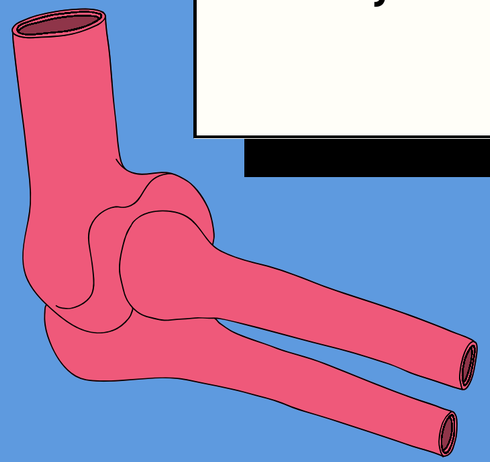
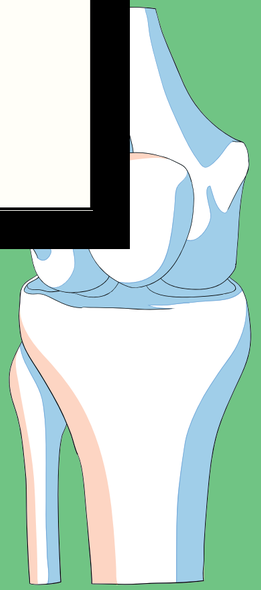




Joint Effort:

Objective: *Know the muscles involved in the knee joint; ACL Surgery Edition*





Hello everyone, my project is about the knee joint, specifically focusing on ACL injuries and surgical repair. This is my 3D model of a knee, made with foam, pipe cleaners, and textured strips to represent real anatomical structures.



In a healthy knee, the ACL, or anterior cruciate ligament, helps stabilize the joint. It runs diagonally from the femur to the tibia and prevents the tibia from sliding too far forward. ACL tears are common in athletes due to sudden stops, pivots, or awkward landings.

In my model:

- The pink circle is the patella, or kneecap.
- The pink strip above is the quadriceps tendon, and the strip below is the patellar tendon.
- The blue ridges on top of the tibia represent the meniscus and articular cartilage, which cushion and protect the joint.
- On the side, you'll see the MCL and LCL, which are the medial and lateral collateral ligaments that help stabilize the knee from side to side.
- The silver pipe cleaner is my repaired ACL; it mimics a graft, often taken from the patellar tendon or hamstring, and is surgically inserted with screws (shown here with a mini clip).
- Behind the model, I also included structures like the hamstring, gastrocnemius, and popliteus to show how surrounding muscles support recovery.

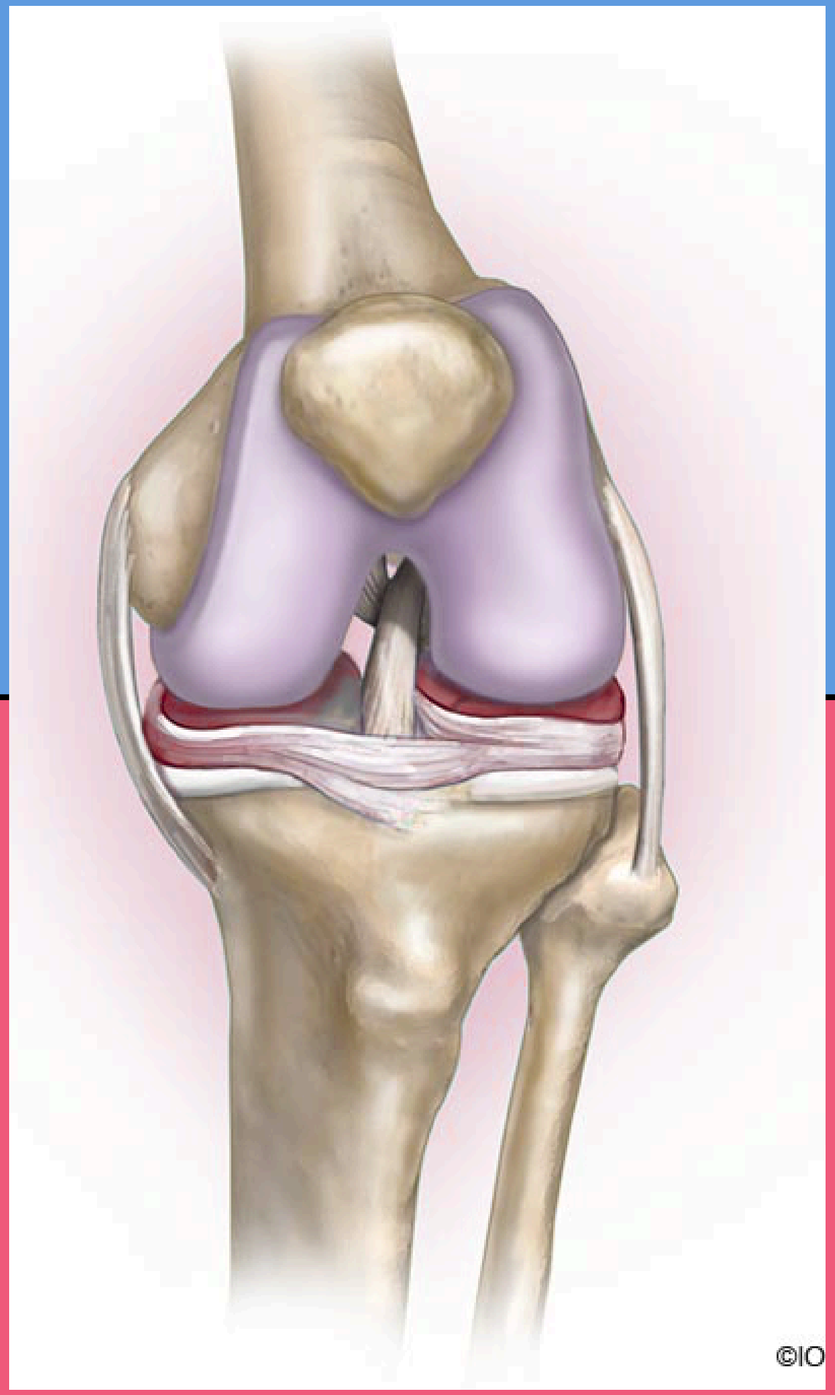


I also included a QR code that links my 3D model to this canva link for more information.

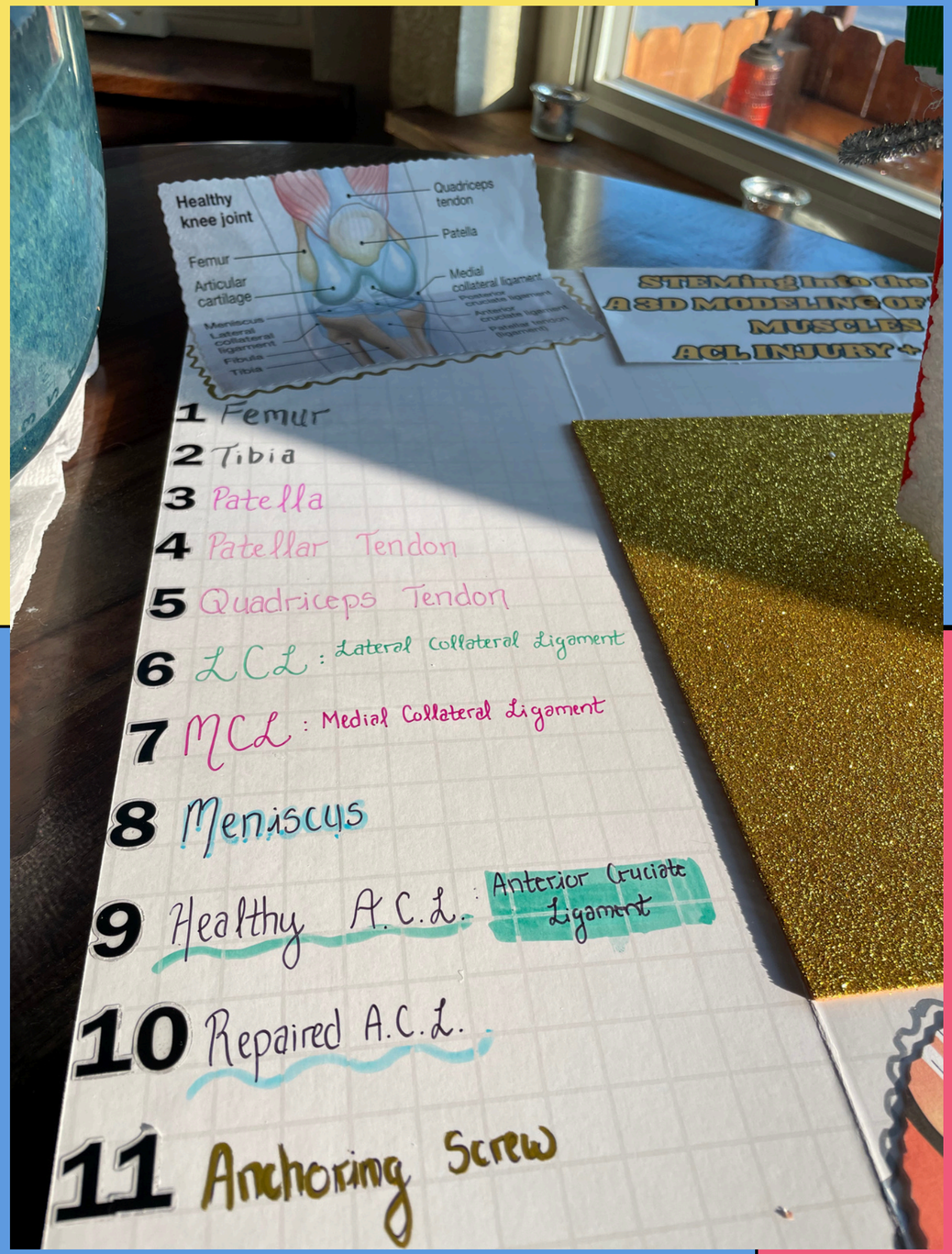
This model helped me understand how complex and important our joints are, especially how something as small as a ligament can change how we move, walk, or run.

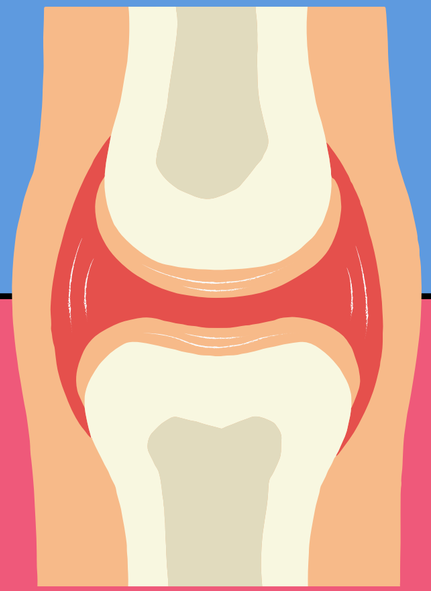
Thank you and hope you enjoy learning more about my STEAM project!

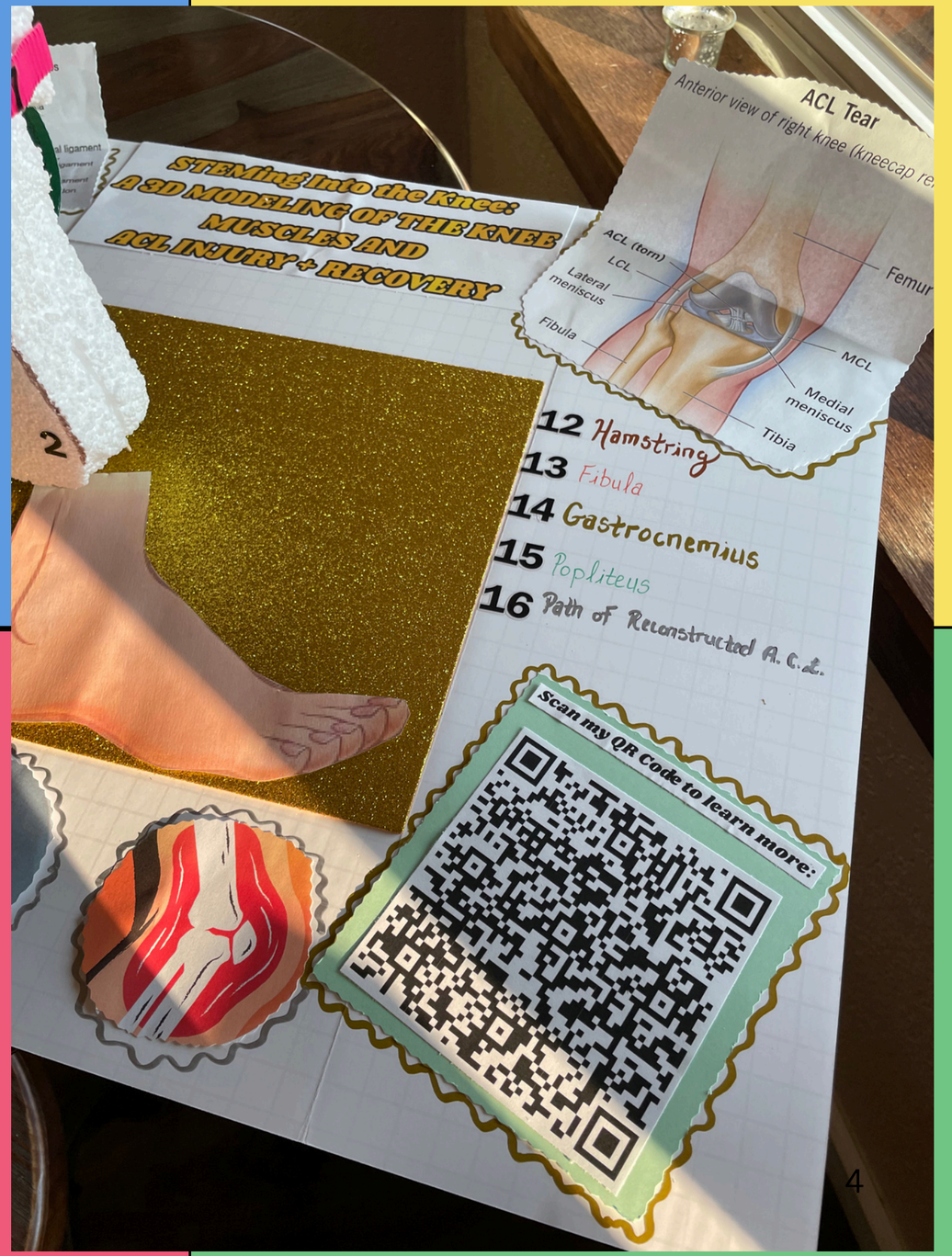

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Tendon
Collateral Ligament
Collateral Ligament


©IO

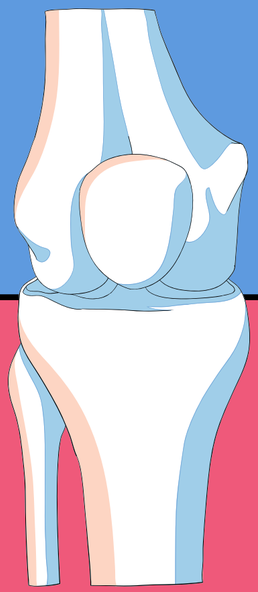

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Tendon
Collateral Ligament
Collateral Ligament


Healthy knee joint
Quadriceps tendon
Patella
Femur
Articular cartilage
Medial collateral ligament
Meniscus
Lateral collateral ligament
Fibula
Tibia
STEMing Into the Knee:
A 3D MODELING OF THE KNEE
MUSCLES AND
ACL INJURY + RECOVERY
1 Femur
2 Tibia
3 Patella
4 Patellar Tendon
5 Quadriceps Tendon
6 LCL : Lateral Collateral Ligament
7 MCL : Medial Collateral Ligament
8 Meniscus
9 Healthy A.C.L. Anterior Cruciate Ligament
10 Repaired A.C.L.
11 Anchoring Screw




STEMing Into the Knee:
A 3D MODELING OF THE KNEE
MUSCLES AND
ACL INJURY + RECOVERY
ACL Tear
Anterior view of right knee (kneecap re
ACL (torn)
LCL
Lateral meniscus
Fibula
Femur
MCL
Medial meniscus
Tibia
12 Hamstring
13 Fibula
14 Gastrocnemius
15 Popliteus
16 Path of Reconstructed A.C.L.
Scan my QR Code to learn more:

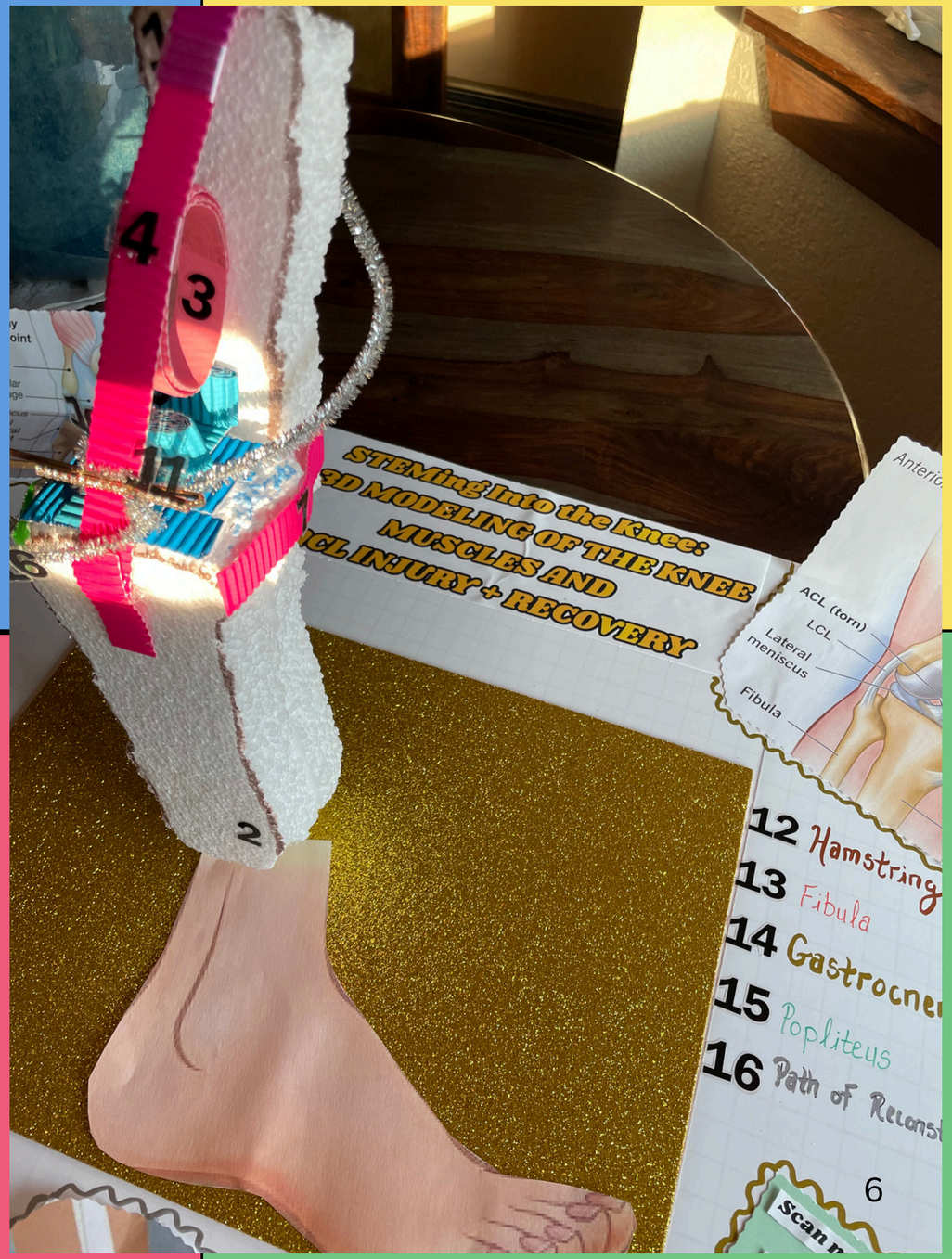

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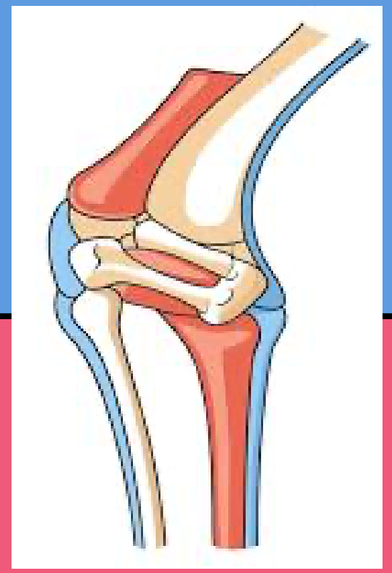

15
A 3D MODELING OF THE KNEE
MUSCLES AND
ACL INJURY + RECOVERY

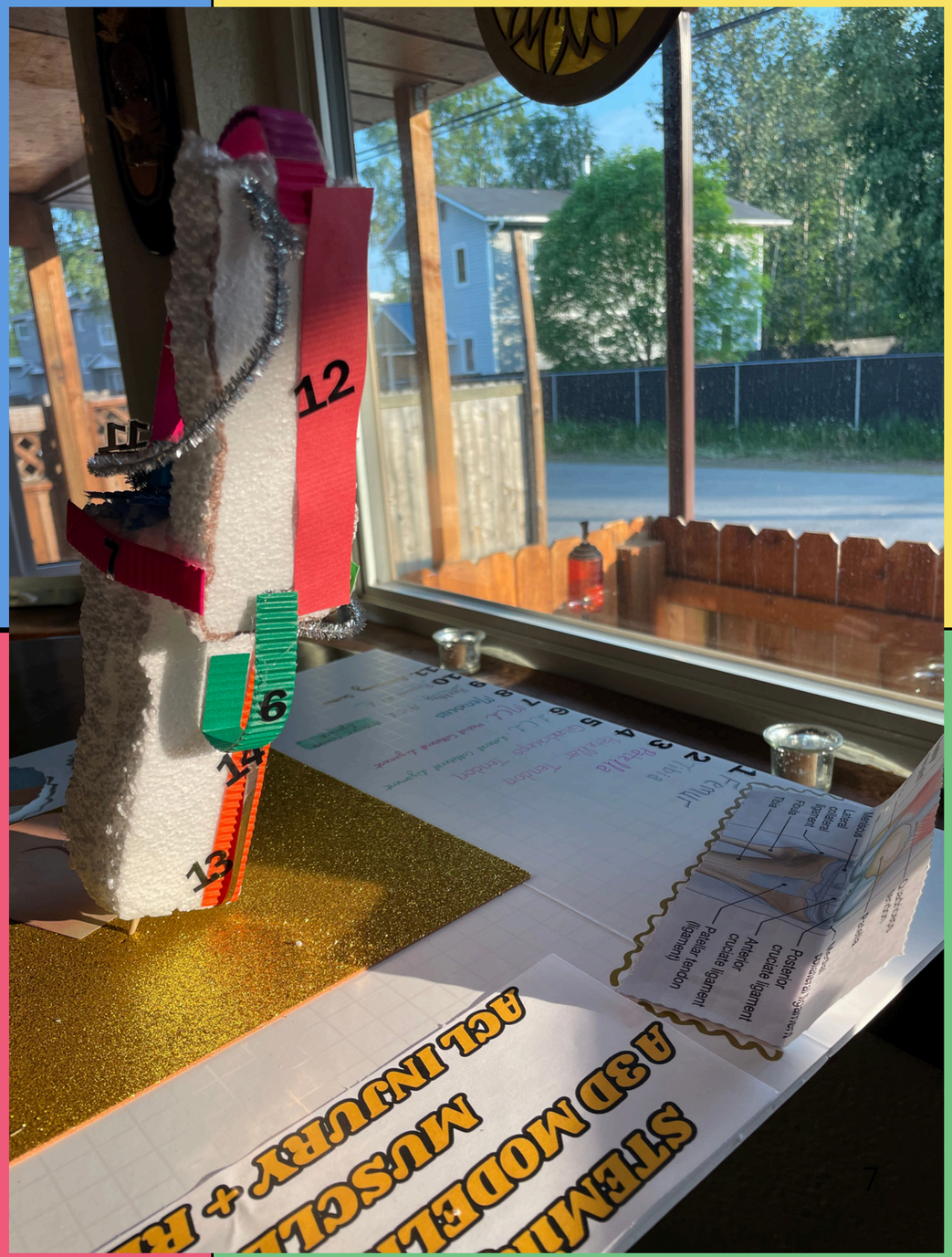

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A 3D MODELING
ACL INJURY




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STEMing Into the Knee:
3D MODELING OF THE KNEE
MUSCLES AND
ACL INJURY + RECOVERY
ACL (torn)
LCL
Lateral meniscus
Fibula
12 Hamstring
13 Fibula
14 Gastrocne
15 Popliteus
16 Path of Recons


7
Quadriceps tendon
Patella
Medial collateral ligament
STEMming
A 3D MODELING
MUSCLES
ACL INJURY + RECO




12
7
6
14
13
Lateral collateral ligament
Posterior cruciate ligament
Anterior cruciate ligament
Patellar tendon
STEM
A 3D MODEL
MUSCLE
ACL INJURY + R


Thank
you