

1.OA Peyton's Books

Task

Materials

- Chart paper
- Word problem

Peyton had 16 books to take on his trip. He lost some. Now he has 7 books. How many books did Peyton lose?

IM Commentary

This task was designed to support students to make sense of problems and persevere to solve them (MP1) and understand the relationship between addition and subtraction. Students will solve the *take from, change unknown* problem, and through a teacher-facilitated discussion, understand that the problem can be solved using addition or subtraction. The wording of the problem may elicit the equation $16 - ? = 7$, however, in order to solve that problem, students may think of the problem as $16 - 7 = ?$ or $7 + ? = 16$. The numbers within the problem were selected purposely as numbers that may require students to apply an operation to solve, rather than a commonly known fact.

Careful attention should be given to the discussion that results from the task so that the intent of the standard is achieved.

See the attached vignette, "A Visit to the Classroom," to see how a teacher-led discussion might look.

The Standards for Mathematical Practice focus on the nature of the learning experiences by attending to the thinking processes and habits of mind that students need to develop in order to attain a deep and flexible understanding of mathematics. Certain tasks lend themselves to the demonstration of specific practices by students. The practices that are observable during exploration of a task depend on how instruction unfolds in the classroom. While it is possible that tasks may be connected to several practices, only one practice connection will be discussed in depth. Possible secondary practice connections may be discussed but not in the same degree of detail.

This particular task helps illustrate Mathematical Practice Standard 1, Make sense of problems and persevere in solving them. As students approach this problem, they might use concrete objects or pictures to show the action of the problem, such as drawing 16 books then taking the seven books away, resulting in the 9 books Peyton lost. Or a student may start with the 7 books Peyton has left and count up to the 16 books he started with to determine how many books he lost. One approach uses a subtraction pathway while the other uses an addition perspective. This allows students to think about this problem from different perspectives and choose a pathway that makes sense to them. Students may also need to search for a similar problem they have solved previously to give them a starting point. These types of experiences support a productive disposition towards problem solving as they provide students with multiple entry points and opportunities to build on what they already know.

Solution

There are many possible solutions to this problem. Several are listed, however, this list is not exhaustive.

- $16 - ? = 7$. Student may draw 16 lines to represent the 16 books and then cross out 7 lines to represent the 7 remaining books. Student may then count the 9 lines to represent the “some” that were lost.
- $16 - ? = 7$. Student may count down from 16. Student may state; “16, 15, 14, 13, 12, 11, 10 ...take away those and then there are 9. Nine books were lost.
- To find $16 - 7$, we can break 16 into $10+6$, subtract the 7 from the 10, and add the result back to the 6:

$$16 = 10 + 6$$

$$10 - 7 = 3$$

$$3 + 6 = 9$$

- $7 + ? = 16$. Student may use manipulatives to represent the starting quantity of 7 and then add more until reaching the total quantity of 16. Student may then count the number of manipulatives added on to reach 16.
- $7 + ? = 16$. Student may count up from 9 to 16. Then, student may double count the number counted on to determine the number of lost books. Nine books were lost.



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