

### **Task: “IT’S ALL IN OUR MIND”**

For each of the problems below, find at least one strategy you can use to mentally calculate the product (without using paper and pencil).

- a.  $35 \times 18$
- b.  $61 \times 31$
- c.  $42 \times 99$

### **Discussion, Suggestions and Possible Solutions**

*There are a number of mental computation strategies that utilizes different patterns and properties of multiplication. In this task, we ask students to devise their own mental computation strategies. It is important for the class to discuss when a specific strategy may be useful.*

*For (a), here are a couple of strategies children might devise:*

*First, find  $35 \times 20 = 700$ . Then, since we are only multiplying by 18, we must subtract  $35 \times 2 = 70$ , from 700. Therefore, the final answer is 630.*

*Another strategy is to double 35 to obtain 70. In order to compensate for this doubling, we halve the other factor, 18. Thus, instead of calculating  $35 \times 18$ , we calculate  $70 \times 9$ . This strategy is particularly useful when a factor ends with a 5, and the other factor is an even number.*

*For (b), one strategy is to find  $61 \times 30 = 1830$ . Then, since we are multiplying by 31, not 30, we must add another set of 61 to this product, or  $1830 + 61 = 1891$ .*

*Alternately, we can first find  $60 \times 31 = 1860$ . Then, since we are multiplying by 61, not 60, we have to add another set of 31, or the product of 1891. These two strategies are the special case of the distributive property, when the multiplier increases by 1, the product will increase by the multiplicand.*

*For (c), we can first calculate  $42 \times 9 = 378$  [this may be easier to carry out mentally if you first determine  $20 \times 9 = 360$ , then add  $2 \times 9 = 18$  to the product, or  $360 + 18 = 378$ .] Then for  $42 \times 90$ , it will be simply 10 times of 378, or 3780. By adding 3780 and 378, we obtain the product of 4158.*

*Another strategy is to subtract 42 from 4200, that is,  $42 \times 100$ .*

*Extension:*

*Ask other mental computation problems. Select problems carefully, perhaps intentionally picking numbers so that some of the strategies shared by students will be particularly useful.*