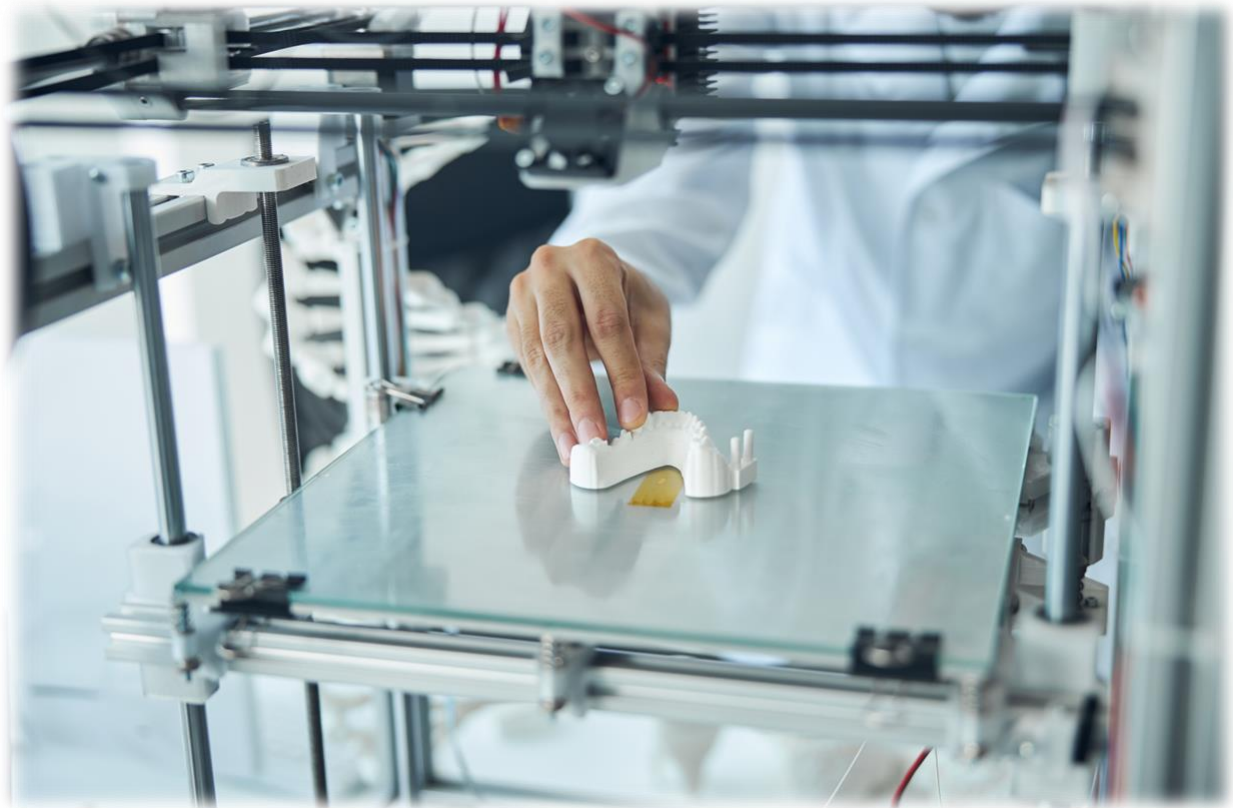


3D Printed Learning Tool

Lending Library Catalog



Sponsored and Developed by:
Tikkum Olam Makers and Department of Occupational Therapy at Thomas
Jefferson University

Overview

The lending library is intended to support the learning and educational experience of students with diverse needs. The 3D printed products included in this manual are available to any student upon request and can be kept for as long as the student benefits from the product. This manual outline each of the products available. Instructions on how to borrow these tools are listed below.

Instructions to Borrow Learning Tools

1. The student contacts the GOALS² program at TJU_EF_Goals2@jefferson.edu and expresses an interest in a consultation to borrow a learning tool.
2. The student and the GOALS² program will plan for the student to obtain the learning tool.
3. The student completes a brief questionnaire prior to obtaining their learning tool. The questionnaire is available through scanning the QR Code below.
4. The student takes their learning tool and trials it.
5. The GOALS² program will reach out to seek feedback about the learning tools within 2 weeks.



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Reading

One-Handed Book Holder



Description:

This device is diamond-shaped with a hole for a thumb or another finger in the middle.

How does it work?

Slip a thumb or finger in the hole with the sharp V down towards the book. Place the sharp V in the spine/center of the book so that the wings touch both the right and left pages. This will keep the book open without straining hands, thumbs, or other fingers.

Who would benefit from it?

Anyone with:

- Hand and/or finger pain
- Decreased hand or finger strength
- Use of one hand
- Difficulty with hand coordination making holding pages open hard to do

Fabrication notes:

Use 0.2 mm layer height and a 10% infill. Any color can be used.

Credit: Makers Making Change

Reading Guide (Curved)



Description:

This is a slightly curved bar with an opening in the middle and a sharp V on one side.

There are two different size windows: a small window and a large window depending on how many lines of text you need to see or the size of the font.

What does it do?

It allows you to only see one to a few lines of text at a time in the opening, making it easier to focus on the words and follow the lines of text in a straight line. Place the V in the center of the book and move the guide down the page as you read. It can be used on both sides of the book by flipping the guide to the other side.

Who would benefit from it?

People with difficulty with reading, but especially:

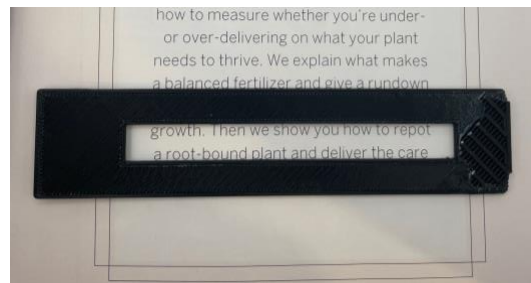
- Concentrating/focusing on a task, especially when reading
- Moving their eyes smoothly in straight lines
- Finding their place on a page of written words
- Remembering what they read
- Pattern glare, which is when the words look like they are moving around on the page, by helping the words appear to stay in place
- Feeling fatigued and/or experiencing eye strain when reading
- Reading comprehension by allowing the brain to process the letters and words accurately and in an organized way
- Slow reading: the increased focus can help increase reading speed.

Fabrication notes:

Use 0.2 mm layer height, a 20% infill, and supports for the window. This should not be printed flat. It works best when printed in black PLA or ABS (not silk) to increase contrast between the page and guide.

Credit: Makers Making Change

Reading Guide (Flat)



Description:

This is a flat bar with an opening in the middle meant for reading flat pieces of paper.

There are two different size windows: a small window and a large window depending on how many lines of text you need to see or the size of the font.

What does it do?

It allows you to only see one to a few lines of text at a time in the opening which makes it easier to focus on the words and follow the lines of text in a straight line. Line the guide with the words to be read and move it down the page as you read.

Who would benefit from it?

People with difficulty with reading, but especially:

- Concentrating/focusing on a task, especially when reading
- Moving their eyes smoothly in straight lines
- Finding their place on a page of written words
- Remembering what they read
- Pattern glare, which is when the words look like they are moving around on the page, by helping the words appear to stay in place
- Feeling fatigued and/or experiencing eye strain when reading
- Reading comprehension by allowing the brain to process the letters and words accurately and in an organized way
- Slow reading: the increased focus can help increase reading speed.

Fabrication notes:

Use 0.2 mm layer height, a 20% infill, and supports for the window. This can be printed flat. It works best when printed in black PLA or ABS (not silk) to increase contrast between the page and guide.

Credit: Makers Making Change

Smartphone Magnification Stand



Description:

This device has curved sides and a flat bottom to be placed on any surface. A phone can be snapped onto the top between the two sides. It is meant to be used with any magnifier app or the magnifier present in a phone's accessibility settings.

What does it do?

Once placed in the holder, the stand will hold the phone steady above whatever needs to be magnified. The device is slightly flexible to allow for the sides to be pulled apart slightly when placing the phone between them. Any smartphone will fit.

Who would benefit from it?

People who need to be able to magnify something or use another accessibility feature on their phone without using their hands.

Fabrication notes:

Use 0.2mm layer height and 20% infill. This can be printed in any color though bright/lime green is considered best when someone has low vision. Do not print in silk due to the potential for glare.

Credit: Makers Making Change

Writing

Number Aligner



Description:

This device is a small rectangle with 4 rows and 6 columns of open boxes. A printed rectangular aligner slides into the right or left side and hooks onto the top or bottom of the paper to ensure it is straight on the page. From Right to Left, it has places for the Ones, Tens, Hundreds, Thousands, and Ten-Thousands places.

A second version is designed specifically for math problems with decimals. This has 9 boxes.

How does it work?

Slide the aligner into the right or left slot with the notch down towards the page. Hook the end of the page (top or bottom) under the notch. Fill in the boxes with numbers; it is recommended to start the math problem on the second row so that there is room for carryovers. The spaces between grid let you write math symbols (i.e. long division or "=").

Who would benefit from it?

People who have trouble lining numbers up due to:

- Low vision
- Visual perceptual issues
- Decreased hand coordination
- Or have difficulty reading numbers

Fabrication notes:

Use 0.2 mm layer height and 20% infill. It works best when printed in black PLA or ABS (not silk) to increase contrast between the page and guide. Use a scraper to carefully remove from the plate or raft (if using) as the thinner pieces can break. There are two print files; one for the guide and one for the aligner.

Credit: Makers Making Change

Pen Holder (Horizontal)



Description:

This device is a ring with a small clamp on the side that holds a pen or pencil at a 90 degree angle on the side of the finger. The writing utensil slides in from the top and faces horizontal across the knuckles.

How does it work?

Slide a pen or pencil into the clamp and put the ring on a thumb or index finger.

Who would benefit from it?

Anyone who has some movement in their wrist or hand but has difficulty holding pens and pencils due to:

- Decreased hand strength
- Decreased hand coordination
- Decreased ability to pinch
- Increased hand pain

Fabrication notes:

Use 0.2mm layer height and 20% infill. Be sure to print with supports to avoid misprints in empty spaces. Any color can be used; PLA is recommended for flexibility.

Credit: Makers Making Change

Pen Holder (Vertical)



Description:

This device is a ring with a small clamp on the side that holds a pen or pencil at a 90-degree angle on the side of the finger. The writing utensil slides in from the top with the end of it facing up towards the person's face.

How does it work?

Slide a pen or pencil into the clamp and put the ring on a thumb or index finger.

Who would benefit from it?

Anyone who has some movement in their wrist or hand but has difficulty holding pens and pencils due to:

- Decreased hand strength
- Decreased hand coordination
- Decreased ability to pinch
- Increased hand pain

Fabrication notes:

Use 0.2mm layer height and 20% infill. Be sure to print with supports to avoid misprints in empty spaces. Any color can be used; PLA is recommended for flexibility.

Credit: Makers Making Change

Signature Guide



Description:

This device is about the size of a credit card and has 5 different size openings for different sized lines for signatures, initials, and dates.

What does it do?

It creates a border to outline where a signature, initials, and/or date should be so that someone can write straight and in the appropriate location.

Who would benefit from it?

People who have low vision, vision impairments (including spatial), or difficulty reading, but especially:

- Moving their eyes smoothly in straight lines
- Staying focused on a single spot on a page
- Writing in a straight line
- Writing letters at an even height
- Pattern glare, which is when the words look like they are moving around on the page, by helping the place to sign remain in place

Fabrication notes:

Use 0.3 mm layer height and a 20% infill. It works best when printed in black PLA or ABS (not silk) to increase contrast between the page and guide. This can be printed flat.

Credit: Makers Making Change

Drag Assistive Writing and Drawing Device



Description:

This device is the shape of a mouse and is used by placing a writing device in the middle and writing by pressing down and dragging rather than needing to grip the pen itself.

What does it do?

It holds a pen, pencil, or other writing device so that an individual can use it without needing to form a grip on the writing device itself.

Who would benefit from it?

Anyone who has some movement in their wrist or hand but has difficulty holding pens and pencils due to:

- Decreased hand strength
- Decreased hand coordination
- Decreased ability to pinch
- Increased hand pain

Fabrication notes:

Requires 3 x M3x20 machine screws

Credit: Makers Making Change

Fidgets

Fidgets are used to help improve concentration by providing a mindless repetitive movement that our brains need to quiet restless energy. They can also wake up the brain by providing needed stimulation when bored or for people who need more stimulation to keep their brains activated. This allows our brains to refocus our attention on important topics.

Fidgets can also be used to calm anxiety or provide sensory stimulation for people who crave it.

When choosing a fidget, individual preference is key. It is recommended to test different fidgets until finding the one that suits your needs.

8 Point Fidget Star



Description:

This fidget is shaped like a star with multiple concentric layers.

What does it do?

The inner layers move when pushed and pulled into stacks.

This fidget provides sensory input for:

- Touch
- Sound
- Vision
- Movement

Fabrication notes:

Use 0.2 mm layer height and 20% infill. A raft is not recommended but with or without one, be very gentle in removal as the layers are delicate. Sizing less than at least 2" in any axis runs the risk of fusing layers together. It can be printed in any color in PLA.

Fidget loosens up with time and activity to be more effective as a fidget.

Credit: chuuckaducck (thingiverse)

Joystick Fidget



Description:

This fidget looks like a game controller joystick mounted in a circle.

What does it do?

The joystick part bounces up and down when pressed and can be moved in all directions like a joystick on a game controller.

This fidget provides sensory input for:

- Movement

Fabrication notes:

Use 0.2 mm layer height and 15% infill. Print low tolerance version which is more likely to snap together. If needed, superglue the top and bottom together. For a dual color fidget, print the top and bottom in different colors. It can be printed in any color in PLA.

Credit: tomo_designs (thingiverse)

Rotating Squares Fidget



Description:

This fidget is a set of three concentric squares.

What does it do?

The squares all move in perpendicular directions from each other. The middle square can be spun.

This fidget provides sensory input for:

- Vision
- Movement

Fabrication notes:

Use 0.2 mm layer height and 15% infill. These print in a single piece with no assembly required. Print the low tolerance version. It can be printed in any color in PLA.

Credit: tomo_designs (thingiverse)

Miscellaneous

Blood Pressure Cuff Valve Knob



Description:

This is a built-up knob with indents for fingers to be placed over the valve of a blood pressure cuff.

There are two versions: one with teeth that can fit on a 11.8 mm valve, and one without teeth that can fit on any other valve with the use of 1-3 pieces of scotch tape to improve fit.

What does it do?

By increasing the size of the valve, it requires less strength and coordination to turn the valve when taking a blood pressure. It also becomes possible to use easily with one hand as it requires no more than a finger push to turn the valve.

Who would benefit from it?

People with:

- Decreased hand strength, hand/finger coordination, or ability to feel in their fingers
- Increased hand/finger pain or difficulty with pinching the valve with 2 fingers
- With a need to take blood pressure entirely with one hand

Fabrication notes:

Measure the valve with calipers before printing or print the toothless version which will always require scotch tape to create a tight fit.

Credit: Monique Chabot, TOM@University: Thomas Jefferson University Fellow AY2023-2024

Portable Slant Board



Description:

This device is an attachment that goes on either side of a clipboard to convert the clipboard into a slant board with a 25-degree angle. The attachments can be removed for easy transportation in a backpack.

How does it work?

Placing papers between a 20–25-degree angle stabilizes shapes of letters to make them easier to read. It also reduces the need to bend your head and can help with writing by stabilizing the wrist.

Assembly required: snap two side pieces together to form a triangle. The marking for the side (R or L) should be on the outside. Push the clipboard into the groove in each side. A clipboard is required to be purchased for this device.

Who would benefit from it?

People who:

- Find reading difficult due to trouble processing letters
- Have difficulty looking down for any reason, such as trouble or pain with bending their neck or head
- Need reading or writing materials raised to a higher height than a tabletop for any reason
- Need to stabilize their wrist when writing due to pain or trouble with coordination

Fabrication notes:

Print all four pieces. The connectors do not need to be pushed together for the sides to work. Supports under the connector on the front pieces will reduce the potential for a misprint that needs to be shaved to fit into the other side. Print at 20% infill. Any color can be used. The back pieces can be used without the front for reading however the board is sturdier with all four pieces placed on it. This version was designed for the Amazon Basics Hardboard Office Clipboard (12.5x 8.98x 0.5 inches, 3 mm thick).

Credit: Monique Chabot, TOM@University: Thomas Jefferson University Fellow AY2023-2024

Disclaimer

This program was initially designed by a licensed and registered occupational therapist as a Tikkun Olam Maker (TOM) University student fellow. TOM is a global non-profit venture that aims to improve people's lives by designing and building open-source solutions to neglected challenges with no market solutions. While our communities make the utmost effort to design safe and sustainable solutions, please note that TOM products have not been tested or approved by regulatory agencies, and their use is at the user's own discretion.

Written information provided in this manual should be applied with caution due to the unique needs of individuals and potential changes in information over time. Choosing assistive devices should always be done under the assessment and guidance of licensed professionals. By using this library in any form, you assume all risk and liability associated with your participation.