Key Stage 1 Problem Solving

How many ways can I sort 7 buttons into three boxes?

- An empty box is acceptable
- The order of the boxes is not important (eg. 2,4,1 is seen as the same as 4,2,1)
- Problem solving skills:
  - Recording – pictures or symbols
  - Ordering – recognising a link between answers
  - Checking for repeats – reviewing own work
  - Reasoning – responding to questions posed about the problem
- Answers:
  - 0,0,7
  - 0,1,6
  - 0,2,5
  - 0,3,4
  - 1,1,5
  - 1,2,4
  - 1,3,3
  - 2,2,3 (8 possible ways)

Level Statements

Level	Evidence in work
1c	• represent work using objects and pictures • recognise and use simple patterns (these boxes have the same number of counters in)
1b	• represent and discuss work using objects and pictures • recognise and use simple patterns or relationships (move one counter at a time to make a new answer)
1a	• represent and discuss work using objects and pictures, ask questions • they can use a pattern they have recognised to predict (find the answers that have at least one empty box)
2c	• Select mathematics for classroom activities (add the counters from each box rather than counting individually) • Discuss work using simple mathematical language and ask questions about it (one less, one more, double, pair, zero, add)
2b	• Select mathematics for classroom activities (add the counters from each box rather than counting individually) • Beginning to represent their work using symbols (able to record 2+2+3 independently after suggestions from an adult if necessary) • Discuss their work. They respond appropriately to questions(explain how they are finding different solutions, why is there no answer with double 4?)
2a	• Select mathematics for classroom activities (add the counters from each box rather than counting individually) • They can discuss their work • They ask and respond appropriately to questions including 'What would happen if…' (what would happen if you were not allowed to put the same number of counters in two boxes?, what would happen if you tried this with 8 counters?)

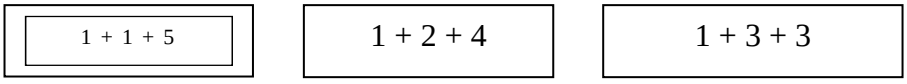
3c/3b	• They are beginning to organise their work and sometimes check results (looking for repeats) • They use and interpret mathematical symbols • Pupils discuss their mathematics work (I am trying all the ones with empty boxes first) • Pupils show that they usually understand a general statement by finding a particular example to match it
3a	• They are beginning to organise their work and consistently check results (looking for repeats) • They consistently use and interpret mathematical symbols • Pupils discuss their mathematics work and are beginning to explain their thinking (I kept 1 counter in the first box and moved the others around) • Pupils show that they consistently understand a general statement by finding a particular example to match it

Assessment Activities:

Level 1

Encourage children to draw their practical work.

Place 1 counter in a box, ask the children to tell you what could go in the other boxes. Show answers on flashcards – do the children notice anything?



Level 2

Question children to encourage use of mathematical vocabulary

Encourage children to move recording from pictures to symbols

Question 'why is there no answer with double 4'?,

'what would happen if we tried with 8 counters'?

ask children to explain their approach to the problem

Level 3

How are the children checking they have found all the answers?

Do they check for results?

Ask children to explain their approach to the problem.

Show the answers on flashcards, discuss how they can be grouped/ordered, formed into sets