

facebook/Zen to Zany

**It's a Journey..No one is ahead of you or behind you. You are not more "advanced" or less enlightened. You are exactly where you need to be. It's not a Contest....
It's LIFE. We are ALL teachers and we are ALL students.**

Critical thinking Skills



**Taught
the Ag
way**

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 <i>Select from among seemingly equal alternatives</i>	Situational Problem Solving <i>Accomplish a goal for which obstacles exist</i>	Invention <i>Develop a new product/process that fulfills a perceived need</i>	Experimental Inquiry <i>Offer and test explanations for what is observed</i>	Investigation <i>Historical-Projective-Definitional</i> <i>Resolve confusions related to concepts or events</i>	Systems Analysis <i>Explain parts of a system and how changing one part influences others</i>
<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			...Logical Inferences	
Comparing <i>Identify similarities & differences among items and ideas</i>	Classifying <i>Group items according to similarities</i>	Analogical Thinking <i>Show similar relationships for items across domains</i>	Analyzing Perspectives <i>Identify reasons & logic for perspectives on an issue</i>	Constructing Support <i>Build support for assertions or opinions</i>	Analyzing Errors in Reasoning <i>Identify logical or factual errors</i>	Deductive Reasoning <i>Apply general statements to specifics; draw conclusions</i>	Inductive Reasoning <i>Draw general conclusions from multiple specifics</i>
<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 ___ is to ___ as ___ is to ___ 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 	<ul style="list-style-type: none"> Make and defend Predict what will happen Complete: If...then Because this is A, what do you know 	<ul style="list-style-type: none"> Create a principle Create a rule What conclusions can be drawn

COMPREHENDING KNOWLEDGE

Symbolizing: <i>Construct symbolic representations of information</i>	Integrating: <i>Identify basic elements/structure of knowledge</i>
<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: <i>Identify information related to targeted knowledge</i>	Recalling: <i>Produce information related to targeted knowledge</i>	Executing: <i>Carry out a mental or physical procedure</i>
<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 		

SIMILARITIES AND DIFFERENCES

Comparing- looking at the similarities and differences of items using specific characteristics

Classifying-selecting characteristics and then grouping items that have the specified attributes

Abstracting-statement that summarizes the important points

Create your chart for a comparison, classification, etc. Add your categories

Characteristics Maine Economics	Item 1 Maine	Item 2 State you researched (Florida)	Item 3 A friends state they studied (Kansas)	Similarities/ differences
Characteristic 1 Agriculture	Potatoes Blueberries Apples Poultry and eggs seafood dairy products cattle	Citrus vegetables nursery stock cattle sugar cane dairy products	Wheat cattle sorghum soybeans hogs corn	Maine doesn't grow citrus fruits because of our temperate climate. We do not have a long enough growing season. We do grow wheat, but not as much as the prairie states as they have more flat prairies.
Characteristic 2 Manufacturing/ Industry	Paper Lumber wood products food processing Leather products electric equipment	electric equipment tourism food processing printing and publishing transportation equipment machinery	transportation equipment food processing printing and publishing petroleum mining	Maine all 3 states do food processing. I don't think it is the same foods that are processed though. Maine is potatoes and blueberries, Florida is like orange juice and stuff, and Kansas is probably wheat
Characteristic 3				
Characteristic 4				

Classifying the 3 main parts of the Farm Belt

<p>Wheat Belt, the part of the North American Great Plains where wheat is the dominant crop.</p>	<p>Corn Belt, major agricultural region of the U.S. Midwest where corn acreage once exceeded that of any other crop. It is now commonly called the Feed Grains and Livestock Belt. The belt produces much of the U.S. corn crop.</p>	<p>The Dairy Belt makes lots of milk, butter and cheese. The Dairy Belt, makes use of a shorter growing season and cooler summers in New England and the Great Lakes–St. Lawrence region, where clover, timothy hay, and hardy small grains and the lush pastures of the Pacific Coast’s</p>	<p>Abstracting/ generalization</p>
<p>Winter wheat: Kansas</p>	<p>Iowa</p>	<p>Wisconsin</p>	<p>Wheat belt are mostly the prairie states where they have a lot of flat land to grow large wheat crops. Maine can grow wheat but not as much- it can be used as a cover crop (a crop grown for the enrichment of the soil</p>
<p>Oklahoma</p>	<p>Illinois</p>	<p>Minnesota</p>	
<p>Nebraska</p>	<p>Nebraska</p>	<p>Michigan</p>	
<p>Colorado</p>	<p>Minnesota</p>		
<p>Spring Wheat:</p>	<p>Sometimes Parts of: South Dakota</p>		
<p>Montana</p>	<p>North Dakota</p>		
<p>North Dakota</p>	<p>Indiana</p>		
<p>South Dakota</p>	<p>Ohio</p>		
<p>Minnesota</p>	<p>Wisconsin</p>		

Abstracting (making generalizations)

<p>Specific/ literal</p> <p>Food</p>	<p>General/ Abstract</p>	<p>specific/ literal</p> <p>Shelter</p>
<p>Climate What you eat depends on the weather. If you are where it is hot you may have citrus fruits. If you live where it is cold you have to preserve food for when you can not grow it.</p>	<p>Climate Our basic needs are dependent on the climate. It is important to think about the climate when you are building a house.</p>	<p>Climate The type of shelter you build depends on the climate. If you live where it is cold you have to have a strong sturdy house with heat to keep you warm. If you live where it is hot you may need air conditioning so you do not over heat</p>
<p>Location What type of foods you eat can depend on where you live. If you are closer to an ocean you may have seafood. If you are closer to the prairies you may have more corn or wheat.</p>	<p>Location Our basic needs are dependent on your location. It is important to think about the location of your house.</p>	<p>Location Where you live can determine the type of shelter you build. If you live near the ocean you may put your house on columns in case of high waves. If you live where it is really hot you may have sides to your house open.</p>
<p>Culture Traditions, holidays, religion, customs (culture) can make a difference with the food you eat. You may give up certain foods for lent or not eat a certain type of meet.</p>	<p>Culture Our basic needs can be determined by your culture.</p>	<p>Culture Traditions, holidays, religion etc., can determine the type of shelter you build.</p>

Misconceptions:

At first the students used the classifying chart and just made a comparison.

The difference between the two is that with Comparisons you select the items and characteristics to compare.

With classifying you select the characteristics and then find items that fit that particular characteristic.

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 <i>Select from among seemingly equal alternatives</i>	Situational Problem Solving <i>Accomplish a goal for which obstacles exist</i>	Invention <i>Develop a new product/process that fulfills a perceived need</i>	Experimental Inquiry <i>Offer and test explanations for what is observed</i>	Investigation <i>Historical-Projective-Definitional</i> <i>Resolve confusions related to concepts or events</i>	Systems Analysis <i>Explain parts of a system and how changing one part influences others</i>
<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			...Logical Inferences	
Comparing <i>Identify similarities & differences among items and ideas</i>	Classifying <i>Group items according to similarities</i>	Analogical Thinking <i>Show similar relationships for items across domains</i>	Analyzing Perspectives <i>Identify reasons & logic for perspectives on an issue</i>	Constructing Support <i>Build support for assertions or opinions</i>	Analyzing Errors in Reasoning <i>Identify logical or factual errors</i>	Deductive Reasoning <i>Apply general statements to specifics; draw conclusions</i>	Inductive Reasoning <i>Draw general conclusions from multiple specifics</i>
<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 • ___ is to ___ as ___ is to ___ • 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 	<ul style="list-style-type: none"> • Make and defend • Predict what will happen • Complete: If...then • Because this is A, what do you know 	<ul style="list-style-type: none"> • Create a principle • Create a rule • What conclusions can be drawn

COMPREHENDING KNOWLEDGE

Symbolizing: <i>Construct symbolic representations of information</i>	Integrating: <i>Identify basic elements/structure of knowledge</i>
<ul style="list-style-type: none"> • Symbolize • Represent • Draw/Illustrate 	<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"> • Show the organizational patterns in • Diagram to highlight • Chart 	<ul style="list-style-type: none"> • Describe in your own words the effects • Explain ways in which • Paraphrase, Summarize

RETRIEVING KNOWLEDGE

Recognizing: <i>Identify information related to targeted knowledge</i>	Recalling: <i>Produce information related to targeted knowledge</i>	Executing: <i>Carry out a mental or physical procedure</i>
<ul style="list-style-type: none"> • Select • True, False • Match 	<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"> • Identify • Point to 	<ul style="list-style-type: none"> • Read • Write • Demonstrate 	<ul style="list-style-type: none"> • Add, Subtract • Multiply, Divide • Solve for • Complete • Use • Perform

Assertions and Arguments

Assertions-the action of stating something or exercising authority confidently and forcefully.

Arguments-a reason or set of reasons given with the aim of persuading others that an action or idea is right or wrong.

Analyzing Perspectives

Issue:

What should we grow in our school garden?

perspective 1:

Only pumpkin

Reasons/ Reasoning:

It would be easier to take care of one crop, less weeding and up keep in the summer

Perspective 2:

multiple items-cucumbers, tomatoes, peppers,

Reasons/ Reasoning:

there would be more of a variety and things you could eat earlier

Decision

Make two spaces for growing one for pumpkins and one for other items

First supporting reason for this decision

We have space in two areas that the soil has been checked and is good for growth

Second supporting reason for this decision

We could rotate our crops form year to year if we had 2 areas

Constructing support

Position or Point of View Our school should do composting	Evidence (data, examples, quotes):
Reason 1: Recycling helps save our environment	We have landfills that are piles of buried trash that won't go away. If we recycle what we can less trash has to be "stored" and we will not run out of room for this
Reason 2: When you compost you reuse what is left over, so it is not waste	When you put things in a plastic garbage bag it does not decompose. If you put left over food in a compost pile and stirred it now and again it would decay and decompose back into the earth
Reason 3: We could use the compost to fertilize a school garden	When a tree or plant or animal decomposes it goes back into the ground and helps other things grow, so you could put it on a school garden to help it grow
Opposing view/qualifier Composting takes time, it can smell	Acceptance, refutation We could have students and adults that are willing to help give up recess time or help out before or after school We could put it in a location that wasn't too close to an entrance

Analyzing errors

Information

Only Bulls have horns



Is this information important or intended to persuade?

Stop Analysis

Does anything seem wrong?
Not all bulls have horns

Bull at rodeos don't have horns

Stop Analysis

What is wrong with the thinking in the information?

yes

Faulty Logic?

Just what someone said

Weak References?

Sometimes cows have horns

Attacks?

yes

Misinformation?

Ask for more information

Misinformation-calves are dehorned so the do not hook each other later

Challenges:

Students needed a lesson in active listening - the listener needed to give feedback about what they heard to the speaker to confirm what they have heard and moreover, to confirm the understanding, in order to understand others' perspectives and not just argue for their own.

Students needed lessons in empathy- the ability to understand and share the feelings of another when arguing so as to not offend others.

Students needed modeling in admitting they have made a mistake so they would be able to analyze their work for errors.

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 <i>Select from among seemingly equal alternatives</i>	Situational Problem Solving <i>Accomplish a goal for which obstacles exist</i>	Invention <i>Develop a new product/process that fulfills a perceived need</i>	Experimental Inquiry <i>Offer and test explanations for what is observed</i>	Investigation <i>Historical-Projective-Definitional</i> <i>Resolve confusions related to concepts or events</i>	Systems Analysis <i>Explain parts of a system and how changing one part influences others</i>
<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			...Logical Inferences	
Comparing <i>Identify similarities & differences among items and ideas</i>	Classifying <i>Group items according to similarities</i>	Analogical Thinking <i>Show similar relationships for items across domains</i>	Analyzing Perspectives <i>Identify reasons & logic for perspectives on an issue</i>	Constructing Support <i>Build support for assertions or opinions</i>	Analyzing Errors in Reasoning <i>Identify logical or factual errors</i>	Deductive Reasoning <i>Apply general statements to specifics; draw conclusions</i>	Inductive Reasoning <i>Draw general conclusions from multiple specifics</i>
<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 • ___ is to ___ as ___ is to ___ • 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 	<ul style="list-style-type: none"> • Make and defend • Predict what will happen • Complete: If...then • Because this is A, what do you know 	<ul style="list-style-type: none"> • Create a principle • Create a rule • What conclusions can be drawn

COMPREHENDING KNOWLEDGE

Symbolizing: <i>Construct symbolic representations of information</i>	Integrating: <i>Identify basic elements/structure of knowledge</i>
<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: <i>Identify information related to targeted knowledge</i>	Recalling: <i>Produce information related to targeted knowledge</i>	Executing: <i>Carry out a mental or physical procedure</i>
<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 • Complete • Use • Perform

Logical Reasoning

Inductive reasoning:

Is known as the bottom up approach.

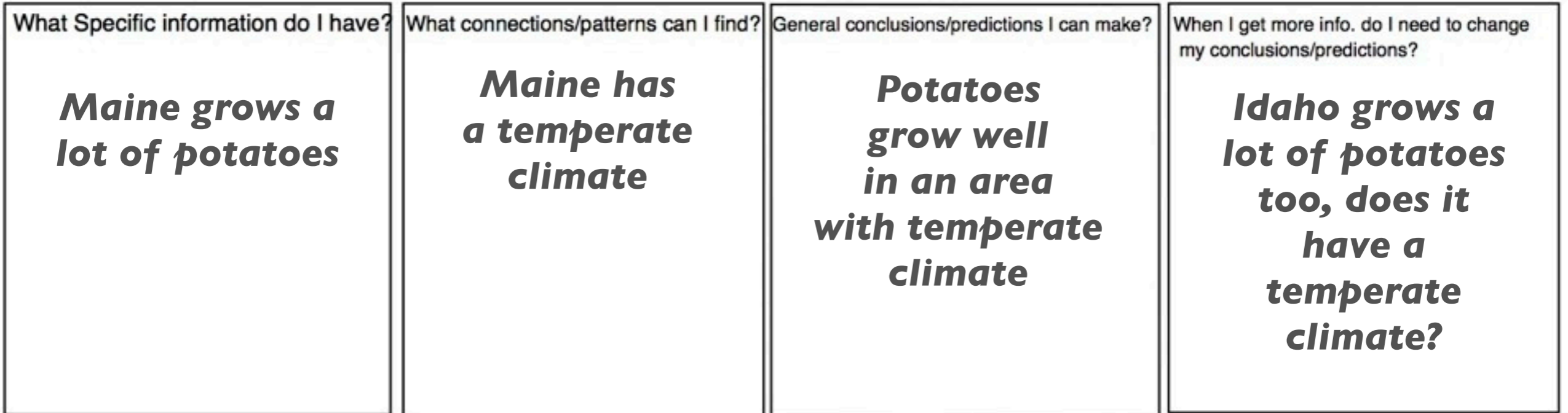
Starts with a small observation or question and works its way up to a theory by examining the related issues.

Deductive reasoning:

Is known as the top up approach.

Starts with the theory or hypothesis and then works its way down to a conclusion based on evidence.

Inductive Reasoning:
Topic:



Conclusion :

Potatoes do grow well in a temperate climate

Deductive Reasoning:

Specific topic

Not all animals are mammals.

related generalizations/principle

Birds are animals and they lay eggs and have feathers



**Mammals:
birth to live babies
babies drink their mothers milk
have hair**

Conditions that have to be in place for the generalization/principle to apply

Does the specific topic meet the conditions that make the generalization/principle apply?



Conclusion/prediction

Therefore not all animals are mammals.

No Conclusion/prediction

Challenges:

Students have to be taught to understand fact vs fiction, not to believe everything you read or hear, and how to find supporting evidence for their theories.

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 <i>Select from among seemingly equal alternatives</i>	Situational Problem Solving <i>Accomplish a goal for which obstacles exist</i>	Invention <i>Develop a new product/process that fulfills a perceived need</i>	Experimental Inquiry <i>Offer and test explanations for what is observed</i>	Investigation <i>Historical-Projective-Definitional</i> <i>Resolve confusions related to concepts or events</i>	Systems Analysis <i>Explain parts of a system and how changing one part influences others</i>
<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			...Logical Inferences	
Comparing <i>Identify similarities & differences among items and ideas</i>	Classifying <i>Group items according to similarities</i>	Analogical Thinking <i>Show similar relationships for items across domains</i>	Analyzing Perspectives <i>Identify reasons & logic for perspectives on an issue</i>	Constructing Support <i>Build support for assertions or opinions</i>	Analyzing Errors in Reasoning <i>Identify logical or factual errors</i>	Deductive Reasoning <i>Apply general statements to specifics; draw conclusions</i>	Inductive Reasoning <i>Draw general conclusions from multiple specifics</i>
<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 • ___ is to ___ as ___ is to ___ • 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 	<ul style="list-style-type: none"> • Make and defend • Predict what will happen • Complete: If...then • Because this is A, what do you know 	<ul style="list-style-type: none"> • Create a principle • Create a rule • What conclusions can be drawn

COMPREHENDING KNOWLEDGE

Symbolizing: <i>Construct symbolic representations of information</i>	Integrating: <i>Identify basic elements/structure of knowledge</i>
<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: <i>Identify information related to targeted knowledge</i>	Recalling: <i>Produce information related to targeted knowledge</i>	Executing: <i>Carry out a mental or physical procedure</i>
<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 		

Address Situations and Issues

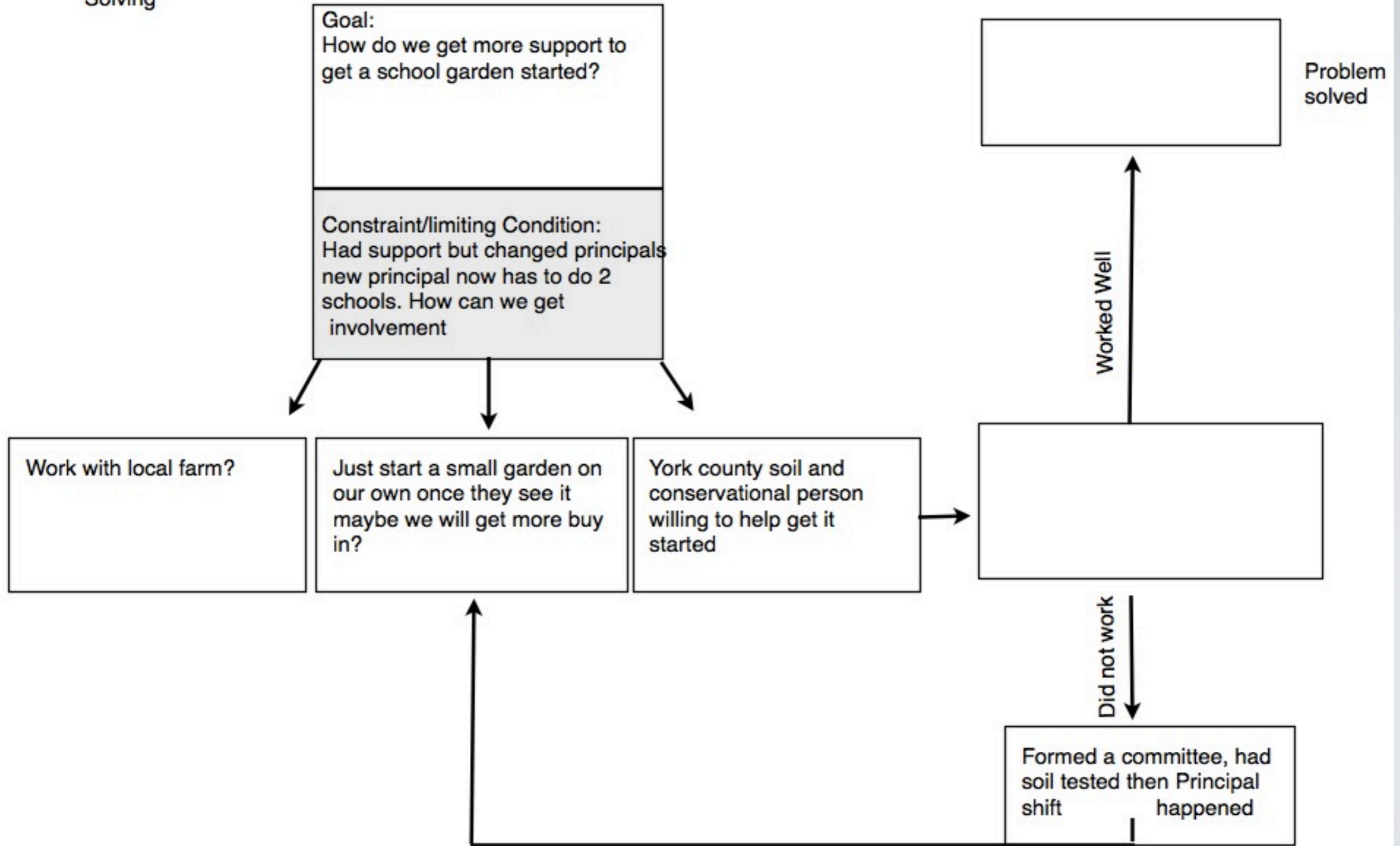
Explore an important topic or problem for debate or discussion, using a set of circumstances in which one finds oneself.

Decision making: What am I trying to decide?

Where to put School Garden?

What are important criteria for making this decision? In order of importance to designate an importance score. write topic in spaces below +	Alternatives: What are my choices?		
	Amount of sun Space	Water Source	Public access view
Score of 1 Behind the building in front of the art room	Full Sun could put about four 12 by 4 foot raised beds <input type="checkbox"/>	Access to rain water run off from building and water spicket near <input type="checkbox"/>	School blocks it from public view there is a fence there are cameras <input type="checkbox"/>
Score of 2 Behind the building-where brick wall of gym is at the bottom of the hill	Partial sun 20 ft by 4 ft space <input type="checkbox"/>	Access to rain water run off and water spicket, Drain on hill and run off <input type="checkbox"/>	School blocks it from public view there is a fence there is a camera <input type="checkbox"/>
Score of 3 To the left of the school near Kindergarten first grade rooms toward front of <u>bulding</u>	Sun blocked part of the day by the building but does get sun <input checked="" type="checkbox"/>	Access to rain water run off quite a distance from water source <input type="checkbox"/>	Can see when driving into school no fence there is a camera <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TOTALS			

Problem Solving



Investigation

What event or idea do I want to explain?

Could we put a pumpkin patch at the bottom of the hill or would the water run off from the hill effect their growth?

What do people already Know?	What confusions do people have?
All plants need sunlight to grow	Some plants need more direct sunlight than others
All plants need water	You can over water a plant

Suggestions for clearing up confusions-
Students plant some items vary direct, indirect sunlight for some and amount of watering for some chart what happens with students

How can I defend my suggestion?
Experimentation
Research

Challenges:

Students must be taught to think outside the box

Students at times come up with decisions, ideas for solutions to problems that are grandiose or impractical

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 <i>Select from among seemingly equal alternatives</i>	Situational Problem Solving <i>Accomplish a goal for which obstacles exist</i>	Invention <i>Develop a new product/process that fulfills a perceived need</i>	Experimental Inquiry <i>Offer and test explanations for what is observed</i>	Investigation <i>Historical-Projective-Definitional</i> <i>Resolve confusions related to concepts or events</i>	Systems Analysis <i>Explain parts of a system and how changing one part influences others</i>
<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			...Logical Inferences	
Comparing <i>Identify similarities & differences among items and ideas</i>	Classifying <i>Group items according to similarities</i>	Analogical Thinking <i>Show similar relationships for items across domains</i>	Analyzing Perspectives <i>Identify reasons & logic for perspectives on an issue</i>	Constructing Support <i>Build support for assertions or opinions</i>	Analyzing Errors in Reasoning <i>Identify logical or factual errors</i>	Deductive Reasoning <i>Apply general statements to specifics; draw conclusions</i>	Inductive Reasoning <i>Draw general conclusions from multiple specifics</i>
<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 • ___ is to ___ as ___ is to ___ • 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 	<ul style="list-style-type: none"> • Make and defend • Predict what will happen • Complete: If...then • Because this is A, what do you know 	<ul style="list-style-type: none"> • Create a principle • Create a rule • What conclusions can be drawn

COMPREHENDING KNOWLEDGE

Symbolizing: <i>Construct symbolic representations of information</i>	Integrating: <i>Identify basic elements/structure of knowledge</i>
<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: <i>Identify information related to targeted knowledge</i>	Recalling: <i>Produce information related to targeted knowledge</i>	Executing: <i>Carry out a mental or physical procedure</i>
<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 		

Clarifying Phenomena & Events

To make ones perception
of an object or statement
less confused and more
clearly comprehensible.

Experimental Inquiry

Experimental Inquiry

Topic:

Is a gallon of milk that I buy in the supermarket really hold 1 gallons worth of milk?

How might I explain what I observed?

The milk does not touch the top of the gallon

What do I predict based on my explanations?

Our class does not think so because the milk does not go all the way to the top

How can I test my prediction?

Use an empty gallon jug and a quart jug (there are 4 quarts in a gallon)
Use an empty gallon jug and a pint measure (there are 8 pints in a gallon)
Use an empty gallon jug and cup measure (there are 16 cups in a gallon)

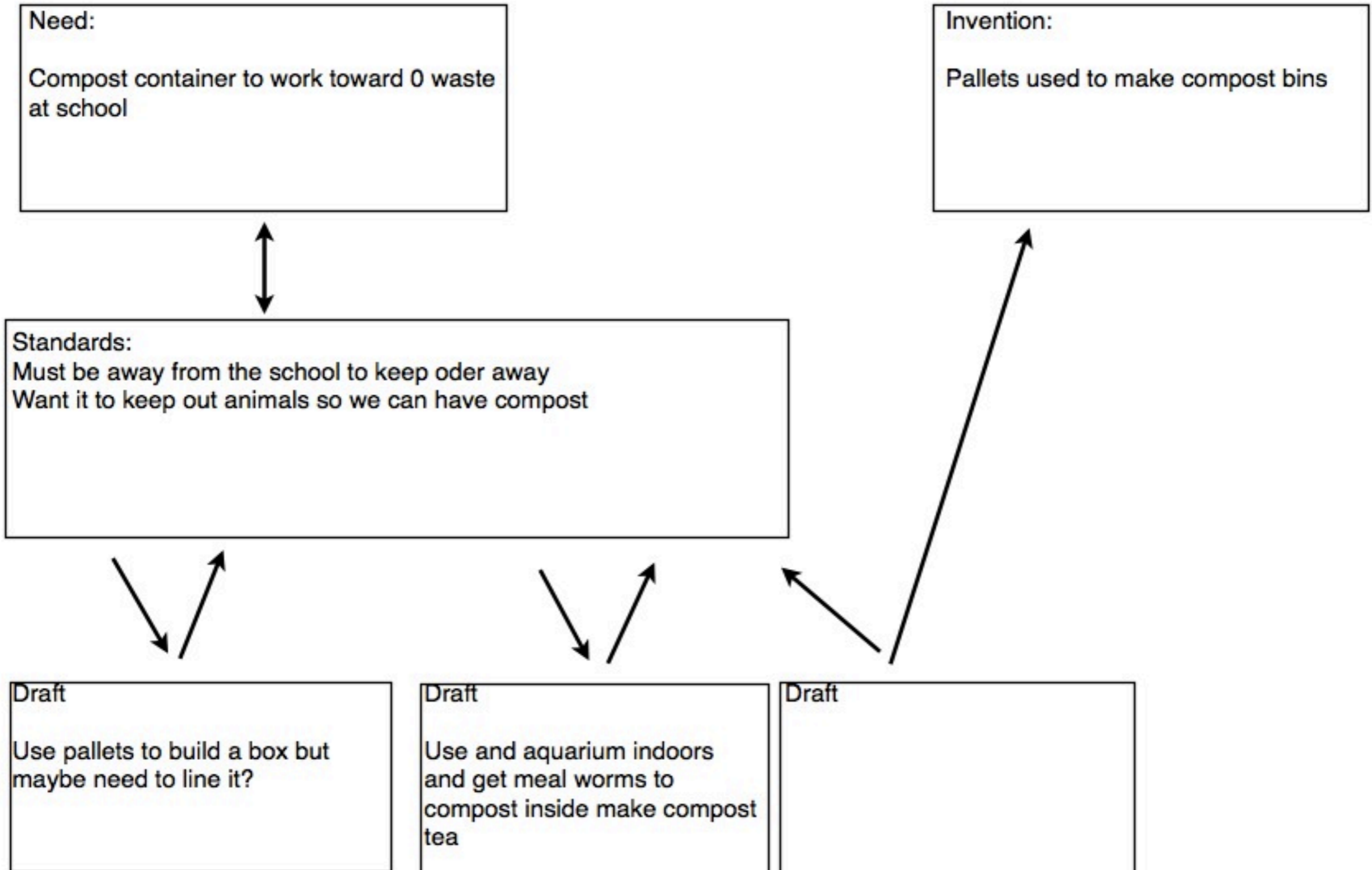
Was my prediction correct? Why or why not? Conclusions

No there was a gallon in the jug- the top part not filled was extra space. We noticed if we totally filled the jug it spilled over so they probably have the extra space so it won't spill.

We think it would be the same with orange juice

Invention

Invention



System Analysis

