ACTIVITY 02

My 3D Christmas Tree

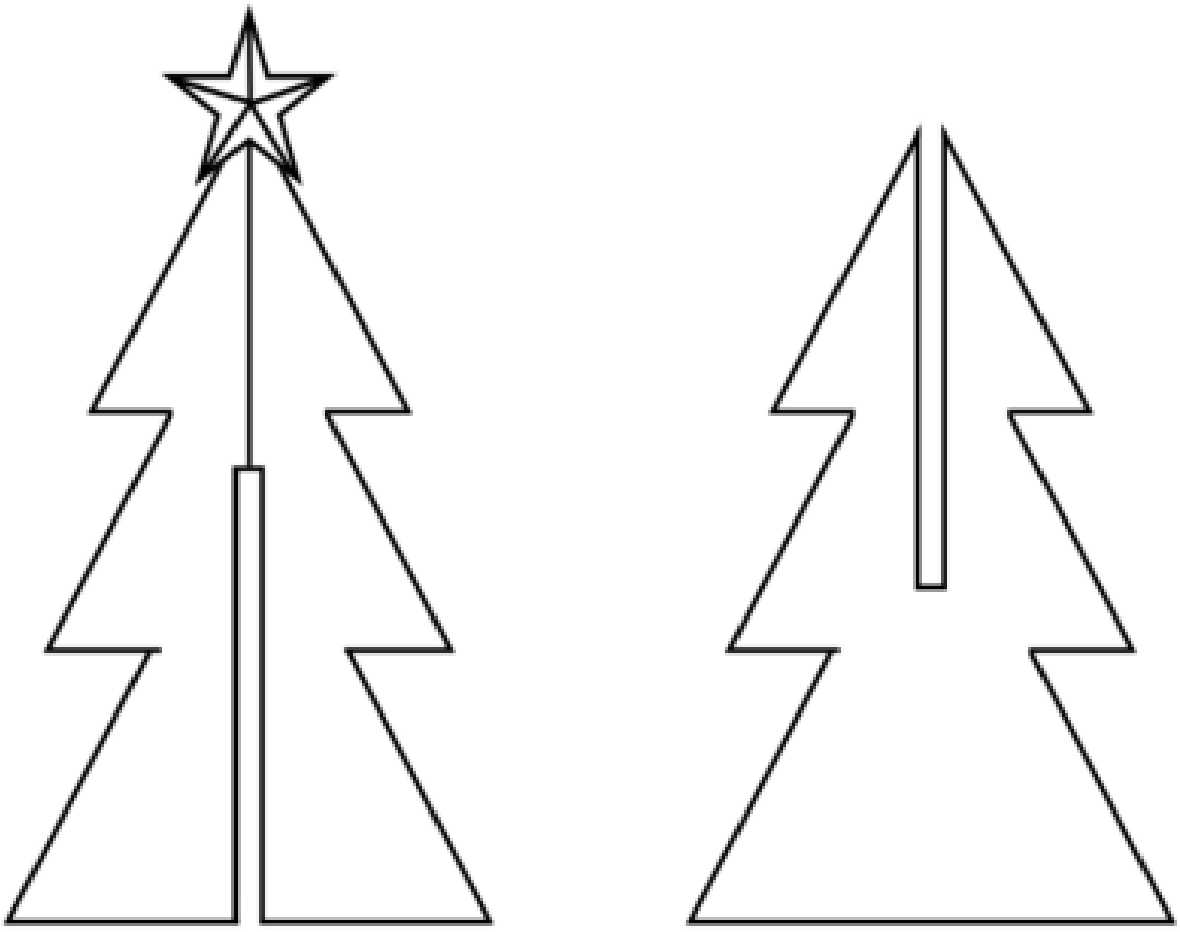

Illustration from the activity

Teaching Planning Tool - 3D Modelling and 3D Printing (STEAM)

Part 1: Conceptual Planning (General Information)

Title of the Thematic (STEAM) Unit

My 3D Christmas Tree

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SUBJECT	Mathematics and Working with Information; Arts and Culture; Man and the World of Work
YEAR	Children aged 5-6 (pre-primary education)
NUMBER OF LESSONS	1-2 educational activities (free / guided play)
DIDACTIC OBJECTIVES	Discover the difference between flat (2D) and spatial (3D) objects through creative work with the 3D pen; develop fine motor skills and the ability to follow a procedure.
SPECIFIC OBJECTIVES	The child distinguishes 2D and 3D objects; understands that a spatial object is formed by joining parts; follows a simple working procedure; traces a template and assembles a 3D tree.

Note

This activity follows the project's national (SK) pre-primary/primary layout. This page summarises it in the common STEAM template format; the full original activity (procedure, STEAM links, cross-curricular connections, reflection and photo documentation) follows on the next pages.

My 3D Christmas Tree

Educational Area	Man and the World of Work, Mathematics and Working with Information, Arts and Culture, Man and Nature
Subject / Domain	Mathematics and Working with Information, Arts and Culture, Man and the World of Work
Age Group	5–6 years (pre-primary education)
Total Time	1–2 educational activities within free play and guided play sessions

CROSS-CURRICULAR LITERACIES

Technical and Digital Literacy

The child is introduced to a simple technical tool – the 3D pen. They gain a basic understanding of creating a three-dimensional object by layering material and learn to use age-appropriate technology safely.

Mathematical Literacy

The child works with lines, shapes and proportions. They distinguish between flat (2D) and spatial (3D) objects and orient themselves in basic spatial relationships.

Visual and Aesthetic Literacy

The child perceives shape, colour and composition when creating their own product. They develop aesthetic sense and creativity.

Social Literacy

The child collaborates in a pair or small group, takes turns, respects agreed rules and communicates about the outcome of their activity.

STANDARDS

Content Standard

Through practical and creative activity, the child discovers the difference between a flat and a spatial object. By manipulating materials and the tool, the child develops fine motor skills, hand-eye coordination and the ability to follow a simple procedure. They learn to plan work steps and complete an assigned task.

Performance Standard

The child traces a shape following a template using the 3D pen, creates a simple 3D model from several parts, distinguishes between 2D and 3D objects, follows basic safety rules when working with the 3D pen, works with focus and can describe the result of their work in a simple sentence.

SPECIFIC OBJECTIVES

Cognitive Objectives

- The child distinguishes between 2D and 3D objects.
- The child understands that a spatial object is formed by joining several parts.
- The child comprehends a simple working procedure.

Affective Objectives

- The child shows joy in creative activity.
- The child works with interest and patience.
- The child experiences a sense of achievement from a completed product.
- The child develops a positive attitude towards learning through play.

Psychomotor Objectives

- The child traces a shape on a template using the 3D pen.
- The child develops fine motor skills and hand-eye coordination.
- The child handles finished parts and assembles them into a three-dimensional structure.
- The child observes basic safety rules.

STEAM CONNECTIONS

S	The child observes changes in material properties as the plastic heats and cools.
T	Use of the 3D pen as a simple technical tool.
E	Planning the work procedure; connecting parts into a stable whole.
A	Creating a Christmas tree according to their own imagination; working with colour and shape.
M	Working with lines, shapes, directions and proportions.

TEACHING ORGANISATION

The activity takes place in the kindergarten classroom within free play and guided play sessions. The workspace is prepared so that children have sufficient room to create and safely handle the 3D pen. Tables are arranged into smaller workstations. Children work in small groups (3–5 children) or individually according to the organisational possibilities of the classroom.

Organisational Forms

- Teacher-led activity – explanation of the procedure, motivation and supervision of children's work.
- Individual work – the child traces the Christmas tree shape using the 3D pen.
- Small group work – taking turns, mutual observation and communication.
- Closing whole-group reflection – conversation about the products created.

Teaching Methods

Learning through play, experiential and creative learning, teacher demonstration, practical hands-on activity, guided conversation and discussion, encouragement and positive feedback.

Didactic Materials

Low-temperature 3D pens designed for children; filaments in various colours (green, brown, colourful for decorations); heat-resistant mats; 2D Christmas tree templates; a finished 3D Christmas tree model as an example; work tables and chairs adapted to the age of the children.

METHODOLOGICAL PROCEDURE

Motivation

The teacher sits with the children in a circle or at the tables and creates a pleasant, calm atmosphere.

Teacher: "Children, what special time of year is coming?" Children: "Christmas!"

Teacher: "What do we have at home for Christmas?" Children: "A tree." / "Decorations." / "Lights."

The teacher shows a picture or a small Christmas tree and says: "Today each of you will make your own Christmas tree – in a special way, using a 3D pen."

Explaining How the 3D Pen Works

Teacher: "This is a 3D pen. A thin plastic line comes out of it – it is soft at first and hardens after a moment. When we draw slowly, the line keeps its shape."

Safety: "The tip of the pen is warm, so we do not touch it. We hold the pen like a pencil and always put it down on the mat."

Main Activity

The teacher distributes Christmas tree templates. Children trace the outline of the tree with their finger first, then trace it using the 3D pen. They add decorations (dots, lines, small shapes) in their chosen colours. After finishing, they let the tree cool, then carefully peel it off and compare their tree with others.

Closing Activity

Short conversation: "What does your tree look like?" / "What do you like most about it?" / "What was difficult for you?"

CROSS-CURRICULAR CONNECTIONS

Mathematics and Working with Information

The child works with shapes, lines and proportions. They notice the tree's shape, apex and symmetry, distinguish the position of decorations and orient themselves in space.

Arts and Culture

Creating the Christmas tree develops aesthetic sense, creativity and the ability to express oneself visually. The child works with colour, line and composition.

Man and the World of Work

The child learns to follow a working procedure, safety rules and to handle equipment responsibly.

Language and Communication

The child names what they created, describes their product and expresses feelings about the work.

Movement and Health

Handling the 3D pen and the tree parts supports fine motor skills and hand-eye coordination.

PHOTO DOCUMENTATION

Fig. 19 Drawing the template

Fig. 20 Tracing the template

Fig. 21 Adjusting the shapes

Fig. 22 Completing the star

Fig. 23 Completed Christmas tree

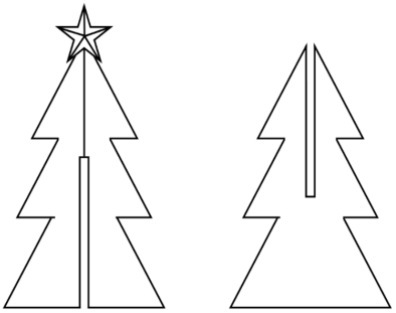

Fig. 24 Christmas tree template

REFLECTION

The activity focused on creating a 3D Christmas tree using a 3D pen was an engaging and thought-provoking experience. Working with the 3D pen highlighted the importance of moving smoothly, completing each stroke carefully, and planning the three-dimensional outcome from the start. The planning phase – preparing templates – was positively received, as it allowed for creativity while simultaneously encouraging spatial and constructional thinking. The activity contributed to the development of fine motor skills, spatial imagination and systematic, step-by-step working.

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3D STEAM

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