

Teacher Education Design Principle + code:	6. Teacher education should provide pedagogical content knowledge to stimulate inquiry and problem solving in science and mathematics education. TE: IBSE
Specific Teacher Outcome(s):	6.2 Teachers should be able to open up everyday learning activities to allow greater opportunities for inquiry, problem solving and scope for creativity. 6.3 Teachers should be able to recognise the key roles of children’s questioning and existing ideas (both implicit and explicit) of science and mathematics. 6.4 Teachers should be able to use a variety of strategies for eliciting and building on children’s questions and ideas during inquiry processes (before, during and after explorations and investigations). 6.5 Teachers should be able to foster opportunities for children’s agency and creativity in learning in inquiry and problem solving – in particular the importance of children making their own decisions during inquiry processes, making their own connections between questions, planning and evaluating evidence, and reflecting on outcomes.
Factors linked with:	P: Ques; LA: Connect; LA: Equip; P: R and R; LA: Obs; P: Express; AO: IBSE/PBL
Type of material (image – interview (int) – classroom extract (class):	Classroom
Originating from:	
Country report :	D4.3 – report Portugal
Case:	Case 4
Episode:	SwinggameRope
Teacher:	Olivia
Age Group:	5
Selected episode present in D4.4 Appendix	Yes

The swing game

The aim of the activity is to build a pendulum (swing game) and explore the factors that affect its motion (movement). Every child and the teacher had a string and could be wagging the string and observe its motion.

The teacher started questioning and dialoguing with the students about the length of the string and its effects in the pendulum motion, *“Which string should we use? A long one or a short one? If you want to make a swing (game), then you need a good swing. What is a good swing?”*

The children began the discovery of the simple pendulum. They explored a possibility with a string holding an espresso capsule at one end, and they gave the suggestion where the pendulum could be mounted. The first attempt was not successful because it was hanging from the wall (see Image 1) and therefore the pendulum was bumping against the wall.



Image 1

Many children tried to make it swing, unsuccessfully. Finally, they reached a conclusion:

Children: The swing can't be fixed in the wall, because it's impossible to make it swing, hanged in there.

A child suggests: Maybe we can fix it to the top of the door opening.

So it was done, and the pendulum could swing at last (Image 2).



Image 2

An open-ended problem

Teacher: If you want to make a swing (game), then you need a good swing. What is a good swing?
(...)

Child M: With the plastic bag we hold the oranges fasten to the rope, and there is the pendulum!
(...)

Child R: Attach the swing to the wall, hanging something in the end of the rope.

Children's own investigations / Children gathering evidence through observation / Rich physical environment for exploration

The teacher helped a child to attach a capsule of coffee to the end of the rope and fix it to the wall. Children tested their hypotheses, trying to swing it.

Child R: This isn't a swing! It hits the wall and doesn't swing.

Child S: Pull away from the side.

Child J: Take it more out.

Children: Let me try, I think I can make it swing and don't hit the wall.

Many children tried to make it swing, unsuccessfully. Finally, they reached a conclusion:

Children: The swing can't be fixed in the wall, because it's impossible to make it swing, hanged in there.

Child R: Maybe we can fix it to the top of the door opening.



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