ShopTALK

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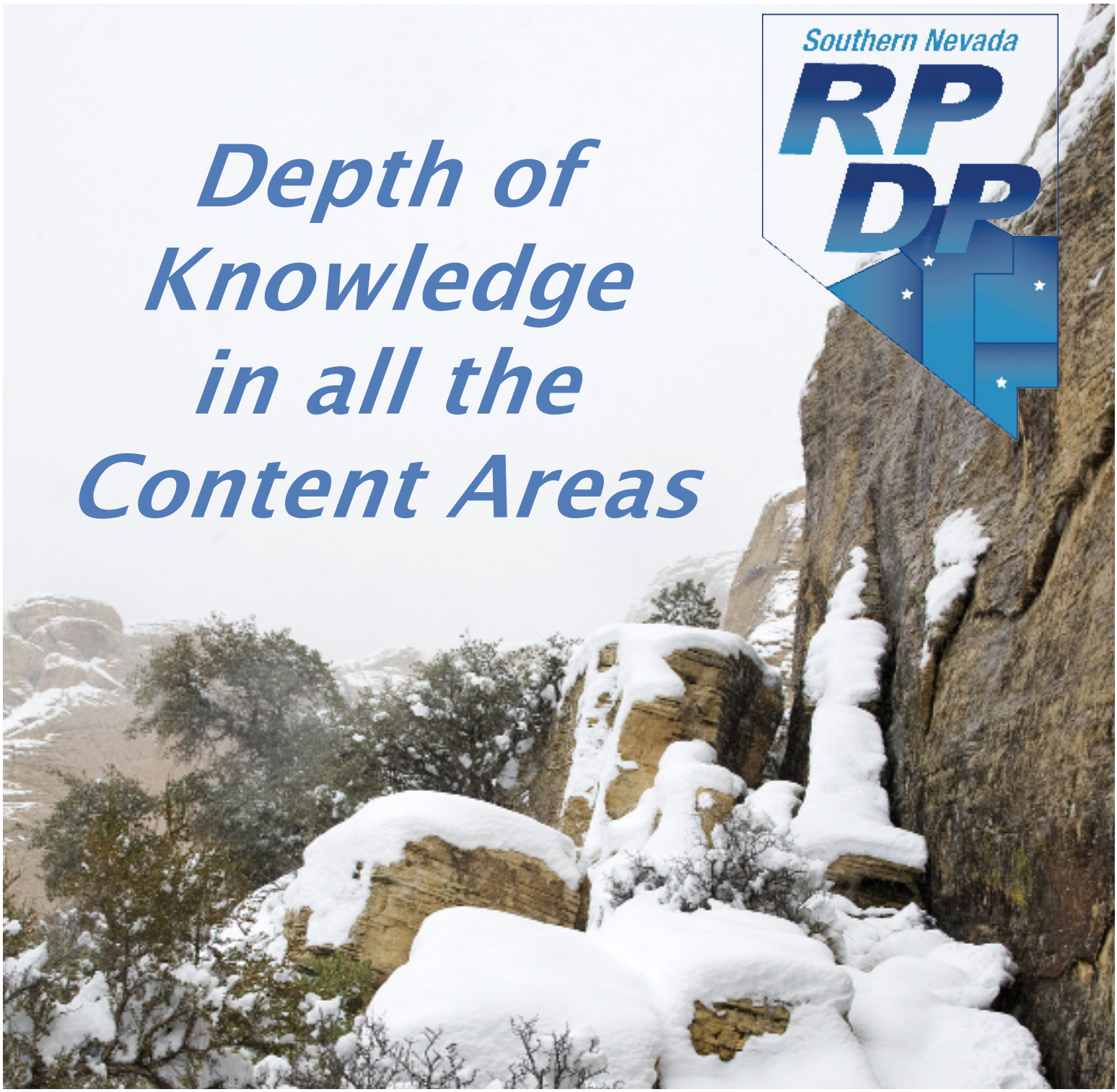
Southern Nevada RPDP

Depth of Knowledge in all the Content Areas



The Southern Nevada Regional Professional Development Program

ShopTALK

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Regional Professional Development Program
515 W. Cheyenne, Suite C
North Las Vegas, NV 89030
Ph. 702.799.3835
Fax 702.799.3821

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Director

Bill Hanlon

Staff

Ahern, Cindy
Chalmers, Inga
Costantino, Stephanie
Finney, Ruby
Leon, Maria
Kessler, Mark
Lombardi, Doug
Smith, Chelli

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Hicks, Pam
Salazar, Pam

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Spendlove, Karl

Secondary Science
Bostic, Jeff
Ebert, Ellen
Marconi, Elizabeth
Sibley, Bret

Table of Contents

Cover Photo Credit: Jeff Bostic

This issue of ShopTALK focuses on Depth of Knowledge (DOK). You will find classroom ready ideas and activities for each content area and DOK level that will help you integrate DOK into the classroom and prepare your students for success on the state exams.

For more information about DOK, as well as classroom ready resources visit the RPDP's website, www.rpdp.net. Click on the red "DOK Resources" tab in the upper-left corner.

Depth of Knowledge: An Effective Tool for Educating Students

By Elizabeth Marconi, Chelli Smith, and Doug Lombardi

In order to ensure student learning at the highest levels, practices within our classrooms must be comprehensive and rigorous. Furthermore, students who are provided with comprehensive and rigorous learning opportunities perform better on state achievement tests than those who don't. In an effort to create these positive learning opportunities and ensure that the standards are accurately assessed, the Nevada Department of Education has adopted Norman Webb's Depth of Knowledge (DOK) levels. The Department of Education feels the DOK levels not only provide for a greater depth and breadth of learning, but also meet the requirements of academic rigor required by No Child Left Behind.

These DOK levels will be incorporated into all of Nevada's state tests starting in 2010, with field test items leveled to DOK in 2009.

A Familiar Face

DOK is familiar territory to Southern Nevada's teachers because DOK reinforces exemplary classroom practice and is consistent with both the *Components of an Effective Lesson* and *Teacher Expectancies*. Most teachers learned about Bloom's Taxonomy in pedagogy classes during their teacher preparation program. In Bloom's Taxonomy, different verbs represent six levels of cognitive processes. However, unlike Bloom's system, the DOK levels are not a taxonomical tool that uses verbs to classify the level of each cognitive demand. The DOK level is determined by the degree of mental processing required by the student to meet the objectives of a particular classroom activity. In the case of assessment, DOK is the cognitive demand required to correctly answer test questions. It is important to note that DOK levels will replace the ability levels (A1, A2, and A3) on the state standardized tests as DOK more closely reflects the depth and breadth we would like our students to achieve in the classroom.

What Are DOK Levels?

The DOK level describes the kind of thinking involved in the task, not whether it will be completed correctly. A greater DOK level requires greater conceptual understanding and cognitive processing by the students. Therefore, on average, students who reach greater DOK levels more regularly will have increased student achievement.

Level 1 involves recall and the response is automatic. Students either know the answer or not. Level 1 activities require students to demonstrate a rote response, follow a set of procedures, or perform simple calculations.

Level 2 activities are more complex and require students to engage in mental processing and reasoning beyond a habitual response. These activities make students decide how to approach the problem, involving interpreting and developing relationships among concepts.

Level 3 activities necessitate higher cognitive demands than the previous two levels. At Level 3 students are providing evidentiary support and reasoning for conclusions they draw. In most instances, having students explain and justify their thinking is at a Level 3. Typically, Level 3 activities have more than one correct response or approach to the problem.

Level 4 includes those tasks in which students must demonstrate reasoning, planning, and developing connections within and beyond a content area. These activities usually occur over an extended period of time and cannot be assessed on the Criterion-referenced Tests (CRT) or High School Proficiency Exam (HSPE). However, these tasks should be incorporated into the curriculum since it is this type of thinking we want to encourage from all of our students.

Not all state standards and benchmarks support DOK levels 3 and 4. Each of the benchmarks has a "ceiling" DOK level depending on the content. Specific information about the ceiling DOK level for each benchmark can be found on the Nevada Department of Education website.

DOK levels are ***cumulative***. For example, a DOK level 3 activity will probably contain DOK level 1 and 2 elements; however, DOK levels are **NOT *additive***. You cannot create a DOK level 2 activity with only DOK level 1 elements (i.e., a DOK level 1 + DOK level 1 does not equal a DOK level 2) *(Continued on page 4)*

Using DOK

Following are some questions to consider when analyzing your curriculum tasks for DOK.

1. ***What level of work are the students most commonly required to perform?***
2. ***What is the complexity of the task rather than the difficulty?***
3. ***What are all the skills and knowledge scaffolding that the students will have already needed to build to complete the task?***

Examples of what Depth of Knowledge look like in the classroom				
Content Area	***Level 1***	***Level 2***	***Level 3***	***Level 4***
Elementary Language Arts	Sort known words as quickly as possible.	Find words in text that illustrate a defined pattern. (Word Hunt)	Create an open sort and define the rule and explain.	Illustrate through authentic writing stability in pattern and content of identified stage.
Elementary Mathematics	Collect data on the number of teeth lost by students in one 2nd grade classroom.	Organize these data using a graph or chart (e.g., a line plot).	Using the graph, predict how many teeth would be lost by all the 2nd grade classes in the schools and justify your answer.	Come up with a model to estimate how many teeth are lost by 2nd grade students in the United States in one year. Include the type of data you would need to collect and explain how your model works.
Elementary Interdisciplinary	List the ingredients of a peanut butter and jelly sandwich.	Collect the ingredients for a peanut butter and jelly sandwich and write the recipe.	Investigate how many people are coming to dinner and formulate the appropriate amounts of ingredients for 8 people.	Design a plan to feed the entire class using the following information: one jar of peanut butter makes 10 sandwiches, one jar of jelly serves 8, and one loaf of bread contains 18 slices.
Middle School Science	Define the following terms: electrical generator, electrical motor, magnetic field, and electrical current.	Compare and contrast how an electrical motor operates to how an electrical generator operates.	Design and conduct an experiment to demonstrate that electrical currents produce magnetic forces.	Research and design a system to lift heavy objects using the conversion of electrical energy to mechanical energy. Build a prototype of the system using materials found in the classroom.
U.S. History	Name the U.S. presidents in order.	Using the left and right political continuum, categorize the presidents of the 20th and 21st centuries according to their political standing.	Hypothesize how Dwight D. Eisenhower would react to today's world political situation.	Analyze the strategies and effectiveness of George H. W. Bush's war strategies in the Persian Gulf with the war strategies of George W. Bush in Iraq.
High School Music	Name several composers from the Baroque and Classical periods.	Describe differences between the Baroque and Classical periods.	Critique, compare, and contrast pieces of music from the Baroque and Classical periods.	Choose a period and develop a 16 measure piece of music from that style.

Depth of Knowledge in Literacy

By SNRPDP Elementary Literacy Trainers

Below is an example of a primary and intermediate lesson that is aligned to Depth of Knowledge levels. The lessons use both fiction and informational text. Most teachers are already using DOK in their classrooms; the following illustrates how to label specific lessons.

"All About Insects" from The Six Minute Solution: A Reading Fluency Program
Primary Lessons

"An insect is a tiny animal. It has six legs. It has a body. An insect's body has three parts. Most insects have wings. Insects do not have a backbone.

There are more than one million kinds of insects. They are found all over. Insects can live in hot places. They can live in cold places. There are many kinds of insects. Insects do not look alike. They come in many colors. They also come in many shapes.

Insects have a life cycle. Each insect starts life as an egg. The egg hatches. It becomes a larva. A larva looks like a worm. It has a mouth. But it does not have eyes. A larva likes to eat. It eats and eats. The larva sheds its skin. Later, the larva spins a cocoon. It lives in the cocoon. Now it is called a pupa. After a while, the pupa leaves its cocoon. Then, it is an adult insect."

DOK 1:
Recall the four stages of an insect's life cycle and label them in the correct sequence using a Flow Map. (egg, larva, pupa, and adult)

DOK 2:
Observe two different insects over a period of a week and create a Double Bubble Map of their similarities and differences, including behavior, eating habits, physical traits, etc. Orally compare the data.

DOK 3:
After listening to the teacher read Eric Carle's *The Very Quiet Cricket*, *The Grouchy Ladybug*, *The Very Lonely Firefly*, *The Very Clumsy Click Beetle*, and *The Very Hungry Caterpillar* over time, use the information from these books, the passage above, and other non-fiction material to create an informational poster about one insect.

DOK 4:
At the culmination of the insect unit, assume the perspective of an insect. Create a journal entry in which you survive a 24 hour period in our classroom. Create a second journal entry in which you survive a 24 hour period on our playground. In a third journal entry, prove which habitat is best suited for your survival.

"Insects" from The Six Minute Solution: A Reading Fluency Program
Intermediate Lessons

"Insects belong to a huge group of animals. This group is called arthropods. All arthropods have a hard outer coat called an exoskeleton. This exoskeleton protects the soft insides of an arthropod's body.

An adult insect's body is divided into three sections: a head, a thorax, and an abdomen. The insect's head contains mouthparts, eyes, and antennae. The thorax is the middle part of an insect's body. Three pairs of jointed legs are found on the thorax. Insects have six legs. Two pairs of wings are also attached to the thorax. The abdomen is the bottom part of an insect. It is the biggest part of the body.

Most insects undergo a change. This change is called metamorphosis. The metamorphosis has four stages: egg, larva, pupa, and adult. Most insects lay eggs. Each egg then turns into a larva. After several molts, the larva enters the pupa stage. During this stage, it does not eat or move. When the pupa stage ends, the adult insect emerges.

There are thousands of insects in the world. More than 900,000 kinds have been found. That is more than three times as many other animal types put together. Many more new insects are discovered every year."

DOK 1:
Draw an insect and label its body parts, including head, thorax, abdomen, mouthparts, eyes, antennae, legs, and wings.

DOK 2:
Construct a model showing the four stages of metamorphosis.

DOK 3:
Use the information from the passage above, the internet, and other non-fiction material to research and explain the habitat, eating habits, lifespan, etc. of a specific insect. Orally share your written work.

DOK 4:
The last paragraph of the article mentions that there are three times as many insects as other animal types put together. Our school has an insect problem with ants and cockroaches. Our task is to design an eco-friendly method to get rid of these pests. Work in groups to identify solution paths, solve the problem, and report the outcome. Share results with peers.

Accessing Higher DOK Levels Using Think-Alouds

By Deborah Baughman, The Standards Company LLC

Depth of Knowledge (DOK), originally created by Norman Webb, can best be described as a tool used to measure the cognitive demand of instructional objectives and assessment items. Webb first introduced it for the purpose of aligning assessment to standards in the area of cognitive rigor. While this is all good to know, it does little to help us understand how DOK can be practically applied within the classroom.

While No Child Left Behind has addressed cognitive demand with regards to standards and assessments, the Act has not addressed cognitive demand in the area of classroom instruction. Yet, there must be instruction of the standards for assessment to take place—students must first be instructed before they are assessed. If students are to master a standard which requires the type of cognitive demand of DOK level 3, for example, then we must instruct students in such ways that they can reach this mastery.

Practically speaking, how is this done?

THINK-ALOUDS AS A TEACHING STRATEGY

One way we can acclimate students to higher DOK activities is by using think-alouds, a simple cognitive strategy developed to help students access meaning associated with higher-level thinking processes and skills. For reading comprehension lessons, we can use think-alouds as a teaching strategy in which we share the thought processes we undertake when comprehending text. Think-alouds can therefore help model how good readers think before, during, and after reading. According to author Jeffrey Wilhelm, "Think-alouds make invisible mental processes visible to children."

Eventually, our students can use think-alouds in collaborative group settings and independently as a learning strategy. According to Wilhelm: "While reading, teachers model their thinking by voicing all the things they are noticing, doing, seeing, feeling, and asking as they process the text. Students can then 'borrow' the various strategies teachers use and apply them in their own reading."

THINK-ALOUDS AND DEPTH OF KNOWLEDGE

To help students achieve at all four DOK levels, we can share our thoughts that correspond to the thinking processes required at each level. Our goal is to model for students cognitive thought processes so that students can eventually master levels 2, 3, and 4. Although an important level in its own right, we do not need to spend much time modeling level 1.

We should not, however, expect students to demonstrate mastery of levels 3 and 4 *on assessments* unless the standard calls for it. Our goal is to support, guide, and practice the use of higher DOK levels until mastery is required.

EXAMPLES

Below are some examples of think-alouds and questioning strategies using the story *The Quiltmaker's Gift*. When reading these examples, we should remember that the mere act of listening to teachers model thinking processes is not a higher DOK activity on the part of students; rather, think-alouds are a cognitive strategy designed to teach students how to engage in such thinking on their own.

DOK 1: I see that the quiltmaker sews. I can tell from the pictures and also the book says that she was "sewing away day after day." What else do I know so far? I know where she lives. In the mountains. It says that she had a house in the "mountains up high," and I can see her house in the picture.

> *(This example models recall of simple and literal information. As stated earlier, such modeling of level 1 activities is probably unnecessary.)*

DOK 2: The king was frowning. Hmmm... I don't really know what "frowning" means. When I don't know what a word means, I use clues from the story to help me. The clues I use are pictures and other words in the story. So, I'm going to try that now to figure out what that word means. I can see in the picture that the king looks sad. And it says here that "still, the king did not smile." So, those clues make me think that "frowning" looks like this (teacher makes a frown imitating the king).

> *(This example shows the use of context clues to determine meanings of unknown words. Students are interpreting text but knowledge remains at the literal level and does not go "beyond" the text).*

DOK 3: Now that I have finished reading the story, I'm going to figure out the theme. Now I remember that a theme is an idea that reappears throughout a story. When I try to identify a theme, I think about the things that happened in the beginning, middle, and end. And I also pay close attention to the pictures and the things that characters say or do. In the beginning of this story, the king did not like her. But in the end, when she gave the king a quilt, they became friends. How do I know this? Well, I think about my own experiences and friends. I know that I often give them things. She also made friends with other characters in the story like the bear and the sparrow. She treated them kindly and lovingly, which I know from my own life is what friends do. So, I think one of the themes of this story is friendship, because acts of friendship appear throughout the story.

> *(This example shows abstract theme identification using reasoning. Students go "beyond" the text and make connections. There are also several different answers).*

DOK 4: I notice that the themes of friendship, kindness, generosity, and love are similar. And gifts, smiles, and hugs, which I saw in the story, all have to do with all of the themes. I have read other books where there are gifts, smiles, or hugs. *The Quiltmaker's Gift* made me think of them. One book is even from another country, Russia. But I think the themes are the same, and the characters are like the ones in *The Quiltmaker's Gift*. And even though the stories have the same themes, they were written by different people.

Now, let's examine some books we've read. What are some books that have these themes in them? Yes, *Stellaluna*, *Thundercake*, and *Officer Buckle and Gloria* all have similar themes. Why do you think so many different authors write about these themes? What about *Thundercake*, which takes place in Russia? Do people in Russia also experience friendship and kindness?

> *(This example shows complex analysis of the connections among texts---complex considering the grade level of the students. It also shows students examining common themes found across texts, including text from other cultures. Student activities centered on such level 4 thinking would be large-scale projects extending over a lengthy time period).*

Think-alouds are a powerful teaching strategy that we can use more often in the classroom. By incorporating depth of knowledge into our think-aloud strategy, we can equip students with the tools needed for higher-level critical thinking, enhance our understanding of depth of knowledge, and strengthen our teaching effectiveness.

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Brumbeau, Jeff, *The Quiltmaker's Gift*. 2001. New York: Scholastic Press.

Webb, Norman L. "Alignment of Science and Mathematics Standards and Assessments in Four States." National Institute for Science Education, University of Wisconsin-Madison. August 1999.

Jeffrey Wilhelm, *Improving Comprehension with Think-Alouds: Modeling What Good Readers Do*. New York: Scholastic Press.

Depth of Knowledge in K-5 Science

Science presents the perfect opportunity for students to interact firsthand with materials, ask questions, collect, organize, interpret data, state claims and support them, and connect their understandings to the world around them. This enables students to think at a higher cognitive level. The following are some examples of science tasks and questions as they relate to the different DOK levels.

Level 1 – Recall

Many times we ask our students to label the parts of a plant, measure the width of their desks, or list five animals that are mammals. When we present such tasks to our students we are simply requiring them to recall or reproduce knowledge in a rote manner.

When considering the Depth of Knowledge levels as they relate in science, these types of tasks would fall under DOK 1 or Depth of Knowledge Level 1. Depth of Knowledge Level 1 tasks require students to recall or recognize facts or information, perform simple procedures ("recipe-type" procedures), identify, calculate, or measure something.

Some examples of Level 1 tasks are:

- make a list of objects that are solids
- draw a diagram of the water cycle
- give the definition of a vocabulary word

Level 2 – Skills and Concepts

DOK Level 2 tasks focus on the use of skills or concepts. They require more than one step and are more complex than Level 1.

Level 2 tasks in science include:

- describe the difference between a rock and a mineral and give an example of each
- choose two insects that you have observed and compare them
- make observations of your terrarium
- collect and display data while working with balls and ramps

Level 3-Strategic Thinking

Strategic thinking and problem solving that necessitate deep knowledge, reasoning, planning, and evidence to support results are the components of a DOK Level 3 task. It is quite possible to have more than one answer at this level, therefore students would be expected to explain and justify their thinking to questions or tasks at this level.

Consider the following question. "Is toothpaste a solid or a liquid? Explain and justify your answer." This is far more complex than the examples shared in levels one and two as it requires students to use reasoning, justification, and evidence to support their response.

There are times when we present students with challenges in science. One such challenge is to determine the "mystery chemical." Students must do several things in order to figure this out. They will have to conduct tests to collect data, analyze it, make a claim, and support their claim with evidence in order to verify the "mystery chemical." Because of the complexity, this procedure would be an example of a Level 3 question.

Level 4 – Extended Thinking

Questions are naturally generated by students during science. DOK Level 4 questions and tasks require extended thinking at a higher cognitive level. Students must make connections within a content area or among other content areas, and then devise an approach regarding how the problem can be solved among many possible alternatives. Many performance assessments and open-ended questions that require considerable thought are Level 4. Questions at this level often require an extended period of time to complete; however, time is not the only determining factor for a task or question to be labeled as a Level 4 question.

Instructing students to select a question to investigate, set up and conduct an investigation, collect, organize, and analyze the data, and formulate a conclusion is an example of a Level 4 activity.

Posing a scenario such as: "One of the instruments in an orchestra is too soft for everyone in the theatre to hear. The orchestra member would like to devise a way to make the instrument louder so everyone will be able to hear it." Students would be able to work in small groups to generate ideas and possible solutions, plan how they will go about their task, put their plan into action, and share their ideas with an audience.

Depth of Knowledge During Science Instruction

Mentioned above are examples for each of the DOK levels in science. As teachers of science, it is essential to take some time to reflect on the questions you pose and the tasks you require your students to do. Where do the majority of your questions fall? Do you see a mix of questions from different levels? If your questions and tasks are mostly DOK 1s and 2s, think about how you might modify them to DOK Levels 3 and 4 to get your students to thinking more strategically.

Sample of Depth of Knowledge Levels Solids and Liquids

Level 1

- What is a solid?/What is a liquid?
- Identify the properties of a solid./ Identify the properties of a liquid.
- Using the list provided, identify which are solids and which are liquids.
- Draw a picture of your solid/liquid.

Level 2

- Describe the difference between a solid and liquid. Give an example of each.
- Compare two solids. /Compare two liquids.

Level 3

- Is toothpaste a solid or a liquid? Explain and justify your answer.

Level 4

- We have been working with solids and liquids over the past few weeks. Design a plan, carry out the investigation, and share your results with classmates.

Sample of Depth of Knowledge Levels Rocks and Minerals

Level 1

- What is a rock?/ What is a mineral?
- Identify properties of rocks.
- Using the list provided, identify which are rocks and which are minerals.
- Measure the circumference, diameter, and depth of your rock.
- Draw a picture of your rock/mineral.

Level 2

- Describe the difference between a rock and a mineral and give an example of each.
- Compare two minerals. /Compare two rocks.
- Order your minerals from hardest to softest.

Level 3

- Of the four rocks you are working with, determine which ones contain the mineral calcite. Support your claims with evidence from your investigation.
- A friend has given you a bag of rocks. You have noticed that some are smooth while others are rough. Where do you think your friend found these rocks? Support your answer.

Level 4

- We have learned many things about rocks and minerals over the past few weeks. Design a model that will show how they can be changed and relate it to another cycle. Be prepared to share with your classmates.

Using Depth of Knowledge in a High School Laboratory

By Ellen Ebert ~ Secondary Science

As Nevada moves from using ability coding based on Bloom's Taxonomy to coding at Depth of Knowledge (DOK) levels for test items, the implications for curriculum cannot be underestimated. Teachers need to be cognizant that the DOK levels within content presented to their students may not be at State expected levels. Analysis of publisher generated materials reveals that many worksheets, laboratory activities and test questions are conveying information written at lower DOK levels. Use of materials that are consistently written at lower DOK levels has serious implications for students attempting to be successful on the High School Science Proficiency test which is written at DOK levels 1-3.

The good news is that verification laboratories and activities can easily be rewritten using science inquiry and science writing heuristic. Each of these strategies will naturally embrace all four DOK levels.

Science inquiry incorporates five essential learner features:

1. *Students engage in the study of a scientifically oriented question, event or phenomenon that they generate or that has been provided for them.*
2. *Students create explanations based on testing of suggested hypotheses, hands-on activities, and problem solving.*
3. *Students analyze and interpret data, synthesize their ideas, generate models, use scientific understandings to extend their knowledge.*
4. *Students apply what they have learned to new situations.*
5. *Students communicate their findings to their peers and teacher clarifying ideas and assessing their findings (National Science Educations Standards, p. 35).*

In the sample laboratory provided, *Energy Transfer in the Park*, a traditional verification lab emphasizing specific heat capacity has been rewritten to reflect new Depth of Knowledge levels. AVID style interactive notebook questions have been embedded in the combined science inquiry and science writing heuristic model. Each of the sections has been coded to Depth of Knowledge levels.

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Burke, K.A., Hand, B., Poock, J., and Greenbowe, T. (2005). Using the Science Writing Heuristic: Training Chemistry Assistants. *Journal of College Science Teaching* 35(1).

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Special thanks to Kristoffer Carroll, Project Facilitator, CPDD Science for his assistance in writing the laboratory activity.

Special thanks to M. Dale Streigle, Science Teacher, Green Valley H.S. for his photographs and data chart.

ENERGY TRANSFER IN THE PARK

Have you ever wondered why ordinary objects when placed in the sun feel warmer or cooler than each other? Why do you think this happens (DOK Level 2)?

_____

From: http://www.sspco.com/pdf/2107.pdf

How do you account for the difference in temperatures between water and concrete; after all, they are both receiving the same amount of sunlight (DOK Level 2)?

_____

MISCONCEPTION ALERT!

Heat and temperature are not the same! Can you explain why (Definition: DOK Level 1; Explanation: DOK Level 2)?

_____

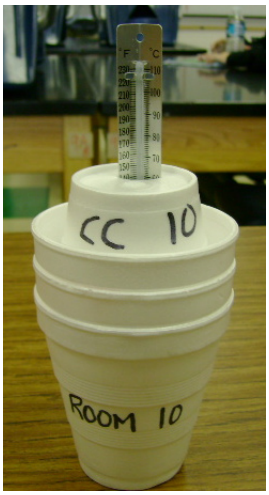
BACKGROUND:

The specific heat capacity of a material is determined by placing a predetermined amount of water into a calorimeter. The tested materials are placed into boiling water for five minutes, and then transferred to the water in the calorimeter where a temperature change is noted.

The amount of temperature that a substance will absorb or release can be related by the equation

$$Q = m \Delta T Cp$$

Q = amount of heat measured in joules
M = mass of the sample measured in grams
ΔT = difference between the initial and final temperatures of the substance measured in degrees Celsius
Cp = specific heat capacity of the sample with units of joule/g^{0}C



PURPOSE:

In this activity, you will compare the thermal properties of several different samples by using a calorimeter.

PREDICTION:

Predict the ranking of the five materials given to you by your teacher in order from highest to lowest specific heat (use materials such as different metal and plastics, etc.) (DOK Level 2).

Courtesy M.D.Streigle, GVHS

Highest Specific Heat:

1. _____
2. _____
3. _____
4. _____
5. _____

Justify your ranking for highest specific heat.

_____

INQUIRY LAB:

A student is asked to design a park bench that is durable and can be used year round. Which of the following materials would be the best material for people to sit on without getting burned?
Design an experiment to support your answer (DOK Level 3) using the equations below to guide your data collection (DOK Level 2).

$$Q_{H2O} = Q_{material}$$

$$Q_{H2O} = m\,\Delta T\,Cp \qquad Q_{material} = m\,\Delta T\,Cp$$

$$m_{H2O}\,\Delta T_{H2O}\,Cp_{H2O} = m_{material}\,\Delta T_{material}\,Cp_{material}$$

Write your procedure in your notebook and be sure to include the steps listed below (DOK Level 3):

1. Safety goggles must be worn during the lab.
2. Have your teacher check your procedure **PRIOR** to starting your lab.

Data Collection (DOK 1)

Type of Material	Mass of Water (grams)	Water Initial Temperature (°C)	Water Final Temperature (°C)	Change in Water Temperature ΔT (°C)	Mass of Metal (grams)	Metal Initial Temperature (°C)	Metal Final Temperature (°C)	Change in Metal Temperature ΔT (°C)	Specific Heat of Metal (joules/g °C)
Trial 1									
Trial 2									
Average									

Courtesy M.D.Streigle, GVHS

CLAIMS:

Which material is the best material for the park bench (DOK Level 2)?

_____

EVIDENCE:

What is the evidence that supports your claim (DOK Level 3)?

_____

SOURCES OF ERROR:

What would you do differently if you were to redo this experiment? Justify your response with evidence from your lab (DOK Level 3).

_____

REFLECTION:

What further information or experimentation would you need in order to make a better decision about the design of your park bench? Explain your answer (DOK Level 3).

_____

COMMUNICATION:

Communicate and justify your findings to the class (DOK Level 3).

OUT QUESTIONS:

Farmers in temperate areas grow crops yearlong.
Explain why farmers spray their crops with water when the temperature falls to just below zero (DOK Level 3).

_____

EXTENSION:

A company has hired you to use your design of park benches in their community project. You have been given a budget of $10,000 and asked to build as many park benches as possible using the most cost effective material that will be practical for year round use. Generate a proposal that includes the most expensive material, a medium cost material and the cheapest material. Include justifications for each of your proposals. Build a prototype for each of your proposed benches (DOK Level 4).

USING DEPTH OF KNOWLEDGE LEVELS IN THE SECONDARY ELA CLASSROOM

In the ELA classroom, good teaching using the DOK levels looks no different than good teaching has looked in classrooms for decades: Instruction based on authentic learning practices designed to take students from the most basic knowledge of a new concept, to understanding, applying, evaluating and connecting to that concept. In today's climate, how we describe good instruction is often dictated by standardized assessments. Our students should be able to demonstrate that they know and understand the state standards and our assessments should accurately evaluate that knowledge. For years, education has addressed this need, starting with Bloom's 6-level taxonomy and now, Norman Webb's Depth of Knowledge.

To understand DOK in the context of the secondary ELA classroom, it is helpful to examine our state standards and their potential DOK levels. For example, in *Standard 4.12.5, Responding to Text,* students are asked to use information to answer specific questions. The ceiling for this standard is low. A question designed to assess this skill is at a DOK Level 1. Other indicators, like *Vocabulary Development* and *Text Features* can go no higher than a Level 2. Even though basic, these skills represent a student's schema (Hunter, 1982); hence, they are essential as they are the foundation for other more complex skills.

Most of our standards can be tested at a Level 3 and should be taught as high as a Level 4. For example, in *Standard 3.12.2, Characterization*, students are asked to analyze and evaluate the author's methods of characterization, describe and compare character motivation, make inferences and draw conclusions based on stated and implied information. Well-written test items, often taking the form of Constructed Response, can measure these skills. Even though standardized assessment can go no further, teachers should always be looking for ways to extend student thinking to DOK Level 4. At this level, students are asked to think beyond the immediate context of their knowledge as they analyze and synthesize information from multiple sources and learn to communicate effectively.

Even though Webb's intent was to find a better way to align state standards and their assessment items, Depth of Knowledge can be a way to think about how instruction looks in the secondary English classroom.

DOK LEVEL ONE

The purpose at this level is to ensure students know factual information. If they are reading a story, they should be able to read orally and locate and recall details; they should demonstrate an understanding of the elements of fiction by describing character, setting, plot, sequence of events, and identifying figurative language; they should also be able to use basic reference materials to locate information.

When learning a concept at this level, students should be able to understand and identify its attributes. For example, at the beginning of a lesson on persuasive writing, students can be introduced to the elements of persuasion using examples of persuasion—advertisements from TV, radio, billboards, magazines, brochures, flyers, editorials and letters to the editor. These concept models will allow students to identify the elements in context. Using two-column notes, students can list the elements of persuasion in the left-hand column and, using the teacher models provided, define and describe them in the right-hand column.

DOK LEVEL TWO

Level 2 requires comprehension and application. Moving beyond simple descriptions, students at this level can compare and contrast characters and explain how behaviors contribute to conflict. They can infer and predict outcomes based on verbal and non-verbal clues. When asked to summarize, students should be asked to do more than retell the story. They should determine what is relevant and discern fact from opinion. At this level, students can identify the meaning of unfamiliar words using context clues and word analysis strategies.

(Continued on page 12)

Building on the earlier persuasive writing example, at DOK Level 2, students move from this basic understanding of the elements of persuasion to being able to identify and collect examples of persuasion independently. To do this, students can bring to class examples of persuasion in their lives and share in small groups. Group discussion should focus on identifying and classifying the elements used and the audience (age, gender, income, ethnicity, and education) and purpose of the piece.

DOK LEVEL THREE

Complex, strategic thinking becomes the focus at Level 3. Students move towards a deeper level of understanding—beyond describing "how and why" to justifying the "how and why" through application and evidence. At this level, concepts are more complex, more abstract, and require more reasoning than in Levels 1 or 2.

As the persuasive writing lesson moves to DOK Level 3, the students begin to evaluate how well the author uses the elements they have previously identified. Students can choose the best examples of persuasion representing various media to use as models for later. At this point, students should have a clear understanding of how the elements of persuasion can be manipulated for effectiveness and be able to choose the most appropriate medium based on an analysis of audience and purpose.

DOK LEVEL FOUR

Level 4 combines the complex reasoning of Level 3 with the addition of planning, discovery and development; therefore, Level 4 usually requires an extended period of time. A Level 4 performance asks students to analyze and synthesize information from multiple sources and examine and explain alternative perspectives. They should be able to predict using evidence as support, develop a logical argument, and plan and develop solutions to problems.

With this in mind, to reach Level 4 in the writing lesson, students need to look beyond the classroom and synthesize what they have learned about persuasion. Ask them to identify an issue important to them that they would like to change (school rules, curfew, homework, street violence). Begin with analysis—What is the problem? Who or what caused this? What are the effects? How can I change this problem? Who is my audience? What forms of persuasion work best with my audience? From this brainstorm, students create an advertisement (TV, radio, print), a brochure, a blog, or a webpage; or they write an editorial, debate or letter to the editor persuading their audience to adopt their point of view. Students should be asked to justify the medium they have chosen and identify the elements of persuasion used based on an analysis of the intended audience.

The good news for educators is that understanding the levels of cognition and how standards and questions are written to access different levels of thinking can translate into good teaching practices. Depth of Knowledge provides us with new terminology to describe what we've known since Socrates: Good teachers design lessons that move students from a basic understanding to more complex thinking where they can connect and extend their knowledge.

By
Saralyn Lasley
RPDP Secondary Literacy

Secondary Literacy

NEWS TALK!

Writing TALKS!

When a butterfly egg is hatched in a proper environment,
It has everything needed to thrive.
When a child enters the writing world,
He has everything he needs to become an effective author.
"A Butterfly in the Wind"

"What is all the fuss these days about writing across the curriculum?" "Don't they write in their language arts class?" I am sure these questions sound familiar to many educators. Unfortunately, the answer is "no." Due to intense state curriculum and assessment, language arts teachers do not have the time to teach enough writing to meet all demands. Every student has the ability to write, but it is in the hands of the educator to make the students interested and focused in what they write. Educators need to look at their units, and incorporate various writing assignments that will enhance student achievement and promote creativity.

Writing in any subject is a powerful tool. It is a tool that once a student becomes comfortable using, the possibilities are endless. If the subject matter is World War II, a student could write an editorial for a local newspaper on their personal feelings of the war. In social studies class, the student could write a personal diary and take on the role of a young child growing up during the war. Educators need to be able to give them the opportunity to write, provide feedback, and more importantly, support these students to write during each class period.

RPDP Secondary Literacy has exemplary resources and classes to offer to assist all content teachers with reading and writing curriculum and strategies. We understand the need for assistance, and we have developed UNLV graduate credit courses and workshops to meet these needs. To register for our classes, please visit rpdp.net and register online. If you have any questions, please feel free to contact Rosanne Richards at 799-3835 extension 260.

DOK for Cognitive Coding in 6-12 Mathematics

The state of Nevada will soon be using Depth of Knowledge (DOK) cognitive coding in its state assessments, including the mathematics CRTs and HSPEs. There are four levels of DOK, where the levels represent a hierarchy based on cognitive complexity (rather than time on task difficulty). The hierarchy is based on two main factors: 1) sophistication and complexity, and 2) the likelihood that students at the grade level tested would have received prior instruction or would have had an opportunity to learn the content. Some problems or tasks have a low DOK level because the knowledge required is commonly known and students with instruction at grade level should have had the opportunity to learn how to routinely perform what is being asked.

It is vital for student success that mathematics teachers expose their students to activities that represent all DOK levels. For example, consider the activities and associated DOK levels when designing lessons in your mathematics classroom.

DOK Level 1 (Recall and Reproduction)

- Find the area of a rectangle
- Convert scientific notation to decimal form
- Do basic mathematical calculations, routine procedures
- Identify a diagonal in a geometric figure
- Do basic computations, multiply two numbers
- Measure an angle
- Recall of a fact, information, procedure, definition, term
- Perform a simple algorithm
- Follow a set procedure
- Apply a formula
- Perform a clearly defined series of steps
- Habitual response: can be described; can be explained
- Use a routine method
- Recognize patterns
- Retrieve information from a graph
- Use appropriate tools
- Identify, recognize, measure

DOK Level 2 (Basic Reasoning, Skill/Concept)

- Basic application of a skill or concept
- Classify quadrilaterals
- Determine a strategy to estimate
- Solve routine multiple-step problems
- Identify patterns in events or behavior
- Formulate a routine problem given data and conditions
- Make observations
- Collect, organize, classify, display, represent, compare data
- Explain purpose and use of experimental procedures
- Explain, describe or interpret
- Organize and display data in tables, charts and graphs
- Perform more than one step or procedure
- Demonstrate conceptual knowledge through models and explanations
- Extend a pattern
- Explain concepts, relationships, and non-examples
- Demonstrate visualization skills
- Demonstrate probability skills

DOK Level 3 (Strategic Thinking, Complex Reasoning)

- Write a mathematical rule for a non-routine pattern
- Determine the equations and solve and interpret a system
- Provide a mathematical justification
- Interpret information from a series of data displays
- Support ideas with details and examples
- Apply a concept in other contexts
- Requires reasoning, planning using evidence and a higher level of thinking
- Explain/justify your thinking
- Make conjectures

- Cognitive demands are complex and abstract
- Conjecture, plan, abstract, explain
- Draw conclusions from observations
- Interpret information from a complex graph
- Cite evidence and develop logical arguments for concepts
- Explain phenomena in terms of concepts
- Use concepts to solve problems
- Provide justification when more than one possible answer
- Exhibit strategic thinking
- Analyze, synthesize

DOK Level 4 (Extended Thinking/Reasoning)

- Project-based assessment
- Performance tasks; cognitive demands of the tasks are high
- Collect data over time taking into consideration a number of variables and analyze the results
- Develop a rule for a complex pattern and find a phenomenon that exhibits that behavior
- Complete a unit of formal geometric constructions, such as nine-point circles or the Euler line.
- Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/solutions
- Apply mathematical models to a problem or situation
- Design a mathematical model to inform and solve a practical or abstract situation
- Include complex reasoning, planning, and thinking
- Students make connections within the content area or among content areas
- Select one approach among alternatives
- Design and conduct experiments
- Combine and synthesize ideas into new concepts
- Critique experimental designs

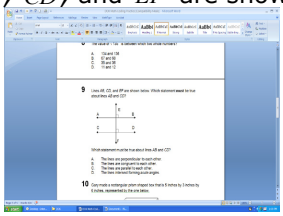
Due to the complex cognitive demands and the possibility of extended time requirements, DOK level 4 questions will not be included on the CRTs and HSPE.

For the mathematics HSPE, two important events will occur in Spring 2010. First, sophomores who take the HSPE will experience a different mathematics portion of the exam. All questions will reflect the 2006 revised math standards and ***only*** at the 9 through 12 grade levels. In the past, students taking the exam had exposure to around 45% of the items from the 7th and 8th grade standards. This is no longer allowed under the Federal Compliance Assessment Agreement. Second, the HSPE questions will be leveled to DOK and not to ability levels. This will require the students to answer 10% of the 60 questions at a DOK Level 3, 47% at a DOK Level 2 and 43% at a Level 1.

Here are some example questions to test your DOK savvy:

1. Evaluate the expression:
$5n - 4$, for $n = 1.2$
A. 2.0
B. 2.2
C. 5.8
D. 56.0

2. Lines $\overleftrightarrow{AB}$, $\overleftrightarrow{CD}$, and $\overleftrightarrow{EF}$ are shown below:

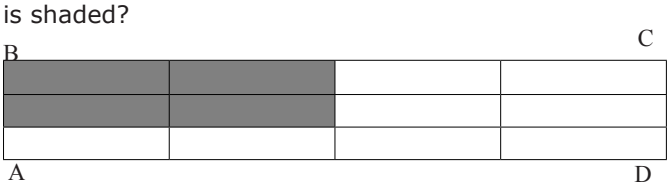


Which statement **must** be true about lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$?
A. The lines are perpendicular to each other.
B. The lines are congruent to each other.
C. The lines are parallel to each other.
D. The lines intersect forming acute angles.

3. If $1 < a < 2$, and $b = a$, which of these expressions has the GREATEST value?
A. ab
B. $a + b$
C. $a - b$
D. a/b

4. A car odometer registered 41,256.9 miles when a highway sign warned of a detour 1,200 feet ahead. What will the odometer read when the car reaches the detour? (5280 feet = 1 mile)
A. 41,279.9
B. 41,261.3
C. 41,259.2
D. 41,257.1

5. In the figure below, what fraction of rectangle ABCD is shaded?



A. 1/6
B. 1/5
C. 1/4
D. 1/3

(Answers on page 20)

A Quest of Depth of Knowledge in Elementary Mathematics

The Nevada Department of Education has begun to rollout a change in ability level descriptors to increase student learning that result in increased student achievement. Since the initial development, the Criterion Referenced Tests (CRTs), including the elementary mathematics sections, have assessed student knowledge on three levels; conceptual, procedural, and problem solving, based on the National Assessment of Educational Progress (NAEP) descriptors. In order for student learning and to accurately assess that our students are meeting educational standards, the state of Nevada is adopting Norman Webb's Model of Alignment and Depth of Knowledge levels.

Norman Webb's Depth of Knowledge is a measure to determine what students know; and to what depth they reflect that knowledge. There are four Depth of Knowledge levels that permeate into all subject areas. Following are some examples for elementary mathematics.

DOK Level 1
Recall and Reproduction

Determine the perimeter or area of rectangles given a drawing or labels.

DOK Level 2
Skills and Concepts

Classify plane and three dimensional figures.

DOK Level 3
Strategic Thinking

You have a given amount of money.
a) Show the different combinations of coins to make that amount of money.
b) Show the different combinations of bills and coins to make that amount of money.
c) Use the fewest possible number of coins to make that amount of money.

DOK Level 4
Extended Thinking

Collect data on the population of your school over the last ten years. Graph the information. What would you predict the school population will be in six years? What trends do you see in the population and what are a few reasons for the trends? Would enrollment figures suggest a need to increase the size of your school facility in the next ten years? Why or why not?

Up to this point, our perspective on assessments has been to focus on what we want our students to know. Assessments have been a target. We teach what we want our students to know, and we hope they succeed at hitting the target. Our perspective will now need to change. Assessments now will be the ceiling, the highest level a standard can be assessed at to measure a student's knowledge. The goal in this change of perspective is to promote higher order thinking for all students.

This change in assessment must also be reflected in a change in our instruction. All teachers have become acutely aware of the use of Bloom's Taxonomy within our classroom, but Depth of Knowledge is not a taxonomical tool. Depth of Knowledge focuses on how deeply a student has to know the content in order to answer a question, perform a task, or generate a product. As educators, we need to be cognizant to incorporate the Depth of Knowledge levels into our lesson planning and implementation. Below examples of data analysis activities are outlined by level.

DOK Level 1 Activity

Retrieve information from a table or a graph.
Explanation:
The activity recalls information that requires only one step to complete the task.

DOK Level 2 Activity

Retrieve information from a table or a graph and use it to solve a problem requiring multiple steps.
Explanation:
This activity requires basic application of skills and also requires deeper knowledge than just giving a definition, such as how and why.

DOK Level 3 Activity

Draw conclusions from observations or data, citing evidence.
Explanation:
This activity requires deep understanding as exhibited through planning and citing evidence.

DOK Level 4 Activity

Conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results.
Explanation:
This activity requires complex reasoning, planning, and thinking generally over extended periods of time for an investigation.

The Criterion Referenced Test (CRT) will assess student knowledge at DOK levels 1, 2, and 3. The DOK level assigned to a problem indicates how deeply the student will need to apply their knowledge of the content. In the problems listed below, focus on how deeply a fifth grader's knowledge of number sense will need to be to answer the problem successfully.

Which expression could be used to check the answer to 63 divided by 7?
a) 63 + 7
b) 63 x 9
c) 7 + 9
d) 7 x 9

Level 1: Recall and Reproduction
Recall of a math fact asked in a non-traditional way.

Mario has 20 packages of building blocks and each package has 12 blocks. He gave two packages of blocks to his cousin. What is the total number of blocks Mario had left?
a) 18
b) 30
c) 216
d) 360

Level 2: Skills and Concepts/ Basic Reasoning
Decision point on calculations beyond the traditional algorithm.

Although Depth of Knowledge level 4 (Extended Thinking/ Reasoning) will NOT be assessed on the standardized tests, a focus on this level will enable students to incorporate all DOK levels into an activity. Our goal as educators is to prepare our students to become responsible, productive citizens. Only by using effective habits of mind and higher order thinking skills in classrooms today will students be prepared for their future in 21st century society.

RPDP Highlights

Beverly Ann Lousignont is in her 11th year of teaching with the last 8 in CCSD, she currently teaches seventh grade science at Bailey MS. For the past two years she has been working with the National Parks Service (NPS) in Death Valley on their Educational Outreach program. The program Death Valley R.O.C.K.S. (Recreational Outdoor Campaign for Kids through Study) incorporates the Junior Ranger in the Classroom Program and encourages students to learn about the outdoors as well as geology, astronomy, history, climate & weather, and a little bit of biology. This year thirty-seven 7th grade students spent two nights camping and learning all about Death Valley during this lifelong learning experience that reaches out to students that would normally not go to a National Park. DV ROCKS is grant funded by the Death Valley Natural History Association and the NPS. As DV ROCKS enters its 3rd year it is looking to expand to other schools. The program will also be highlighted in the fall of 2009 in "The National Parks Untold Stories" film from Florentine Films/Sherman Pictures to be aired on PBS.

Meet ***Melanie Mahoney***, a full-day kindergarten teacher, at Lamping ES in Henderson. Melanie began the full-day kindergarten pilot program in 2003 and has served as a mentor for other full-day kindergarten teachers. Not only does Melanie greatly impact the full-day kindergartners at Lamping ES, but she shares her time and talents with kindergarten teachers throughout Southern Nevada. Melanie co-wrote *The Kindergarten Chronicles* last school year and recently completed *The Kindergarten Scrapbook*, a guide for full-day kindergarten teachers based on her personal experiences, favorite internet sites, and collected resources.

Melanie has a passion for teaching and a zest for learning. We are so lucky to have her here in CCSD!

Jon Felix has been teaching high school for seven years in Clark County. Currently, he is teaching woods and drafting classes at Virgin Valley High School located in Mesquite, Nevada. Jon loves to see his students apply academics to real world situations. He uses Computer Numerical Code (CNC) technology to have students design, draw, write programs, and cut wooden parts for various projects. This requires students to use math, computers, and technology while using wood working machines to complete projects. Jon maintains a web site on myccsd.net where students can go to view important class information, pictures of student projects, and fun podcasts. He also uses KVLX and the internet to help his students learn how to be successful in his classes and life.

Congratulations to Jon Felix for successfully integrating technology into his drafting curriculum.

RPDP would like to recognize these teachers for their outstanding work in education.

RPDP Highlights

Karen Brooks is no stranger to education with an outstanding twenty-three years under her belt. Karen has taught both Social Studies and English Language Arts for over fourteen years, and has worked as a Learning Strategist for the Clark County School District for the past five years. Karen has devoted her career to not only helping students achieve, but also to mentoring and coaching teachers to become lifelong lovers of learning. Mrs. Brooks sums up her success with this, "A staff that believes in coaching and mentoring as part of their daily culture is not only going to have successful teachers, but also a significant increase in student achievement."

Thank you, Karen, for the talent and expertise you bring to Bridger Middle School. You truly do make a difference!

During ***Mary Weisenmiller***'s teaching career, she has worked to encourage elementary teachers to provide interactive, hands-on, minds-on science experiences as a way to promote equitable educational experiences for ALL students. Mary believes that students that are actively immersed in developmentally appropriate science experiences, will become more naturally engaged, and thus, further develop the skills of higher level thinking and reasoning. Her philosophy is that engaging our students in common experiences allows our diverse student population to interact with the content, and each other, on a level playing field.

In addition, Mary brings over sixteen years of experience to our students. She has worked nationally with science educators to encourage the reform of science teaching in America. Mary has taught first through fifth grade, was a school librarian and a science teacher.

Mary has taught Science Workshop for the Second Grade Teacher, Seeing Science through Sketching, and Seeing Science through Photography for SNRPDP.

Mary truly shines in science!

Tia Price is a product of the Clark County School District. She attended Guinn Junior High School and graduated from Clark High School. She earned her undergraduate degree in Secondary Mathematics and a Master's degree in Educational Leadership, both from UNLV.

In her sixteenth year with the district and her third year as the Math DC at Advanced Technologies Academy, Tia is teaching AP Statistics, Pre-Calculus Honors, and Geometry Honors. At Durango High School, before moving to A-TECH, Tia taught every high school math course offered by the district, with the exception of AP Calculus.

Her favorite teaching moments include the interactions with her students, watching the "light bulb" turn on when students learn a new concept, and maintaining relationships with many students who return and describe the impact she has made in their educational journey.

Tia has been teaching AP Statistics at A-TECH for the last three years. For each of those years, A-TECH has earned the Siemens Award for the highest AP Statistics pass rates. Her principal has nominated Tia for the Siemans Math/Science teacher award. RPDP also recognizes her talents as a part-time instructor of *Algebra for the Classroom Teacher* for the Middle School Math Certificate program as well as the AP Statistics workshops.

RPDP ElementaryMath would like to acknowledge ***Beckie Dehner***. She arrived in Las Vegas in 1982. She attended Mountain View ES, Quannah McCall Sixth Grade Center, Dell H. Robinson MS, and graduated from Eldorado HS. Beckie attended UNLV earning her graduate and post graduate degrees.

Beckie spent 10 years teaching second and third grades at Goldfarb ES and Bilbray ES. She is currently the math strategist at Fong ES. She is enjoying the challenges of introducing a new math program and helping the teachers and students become comfortable in their math instruction. Beckie is very excited about math and enjoys sharing her excitement while working one on one with teachers and students. Her goal is to assist teachers in making math instruction more valuable to the students.

"My hope is that students will do more than simply solve a problem just because they are told to. I want them to be thinkers and problem solvers."

Congratulations to Beckie Dehner for bringing her love of math to the students of CCSD.

Depth of Knowledge in Secondary Social Studies

The following question items and activities are coded to the Depth of Knowledge levels according to the Social Studies descriptors (Webb 2002):

Social Studies Depth of Knowledge Items

1. (DOK 1) The study of economics focuses on

A. ***production, distribution, and consumption of goods and services.***
B. Earth and its relationship to our environment.
C. different types of governments and how they operate.
D. past cultures of different peoples.

2. (DOK 1) At the Constitutional Convention of 1787, conflicts between states with large populations and states with small populations resulted in the creation of

A. the offices of president and vice president.
B. the three branches of government.
C. a federal court system.
D. ***a bicameral (two-house) legislature.***

3. (DOK 1) The Supreme Court decision in *Marbury v. Madison* (1803) established the principle of

A. ***judicial review.***
B. separation of powers.
C. habeas corpus.
D. nullification.

4. (DOK 1) What was the immediate cause of the outbreak of World War I (1914)?

A. Formation of secret alliances.
B. Competition over Asian and African colonies.
C. Accumulation of arms and weapons.
D. ***Assassination of Archduke Ferdinand of Austria.***

5. (DOK 1) The principle of "separate but equal" established by the Supreme Court in the case of *Plessy v. Ferguson* (1896) was used to

A. provide reservation lands for Native American Indians.
B. ***justify racial segregation of public facilities.***
C. end the use of child labor.
D. expand the freedoms guaranteed by the Bill of Rights.

6. (DOK 2) Use the table to answer the question.

1860

North	South
Industrial	Agricultural
More cities	Mainly rural
Many factories	Few factories
Slavery widely opposed	Slavery widely supported

Which conclusion related to the Civil War can be drawn from the information in this chart?

A. The South had more large cities than the North.
B. Sectionalism was based on social and economic differences.
C. The South was well prepared to win a war against the North.
D. Agriculture was no longer important to the United States economy.

7. (DOK 2) Why did most colonial farmers settle near oceans or coastal waterways?

A. Fewer Native American Indians lived there.
B. Local governments paid farmers to do so.
C. There were fewer problems with removal of trees and rocks.
D. ***Transportation of products was easier.***

8. (DOK 2) Use the statements below to answer the question.

• The president appoints new members to the Supreme Court.
• The Senate must approve presidential appointments to the Supreme Court.
• The Supreme Court can declare laws made by Congress unconstitutional.

Which constitutional principle do these statements illustrate?

A. Flexibility
B. Federalism
C. ***Checks and balances***
D. Federal supremacy

9. (DOK 2) In a free market economy, the price and quality of goods and services are most strongly affected by
A. advertising.
B. ***competition.***
C. borrowing.
D. regulation.

10. (DOK 2) What was the most significant economic impact of the transcontinental railroads during the late 1800s?

A. Eliminating overseas trade with Europe.
B. ***Expanding interstate commerce nationwide.***
C. Decreasing the influence of big business.
D. Rapid rebuilding of the South after the Civil War.

Social Studies Depth of Knowledge Activities

(DOK 3) Investigate the causes for and reactions to the Great Depression. Compare the Great Depression causes and reactions to today's economic situation. Identify the differences and explain why those strategies may or may not work.

(DOK 4) Propose solutions for today's economic crisis. Predict outcomes for each solution.

The following is an example of DOK levels 1 through 4 for the same content:

DOK 1 Identify the Democratic and Republican party platforms by viewing the series of debates. ***(This activity could be DOK 2 if students have to infer the issues.)***

DOK 2 Explain four issues identified by the Democratic and Republican party platforms by viewing the series of debates.

DOK 3 Justify the Democratic and/or Republican party platforms expressed in the series of debates.

DOK 4 Create your own party and party platform. Include three to five issues and be prepared to present and debate those issues.

Sample Social Studies Depth of Knowledge Project

(DOK 4) Generate a constitution for an imaginary country.

In 1516, Sir Thomas More, one of the leading English humanists, wrote the fictional *Utopia*. More's *Utopia* is an imaginary discourse by a

fictional traveler to the New World. More coined the name *Utopia* from the Greek word meaning "nowhere". *Utopia* has been taken as a model by social reformers who like to envisage an ideal society founded on perfect order and justice. Many of the ideals established in America come from More's *Utopia*. Ironically, when More refused to take any oath of loyalty to King Henry VIII (of six wives' fame), he was tried, found guilty of high treason, and beheaded.
Using your extensive knowledge of the United States' government, create a Constitution for your "ideal" nation. You may use any type of government system as long as all of the following requirements are included:

A. You can use any medium to turn in this assignment (e.g. PPT, Publisher, webpage, podcast, video, Word)

B. Include a "preamble" stating the main idealistic goals of your government system (e.g. …life, liberty, property…)

C. Clearly delineate your objectives using sections, chapters, articles, etc.

D. **Address ALL OF THE FOLLOWING issues:**
- Leadership
- Military
- Education
- Justice – equity under the law
- Crime
- Immigration
- Overpopulation
- Religion
- Foreign Relations/Diplomacy
- Economic system
- Elections/lack of elections
- Use of new/advanced technologies

**** You may include additional issues, but please do not exclude any of the required issues.****

E. If you are creating a democratic nation, you may want to include a Bill of Rights for extra credit. If you are choosing a different form of government, outline and explain which rights are protected for the people.

DOK Social Studies Coding and Annotations
Secondary including Grades 6 - 12

Item Number	Standard	DOK Level	Annotation
1	1.8	1	Recall definition of Economics
2	2.8.2	1	Recall of term - *bicameral*
3	2.8.5 Civics 6.8.13 History	1	Recall principle of *judicial review*
4	7.8.17	1	Identify immediate cause of World War I
5	5.8.7	1	Recall principle of *separate but equal* (DOK 1) and identify the principle's primary use (DOK 1)
6	6.8.21	2	Use graphical information, compare and contrast information (DOK 2), draw a conclusion (DOK 2) about the Civil War
7	5.8.10	2	Explain why colonial farmers settled near water
8	2.8.7	2	Use the statements to illustrate the constitutional principle of checks and balances
9	7.8.5	2	Determine that competition most strongly affects price and quality
10	6.8.14	2	Explain the most significant economic impact of the creation of a national transportation system.
Great Depression Comparison	8.8.5	3	Investigate causes, investigate reactions; Compare/contrast Great Depression to today's economic situation;Identify differences; Explain what may or may not work
Today's Economic Crisis	2.12.3	4	Using the information from the DOK 3 economic activity, now propose solutions and predict outcomes
Party Platforms/ Debates	4.8.2	1	Identify party platforms. *This could be a DOK 2 if the students have to infer the specific issues.
Party Platforms/ Debates	4.8.2	2	Explain the identified issues of each party platform.
Party Platforms/ Debates	4.8.2	3	Justify issues from one of the party platforms.
Party Platforms/ Debates	4.8.2	4	Create a party and party platform with three to five issues. Present and debate those issues.
Create a Constitution	1.8.2	4	Create a constitution; determine a type of government system; develop ideals for your government; address pertinent issues; propose solutions; extend and explain rights held by the people; connect and relate ideas and concepts within and among content areas

What Does a Depth of Knowledge (DOK) Level 4 Technology Activity Look Like?

Having trouble envisioning what a technology-infused lesson may look like for your specific content area? Some content areas seem a natural fit for effective technology use, while others seem to present a challenge. Social studies, science, and literacy are areas where one can easily visualize integrating technology; while math, the arts, physical education, and electives may need more of a creative twist. See how Jon Felix incorporates technology in his Virgin Valley High School woodworking class to maximize student skills and achievement with this DOK level 4 activity.

rpdp.net/class-resources

How might you adapt this DOK Level 4 activity to your own content area? Having students use Excel spreadsheets to create their own forms, charts, and graphs; producing videos for presentations; and even incorporating tools like *Google Earth*, *Google Earth's SketchUp*, and *Google Earth's 3D Ancient Rome* to enhance current traditional activities are some ways to incorporate technology into your content objectives. What a way to create truly interactive, real-world lessons for your students!

Keep in Mind...

- **DOK is a tool to promote student achievement**
- **DOK is a scale of cognitive demand**
- **DOK level is determined by the item/standard, not the students' ability**
- **DOK is determined by the context, not the specific verb being used**
- **DOK 1 + DOK 1 does not equal DOK 2**

Answers - 1) DOK 1 2) DOK 2 3) DOK 3 4) DOK 2 5) DOK 1

Professional Development Offerings

Visit www.rpdp.net and learn more about registering for RPDP's professional development offerings and additional programs supported by the respective teams at RPDP including: workshops, institutes, and Advanced Studies Programs (ASP)

Code	Description	Credits
Elementary Literacy		
RPDP 520B	Units of Study K-2, Part II (prerequisite required)	3
RPDP 521B	Units of Study 3-5, Part II (prerequisite required)	3
RPDP 524	Reading Instruction	3
RPDP 525	Word Knowledge	3
RPDP 527	Nonfiction Reading and Writing	3
Elementary Math		
RPDP 541	Problem Solving for K-5	1
RPDP 544	Geometry for Elementary School Teachers	1
RPDP 544A	Spatial Reasoning and Geometry	1
RPDP 545	Measurement for Elementary School Teachers	1
RPDP 546	Number Sense for Elementary Teachers	1
RPDP 549	Family Math Night for Elementary School Teachers	1
RPDP 549A	Children's Literature and Math for Elementary School Teachers	1
RPDP 549B	Connecting the Math Strands K-2	1
RPDP 549C	Connecting the Math Strands 3-5	1
RPDP 549E	Writing about Mathematics for Elementary School Teachers	1
RPDP 549F	CRT Math Camp	1
RPDP 549H	Grade Specific Mathematics Strand Exploration K-1	1
RPDP 549H	Grade Specific Mathematics Strand Exploration 4-5	1
RPDP 549I	Constructed Mathematics Response 3-6	1
	See RPDP website for following classes:	
	Assessing and Developing Number Concepts: Counting & Number Relationships	1
	Assessing and Developing Number Concepts: Addition & Subtraction	1
	Assessing and Developing Number Concepts: Place Value & Computation	1
Elementary Science		
RPDP 550a	Science Workshops Kindergarten	1
RPDP 550b	Science Workshops 1st Grade	1
RPDP 550c	Science Workshops 2nd Grade	1
RPDP 550d	Science Workshops 3rd Grade	1
RPDP 550f	Science Workshops 5th Grade	1
RPDP 551a	K-2 Science and Literacy	1
RPDP 551b	3-5 Science and Literacy	1
RPDP 552	Introduction to Science Notebooks K-5	1
RPDP 553a	K-2 Science	3
RPDP 553b	3-5 Science	3
RPDP 554a	Science thru Sketching	1
RPDP 554b	Science thru Photography	1
RPDP 554c	Science thru Textures	1
Secondary Literacy		
RPDP 530	Just Voices Writers in the Schools	1
RPDP 530A	Literacy in the Content Areas	1
RPDP 531	Effective Strategies to Teach Vocabulary	1
RPDP 531A	Non-Fiction Reading and Writing Workshop	3
RPDP 531B	Reading Comprehension	1
RPDP 531C	Methods in Critical Literacy	2
RPDP 531D	Just Voices Reading & Writing Workshop	2
RPDP 532A	Emergent Reading & Writing Strategies	2
RPDP 532B	Reading & Writing for Proficiency	2
RPDP 533A	Strategies to Reach All Learners	1
RPDP 533B	Brain Compatible Learning Strategies	2
RPDP 534A	Analytic Trait Scoring	1
RPDP 534B	Using Literature to Teach the Traits	2
RPDP 535A	Internet Literacy	1
RPDP 535B	Alternative Assessment in Literacy	1
RPDP 536A	Secondary Literacy Curriculum Mapping	1
RPDP 536B	Research Techniques and Multi-Genre Writing	2
RPDP 538	Critical Friends Group Coaches Institute	3
RPDP 538A	Transforming K-12 Classroom through Writing	3

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Code	Description	Credits
Secondary Math		
	Middle School Math	
UNLV RPDP 530b	Literacy in the Content Areas	1
UNLV RPDP 620g	Introduction to TI-83/84	1
UNLV RPDP 640f	Intermediate TI - 83/84	1
UNLV SCI 620a	Operations and Number Sets	2
UNLV SCI 620b	Introduction to Probability, Statistics, and Geometry Concepts	3
UNLV SCI 620c	Algebra for the Classroom Teacher	3
UNLV SCI 620d	Euclidean and Non-Eucledian Geometry for the Classroom	3
UNLV SCI 620e	Problem Solving in Action, 6-8	3
UNLV SCI 620f	Practicum - Instructional Strategies	3
		2
	High School Math	
UNLV RPDP 530b	Literacy in the Content Areas	1
UNLV SCI 640a	Geometry Overview for HS Teachers	3
UNLV SCI 640b	Advanced Algebra Overview for HS Teachers	3
UNLV SCI 640c	Trigonometry and Analysis Overview for HS Teachers	3
UNLV SCI 640d	Probability and Statistics Overview for HS Teachers	3
UNLV SCI 640e	Calculus Overview for HS Teachers	1
UNLV SCI 640f	Intermediate TI - 83/84	1
UNLV SCI 640g	Integrating High School Mathematics and Science	1
Secondary Science		
UNLV SCI 630A	MSSCP Laboratory and Process Skills	1
UNLV SCI 630B	MSSCP Life Science for MS Teachers (Sem. 2)	3
UNLV SCI 630D	MSSCP Physical Science for MS Teachers (Sem. 2)	3
UNLV SCI 630F	MSSCP Earth Science for MS Teachers (Sem. 2)	3
UNLV SCI 620G	RPDP Technology in the Science Lab: Part I	1
UNLV SCI 640F	RPDP Technology in the Science Lab: Part II	1
UNLV SCI 650A	HSSCP Laboratory Safety and Science Process	1
UNLV SCI 650B	HSSCP Content Area Literacy and Assessment	2
UNLV SCI 650D	HSSCP Biology I for HS Teachers (Sem. 2)	3
UNLV SCI 650F	HSSCP Earth Science for HS Teachers (Sem. 2)	3
UNLV SCI 650H	HSSCP Chemistry I for HS Teachers (Sem. 2)	3
UNLV SCI 650K	HSSCP Physics I for HS Teachers (Sem. 2)	3
UNLV SCI 650M	HSSCP AP Chemistry Mini Course 2	1
UNLV SCI 650Q	HSSCP Principles of Science for HS Teachers (Sem. 2)	3
Technology		
RPDP 512a	Productivity w/MS Word and Excel	1
RPDP 512b	Video Editing & PowerPoint	2
RPDP 512c	Internet Activities	1
RPDP 512d	InDesign	1
RPDP 512e	Palming with Teachers and Students	1
RPDP 512f	Microsoft Office: Course 1	1
RPDP 513a	Productivity Tools	1
RPDP 513b	Premier Elements	1
RPDP 513c	Computer Bonanza - Uses and Implementation	1
RPDP 513d	Adobe Acrobat	1
RPDP 513e	The Diverse World of iPod	1
RPDP 513f	Microsoft Office: Course 2	1
RPDP 514a	Spreadsheet Applications	1
RPDP 514b	Macromedia Dreamweaver I	1
RPDP 514c	PowerPoint Basics	1
RPDP 514d	Photoshop Elements	1
RPDP 514e	Visual Recordings	1
RPDP 514f	Microsoft Office: Course 3	1
RPDP 515a	Educational Recordkeeping	1
RPDP 515b	Macromedia Deamweaver II	1
RPDP 515c	Macromedia Flash	1
RPDP 515d	Introduction to Online Education Part I	2
RPDP 515e	World Cultures with Technology	2
RPDP 515f	Integrating History with Technology	1
RPDP 516a	Power Point - Beyond the Basics	1
RPDP 516b	Macromedia Fireworks	1
RPDP 516c	Introduction to Website Design using Macromedia Dreamweaver	1
RPDP 516d	Introduction to Online Education Part II	2
RPDP 516f	Technology for Educators	1
RPDP 518a	Methods Teaching with Technology	3
RPDP 518b	Internet Resources	3
RPDP 518c	Productivity Programs	3
RPDP 518d	Desktop Publishing	3
RPDP 518e	Web Design	3
RPDP 518f	Video & Audio Editing	3
RPDP 519a	Design and Application of Technology Applications	3
RPDP 519b	Handheld Technologies	3
RPDP 519c	Creating Video Tutorials	3
RPDP 519d	K-12 Classroom Strategies	3
RPDP 519e	Document Management	3
RPDP 519f	The Electronic Environment - Problems, Issues, and Strategies	3