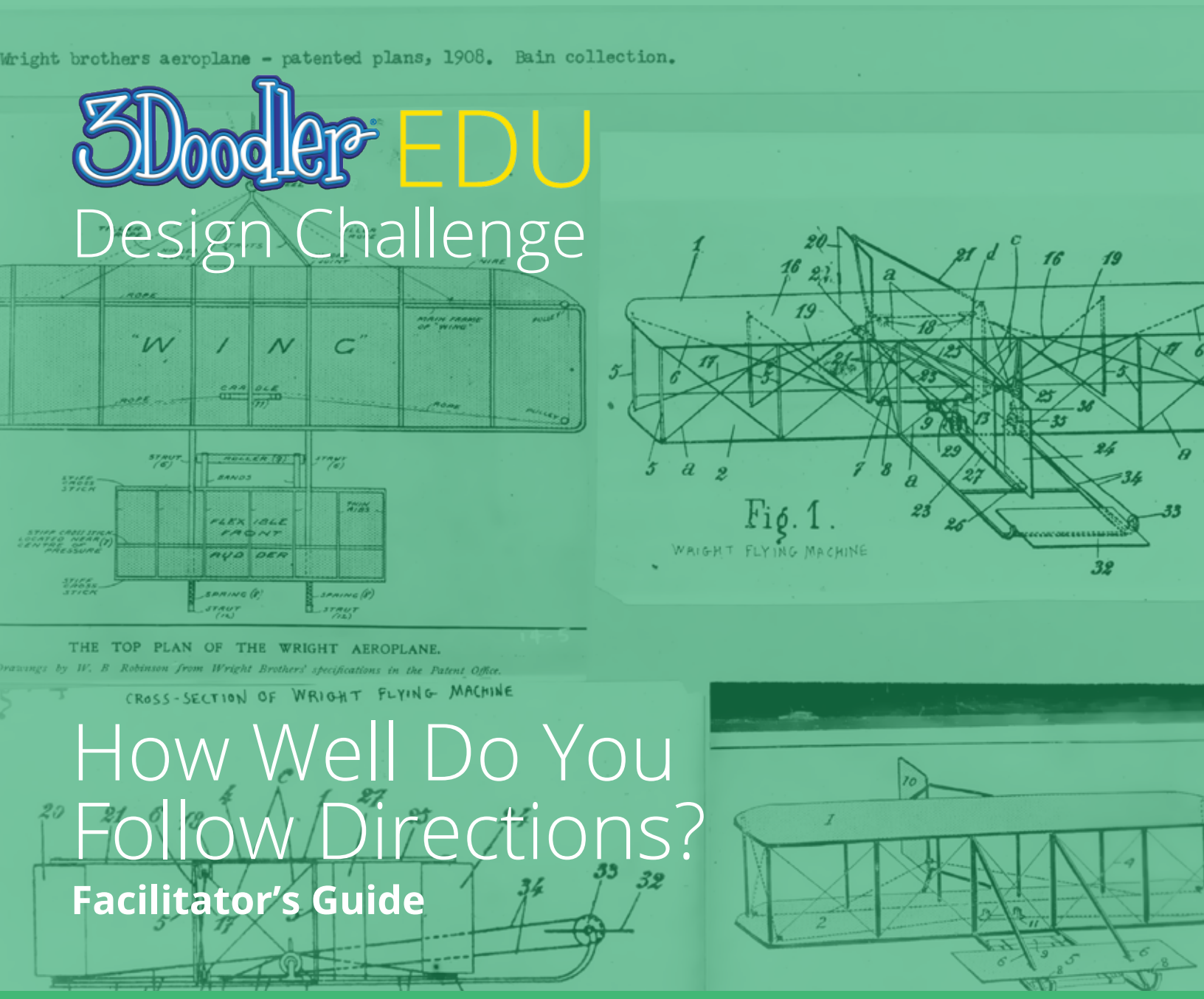
3Doodler EDU

Design Challenge



How Well Do You Follow Directions?

Facilitator's Guide

The Challenge

Using the 3Doodler and the materials provided, construct a sculpture and write out step-by-step instructions with no images to give to another group to follow. Compare and contrast the original result with the reproduction.

Overview

Total Time:100 minutes (2 Class Periods)

This challenge provides a good introduction to the 3Doodler pen while working with participants' logic and technical writing skills.

Challenge Background

Take It Further
This challenge could be conducted as a 2-hour after-school program.

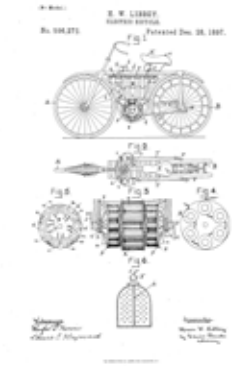


Fig.1

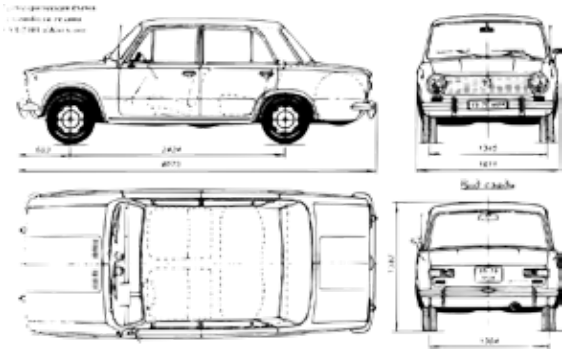


Fig.2

How good are you at following directions? Writing directions requires breaking down actions into individual steps and procedures. Seeing a picture allows for more accurate replication, but what if you could only communicate with words? Those who make a profession of writing directions are called technical writers. They write manuals for making airplanes parts and the directions for assembling them, for example. Their goal is write clear, accurate information about a product, service or use of equipment.

Materials & Tools

Before You Start Doodling
We recommend using a DoodlePad or clear tape placed over paper as a foundation to keep your Doodles in place and so that you can peel them off with ease.

A. 3Doodler Pens and Plastic Strands of various colors (one per student, or have students work in pairs or small groups)
B. Tools (from your 3Doodler box) plus needle-nose pliers or scissors for snipping plastic ends
C. Clear plastic tape or DoodlePad for Doodling foundation
D. Paper for Doodling foundation and extra sketching/note-taking space
E. Drawing utensils (markers, pens or pencils)
F. Camera or video recording device to document the Challenge and results
G. 12" x 12" or 30 cm x 30 cm cardboard squares (two for each team)
H. Cloth or material to cover completed sculptures
I. Ruler or measurement device

Challenge Organization

Challenge Documentation
Take photos & videos of your process using a camera. Document what to do and what not to do. Share your experience with the online community using #3DoodlerEDU!

Challenges are organized into 50-minute periods so they can fit into a traditional classroom structure, or be combined into a single workshop with breaks in between activities. This Challenge is designed to have participants work in short sprints to quickly explore the concepts.

Class 1: Design & Plan

Total Time: 50 min.

Design (30 min.)

Step 1: In teams of two, design and Doodle a three-dimensional sculpture no larger than 12" or 30 cm square, including a base and three different shapes and/or forms (pyramid, triangle, sphere, circle, cube, rectangle, etc.).

Step 2: While designing and creating the sculpture, write down and record the procedures and steps it took to create the finished product. Remember to shield your sculpture from other groups and to cover the sculpture when directions are completed to not give away any clues.

Facilitator's Notes
Class 1 will have participants work on designing their sculpture and writing out the directions. You may want to hold back on providing too many examples of directions ahead of time, as this might interfere with the participants' creativity and their ability to assess their basis for technical writing skills.

Plan (20 min.)

Step 1: Review and finalize the sculpture directions.

Consider the following:

- Directions must be legible and use correct spelling and appropriate grammar.
- Directions can only be written. Do not include images.
- Directions cannot exceed one page.
- Cover your sculpture when directions are completed.

Step 2: Turn in your directions to the facilitator.

Class 2: Build, Present & Evaluate

Total Time: 50 min.

Build (30 min.)

Remember to Snip Those Ends
We recommend pliers or scissors for snipping plastic ends. Make sure to keep your plastic ends clean to prevent clogs and jams. Snip plastic after removing it from the 3Doodler pen to make sure it's clean for the next time.

Step 1: Select another group's set of instructions for making a sculpture.

Step 2: Read and review the instructions carefully.

Step 3: Gather the 3Doodler pen, plastic and nozzles needed before you begin.

Step 4: Ready. Set. Doodle!

Facilitator's Notes
Class 2 provides a timed period for the teams to switch directions and create the new sculpture. It is important to keep to the 30-minute period so that there is time to evaluate the directions and provide feedback to each team.

Present & Reflect (10 min.)

Step 1: Place the original sculpture and the replicated sculpture side by side, along with a copy of the directions.

Step 2: Evaluate how close the replicated sculpture looks to the original. Evaluate the directions and sculptures using the criteria below:

- Similarity of the replicated sculpture to the original:
  - How many of the components are the same size? _____
  - How many of the components are the same shape? _____
  - How many of the components are the same color? _____
  - How many of the components are in the correct location? _____
  - How many total variations are there between the original and replication? _____

- Quality of directions:
  - Were the instructions broken down into steps? _____
  - Did the instruction include correct use of grammar and spelling? _____
  - If not, how many grammatical and spelling mistakes were there? _____
  - Did the instructions provide measurements for each component? _____
  - Did the instruction provide locations of each component? _____
  - Did the instructions provide color and type of plastic used (ABS or PLA)? _____

Step 3: Wrap-up by having all of the participants discuss the process, how they would improve their directions and how they would approach the challenge differently the next time.

More Information:

For more information on technical writing instructions, please visit:

- http://techwhirl.com/what-is-technical-writing/
- http://eduscapes.com/tap/topic50.html

Images:

Cover Page: https://goo.gl/aOkNYX

Fig.1: https://upload.wikimedia.org/wikipedia/commons/a/ab/Patent_Electric_Bicycle.png

Fig. 2: https://pixabay.com/static/uploads/photo/2012/04/15/18/16/car-34762_960_720.png