

PROJECT FOUR: MILESTONE 2 – COVER PAGE

Team Number: 

Thurs-51
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Please list full names and MacID's of all *present* Team Members.

Full Name:	MacID:
Maryam Butrus	butrusm
Areeb Jamal	jamala19
Amanda Pilgrim	pilgra1
Jeremiah Musselman	musselmj

## MILESTONE 2.1 – CLIENT NOTES

Team Number: Thurs-51

You should have already completed this task individually prior to Design Studio/Lab B for Week 8.

1. Compile your team's notes from the client Q&A visit.

Jeremiah:

- Any particular chores that are harder?
  - o 'Everything' is more difficult
  - o Fine motor skills
  - o Bending at the waist
    - Squatting is helpful but tiring
- Is there an approximation for weight you can lift?
  - o About 5-10 pounds is reasonable
- Do you plant seeds or plants?
  - o Prefers to plant seeds, but has done plants
- Do you plant from a raised plant bed?
  - o Not anymore, but she used to
  - o Has an indoor and an outdoor garden
- What do you garden?
  - o Vegetables (not sure if she will anymore)
    - Impatient
  - o Medicinal herbs and flowering plants
- Range of motion of hands?
  - o When having spasms, limited range of motion
  - o Holding things can become uncomfortable after a long time
- Do you have any allergies?
  - o Allergic to gluten
  - o Allergic to some pre-primed canvas
  - o Cautious with chemical components
- Is it hard to bear the weight of your arm
  - o Lymphedema is in arms *and* torso
  - o Muscles get exhausted very quickly from just her arm
    - Even harder when holding something
- When the lymphedema flares, what happens?
  - o Has been able to catch flares early recently

- o 1-2mm of swelling
- Are there some things that are easier to do than others?
  - o Much easier to extend then to grasp
  - o It is easier to lower arm then raise it
- Do you have a preference for portability vs function?
  - o No preference
  - o Wants something that she can use on her own without help
- Are there any motions that don't cause pain?
  - o Non-repetitive motion
  - o Holding things for long periods of time is what hurts

Maryam:

- Does not have any preferences when it comes to materials but would benefit from any type of strong materials such as metal to help with the feeling of dizziness and nausea.
- Wrist size: 5.75 inches on both left and right
- Is allergic to:
  - gluten
  - pre-primed canvas
- Gardens indoors and outdoors
- Likes to garden different types of things such as:
  - medicinal herbs
  - flowers
  - vegetables.
- Would like to use actual seeds for gardening but is currently buying plants.
- Her lymphedema is currently maintained but it does affect the abilities in her arms to hold things for a long period of time. It also causes:
  - arm tightness
  - heaviness/fullness
  - discomfort
  - reduced limb control.
- She is unable to support her own weight which is why she sits on the floor to work on her paintings.
- Easier for her to hold onto handles that are thicker (big painting brush vs small painting brush).
- Can carry up to 10 pounds of weights without major difficulties.
- Prefers to use an oblique grip method as it makes it easier to control with her hands.

Amanda:

- Holding a paint brush in a different way would need adapting. But detailed work involving fine lines would be more difficult.
- How does pain differ using different joints?
  - Hands not currently impacted. Ultrasounds done on hands.
- What daily activities are more difficult?
  - Everything
  - Anything involving fine motor skills with hands or bending at the waist.
    - Easier to stand and wash dishes then bend and fill dish washer.
- In terms of work, what size paintings are completed.
  - Largest about ten feet by ten feet. Not a canvas. It has nine panels put together with weaving.
- Lifting heavy objects
  - Maximum load is five to ten pounds.
- Paint only in studio. There is an area connected to studio which is meditation and movement space.
- Gardening
  - Plants are grown from seeds preferably. But she currently gets them from plants.
  - Run children's community center for gardening.
  - Garden is indoor as well as outdoor space unplanted.
  - Previously grown vegetables. Not enough patience right now.
    - Medicinal herbs and flowering plants. Wants to plant more flowers.
- Range of motion when hands are in pain.
  - When having muscle spasms hand freezes up giving limited range of motion.
    - Sometimes can't even hold the paint brush.
  - Range of motion isn't as bad as gripping for a long period of time.
- Set up of painting on floor.
  - Sometimes closer to ground because can't stand, uses cushion under her and props canvas on stool.
  - On floor uses floor to hold body up. Easier to put body down sometimes.
- Painful things include repetitive prolonged movement. Holding something isn't bad but actually needing to do something with it is difficult.
- Allergies
  - No gluten. Pre primed canvas with flour-based paste.
  - Cautious of chemicals. Reacts to things unpredictably.
- Wrists are small. Right wrist (dominant) is 5 and three quarters inches at base. Left wrist is the same.
- Uses variety of brush sizes when painting. Finger painting at some point during each piece.
- The weight of own arm can be a lot of work as well.
  - Lymphedema in arms and torso.
  - Muscles get exhausted just holding up own arm not only from holding objects.

- Length and width of hand. From tip of middle finger to where wrist starts and horizontally across crook of thumb to outer finger area.
  - Six and a half inches.
  - Four inches.
- Are there some actions easier to perform than others?
  - Easier to extend than to grasp.
  - Easier to pull arm downwards than to lift it up.
- Any specific daily activity or task that would have the best impact on your life if regained.
  - Painting because she has a need to leave the world a better place through painting to communicate with the world.
- To instantly relieve pain in hand.
  - Shake hand out, sometimes shake the entire arm plus hand.
  - Run hands under warm water but not hot.
  - Opening fingers and extending them does not cause pain.
- Prefers a bigger grip than a small one on paint brushes.

Areeb:

- Alanna helped in a free summer camp for gardening and has a lot of experiences with plant beds.
- She plants indoors and has space outdoors to plant.
- Had previously grown vegetables, but she does not know if she has the patience for it right now
- Likes to grow medicinal herbs and flowering plants: she would love to plant more flowers
- “The more flowers the better”
- She used to plant pre grown but she would love seed planting
- Had trouble with small brushes. She explains the pain does not let her hold the position for a length of time. She can grip but after gripping for a period is difficult.
- Working with the arthritis society, nothing is that painful to do; basic tasks are fine.
- Cannot work with gluten, some pre primed canvas have flour-based paste involved in the priming process so she keeps an eye out for that.
- Nothing that she can name that she is directly allergic to, but she is usually cautious with chemical products.
- Bearing the weight of her own arm is sometimes a lot of work.
- Lymphedema affects her torso and not only in her arm. As she is weight bearing, she can feel it in her pectoral muscle and the lat muscles in her back and they get exhausted quickly.
- The closer she is to the ground the less she feels dizzy and nauseous.
- Length and width of her hand are 6.5 inches and 4 inches, respectively.
- Wrists are small, both being 5 and  $\frac{3}{4}$  inches at the base.

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## MILESTONE 2.2 – RESEARCH ASSIGNMENT

Team Number: 

Thurs-51
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You should have already completed this task individually prior to Design Studio/Lab B for week 8.

1. Copy-and-paste each team member's research assignment on the following pages (1 assignment per page)
  - Be sure to indicate each team member's Name and MacID

**See individual worksheet for assignment specification.**

We are asking that you submit your work on both the team and individual worksheets. It does seem redundant, but there are valid reasons for this:

1. Each team member needs to submit their research assignment with the **Milestone Two Individual Worksheets** document so that it can be *graded*
2. Compiling your individual work into this **Milestone Two Team Worksheets** document allows you to readily access your team member's work
  - a. This will be especially helpful when completing the rest of the milestone

Team Number: **Thurs-51**

Name: Maryam Butrus	MacID: butrusm
<p><i>Include your research assignment below.</i></p> <p><i>Question: What is lymphedema and how does it affect patients?</i></p> <p><i>What is your answer?</i></p> <p>Lymphedema is a non-healing, progressive swelling due to a compromised lymphatic system, affecting up to 250 million patients worldwide [1]. As advancement continues to be made in the treatment of breast cancer, patients and health care professionals are focused on post-treatment quality of life [2]. A thorough understanding of and treatment of breast cancer-related lymphedema (BCRL) is also mandatory for all healthcare providers [2]. BCRL, a feared risk to breast cancer treatment, arises from lymphatic system dysfunction that prohibits proper drainage from lymphatic vessels, allowing protein-rich lymph fluid to collect in the interstitial zone [2]. This extra fluid can cause excessive swelling in the breast or upper limbs [2].</p> <p>Depending on the level of lymphedema, signs of BCRL could include arm tightness, heaviness/fullness, discomfort, and reduced limb control [2]. In addition, adipose deposition and fibrosis will occur as BCRL progresses [2]. BCRL adversely affects the quality of life of a patient, inducing increased rates of stress and anxiety in addition to physical disability relative to non-BCRL patients [2]. Patients experience the ill effects of the low quality of life because of weakness and diminished scope of movement because of the growing swelling [2]. Extreme cases of swelling can be promptly intervened by a special “back rub” procedure known as Manual Lymphatic Drainage (MLD) [2]. Constraints of MLD include long travel distance, the expense of ordinary treatment meetings, and the absence of lymphedema healthcare specialists [2].</p> <p>Apart from long-term health complications, lymphedema often triggers severe neurological and social problems for patients. Affected women may have diminished self-confidence as a result of skewed body perception, and negative feelings are frequently identified, including distress, dissatisfaction, depression, rage, terror, and elevated self-consciousness [3]. As a result, the emphasis on quality of life and patient-reported output measures has intensified over the last decade [3]. Most of the Arm Symptoms lead to discomfort, heaviness, swelling/weight, lack of strength, tingling/burning/pins and skin issues, increased arm and mobility challenges, and the desire to wear clothing of choice as significant daily problems [3]. The need to wear pressure sleeves are seen as hindrances today by day life and the current items are portrayed as "horrible everyday reinforcement", awkward, tight, influencing garments wearing and patients' distress is depicted by descriptors, for example, "hurting," "greatness," and "pulling" [3]. Numbness, dehydration with scratching or sweating with itching, and the chance of bacterial or fungal infection are the most reported skin issues due to the lack of a pH-neutral moisturizer and an antibacterial coating in existing devices [3].</p> <p>It is very important to comprehend the danger factors affecting BCRL as well as to utilize this information to advise precaution measures and analytic methodologies [3]. This research gives us</p>	



an insight on some of the complications that our client, Alanna, is facing in her day-to-day life caused by lymphedema. It is helpful to know the effects that lymphedema might have on Alanna and try and design a gardening tool that takes those complications into account.

*List of sources:*

[1] H. J. Yoo, W. Kim, S.-Y. Lee, J. Choi, Y. J. Kim, D. S. Koo, Y. Nam, and K.-J. Cho, "Wearable Lymphedema Massaging Modules: Proof of Concept using Origami-inspired Soft Fabric Pneumatic Actuators," 2019 IEEE 16th International Conference on Rehabilitation Robotics (ICORR), 2019.

[2] T. C. Gillespie, H. E. Sayegh, C. L. Brunelle, K. M. Daniell, and A. G. Taghian, "Breast cancer-related lymphedema: risk factors, precautionary measures, and treatments," *Gland Surgery*, vol. 7, no. 4, pp. 379–403, 2018.

[3] K. Wang and A. Kopsini, "Design of an Innovative Medical Device to Improve Quality of Life in Lymphedema Patients," *Proceedings of the 13th International Joint Conference on Biomedical Engineering Systems and Technologies*, 2020.

Team Number: **Thurs-51**

Name: Areeb Jamal	MacID: jamala19
<p><i>What is your question?</i></p> <p>What is fibromyalgia? What are some physical and mental restrictions that come with it?</p>	
<p><i>What is your answer?</i></p> <p>Fibromyalgia is a chronic, nonarticular pain syndrome, and generalized pain in tender points [1]. It is the diagnosis given to individuals with widespread musculoskeletal pain for which no alternative cause, such as tissue inflammation or damage, can be identified. It is now believed to be a disorder of central pain processing that produces strong responses to painful stimuli [2]. Until around a decade ago, fibromyalgia and other pain conditions were all on somewhat of a flimsy scientific ground. Within a relatively short time however, innovations, imaging, and genetics have led to the advances in the understanding of these conditions [1]. The diagnosis, and evaluation of an individual with chronic pain is a complex process because within any given pain diagnosis, there is a very large scale of what the underlying cause could be. Commonly, a careful musculoskeletal history and examination is deemed as very important in the pain diagnosis process [2].</p> <p>Common symptoms include sleep disturbances, fatigue, headache, morning stiffness, paresthesia's, and anxiety. Fibromyalgia is a common rheumatic disease that is often under diagnosed. A rheumatic disease is a term used for conditions that affect one's joints, tendons, ligaments, bones, and muscles [3]. These musculoskeletal diseases are commonly different types of arthritis [1]. Reasons for previously listed symptoms are seen to be environmental factors along with genetics. In some cases, psychological and behavioral factors are also in play [2].</p> <p>Fibromyalgia is usually considered a disorder of women 20 to 50 years of age; however. It also has been observed in males, children, adolescents, and older people. It is more common in relatives of previous patients with it proving to the theory that it has a contribution of both genetic and environmental factors [1]. First degree relatives are an 8-fold greater risk compared with the general population. Some examples of environmental factors are physical trauma, certain infections (e.g., hepatitis C, parvovirus, etc.), and emotional stress [2].</p> <p>The main physical restrictions due to fibromyalgia is pain in multiple locations, and overall fatigue. Specifically, it tends to cause low back pain which often radiates to the buttocks and legs. Other complaints of tightness/soreness in the upper shoulders and neck area have been very common. The pain is often described as burning, stiffness, or aching [1]. Some cases of fibromyalgia have been associated with irritable bowel syndrome (IBS), irritable bladder syndrome, interstitial cystitis, and temporomandibular disorder (TMD) [2].</p>	

Mentally, fibromyalgia affects cognitive functions such as memory problems, loss of words, and occasionally affects vocabulary. Light-headedness, dizziness, anxiety, or depression are all also common with fibromyalgia [1].

Through this research, we can come to design solutions to help Alanna's gardening, while working around her physical and mental limitations due to fibromyalgia.

*List of sources:*

- [1] S. Chakrabarty and R. Zoorob, "Fibromyalgia," 2007. Accessed: Mar. 07, 2021. [Online]. Available: [www.aafp.org/afp](http://www.aafp.org/afp).
- [2] "Elsevier Enhanced Reader."  
<https://reader.elsevier.com/reader/sd/pii/S0002934309008237?token=CD67F0A514A93BDCB5751813D862F6F6871AFB54F6C6CAA6363AD728CF15987BDDC8405C8F4A4DBF2012842C4B5FF193> (accessed Mar. 07, 2021).
- [3] "Rheumatic Diseases: Types, Causes, and Diagnosis."  
<https://www.webmd.com/rheumatoid-arthritis/an-overview-of-rheumatic-diseases>  
(accessed Mar. 07, 2021).

Team Number: **Thurs-51**

Name: Amanda Pilgrim	MacID: pilgra1
<p><i>What is your question?</i></p> <p>What is spinal arthritis and how could it cause challenges throughout a person's daily life?</p> <p><i>What is your answer?</i></p> <p>Spinal arthritis is an inflammation of the facet joints in the spine or the joints between the spine and the pelvis.[1] It can sometimes even affect the sites where ligaments and tendons attach to the bones of the spine.[1] This can be extremely painful and often times it becomes chronic, meaning it is constantly reoccurring. [1]</p> <p>There are various symptoms for spinal arthritis, and they may even differ from person to person. Some of the general symptoms include back and neck pain, especially in the lower back.[2] The client with spinal arthritis mentioned that it was painful for her to bend at the hips, which is most definitely an affect of her spinal arthritis. Another symptom includes having stiffness or loss of flexibility in the spine.[2] This can make it difficult for a person to do the simplest tasks such as, straighten their back. A third symptom of spinal arthritis is whole-body weakness and fatigue.[2]</p> <p>Having spinal arthritis can raise all kinds of problems when it comes to completing normal everyday tasks. Our client may have troubles performing simple hobbies such as painting and gardening. Gardening requires a person to bend down low to the ground to plant flowers and seeds. However, a problem is raised when a person is met with extreme pain just by moving their back slightly. Therefore, if a person with spinal arthritis were interested in gardening, they would have problems when it comes to actually planting. A second problem is the weakness and fatigue, spinal arthritis causes a person extreme tiredness making it difficult to even get out of bed some days.</p> <p>Spinal arthritis can also contribute to other issues in the spine.[1] One of these potential problems is bone spurs, which is an overgrowth on the edges of bones.[1] Bone spurs tend to affect facet joints the most, this condition is called facet joint hypertrophy.[1] Bone spurs could narrow the passages for the spinal cord and the nerves exiting the spine which can lead to two extremely painful conditions. First spinal stenosis, this is a compression of the spinal cord inside the spinal canal and second radiculopathy, which is the pinching of the peripheral nerves as they exit the spine.[1]</p> <p>There are many factors to consider when getting spinal arthritis treated (age, pain level, type, severity, etc..). The joint damage caused by arthritis is irreversible, therefore the treatment is more focussed on stopping further damage and managing the pain.[3] Various treatments can include nonsteroidal anti-inflammatory drugs and corticosteroids, which reduce the pain and</p>	

swelling.[3] Physical therapy is also another option for treatment to help improve the muscle strength in the persons back as well as improve the range of motion in the spine.[3] Therefore, the treatments for spinal arthritis are not ideal but they do help a little.

*List of sources:*

- [1] “Spinal Arthritis (Arthritis in the Back or Neck) | Johns Hopkins Medicine.” <https://www.hopkinsmedicine.org/health/conditions-and-diseases/spinal-arthritis> (accessed Mar. 11, 2021).
- [2] “Symptoms of Arthritis of the Spine.” <https://www.spine-health.com/conditions/arthritis/symptoms-arthritis-spine> (accessed Mar. 11, 2021).
- [3] “Arthritis of Spine Treatment from Experienced Spinal Doctors and Specialists | Spine Arthritis Services for Severe Arthritis in Back in Northeast Ohio | University Hospitals.” <https://www.uhhospitals.org/services/spine-services/Conditions-and-Treatments/arthritis-spine> (accessed Mar. 11, 2021).

Team Number: **Thurs-51**

Name: Jeremiah Musselman	MacID: musselmj
<p><i>What are the symptoms and treatments for spondylitis and what are the physical limitations that apply to our problem?</i></p> <p>Ankylosing Spondylitis (AS) is a rare type of arthritis that causes pain and stiffness in the spine [1 par 1]. AS is an ‘uncurable’ disease, but its symptoms can be treated with medication and exercise [1 par 3]. Often diagnosed in individuals fifteen to thirty years old [2 par 6] and starting in the sacroiliac joints (lower back area), AS can eventually make its way up to the lower neck [1 par 4]. Patients with AS will typically be affected in places where tendons and ligaments attach to bones [1 par 4], as well as in the vertebrae, where small bones can fuse together [3 par 1]. In addition to the lower back, individuals may experience discomfort in the shoulders, hands, ribcage, hips, thighs, and feet [1 par 5]. More symptoms include tiredness, trouble breathing, swelling of the joints, and pain in the mornings [1 par 6]. These physical symptoms make gardening, an activity which traditionally requires mildly intense exertion and bending of the waist, very difficult for our client.</p> <p>AS can make everyday tasks challenging or even impossible to complete; yard work can be very hard on the backs of individuals with AS, as well as vacuuming, cleaning, and other chores [3 par 7]. Patients with AS should “invest in tools to make housework easier” [4 par 10], such as a handle-extender on a lawnmower. Individuals should avoid heavy lifting and physical activity that strains the back; however, the right kind of exercises can make patients feel better [2 par 10-11]. A daily exercise routine, especially in water can prove to be very helpful [1 par 21]. Patients must consider the range of motion and strain of an activity or task before tackling it [4 par 13]. Charis Hill, an individual with AS, stays active by maintaining a small garden in her backyard and says it is important to find happiness in things you are passionate about even if it is challenging [5 par 3-4].</p> <p>Prescription anti-inflammatory drugs help most people with AS but can lead to harmful side effects [1 par 16]. Another treatment method is physical therapy: practicing good posture, how to stretch, and other techniques [1 par 18]. Good posture could involve utilizing <i>ergonomic</i> assistive tools when completing an otherwise challenging task. Moving forward, it will be important in the design process to consider these physical limitations, and create a product built around the specific client’s condition. Certain concepts will have to be discarded or modified to compensate for her spondylitis.</p> <p>References:</p>	

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- [1] M. Smith, “What is Ankylosing Spondylitis?” WebMD, October, 2020. [Online]. Available: <https://www.webmd.com>. [Accessed March 2021].
- [2] A. Pietrangelo, “Ankylosing Spondylitis: Myths and Facts,” Healthline, December, 2019. [Online]. Available: <https://www.healthline.com>. [Accessed March 2021].
- [3] A. McDermott, “Reasons Why Some Household Chores Can Make Your AS Symptoms Worse,” Healthline, July, 2020. [Online]. Available: <https://www.healthline.com>. [Accessed March 2021].
- [4] “Ankylosing Spondylitis,” Mayo Clinic. [Online]. Available: <https://www.mayoclinic.org>. [Accessed March 2021].
- [5] C. Hill, “Staying Active with Ankylosing Spondylitis,” WebMD. [Online]. Available: <https://www.webmd.com>. [Accessed March 2021].

\*If you are in a team of 5, please copy and paste the above on a new page.

## MLESTONE 2.3 – REFINED PROBLEM STATEMENT

Team Number: **Thurs-51**

1. Write your initial problem statement below. This is what you have submitted for Milestone 1.2.

Design a system or mechanism to help Alanna comfortably and efficiently garden, considering her immobility and physical challenges.

2. Outline the Who, Where, Why, and What elements of your problem statement. Then write the refined problem statement below. Refer to the provided Refined Problem Statement rubric provided.

- Who? – Alanna, an individual with various physical disabilities.
- Where? – Alanna's backyard garden
- Why? – She had to stop gardening due to physical limitations, so we want to help her get back into gardening and doing the things she loves.
- What? – A mechanism or device that makes gardening more comfortable and efficient for the client.

Refined Problem Statement:

Design a system or mechanism to help Alanna comfortably and efficiently garden in her backyard, considering her immobility and physical challenges, so she can do the things she loves again.

\*Refined problem statement includes 'why'



## MILESTONE 2.4 – FUNCTIONAL ANALYSIS

Team Number: **Thurs-51**

1. Identify your team's choice of design tool to perform Functional Analysis and the rationale behind choosing it. For examples of design tools, see lecture on Monday March 8<sup>th</sup>.

Choice: Morph Chart

Rational: A morph chart provides an organized approach to coming up with different concept to open the search for solutions to a defined design problem. The morph chart has several benefits over less formal approaches such that, it can allow us to find new relationships or configurations, that might not be so obvious, or something we might have missed by other, less formal, approaches.

2. Include a copy of your team's functional analysis below.

Function	Means			
Dig a hole	Pyke	Shovel	Drill	Mini Excavator
Seeding Mechanism	Tube	Drop mechanism	Toss	Mini Slide
Refill hole	Claw mechanism	Sweeper	Dirt Dispenser	Scooper
Remove Weeds	Handheld weeder	Small, Safe Rotating Blades	Herbicide Sprayer	Plucker Mechanism

## MILESTONE 2.5 – CONCEPT EXPLORATION

Team Number: Thurs-51

Complete this worksheet during Design Studio/Lab B for Week 8.

1. Include multiple photos of your concept exploration, if needed
  - Include necessary annotations to help in the communication of your ideas
  - Include your Team Number, Name and MacID on each concept
2. Insert your photo(s) as a Picture (Insert > Picture > This Device)
3. **Do not include more than two concept photos per page**

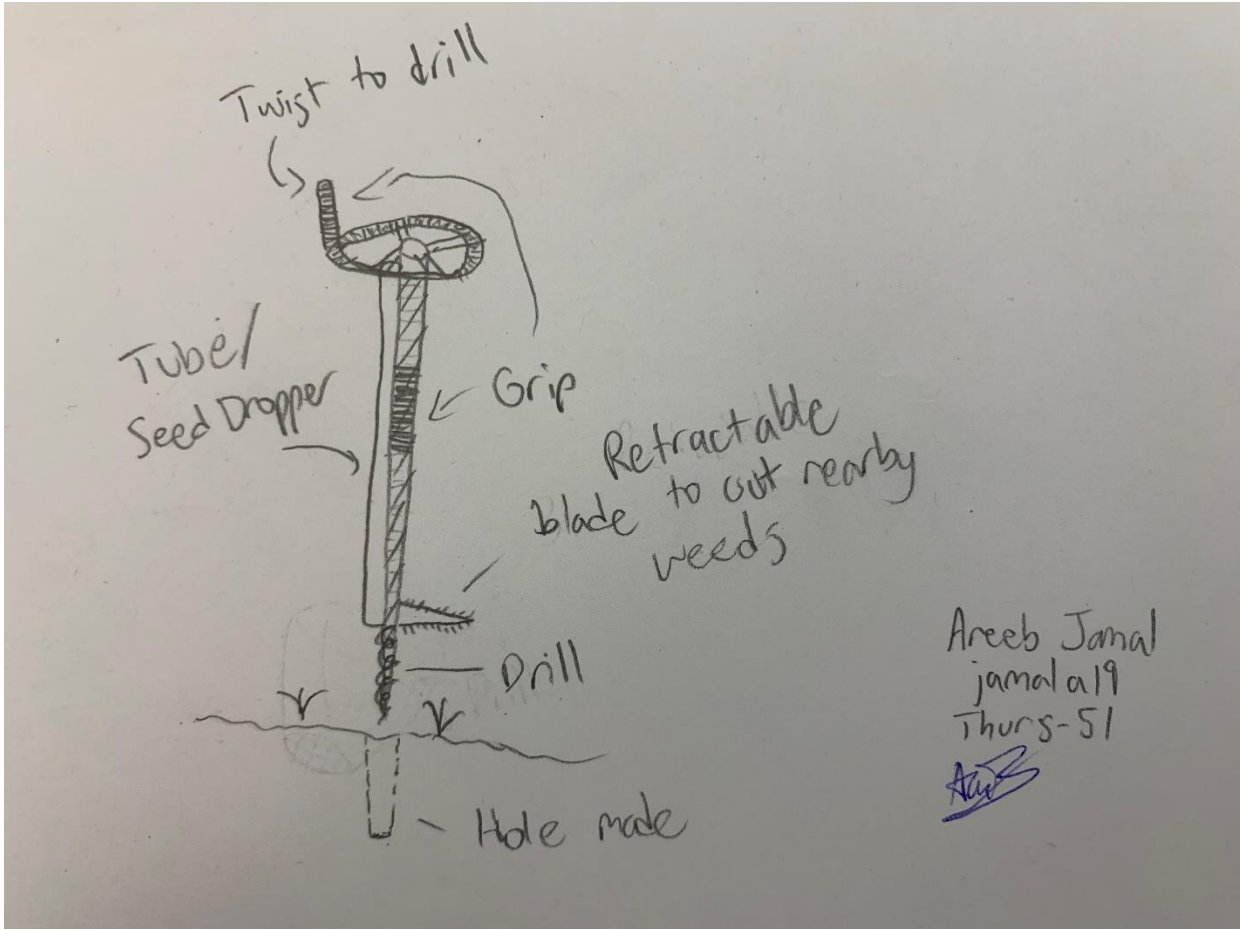
Make sure to include photos of each team member's concept exploration

We are asking that you submit your work on both the team and individual worksheets. It does seem redundant, but there are valid reasons for this:

- Each team member needs to submit pictures of their concept with the **Milestone Two Individual Worksheets** document so that it can be *graded*
- Compiling your individual work into this **Milestone Two Team Worksheets** document allows you to readily access your team member's work
  - This will be especially helpful when completing the next milestone

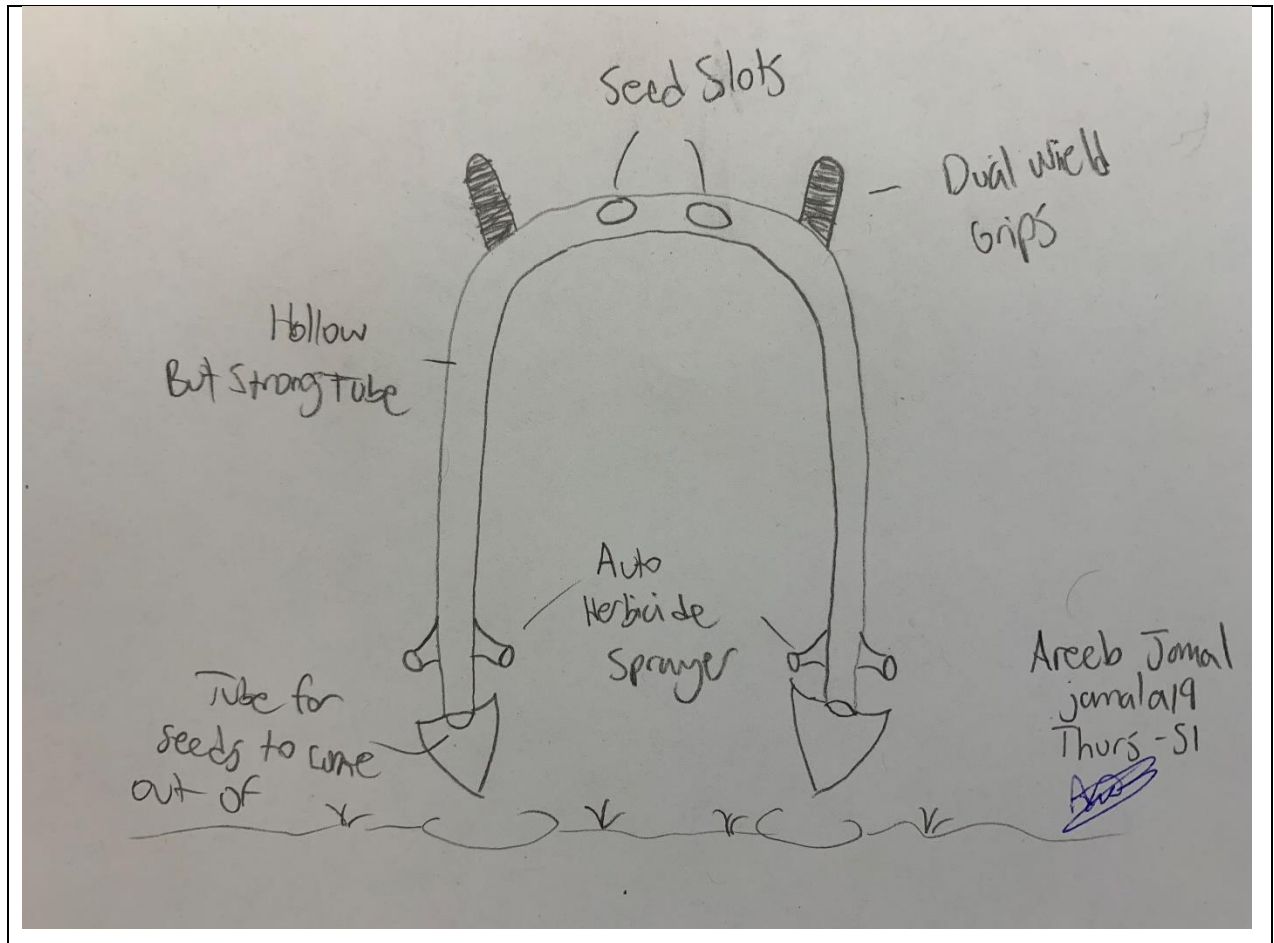
Team Number: Thurs-51

**Concept 1**

Name: Areeb Jamal	MacID: jamala19
Insert screenshot(s) of your concept below.	
	

**Concept 2**

Name: Areeb Jamal	MacID: jamala19
Insert screenshot(s) of your concept below.	

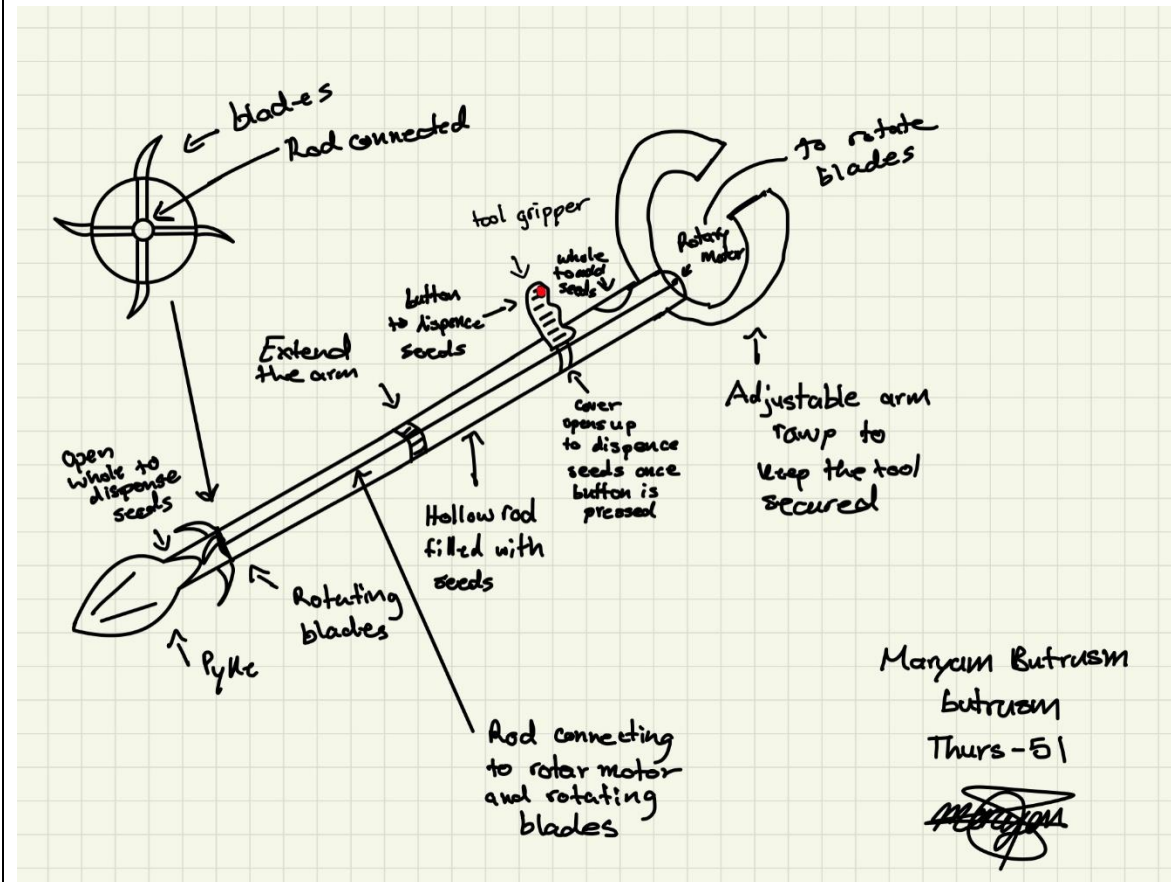


Team Number: **Thurs-51****Concept 1**

Name: Maryam Butrus

MacID: butrusm

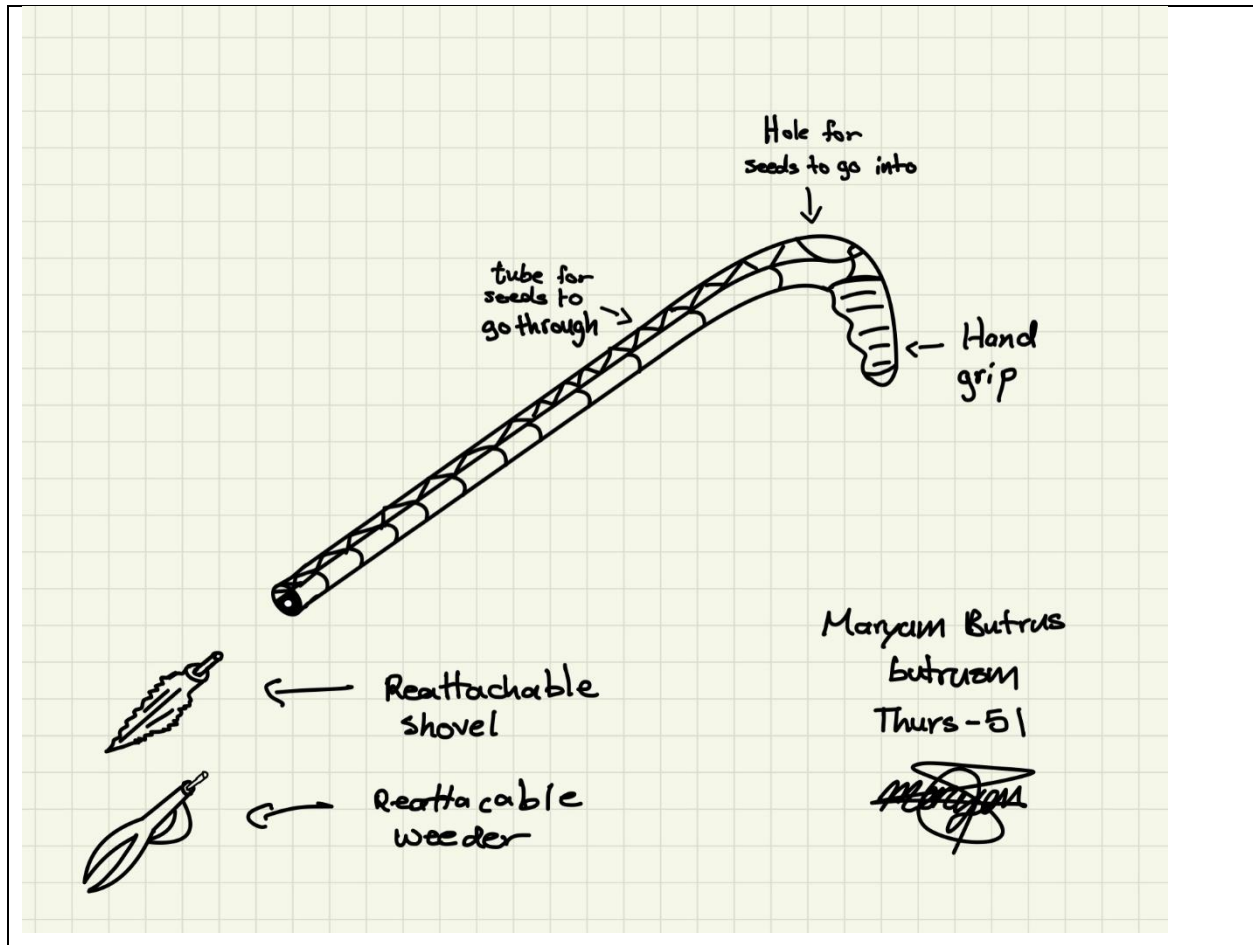
Insert screenshot(s) of your concept below.

**Concept 2**

Name: Maryam Butrus

MacID: butrusm

Insert screenshot(s) of your concept below.



Team Number: Thurs-51

**Concept 1**

Name: Amanda Pilgrim	MacID: pilgra1
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The sketch is a hand-drawn diagram of a seed container and a digging tool. It includes the following labels and descriptions:

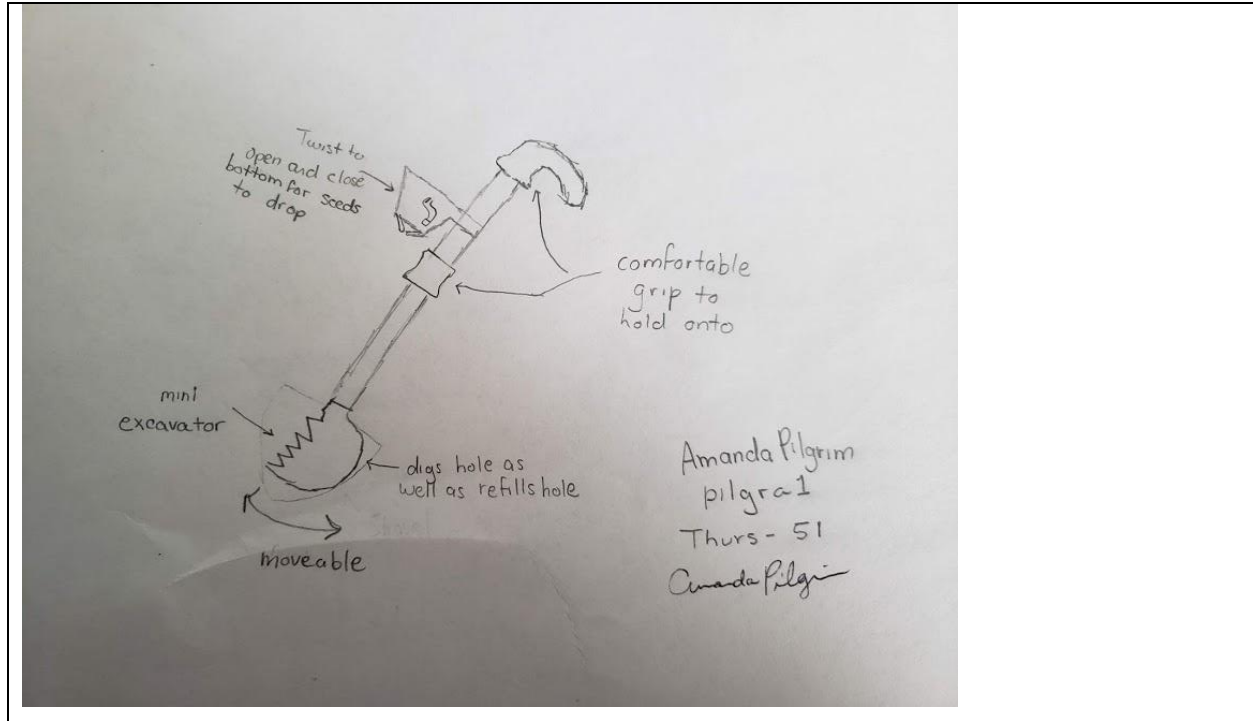
- Close Up View of Seed Container**: A title for the top-left section.
- Seeds Stay**: Points to a container where seeds are held.
- Elastic Hangs loose**: Points to a component of the seed container.
- Push Down**: An arrow indicating the action to release seeds.
- Seeds in container**: Points to the seed container on the main device.
- Tube for seeds**: Points to a tube leading from the container.
- Comfortable handle**: Points to the handle of the device.
- Clamp to open seed container**: Points to a clamp mechanism.
- Pyke to dig hole**: Points to a digging tool.
- Blades to remove weeds (twist for use)**: Points to a set of blades.
- Sweeper to refill hole (Tilt device for use)**: Points to a tilting mechanism.

Amanda Pilgrim  
pilgra1  
Thurs - 51  
Amanda Pilgrim

**Concept 2**

Name: Amanda Pilgrim	MacID: pilgra1
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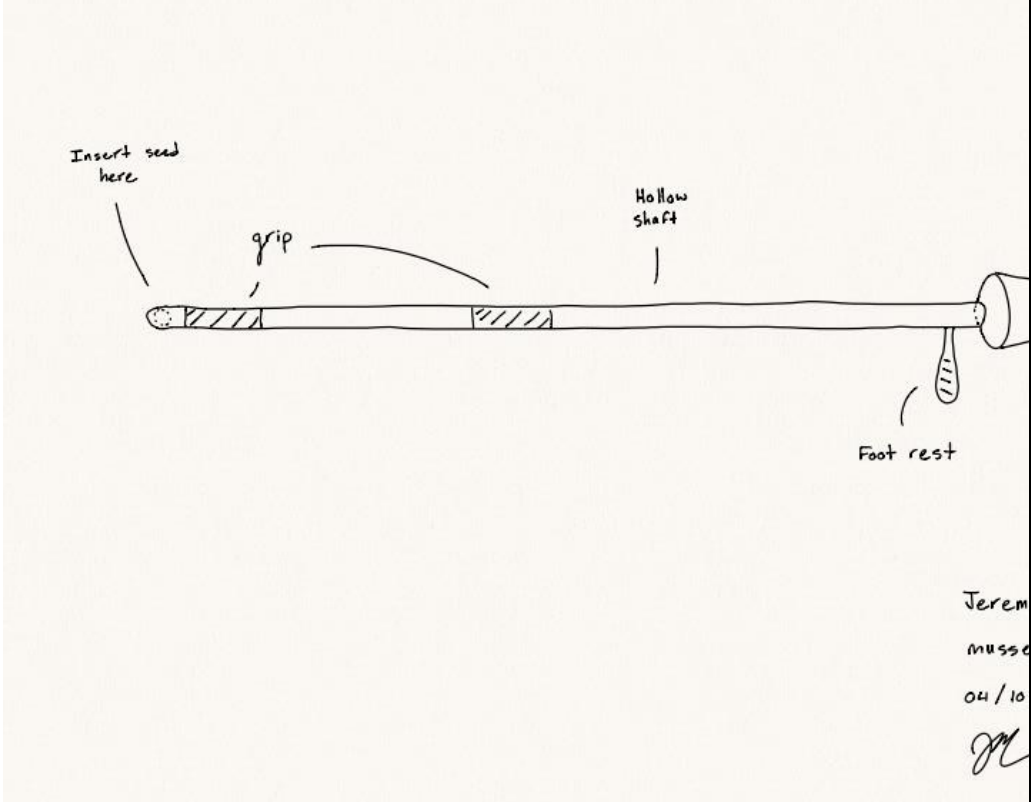




Team Number: 

Thurs-51

Concept 1

Name: Jeremiah Musselman	MacID: musselmj
<div><p>Jerem musse 04/10 <i>JM</i></p></div>	

Concept 2

Name: Jeremiah Musselman	MacID: musselmj
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