

<b>Teacher Education Design Principle + code:</b>	3. Teacher education should advance teachers' understandings about the nature of science and how scientists work, confronting stereotypical images of science and scientists. <b>TE:NoS</b>
<b>Specific Teacher Outcome(s):</b>	3.2 Teachers should be able to recognize young children's capabilities to engage with processes associated with the evaluation as well as generation of ideas in science and mathematics, since these processes are also important for the development of learner creativity. 3.3 Teachers should be able to use foster the processes of imagination, reflection and consideration of alternative ideas in supporting children's understanding of scientific ideas and procedures and development of creativity.
<b>Factors linked with:</b>	<b>LA: Expl;</b> <b>P: R and R;</b> <b>AO: Kn.Sc;</b> <b>AO: Sc ProcSkills</b>
<b>Type of material (image – interview (int) – classroom extract (class):</b>	Interview (int)
<b>Originating from:</b>	
<b>Country report :</b>	D4.3 UK (England)
<b>Case:</b>	Case 11
<b>Episode:</b>	Doubling
<b>Teacher:</b>	Emily
<b>Age Group:</b>	5-6
<b>Selected episode present in D4.4 Appendix</b>	No

### Context for the interview

This material is based on an interview with children following a *Snakes and Ladders* game.

The teacher had planned a series of activities focused on doubling to be carried out in mixed ability groups in rotation across the week. The tasks were set up to foster problem solving in mathematics. The children worked in pairs. The activities were as follows:

1. *Snakes and Ladders game*- This was a Snakes and Ladders game using doubles. The children had to roll the dice, then depending on the number the dice landed on, they doubled the number and moved that up the board.
2. *Doubling larger numbers* - There were number cards in a box and the children had to take out number cards at random and double them, using unifix if needed.
3. *Finger painting*- Children picked a card and printed a few dots on one side of a piece of paper that was then folded to make a butterfly with symmetrical dots on the wings. They were asked to write the number sentence representing the total number of dots for example  $4 + 4 = 8$ .
4. *Number towers* - Children picked a number card (for example 10). They then must build two towers of unifix made of the number on the card (for example  $10 + 10$ ) and write the double number sentence on paper.

### Reflection on practical activities focusing on doubling Considering alternative ideas

Following the taught session the researcher had a discussion with a small group of children about their learning during the Snakes and Ladders game. These children had been observed during the session. Although it was not clear at the time they were observed what learning was taking place, afterwards they were able to use their learning effectively to reflect on strategies with double numbers.

- Researcher:** Did you learn anything when you were playing the Snakes and Ladders game?  
**Chloe:** I learnt Doubles. Doubles in the Snakes and Ladders.  
**Researcher:** Doubles you didn't know?  
**Chloe:** Yes  
**Researcher:** What was the biggest double that you could have when playing?  
**Charlie:** Biggest was  $3+3$ .  
**Researcher:** Was it? Was there no larger number than 3?  
**Freddie:** It did have 6.  
**Ben:** No it didn't no 6?  
**Children:** It had 2 3's, 2 2's and 2 1's. 1 2 3.  
**Researcher:** What if there had been a 6? How far could you have moved then?  
**Alec:** 12 steps.  
**Audrey:** I think I know why it's up to 3, so it's not too easy.  
**Ben:** That is easy, it should challenge you.  
**Audrey:** If it was 6 or 10 it would get finished straight away.  
**Ben:** If it was little numbers it would be so easy.  
**Audrey:** You just got there but if you had 20 you move 20 steps. You had 20 steps without moving you'd be at the finish.



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