

ACTIVITY IA4.8: Making Six

Intended learning: To learn combinations and partitions of numbers in the range 1 to 10.

Instructional mode: Longer, productive practice for individuals or groups.

- ⑤ **Materials:** Best with sets of numeral cards 1–6. Each group needs at least six sets, preferably ten sets, or many extra 1 and 2 cards.

Description: Show examples of sets of cards totaling 6: 3 and 3; 4, 1 and 1. Invite students to make up other combinations totalling 6. After some exploratory time, invite each group to share a different number combination, and record them. Manage discussion clarifying what is different. At some point, issue the challenge *Can we find all the different ways of making up a total of six?*

Responses, variations and extensions:

- The basic challenge can be posed without using numeral cards. However, some students have much more success engaging with the task when presented with the cards.
- Students could also show combinations with different colours of linking cubes, or Cuisenaire rods.
- Students may be used to combining only two numbers. Once they realize they can combine more than two numbers, most students can find many combinations.
- Students may not find ways to be certain of having all combinations, or of justifying their list. The attempt is a valuable challenge in mathematical reasoning. Alternatively, students can just try to find as many as they can.
- Keeping the recording of the combinations organized can support students' problem-solving. For example, the 11 partitions of six could be recorded in columns:

6	51	42	33	222	11111
		411	321	2211	
			3111	21111	

- Extend by partitioning other totals. Finding all five partitions of 4 is easy. Finding all 42 partitions of 10 requires a well-organized approach.