# Metabolism

­­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: all the basic processes your body continues to keep you \_\_\_\_\_\_\_\_\_\_\_

 Metabolism requires \_\_\_\_\_\_\_\_\_\_ to burn and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for fuel, to burn it.

 Hormones produced in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ system affect your metabolism, energy levels.

Hormones also affect your \_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_, rest, etc.

­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: how quickly your body uses energy

 Higher for: rather than

 Higher for: rather than

 Higher for: rather than

Higher for: rather than

(Higher for larger, more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: the rate at which your body uses energy while resting

 Minimum daily requirements, just to keep body \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Higher or lower based on the same factors as above

 A larger person can “\_\_\_\_\_\_\_\_\_\_\_” if their BMR is not met. They will start consuming their own energy stores.

Ingestion/Digestion: provides \_\_\_\_\_\_\_\_\_\_\_\_ (the raw materials) for the body to get energy from

 Provides the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ needed for cellular respiration

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ makes energy, or \_\_\_\_\_\_\_\_\_\_\_, using oxygen

 Not all foods provide energy for metabolism

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ does not provide energy either, even though it is vital

 Some foods go into building the body, repairing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Some food passes through the body undigested (like \_\_\_\_\_\_\_\_\_\_\_\_\_ )

 Some substances are \_\_\_\_\_\_\_\_\_\_\_\_, or waste products (artificial color, flavor, preservatives)

Respiratory system: provides\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for cellular \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 All \_\_\_\_\_\_\_\_\_\_\_ require oxygen to stay alive, functioning

 Burning \_\_\_\_\_\_\_\_\_\_\_\_\_\_ with oxygen creates ATP, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ molecule

* Labs: 23A, 23B (first side)

# Nutrition

Every day, the body needs three basic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: carbohydrates, fats, and proteins

Carbohydrates are basically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Complex sugars are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Excess sugar is stored as glycogen in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Stored glycogen may eventually turn to \_\_\_\_\_\_\_, if not used

Sugar levels in the blood are regulated by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (through insulin)

Basic levels of sugar are required for glucose to power cells.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ include solid fats and liquid oils.

Some fats are very \_\_\_\_\_\_\_\_\_ and very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to basic functioning.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organs by providing liquid-protective barrier

They insulate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (the axons) for speedy processing.

They also store energy for times when food intake is \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Nuts, \_\_\_\_\_\_\_\_\_\_\_\_\_, oils, and some fruits contain good fats.

\_\_\_\_\_\_\_\_\_\_\_\_ fats are unsaturated; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fats are saturated.

Proteins are the building blocks of bodily \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Tissues and \_\_\_\_\_\_\_\_\_\_\_\_\_ are made of proteins.

Made of amino acids, the building blocks of \_\_\_\_\_\_\_\_\_ and your body’s instructions.

Proteins are hard to \_\_\_\_\_\_\_\_\_\_, store a lot of energy, will burn \_\_\_\_\_\_\_\_\_\_\_.

Provided primarily by \_\_\_\_\_\_\_\_\_\_\_\_, also nuts, seeds, beans, some vegetables.

Fats, proteins, carbohydrates need to be broken down by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the digestive tract before they can be used. Water, vitamins, and minerals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Your metabolic rate says how hard it is for the body to do that, to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and derive \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_from the food you eat.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: units of physical energy that your body runs on, provided by food

Food provides macronutrients and energy

 The average person needs \_\_\_\_\_\_\_ calories a day—up to \_\_\_\_\_\_\_\_ for an athletic teenage boy!

 Taking in fewer calories causes your body to start burning stores of fat, so you get \_\_\_\_\_\_\_\_\_\_\_

 Taking in too many calories causes your body to store extra calories as fat, so you get \_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_supply essential organic materials for bodily processes; boosts certain reactions.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ supply needed inorganic materials, especially for bones.

* Labs: 23C, 23H (exercise, first side)
* Vitamin/Mineral Chart: Make chart of Vitamins A, Bs, C, D, E, K, Minerals calcium, phosphorus, magnesium, potassium with Function/Foods I Like

# Drugs

The first category of drugs are medicinal drugs.

These are any chemical or medicine taken into the body to address illness, pain, or disorder.

Some cure, some treat, some are preventative.

We usually buy these “over the counter” or get a prescription from a doctor.

“Pharmacy” (drug store) comes from the Greek word *pharmakon*, for “drug.”

The second category of drugs are abused primarily to affect mood, and are called psychoactive drugs.

 They are special kinds of chemicals processed in certain ways.

They are also illegal.

 They generally lead to physical and emotional addiction.

 There are several subcategories.

Drugs that slow the central nervous system are depressants.

Depressants decrease bodily functions and relax muscles.

 They include: Alcohol, sedatives, sleeping pills, tranquilizers.

 Alcohol first causes a person to lose the ability to concentrate, think clearly.

It then makes someone unable to form sensible or logical responses, react in the right ways.

It can cause a person to fall asleep or lose consciousness.

People die every year from alcohol poisoning, when the levels in the blood get so high that they

fall into a coma and cannot wake up.

Doctors will pump the stomach to save someone from any kind of drug or alcohol poisoning.

 Drinking may cause vomiting, headaches, blurred vision; long term liver damage.

Alcohol is illegal under the age of 21.

The legal limit, tested by breathalyzer, is .08%

Alcohol is involved in more than 40% of traffic-related deaths.

Drugs that increase mental activity and alertness are stimulants.

They have an effect like caffeine, but much stronger.

Stimulants increase bodily functions and stimulate muscles.

 Stimulants include nicotine in cigarettes.

Nicotine depresses the appetite (+ tar); e-cigarettes (vapes) still have nicotine.

Amphetamines, meth, speed, cause hyper energy and excitement, increase sensory receptivity.

 Also includes cocaine, which is extremely addictive to the body.

 Stimulants usually cause a person to lose sleep, sometimes for days, and then crash. The body

becomes even more tired and unresponsive than usual because it is overtired.

Many stimulants also cause anxiety, panic attacks, headaches, nausea, or dehydration.

Drugs that cause people to see imaginary things are called hallucinogens.

 Cocaine, LSD, marijuana/pot are all hallucinogens.

They stimulate the brain causing visions, moods, and sensations that the body cannot control. Some hallucinations are benign but many people describe negative, tormenting experiences they could not escape—like nightmares that feel real.

Narcotics are drugs that dull pain and the sensory system.

 These are often referred to as “hard drugs.”

Most are highly addictive, even after one attempt.

They include common painkillers: morphine, heroin, codeine, oxycodone, and other prescription drugs.

 The body can get so addicted that it requires daily usage to avoid pain, which then starts up

again when the dosage wears off.

Physical withdrawal symptoms are extremely strong. People feel sick, shaky, chills, flu, and have

indigestion, anxiety, loss of control, even intense cramping or shock-like pain waves.

An addiction has two parts which often have to be treated separately: the physical addiction in the body, and the emotional addiction in the mind.

* Lab 23D

# Disease

Your immune system works all the time to keep you well.

The immune system produces antibodies which kill many pathogens.

It also fights bacteria and viruses directly.

Skin, mucous membranes, and stomach acid take care of a lot of problems.

The body naturally produces blood, lymph, white blood cells, fever in response to attack.

Pathogens are in the air, on surfaces, in liquids, in raw foods, and on people/animals.

Many substances contain toxins which poison the body.

Bacteria grow exponentially, in warm, moist conditions.

Most infections are due to bacteria, and medical treatment requires antibiotics to inhibit the

growth of that bacteria.

Fungal infections require fungicides, not antibiotics.

Viruses are small strands of harmful DNA or RNA that attacks a certain kind of cell (i.e.

respiratory tract cells) and use cells to house/reproduce themselves

Most viruses cannot be cured, although some antivirals make them easier to handle.

Some vaccines prevent viruses (chicken pox, flu vaccine, measles/mumps/rubella, polio, rabies)

Common colds and flus are all viruses; you become immune but they mutate quickly and easily,

changing their outside coatings so your white blood cells don’t recognize it

Infections cause fever, inflammation, and cell damage. They can be viral or bacterial.

Contamination: when water, air, or soil is polluted with chemicals or pathogens

Contact infection: caused by coming into direct physical contact with a surface or substance; is

prevented by using gloves, washing hands, sterilizing tools

Airborne infection: caused by breathing in germs. Prevented by using masks, filtration systems,

covering cough or sneezes.

Wound infection: prevented by cleaning wounds carefully so that bacteria in them do not grow. Bacteria can be introduced from outside the body (mud, gravel, wood) or can occur during

surgery from tools, doctors, infected substances.

Vector-carried infections are carried by hosts like insects or wild animals: malaria, Lyme disease.

* Lab 23E