Exemplar 1: Bead Game

Learning Dimension: Number

Learning Unit: Numbers to 10

Key Stage: 1

Objective: To develop an understanding of the composition of numbers 1 – 10

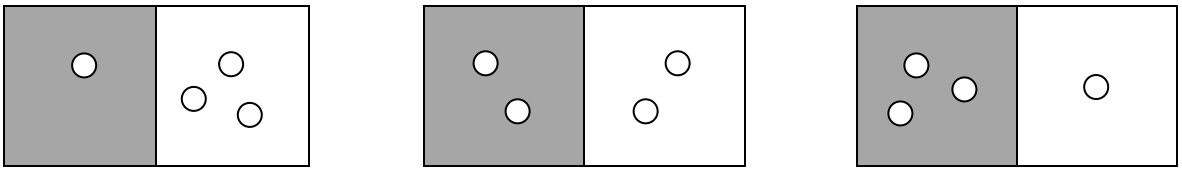
Prerequisite Knowledge:
(i) Counting and reading the number of objects
(ii) Recognizing odd and even numbers
(iii) Comparing two types of objects by one-to-one correspondence

Teaching Resources:
(i) Beads
(ii) Stickers
(iii) Worksheets (Bead Game)

Description of the Activity:

Activity 1:

1. Pupils are grouped in pairs. Each group of pupils is given 10 beads.
2. The teacher asks pupils to take out 4 beads and group them into two sets (each set has at least 1 bead). Pupils are requested to explore the different ways of grouping that can be found and record their findings by using stickers on the worksheets as shown in the following figures.



Questions for discussion:

1. How many different ways can be found of grouping 4 beads into 2 sets?
2. If one more bead is put in the shaded region, what is the change in the number of beads in the unshaded region?

3. If more and more beads are put in the shaded region, what is the change in the number of beads in the unshaded region?
4. How can you ensure that all combinations are found?

Notes for Teachers:

1. As pupils do not understand the concept of "0" at this stage, the teacher should give hints to pupils to put at least 1 bead in the shaded or unshaded region.
2. If stickers are not used, the teacher can ask pupils to draw their results on the worksheets.

Activity 2:

1. Pupils repeat the procedures in Activity 1 for grouping 2 to 10 beads into two sets and find the different compositions of each number.
2. Pupils record the results by using stickers on the worksheets.

Questions for discussion:

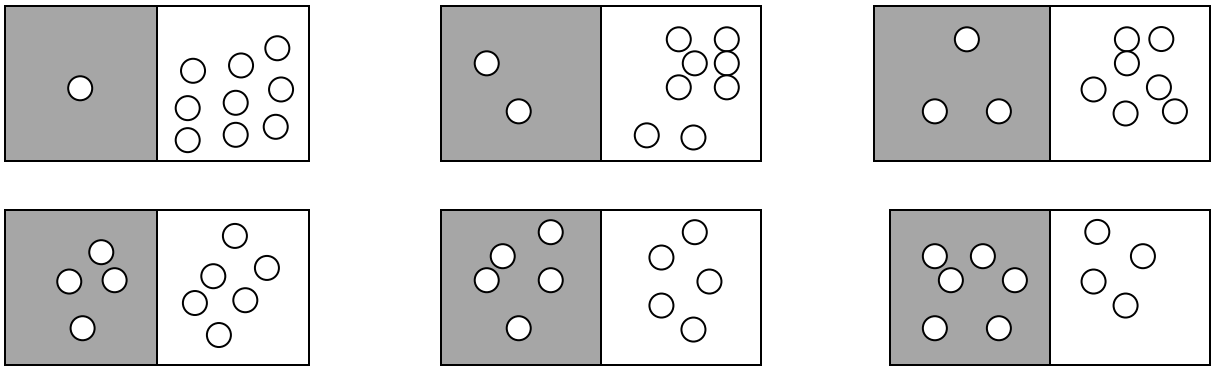
1. Repeat the discussion in Activity 1.
2. According to the results in Activity 2, which numbers have the same quantity of beads in the shaded and unshaded regions when grouping the beads into 2 sets? (2, 4, 6, 8, 10)
3. What is the characteristic of these numbers? (The teacher leads pupils to find out that these are even numbers.)

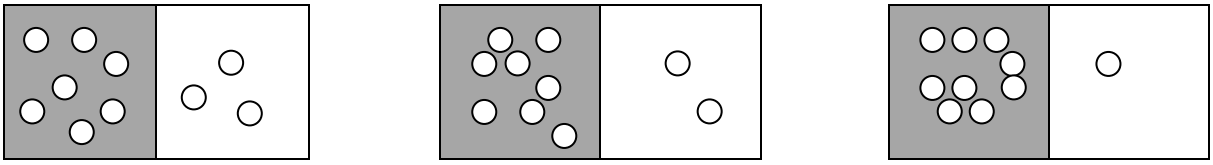
Notes for Teachers:

As pupils do not understand the concept of "0" at this stage, 2 to 10 beads should be used in the Activity.

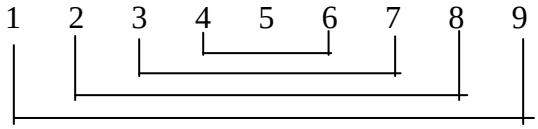
Activity 3:

1. The teacher asks pupils to observe the results in Activity 2 by grouping 10 beads into two sets as shown in the following figures.





2. The teacher writes the numbers from 1 to 9 on the blackboard. Pupils then join the numbers together from the above results and describe the rule they find as follows.



Questions for discussion:

1. Which number cannot be joined to another number? Why?
2. If we need to join a line to this number, what is its partner? Why?

This exemplar mainly involves the following generic skills:

1. Critical Thinking Skills
   - Understand straightforward cause and effect relationships, i.e. adding one bead in the shaded region will lead to taking away one bead from the unshaded region
   - Reason inductively when exploring ways of finding out all the combinations and the characteristics of numbers
   - Draw logical conclusions based on adequate data and evidence, for example, by joining the numbers together, by observing the results of grouping 10 beads into 2 sets

2. Communication Skills
   - Comprehend and act appropriately on spoken instructions, for example, by following the teacher's instructions to group the beads into 2 sets and to record the findings on the worksheet
   - Present results of tasks with drawings and symbols
   - Discuss with others in accomplishing tasks, for example, by grouping the beads into 2 sets

3. Problem-solving Skills
    - Learn from past experience to solve new problems in grouping 2 to 10 beads
    - Adopt various ways of solving problems, for example, by finding out all combinations by transferring beads one by one from one region to another region or by putting some beads in one region and then the rest in another region

Bead Game

Group ☐ beads into two sets and record the results by putting stickers on the figures below.