

## **Responding to errors**

When a student makes a mistake in a calculation we often simply mark it wrong and perhaps offer a correct solution. However, in doing so, we may be missing a golden opportunity to gain an insight into how the student is thinking and how we, as teachers, can best help to put things right.

Some general points

- Errors are often due to misconceptions rather than careless slips
- You need to diagnose the misconception rather than simply re-teach the topic.
- An effective strategy is to ask the student to explain or record how they worked out the answer...
- ...then deal with the misconception, perhaps by offering a different explanation, or by using a different resource to model the method
- Try to be proactive about addressing misconceptions
- The students themselves can identify many problems by systematically checking their answers

## **Common Calculation Difficulties**

Some common errors and examples

### **1. Obvious computational error or careless slip**

Correct operation but incorrect recall of basic number facts.

Example: A pencil cost 37p and a ballpoint pen costs 45p. How much would eight pencils and three ballpoint pens cost altogether?

Answer

$$\begin{array}{r} 8 \times 37 = 303 \\ 3 \times 45 = \underline{135} \quad + \\ \hline 438 \end{array}$$

### **2. Conceptual error**

Student has not grasped the concept of the relevant operation.

Example: Calculate the value of  $5^2$

Answer: 10

### **3. Misunderstanding of vocabulary**

Example: Estimate the value of  $28.93 \times 20.987$

Answer: *607.15391*

### **4. Wrong operation**

The wrong operation is used in the solution.

Example: Find 15% of £300

Answer:  $\frac{300}{15} \times 100 = \text{£}2000$

### 5. Defective procedure or method

Correct operation chosen and no number fact errors but errors in carrying out steps of the procedure.

Example: There are 12 boys and 18 girls in a Key Skills class. What percentage of the whole class are boys?

Answer:  $\frac{12}{30} \times 100 = 250\%$

### 6. Incorrect transfer of a rule

Pattern or rules learned and then applied to situations where they no longer work.

Example: The rule that has been learned is: “to multiply by 10, add a nought”

What is  $3.1 \times 10$ ?

Answer: 3.10

### 7. Over-generalisation

Too few examples and so generalises on the basis of too little data

Example: 2, 4, 8, ..... what is the next number

Answer: 16

The answer could be 16, but it might equally be 14,.....

### 8. Random response

A wild guess!

Example: A coach has been hired for a college trip. It costs £600 for the day. If there are 50 students on the trip, how much should each student pay?

Answer: £31.24