

DOCTOR DIGEST

Special thanks to the team at Nanyang Primary School for creating this deck of slides.

WHAT IS AR?

VIRTUAL REALITY (VR)

Fully artificial environment



Full immersion in virtual environment



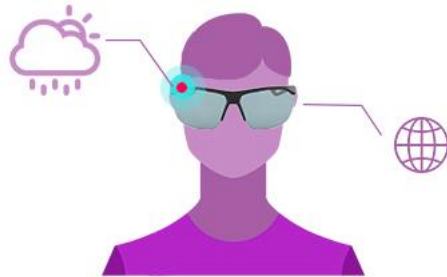
<https://diui35v2plibz7.cloudfront.net/blogs/20210914194822.jpg>

AUGMENTED REALITY (AR)

virtual objects overlaid on real-world environment



The real world enhanced with digital objects



<https://youtu.be/vz0UUVDt2ps>



<https://scx2.b-cdn.net/gfx/news/2017/pokemongounl.jpg>

REMINDERS FOR GROUPWORK

1. Be considerate. Work at Volume 1.
2. Be cooperative. Take turns to hold the ipad and write your answers.
3. Be focused to complete your task in the given time.
4. Be proactive. Raise your hand if you need help.

Take care of the ipad. Do not bend the paper codes.

WHEN YOU HAVE FINISHED ALL 4 MISSIONS,

Staple the supplementary worksheet to the back of your Activity Worksheet and submit to the front.

Index Number	Roles
Smallest	Collect and return ipads
Middle	Collect and return paper codes
Largest	Collect and return activity worksheets

TRAINING SIMULATION

MODULE - TRAINING SIMULATION

LEARNING OBJECTIVE:

1. STATE THE ORGANS OF THE DIGESTIVE SYSTEM IN THE SEQUENCE BY WHICH THE FOOD MOVES THROUGH
2. STATE THE FUNCTIONS OF EACH OF THE ORGANS

DOCTOR DIGEST TRAINING SIMULATION

1. Search for the "Doctor Digest" app
2. Continue as a ~~guest~~ Log in details
3. Scan the simulation code using the in-app scanner (not camera)
4. Do not change any wifi settings



Scan a Module Card

A screenshot of a game interface. At the top, there are two tabs: "Missions" and "Scan Data". Below the tabs, the word "Missions" is displayed in a large, bold font. To the right of the "Missions" list, there is a vertical "Information" button. The list contains four mission items, each with a diamond-shaped icon, a description, and a progress bar. Yellow callout boxes are placed to the right of each progress bar, containing text that matches the mission description. The background of the interface is a dark grey with a hexagonal pattern and the words "TRAINING SIMULATION" in large, stylized letters.

Missions

Scan Data

Missions

Information

- Scan the Training Simulation marker to make the body appear.
1/1
Load Body
- Attach all six digestive organs to the body model.
0/6
Install Organs
- After attaching all six organs to the body, scan each one to find out what it does.
0/6
Scan Organs
- Run the simulation, and watch it from start to finish.
0/2
Run Simulation

REVIEW: WHAT ARE THE TWO FUNCTIONS OF THE DIGESTIVE SYSTEM?

In your groups, complete the question to obtain your iPad and the markers (paper codes).

- Do not bend the codes.
- You may work on the tables or on the floor.

MODULE – TRAINING SIMULATION



**PAPER CODES: TRAINING SIMULATION,
SIX ORGANS**

DOCTOR DIGEST TRAINING SIMULATION

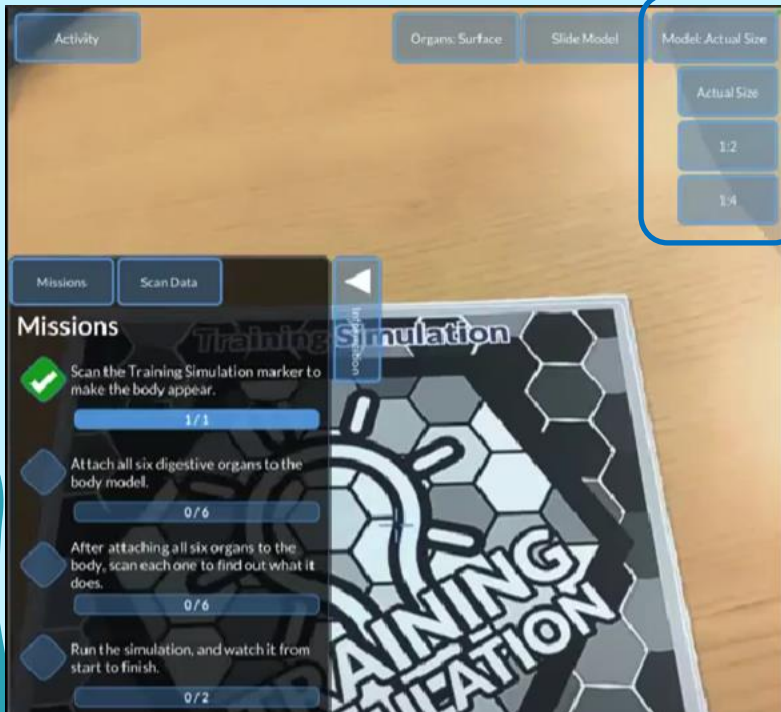
1. Search for the "Doctor Digest" app
2. Continue as a guest
3. Scan the simulation marker given using the in-app scanner (not camera)
4. Do not change any wifi settings



SAMPLE

MODULE – TRAINING SIMULATION

Mission 1 – Load Body



Model Actual Size
Choose 1:4 (smallest)

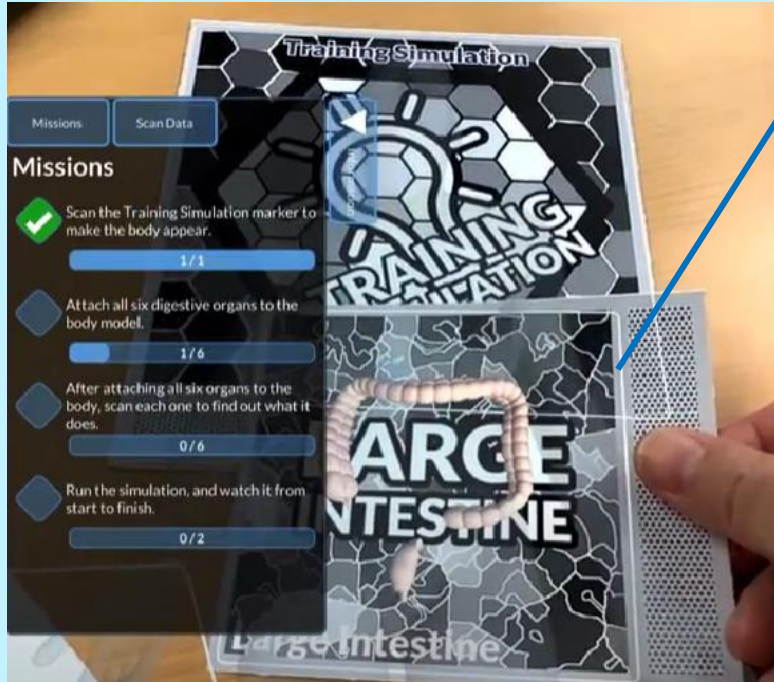


Body should appear.
Leave the Training
Simulation paper
code on the table
throughout.

MODULE – TRAINING SIMULATION

Mission 2 – Install Organs

Scan organ one at a time, according to how food will move through the digestive system.

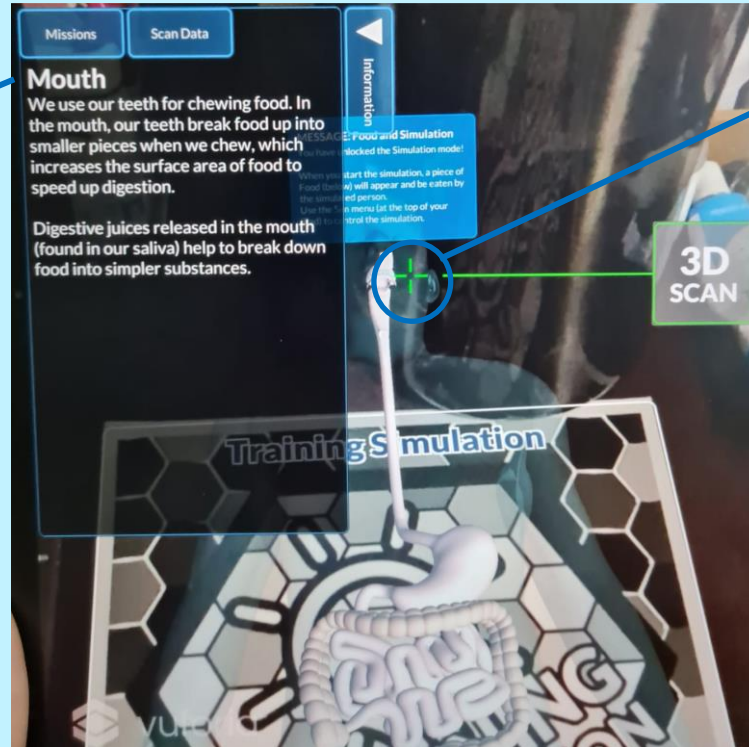


Green tick will appear when connected correctly. Then remove the organ card before scanning the next one.

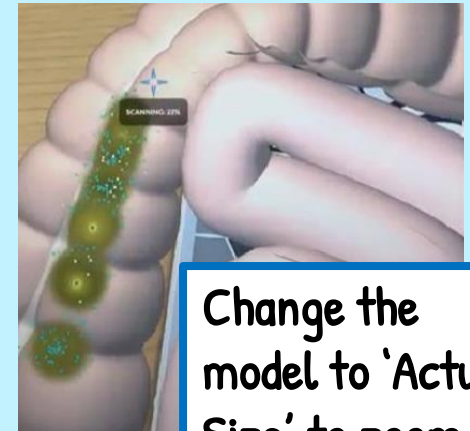
MODULE – TRAINING SIMULATION

Mission 3 – Scan Organs

Read the function of each digestive organ and complete your activity sheet.



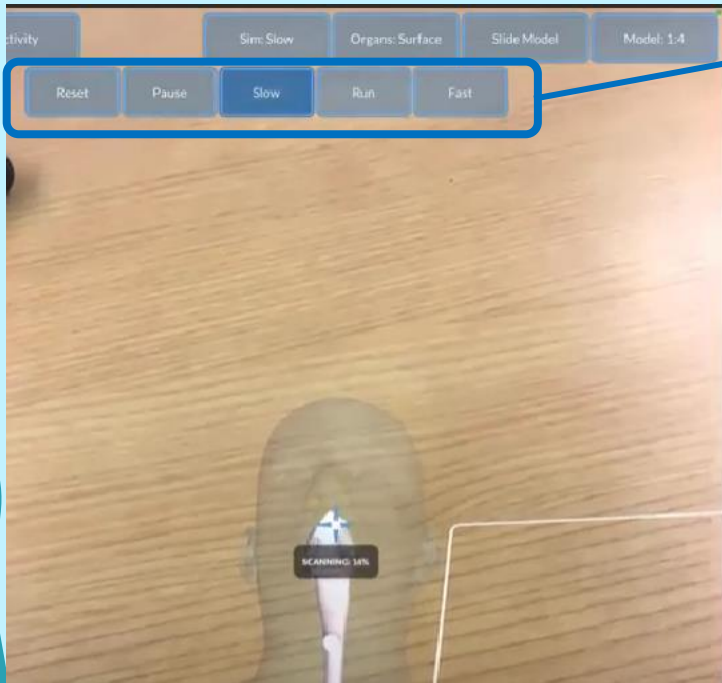
Place the green cross hairs at the organ, one by one. Click on 3D scan.



Change the model to 'Actual Size' to zoom in.

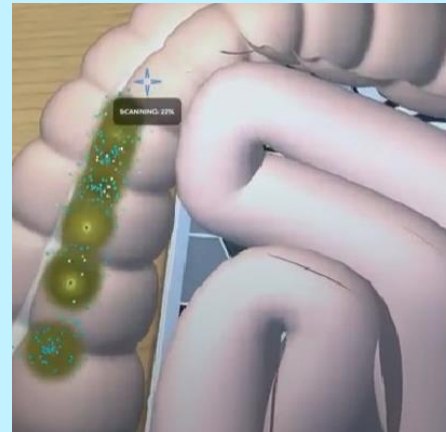
MODULE – TRAINING SIMULATION

Mission 4 – Run Simulation



Use these to control the simulation.

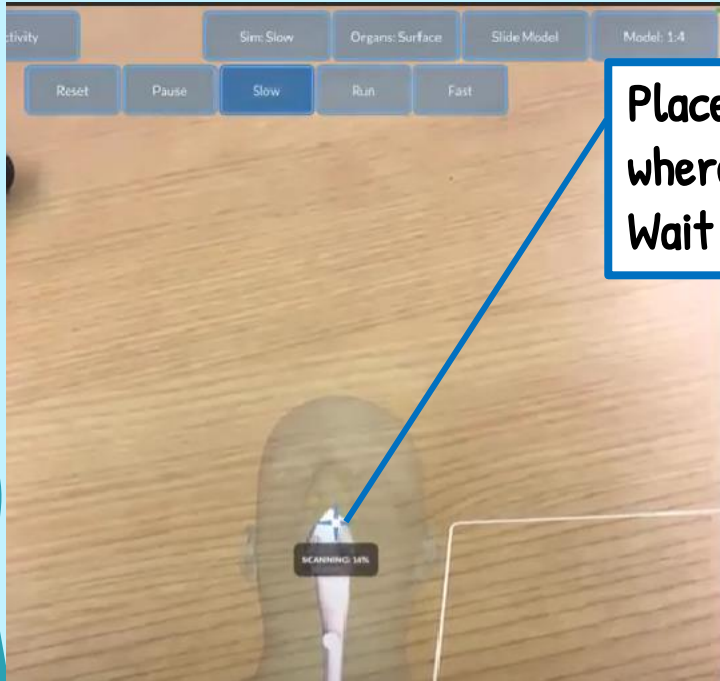
- Run (slow/fast)
- Pause
- Reset



Change the model to 'Actual Size' to zoom in.

MODULE – TRAINING SIMULATION

Mission 4 – Run Simulation



Place the green cross hairs at the organ where you want to obtain data. Click 3D Scan. Wait for scan to reach 100%.

Complete Page 1 of Worksheet.

Name: _____ () P4 _____ Date: _____

Mission - Run Simulation

- Change the ratio to 'Actual Size' to zoom in.
- To scan data, click 'Pause', then click '3D Scan'.
- To view the bar graph, change the tab from 'Missions' to 'Scan Data'.

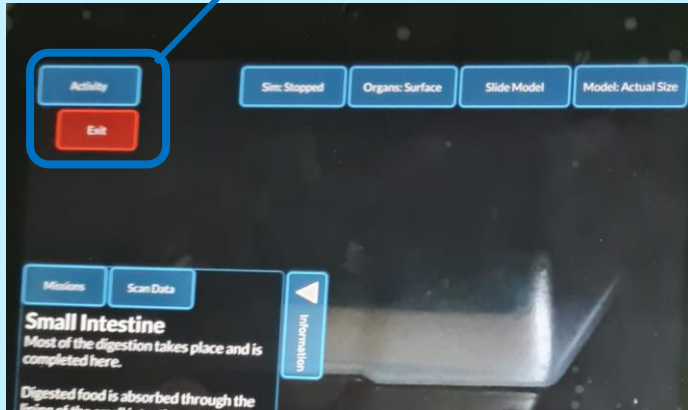
1. Compare and record the size of food when it leaves the mouth.

	Size of Food
In the mouth (whole food)	small / medium / <u>large</u>
Leaves the mouth	small / medium / large *

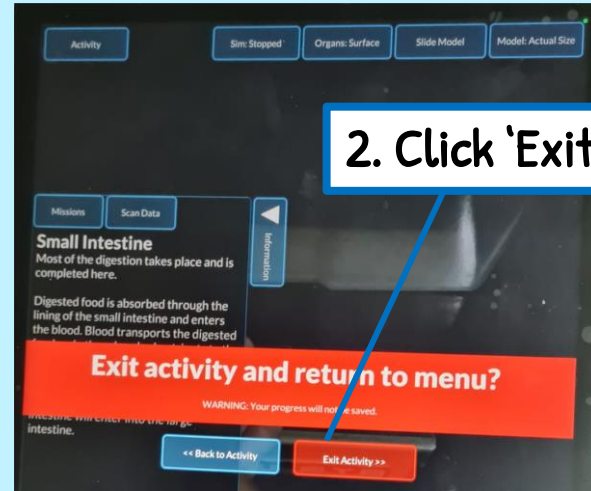
*Circle as appropriate

EXIT THE ACTIVITY

1. Click activity on the top left hand corner. Click Exit.



2. Click 'Exit Activity'.



3. Return to 'Scan a Module'.

4. Press 'Home' button.

WHEN YOU HAVE FINISHED ALL 4 MISSIONS,

Staple the supplementary worksheet to the back of your Activity Worksheet and submit to the front.

Index Number	Roles
Smallest	Collect and return ipads
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TRAINING SIMULATION

Consolidation

MODULE - TRAINING SIMULATION

LEARNING OBJECTIVE:

1. STATE THE ORGANS OF THE DIGESTIVE SYSTEM IN THE SEQUENCE BY WHICH THE FOOD MOVES THROUGH
2. STATE THE FUNCTIONS OF EACH OF THE ORGANS

Missions

Scan Data

Mouth

We use our teeth for chewing food. In the mouth, our teeth break food up into smaller pieces when we chew, which increases the surface area of food to speed up digestion.

Digestive juices released in the mouth (found in our saliva) help to break down food into simpler substances.

Information



Digestion **starts** here!

Teeth (not mouth) help to break food up into **smaller pieces**.

- Smaller compared to before
- Increases surface area in contact with digestive juices

Digestive juices, which can be found in saliva) help to break food down into simpler substances.

Saliva also helps to soften the food to make food easier to **swallow**.

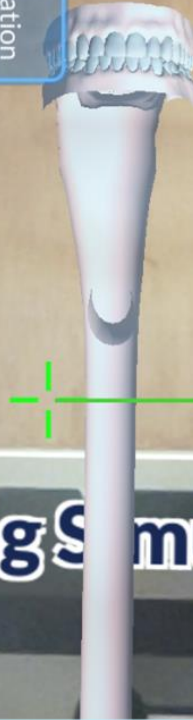
Missions

Scan Data

Gullet

The gullet connects the mouth to the stomach. It uses muscles to push the chewed food into the stomach.

Information



Partially digested food moves from the **mouth** to the **stomach**.

Little to no **digestion** takes place here as the gullet does not produce digestive juice.

3D
SCAN

Training Simulation

Missions

Scan Data

Stomach

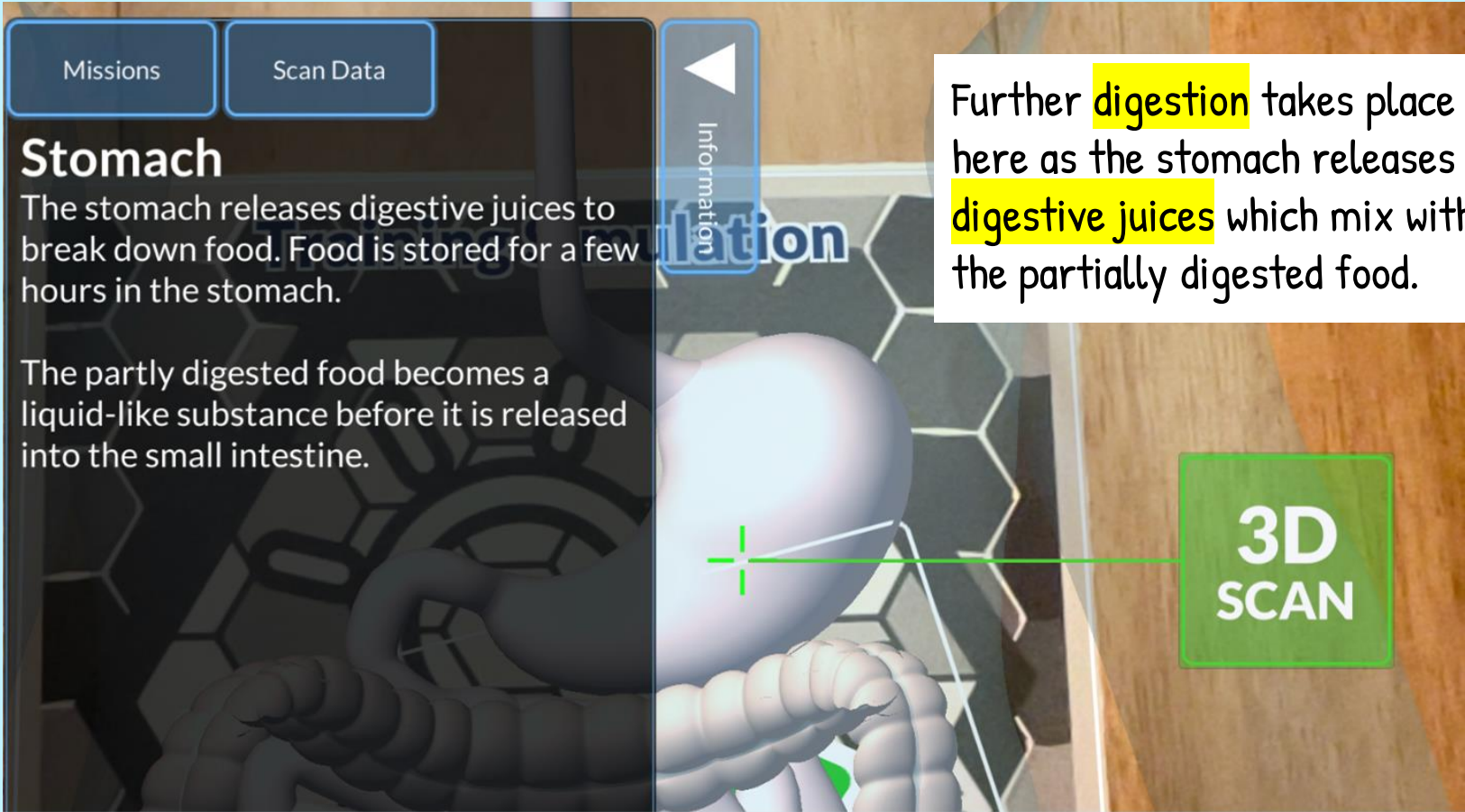
The stomach releases digestive juices to break down food. Food is stored for a few hours in the stomach.

The partly digested food becomes a liquid-like substance before it is released into the small intestine.

Information

Further **digestion** takes place here as the stomach releases **digestive juices** which mix with the partially digested food.

3D
SCAN



Missions

Scan Data

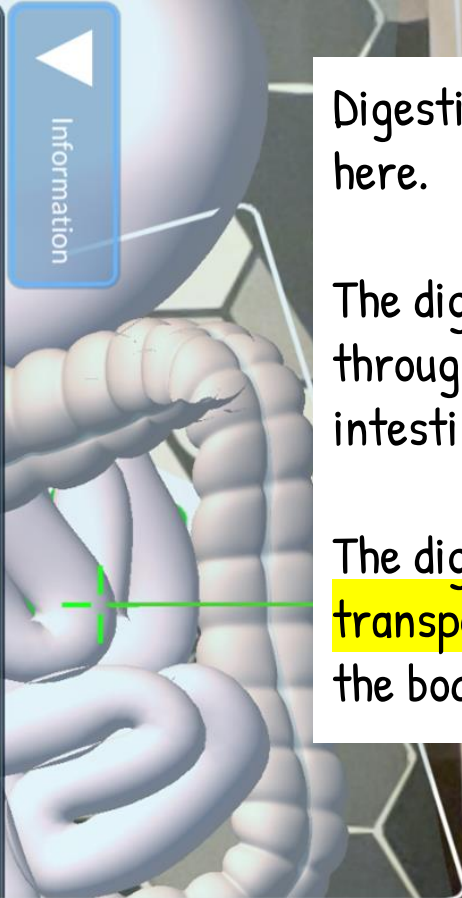
Small Intestine

Most of the digestion takes place and is completed here.

Digested food is absorbed through the lining of the small intestine and enters the blood. Blood transports the digested food and other absorbed nutrients to all parts of the body.

The rest of the undigested food in the small intestine will enter the large intestine.

Information



Digestion of food is completed here.

The digested food passes through the walls of the small intestine into the bloodstream.

The digested food is then transported to all other parts of the body by the blood.

Large Intestine

No digestion takes place in the large intestine.

In the large intestine, water and mineral salts are absorbed from the undigested food. They pass through the wall of the large intestine and enter the blood.

Undigested food will move into the rectum and be stored there as waste before being passed out through the anus.

Information

Water is removed from the undigested food.

The undigested food then goes into the large intestine which is then passed out from the body as waste through the anus

SCAN

EVERY ORGAN PLAYS A PART EACH HAS ITS OWN **FUNCTION!**

Transport food from mouth
to stomach.

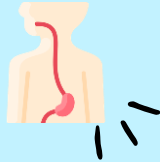


MOUTH

Teeth cut food into smaller
pieces.

Saliva helps to soften food
and contains digestive
juices.

GULLET



STOMACH

Contains digestive juices
which help to break down
food into simpler
substances.

Digestion is completed here.
Absorption of digested food into the
bloodstream.

SMALL INTESTINE



LARGE INTESTINE

Absorption of water from
undigested food.

DIGESTION IS THE PROCESS WHERE

**(1) FOOD IS BROKEN DOWN INTO SIMPLER
SUBSTANCES**

(1) FOR ABSORPTION INTO THE BODY

**IF ALL THE ORGANS WORK PROPERLY, CAN THEY
COMPLETE DIGESTION ON THEIR OWN?**

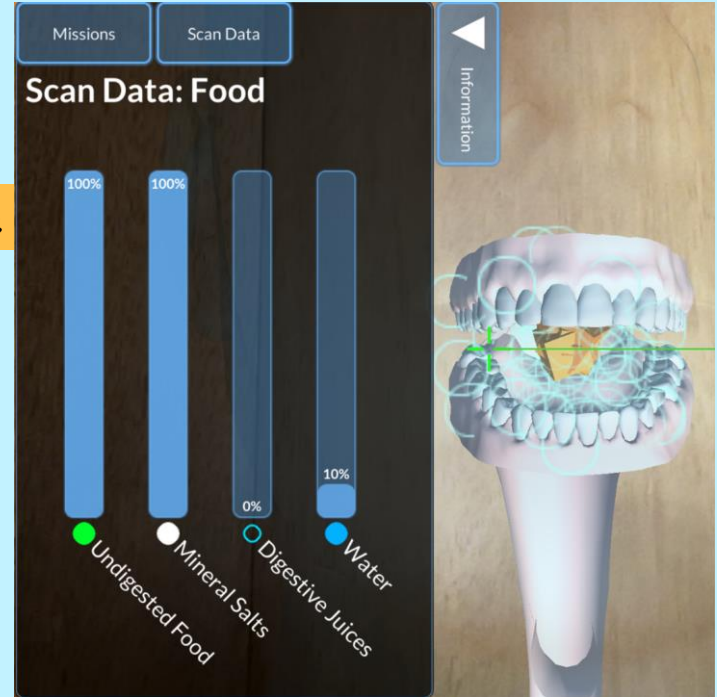
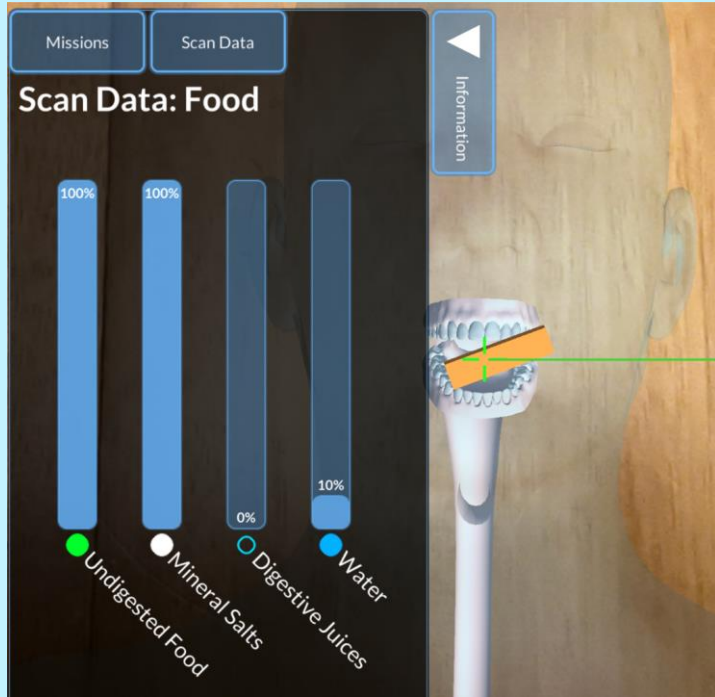
WE STUDIED THESE FIVE ORGANS:

- 1. MOUTH**
- 2. GULLET**
- 3. STOMACH**
- 4. SMALL INTESTINE**
- 5. LARGE INTESTINE**

**EACH HAS THEIR OWN FUNCTION (ROLE) BUT THEY
MUST WORK TOGETHER FOR DIGESTION TO TAKE
PLACE PROPERLY.**

MOUTH

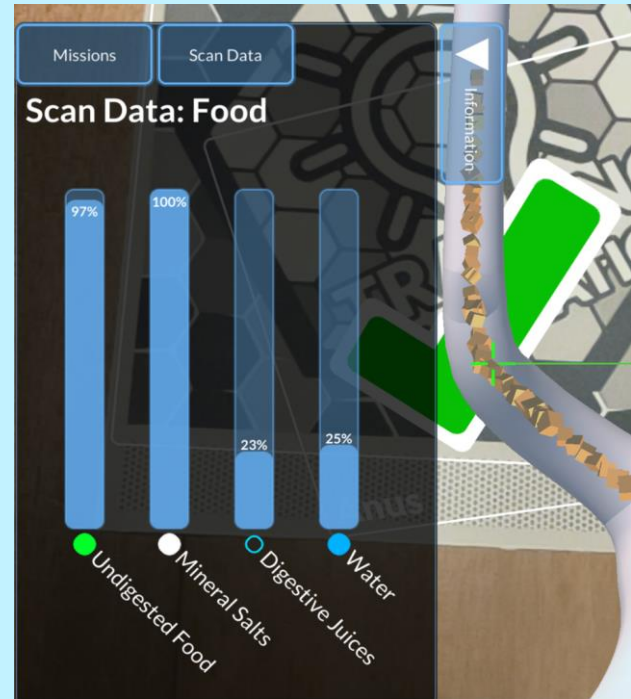
What do you notice about the size of the food?



% Undigested food leaving mouth = 98%

GULLET

Why does the amount of undigested food decrease by 1% even though there is no digestive juice produced here?

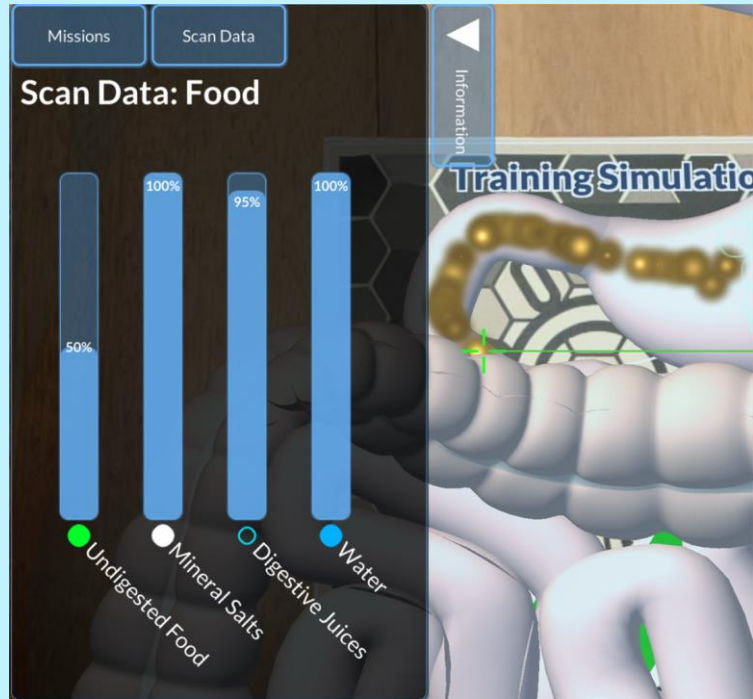


% Undigested food leaving gullet = 97%

STOMACH

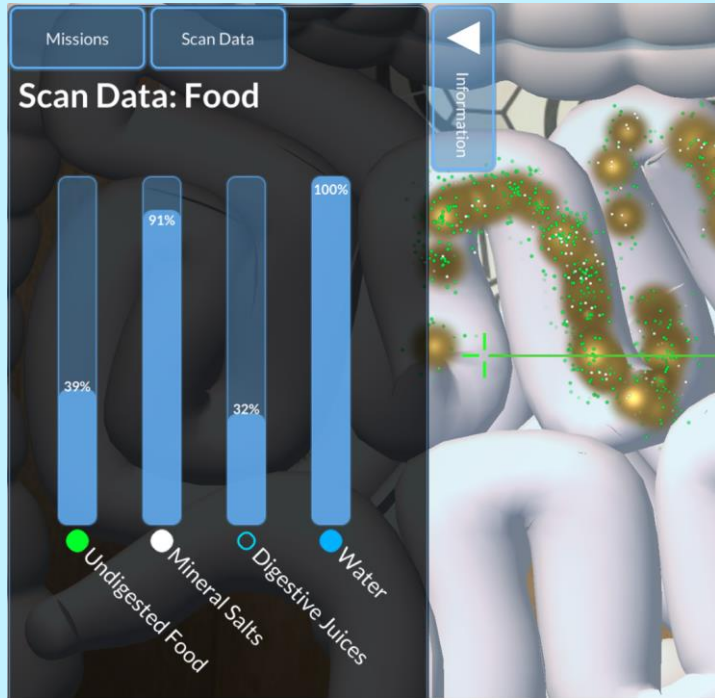


STOMACH

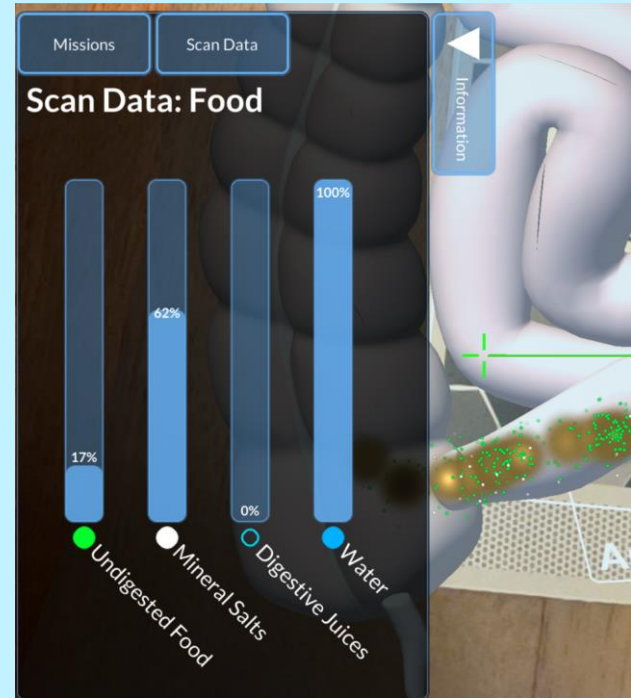


% Undigested food leaving stomach = 50% to 62%

SMALL INTESTINE

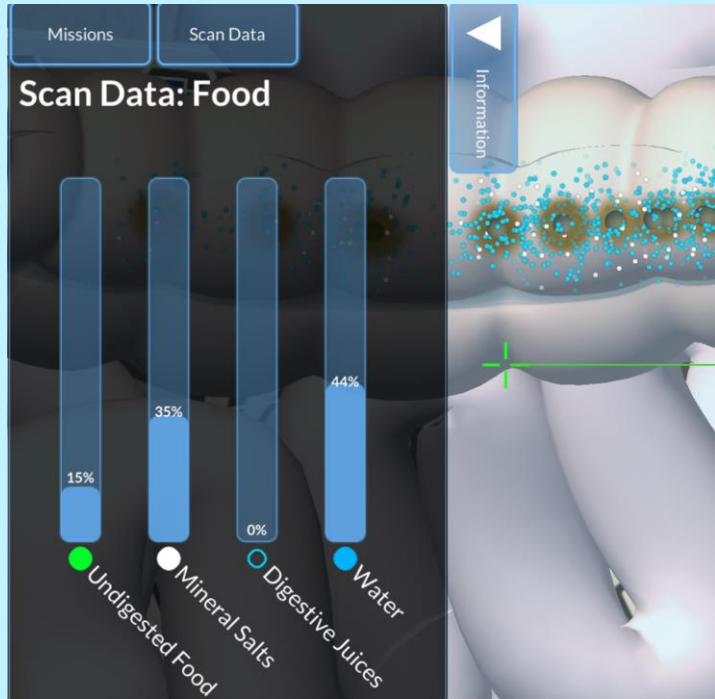


What differences do you note about the amount of undigested food, digestive juices and water?

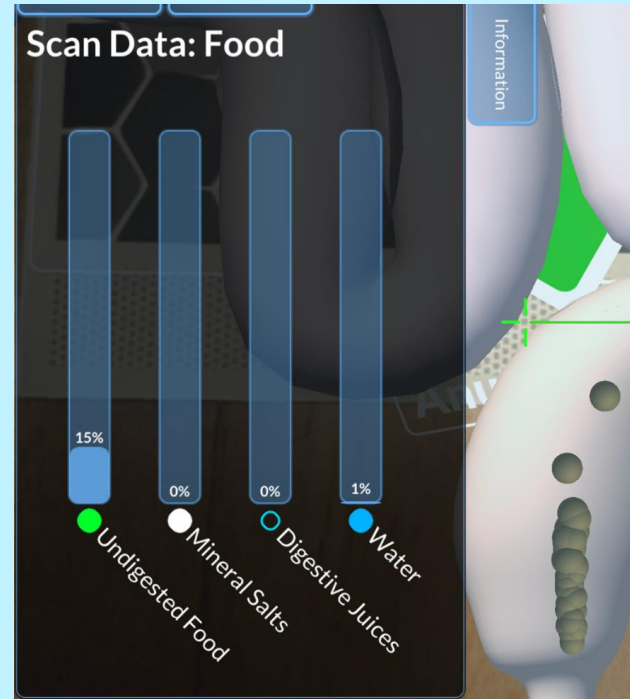


% Undigested food leaving small intestine = 15% to 17%

LARGE INTESTINE



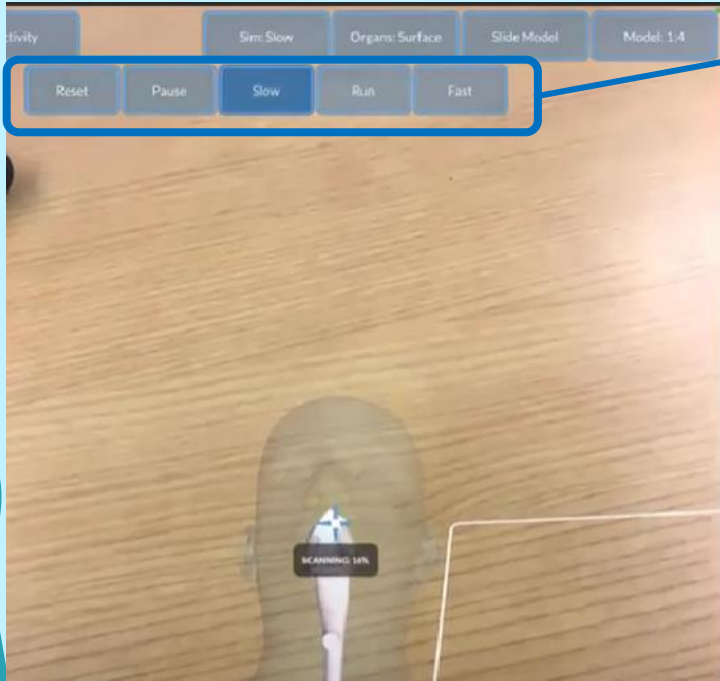
What happened to the amount of mineral salts and water?



% Undigested food leaving small intestine = 15%

MODULE – TRAINING SIMULATION

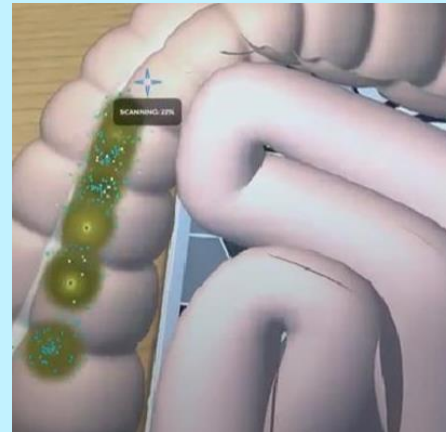
Mission 4 – Run Simulation



Use these to control the simulation.

- Run (slow/fast)
- Pause
- Reset

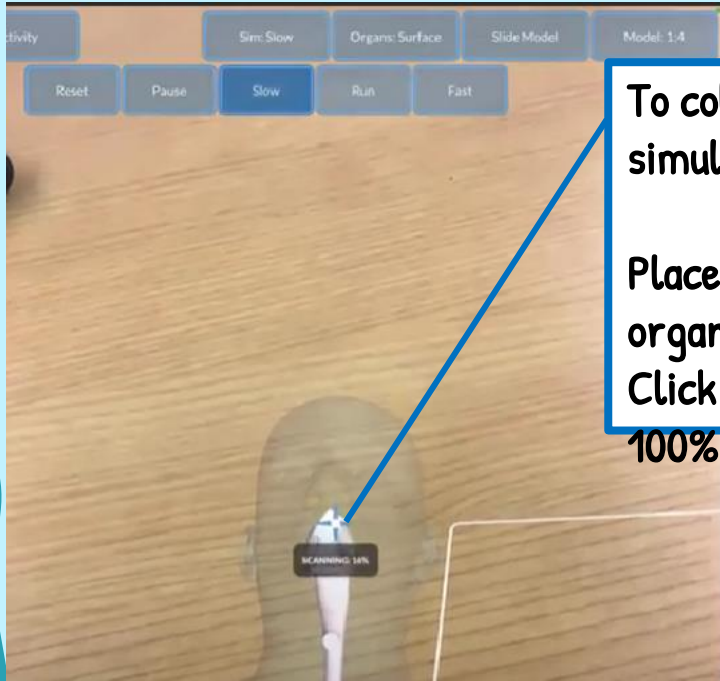
You must view the entire simulation from start to finish to “complete” the mission!



Change the model to 'Actual Size' to zoom in.

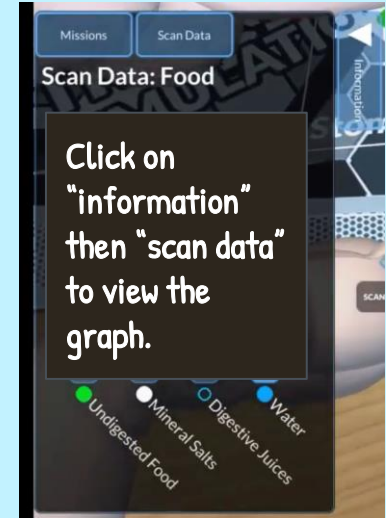
MODULE – TRAINING SIMULATION

Mission 4 – Run Simulation



To collect the data for the graph, run the simulation and pause at each organ.

Place the green cross hairs at the organ/food where you want to obtain data. Click 3D Scan. Wait for scan to reach 100%.



Complete Page 1 of the extra worksheet.

Name: _____ () P4 _____ Date: _____

Mission - Run Simulation

- Change the ratio to 'Actual Size' to zoom in.
- To scan data, click 'Pause', then click '3D Scan'.
- To view the bar graph, change the tab from 'Missions' to 'Scan Data'.

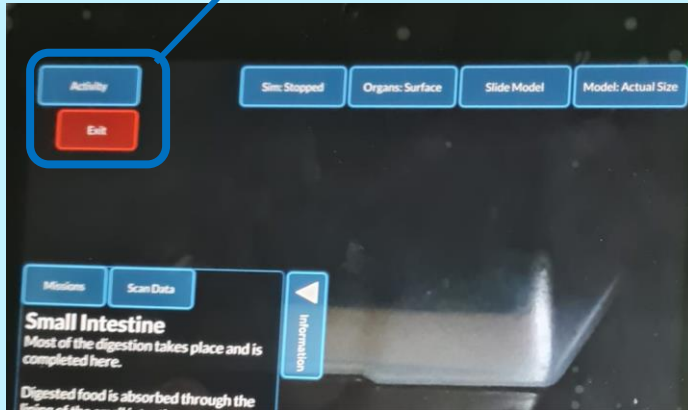
1. Compare and record the size of food when it leaves the mouth.

	Size of Food
In the mouth (whole food)	small / medium / <u>large</u>
Leaves the mouth	small / medium / large *

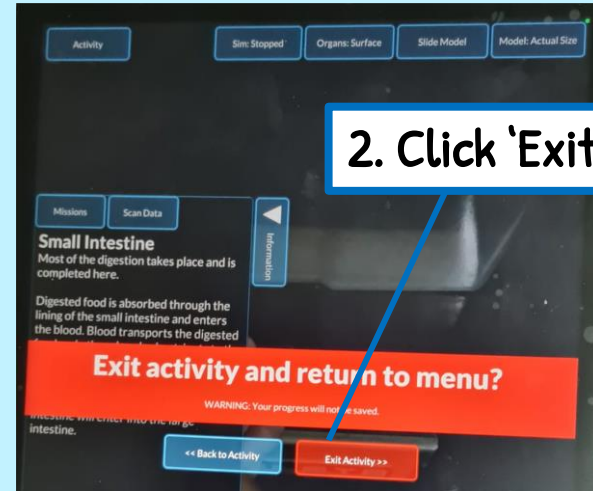
*Circle as appropriate

EXIT THE ACTIVITY

1. Click activity on the top left hand corner. Click Exit.



2. Click 'Exit Activity'.



3. Return to 'Scan a Module'.

4. Press 'Home' button.

WHAT HAPPENS?

MODULE - WHAT HAPPENS?

LEARNING OBJECTIVE:

TO INFER AND STATE WHAT HAPPENS IF ONE PART OF THE DIGESTIVE SYSTEM IS NOT WORKING WELL.

MODULE - WHAT HAPPENS?



Click Start

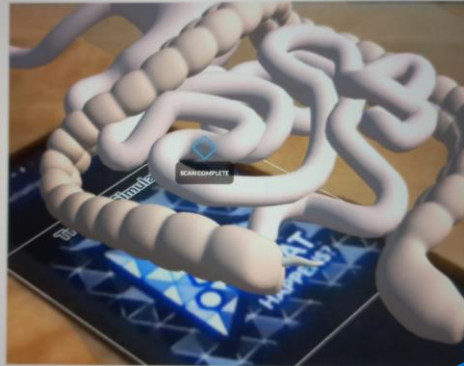
PAPER CODE: WHAT HAPPENS?

WHAT HAPPENS?

What happens if...?

Question 1

What do you think will happen to the digestive system if the small intestine is too short?




Enter your answer (at least 25 letters)...

Type in your
answer with at
least 23
letters

WHAT HAPPENS?

Question 2

What will happen to a person's digestion if they have many missing teeth?



Enter your answer (at least 25 letters)...

Submit

<< Previous Question Next Question >>

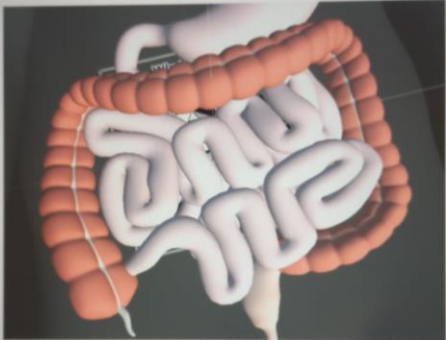
After submission,
move on to the
next question.

WHAT HAPPENS?

What happens if...?

Question 3

What happens if the large intestine is not working well?



Enter your answer (at least 25 letters)...

Submit

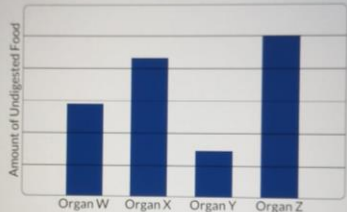
<< Previous Question Next Question >>

Complete all 4 questions.

What happens if...?

Question 4

Laura ate a plate of chicken rice for lunch. The graph below shows the amount of undigested food entering the mouth, stomach, small intestine and large intestine. The organs are not arranged in order.



Organ	Amount of Undigested Food
Organ W	2 units
Organ X	4 units
Organ Y	1 unit
Organ Z	5 units

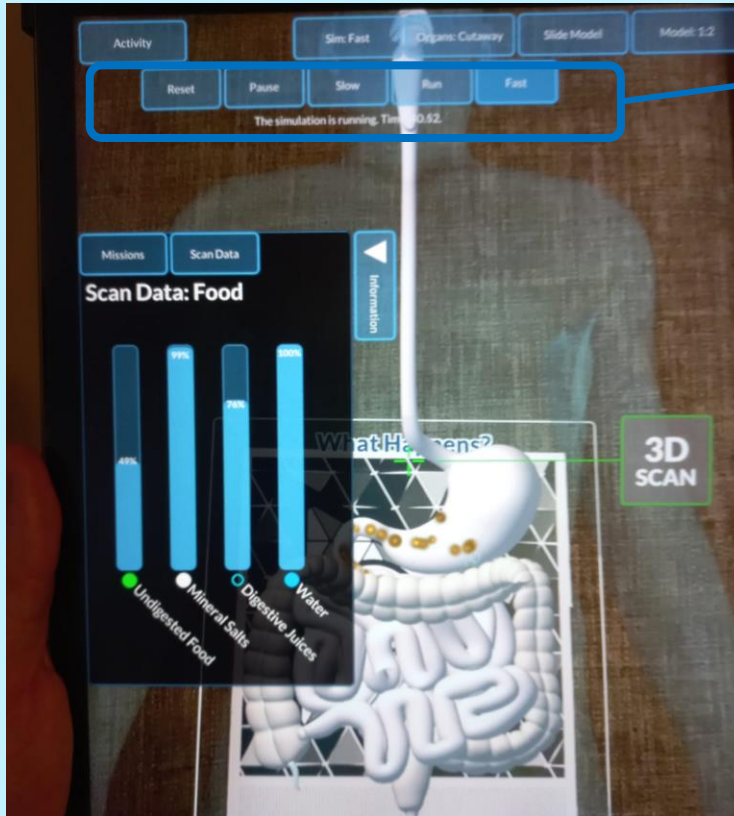
Which organ is X, and why?

Enter your answer (at least 25 letters)...

Submit

<< Previous Question Close Questions >>

WHAT HAPPENS?



Use these to control the simulation.

- Run (slow/fast)
- Pause
- Reset

Place the green cross hairs at the organ where you want to obtain data. Click 3D Scan. Wait for scan to reach 100%.

REMINDERS FOR GROUPWORK

1. Be considerate. Work at Volume 1.
2. Be cooperative. Take turns to hold the ipad and write your answers.

Answer all 4 questions in 15 mins

3. Be focused to complete your task in the given time.
4. Be proactive. Raise your hand if you need help.

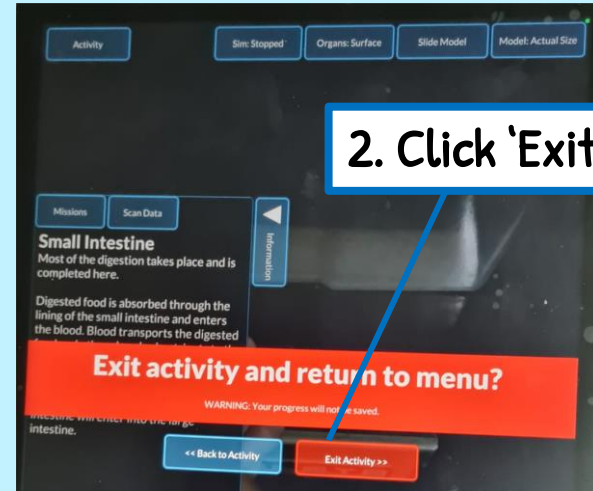
Take care of the ipad. Do not bend the paper codes.

EXIT THE ACTIVITY

1. Click activity on the top left hand corner. Click Exit.



2. Click 'Exit Activity'.



3. Return to 'Scan a Module'.

4. Press 'Home' button.

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CASE FILES

DIGESTION IS THE PROCESS WHEREBY

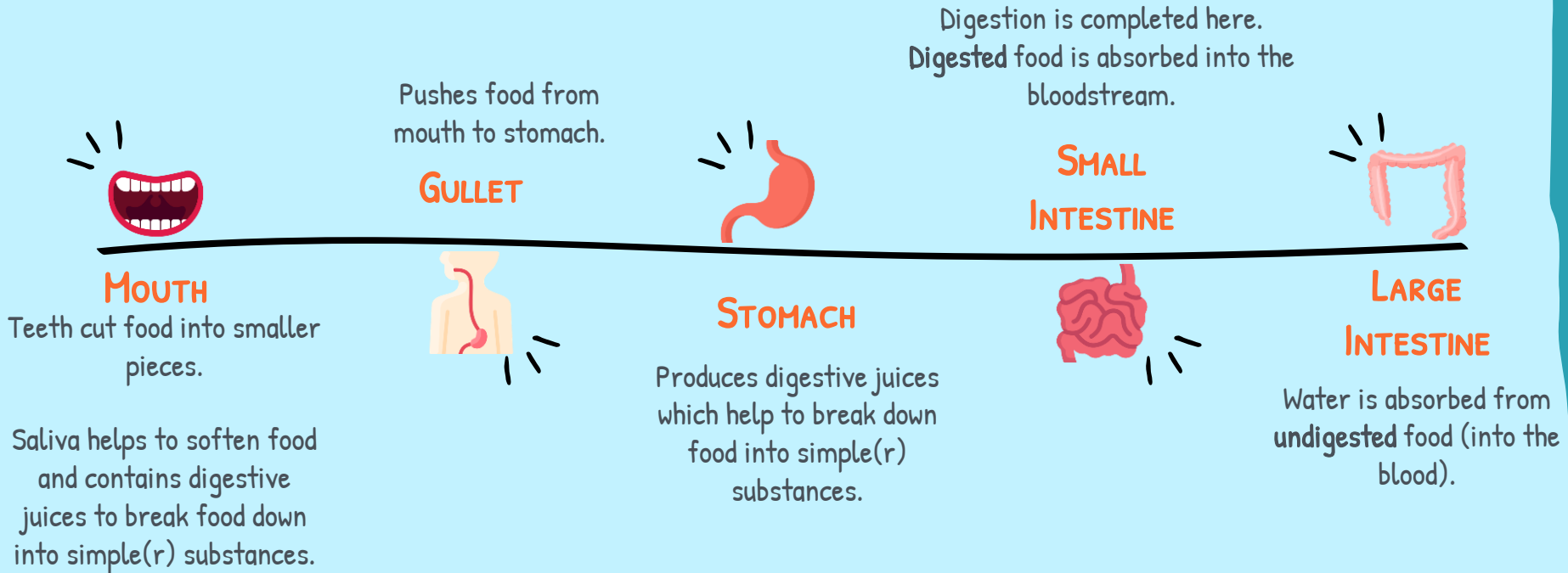
FOOD IS BROKEN DOWN INTO SIMPLE(R) SUBSTANCES

FOR ABSORPTION INTO THE BODY

IF EACH ORGAN WORKS PROPERLY, CAN IT COMPLETE
DIGESTION ON ITS OWN?

No

EVERY ORGAN HAS A _____ IN THE DIGESTIVE SYSTEM.



**ALL THE ORGANS MUST WORK TOGETHER FOR
DIGESTION TO TAKE PLACE PROPERLY.**

MODULE – WHAT HAPPENS?

LEARNING OBJECTIVE:

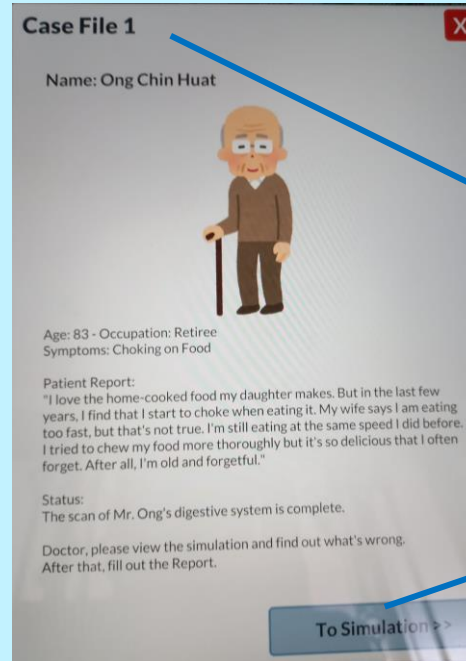
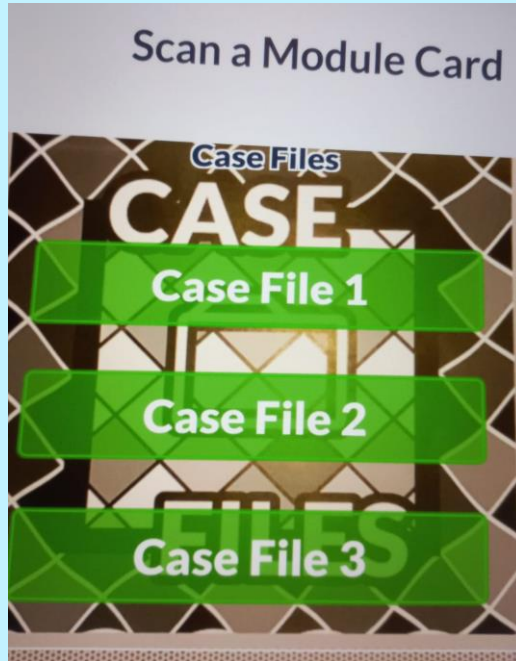
PLAY THE ROLE OF A DOCTOR AND APPLY
YOUR KNOWLEDGE OF THE DIGESTIVE SYSTEM
TO SIMULATED* CASES OF PATIENTS

*create a situation/ model
that is like one in real-life

SKILLS INVOLVED:

- MAKE OBSERVATIONS DURING THE SIMULATION
- COMPARE DIFFERENT SETS OF DATA
- DRAW CONCLUSION ABOUT PROBLEMATIC ORGAN
- SUGGEST A METHOD OF TREATMENT

MODULE – CASE FILES



Information

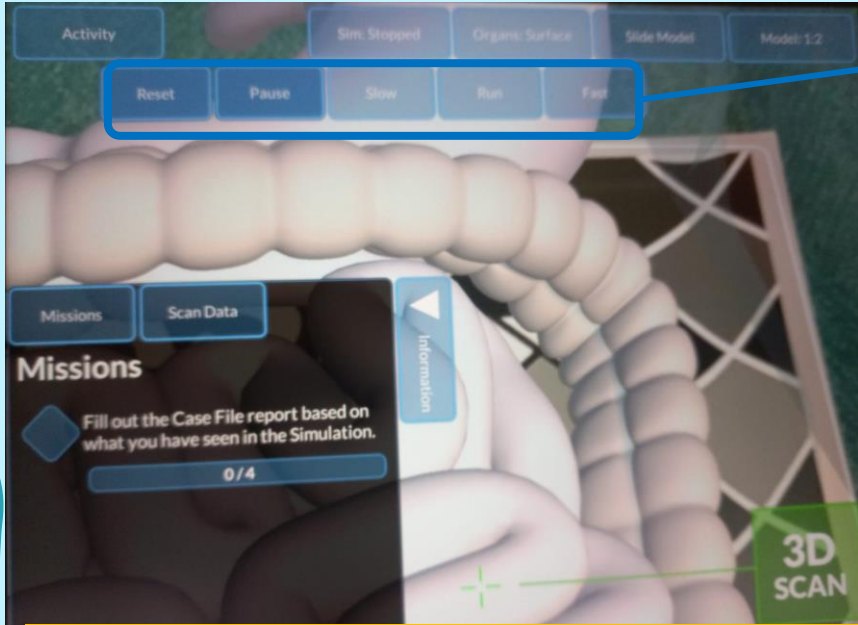
Read the Case File

Run Simulation

PAPER CODE: CASE FILES

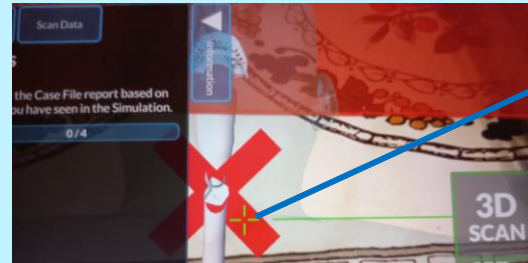
CASE FILES

Run Simulation



Use these to control the simulation.

- Run (slow/fast)
- Pause
- Reset



Place the green cross hairs at the organ where you want to obtain data. Click 3D Scan. Wait for scan to reach 100%.

Take down the data in the Page 2 of the supplementary worksheet for comparison.

CASE FILES

Doctor's Report

Case File 1

Doctor's Report for Mr. Ong Chin Huat

Dear Mr. Ong,

Your [Select an Organ] is not working well.

It [Select a Problem]

On the scan, I observed the following:

Describe what you saw in the simulation...

In order to get well, please follow my instructions below:

[Select a Treatment Method]

Yours sincerely,

Dr. Tan Ah Kow

Send Report

<< To Simulation

Fill up the Doctor's Report using the options provided.

You will also need to describe what you see in the simulation in at least 23 letters.

Case File 1

Doctor's Report for Mr. Ong Chin Huat

Dear Mr. Ong,

Your [] mouth

It has too many te

On the scan, I observe

Describe what y

In order to get well, please follow my instructions below:

Ask a dentist to make a set of false teeth for you.

Yours sincerely,

Dr. Tan Ah Kow

Send Report

<< To Simulation

You can only submit report when you get 4 green ticks.

REMINDERS FOR GROUPWORK

1. Be considerate. Work at Volume 1.
2. Be cooperative. Take turns to hold the ipad and write your answers.
3. Be focused to complete your task in the given time.
4. Be proactive. Raise your hand if you need help.

Submit all 3 Doctor's Reports in 15 mins

Take care of the ipad. Do not bend the paper codes.

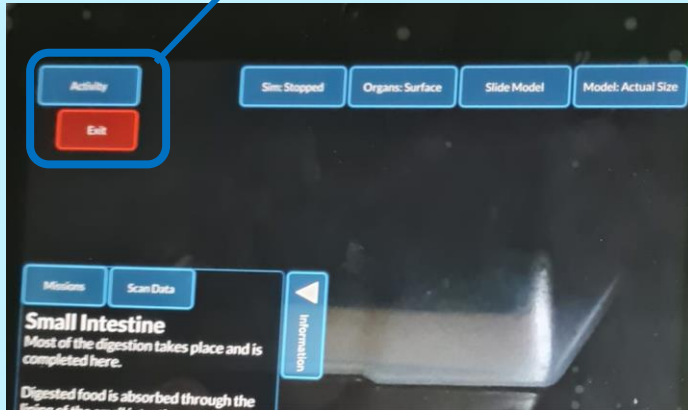
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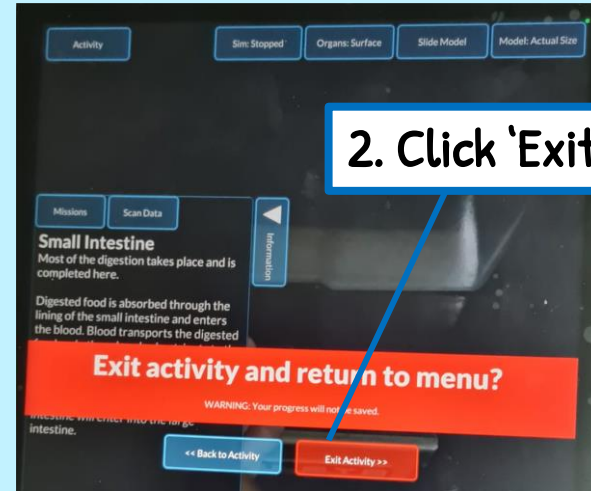
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3. Return to 'Scan a Module'.

4. Press 'Home' button.

CASE FILES

Consolidation

CASE FILE #1 - CHOKING ON FOOD

Organ affected: Mouth

Problem: Does not have enough teeth



CASE FILE #1

Case File #1

Symptoms: Choking on Food

Compare and record the size of food before and when it leaves the mouth.

	Size of Food
In the mouth (whole food)	small / medium / large
Leaves the mouth	small / medium / large

CASE FILE #1 – CHOKING ON FOOD

Organ affected: Mouth

Problem: Does not have enough teeth

- Not able to chew food properly into smaller pieces due to missing + damaged teeth
- Food pieces are too large
- Food got stuck in the gullet

Solution: Needs a set of false teeth



CASE FILE #2 - WATERY FAECES

Organ affected: Large Intestine

Problem: Not absorbing enough water



CASE FILE #2 - WATERY FAECES

Case File #2

Symptoms: Watery Faeces

Compare and record the amount of water when it enters and leaves the large intestine.

	Amount of water in Food (%)
Entering the large intestine	98 - 100
Leaving the large intestine	65 - 67

CASE FILE #2 - WATERY FAECES

Organ affected: Large Intestine

Problem: Not absorbing enough water

- Amount of water leaving the large intestine was more than normal (data: 100% vs 67%)
- Too little water was absorbed (inference)

Solution: Take medicine to slow down the speed food moves through the large intestine



More time for
absorption of water

CASE FILE #3 – STOMACH PAIN

Organ affected: Stomach

Problem: Making too much digestive juice



CASE FILE #3 – STOMACH PAIN

Case File #3

Symptoms: Stomach Pain

Observe what happens when food is in the stomach.

What do you observe in the stomach? a lot of bubbles

What happens to the appearance of the stomach? became red and swollen

CASE FILE #3 – STOMACH PAIN

Organ affected: Stomach

Problem: Making too much digestive juice

- Too much digestive juice produced
- Stomach becomes red and inflamed / swollen

Solution: Take medicine to reduce the amount of acid produced (in digestive juice)



Having too much digestive juice → too much acid → stomach gets inflamed as acid breaks down the stomach lining