# Bears in caves

## Purpose:

The purpose of this activity is to engage students in problem solving to find an unknown addend.

Achievement Objectives:

NA1-4: Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures.

NA1-3: Know groupings with five, within ten, and with ten.

NA1-1: Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions.
AO elaboration and other teaching resources

Description of mathematics:

In readiness for this problem, the students should have familiarity with each of the following components of mathematics. The problem may be solved with different combinations of these components.

- Counting one to one
- Counting on
- Equal sharing
- Partitioning

This activity may be carried out with guidance, or by allowing the student to follow their own method of solution. The approach should be chosen in sympathy with students' skills and depth of understanding.

## Activity:

Here are three caves.
There are bears in each cave.
There are 12 bears altogether.

If there are 2 bears in the first cave, how many bears might be in each of the other caves?

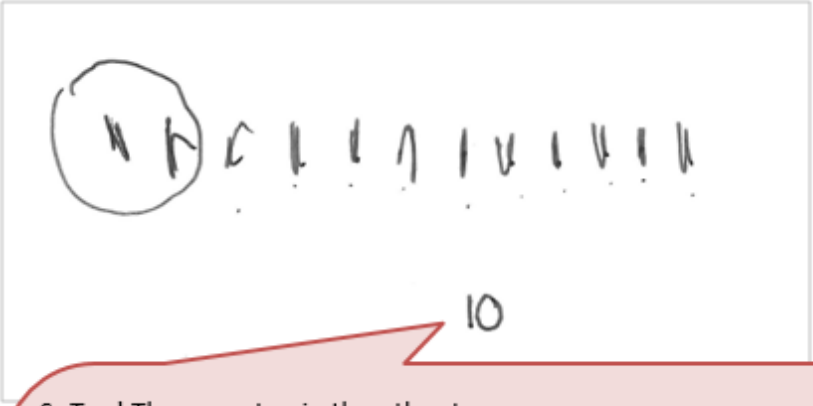
***Note to teacher: This activity requires materials for illustration. The 'bears' could be counters or buttons, the caves could be paper cups.***

## The visual approach

The student is able to use images and/or objects to represent a problem and find a solution.

Prompts from the teacher could be:

1. How many bears are there altogether?
2. How many bears are in the first cave?
3. How many bears are not in the first cave? This is how many bears there are in the other two caves.
4. How many bears might be in each of the other two caves?




S: Ten! There are ten in the other two caves.

T: I see that you have counted up the bears on your diagram that aren't in the first cave. Can you tell me how many might be in each cave?

S: Oh well, they might be all in the next cave and none in the other so ten and none. Or one and … [counts up the remaining images] … nine.

T: Are there other possibilities?

S: Yes. Two and … eight, or three and … seven.

T: What if there were the same number of bears in each of the other two caves?

[student thinks for a while and counts from their diagram]

S: Um… five and five.

## The conceptual approach

The student is able to solve a problem using sharing and other strategies, to find unknown addends.

Prompts from the teacher could be:

1. How many bears are there altogether?
2. How many bears are in the first cave?
3. How many bears are not in the first cave?
4. How many bears might be in each of the other two caves?

S: Five!

T: Can you explain that to me.

S: Well there are ten bears not in the first cave because two and ten make twelve. And so that must be five in each.

T: Well, yes, it could be five in each. But do there have to be the same number in each of the other two caves.

S: Oh. Oh, I see, there are two not five in the first cave.

[Student thinks for a while and produces a list of numbers]


T: Tell me about these numbers.

S: They are all the ways to make ten from the two caves. There's five and five, then I moved one bear, to make six and four, then I moved another bear. That's the seven and three. Then the next bear moved and it's eight and two. Then another bear moves and we get nine and one. If the last bear moves, then it would be ten and none but it said there were bears in each cave and that would make bears in two caves so you can't have ten and none.