

BE\_Class\_TheCircleandtheOval\_Multimodal

<b>Teacher Education Design Principle + code:</b>	9. Teacher education should enable teachers to make best use of and assess the various modes of expression and representation of science and mathematics learning to support inquiry and the development of creativity. <b>TE: ChildIdeas</b>
<b>Specific Teacher Outcome(s):</b>	9.1 Teachers should be able to recognize and value children's various forms of expression and representation of their ideas and learning in science and mathematics. 9.2 Teachers should be able to make best use of children's preferred forms of expression and representation of their science and mathematics ideas to support inquiry and their creativity development.
<b>Factors linked with:</b>	<b>T: Ped;</b> <b>LA: Quest;</b> <b>A: Form</b>
<b>Type of material (image – interview (int) – classroom extract (class):</b>	Class
<b>Originating from:</b>	
<b>Country report :</b>	D4.3 – report Belgium
<b>Case:</b>	Case 6
<b>Episode:</b>	The Circle and The Oval
<b>Teacher:</b>	Ilse
<b>Age Group:</b>	6–7
<b>Selected episode present in D4.4 Appendix</b>	No

## Learning mathematics at unexpected moments using the interests or ideas of children - fostering.

All children are sitting in a circle; the teacher is in the middle of the circle. The teacher reflects with the children on what they have learned about the different painters and art forms. These painters were in fact also inquirers, since they developed their own art form. At the end of this reflection moment the teacher links painters to mathematics and cubism to geometric figures.

*'That's crazy, hey. Each artist has made his painting with a little mathematics. A lot of fantasy, many colors and a drop of mathematics.'*

*'Because Cubism, that is all geometric figures. That is a difficult word; I'm going to write it down on the white board.'*



The teacher points towards the classroom and encourages the children to find geometric figures in the classroom. During the conversation which follows she is categorizing the figures on the white board. At a certain moment all known figures are on the board and one of the children is saying 'oval'. This is the start of a real inquiry about circles and ovals. Both are round and have no angles, but what is the difference between both. As the children are that curious, the teacher learns them more about radius and ovals in a very humorous and expressive way, using tools to measure and to draw.

Although the teacher has planned a mathematics activity she is open for interests of children linked with the topic and the goal she wants to reach. As such she teaches them something about ovals which is not in the curriculum for these younger ages.

*'I normally work with a brief agenda (teacher journal); I certainly don't write everything out. I create a calendar schedule for the week. The main objectives are important, how to reach them differs. The key for me is to work with and build upon the experiences and interests of the children. As a teacher you have to dare to let go if the activity (or the practice you have developed) doesn't work at that moment. Together with the children you must probably find a solution which does work. So, it is possible that an activity completely changes because of the interests of the children (what they say or do). This does not alter the fact that I do reach my goals with the children.'*

# creative little SCIENTISTS

**Boy** 'Oval'

**Teacher** 'Where are the angles in an oval? But an oval ... is that with points?'

**Children** 'no'

**Boy** 'Round is like this but an oval is like that.' The boy is drawing both forms in the air.

**Teacher** 'Come, draw.' The boy is drawing something on the board.

**Teacher** 'Is that an oval?' Some of the children say no.

**Teacher** 'Could you draw a circle?'



The teacher is working with a mixed ability group. Several of the children are non native speakers. Although they don't always express themselves in a proper way, they are used and engaged in the process of encouraging conceptual understanding and thinking. The concepts are not that simple however the children are very engaged.

The teacher is repeating the words and concepts because of the non native speakers in her classroom. She also is visualizing the content by creating drawings on the whiteboard. Or by asking the children to draw.

**Teacher** 'If you put in the middle of the circle a point and you measure from the middle to the end of the circle.' She measures several times and the children are saying the length.

**Child** 'That is equal round.' He shows it with his hands.

'The radius, actually we don't have to know it yet. But do you want to know?' *She is whispering it and saying sstt. She is saying it is content for the older children. The others may not hear this or know this.*

**Children** 'Yes'

**Teacher** 'Look this that they call in mathematics, the radius.' She draws a line from the middle point of the circle to the edge of the circle.

**Teacher** 'And the radius of the circle is equal everywhere.'

**Teacher** 'How much was it here?'

**Child** '5'

**Teacher** 'And this stick is 1 meter and a little piece of this stick is 1 cm, so how much is it then.'

**Child** '5 cm'

**Teacher** 'Suppose I would put a point in my oval.' She gives the pen to a boy. He places a point in the oval. The other children have helped him to search the oval on the board.

**Teacher** 'Is it in the middle? We shall see.'

*The teacher chooses a girl and instructs her to measure the oval. It is a shy girl and the teacher asks if she wants to do it together with her. Another girl must read the sizes.*

**Child** '11'

**Child** '3'

**Child** '10'

**Child** '3'

*The teacher takes over the pen and writes the sizes near the lines. In fact she uses 2 colors, red for the horizontal lines and blue for the vertical lines.*



# creative little SCIENTISTS

**Teacher** 'What is now the difference between an oval and a circle?'

**Child** 'With the circle it is round and with the oval it is straighter.'

**Teacher** 'With the circle the radius is always the same and with the oval it is not always the same, but the oval is round because the oval has no?'

**Child** 'rectangles, squares ...'

**Teacher** 'No, what is this?' She is showing an angle.



The teacher is able to enhance the children's attitude towards mathematics by using humor, by interacting on their interests, experiences, opinions and preconceptions and by creating mystery (see opportunities for creativity). In the short episode below you will notice the playful interaction between the teacher and the children.

*The teacher is drawing a circle on the board and she is using a tool, a round lid.*

**Child** 'That is not fair.'

**Teacher** 'And why it is not fair?'

**Child** 'Because we may not use that and you are using it.'

**Teacher** 'I have thought about it. Did I say that you couldn't use a tool?'

*Meanwhile there is a circle on the board.*

**Teacher** 'Is this a circle?'

**Children** 'Yes'

**Teacher** 'How can you say 'Yes that is a circle?'

**Child** 'Because it is round and it is thick.'

**Teacher** 'Yes, could be.' She asks a girl to say why she thinks that is a circle and the other form (oval) isn't.

**Child** 'It is not the same.'



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