

## UK Clarification on Item 17 Using Language to Develop Reasoning Skills

There has been some confusion over this item and, particularly, the extent to which it encourages 'formal' maths activities and materials rather than crediting and encouraging use of everyday and natural materials to support mathematical understanding.

Having studied the item and notes carefully, we do not believe that an amendment within the UK addendum is necessary but have written the notes below to help clarify what we think can be used as evidence to score Item 17.

### **5.1 Staff talk about logical relationships while children play with materials that stimulate reasoning**

This indicator is about use of **materials** to illustrate specific concepts. This can include mathematical concepts (e.g. counting, sorting) and also science concepts (see All About ECERS-R p.171, notes for 3.2 refer to water evaporating).

The materials do not have to be specifically designed as maths materials (i.e. manufactured resources) but they must be used **intentionally** to support the concept being developed; and they will usually have been put together with intent by staff. Example given in the All About ECERS-R (p.172) include:

- Manufactured resources such as sequencing cards, matching games, balance scales with things to weigh, objects for counting/sorting, number/object matching puzzles
- Collections of natural materials such as pinecones of different sizes to put into a sequence

Other examples might include: science resources such as magnets, buttons or other 'real life' materials for counting, other types of natural materials for counting sorting or comparing (e.g. runner beans of different sizes, shells, autumn leaves of different colours and shapes), compare bears, pattern boards, peg boards, tape measures, collections of materials for sorting (e.g. fruit, socks, unifix cubes, stones of different sizes/colours/textures).

Maths concepts might include: size (e.g. bigger, smaller), sorting (e.g. by colour, shape), matching and comparing (e.g. same, different, longer, shorter), (e.g. , sequencing (e.g. before, after), spatial relationships (up, down, over, in, out), 1 to 1 correspondence

Science concepts might include: change of state (e.g. freezing, melting), magnetism, friction and forces, light/shadows, growth

**Staff must also be observed talking about logical relationships or concepts**, for example comparing the length of runner beans or demonstrating how to sort stones into rough and smooth. In this indicator, it is enough that practitioners are observed talking to children. Indicator 5.2 assesses how well staff encourage the *children* to talk and to reason.

In summary, the indicator considers whether staff are planning and providing for concept development by providing resources which might stimulate mathematical and scientific thinking, offering interesting opportunities and activities for the children and by actively supporting the development of children's understanding.

### **5.2 Children encouraged to talk through or explain their reasoning when solving problems**

In contrast to 5.1, which focuses on staff talk, this indicator assesses the extent to which staff encourage children's language and reasoning. Examples might include a child explaining that they mixed red and blue to make green, or explaining that they got 3 bowls so that each bear could have a bowl for their porridge (and that the Daddy bear needs a large bowl because he is a large bear).

## **7.1 Staff encourage children to reason throughout the day, using actual events and experiences as a basis for concept development**

In contrast to 5.1, this indicator measures how effectively staff make use of incidental and everyday opportunities for reasoning and concept development.

Examples given in the ECERS-R include talking about daily routines (e.g. what comes first, setting the table or eating) or about the sequence of a cooking project (e.g. talking about the order of steps in a recipe).

Other examples might include talking about the ice melting in drinks on a warm day, sharing out fruit at snack time, sorting blocks by size and shape at tidying up time.

### **Is it 5 or is it 7?**

Sometimes it can be difficult to decide whether an example 'fits' better under 5.1 or under 7.1. For example, comparing the size of runner beans might happen as part of a planned activity (e.g. staff plan for a group of children to visit the allotment to collect vegetables, including a focus on developing concepts of length and size) or incidentally (e.g. children are watering the garden and a conversation arises naturally about the beans, which a member of staff develops by noting the different sizes). In some cases, you may need to ask about a specific example to find out whether it was planned or incidental. Both are good practice but 'incidental' reasoning is considered to be higher level practice than the planned activity because it requires that staff are aware of and alert to opportunities to develop understanding of concepts in any situation, and not just when it is planned for.

A second example might involve a planned activity involving sorting clothes into 'winter suitcases' and 'summer suitcases' (credited under 5.1) as compared with a member of staff asking children to help him sort the nursery aprons into a dirty pile for washing and clean pile to be returned to the pegs (credited at 7.1).