Make:able Challenge

Workbook

Team Name

PrintLab

AUTODESK

www.makeablechallenge.com

This workbook is intended to be used alongside the Make:able Challenge Toolkit. It aims to support you in planning, implementing and documenting each stage of your design journey to design a 3D printed assistive device. For detailed instructions on filling in the workbook, refer to the guidance in the toolkit.

Introduction

01

Building your team and setting the foundations to begin the challenge.

Team Roles

Project Manager .....

Lead Designer .....

Video Creator .....

....

....

End User

Name

.....

Timeline

Preparation + Inspiration → *Empathy + Idea Generation* → *Design, Make + Iterate* → *Submission Preparation*

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Checklist

- [ ] I have read the brief and scanned the toolkit.
- [ ] I have assembled a team and allocated roles.
- [ ] I have identified an end user to design for.
- [ ] I have outlined an approximate timeline.

Notes

Get Inspired

02

Broaden your knowledge of 3D printed assistive technology and gain inspirational insights.

3D Printing + Assistive Technology

Why 3D printing for assistive technology?

Case Study Reviews

Case Study 1

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Things I enjoyed...

01 .....

02 .....

Case Study 2

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Things I enjoyed...

01 .....

02 .....

Case Study 3

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Things I enjoyed...

01 .....

02 .....

Checklist

- ☐ I can explain the benefits of using 3D printing for assistive technology.
- ☐ I have reviewed several case studies and made notes on things I enjoyed.

Notes

Skill Building

03

Developing new skills that allow you to bring creative ideas to life.

3D Printer Operation

Skill level in operating a 3D printer and its materials.

Beginner ○ ○ ○ ○ ○ Expert

Slicing

Skill level in using slicing software to set and adjust print settings.

Beginner ○ ○ ○ ○ ○ Expert

Basic 3D CAD

Skill level in navigating and using the basic tools in your chosen Autodesk design software.

Beginner ○ ○ ○ ○ ○ Expert

Design for 3D Printing

Skill level in generating 3D models that are suitable and optimised for the 3D printing process.

Beginner ○ ○ ○ ○ ○ Expert

Mechanisms

Skill level in designing models that incorporate connections and movement.

Beginner ○ ○ ○ ○ ○ Expert

Assistive Technology

Skill level in designing 3D printed assistive technology solutions.

Beginner ○ ○ ○ ○ ○ Expert

Design Thinking

Skill level in using creative problem solving and design thinking methods.

Beginner ○ ○ ○ ○ ○ Expert

Video Capture

Skill level in capturing video footage to document stories and journeys.

Beginner ○ ○ ○ ○ ○ Expert

Checklist

- ☐ I have selected a 3D design software to use.
- ☐ I have developed the necessary skills to design and make an assistive device for a real end user.

Notes

Develop Empathy

04

Gain a complete understand of your end user's challenges, needs and wants.

End User Disability

What do you know about your end user's disability?

Empathy Methods

Methods to use in the empathy phase.

Online Research ☐

User Interview ☐

Simulations ☐

Observations ☐

Challenge Map ☐

Empathy Map ☐

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..... ☐

Empathy Tips

Key things to remember/consider when developing empathy.

01 .....

02 .....

03 .....

Documentation Strategy

How the empathy phase will be documented.

Plan

When + Where? .....

Who + What? .....

Summary of Experience

Insights

Insight 1

Insight 2

Insight 3

Insight 4

Challenge Framing

How might we...

Initial Design Criteria

Criteria 1

Criteria 2

Criteria 3

Criteria 4

Criteria 5

Criteria 6

Checklist

- [ ] I planned and implemented a human-centred design strategy to develop empathy for an end user.
- [ ] I analysed and used data to frame design opportunities and initial criteria.

Notes

Idea Generation

05

Use your empathy studies to brainstorm a broad range of creative ideas.

Ideation Methods

Methods to use in the idea generation phase.

 Icon Sketching ☐

 Group Brainstorm ☐

 ..... ☐

 Priority Diagramming ☐

 Dot Voting ☐

 ..... ☐

Ideation Tips

Key things to remember/consider when generating ideas.

01 .....

02 .....

03 .....

Documentation Strategy

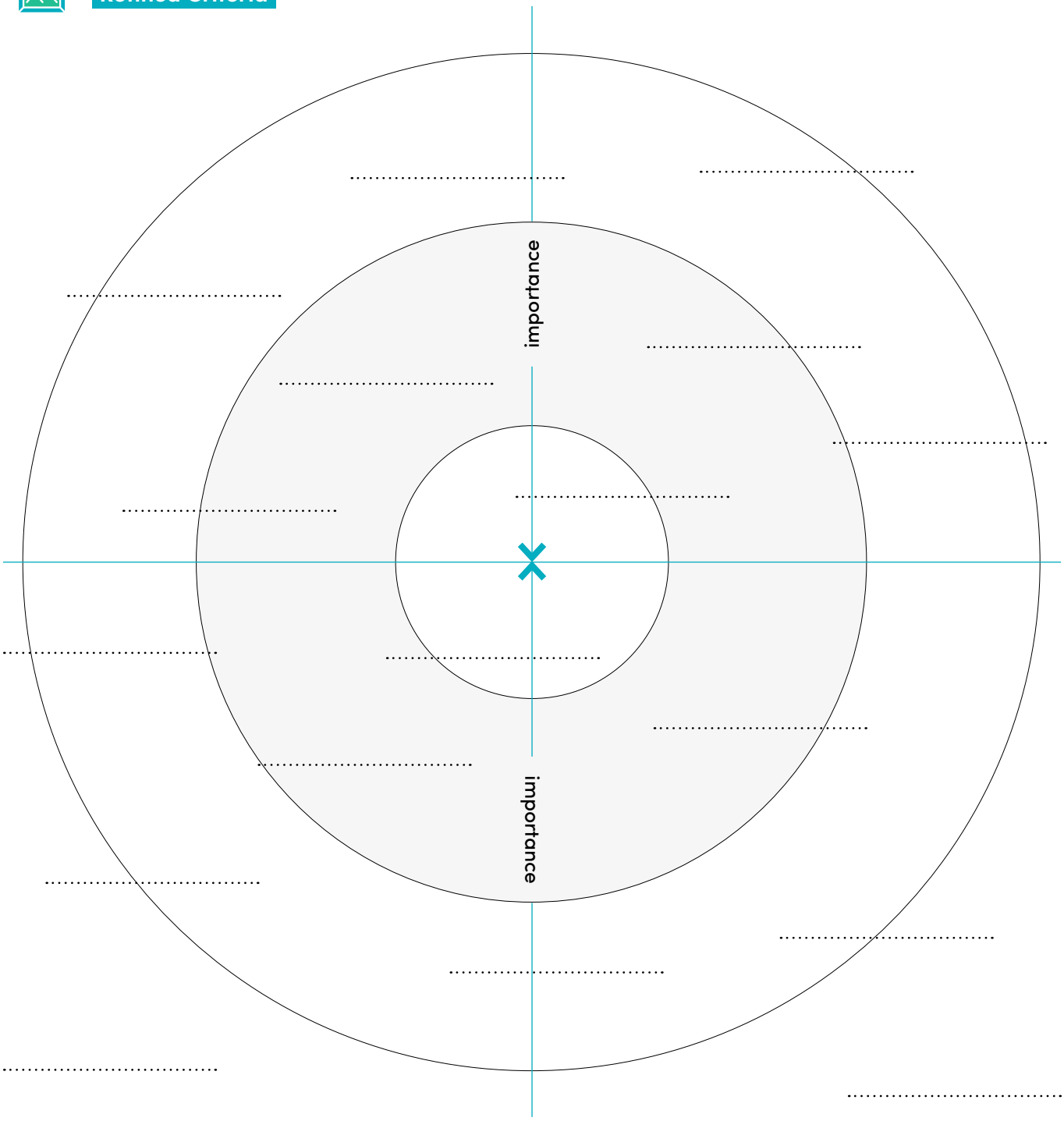
How the idea generation phase will be documented.

Ideas

Summary of Ideas

The Key Idea

Refined Criteria



Checklist

- [ ] I used divergent thinking to generate a broad range of design ideas.
- [ ] I used convergent thinking to narrow design ideas down to a single key idea.
- [ ] I determined necessary design criteria and features based on my end user's needs and wants.

Notes

Prototype

06

Transform your key idea into an initial 3D printed prototype.

Prototyping Methods

Methods to use in the prototype phase.

 Sketching ☐

 Rough Modelling ☐

 ..... ☐

 3D CAD ☑

 3D Printing ☑

 ..... ☐

Prototyping Tips

Key things to remember/consider when creating a prototype.

01 .....

02 .....

03 .....

Documentation Strategy

How the prototype phase will be documented.

Prototyping Process

Summary of Process

Prototype Description

Key Features

Feature 1

Feature 2

Feature 3

Checklist

- [ ] I developed visual concepts and low-fidelity prototypes driven by a set of design criteria.
- [ ] I developed a 3D printable digital model of an assistive device, based on my chosen concept.
- [ ] I used 3D printing technology to manufacture an assistive device prototype.

Notes

Test + Iterate

07

Go through iterative design cycles to test and refine your solution.

Iteration Methods

Methods to use in the iteration phase.

-  User Testing ☐
-  Roleplay/Simulation ☐
-  Survey ☐
-  Evaluation Matrix ☐
-  Importance Difficulty Matrix ☐
-  Feature Variation Models ☐
-  ..... ☐
-  ..... ☐

Iteration Tips

Key things to remember/consider when testing and iterating.

01 .....

02 .....

03 .....

Documentation Strategy

How the iteration phase will be documented.

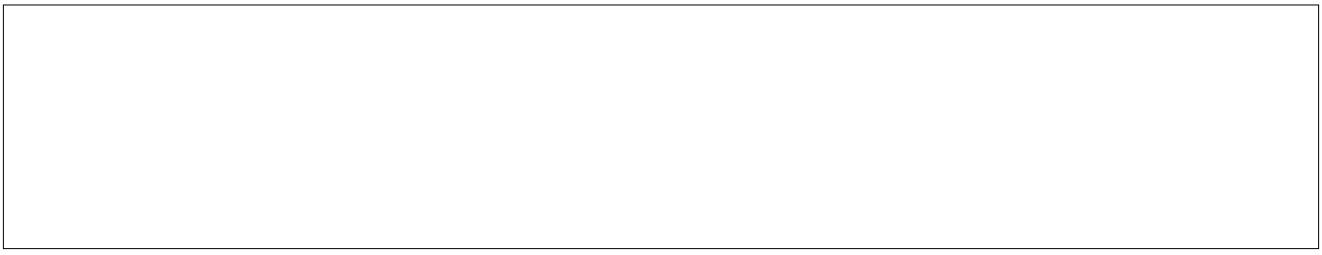
Iterations

Iteration 1

Iteration 2

Iteration 3

Iteration 4



The Final Product

Product Name

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Final Product Summary

Key Features

Feature 1

Feature 2

Feature 3

Feature 4

Feature 5

Checklist

- [ ] I evaluated the functionality, ergonomics, aesthetics and production methods of my prototype.
- [ ] I used my evaluation data to develop improved iterations of my prototype.

Notes

Share your Story

08

Share your entire journey in a 2-4 minute video submission.

Video Editing Software

OpenShot

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iMovie

☐

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☐

Main Narration Style

Voice over on top of footage

☐

Interview style - talking to the camera

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Text narration - no voice over or talking

☐

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☐

Main Music Format

Background music

☐

No music

☐

Switch between music and footage audio

☐

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☐

Video Editing Tips

Key things to remember/consider when creating your submission video.

01 .....

02 .....

03 .....

Storyboard

Scene 1

Scene 2

Scene 3

Scene 4

Scene 5

Scene 6

Scene 7

Scene 8

Scene 9

Scene 10

Scene 11

Scene 12

Checklist

- [ ] I have completed my final submission video and generated a shareable link.
- [ ] I have generated a share link (Tinkercad or Fusion) for my final digital 3D model file.
- [ ] I have captured a high-quality image of my final product.
- [ ] I have created a basic bill of materials and assembly instructions document (only required for multi-component products).
- [ ] I have had any relevant consent forms (parental consent or end user consent) signed and digitally scanned.
- [ ] I understand what model consent is and have made a decision on whether I'd like to share my design open-source.
- [ ] I have completed the Make:able Challenge by submitting my work through the online form in the 'Share your Story' toolkit!

Challenge Reflection