

## LESSON A

# Exploring 3D Toys: From Paper to Print



Objective: introduce elementary school students to the concept of creating 3D toys through paper folding, and then transferring their designs to a digital format for 3D printing, during which Printerform will be used for testing.

## MATERIALS

- Sheets of paper (preferably square)
- Scissors
- Optional: 3D printer (if available)
- Markers, colored pencils, or crayons
- Rulers

## LESSON

### 1. Introduction (5 minutes):

Begin by discussing with students what 3D shapes are (cubes, pyramids, spheres, etc.) and how they are different from 2D shapes. Introduce the concept of creating 3D toys through paper folding and explain that they will be designing their own 3D toys today.

### 2. Paper Folding Activity (20 minutes):

Demonstrate how to fold a simple 3D toy, such as a cube or pyramid, using a sheet of paper. Origami Way [<https://www.origamiway.com/>]. Encourage students to follow along and create their own 3D toys using the provided sheets of paper. Circulate around the classroom to provide assistance and guidance as needed.

### 3. Toy Design and Decoration (15 minutes):

Once students have folded their 3D toys, allow them to use markers, colored pencils, or crayons to decorate their creations. Encourage creativity and experimentation with different colors and patterns.

### 4. Reflection and Discussion (10 minutes):

Gather students together for a group discussion about their experiences with paper folding and toy design.

Ask questions such as:

- What was challenging about folding the paper into a 3D shape?
- How did you decide on the design and decoration for your toy?
- What other types of 3D toys do you think you could create through paper folding?
- Encourage students to share their thoughts and ideas with the class.

### 5. Introduction to PrinterForm & 3D printing (10 minutes):

Briefly explain what 3D print does and how it works; explain why we need Printerform (can use a prepared example of a simple shape).

Explain that they will have the opportunity to turn their paper toy designs into digital 3D models for printing.

Optional: 3D Printing Demonstration (if available) (10 minutes):

If a 3D printer is available, demonstrate printing a digital 3D model using Printerform. Compare the printerform model and the 3D print side-by-side.

### 6. Conclusion (5 minutes):

Wrap up the class by summarizing what students have learned about paper folding, toy design, Printerform prototyping and 3D printing. Encourage them to continue exploring these concepts and experimenting with new designs in the future.

