

A watercolor illustration of three children, two girls and one boy, working together on a project. They are gathered around a table, focused on their work. The child on the left is a girl with a blue beanie and a green and yellow striped shirt. The child in the middle is a boy with short dark hair wearing a yellow shirt. The child on the right is a girl with a ponytail wearing a blue shirt. They appear to be working with a large blue funnel or container on the table. The background is a simple, light-colored wall.

Unwaste

Team Unwaste

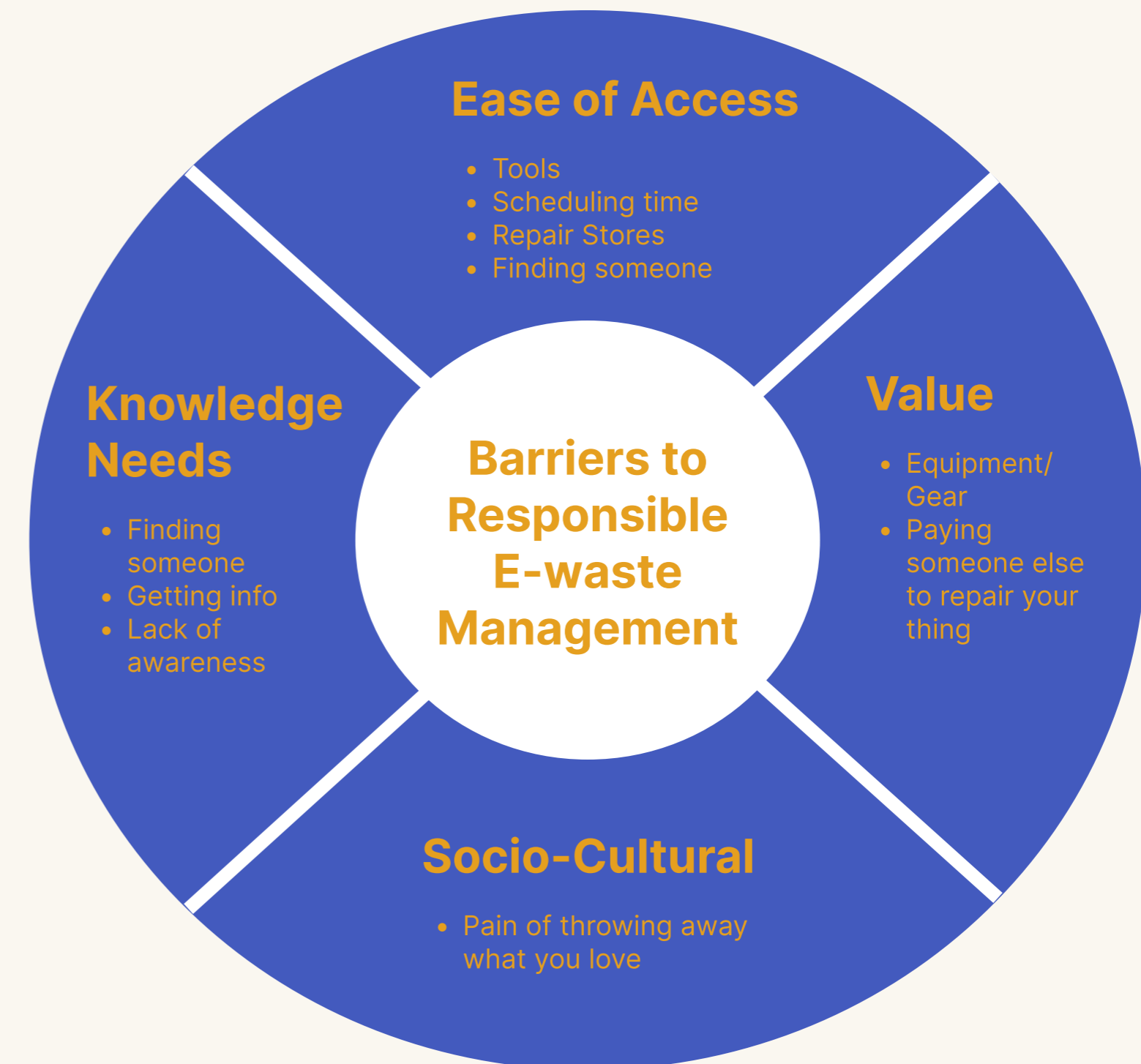
Mrinal Bhatia, Shraddha Jain,
Snehal Khatvkar, William Rutter

Barriers to responsible e-waste disposal behavior

At the time of e-waste disposal, there are two choices: *to dispose in a landfill* or *to retain*.

The reasons for retaining include:

- **Repair**
- **Repurpose**
- **Reuse**



Introducing **Unwaste**



UNWASTE, dedicated to fostering sustainable behaviors among children, crafts purposeful **missions and educational curriculum**. These missions empower kids to extend the lifespan of electronics through activities such as maintenance, repair, responsible disposal, and the collection and donation of electronics, effectively **diverting e-waste** from landfills.

UNWASTE provides **guidance and scaffolding** to empower them to **take the lead** in engaging with their communities. The organization streamlines processes for volunteering time, encouraging the formation of **collectives**, and fostering participation in various sustainable activities. UNWASTE is a catalyst for a community-driven approach towards a greener, more responsible future!

Research Learnings

While parents and kids share enthusiasm for repairing electronics, they lack the necessary skills or knowledge to do so.

“They love to watch. They love to ask questions.”

-Repair Cafe, Interview Participant

“When I was preparing that base to fix the music box, I showed the little girl- here's how we're gonna fix it up and she was just looking into it. Just was ecstatic. So I think that also gets that excitement that you know how it works, what is hidden behind.”

-Repair Cafe, Interview Participant





Selecting a mission

Before a chapter meeting, chapter leaders select missions for each member depending on:

- Member skills and interests
- Available items and equipment
- Ecological impact



Gathering mission electronics

Before the chapter meeting, chapter leaders and high-level, older chapter members gather the required repairable items for the mission.



Accomplishing the mission

During the chapter meeting, chapter members work together in small teams to complete their mission to repair or maintain or repurpose a piece of electronics.



Share out and mission report

Every mission is followed by a share out and mission report.

During **share-out**, each chapter member shares their mission accomplishments with the rest of the group. This encourages group learning and fosters camaraderie.

Mission report is an online form that chapter members complete with data about what they repaired. This is a key source of data for the service's smooth operation.



Electronics return or delivery

Chapter members deliver their handiwork, whether its the original owner or a new recipient. This experience is key to instilling a love of service in chapter members.



Leveling up

As chapter members complete missions, gain skills, and practice service, they level up to unlock new ways to learn, lead, and serve.

Discovering Unwaste



**Source: Waring ME, Blackman Carr LT, Heersping GE. Social Media Use Among Parents and Women of Childbearing Age in the US. Prev Chronic Dis 2023;20:220194. DOI: <http://dx.doi.org/10.5888/pcd20.220194>*

Registering a chapter

Unwaste SUPPORT

HOME MISSIONS **CHAPTER** VOLUNTEER

Find a Chapter

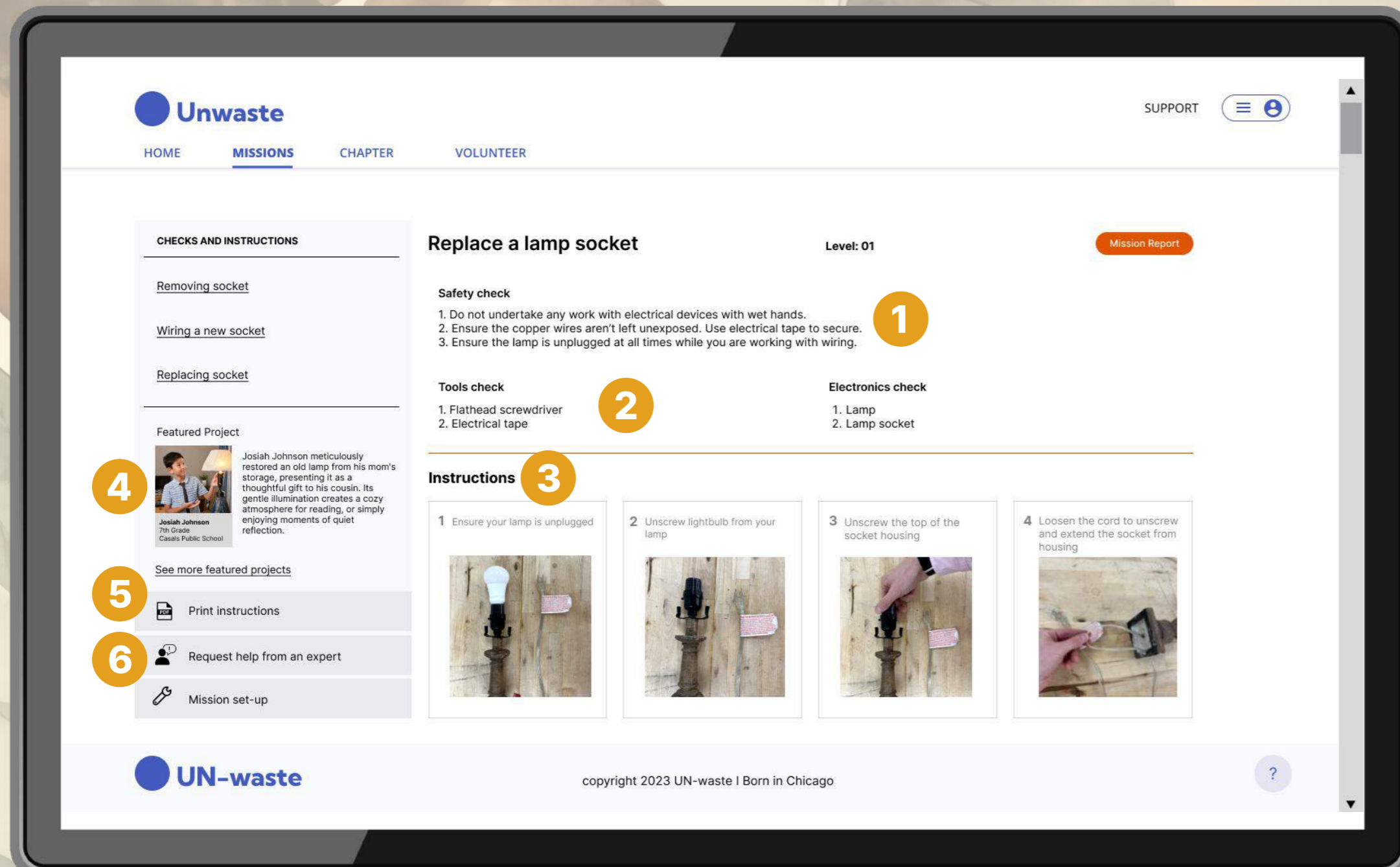
Make a New Chapter

Chapter Information	Chapter Leaders 1	Chapter Members 2
3 Chapter Name*	Chapter Leader Name*	Member name
Zip Code*	Email *	Member/Parent email
Meeting Address	Adult member Name*	Member name
First Planned Meeting Date	E-mail*	Member/Parent email
Affiliated Organization	+ Add adult members	Member name
4	+ Add adult members	Member/Parent email
		+ Add a chapter member
		5 Pay Here

*Mandatory Information

Unwaste copyright 2023 UN-waste | Born in Chicago ?

- 1** Chapters may have many adult members, but only one chapter leader.
- 2** Chapters must have at least one chapter member (children) to be registered.
- 3** Optional information on first meetings is used to provide follow-up services to ensure smooth early meetings.
- 4** Affiliated organizations like schools or churches, while not required, are highly recommended for the support they provide chapters.
- 5** Chapter registration fees are necessary to keep the service running, but are set as low as possible.



- 1 Missions always start with a safety check.
- 2 Necessary equipment and items come at the top so chapter members are set up for success from the beginning.
- 3 Missions explain repair and maintenance activities step-by-step with photos for maximum clarity.
- 4 Examples of members from other chapters serve as inspiration and create connections between chapters.
- 5 Instructions are also available in print.
- 6 If chapter members run into challenges that chapter leaders can't address, they can contact an expert volunteer for assistance.



Unwaste Collection Form

Brand/Model _____ Approx usage time _____

1

Issues with item _____

2

For return For donation

3

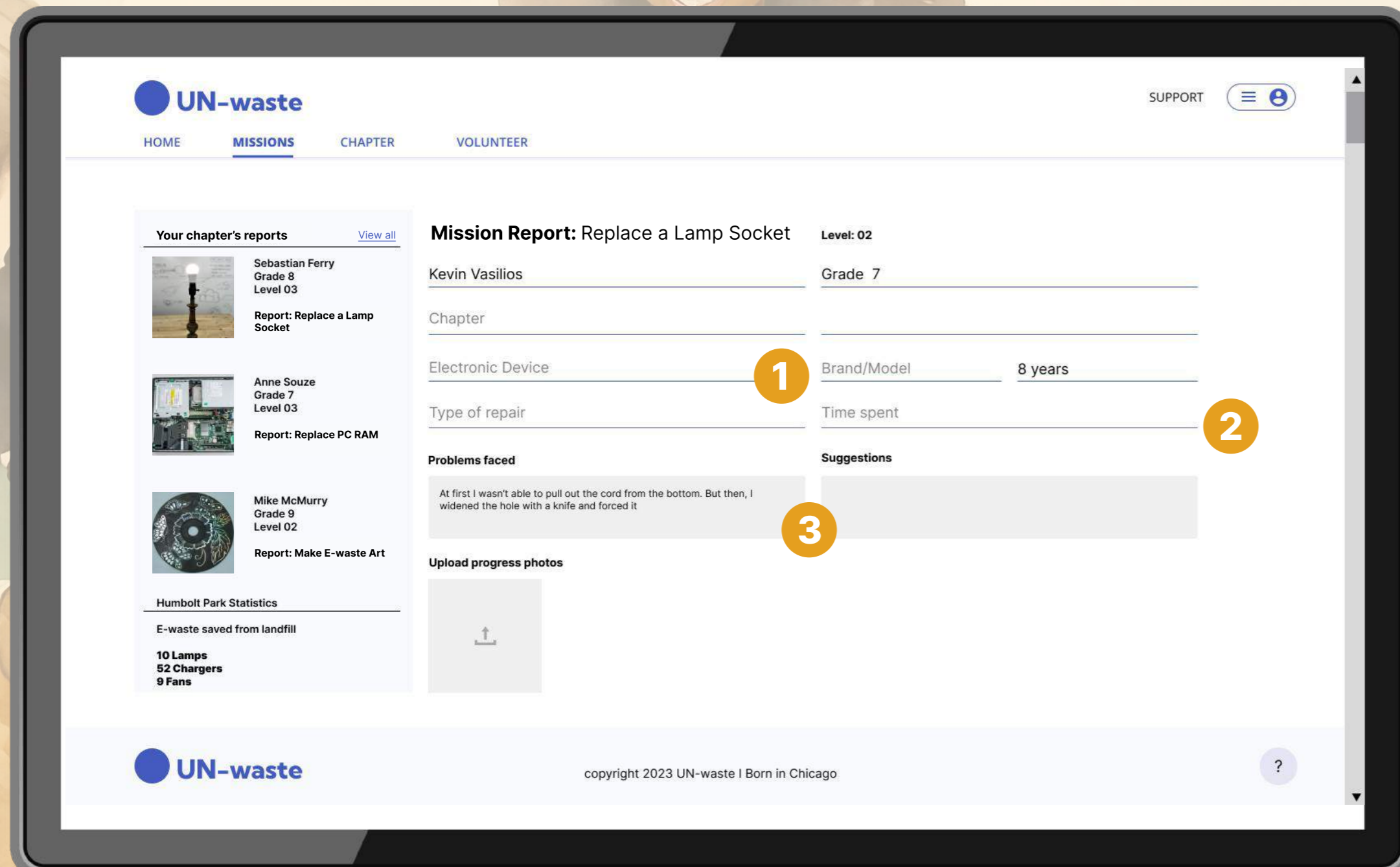
If for return, please enter contact info below

Name _____

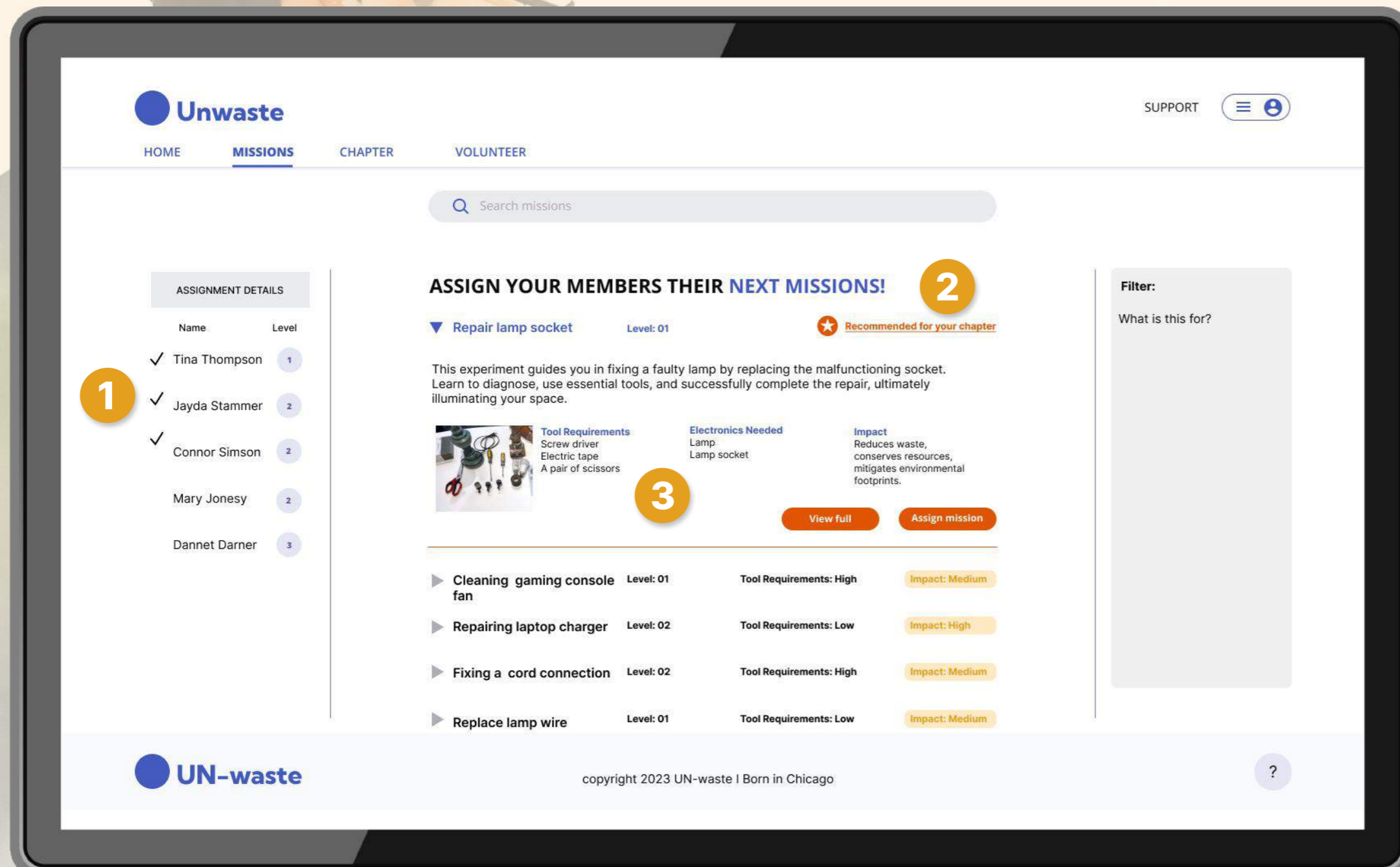
4

Email _____ Phone _____

- 1 Collection form outlines type of item donated and what is wrong/malfunctioning about it.
- 2 Usage time metrics are collected to better understand how long electronics stay in circulation and develop e-waste data.
- 3 User marks whether they expect this item to be returned, or if it is a donation.
- 4 If marked for return, contact information is collected in order to arrange delivery.



- 1 Mission report captures information about the brand, model of electronics, and type of failure repaired, which can then be used to improve missions and published for use by manufacturers and regulatory entities.
- 2 Mission report also records the amount of time spent on missions, as they may be counted toward service hours for school.
- 3 Mission report logs any problems faced by the chapter member. These problems can then be addressed in new mission versions.



- 1 Missions are assigned to groups of chapter members based on level and interests.
- 2 Recommended missions are based on data available about the availability of items and needs of the chapter's locality.
- 3 Mission descriptions include required items and tools as well as impact to aid chapter leaders in their choice.



Return

Items marked for return will be used for a repair or maintenance oriented mission and then hand-returned to the owner using contact information on the collection form.



Donation

Items marked for donation can be used for repair, maintenance, or creative missions. These items are **delivered or distributed at a donation fair** to new owners in the chapter community.

Unwaste Level System

Curricula:

Electronics

Civic/leadership

Level 1

Recommended
Ages 7 and up

Customization and connection

Decorating and accessorizing your own electronics.

E C

Easy fixes & maintenance

Fraying wires, etc.

E

Responsible disposal basics

Recognizing when and how to dispose of electronics properly.

E C

Level 2

Recommended
Ages 12 and up

Basic electronics fixes

Lamps, fans, toasters, etc. What can be fixed, and what needs to be disposed of

E

Beginning to repair and make things for other people

Understand the responsibility and duty inherent in repairing things for others.

C

Level 3

Recommended
Ages 12 and up

Complex electrical devices and machines

Microwave ovens, basic radios, speakers, etc.

E

Basic circuit repair

Circuit boards, electrical components, and what to do when they fail.

E

Teaching younger and less experienced members.

Sharing your experience to help other members.

C

Level 4

Recommended
Ages 14 and up

Basic computer maintenance, repair, and customization

Cleaning fans, diagnosing simple hardware faults, upgrading personal computers.

E

Introductory leadership roles

Co-organizing and publicizing chapter events like donation fairs, helping with missions item collection, etc.

C

Level 5

Recommended
Ages 16 and up

Advanced computers

Laptops, highly specialized electronics like digital cameras.

E

Addressing software-related computer issues

Diagnosing and resolving software issues like viruses.

E

Executive Leadership Roles

Organize chapter meetings with minimal oversight, select missions for young members, nearly a chapter leader.

C

The Impact of Unwaste

Impact: Unwaste and the 5R's

Reduce

Through maintenance and repair, Unwaste reduces the need to purchase new electronics and keeps old electronics out of the trash.

Example



Unwaste mission: replace a lamp socket

Reuse

Through donation options, Unwaste allows repaired and maintained electronics to be reused by individuals who need them instead of making their way into trash.

Example



Unwaste electronics donation fair

Repurpose

Creative missions repurpose components of donated, often irreparable items into new, useful items, such as art of various types.

Example



Unwaste mission: create e-waste art

Recycle

Responsible disposal—i.e. recycling—of electronics is a core piece of Unwaste curriculum throughout the member levels.

Example

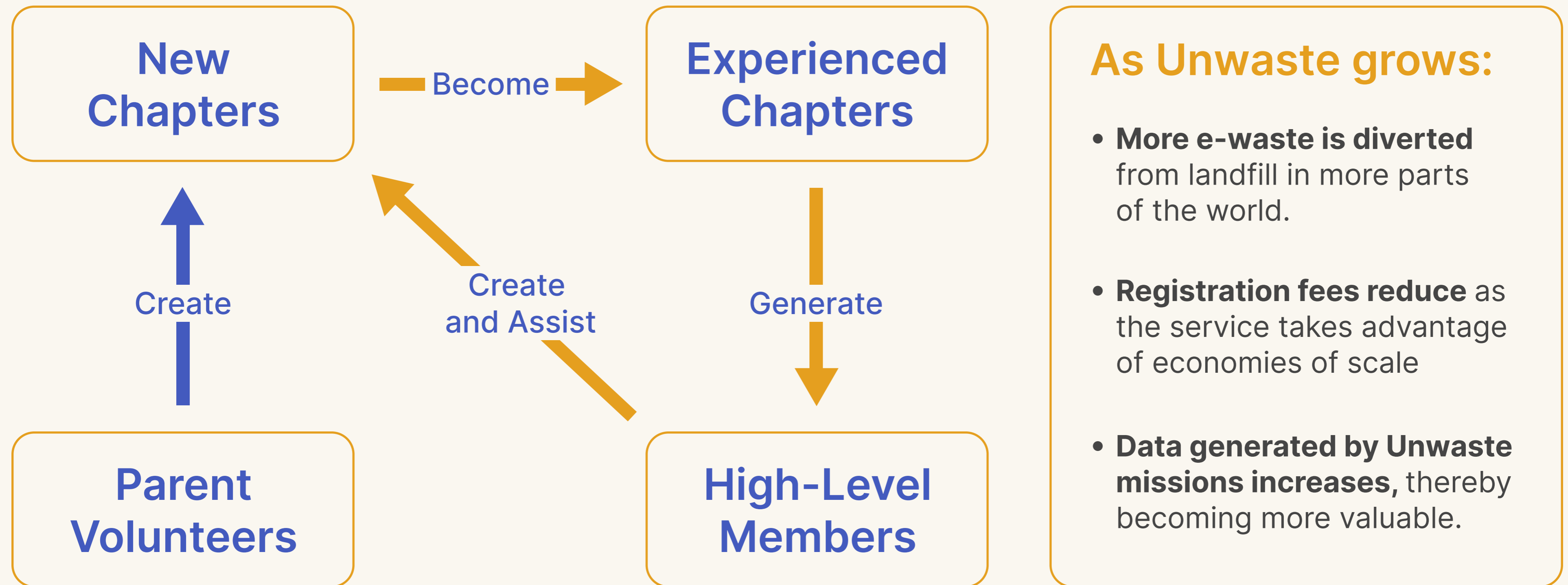


Unwaste mission: bring irreparable e-waste to your local waste station

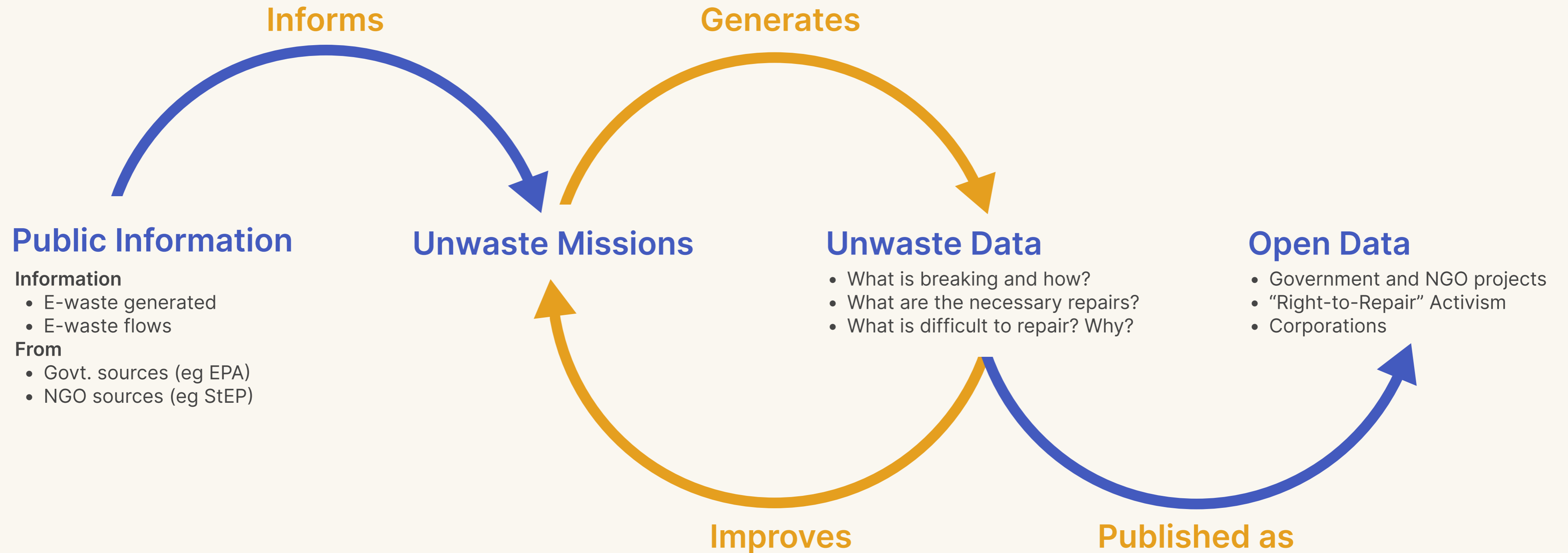
Reclaim

Reclamation, due to toxicity and equipment restrictions, is out of scope of Unwaste.

Impact: Unwaste at scale



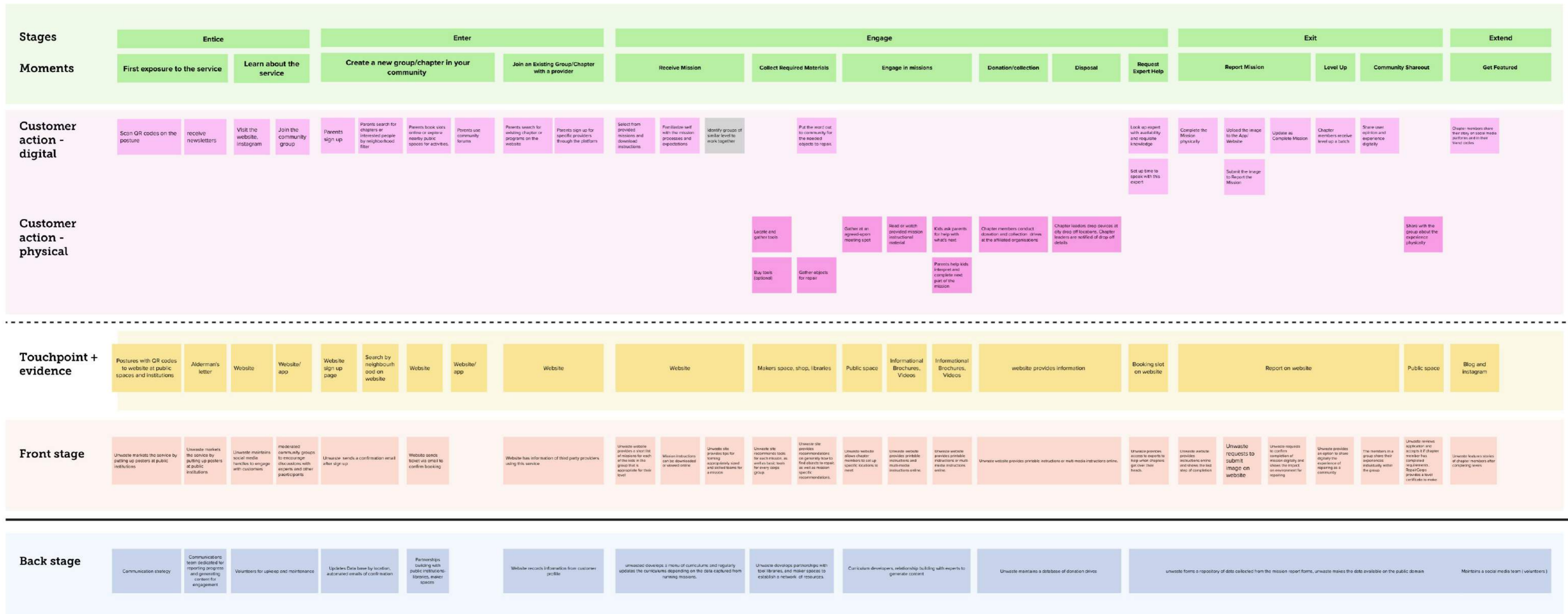
Impact: Unwaste with data



Unwaste: let's fix e-waste, together.

Questions & thoughts

Appendix A: Service blueprint



Appendix B: Most Common Types of E-Waste

Item	Million kilograms	Million pieces
Personal care equipment, e.g. toothbrushes, hairdryers, razors	391	711
Small IT equipment, e.g. routers, keyboards, external drives	763	1891
Small consumer electronics, e.g. headphones, remote controls	347	910
Speakers	620	280
Small lighting equipment, e.g. LED lamps	365	4118
Household tools, e.g. drills, saws, lawn mowers	1047	421
Toys, e.g. car racing sets, electric trains, drones, musical toys	3234	7294
Household medical equipment	3	14
Household monitoring, e.g. heat and smoke alarms	1336	5476
Cables	950	n/a
Total Invisible E-waste	9055	

Source: <https://www.newsweek.com/toys-top-common-electronic-waste-recycling-1833565>

Appendix C: Image Sources

Mission Instructions Mockup:

- Featured Project: Adobe Firefly

Mission Report Mockup:

- CD Art Photo: <https://www.instructables.com/CD-Art/>
- PC Photo: <https://www.crucial.com/articles/about-memory/how-to-upgrade-desktop-memory>

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