Mixtures — Bean Salads and Fish Bowls

This activity was contributed by Ann Carlyle, based on one by Ernestine Camp. It is appropriate for children seven years and older.

THIS IS ABOUT

numbers

pre-algebra

logic

YOU WILL NEED

beans or markers of various colors (those mentioned in the bean problems are black beans, red beans, and lima beans, but other kinds may be substituted)

a "salad bowl" or "fish bowl" or place to put the beans

GETTING READY

Each of the salads or fish bowls is a number problem.

Each has two kinds of beans or fish.

Work together to find the solutions.

If the problems seem too hard, put this activity aside for later. There are samples appropriate for four to six year-olds in Part 3 of this activity.
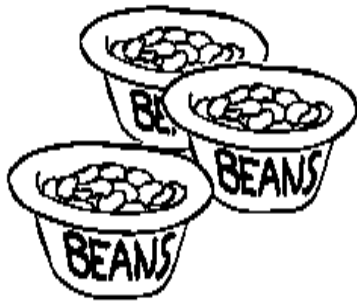
Somebody says we're supposed to be teaching our kids "algebra" when they are little?!!

You mean like a+b=c? It's just getting some ideas about algebra and numbers. Here's an example:

"The number of black beans is twice the number of red beans, and there are 6 beans in all."

Now ask yourself these questions: Are there more black beans or red beans?

> *black*

If I put 1 red bean in the salad, how many black beans would I put in?

> *2*

Does that add up to 6?

> *no*

If I put in 1 more red bean, how many black beans should I add?

> *2*

Does that add to 6?

> *yes*

Later, when we get ready for algebra, we might say:

> *Let "r" stand for the number of red beans.*
>
> *Then (since there are twice as many black beans) "2r" stands for the number of black beans.*
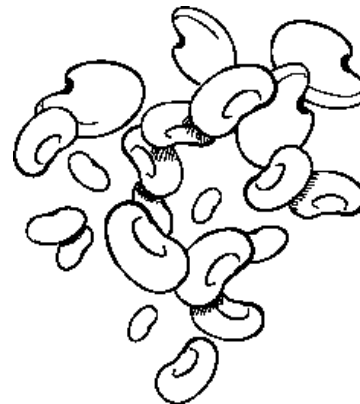>
> *And r + 2r = 6 (or 3r = 6)*

ACTIVITY 1: TWO BEAN SALADS

Work together to find out what's in each salad. Each one has two kinds of beans. Some salads may have more than one answer.

This salad has 8 beans.
Half of the beans are black.
How many are not black?

This salad has 10 beans.
4 of the beans are lima beans.
How many are red beans?

This salad has 10 beans.
It has the same number of each kind of bean.
What could be in the salad?

This salad has 4 black beans.
The number of red beans is double the number of black beans.
How many beans are in the salad?

There are 5 lima beans and 2 more red beans than lima beans.
How many red beans are there?

There are 5 beans in all.
There is 1 more lima bean than red beans.
How many of each kind?
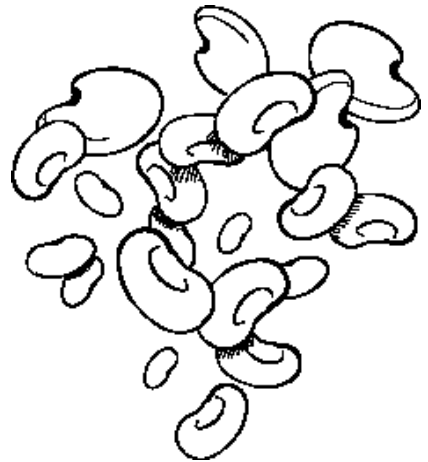
There are 6 lima beans.
There are 3 more red beans than lima beans.
How many beans in the salad?

There are 6 beans in all.
There are half as many lima beans as red beans.
Describe this salad.

There are 4 beans in all.
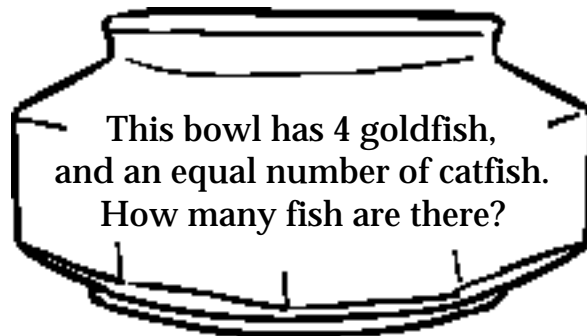There are three times as many black beans as red beans.
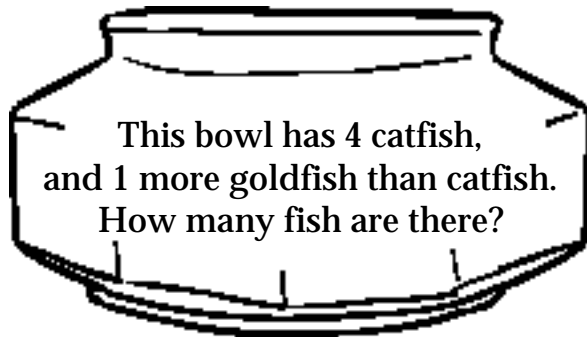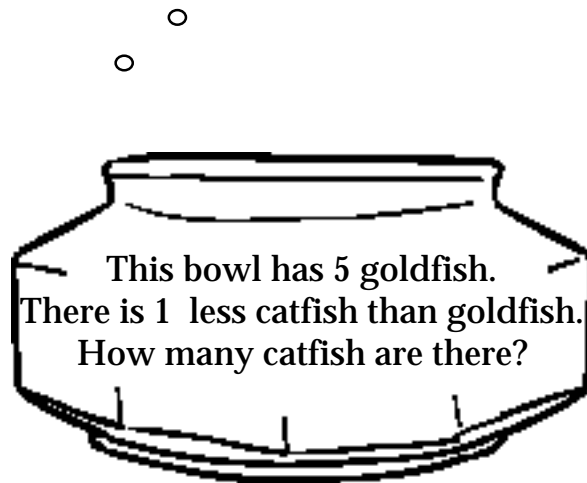How many of each color?

There are 5 lima beans and 2 less red beans than lima beans.
How many red beans are there?

ACTIVITY 2: TWO-FISH BOWLS

Each fish bowl has two kinds of fish.

This bowl has 5 fish.
There are 3 goldfish.
How many catfish are there?

This bowl has 5 goldfish.
There is 1 less catfish than goldfish.
How many catfish are there?

This bowl has 4 catfish,
and 1 more goldfish than catfish.
How many fish are there?

This bowl has 4 goldfish,
and an equal number of catfish.
How many fish are there?
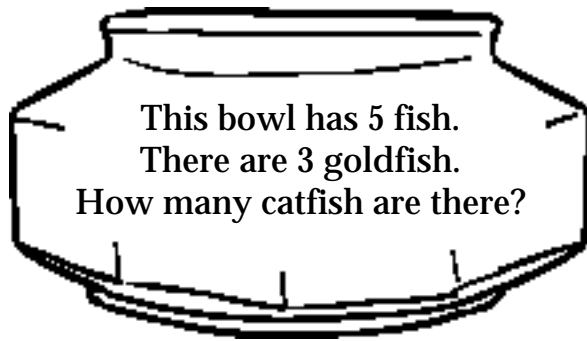
Create your own fish bowl combinations.

This bowl has 9 fish in all.
There are twice as many catfish as goldfish.
There is an uneven number of goldfish.
Describe the fish in the bowl.

There are an equal number of catfish as there are goldfish.
There are fewer than twelve fish all together.
How many of each kind of fish could there be?

This bowl has the same even number of each kind of fish.
There are between 5 and 10 fish in the bowl.
How many of each fish could there be?