structure of knowledge			
<ul style="list-style-type: none"> • Symbolize • Represent • Draw/Illustrate 	<ul style="list-style-type: none"> • Show the organizational patterns in • Diagram to highlight • Chart 		<ul style="list-style-type: none"> • Describe how or why • Identify the key parts of • Trace the development of ideas in 	<ul style="list-style-type: none"> • Describe in your own words the effects • Explain ways in which • Paraphrase, Summarize 		
RETRIEVING KNOWLEDGE						
Recognizing: Identify information related to targeted knowledge		Recalling: Produce information related to targeted knowledge		Executing: Carry out a mental or physical procedure		
<ul style="list-style-type: none"> • Select • True, False • Match 	<ul style="list-style-type: none"> • Identify • Point to 	<ul style="list-style-type: none"> • State • Describe • Explain the major 	<ul style="list-style-type: none"> • Who, what, when where • How, why • List, name 	<ul style="list-style-type: none"> • Read • Write • Demonstrate 	<ul style="list-style-type: none"> • Add, Subtract • Multiply, Divide • Solve for 	<ul style="list-style-type: none"> • Complete • Use • Perform

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...Address Situations 81 Issues ...Clarify Phenomena & Events

- ' Select the best alternative - Figure out a way to - Create a new way to 1f....then... - What actually happened when
 - Figure out a way to - Create a new way to I if....then... - What actually happened when - Explain purpose of system Generate criteria to select - Given the conditions] Devise something that will ' What can be predicted What would have happened if - Describe how parts affect - What is the best way obstacles, how will you Change the way ' What would happen if - Resolve the confusion about each other
- Which has the must reach your goal
- Improve this situation with a new

' How would you determine if

' What will happen if

- What would happen if

suitable How can this be explained - Construct a definition of this part changes

...Similarities & Differences ...Arguments & Assertions ...Logical Inferences

Comparing Classifying Analogical Analyzing Constructing Analyzing Errors Deductive Inductive Group-items Thinking Perspectives Support in Reasoning Reasoning Reasoning 8' dwgences ac'cof'dfq-a: to Show simiior identify reasons

8: logic Huiid sooprt for identify logicoi or Appiy generoi Draw generoi among" items and Similarities relationships for for perspectives on on osserriions or opinions factual errors statements to specifics; conciusions from "1905 items across domains issue draw conciusions mult'ipie specifics

- Compare Sort - Create an analogy Clarify the reasons for ' Take a position on I Question the ' Make and defend ' Create a principle Contrast ' Categorize for Identify the logic ' Defend your validity-of Predict what will - Create a rule - Differentiate - Organize i is to i as behind position on - Listen to insure happen I What conclusions Discriminate is to Find out why someone - Expain your reasons - Assess Complete: if...then can be drawn Distinguish - Show the same might think - Offer arguments for Expose fallacies in Because this is A, pattern in both what do you know

I Symbolize - Represent I Draw/Illustrate

- Show the organizational patterns in - Diagram to highlight

Chart

I Describe how or why I Identify the key parts of I Trace the development of ideas in

I Describe in your own words the effects I Explain ways in which I Paraphrase, Summarize

' Select ' Identify I State - Who, what, when where Read ' Add, Subtract ' Complete True, False ' Pu'mitto - Describe - How, why - Write - Multiply, Divide '. Use

- Match - Explain the major - List the name - Demonstrate - Solve for ' Perform

Planning (Stimulus) Questions for Structured Tasks

Analysis		Using Knowledge
<p>Comparing</p> <ul style="list-style-type: none"> • Would it be useful to show how things are similar and/or different? • Would it be useful for students to focus on identifying how similar things are different and how different things are similar? <p>Classifying</p> <ul style="list-style-type: none"> • Would it be helpful to have students group things? • Would it be beneficial for students to generate a number of ways to group the same list of things? <p>Analogical Thinking</p> <ul style="list-style-type: none"> • Is there a relationship in one domain that could be used to understand something in a very different domain? • Could something complex or unfamiliar be understood better by connecting it to a relationship from something simple or more familiar? <p>Constructing Support</p> <ul style="list-style-type: none"> • Are there important claims to be refuted or supported? • Would it be important to examine existing arguments that support or refute a claim? <p>Analyzing Errors in Reasoning</p> <ul style="list-style-type: none"> • Are there situations in which it would be beneficial to identify errors in reasoning? <p>Analyzing Perspectives</p> <ul style="list-style-type: none"> • Would it be useful to identify and understand the reasoning or logic behind a perspective on a topic or issue? • Would it be useful to analyze opposing perspectives on a topic or issue? <p>Inductive Reasoning</p> <ul style="list-style-type: none"> • Are there important unstated conclusions that could be generated from observations or facts? • Are there situations for which probable or likely conclusions could be generated? • Are there issues or situations for which students could examine the inductive reasoning used? <p>Deductive Reasoning</p> <ul style="list-style-type: none"> • Are there generalizations (or rules or principles) that could be applied to reach conclusions and make predictions? • Are there topics or issues for which students could examine the validity of the deductive reasoning used? 	 <p>Decision Making</p> <ul style="list-style-type: none"> • Is there an unresolved decision important to the unit? • Is there an unresolved issue about who or what <ul style="list-style-type: none"> • has the most or least? • is the best or worst? <p>Problem Solving</p> <ul style="list-style-type: none"> • Is there a situation in which a goal cannot be achieved because of a major constraint or limiting condition? • Is there a situation or process that could be better understood if constraints or limiting conditions were placed on it? <p>Invention</p> <ul style="list-style-type: none"> • Is there a situation that can and should be improved on? • Is there something new that should be created? <p>Experimental Inquiry</p> <ul style="list-style-type: none"> • Is there an unexplained phenomenon (physical or psychological) for which students could generate explanations that can be tested? <p>Investigation</p> <ul style="list-style-type: none"> • Is there an unresolved issue about something for which a resolution could be posed? For example, are there unresolved issues about <ul style="list-style-type: none"> • the defining characteristics of something? (Definition) • how or why something occurred? (Historical) • what would happen if or what would have happened if? (Projective) <p>Systems Analysis</p> <ul style="list-style-type: none"> • Is there a system for which the interaction of parts could be clarified? • Is there a system for which parts could be altered and then conclusions drawn about potential effects? 	

Debra Pickering: Senior Scholar, Marzano Research Lab, MCCL Reasoning Processes Training 2013

Planning (Stimulus) Questions for Structured Tasks

Analysis

Comparing

Would it be useful to show how things are similar and/or different? Would it be useful for students to focus on identifying how similar things are different and how different things are similar? Classifying

Would it be helpful to have students group things? Would it be beneficial for students to generate a number of ways to group the same list of things? Analogical Thinking

Is there a relationship in one domain that could be used to understand something in a very different domain? Could something complex or unfamiliar be understood better by connecting it to a relationship from something simple or more familiar? Constructing Support

Are there important claims to be refuted or supported? - Would it be important to examine existing arguments that support or refute a claim?

Analyzing Errors in Reasoning

. Are there situations in which it would be beneficial to identify errors in reasoning?

Analyzing Perspectives

Would it be useful to identify and understand the reasoning or logic

behind a perspective on a topic or issue?

- Would it be useful to analyze opposing perspectives on a topic or issue? Inductive Reasoning

Are there important unstated conclusions that could be generated from observations or facts?

Are there situations for which probable or likely conclusions could be generated?

0 Are there issues or situations for which students could examine the inductive reasoning used? Deductive Reasoning

- Are there generalizations (or rules or principles) that could be applied to reach conclusions and make predictions? -

Are there topics or issues for which students could examine the validity of the deductive reasoning used?

Content Knowledge

Decision Making

- Is there an unresolved decision important to the unit? - is there an unresolved issue about who or what

' has the most or least?

- is the best or worst?

Problem Solving

is there a situation in which a goal cannot be achieved because of a major constraint or limiting condition? Is there a situation or process that could be better understood if constraints or limiting conditions were placed on it?

Invention

Is there a situation that can and should be improved on? - Is there something new that should be created?

Experimental Inquiry

Is there an unexplained phenomenon (physical or psychological) for which students could generate explanations that can be tested?

Investigation

I Is there an unresolved issue about something for which a resolution could be posed? For example, are there unresolved issues about

' the defining characteristics of something? (Definitional) how or why something occurred? (Historical) - what would happen if or what would have happened if?

(Projective)

Systems Analysis

e is there a system for which the interaction of parts could be clarified? - Is there a system for which parts could be altered and then conclusions drawn about potential effects?

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