



## Problem Posing Pro-Forma using photographs

### Assumption

A numerical or maths problem has multiple solutions or none, it is framed as an open-ended question. There is no clear path to the answer – students cannot easily use a formula. Within the problem students are often given too much information or not enough.

1. Activity Name: How much do you save when buying multiples?
2. Expected duration of activity: 15 minutes
3. What EQF level is the activity (approximately)? EQF levels 1-2
4. What is the topic? Exploration of mental maths strategies
5. What are the Learning Outcomes? Explore different mental maths strategies for solving problems.
6. Prerequisite/prior knowledge assumed? Students should have a knowledge of basic arithmetic
7. In what ways does the problem, or the way the problem is delivered to the students:
  - encourage critical way of investigating and thinking? No guidance should be given initially to students on how to find a solution. Students will explore different mental maths strategies for solving the problem.
  - encourage analysis?
  - allow students to be creative? Students may use different strategies to solve the problem. Students may also be encouraged to find their own anomalies in their local grocery shop that will demonstrate some benefits to a basic understanding of mathematics
  - allow independent learning? Initially students should be encouraged to work individually.
  - allow for co-operative learning? Students should be encouraged to work in pairs or small groups to compare and articulate their approach to solving the problem. Groups of students should then be invited to find as many sensible approaches to solving the problem.
  - allow students time to think? The teacher/tutor should allow sufficient time for all students to find a solution to the problem.

[Type here]

- have a relevant or interesting context? Photographs display real life contexts. In this real life example it would appear that it is more expensive to buy the 'offer'.
  - allow for multiple ways of solving or investigating the challenge? Students should be actively encouraged to explore and articulate as many different approaches to solving the problem as possible. In this way they will develop greater confidence, competence and number sense.
8. Resources or materials required? Photograph. Poster paper may be used to demonstrate the different strategies for solving the problem.
  9. What technology is required in the delivery of the problem? The photograph may be displayed through PowerPoint or other similar presentation software.
  10. What technology might potentially be required in the solving of the problem? The problem does not require any technology to solve.
  11. Suggestions for delivery

PowerPoint slide 1

Present the photograph to students. Then pose the problem...

How much would you save if you bought the offer?

Allow time for all students to explore a solution (preferably using mental maths).



[Type here]

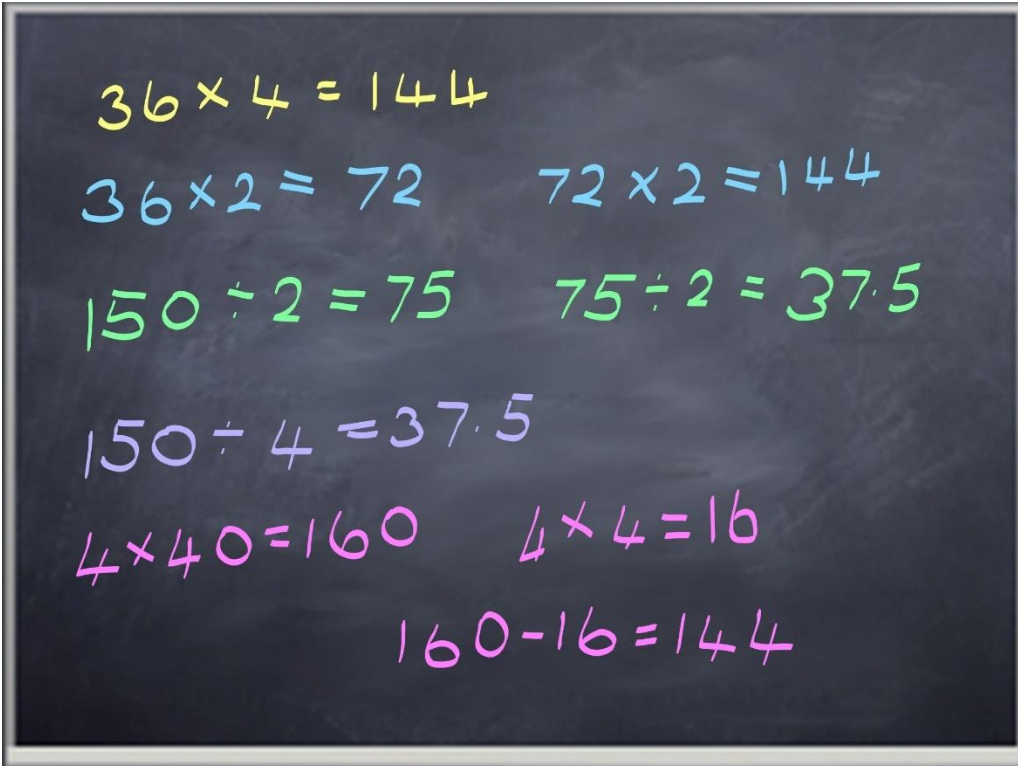
Once, each student has a solution, the teacher/tutor should ask students if they found out anything interesting – the 'offer' is more expensive so you don't save money on this occasion!

Ask one student to explain how they found their solution. Did any student use a different strategy? What did they do? Are there any other ways of solving this problem? Ask students to work together to find as many different ways of solving the problem.

After an appropriate time have the students share their ideas.

Here are some common strategies that might be used...

PowerPoint slide 2



A chalkboard with several mathematical equations written in different colors. The equations are:

$$36 \times 4 = 144$$
$$36 \times 2 = 72 \quad 72 \times 2 = 144$$
$$150 \div 2 = 75 \quad 75 \div 2 = 37.5$$
$$150 \div 4 = 37.5$$
$$4 \times 40 = 160 \quad 4 \times 4 = 16$$
$$160 - 16 = 144$$

Extension:

Students may be encouraged to seek out anomalies in their local grocery store, take a photograph and share with the class on a future date.