DOK Coding for Grade 8 *Reading* Instructional Materials

The narrator of this passage reflects on the connection between math, her family, and her culture. Read the passage. Then answer questions 1 through 7.

Math and After Math
by Lensey Namioka

"Seven!" shouted the teacher.

Or did he shout "Four"?

I shrank down in my seat. Math class was an absolute nightmare. The teacher scared me so much that my hands got sweaty, and my fingers slipped on the abacus beads.

I was in the second grade when I discovered that I suffered from abacus anxiety. The trouble was that I was going to a school where the teacher spoke a different dialect[1]. I grew up with Mandarin, the dialect spoken by the majority of the Chinese. When the eastern part of China was occupied by the Japanese, our family moved inland, to a region where I could barely understand the local dialect.

Writing was pretty much the same in any dialect, so in language and history classes I didn't have trouble with what was on the blackboard. My problems started in the math class, where we had to learn the abacus. Before the days of the calculator, the abacus was the main tool for adding and multiplying. It still is, in many parts of China (as well as countries like Japan and Russia).

The abacus teacher would shout out the numbers he wanted us to add or multiply. My ears didn't always understand what he said, so seven, for instance, sounded a lot like four.

Until that class, math was one of my better subjects, especially when it came to multiplication. Years later, when we emigrated to America, I was astounded to hear one of my American friends recite the multiplication table:

"Two times one is two. Two times two is four. Two times three is six. . ." It seemed to take forever.

The multiplication table is much shorter in Chinese. One reason is that the Chinese names for numbers are all one-syllable. We don't have numbers like *seven*.

Also, we omit words like *times* and *equals* while reciting. Instead of "Seven times two equals fourteen," we say, *Er qi shi si*, or literally, *two seven fourteen*. So we do it in four syllables instead of eight.

[1]**dialect**: a form of speech spoken in a certain district or by a given group of people

The best trick is that we memorize only half as many entries, because we know that seven times two is the same as two times seven. (I learned later this was called the Commutative Law.)

This meant I could rattle off the multiplication table about three times faster than my American classmates. But I learned the table even faster than my Chinese classmates. The reason was that I sang it.

"You can remember a tune better than a string of numbers," my father told me. "So I want you to sing the multiplication table."

The standard way to teach musical notation in Chinese schools was to give numbers to the diatonic scale: *do* was one (not a female deer), *re* was two (not a ray of sunshine), *mi* was three, and so on. When I had to remember that two times seven was fourteen, my father told me to hum the little tune *re ti do fa*. This was not a pretty tune, but certainly stuck in my mind.

Following Father's suggestion, I learned the multiplication table very quickly, and even now I still hum. The other day, when I was in the store buying candy bars, I noticed another customer staring at me. I was trying to figure out if my fistful of change was enough for four candy bars, and I must have been humming as I multiplied.

When I entered American schools, my best subject was math. I didn't need to know much English to manage the Arabic numbers, and my Chinese school had been a year ahead of American schools in math (because of shorter multiplication tables, maybe).

After a while I realized that my classmates found me weird. During our early years in America, my family lived in towns where there weren't too many Asians, and I looked different from everybody else in class. It turned out that my weirdness wasn't just because I looked different, or because I hummed funny tunes.

"How come you're so good at math?" asked one of my classmates.

"Why shouldn't I be?" I asked.

"You're a girl!"

In America, apparently, it was unusual for a girl to be good at math. It was different in China, where women were good at figures. They regularly kept the household accounts and managed the family budget.

A few years ago, I saw a movie about Chinese Americans called *Dim Sum*. A Chinese man who ran a restaurant in Chinatown brought his receipts to a woman friend, who figured out his accounts for him.

My American friends found the situation strange. "It's not unusual at all," I told them. "In my family, for instance, my mother made the major financial decisions."

In fact, my mother made a financial killing when we were living in Berkeley, California.

A neighbor took her to a land auction. A piece of land near our house was offered for sale, and Mother thought it would be fun to bid on it. Someone was bound to top her bid, she thought.

She was stunned when nobody else made a bid, and Mother found herself the owner of a large plot of land.

As she and her friend prepared to leave the auction room, a man rushed up to them. He was a realtor who had planned to bid for the land, but had arrived at the auction too late.

"I'll give you whatever you paid, plus something extra," he told Mother.

"No, thank you," said Mother. "I'm quite happy with the purchase."

The realtor raised his offer, but Mother still turned him down. He became frantic. "Look, I'll go as high as two thousand dollars above your bid!"

This just made Mother more stubborn. "No, I want to keep the land."

The realtor obtained our address and phone number, and immediately called our house.

When Father answered the phone, the realtor shouted, "Do you know what your wife just did? She threw away a chance to make two thousand dollars!"

"I'm sure she had her reasons," Father answered calmly. Nothing that the realtor said could disturb him.

The land turned out to be an excellent investment, and helped to provide a tidy nest egg for my parents in their old age.

1. Why does the narrator have trouble learning to use an abacus?
   - **A** She cannot read the information written on the blackboard.
   - **B** The new math tables are more complicated than the old tables.
   - **C** She cannot understand the instructions shouted by the teacher.
   - **D** The beads on the abacus are difficult to maneuver with her fingers.

2. Why does the narrator's father teach her to sing the multiplication table?
   - **A** to help her translate numbers
   - **B** to improve her musical skills
   - **C** to help her impress her classmates
   - **D** to improve her memory of numbers

3. Based on the passage, which word **best** describes how the narrator feels toward her mother?

> **A** bewildered
> **B** protective
> **C** entertained
> **D** admiring

4. Read this sentence from the passage.

> **The land turned out to be an excellent investment, and helped to provide a tidy nest egg for my parents in their old age.**

> What does the phrase nest egg mean in this sentence?
> **A** tale to tell
> **B** place to live
> **C** sum of money
> **D** reason to worry

5. In addition to being good at math, the narrator's mother can **best** be described as

> **A** greedy.
> **B** shrewd.
> **C** satisfied.
> **D** humorous.

6. Read these sentences from the passage.

> **"I'm sure she had her reasons," Father answered calmly. Nothing that the realtor said could disturb him.**

> The sentences show that the narrator's father is
> **A** furious at the realtor.
> **B** supportive of his wife.
> **C** flustered by the phone call.
> **D** uninterested in the land purchase.

7. The narrator's view about a girl being good at math is different from that of her classmates.

> **A** Describe the narrator's view about a girl being good at math.
> **B** Explain how she developed that view. Use details from the passage to support your response.

Write your answer to Question 7 on a separate piece of paper. Be sure to answer Parts A and B.

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Although the Wright brothers, Wilbur and Orville, invented the first successful airplane, they could not have imagined the advances that would be made in aviation or how their invention would change civilization. Read the passage. Then answer questions 8 through 14.

First Flight
by Glen Phelan

Flying Toys
1 Did you have a favorite toy as a child? The Wright brothers did. Their father brought it home one day in 1878. Wilbur was 11 and Orville was 7. Their father hid the surprise in his hands as the boys tried to see what it was. Then he tossed it into the air.

The boys had never seen anything like this new toy. Two propellers were connected by a tightly wound rubber band. As the rubber band unwound, the propellers spun. The toy rose straight up and hovered for a few seconds. Then it floated to the floor.

3 Wilbur and Orville called the toy the Bat. They played with it until it broke. What do you think they did then? Throw the Bat away? Not the Wright brothers. They looked at how it was put together. Then they built a new one. Then another and another. Each version was better.

That's how Wilbur and Orville were—curious. They wanted to know how things worked. The boys learned what they could from books, then tinkered with gadgets and machines.

Wheels and Wings

First the Wright brothers had to find out what others had learned so far. They read everything they could. Then they wrote to other aviation pioneers for advice.

6 They concluded that a flying machine needs three basic things:

1. wings to lift itself into the air,
2. a source of power for moving through the air, and
3. a way for a pilot to control the machine in flight.

Others had partly solved the first two problems. People already knew that wings should be curved on top. This shape helps create lift, or an upward push, as the wing slices through the air. Experts also knew that an engine and propellers could move the machine through the air.

Books and Buzzards

The biggest problem was controlling the aircraft during flight. Some gliders used rudders to move right or left. Yet the wind—even little gusts—could make a flying machine wobble from side to side. To fly smoothly, a pilot would have to keep the wings balanced. But how?

9 The Wrights found the answer by watching large birds called buzzards. A soaring buzzard keeps its balance by twisting the tips of its wings in different directions. The brothers wondered if they could warp, or twist, the ends of aircraft wings. That would solve the control problem.

Wilbur and Orville tried their idea on a kite. It had two five-foot wings—with strings attached to the tips. Pulling the strings would warp the wings. So did wing-warping allow the Wrights to control the kites? Yes!

Trials and Tunnels

Next the Wrights built a full-size glider. To test it, they needed strong, steady winds. They found them on a stretch of beach near Kitty Hawk, North Carolina. That's where they took their glider in September 1900.

12 For a month, the brothers camped on the beach. Wilbur did the flying. He lay down on the lower wing. Orville held one end of the wing and ran into the wind until the glider took off. The longest glide lasted 20 seconds and covered almost 400 feet.

Over the next two years, the Wrights built bigger and better gliders. But the aircraft still didn't have enough lift. That meant the wing design needed more work.

To find just the right shape for their aircraft's wings, the Wright brothers built a wind tunnel. It was a wooden box with a fan at one end. By putting model wings into the box, the inventors could see which shape worked best.

15 The Wright brothers returned to Kitty Hawk in August 1902 with their best glider ever. This time, Wilbur and Orville took turns flying. For the next month, they made almost a thousand trial flights. They had become the world's greatest flight experts.

Powered Flight

Now they were ready for the last big step—adding power.

Back in Dayton, the Wrights worked on the final pieces of their aircraft: an engine and propellers. Car engines were too heavy, so they built their own.

18 They used their wind tunnel to find the right size and shape for the wooden propellers. Bicycle chains connected the engine to the propellers, making them turn. Wilbur and Orville called the machine *Flyer 1*. Would the invention live up to its name? They'd soon find out.

The Wrights arrived at Kitty Hawk in late November 1903. There were problems from the start. Storms and freezing weather made it difficult to put *Flyer 1* together. Then the propeller rods cracked. Orville had to go back to Dayton to make new ones.

By December 15, all was ready. Wilbur won a coin toss to see who would fly first. As the machine lifted into the air, he pulled hard on the controls—too hard. *Flyer 1* quickly crashed into the sand. Repairing it took two days.

21 Now it was Orville's turn. The brothers shook hands. Orville took the controls, and Wilbur steadied the wing. Just as the craft lifted into the air, an assistant took a famous photograph.

The flight lasted only 12 seconds and covered just 120 feet. The plane jerked up and down the whole time. All the same, that tiny trip was a huge success.

For the first time in history, a heavier-than-air machine, moving by its own power, had carried a passenger during a controlled flight. In other words, *Flyer 1* was the first airplane. The age of aviation had begun!

8. The **main** idea of the section labeled "Books and Buzzards" is that the Wright brothers
   A enjoyed watching birds.
   B liked to read books about birds.
   C studied what other people had written about flight.
   D observed birds to solve an aviation problem.

9. The first problem the Wright brothers had was that the wind could make a flying machine
   A go farther.
   B become unsteady.
   C push upward.
   D crash immediately.

10. Why does the author include the information about the Wright brothers' favorite toy?
    A to show that they had an early interest in flight
    B to describe the way they learned to work together
    C to prove that they were the first to experiment with flight
    D to illustrate the difficulties they overcame to be successful

11. What problem did the Wright brothers still face after thousands of successful glider flights?
    A producing enough aircraft to meet demand
    B convincing the world that aircraft can be safe
    C creating an aircraft that flew under its own power
    D figuring out how to control the direction of an aircraft

12. Which section tells about the science behind flying machines?
    A Flying Toys
    B Wheels and Wings
    C Books and Buzzards
    D Powered Flight

13. Based on the passage, which word **best** describes the Wright brothers?
    A private
    B secretive
    C ambitious
    D irresponsible

14. It took a long time and hard work for the Wright brothers to build a machine that flew.

> **A** Name **two** problems the Wright brothers faced prior to their successful flight on December 17, 1903.

> **B** Explain how the Wright brothers solved each of the two problems you named in **Part A**.

> Use details from the passage to support your response.

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Passage:	Item Number	Standard	DOK Level	Annotation
Math and After Math	1	3.8.1	1	Recall information about the plot.
	2	3.8.2	2	Drawing a conclusion based on motivation of a character
	3	3.8.2	2	Drawing a conclusion about a character.
	4	3.8.2	2	Drawing a conclusion about a character.
	5	3.8.2	2	Drawing a conclusion about a character.
	6	1.8.4	2	Context Clue: drawing a conclusion of a meaning of a word in text.
	7	3.8.2	2	Drawing conclusions about a character.
First Flight	8	4.8.3	2	Determining the main idea of part of a text.
	9	4.8.3	1	Recall of information about a problem from the text.
	10	4.8.6	2	Drawing a conclusion about why an author includes certain information.
	11	4.8.3	2	Basic connection of information about a problem from the text.
	12	4.8.5	1	Locating information in text.
	13	4.8.6	2	Drawing a conclusion about information provided in text.
	14	4.8.3	2	Drawing conclusions about problems and solutions in text.