

Erasmus-Project Modul IO1B – Children module 1

Digital learning in the family

The project "Digital learning in the family" aims to give migrant or refugee parents - explicitly addressing mothers here - the opportunity to further their education in the field of computer and digital media use and thus gain more independence and better chances on the labour market.

In order for these courses to take place, parallel childcare is offered for the children of the participating mothers, which is aimed at younger children between the ages of 5 and 9. The childcare time should be meaningful and interesting for the children, which is why the focus is on experiments from the STEM area (science, technology, engineering and mathematics) and on playful language development in the form of a memory puzzle. The first part of the module - experimentation - will now be discussed in more detail.

Experiments for children?

Children are curious by nature and have a great interest in understanding and comprehending their experienced environment. Even younger children show this curiosity. Small, age-appropriate experiments can awaken their natural curiosity. They can also promote communication, as cooperation is an important aspect of joint experimentation. In addition, they promote independent work, fine motor skills and, last but not least, the children's self-esteem: if an experiment is successful, there is a lot to be amazed about and the joy of successful, own actions strengthens self-confidence.

What is important to pay attention to?

The scientifically correct explanation of the phenomenon should not yet be in the foreground. It is rather the way there - the experimenting itself - that is interesting for the children. Often, explanations only remain on the level of describing what has been observed. However, this is often enough to stimulate the children's curiosity.

When experimenting together with children, experiments should be selected that fulfil the following aspects:

- The experiments are not dangerous.
- The phenomena and materials occur in the children's everyday world.
- They are short and guarantee a sense of achievement.
- They must be able to be carried out by the children.

The selected experiments in this script fulfil these conditions; if there are any restrictions, for example because experiments are carried out with fire, there is a corresponding note in the instructions. Furthermore, despite the harmlessness of the materials, the children must never be left alone while they experiment.

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For a suitable supervision ratio, one adult should not supervise more than 4 children at the same time.

For each course day, general and special laboratory rules adapted to the course day must be discussed.

General laboratory rules:

- No eating or drinking during the experiments. This applies in particular to any food, liquids or chemicals used for the experiment!
- There is no running or playing during the experiments.
- No objects or materials are to be touched without permission.
- Hands are washed after experimenting and before eating.

Special laboratory rules should be discussed in advance, for example when experimenting with fire, electricity or sharp objects. Chemicals to be used should also be discussed in advance.

Procedure of a course day

The project comprises 13 course days in which mothers and children are trained and supervised respectively. The course days each deal with a different subject area from the field of STEM education, for example air, water, plastics or plants. The course days are numbered consecutively, but the order can be adjusted. Course days 9 to 13 are more demanding in terms of execution and understanding than the other course days, so starting with these numbers is not recommended.

The experiment instructions are all structured in the same way: first there is a material list, which lists the materials needed for one experiment. This is followed by the description of the experiment; these steps must be worked through one after the other. The question in bold type or the work instructions are intended to encourage the children to observe and describe exactly or to point out an observation. Finally, there is an explanation of the phenomenon behind the experiment. This is primarily intended for the adults and supervisors. Depending on the level of the children, they can of course work towards the explanation together.

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A few important tips for safe and exciting experimentation:

- Read through the instructions well in advance and before the course day. It is advisable that you have done the experiments yourself at least once.
- All materials should be available. They can be placed on a table from which the children can take the materials they need.
- Set the mood for the topic at the beginning: For example, if the topic is "magnetism", ask the children what or if they already know something about magnets. The materials can also be discussed in advance.
- Experiment together with the children. Explain the steps one by one (either verbally or by demonstrating the respective step) and let the children work independently. Depending on the supervision ratio, work can be done in small groups or individually.
Attention: do not let any child experiment unsupervised!
- Do not reveal or explain any results in advance or afterwards. Rather, help the children to come up with a possible explanation themselves by asking questions: "What did you observe?" "Why do you think that is?" "Have you already tried this?"
- Allow your own experiments, as long as they are safe and manageable for you. If children develop questions of their own accord and are curious to investigate further, they should be given the space to do so.
- Give yourself and the children time. Each child should be given the opportunity to carry out the experiment, even several times. Encourage the children to repeat the experiments if they did not work the first time. If something does not work, it can be discussed together, but without assigning blame.
- Cleaning up is also part of experimenting. Involve the children in this as well. In this way, there is a consistent process on each course day, in which the children participate from beginning to end.
- Despite all the care and repeated testing, it can happen that an experiment does not work. Sometimes it helps to read the instructions or the notes again carefully; often you overread something or do not read it correctly. Therefore, it is important that you have done the experiments yourself and already know them when you do them with the children. This way, you can recognise sources of error early on and act if something should go wrong.

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Sample protocol of a course day

Module: Magnetism

Introduction (10 – 15 minutes)

Meeting the children

Explanation of lab-rules: do not run, be careful, do not eat or drink while experimenting...

Introducing the topic: magnetism

What do you know about magnetism? Where can I find it? (showing some materials)

Experiment phase (45 minutes)

1. What is magnetic/ What objects are attracted to the magnet?
2. Attract and repel of magnetic poles
3. Toys with magnets (playing together, talk to each other)
4. How does a compass work? (for older children, optional)

Included **break** for eating and drinking (**15 – 20 minutes**)

Memory puzzle to repeat vocabulary

Conclusion (10 minutes)

Clean up

What did you like? What did you learn?

Put on jacket/ returning to mothers