

# Curriculum Materials

## Learning Journey

### Exploring materials



Erasmus+

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**Fostering creativity and science teaching through  
scientific inquiry in early years education**

# **Can water be transferred? (exploring materials)**

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### **Background**

Urban school in the 4<sup>th</sup> district of Bucharest with children coming from families different in terms of structure and social context.

**Age group:** 4-5

**Curriculum links** (Science curriculum):

- Stimulating curiosity about explaining and understanding the surrounding world
- Developing the ability to solve problematic situations by acquiring appropriate strategies
- Developing the ability to observe and establish causal, spatial, temporal relationships.

### **Links to CLS Framework**

**Learning activities:** Observing, questioning, explaining evidence

**Creative Dispositions:** Motivation, sense of initiative

**Synergies:** Dialog and collaboration, problem solving and agency, motivation.

### **Aim:**

To increase children's ability to **work in groups and share ideas** and motivate them to explore and develop **thinking skills** .

## Setting the scene

### Focus:

Stimulate **collaboration** by **working in groups**

Increasing children's **curiosity** and **creative thinking** by **asking questions**

Encourage children to engage in **exploration**

### Rationale:

I know that children can easily **collaborate and share ideas** but I wanted to foster more **questioning** and **motivate** them to explore and **observe** the materials and find out about their behaviour when they are immersed in water.

### Implications for planning and teaching

My plan was to have an inquiry activity when children can understand how materials behave in relation to water, to make children **curious** and stimulate their **thinking**.

By discussing about the properties of materials I wanted to provide opportunities for children to **ask questions, explore and take decisions** for grouping the provided materials according to their property of being waterproof or not. At the same time I wanted that children to observe and understand the structure of the materials and **make connections** between their porosity and the possibility of their use to transport water.

# The Learning Journey

## Starting point:

The problem to be solved is how we can transfer water from the small containers into the big one (the first are glued to the table).

It was like finding the answer to a riddle and children try to imagine how to solve this problem.

## Learning activity 1: Discussion about materials and their properties

We start discussing about materials in the world around us.

Children already know about materials and name many of their properties: they can be colored, they can be hard, they can be fragile, they can be bent, they can be shiny...

## Learning activity 2: Exploration

Children explore the provided materials and are invited to make predictions on their behavior when in water.

Children are very curious to touch all the materials and make many predictions and ask many questions.

## Learning activity 3: Experiment

According to their predictions children try each of the materials if they are appropriate for water transfer.

Each child wants to explore by him/her self the behavior of each material.

## Learning activity 4: Reflection

After many trials I discussed with children about their initial predictions. I tried to make the children to reflect on them.

The conclusion is that only some materials can be used for water transport.

## Learning activity 5: Conclusion

I tried to make the children to formulate conclusions about the materials behaviour when in water.

# Developing the learning journey: Starting point

**Activity and rationale:** In order to foster children's **interest and motivation** for the science lesson I introduced the problem of transferring water from the small containers (glued to the table) to the big container in the middle of the table.

My intention was to **encourage children to solve the problem by making connections** with their previous experience and knowledge about materials.

I tried to make children curious and stimulate their thinking, but at the same time I conducted the discussion in such a way that they draw their attention to the materials on the table.

At the beginning children were not so confident that they can solve the problem. It was my role to talk about absorption and materials with such a property we can use for water transfer.

The challenge is rather difficult... I offered them many materials: paper, plastic, cotton, sponges, napkins, pencils, cardboard, bread, fabrics, etc.



## Implications

Time and resources are needed to allow for exploration.



# Developing the learning journey: Activity 1 – Discussion about materials and their properties

**Activity:** The discussion started from the materials I prepared for investigations. I tried to make connections with what children already know about materials. They named some materials (glass, wood, metal, plastic, fabric) and with my help, some properties: hardness, transparency, absorbance, etc.

## Teacher

Materials have different properties that make them useful for different jobs. Can you name some materials?

The napkin is very soft, it is a soft paper.

My questions challenged the children to reflect and communicate their ideas

Is bread a material? It has many holes.

The sheet of paper can be bent easily.

I think the cup is made from a material much more hard...

Some materials are hard, like this pencil.

I know that glass can be broken.



## Developing the learning journey: Activity 2 – Exploring the materials

### Teacher

What materials from these on the table we could use to transfer water from the small containers to the big one?

The sponge is very good to carry the water.

I want to try all these.

Water cannot enter inside the pencil, I believe.

I am not sure about the sheet of paper, how much water it can absorb

Bread absorbs water as it does with milk at breakfast.

It is another moment when children could **collaborate and share ideas**



Children receive the materials to be investigated and many questions and comments raised.

Children make **predictions** and separate the materials in two groups: absorbents and non absorbents.

### Implications:

All children were able to offer ideas, making links with observations from their day to day life.



# Developing the learning journey: Activity 3

## The investigation

**Rationale:** This was an opportunity to observe children *motivation and curiosity*, their scientific skills in particular their *questioning*.



Look! I like very much this sponge, water trickles from it...

This fabric is good for water.

Children talk to each other and share opinions, observing at the same time what their peers are doing and saying.

Children are very curious and want to touch all the available materials: paper, glass, wood, metal, plastic, fabric, sponge, cardboard, and investigate their behavior by themselves.



### Implications:

I offered children a large variety of materials, building on their curiosity and motivation to investigate.

## Developing the learning journey: Activity 3 – The investigation



I put the pencil in the water. It was wet, but I could not squeeze it into the bowl !!!!!

The whole class is working with enthusiasm.



I managed to squeeze the water from the sponge into the bowl.

### Implications:

Children were excited and wanted to investigate more, proving scientific attitude and new understanding.



# Developing the learning journey: Activity 3 – The experiment

I stepped back and let the children the freedom to act and try everything they think is good for the experiment.

The bread soaked in the water ... It will break into pieces.

Wait, let me do it.

The napkin is good, I can collect all the water with it. I cannot do the same with the plastic sheet.



Children could collaborate and share the observations made by comparing the behaviour of different materials

## **Results**

At the end of the investigation I discussed with the children about the predictions they have made at the start and we were very pleased to conclude that almost all of them were correct. We discussed about the nature of materials, the holes they have in their structure or not. I was very glad to see children's enthusiasm for investigations and observed that they could learn about the absorbing properties and the correlated nature of materials. Children knew from previous experience or from intuition how the materials will behave. But the whole activity was very interesting and motivated them to work, collaborate, observe, and explore.

## **Reflections - Children's progress**

- During the activity, the continuous collaboration between children has led to the increased curiosity and creativity in using the available materials.
- Every child was very curious and wanted to try all the materials made available.
- Verbal communication and information sharing took place between children throughout the activity.
- Even if they found out from a colleague that some materials did not absorb water, children wanted to try by themselves.
- Children discovered the property of some materials to absorb water.

## Reflections – Role of the teacher

- The role of the teacher was that of an observer, without interfering in the actions of the children.
- I tried to motivate children to explore the available materials and select the suitable ones for the challenge I proposed.
- My support was reduced during the activity and children could act following their own predictions which proved to be correct.
- I encouraged children to observe and make connections and also: help children to formulate questions and foster their curiosity, encourage dialogue and collaboration to support children's ideas, promote reflection and reasoning.
- I tried to direct children questions to the scientific aspect of the materials: their structure.
- Throughout the activity, a continuous formative assessment was carried out through the direct observation of the children and conversations.
- I made notes, observations and photos.
- I plan to use in my teaching more inquiry activities for science lessons.

## **Reflection questions for the reader**

- How do you foster children's curiosity to make their own observations?
- What is your involvement in children's investigations, how much support do you offer to children?
- How do you support children in expressing their ideas and questions?
- What is the role of appropriate materials in supporting children's investigations?



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