Camping Groups

Purpose:

The purpose of this activity is to engage students in using knowledge of basic facts, to solve a problem in context.

Achievement Objectives:

NA3-2: Know basic multiplication and division facts.
NA3-6: Record and interpret additive and simple multiplicative strategies, using words, diagrams, and symbols, with an understanding of equality.

Description of mathematics:

The background knowledge and skills that should be established before and/or during this activity are outlined in the diagram below:
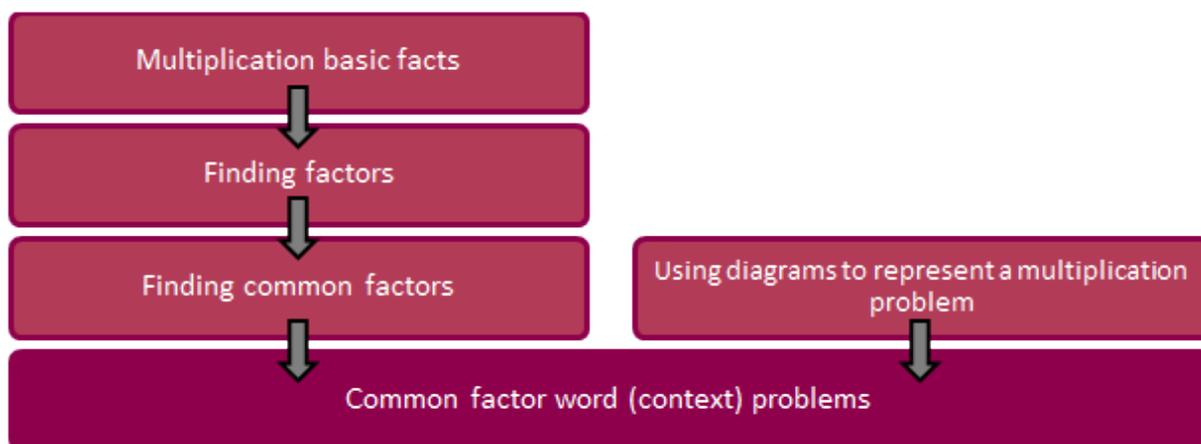
Multiplication basic facts
Give the first three multiples of 6.

Finding factors
List all the factors of 42.

Finding common factors
List all the common factors of 24 and 42.

Using diagrams to represent a multiplication problem
Use a diagram to show how 6 people can share $84.

Common factor word (context) problems
Bags of fruit are sold so that there are 6 apples or 10 mandarins in each bag. Can a teacher buy bags of fruit so that everyone of her 30 students get a piece of fruit with none left over?

This activity may be carried out with step by step 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:

A class of 24 students is planning a camping trip.

The school has tents that fit three people each
and backpacks that can be shared one
between two students.

The teacher wants the class to be split into
cooking groups that will be as small as possible
so that everyone sharing a tent will be in the
same cooking group.

Also, each pair of students sharing a backpack
will need to be in the same cooking group.

How many students will be in each cooking group?
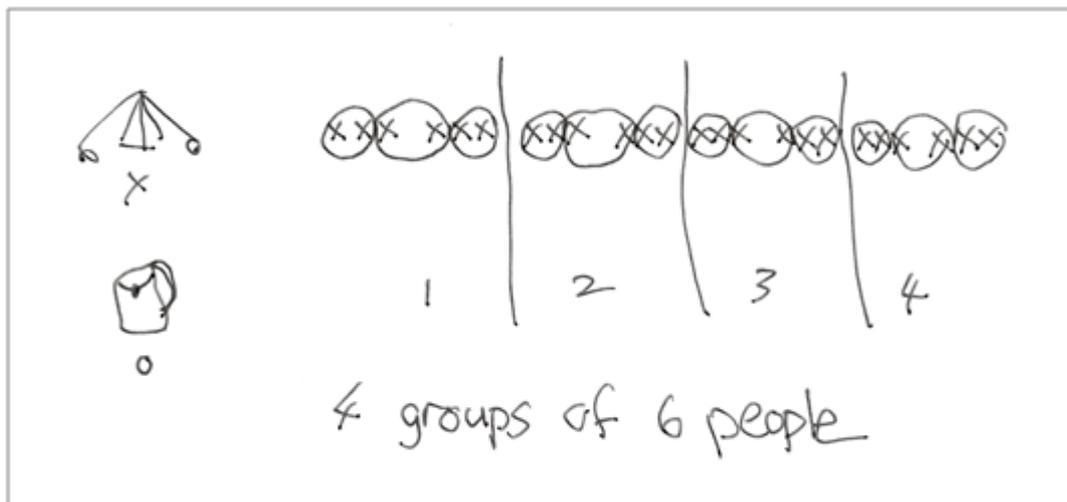Explain how you arrived at your answer.

The procedural approach

The student is able to solve a context problem, using common factors and lowest common multiples with guidance.

Prompts from the teacher could be:

1. Use counters or a diagram to show the 24 students in the class.
2. Group the students into tents (3 students in each tent).
3. Arrange the counters, or show on the diagram, how the packs may be shared (one between two).
4. What is the lowest number of cooking groups possible?

4 groups of 6 people

The conceptual approach

The student is able to solve a context problem, using common factors and lowest common multiples.

Prompts from the teacher could be:

1. How many tents are needed by the class?
2. How many packs are needed by the class?
3. How can the students be grouped to have a whole number of tents and packs per group?
4. What is the minimum size the cooking groups can be?

T: Tell me why you have crossed out these odd numbers.

S: The only odd numbers that go into 24 are 1 and 3. One big cooking group can't be the answer because the question says find the smallest size group, so there must be more than one answer.