



Primary PoW Packet

The Eagle and the Bear

<http://mathforum.org/pows/>

Welcome

This packet contains a copy of the problem, the “answer check,” sample solutions and some teaching suggestions. This is Library Problem #4439. The text of the problem is included below. A print-friendly version is available using the “Print” link from the blue-shaded box on the problem page.

Standards

In *The Eagle and the Bear* students are asked to figure out how many fish the eagle has to catch to tie the bear in their fishing contest. The key concept is equivalency.

If your state has adopted the [Common Core State Standards](#), this alignment might be helpful:

Kindergarten: Operations & Algebraic Thinking

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Grade 1: Operations & Algebraic Thinking

Represent and solve problems involving addition and subtraction.

Understand and apply properties of operations and the relationship between addition and subtraction.

Work with addition and subtraction equations.

Grade 2: Operations & Algebraic Thinking

2.OA.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.

The Problem

The Eagle and the Bear



A bear and an eagle are having a contest to see who can catch the most fish.

The bear catches 3 salmon and 6 trout. The eagle catches 6 salmon.

How many trout would the eagle have to catch to tie the bear? Explain how you figured it out.



Answer Check

After students submit their solution, they can choose to “check” their work by looking at the answer that we provide. Along with the answer itself (which never explains how to actually **get** the answer) we provide hints and tips for those whose answer doesn’t agree with ours, as well as for those whose answer does. You might use these as prompts in the classroom to help students who are stuck and also to encourage those who are correct to improve their explanation.

The eagle has to catch 3 trout.

If your answer does **not** match ours, did you

- draw a picture?
- use two colors of counters to think about the salmon and the trout?
- talk in your group?

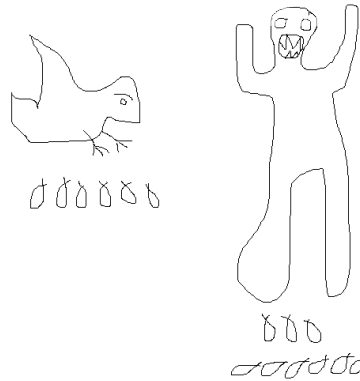
If your answer **does** match ours, did you

- explain?
- write a number sentence?
- help anyone in your group?

Our Solutions

Method 1: Draw a Picture

My teacher read the story to us about the eagle and the bear. My friend and I drew this picture of an eagle with the 6 salmon and the bear with the 3 salmon and the 6 trout:



We wanted the number of fish to be the same for the eagle and the bear. The eagle needs 3 more fish to have the same number. The eagle needs to catch 3 trout.

We wondered if it's really the same amount of fish. Are trout the same size as salmon?

Method 2: Act it Out with Manipulatives

I was the bear and my friend was the eagle. We used blue counters for the trout and red counters for the salmon. I got 3 red counters and 6 blue counters. My friend got 6 red counters. We saw that if he got 3 blue counters we would each have the same number of counters.

We knew that the eagle would need to catch 3 trout.

Method 3: Make a Table

We made a table to think about what we knew from the problem:

	salmon	trout	total number of fish
bear	3	6	9
eagle	6		9

We could see that if the eagle caught 3 trout it would have 9 fish total and that would be how many fish the bear had.

Method 4: Write Number Sentences

I can write this number sentence about the bear:

$$\text{fish} = 3 + 6$$

I can write this number sentence about the eagle:

$$\text{fish} = 6$$

To find the number of fish eagle still needs to catch I think:

$$? + 6 = 3 + 6$$

My answer is 3!

This problem is one that was recently discussed during an online course offered to a group of primary level teachers from Montgomery County, Maryland. Beverly posted several times in the course about this particular problem and what she thought about before and after she used it with her first graders.

Beverly's "Before" Thoughts

I have picked *The Eagle and the Bear* problem #4439. I chose this problem since it creates a problem to answer the meaning of the = sign. Both sides of the equal sign must equal. We worked on this concept during the 2nd marking period and continue to go back and check understanding during this marking period as well. This problem also addresses missing addends which has been a difficult concept for some of my children. I'm thinking this may help to build confidence and understanding while working in a group and independently. The children need to rely on their own understanding and apply what they know to promote problem solving. This problem will allow me the opportunity through observation to help the children who are still struggling to grasp both of the concepts mentioned above.

Beverly's "After" Thoughts

Today my children completed the PoW *The Bear and the Eagle*. I introduced my lesson as a whole class on the Elmo. We read the title only. I had pictures of both animals and asked what do both of these animals have in common. The first answers were that they eat meat and fish. Using this information I asked what could our problem be about today. Many of the children responded – "catching and eating fish." With that each child was given a sheet of 8 1/2 X 14 paper and they folded and divided it in half. One half was to label bear and the other half eagle. (I also had the children add landforms/labels to the picture to incorporate our social studies topic, Geography.) We read on and the children discussed what to illustrate/number sentence for the bear. We then read on and used the information given for the eagle to discuss and solve to make both sides equal. The children wanted to do more. They enjoyed this problem and I noticed that they have retained the strategies for solving missing addends as well as the meaning of the equal sign. I wonder if the children can now attempt to write their own PoW and have their classmates solve their problems. I am going to give it a try.

Beverly's Reflective Thoughts

One of the aspects of the Elementary Integrated Curriculum (EIC) in first grade is that all areas of the curriculum are related with an unifying question (What strategies do you use to ...) and then connections are made to reading, math, science, social studies. All day I find myself asking the children how the tasks we are completing relates to real life situations. I ask for examples from the day or from home. In math the PoW I am using "The Eagle and the Bear" helps to make the connection by answering the question – *How does knowing how addition and subtraction are related help you learn sums and differences to 10?*

Using critical thinking questions helps children to make connections and apply these connections to any problem or situation. Questions I will ask to help the children solve this week's PoW are:

- How many fish did the bear catch?
- What types of fish did he catch?
- How can you figure out how many trout the eagle has to catch?
- Do you think there is more than one answer to this problem?
- Do you think everyone will have the same answer?
- What number sentence do you come up with for the eagle to tie the bear?
- How do you know this is the right answer?
- If someone said that the eagle could have caught 4 trout, would you agree or disagree with them? Explain.

The reading supports my thoughts that teachers should ensure that links are made between routine school activities and mathematics by asking questions that emphasize the mathematical aspects of situations. We plan tasks and pick PoWs that revisit topics previously taught and this enables students to develop new links between previously learned math concepts and procedures with their math goal in mind.

We hope this information is useful in helping you make the most of the Primary Problems of the Week in the Library. Please let me know if you have ideas for making them more useful.

~ Suzanne <suzanne@mathforum.org>