Title of the STEPAM Unit: Symmetry Around Us

Learning Objectives

During the Lesson Subject-Specific Competencies

- Recognize symmetry in nature, objects, and geometry.
- Understand the concept of the line of symmetry and symmetrical figures.
- Use mirrors and geometry tools to explore and create symmetrical designs.
- Engage in physical movements that reflect symmetrical actions.

Learning Objectives After the Lesson

- Identify and explain examples of symmetry in everyday life.
- Create symmetrical designs using art and technology tools.
- Collaborate effectively in team-based activities and improve coordination.
- Understand the role of symmetry in the human body and motion.

Materials

- **Science/Observation**: Pictures of symmetrical objects (e.g., butterflies, flowers, human faces).
- **Art and Technology**: Paper, mirrors, markers, rulers, scissors, Mathigon Polypad web tool.
- **Physical Education**: Open space for symmetry dance and games.
- **Art**: Materials for T-shirt pattern designs (templates, markers, crayons).
- **Mathematics**: Worksheets with symmetrical figures, geometry tools.

Activity 1: Exploring Symmetry (Science and Mathematics)

Objective: Introduce the concept of symmetry and identify symmetrical objects and figures.

1. **Introduction**:
    - Show students pictures of symmetrical objects (e.g., flowers, butterflies, human faces).
    - Ask: “What do you notice about these objects? What happens if we fold them in half?”
    - Define symmetry and explain the concept of the line of symmetry.
2. **Hands-On Activity**:
    - Students use mirrors to explore symmetry in letters (e.g., A, B, F), shapes (e.g., rectangle, circle, triangle), and pictures.
    - Discuss why some objects have symmetry while others do not.
3. **Worksheet Task**:
    - Students complete exercises identifying symmetrical figures and drawing lines of symmetry.

Activity 2: Creating Symmetrical Designs (Technology and Engineering)

Objective: Use digital tools to create and explore symmetrical patterns.

1. **Task**:
    - Students use the Mathigon Polypad web tool to create symmetrical patterns.
    - Explore how to reflect shapes along vertical, horizontal, and diagonal lines.
2. **Reflection**:
    - Discuss how symmetry is used in engineering and design (e.g., buildings, bridges, vehicles).

Activity 3: Symmetry Dance and Games (Physical Education)

Objective: Reinforce the concept of symmetry through movement and coordination.

1. **Symmetry Dance**:
    - Students follow the teacher's symmetrical movements (e.g., clapping, stomping).
    - Discuss: "If we draw a line down our bodies, are our movements symmetrical?"
2. **Games**:
    - **Game 1**: Mirror Movement – Students pair up and mirror each other's movements.
    - **Game 2**: Symmetry Shapes – Students form symmetrical shapes with their bodies in groups.

Activity 4: Art – Symmetrical Pattern Design

Objective: Create artistic designs demonstrating symmetry.

1. **Task**:
    - Students create symmetrical patterns for a T-shirt design using markers and templates.
    - Encourage creativity with colors and shapes while ensuring symmetry.
2. **Reflection**:
    - Display designs and discuss the importance of symmetry in art and fashion.

Activity 5: Symmetry in the Human Body (Science and Mathematics)

Objective: Explore symmetry in the human body and its role in motion.

1. **Discussion**:
    - Talk about how the human body is symmetrical (e.g., left and right halves).
    - Discuss how symmetry aids movement and balance.
2. **Interactive Task**:
    - Students identify symmetrical motions (e.g., clapping, jumping) and asymmetrical ones (e.g., stepping).

Wrap-Up and Evaluation

Class Discussion:

- What did you learn about symmetry in nature, art, and your body?
- How can you identify symmetry in everyday life?

Evaluation Criteria:

- Creativity and accuracy in symmetrical designs.
- Active participation in physical and group activities.
- Completion of worksheets and use of digital tools.

Homework:

- Students find three symmetrical objects at home and draw them, highlighting the line of symmetry.
- Upload their drawings on Padlet for peer feedback.

STEPAM Components

- **Science**: Explore symmetry in nature and the human body.
- **Technology**: Use Mathigon Polypad to create digital symmetrical patterns.
- **Engineering**: Design symmetrical patterns and explore their applications.
- **Physical Education**: Engage in symmetrical movements and games.
- **Art**: Create T-shirt designs demonstrating symmetry.
- **Mathematics**: Identify symmetrical figures and understand the line of symmetry.