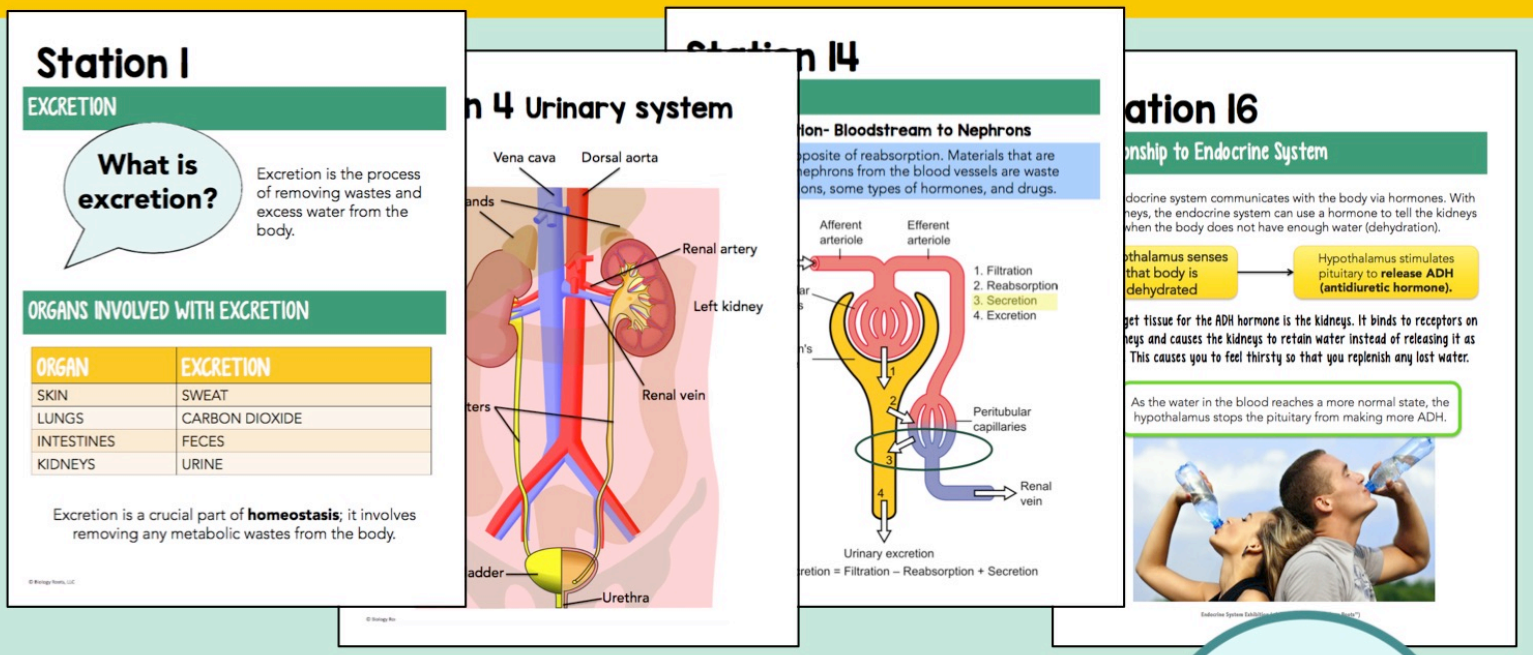
excretory system

Exhibition Stations



STATIONS WITH STUDENT ANSWER SHEET INCLUDED

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24 Stations with student answer sheet included.

Covers entire urinary system with a focus on the nephrons and urine formation (filtration, reabsorption, secretion) as well as relationships to other systems and cell transport. Includes model stations and fun facts!

Editable so you can tailor it to your classroom needs!

Station 1

EXCRETION

What is excretion?

Excretion is the process of removing wastes and excess water from the body.

PREVIEW

ORGANS INVOLVED WITH EXCRETION

ORGAN	EXCRETION
SKIN	SWEAT
LUNGS	CARBON DIOXIDE
INTESTINES	FECES
KIDNEYS	URINE

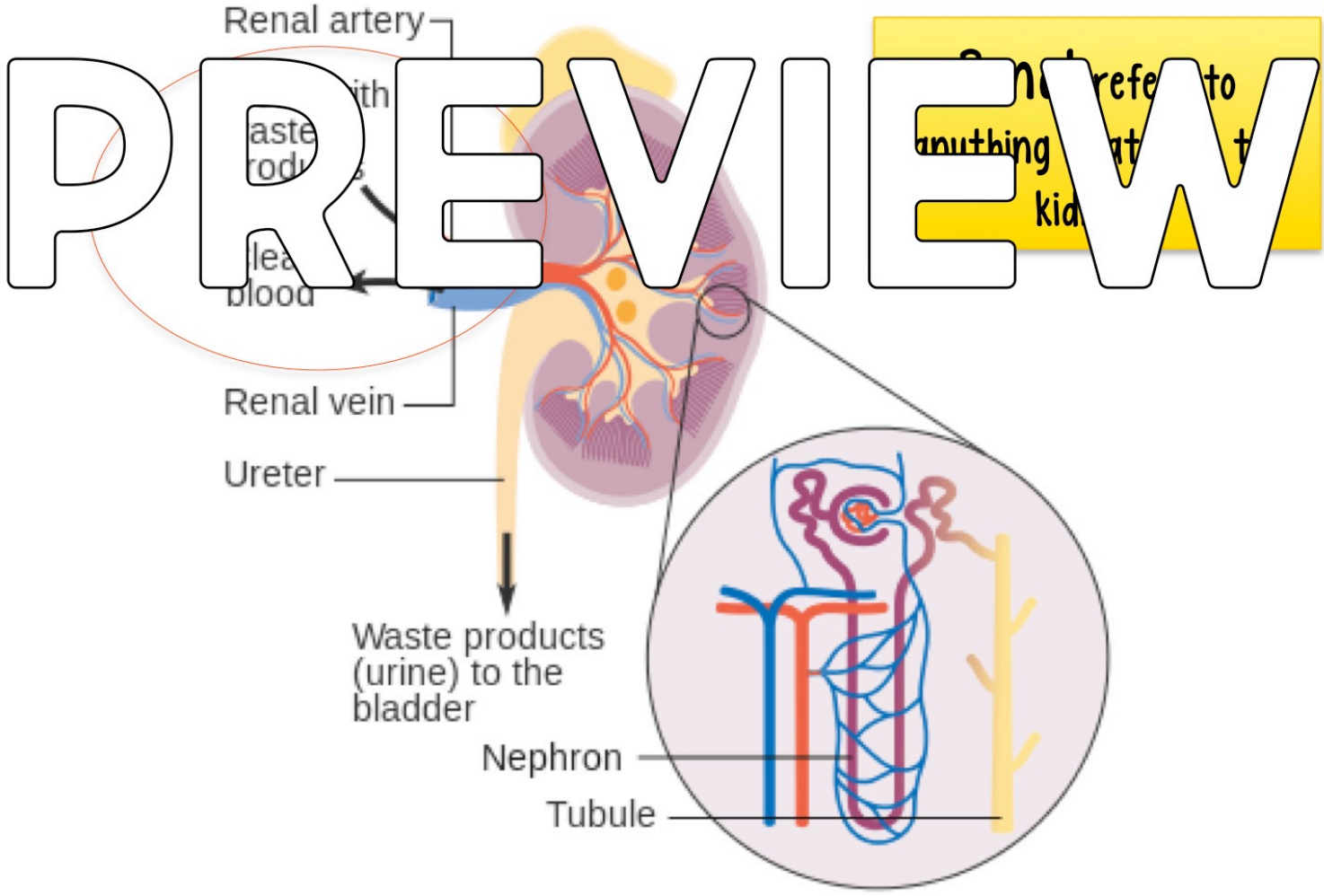
Excretion is a crucial part of **homeostasis**; it involves removing any metabolic wastes from the body.

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Station 3

THE KIDNEYS as a FILTER

The main organs of the excretory system are the kidneys- they filter the blood from MANY substances.



PREVIEW

The kidneys are connected to the circulatory system through the **renal artery and vein.** They filter blood that contains waste and send clean blood back to the heart.

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Station 5

WHAT IS FILTERED?

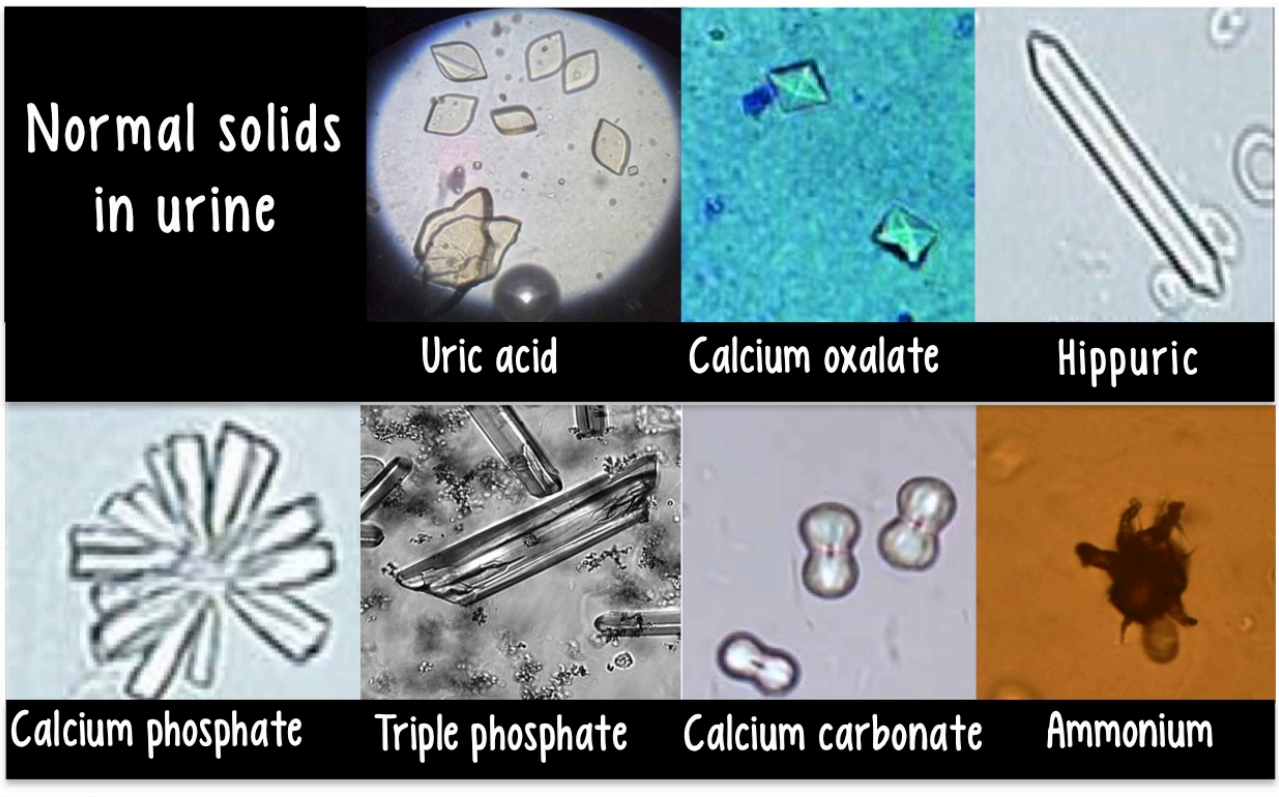
Your **metabolism** is an ongoing process of all the chemical reactions in your body.

Every chemical reaction creates a product. Some of the products we can use, but the ones that we can't are

PREVIEW

Examples of waste that is filtered from the blood

- Extra water
- Urea
- Salts
- Bicarbonate
- Some amino acids
- Drugs or medications



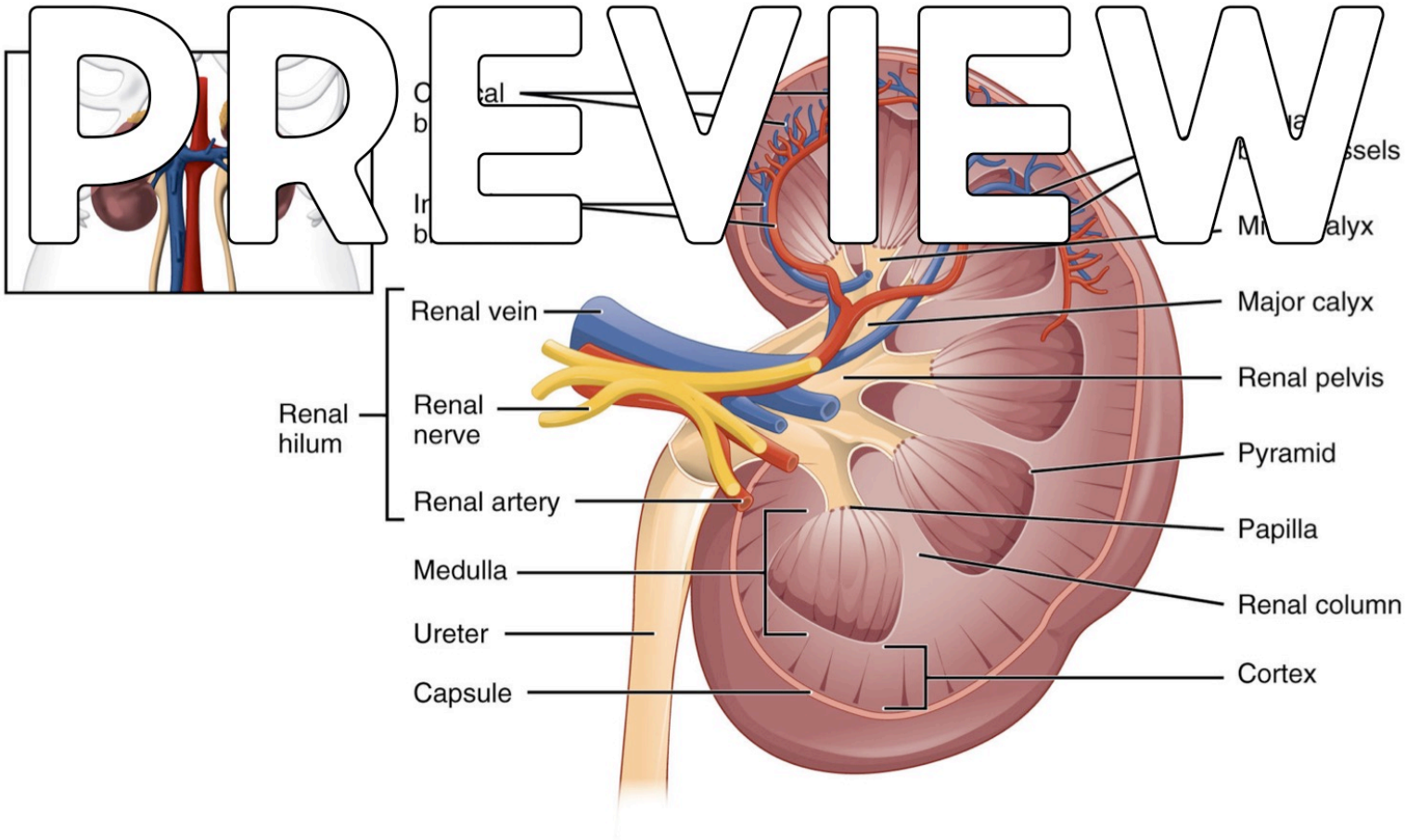
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Station 7

KIDNEY ANATOMY

There are two kidneys in the body each about the size of a clenched fist. The kidneys are located towards the lower back on either side of the spine.

PREVIEW



When viewing a cross section of the kidney, there is an outer region and an inner region.
The outer shell is called the **renal cortex**, and the center is called the **renal medulla**.

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Station 9

URINE

Many waste products of the cell are rich in nitrogen and must be filtered from the bloodstream.
Examples of these include urea, uric acid, and creatinine.

What's In Urine?

PREVIEW

Urine is 90%-95% water.
Remaining 5%-10% is usually made of solutes such as urea, uric acid, ammonia, hormones, dead blood cells, salts, minerals, and can also contain toxins.

Outside of water, the stuff your urine is made up of can depend on what you've drank, eaten, consumed, or even absorbed through your skin!



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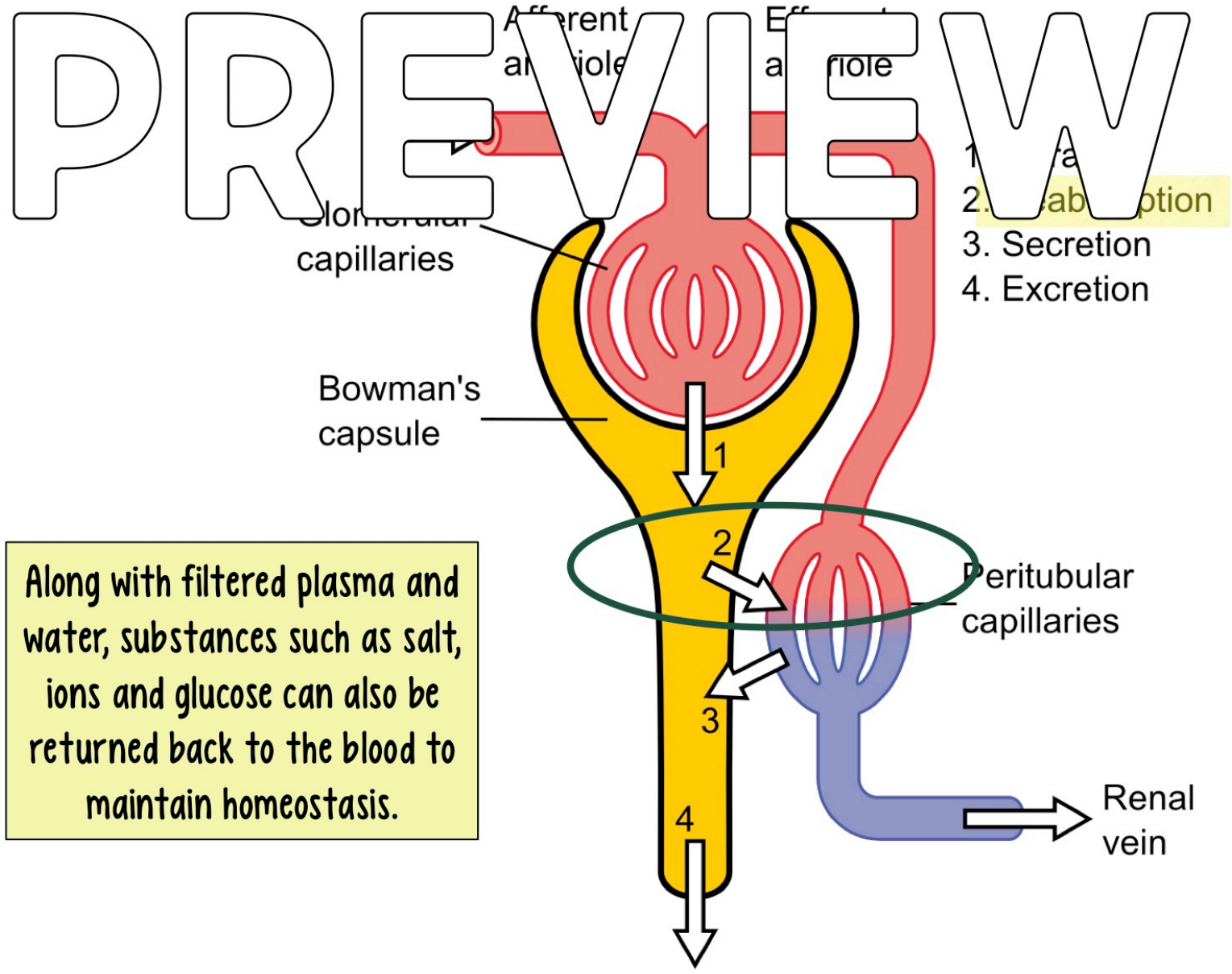
Station 13

REABSORPTION

Reabsorption- Nephrons to Bloodstream

Reabsorption is the process of returning the clean, filtered plasma back into the circulatory system. The concentrated fluid that remains after reabsorption is the urine.

PREVIEW



Along with filtered plasma and water, substances such as salt, ions and glucose can also be returned back to the blood to maintain homeostasis.

Excretion = Filtration – Reabsorption + Secretion

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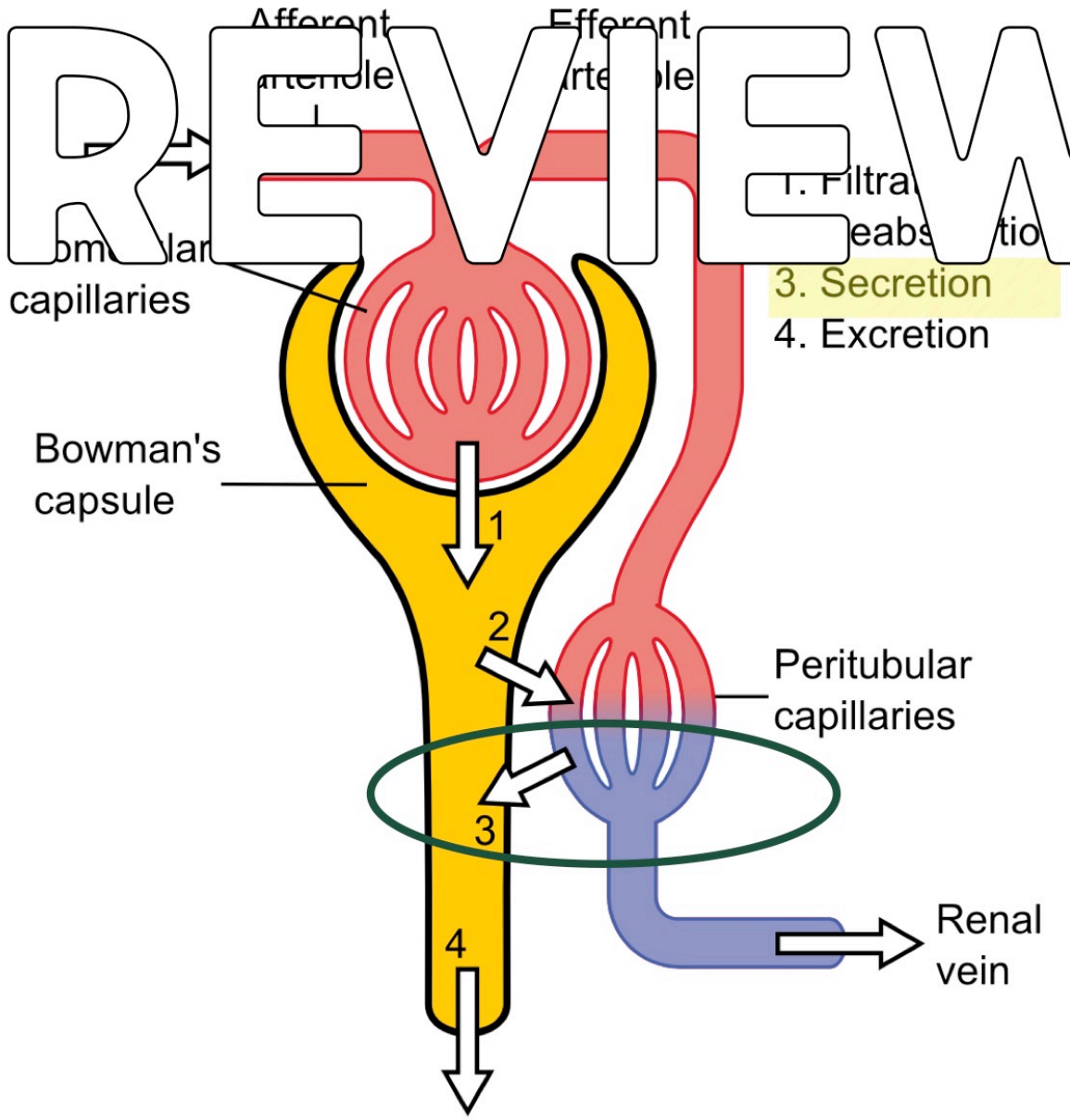
Station 14

SECRETION

Secretion- Bloodstream to Nephrons

Secretion is the opposite of reabsorption. Materials that are secreted into the nephrons from the blood vessels are waste products, such as ions, some types of hormones, and drugs.

PREVIEW



Excretion = Filtration – Reabsorption + Secretion

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Station 17



CELL TRANSPORT & HOMEOSTASIS

Think tank station

WATER BALANCE

PREVIEW

When the water level of our blood plasma is low, more water is reabsorbed back into the bloodstream and the urine is more concentrated.



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Video link of final product:
https://photos.app.goo.gl/GFkWFAv7zhLD8dQQ9

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EXCRETORY STUDENT ANSWER SHEET

Name: _____ Date: _____

EXCRETORY SYSTEM EXHIBITION LAB

Station 1- Excretion

- Excretion is the process of _____ _____ from the body.

ORGANS INVOLVED	EXCRETION
SKIN	
	FECES
KIDNEYS	

How is excretion crucial for homeostasis?

_____

Station 2- The Kidneys

The main job of the kidneys is to _____ _____.

Secondary functions include maintaining correct _____ levels, salt and _____ levels in the blood, and to produce _____.

Station 3- The Kidneys as a Filter

The kidneys are the _____ _____ of the excretory system because they filter the _____ from many substances.

- *How are the kidneys connected to your blood supply?*

_____

_____

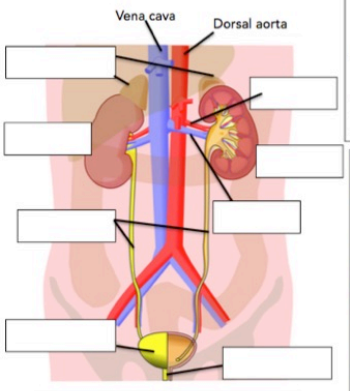
- *How are the kidneys like the lungs of the respiratory system?*

_____

_____

_____

Station 4- Diagram Label



Station 5- What is filtered?

A _____ product is a product of a chemical reaction that we cannot use.

Examples of waste filtered from the blood:

- _____
- _____
- _____
- _____
- _____
- _____



Healthy urine contains tiny solid particles sometimes called **crystals**. Examples include (name 3): _____

_____

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Station 6- Kidney Stones



How can kidney stones form?

_____

_____

What are kidney stones usually made of?

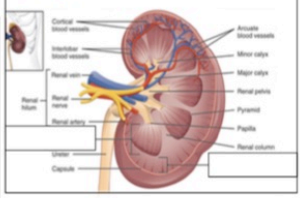
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Station 7- Kidney Anatomy

Kidneys are about the size of a _____ and located _____ _____.

Outer region= _____

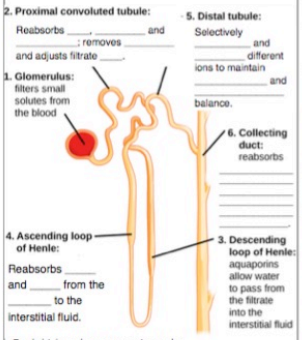
Inner region= _____



Station 8- Nephrons

Each kidney is made up of smaller filtering units called _____.

The nephron filters the _____ and produces _____.



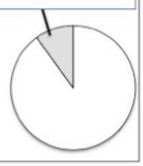
Each kidney has approximately _____ nephrons.

Filtrate = liquid in the nephrons that is being filtered.
Interstitial fluid= fluid outside that leads to the blood vessels.

Station 9- Urine

Use the pie chart below to determine which chunk is water and which chunk is solutes. Label accordingly. For the solutes, write down 6 or 7 of them in the space provided.

_____



The stuff your urine is made of up can depend on what you've _____, _____/ consumed, or _____ through your _____.

Station 10- Plasma, not blood cells.

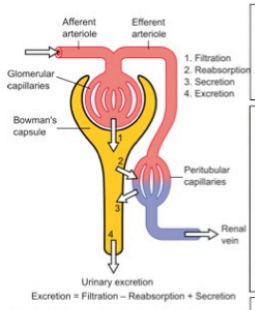
Plasma is _____ through the nephrons, blood cells are not because they are _____ to fit through the filtration system. Red blood cells in the urine can be a sign of _____.

Station 11- STEPS OF URINE FORMATION:

1. _____
2. _____ **(back to blood stream)**
3. _____ **(from blood stream into nephron).**

Urine formation occurs in the _____.

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Station 12- FILTRATION

Most filtration occurs in the _____. Naturally occurring blood _____ forces _____ into the _____ _____. *Put a star in the area between the glomerulus and the Bowman's capsule.

Station 13- REABSORPTION

Nephrons → _____.

Reabsorption is the process of returning _____, filtered plasma back to the _____ system. The concentrated fluid that remains is _____.

- ***What else might be reabsorbed back into the blood?***

_____

- ***What would happen if reabsorption did not occur?***

_____

Station 14- SECRETION

Bloodstream → _____.

Secretion is the movement of materials into the nephrons and these may include ions, _____, and _____.

Station 15- Cell Transport within the kidneys

- Nephrons rely on _____ or _____ _____ _____ to filter the blood and form urine.
- The passing of fluids and solutes occurs across the cell _____ of the _____.
- Materials are transported between the nephrons and the _____ _____ to help maintain _____.
- Nephrons have very active _____ _____ pumps!

Review the diagrams at this station.

- What types of substances are being reabsorbed?
- What types of substances are being secreted?

(If you are unsure of reabsorption vs. secretion, please come back after you have visited stations 13 and 14).

Station 16- Relationship to Endocrine System

What is ADH and what does it do?

_____

_____

How is the relationship between the kidneys and the endocrine system important for homeostasis?

_____

_____

_____

Station 17- CELL TRANSPORT and HOMEOSTASIS

Read the station and provide an example of how cell transport assists in homeostasis. _____

_____

_____

_____

_____

_____

_____

_____

What do you think happens if you are dehydrated? _____

_____

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Station 18- Urine Samples

Urine tests can be used to detect _____, diseases such as _____, some _____ transmitted _____, _____ and drugs.

How do these substances get into your urine? _____

_____

Station 19- Color of Urine

What can the color of urine tell you?

_____

Note the colors are the chart for your own health.

Station 20- UTI

What causes a UTI or bladder infection?

_____

How are UTIs treated? _____

How can you prevent UTIs? _____

_____

_____

Station 21 - Dialysis- a treatment that takes

over your _____ _____ for patients that have kidney _____.

Dialysis has been around since _____.

Station 22 - Interesting Facts!

Can you drink your pee for survival? _____! But only if it is _____.

Does holding in your pee cause a bladder infection? ____! But if you hold it frequently it can give any present bacteria more time to _____, which can lead to an infection.

The kidneys filter about _____ of blood each day. Why don't we urinate this amount each day? _____!

Why is pee yellow? _____

_____

How long does it take for the kidneys to filter your entire blood supply? _____.

Station 23- Waste not, want not!

CAREFULLY READ ALL DIRECTIONS ON STATION BEFORE PROCEEDING. Record your data here.

Record the flow time in seconds. You can use this information to consider which beaker has the best results. Under "description of results" describe the time and the color of the water in the beaker after filtration.

Beaker	Flow Time (s)	Description of results
A		
B		
C		

Based on your results, which beaker do you think would represent the "best" or healthiest functioning kidney and why? _____

_____

_____

_____

Station 24 - MODEL- For each item on the model, determine which part of the excretory system it represents:

Water bottles	
Tubes	
Funnel	

Pour the container that has the colored water into one of the water bottles. Observe what happens:

_____

What do you think the food coloring represents? _____.

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Students record their answers or observations on this packet as they move from station to station.

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