"12" Problem:
What does 12 look like? Explain your thinking.

- 0 0 0 0 0 0 0 0 0 0 0 0
- □ □ □ □ □ □ □ □ □ □ □ □
- counting tally
- 0 1 2 3 4 5 6 7 8 9 10 11 12 13
- number line
- 2 + 2 + 2 + 2 + 2 + 2 = 12
- 5 + 2 = 12
- 10 + 2 = 12
- 8 + 3 + 4 = 8 + 5 + 2
- 8 + 2 + 5 = 10 + 5
- 15 = 15
- 3 + 4 + 8 = 3 + 2 + 4 + 1 + 5
- 5 + 5 + 5 = 15
- 15 = 15
- 3 + 4 + 8 = 3 + 2 + 4 + 1 + 5

How many equal groups?

DURING (Working on It)
- 15 to 20 minutes
- Understanding the problem – Teacher asks, “What information from the problem are we using to make a plan to solve it? Explain.” Teacher records in a list below the problem, the information that students identify.
- Students solve the problem on chart paper (landscape) with markers (visible for whole class discussion) in pairs or in small groups.
- Teacher circulates to record different student solutions, in addition to the ones the teacher anticipated.

Butterfly Problem A:
Three butterflies landed on a bush. Then, 4 more butterflies landed. Later, 8 more butterflies joined them on the bush.

How many butterflies are on the bush altogether? Show your work.

What information will we use to solve this problem?
- 3 butterflies
- 4 more butterflies
- 8 more butterflies
- How many total butterflies?
- Show your work - calculations, labelled diagrams

Note: Mathematical annotations include mathematical vocabulary, symbols, elaborations of mathematical details from solutions, labels describing the method/strategy, and questions to further thinking. All annotations are records of students’ mathematical discussion.
### Highlights/Summary:

**Addition Strategies** -
- counting (by 1s, counting on from the first number, counting on from the larger number),
- joining or combining quantities (addition) by regrouping to make 5s and 10s,
- regrouping to make equal groups

**Multiplication as equal size groups**

<table>
<thead>
<tr>
<th>Size of Group</th>
<th>Number of Groups</th>
<th>(Product)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 + 5 + 5</td>
<td>3 x 5</td>
<td>15</td>
</tr>
<tr>
<td>(3 + 3 + 3 + 3)</td>
<td></td>
<td>3 x 5 = 15</td>
</tr>
</tbody>
</table>

**Equivalent Number Expressions**

- $5 + 5 + 5 = 5 \times 3$
- $15 = 5 + 5 + 5$
- $5 \times 3 = 15$

### AFTER (Highlights/Summary)

- 5 minutes
- Teacher and students revisit the student solutions for key ideas, strategies, and models of representation that are related to the lesson learning goal.
- Teacher lists key ideas, strategies, and models of representation separately, so the students can see how the mathematical details from their solutions relate explicitly to the lesson learning goal.

### AFTER (Practice)

- 5 to 10 minutes
- Teacher chooses 2 or 3 problems, similar to the lesson problem for students to solve in pairs as a scaffold and individually.
- Problems could vary by number (choice, size), problem contexts, or what is unknown or needs to be solved
- Students are asked to solve these problems using a strategy different from the one they used for the lesson problem.

### Butterfly Problem B:
Six butterflies landed on a bush. Then, 8 more butterflies landed. Later, 16 more butterflies joined them on the bush.

**How many butterflies are on the bush altogether?**

**Solution 1**

$6 + 16 = 10 + 10 + 10$

$10 + 10 + 10 = 30$

$30 = 6 + 8 + 16$

**Solution 2**

$2 \times 15 = 30$

Note: A classroom board is longer proportionally than these 2 pages. Due to the space constraints on these pages, the mathematical annotations are recorded above the solutions with arrows, rather than on and around the solutions.