PARTY BISCUIT DECORATIONS

Chloe decorated 12 biscuits to take to her friend's Birthday party.

She lined them up and put green icing on every second biscuit.

She put a red cherry on every third biscuit and a white chocolate button on every fourth biscuit.

How many biscuits had no decoration? How many biscuits had at least two decorations?

How many biscuits had only one decoration? Which one are they?

Did any biscuits get all three decorations?

Help

Perhaps you could sketch the biscuits or use the sheet below and cut out the circles and decorations.

The second biscuit has icing on it. Which other biscuits have icing on?

Which biscuits have a cherry on them as well as the third one?

What about the biscuits with a chocolate button on them? Which ones are they?
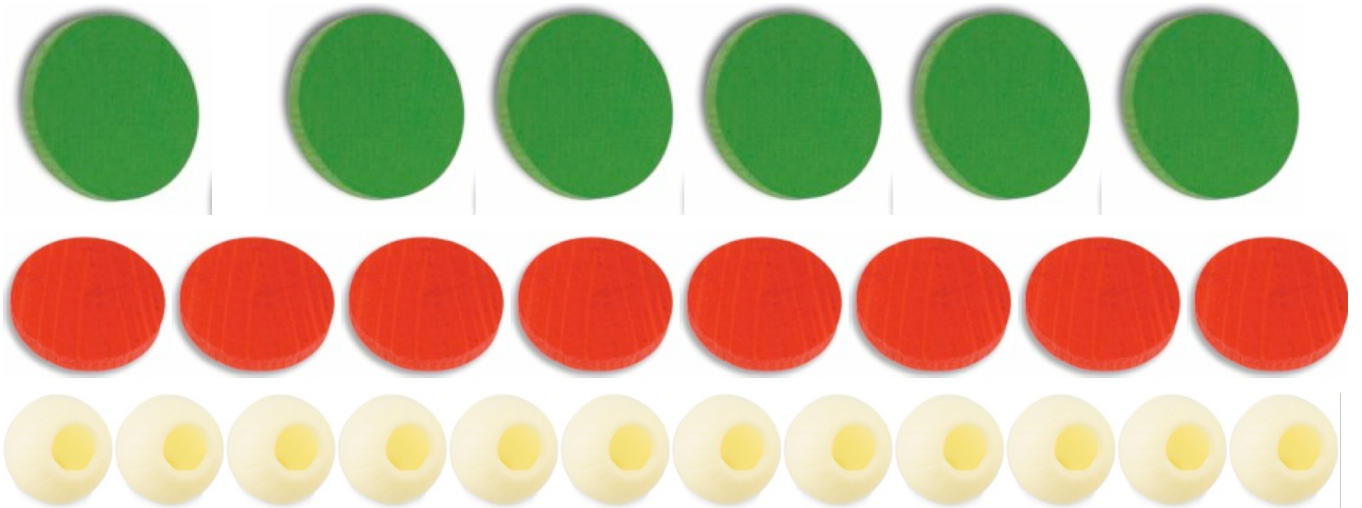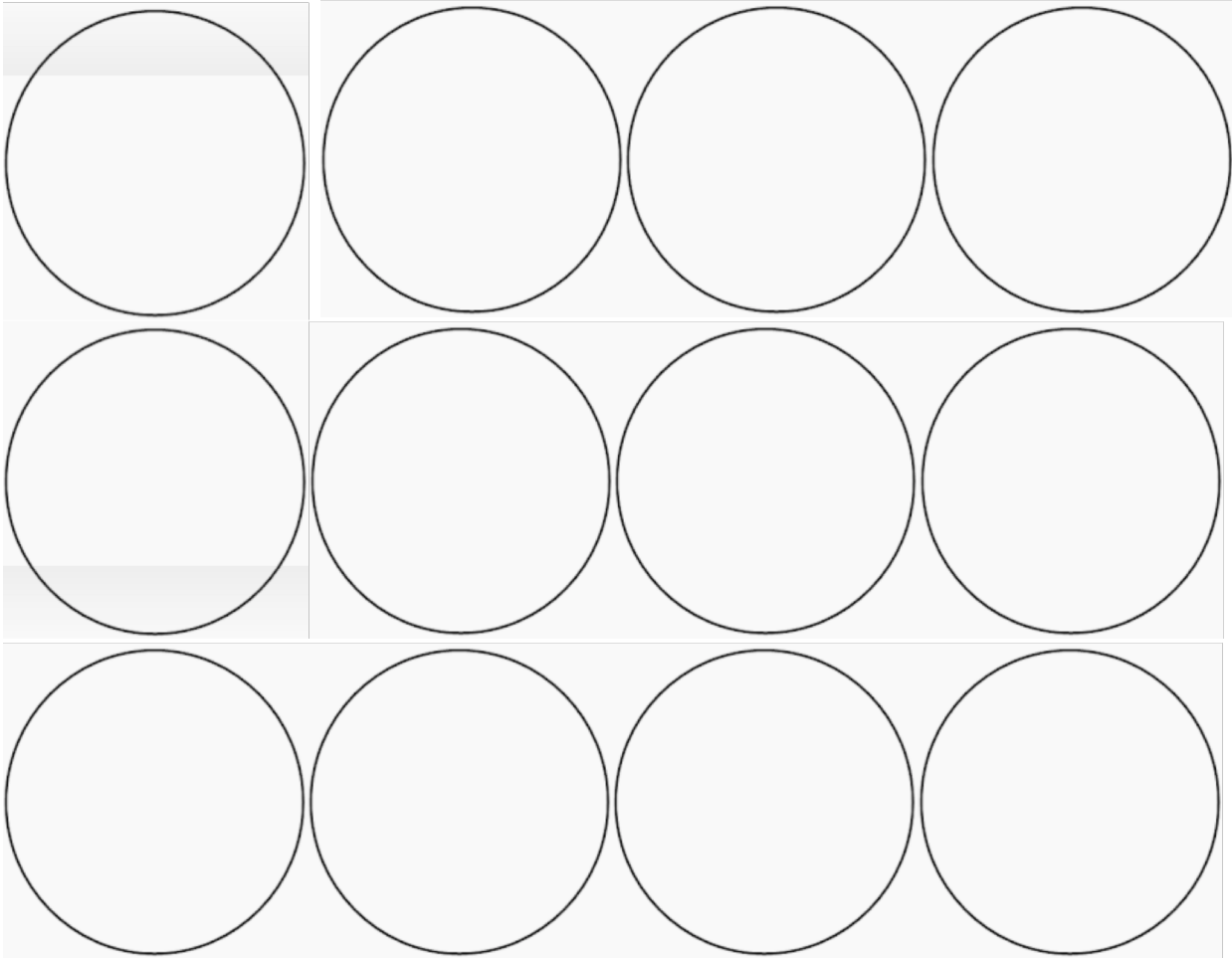
Extension

This is called skip counting.

Use a greater number of biscuits and different combinations of skip counting or investigate other possibilities.

Can you find a combination of skip-counting that allows every biscuit to be decorated?
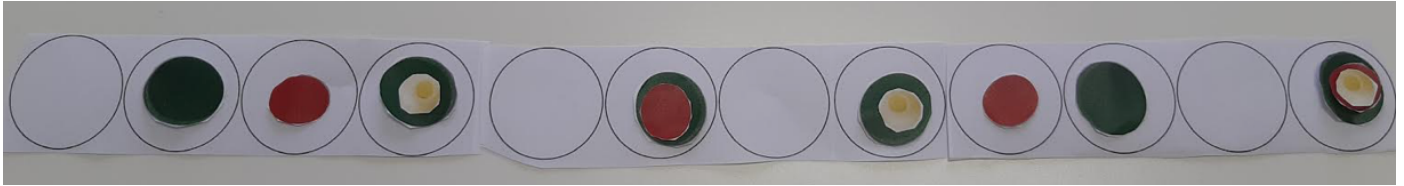
NOTES FOR TEACHERS

SOLUTION

How many biscuits had no decoration? 4
How many biscuits had at least two decorations? 4
How many biscuits had only one decoration? Which one are they? 4, they are
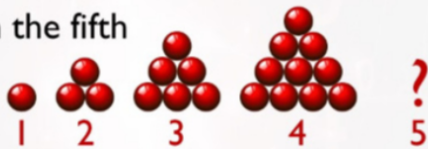the 2nd, 3rd, 9th and 10th Biscuits.

Did any biscuits get all three decorations? Yes, the 12th Biscuit.

Diagnostic Assessment This should take about 5–10 minutes.

1. Write the question on the board, say to the class:
   "Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D".
2. Notice how the learners responded. Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.
3. Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.
4. **Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.** It is important for learners to explain the reason for their answer otherwise many learners will just make a guess.
5. If the concept is needed for the lesson to follow, explain the right answer or give a remedial task.

How many red balls would be in the fifth picture? 1 2 3 4 5 A: 16 B: 19 C: 10 D: 15	**The correct answer is D.**
What number is missing from each box? 2, 4, 6, 8, ▢ 12 25, 20, 15, ▢ 5 ▢ 20, 30, 40, 50 A: 10 B: 9 C: 0 D: Nothing	**The correct answer is A** **https://diagnosticquestions.com**

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Why do this activity?

This activity fits into counting and skip-counting in twos, threes, and fours. The activity can be solved by using physical objects to represent biscuits and decorations. Learners should be given the opportunity to choose how they represent the problem in order to solve it.

Learning objectives

In doing this activity students will have an opportunity to:
- develop better number sense;
- investigate the concept of multiples and common multiples in a practical way through noticing number patterns and without necessarily using the terminology of 'multiples' and 'common multiples'.

Generic competences

Teamwork; mathematical and critical thinking; ability to organise, analyse and interpret information.

Suggestions for teaching

Start with the diagnostic quiz. Having two questions will give you a chance to do some formative assessment. It will enable the learners to review and gain a deeper understanding of sequences and to understand that some counting will go in equal steps (as with the second question in the quiz), and sometimes the steps follow a different pattern or rule. These are hugely important ideas in mathematics.

You might if you can print the attached sheet for the learners to solve the puzzle.

First allow learners to try to solve the puzzle.

You can use circles as biscuits, green counters for green icing, red counters for red cherries, and white counters for white chocolate buttons.

Activities which involve the concepts of ordinal numbers; first, second, third and fourth, could be used to prepare the learners. Allow learners to work in groups and use whatever they find most helpful to solve the problem. Learners could use objects such as paper, pens, pencils, cubes, or counters. Some learners may draw pictures, use different colours or different symbols for the decorations.

You may want to stop the learners part way through to share some different representations with the whole group. Ask learners to comment on the different ways of recording - what are the advantages of each way?

Key questions

- Which biscuits have icing on?
- Which biscuits have a cherry as well as white chocolate?
- What about the biscuits with a chocolate button on them? Which ones are they?
- Tell me about the biscuits that have no decorations on them.

Follow-up ideas

Multiple Patterns   https://aiminghigh.aimssec.ac.za/grades-5-to-8-multiple-patterns/

	Lower Primary or Foundation Phase Age 5 to 9	Upper Primary Age 9 to 11	Lower Secondary Age 11 to 14	Upper Secondary Age 15+
	Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and up to Secondary 5 in East Africa. New material will be added for Secondary 6. **For resources for teaching A level mathematics see https://nrich.maths.org/12339** **Note:** The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is **beyond** the school curriculum for Grade 12 SA.			
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6