

USING DEPTH OF KNOWLEDGE (DOK) LEVELS IN CREATING AND ADAPTING THE ACTIVITIES TO ENHANCE LOGICAL AND CRITICAL THINKING

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ABSTRACT

Teachers can use Webb's Depth of Knowledge (DOK) to categorize activities based on the complexity of thinking required to complete them. Teachers can implement the framework for educators to create more cognitively engaging and challenging tasks. DOK is essential for educators since it helps them to identify the cognitive demand of activities and make informed decisions on how to design effective learning experiences for their students.¹ The four levels of DOK range from simple recall to conceptual understanding and metacognition. In this article, I have created the activities with the Uzbek fairy tale taking into consideration the DOK. While doing these activities students engage in higher-order thinking and promote the complexity of thinking required to apply their understanding to the real world.

Key words: Logical reasoning, critical thinking, Depth of Knowledge, fairy tale.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

Depth of Knowledge, originally developed by Norman Webb, can best be described as a tool for measuring the cognitive demand of instructional objectives and assessment items. Webb first introduced Depth of Knowledge to align assessments to standards in the area of cognitive rigor. Using the Depth of Knowledge categories and descriptors, educators can more clearly delineate how they expect students to demonstrate higher-level thinking. Depth of Knowledge (DOK) has moved to the forefront as the analytical tool of choice to measure cognitive rigor, thus giving teachers a useful way to plan and deliver lessons and learning projects aligned for cognitive rigor with the targeted standard.²

Webb's depth-of-knowledge (DOK) levels (Webb 1997, 1999) Level Description

DOK-1 Recall & Reproduction — Recall a fact, term, principle, or concept; perform a routine procedure.

DOK-2 Basic Application of Skills/Concepts — Use information, conceptual knowledge; select appropriate procedures for a task; perform two or more steps with decision points along the way; solve routine problems; organize or display data; interpret or use simple graphs.

DOK-3 Strategic Thinking — Reason or develop a plan to approach a problem; employ some decision-making and justification; solve abstract, complex, or non-routine problems, complex. (DOK-3 problems often allow more than one possible answer.)³

¹ <https://www.structural-learning.com/post/webbs-depth-of-knowledge>

² Deborah Baughman Dennis Carlock Karen McGaugh John R. Walkup. Depth of Knowledge in the English Language Arts Classroom.

<https://standardsco.com/PDF/Depth%20of%20Knowledge%20ELA%20Classroom.pdf>

³ Karin K. Hess, Ben S. Jones, Dennis Carlock, John R. Walkup. Cognitive Rigor: Blending the Strengths of Bloom's Taxonomy and Webb's Depth of Knowledge to Enhance Classroom-level Processes.

<https://files.eric.ed.gov/fulltext/ED517804.pdf>

DOK-4 Extended Thinking — Perform investigations or apply concepts and skills to the real world that require time to research, problem solve, and process multiple conditions of the problem or task; perform non-routine manipulations across disciplines, content areas, or multiple sources.

A popular technique for developing questions involves question stems, where the likely root of a question would be related to a particular DOK level as in Figure 1 below.⁴

DOK 1	DOK 2	DOK 3	DOK 4
Can you list...? What is the answer to...? What is the definition...?	Can you compare...? How might you organize...? What is the difference between...?	Why would you...? What would happen if...? How might you interpret...?	How might you justify...? What arguments can you make...? How might you strategize a solution...?

Here is the activity which I used with the help of Uzbek fairy tale “Nilufar - Lily” for elementary classes.

LILY

Once upon a time, there was a poor peasant Babur and his wife Ziynat. They had no children. They prayed asking for a child. One day a little bird brought a flower in her beak and threw it on the dress of the peasant's wife. The woman hugged it from happiness and smelt it. The smell of the flower was pleasant.

The woman put it into the cup with water and continued embroidering. When the peasant returned from the field, the woman told the story gaily and showed the flower.

In the evening the flower turned into a little girl and said:

- Father! Mother!

The peasant and his wife were very happy. They named her Lily. The girl brought happiness to the family. There was plenty of harvest in their fields. They bought a cow, a calf and a sheep.

The girl grew up. The rumours of her beauty spread throughout the city and village.

A witch heard the rumours. She came to Lily's place every day and waited for a chance to kidnap her.

Once when Lily was washing the dishes near the river, she heard a voice:

- Hey girl, come here!

The girl was scared. She saw an old ugly woman, who wanted to catch her.

- Father! Mother! Help me,- she said and jumped into the water.

The witch did not achieve her goal and went away.

Her parents looked for their daughter.

They saw the dishes scattered near the river.

They thought that the girl fell into the river and they called her down.

Then they heard a voice of their daughter from the depth of the river.

- I am here Father! Mother! In a minute a white flower with green leaves appeared.

So a beautiful flower Lily came to the world.

⁴ Fontno, Tiffeni & Williams, Adam. (2019). Using Depth of Knowledge Questions to Encourage Deep Thinking: Intentional Questioning as an Instructional Strategy.

Activity 1. Draw a picture of a house for Lily. Write 5 sentences about the house you drew.

Activity 2. Even though the witch tried to steal Lily, she went unpunished. How would you punish a witch? What for?

Activity 3. An increase in crime was observed in Lily's neighborhood. You are the police chief and what do you do to eliminate crime?

Activity 4. Reflecting. Complete the chart with information about Lily, her mother, her father and the witch. When the two answers are the same, put a check in the third column. Then compare your answers with a partner.

	Nilufar	Mother	Father	Witch (now or in the future)	Same answer?
Hard working or lazy?					
Good or bad?					
Job?					
Age ?					
Male or female?					
Interests?					

Activity 5. Reflecting. Think of a time when you took a risk. What type of risk was it? Why did you take the risk?

Discuss your ideas with a partner.

Now think about Lily taking a risk by going to the riverside alone. What type of risk was it? Why did she take the risk?

Activity 6. Making Inferences. From the fairy tale, we can infer that Lily brought Baraka-fortune to her family. Find and underline sentences in the fairy tale that show this.

Note: Inferring means understanding something that the writer does not say directly. When you make inferences about a person, for example, you guess information about that person by the things he or she says or does.

Activity 7. When you analyze the cause or effect of an event, you identify the reasons why it happened or its results. Ask yourself: Why did Lily went alone to the riverside? What happened because of this event?

WILD CAT

Long ago, there was a cat who decided to live in the forest. On the way to the forest, he met a fox. The cat thought: "What kind of animal is this? Will he eat me?" the cat arched his back, hissed, his fur stood on end.

The fox, looking at the cat, thought that she had never met such an animal in her life. He seemed to her very strong and she was struck by the brilliance of his eyes.

- My friend, where are you going? - the fox asked.

- My claws are prick, my teeth are sharp, I'm going to the forest, - answered the cat.

- For what? - the fox asked.

- I want meat, I'm hungry, meow, meow! - answered the cat.

The fox was scared.

"Take me with you, we will eat together," she said respectfully.

They went together.

On the way they met a wolf. The cat frowned, arched his back, his eyes lit up.

The wolf got scared.

- Who is this?- he asked the fox.

- This is the new king, be quiet, otherwise he will tear us apart, - she answered.

- Really? - thought the wolf, trembling with fear. The wolf joined them.

On the way they met a bear.

- Where are you going? - he asked.

He saw a cat and asked:

- What kind of animal is that?

The fox whispered in the bear's ear.

- Be careful, otherwise he will tear off your skin.

- Is he really that strong? Let's test him, - suggested the bear.

But all the same, he was afraid that the cat would really tear off his skin.

- How can I get rid of these dangerous companions - the cat thought all the way. Suddenly he saw a quail. He jumped and ate it in an instant.

Seeing this, his companions were terribly frightened. The wolf, the fox and the bear consulted among themselves and decided:

"Let's give him something to eat, and then we'll find the right moment and run away."

They brought a sheep to the cat. The cat rushed at it.

"Let's see what he'll do next," they decided.

The wolf climbed into the hole, the fox burrowed under the leaves, and the bear climbed the tree.

The cat ate meat, he meowed, purred terribly, his eyes burned like fire. The wolf and the bear were terribly frightened.

The fox thought:

- What will I do if he notices me?

She moved. Hearing a rustle, the cat looked and saw a shiny thing. He thought it was a mouse and rushed at the fox. The fox screamed with all her might, "Help, I'm dying."

The cat was frightened and rushed into the hole where the wolf was hiding. The wolf jumped up and rushed to run with a fright.

- I must escape by climbing a tree, - thought the cat.

And he began to climb the tree.

The bear hiding in the tree thought:

"Now he's going to skin me." I must quickly save myself, - thought he and rushed down.

The cat was trembling.

- Where can I hide? - he thought in despair.

Finding no other way out, he remained on the tree. So the fox, wolf and bear never came close to the cat.

Activity 1. The PMI strategy

A good brainstorming strategy you can use when making decisions is the PMI strategy. Write down the positive consequences (plus) and negative consequences (minus) of making the decision, and also what would be "interesting" of carrying it out.

The cat's decision to live in the forest.

The fox's decision to peep.

The wild animals' decision not to disturb the cat.

The bear's decision to check fox's words.

Plus	Minus	Interesting

Activity 2. Jumping to a hasty conclusion.

People sometimes jump to conclusions with little evidence. Take the fox, for example, she thought that the cat was dangerous.

Read through this hasty conclusion. Why is it a hasty conclusion? How can you make it true?

The cat is dangerous.

Activity 3. Exploring hidden messages

Note: People don't always say what they mean. For example, imagine you show a short story you've written to a friend and ask for their opinion. What do you think when they tell you, "I thought the beginning was great"? Was the beginning really good or are they trying to hide the fact that they didn't really like the rest of it? People do this for a number of reasons: They don't want to be rude, they're not brave enough to tell the truth or they don't really have an opinion. Look at these sentences. What do you think they might really be hiding?

How can I get rid of these dangerous companions? – the cat thought all the way.

Activity 4. The factors that influenced the fox's, wolf's and bear's decision in avoiding the cat are given in the fairy tale. Think about the factors. Write them in the table.

Factors

In pairs think about other factors that make us avoid others. Add them to the table above.

Activity 5. Read the controversial statements in the chart and think about your opinions. Are you in favor of or opposed to the idea expressed in each statement? Then check the boxes that reflect your opinions.

	In favor	Opposed
The cat should live in the forest		
The cat should live with people		
The cat should make friends with the fox, bear and wolf.		

Activity 6. Reflecting. Complete the chart with information about the characters and about yourself. When the two answers are the same, put a check in the third column. Then compare your answers with a partner.

	Cat	Fox	Bear	Wolf	You	Same answer?
Clever or stupid?						
Dangerous or not?					(now or in the future)	
Age ?						
Male or female?						
Interests?						

Activity 7. Synthesizing and Reflecting. Think about your answers. What do you have in common with the characters of the fairy tale? Discuss your answer in a small group.

Activity 8. Reflecting. Think of a time when you took a risk. What type of risk was it? Why did you take the risk?

Discuss your ideas with a partner.

Now think about the cat taking a risk. What type of risk was it? Why did he take the risk?

Activity 9. Reflecting. Think about the characters in the fairy tale. Discuss a question with a partner: Which character is most like you? Why?

	Risks	You
The cat		
The wolf		
The fox		
The bear		

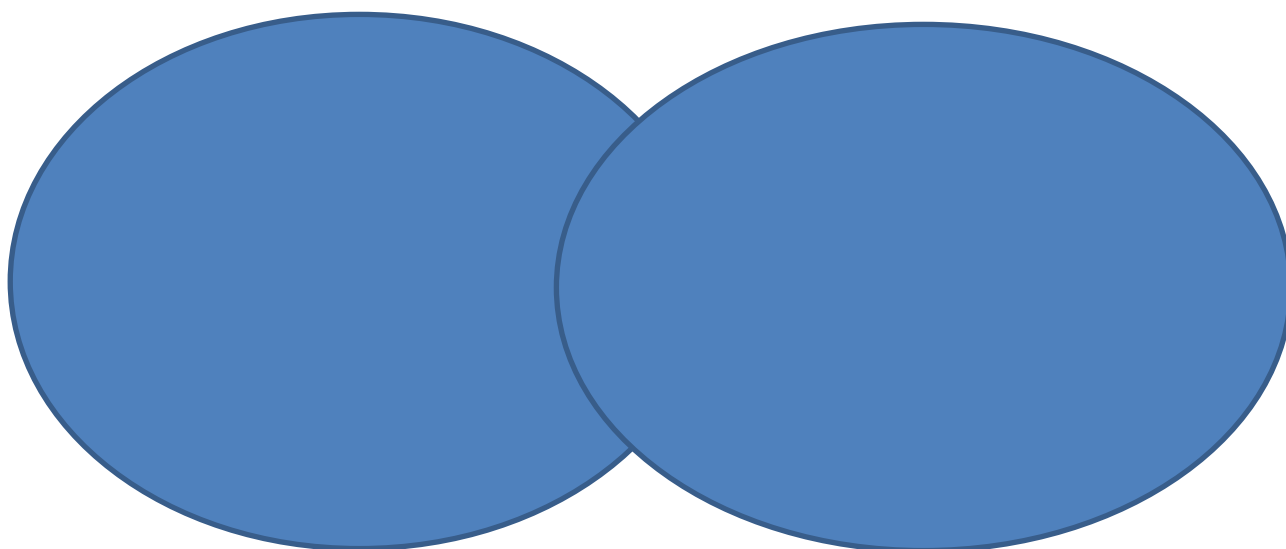
Activity 10. Personalizing. Write answers to the questions.

Would you be interested in being a “cat” in this fairy tale?

Would you be interested in being an “fox” in this fairy tale?

Why, or why not?

Activity 11. Synthesizing. Complete the Venn diagram to compare the cat and the fox.



Activity 12. Analyzing an Argument. With a partner, complete the chart below:

How was the cat described in the fairy tale? Explain your answer.	
How was the fox described in the fairy tale? Explain your answer.	
How was the wolf described in the fairy tale? Explain your answer.	
How was the bear described in the fairy tale? Explain your answer.	

Activity 13. Debate. Here is a motion for debate: “There is nothing wrong with exaggerating your abilities as long as it helps you to avoid misfortunes.” Work in groups: those for the motion and those against. Brainstorm your arguments, and anticipate the arguments of the other side.

Choose three people to represent the group. Conduct the debate, following this sequence.

1) Group A, present your arguments for the motion.

Group B, present your arguments against the motion.

2) Group A, support your arguments and criticize Group B’s arguments

Group B, support your arguments and criticize Group A’s arguments.

3) Group A, sum up

Group B, sum up

4) Take a class vote

By using the activities above the logical reasoning and critical thinking of the preschool children can be enhanced.

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