

The mathematics of the chestnut

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Project diary

The mathematics of the chestnut program was carried out in the Gézengúz group of the Szivárvány Kindergarten with 25 participating children (4- to 5-year-old ones). The primary goals of the project were for the children to experience the joy of mathematical understanding, to develop their basic counting ability, and to recognize mathematical correlations. During the implementation of these themes other types of activities were also utilized besides mathematics, for example exploring nature, education about healthy lifestyle, physical activity, dancing, singing, drawing, painting, as well as arts and crafts.

The focus of the project was on mathematics, but other aspects of kindergarten education were included as well. The social and emotional skills of the children were developed through activities based on shared experiences, like collecting fallen chestnuts, then throwing them to see who can throw their chestnuts the farthest, or which group's chestnuts fly for the longest time. They had the chance to help each other and cooperate in small groups while preparing the ingredients of the chestnut hedgehogs. As a group they have built the figure of Kippkopp from chestnuts. Kippkopp, the boy made of chestnuts is a character of Hungarian children's books, and the children could bring him to life by working together on the figures. The kindergarten teacher and the nurse helped them by cutting holes in the chestnuts. The children have also created the garden of Kippkopp out of nuts and fruits, complemented by their own creations.

The development of artistic skills was incorporated in the program as well. In terms of handicraft, for example, they practiced paper folding, but

they had tasks related to decoration as well, like ornamenting their creations, or furnishing Kippkopp's garden together.

An important goal of Hungarian education is to provide daily Physical Education to the children. In this case, physical activities were connected to set out geometric shapes from chestnuts and gymnastic exercises with chestnuts.

Singing and dancing were parts of the group experience, in smaller groups and with the whole group as well. During these activities they could improve their rhythmic skills through individual tasks with autumn nuts and fruits. In the end the children formed the "nature band" to experience the joy of playing music together. Through dancing and physical activity they could cooperate in small groups and in the big group as well.

These activities were in accordance with the official Program of Kindergarten Education, therefore guided observation and exploration, imitation and modelling, active and playful learning, and gaining experience in a spontaneous and playful way were all important elements of the project.

The sessions were approximately 30 minutes long, but usually several 30-minute blocks took place in the same morning. However, these activities were usually prolonged and we often had small groups taking turns in doing them. The sessions had a relaxed atmosphere and the children could often choose when they would like to join in. It was very rare that a child did not participate and played something else instead.

The progress of the project

Session 1

Time and date of the session: 10.11.2016, 2x30 min.; 14.11.2016, 30 min.

Form of activity: Active discovery of the outside world with mathematical content

Goals of the activity:

Recognizing and solving problem situations, improving independent thinking

Goal related to environmental education: Autumn cleaning in the garden, picking up chestnuts, acorns and leaves

Mathematical goal: comparing multitudes, practicing estimation and forming sets (estimating weight, recognizing shapes, more-less, same amount)

Tasks of the activity:

Skill development

A. Aiding the development of cognitive functions

- Sensing and perception by finding, collecting, touching, and listening to the sound of the nuts
- Depth and span of attention: selection, forming sets
- Aiding the development of cognition; differentiation and comparison while forming sets
- Developing shape constancy, outlining two-dimensional geometric shapes

B. Aiding the development of social skills

- Cooperation with partners: during group work /boys-girls/ by paying attention to each other and working together
- Patience, attention: by listening to each other's ideas and answers

C. Forming a healthy lifestyle

- Outdoor activities and exercise

D. Mother tongue development

- Encouraging speech by talking about new experiences
- Extending active and passive vocabulary with new words and expressions

Organization tasks:

Forming the expected(recommended) small groups of the children

Gardening with a chosen partner

Group work in boy-girl groups assigned by the kindergarten teacher



Session 2

Time and date of the session: 15.11.2016, 2x 30 min.

Form of activity: Active discovery of the outside world with mathematical content

Goal of the activity:

- Putting objects in order based on size
- Weight
- Shape recognition (eg. it looks rounded)

Tasks of the activity:

- Aiding the development of cognition, incentivized use of cognitive processes
- Improving cognitive thinking by solving problem situations
- Helping the children to discover correlations, reinforcing spontaneous recognition
- Highlighting, or giving clues about the correct solution

Subject of the activity:

- Determining if a set contains more or less elements than another based on sight
- Forming sets based on given guidelines or on their own
- Continuing a series by recognizing its patterns
- Developing number sense (addition, subtraction in the set of numbers up to 6)
- Correlations, comparisons
- Units of measurement, measuring weight

Form of organization: whole group, small groups, informal



Session 3

Time and date of the session: 16.11.2016, 3x30 min.

Form of activity: Drawing, painting, handicraft

Goal of the activity:

- Making Kippkopp happy
- By making cakes (chestnut hedgehogs), learning the basics of baking cakes
- Teaching about healthy lifestyle (apple, puffed rice)

Tasks of the activity:

Developing cognitive functions

- Improving attention span and depth by active participation in the activity, sense perception (bigger-smaller)
- Developing cognition by using cognitive processes
- Expanding vocabulary, developing creative thinking, observing logical relations

Subject of the activity:

Stories and poems

- Kippkopp stories
- Shell of the horse chestnut (children's song about chestnuts)

Active discovery of the outside world

- Origins and use of the sweet chestnut, biscuits and puffed rice
- Characteristics of the different states of matter (e.g. apples produce juice)
- Evoking the custom of giving presents

Mathematical experiences:

- Measuring volume: measuring with scales, measuring spoon and cup– which one can hold more-less
- Forming sets for weighing out ingredients
- Size of an apple, cutting it to pieces of equal size, grating – thicker-thinner
- Organized decoration
- Table setting: cardinality, equal, more-less, creating equal groups of objects by adding and taking

Drawing, painting, modelling, handicraft

- Kneading
- Slicing, cutting
- Grating
- Decoration - sticking the spines in the hedgehogs
- Folding napkins
- The aesthetics of table setting

Form of organization: whole group, small groups, informal



Session 4

Time and date of session: 17.11.2016, 2x30 min.

Form of activity: Physical activity

Goal of the activity:

Perfecting the children's competences through physical activity

- Consciously performing movements based on the acquired knowledge by throwing the chestnuts
- Aiding the internalization of thinking, emotions and actions related to environmentally conscious behaviour with a game called "Clean the base of the trees"
- Shaping cooperative behaviour through games

Tasks of the activity:

Skill development

- Developing strength, muscles and the arches of the feet
- Practicing overhand throwing
- Shaping of social behaviour, rule-following
- Developing fine motor skills, eye-hand coordination, spatial orientation, and the ability to stay on course
- Fulfilling some of the basic needs of children: joy and physical activity

Mathematical content:

- Cardinality: more-less
- Practicing measurements with rope
- Correlations, comparisons

Form of organization: team games and individual games



Session 5

Time and date of the session: 18.11.2016, 2X30 min.

Form of activity: Music, games with songs, children's dance

Goal of the activity:

- Learning and practising a new song

Tasks of the activity:

- Aiding the development of musical skills and personality
- Musical development
- Rhythmic skills: practising the production of steady throbbing by knocking chestnuts together and forming the "nature band"
- Developing aural skills:
- Developing timbre recognition by knocking together and producing sounds with walnuts, acorns, hazelnuts, leaves, corn, and chestnuts
- Recognizing the voices of their peers

Form of organization: whole group, small groups, informal





Reflections

The children count on a daily basis, they recite counting rhymes and some of them are able to count up to 10 or 20, but sometimes this is just the result of mechanical "swotting". They have learned a helpful point of reference in this when we counted the autumn nuts and fruits together. They realized that 5 hazelnuts is the same amount as 5 apples, even though they are much smaller. They have discovered different aspects of shape differences as well: chestnuts and walnuts are rounded, but so are small pearls, pepper, apples, and watermelons. Every shape has a lot of variations.

In the game called "What's under the blanket?", for example, the children could discover and learn correlations in a playful way. The task felt like a game for them, while they drew important conclusions. Cooperation with their peers during the activity made them happy as well.

I tried to use chestnuts as balls for throwing exercises. The children were happy to use them as new toys. As they are smaller and harder than regular balls it was more difficult to do the exercises with them, but they could be

used sufficiently. Mathematics was incorporated into the physical activities as well, for example the children themselves measured how far they could throw the chestnuts with steps or jumps.

At a key point of the project the children made hedgehogs out of chestnut dough. They worked as a group, therefore they had to cooperate with their peers, but they had the chance to work individually as well while decorating their own hedgehogs. At the end of the session they put their creations in the garden of Kippkopp. The work of the children made Kippkopp happy, as they have furnished his garden and populated it with new inhabitants. Furthermore, they practiced cooperation and made themselves happy by making their own hedgehogs.

During the program the children were curious, and they often showed signs of deep concentration and absolute focus on the tasks. From the feedback of the children we have learned that they found the joy of creative work in the tasks.