



Vintage Ball and Cup Toy

Completion time: 2 - 3 Lessons

Materials and Resources:

- Rectangular wooden blank – 7 inches long
- Wood turning lathe and tools, drill and suitable drill bits
- Potato, string, and ball
- Drill, small drill bit, screw, washer, screwdriver and knife
- Glue (cyanoacrylate or 2 component epoxy)
- Formech vacuum forming machine
- Suitable plastic material (HIPS recommended)
- <https://formechusa.com/case-studies/workshop-wisdom-college-creative-studies-ccs>

Skills at a glance:

Mathematics

Measurement

Language

Listening skills, following instructions

Thinking skills

Design, problem solving, independent thought, tool selection

Science

Heating plastics and effects, plastic/polymer material knowledge

Project Outline:

This project will see students create a toy of years gone by, which is the traditional cup mounted on a wood turned handle, into which a ball on a string must be swung up and caught in the cup. It will be made using tried and tested carpentry methods, whilst being brought into the 21st century with the addition of a vacuum formed plastic cup. Perfect for lessons where teachers want to demonstrate a range of production techniques, both old and new. What will be interesting for students will be that the vacuum formed cup will be produced using a simple potato as its mold.

Method:

Students must first produce their wood turned handle, upon which to mount their vacuum formed cup. This can be done using a mechanical wood lathe to carve a long rectangular blank of wood, approximately 7 inches long.

Students must be mindful to make the end of the handle which will support the cup as wide as possible, to providing a solid firm base for the cup to be mounted upon.

Students can now create their potato mold to produce their plastic cup, by cutting single potato in half. With the halved potato sitting flat side down on the work bench, the top will need to be cut off horizontally. The height of the cut will be dictated by the width of the end of the handle upon which the cup will sit. Both the end of the handle and the flat area produced on top of the potato should be identical in size creating maximum surface area to join the two together.

The potato can now be taken to the vacuum former, and formed using any suitable plastic material, although HIPS is recommended. The formed plastic cup can have any excess material trimmed off.

The cup and handle can now be joined together with both a screw and glue. On the end of the handle which will house the cup, a small hole can be drilled in the centre of the flat surface and down into the shaft of the handle. A hole should also be drilled in the centre of the bottom of the cup at the same width.

Applying an even layer of glue to the end of the handle, the cup can now be placed on top and screwed securely to the handle, being sure to use a wide washer on the inside of the cup to increase its stability.

The final stage is to attach the ball and string to the completed cup element. A small hole can be drilled through a solid ball, a string passed through, and knotted. The other end of the string can be neatly tied to the wood turned handle, and the vintage toy is complete and ready to be enjoyed.

Homework Tasks:

This toy is known to people the world over, and exists in many forms and guises, but when and from where did it originate? Students might research the story of this well loved toy to give the whole project some context. Students might also look at other vintage wooden toys and see how they might be adapted or reproduced to involve the vacuum forming process. How might they do this?

Optional Extras:

The addition of using a potato as a vacuum forming mold is intended to be fun, and an engaging element for students which will pique their interest, but of course, this is an element which can be omitted if desired. There are other mold production methods which teachers may deem more suitable, or that focus on key skills they wish to involve in the project. Perhaps using a larger wood blank on the wood turning lathe to produce a perfect cup shaped wooden mold, will further develop and demonstrate students' capabilities with this wood shaping technique.

Student Accomplishments:

- The production of a vintage ball and cup game
- Experience using a wood turning lathe
- Learning innovative mould production techniques
- Choosing appropriate tooling methods
- Use of a pillar drill
- Applying independent design choices to a prescribed brief
- Practical hands on experience using a vacuum forming machine, and understanding its wider application

Teachers notes:

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