

Example Summary Board

What did we do?	What did we observe?	What did we figure out?	What additional questions do we have?
<p>Watched videos about girls with kidney disease</p>	<p>Dialysis must be done consistently and transplanted organs need to be matched closely for them to work successfully.</p>	<p>There are two kidneys in humans, but you only need one working kidney to survive. Dialysis or a transplant can help you to live. Dialysis takes a lot of time.</p>	<p>Are females most likely to get kidney disease? How long does a transplanted kidney last? How much does a transplant cost?</p>
<p>Developed a Model of how kidneys function in the human body</p>	<p>All models showed the kidney contributing to urine and eliminating waste from the body.</p>	<p>Kidneys are part of the urinary system in humans</p>	<p>How does it get the waste from the whole body? How does a kidney know what is waste and what should be left in the body?</p>
<p>Dialysis tubing experiment, and interactive Osmosis Simulation. We adjusted our models to include a semi-permeable membrane and the interaction of circulatory and urinary systems.</p>	<p>The dialysis tubing has really small holes in it and only allows small substances to pass through while retaining larger particles.</p>	<p>The kidneys can filter blood to get cellular wastes and pass that waste into the urine. The kidneys interact with both the urinary and circulatory systems in the body. They regulate waste and clean the blood for humans to survive.</p>	<p>Why can't the kidney be fixed? Do cells also have semipermeable membranes so they can stay together but get the garbage out?</p>
<p>Researched issues surrounding transplanted organs</p>	<p>We found that the body will reject organs similarly to how it fights infection. Also,</p>	<p>People with transplants have to take drugs to suppress their immune system so the organ can survive.</p>	<p>Aren't organs like blood types and if you are the same, the organ will survive?</p>

	there aren't enough organs for people who need them.	Organs can fail for many reasons; even once installed.	Were people with transplants more likely to die with Covid? Why can't we fix organs instead of replacing them? Which organs are needed the most?
Researched issues surrounding transplanted organs	We found that the body will reject organs similarly to how it fights infection. Also, there aren't enough organs for people who need them.	People with transplants have to take drugs to suppress their immune system so the organ can survive. Organs can fail for many reasons; even once installed.	Aren't organs like blood types and if you are the same, the organ will survive? Were people with transplants more likely to die with Covid? Why can't we fix organs instead of replacing them? Which organs are needed the most?
Possible segue into genetics and/or how STEM cells work in the body!			
Explored Cutting-Edge Science Videos	Scientists and engineers from many fields are trying to manufacture personalized organs and tissue components.	There are successes and challenges to making organs. A lot of work needs to be accomplished. Organ storage and transport viability are also major issues.	When will they start making organs? How many organs are needed? Are some in greater demand than others? How long can organs be stored? Why is making an organ better than getting an organ from someone who died?
\$100 million Challenge for Research Support	Our class research teams learned about different organs and their importance for homeostasis. We analyzed a variety of websites	Homeostasis for humans relies on many different systems interacting. Some posters included graphics and models of how the organs interact with multiple systems.	How can recipient transplants' success be quantified? We still have questions to be figured out!

	for organ transplants to find data and current research.	Arguments that showed charts and data were good. Current science is really growing in support of humanity.	

A few example articles students found that led to more questions about life science!

The collage includes several key elements:

- NIH Website Header:** U.S. Department of Health & Human Services | National Institutes of Health | Engineering the Future of Health™
- Navigation Menu:** HOME | RESEARCH FUNDING | COVID-19 @ NIBIB | LABS @ NIBIB | TRAINING & CAREERS | SCIENCE EDUCATION
- Science Education > Science Topics > Tissue Engineering and Regenerative Medicine**
- Science Topics List:**
 - Artificial Intelligence (AI)
 - Biomaterials
 - Computational Modeling
 - Computed Tomography (CT)
 - Drug Delivery Systems
 - Image-Guided Robotic Interventions
 - Magnetic Resonance Imaging (MRI)
 - Medical Devices
 - Nanotechnology
 - Optical Imaging
 - Rehabilitation
- Article 1: "Current Developments in 3D Bioprinting for Tissue and Organ Regeneration—A Review"**
 - Authors: Swarnima Agarwal, Ananya Baru, Shreya Saha, Subhadip Bodhak, Yamsi Krishna Balla, Aniruddha Pal.
 - Abstract: "The field of tissue engineering and regenerative medicine that work toward creating functional tissue-constructs mimicking native tissue for repair and/or replacement of damaged tissues or whole organs have evolved rapidly over the past few decades. However, traditional tissue engineering approaches comprising of scaffolds, growth factors and cells showed limited success in fabrication of complex 3D shapes and in vivo organ regeneration leading to their non-feasibility for clinical applications from a logistical and economical viewpoint. In this regard, 3D bioprinting, which is an extended application of additive manufacturing is now being..."
- Article 2: "First pig kidneys transplanted into people: what scientists think"**
 - Date: NEWS | 19 May 2022
 - Author: Sara Reardon
 - Text: "The genetically modified organs seemed to function for more than two days but some researchers are sceptical that the experiments had value."
 - Image: A hand holding a small, pink, bioengineered human liver.
 - Caption: "A mini bioengineered human liver that can be implanted into mice. Source: Sangeeta Bhatia"
- Article 3: "Iranians put their kidneys on sale as sanctions bleed life from economy"**
 - Text: "Sanctions levied by the US have had the perverse effect of strengthening Tehran's hardliners as the economy crumbles"
 - Image: A group of women in black chadors.
- Article 4: "Overcoming Challenges in Organ Transplantation"**
 - Date: December 14, 2020
 - Image: Laboratory equipment including syringes and a pipette.
- Other Elements:**
 - Image of a modern building facade.
 - Image of surgeons in an operating room.
 - Text: "PULSE" logo.
 - Text: "Explore Topics"
 - Social media icons for Twitter, Facebook, and Email.