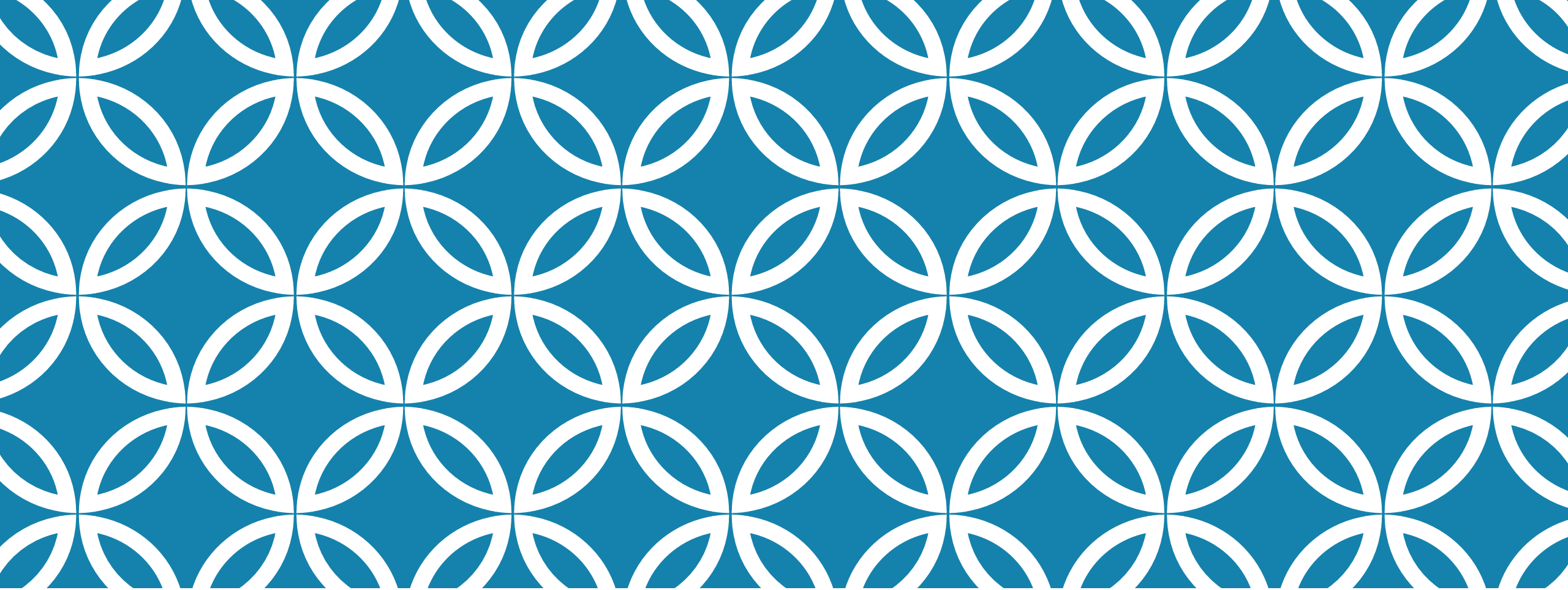

MISSISSIPPI DELTA COMMUNITY COLLEGE

SCIENCE

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Student Success Coach
TEAS TEST PRACTICE

HUMAN ANATOMY AND PHYSIOLOGY

Positional or directional terms

- Superior (cranial): Toward the head of the body or body structure; above another part of the body
- Inferior (caudal): Toward the lower end of the body or a body structure; below another part of the body
- Ventral (anterior): Toward the front of the body; in front of another structure or body part
- Dorsal (posterior):Toward the back of the body; behind another structure of the body
- Medial: Toward the middle of the body;on the inner side of of another structure of the body part

CONTINUED:

- Lateral: Toward one side of the body; on the other side of another structure or body part
- Intermediate: Between medial and lateral
- Proximal: Closer to the trunk of the body
- Distal: Farther from the trunk of the body
- Superficial: Close to the surface of the skin
- Deep: Far from the surface of the skin
- Prone: Lying on the stomach
- Supine: Lying on the back

RESPIRATORY SYSTEM

- Main function: Transport oxygen from the atmosphere into the body's cells and move carbon dioxide in the other direction
- Oxygen in the lungs moves into the blood; carbon dioxide in the blood moves into the lungs, and the lungs move the carbon dioxide into the atmosphere.
- Alveoli: Tiny air sacs in the lungs where oxygen and carbon dioxide are exchanged
- Trachea: The windpipe which connects the larynx to the lungs
- Bronchi: The main passageways directly attached to the lungs

CARDIOVASCULAR/CIRCULATORY SYSTEM

- Main function: Transport nutrients, waste, chemical messengers, and immune molecules
- The closed circulatory system: Transport blood away from the heart, transport blood to the heart, and connect arteries to veins in tissues
- The open lymphatic system circulates and filters interstitial fluid between cells and drains into the circulatory system.
- Two contraction cycles of the heart; systole and diastole
  - Systole: the contraction of the heart muscles
  - Diastole: the relaxation of the heart

CONTINUED

- Blood plasma contains nutrients, hormones, antibodies, and other immune proteins.
- Red blood cells contain hemoglobin and transport oxygen.
- White blood cells are divided into leukocytes and lymphocytes.

GASTROINTESTINAL/DIGESTIVE SYSTEM

- Main functions: breaks down food for absorption and distribution
- Three main secretions of the stomach: pepsinogen (chief cells), mucus (goblet cells) and hydrochloric acid(parietal cells)
- The duodenum, the first part of the small intestine, uses alkaline bile from the gallbladder to help neutralize acid chyme.
- Hormones regulate many aspects of nutrition, such as hunger and the sensation of satiety. They induce secretions, speed up the movement of food through the small intestine, induce cellular uptake of glucose, simulate the breakdown of stored glycogen, and modulate digestive action.

CONTINUED

mouth	• Salivary amylase, salivary lipase • No major hormones
stomach	• Gastric lipase, pepsinogen, HCL • Hormone-gastrin, ghrelin
liver	• Bile • No hormone

CONTINUED

pancreas	• Pancreatic juice • Hormone-secretin, somatostatin, insulin, glucagon
small intestine	• Brush border enzymes • Hormone- cholecystokinin, somatostatin, secretin, motilin

NEUROMUSCULAR SYSTEM

- Main function: Nerves and muscles affect every part of the body; control involuntary and voluntary movement.
- Nerves: Bundles of axons (nerve fibers) that transmit signals (or electrical impulses) from the central nervous system to the peripheral organs
- Autonomic nervous system: Controls involuntary movement, such as heart rhythm, digestion and breathing
- Muscles: soft tissues, or myofibrils, made up of sarcomere units, each containing long strands of proteins. They respond to nerve impulses to produce force and motion.

REPRODUCTIVE SYSTEM

- Main functions: The male reproductive system involves physical structures, hormones, and secretions and works with the endocrine system.
- Major components of the male system: penis, vas deferens, urethra, prostate, seminal vesicles, testes, and scrotum
- The scrotum holds the testes away from the body to lower their temperature for sperm production

CONTINUED

- Major components of female system: ovaries, fallopian tubes, uterus, cervix, and vagina
- Estrogen: made in the ovaries and causes the egg to mature and the uterine endometrium to thicken

INTEGUMENTARY SYSTEM

- Main function: organs and glands protect the body and regulate temperature, including skin, hair, and nails.
- Responsible for some excretion (e.g., water and minerals, such as sodium, chloride and magnesium)
- Takes part in thermoregulation: When the body is too warm, sweat is produced and released. When the body is too cold, blood vessels constrict, reducing the amount of blood brought to the skin surface.
- The skin produces vitamin-D when hit by ultraviolet light.

ENDOCRINE SYSTEM

- Main function: Organs increase hormones that regulate many patterns in the body into the circulatory system.
- Major glands: pineal, hypothalamus, pituitary, thyroid and parathyroid, thymus, adrenal, pancreas, and ovaries or testes
- Regulates blood production, appetite, reproduction, brain function, sleep cycle, salt and water, homeostasis, growth, sexual development, and response to stress or injury
- The nervous and endocrine systems integrate at the hypothalamus.
- The nervous system receives electrical impulses to send signals and activate the pituitary, which releases hormones to other glands.
- The endocrine system acts more slowly than nervous system but the effects are longer lasting.

GENITOURINARY (UROGENITAL) SYSTEM

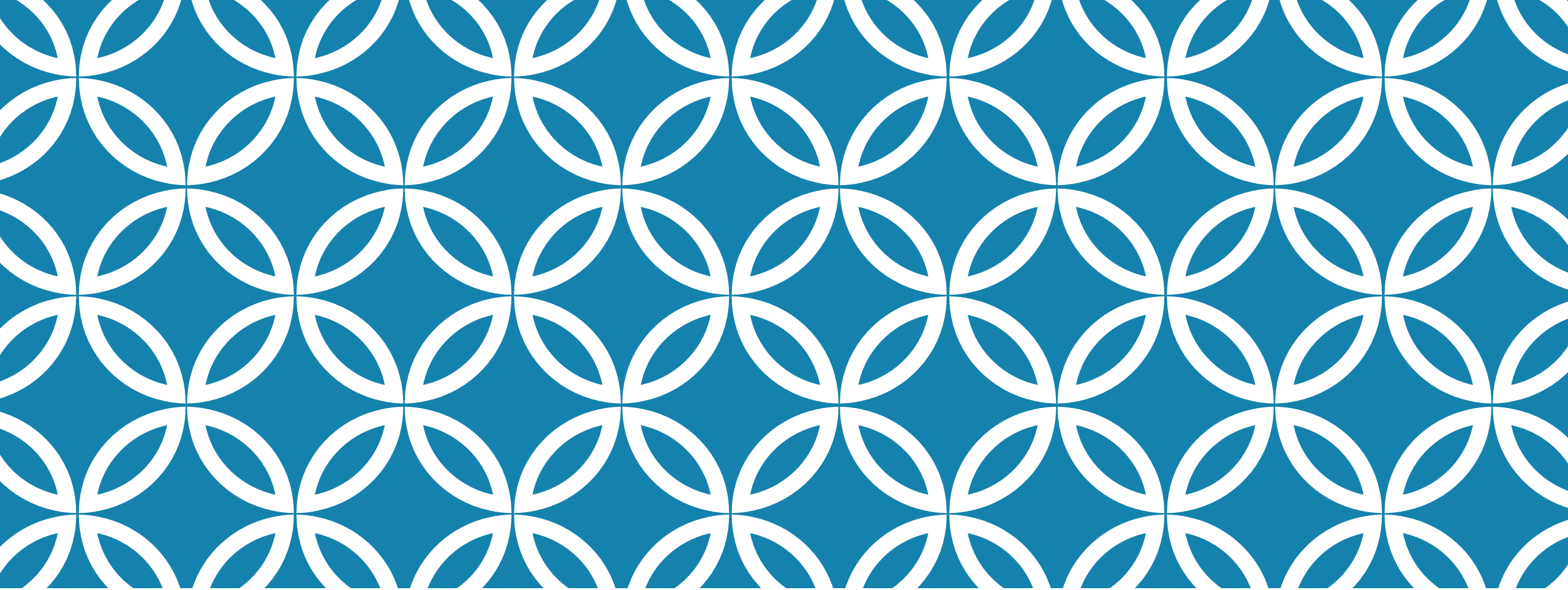
- Main functions: excretory process
- Major organs: kidneys, ureters, urinary bladder and urethra
- Kidneys filter blood, create urine, stabilize water balance, maintain blood pressure, and produce an active form of vitamin-D.
- Males have a longer urethra, which passes through the penis and carries urine and sperm.
- Ureters: small tubes that carry urine to the urinary bladder where it is held until it is released through the urethra.

IMMUNE SYSTEM

- Main functions: prevents the entry of pathogens through the use of barriers, such as the skin and secretions
- If the barriers are breached, there are cells and chemicals that attack the pathogens.
- If the attack fails, the adaptive immune system identifies, targets, and remembers the pathogen.
- Two major components: Innate and adaptive.
  - Innate system: a series of non-specific barriers, divided into external (e.g. skin, hair, mucus, and earwax) and internal (e.g. antimicrobials, inflammation, interferons, and complement) that reduces the number of pathogens that can enter the body or multiply.
  - Adaptative system: divided into reaction (i.e., killing pathogens) and prevention (i.e., antibodies)
- T-cells recognize the pathogen and activate the B-cells, which multiple rapidly and produce antibodies.

SKELETAL SYSTEM

- Three functions: movement, protection, and metabolism
- Four bone types: long, short, flat, and irregular
  - Long bones, such as the humerus, ulna, radius, femur, tibia, and fibula, have hollow shafts containing marrow.
  - Short bones, such as the toe bones and collarbone, are wider than they are long.
  - Flat bones, such as the scapula, ribs, and sternum, contain marrow but are not hollow.
  - Irregular bones, such as the skull, knee, and elbow, are non symmetrical.
- Synovial joints, such as the pivot, ball and socket, and hinge, contain a lubricant and are usually capable of movement.
- Two types of bone cells
  - osteoclast
  - osteoblast



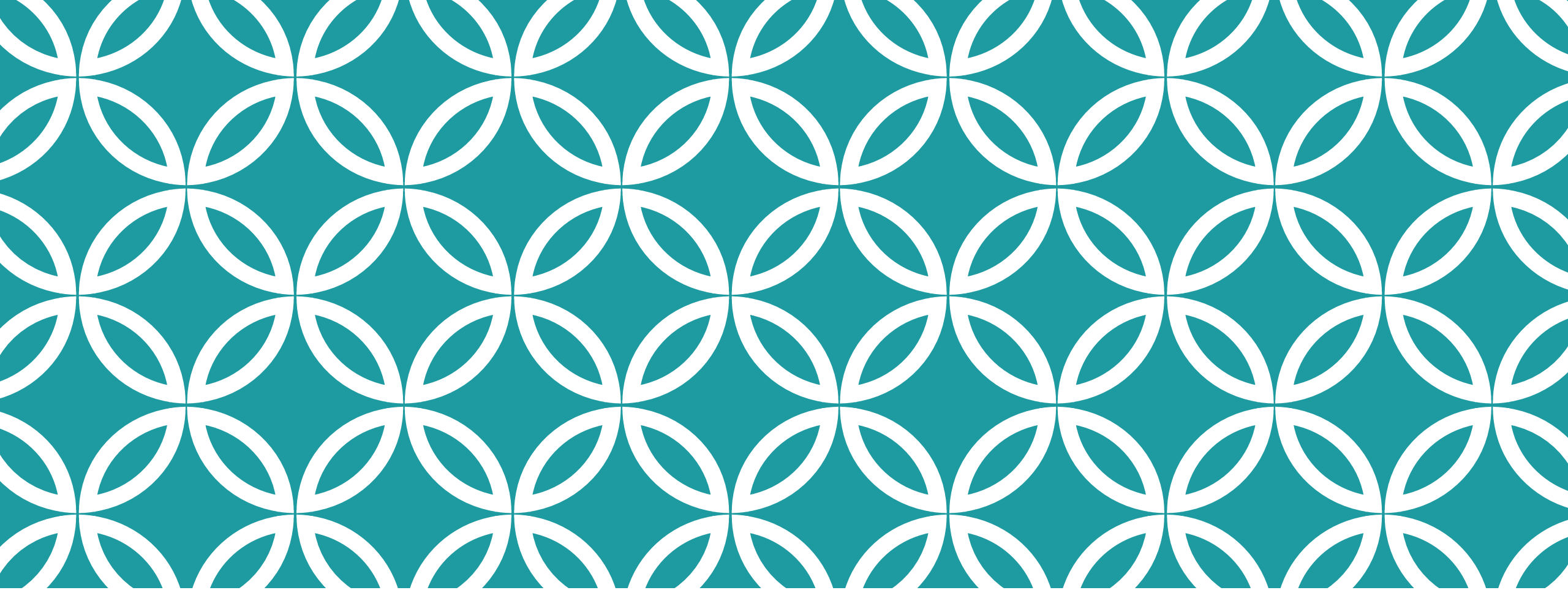
LIFE AND PHYSICAL SCIENCES

GENETICS TERMINOLOGY

- DNA: a nucleic acid that carries the genetic information in cells; it consists of two long chains of nucleotides twisted into a double helix and joined by hydrogen bonds
- Nucleus: membrane-bound organelle containing chromosomes
- Prokaryotic cell: cells without a nuclei and organelles
- Eukaryotic cell: cells with nuclei and organelles
- Meiosis: two-step cell division process that reduces the chromosome number (from diploid to haploid) and creates genetic variation
- Mitosis: division and replication of the nuclear material (DNA) into two identical nuclei; cytokinesis typically occurs creating two identical cells
- Chromosome: a threadlike structure of nucleic acids and proteins found in the nucleus of most living cells. Humans have 22 pairs plus 2 sex chromosomes (XX for women, XY for men), for a total of 46
- Genes: the basic physical and functional units of hereditity; they act as instructions to make molecules called proteins
- Proteins: an important class of molecules found in all living cells; composed of one or more long chains of amino acids, the sequence of which corresponds to the DNA sequence of the gene that encodes it
- Allele: one of two or more versions of a gene; individuals inherit two alleles for each gene, one from each parent

CONTINUED

- Dominant allele: the stronger of two inherited alleles
- Recessive allele: the weaker of the two inherited alleles
- Homozygote: an individual who has inherited two of the same alleles for a particular trait
- Heterozygote: an individual who has inherited two different alleles for a particular trait.
- Genotype: the genetic makeup of an organism or cell.
- Phenotype: an individual's observable and/or biochemical characteristics, such as height, eye color, and blood type.



SCIENTIFIC REASONING

STEPS OF THE SCIENTIFIC METHOD:

1. Ask a question
2. Conduct research
3. Develop a hypothesis
4. Design and conduct an experiment
5. Analyze data
6. Accept/reject the hypothesis

SCIENTIFIC REASONING TERMS

- Experiment: a scientific procedure to test hypothesis
- Hypothesis: an idea or theory that is not yet proven but can be tested through experimentation
- Independent variable: the variable that is manipulated by researchers to the test the dependent variable; the possible cause
- Control variable: a variable that is held constant
- Dependent variable: the variable that is a possible effect

STATES OF MATTER

- Gas: an air-like substance that expands to fill the space it is in; the molecules are in constant random motion
- Liquid: a fluid that takes the shape of the container it occupies; it is a substance that has volume but no shape
- Solid: a substance with a defined size and shape; it is a substance that retains its shape and density when not contained

CHEMISTRY TERMINOLOGY

- Anion: a negative ion formed by electron gain relative to the neutral atom or molecule
- Atom: the smallest unit of matter that contains elemental properties; the nucleus of an atom contains neutrons and protons; electrons are outside the nucleus
- Atomic number: the number of protons in the nucleus
- Boiling point: the temperature at which a liquid boils
- Cation: a positive ion formed by electron loss relative to the neutral atom or molecule
- Condensation: the changing of vapor or gas to a liquid
- Covalent bond: a chemical bond in which the electron pairs are shared between atoms
- Critical point: the temperature at which a liquid and gas phases have the same density

CONTINUED

- Density: mass per unit of volume
- Diffusion: mingling of substances and movement from areas of high concentration to areas of low concentration
- Electrons: negative particles outside the nucleus
- Extensive properties: properties that depend on the state of matter
- Freezing: the temperature at which a substance changes from a liquid to a solid
- Group: a column of elements in the periodic table
- Ion: a charged particle formed by a molecule or atom when it loses or gains one or more electrons
- Ionic bonds: the bond between two oppositely charged ions

CONTINUED

- Intensive properties: properties that do not depend on the state of matter
- Isotopes: two forms of the same element that have the same number of protons but a different number of neutrons
- Malleability: the ability of metal to be shaped into sheets
- Neutrons: uncharged nuclear particles
- Nonpolar: a type of covalent bond in which two atoms share electrons
- Orbital: an area around the nucleus where an electron can be found
- Osmosis: the net flow of a solvent across a semipermeable membrane in response to a concentration gradient

CONTINUED

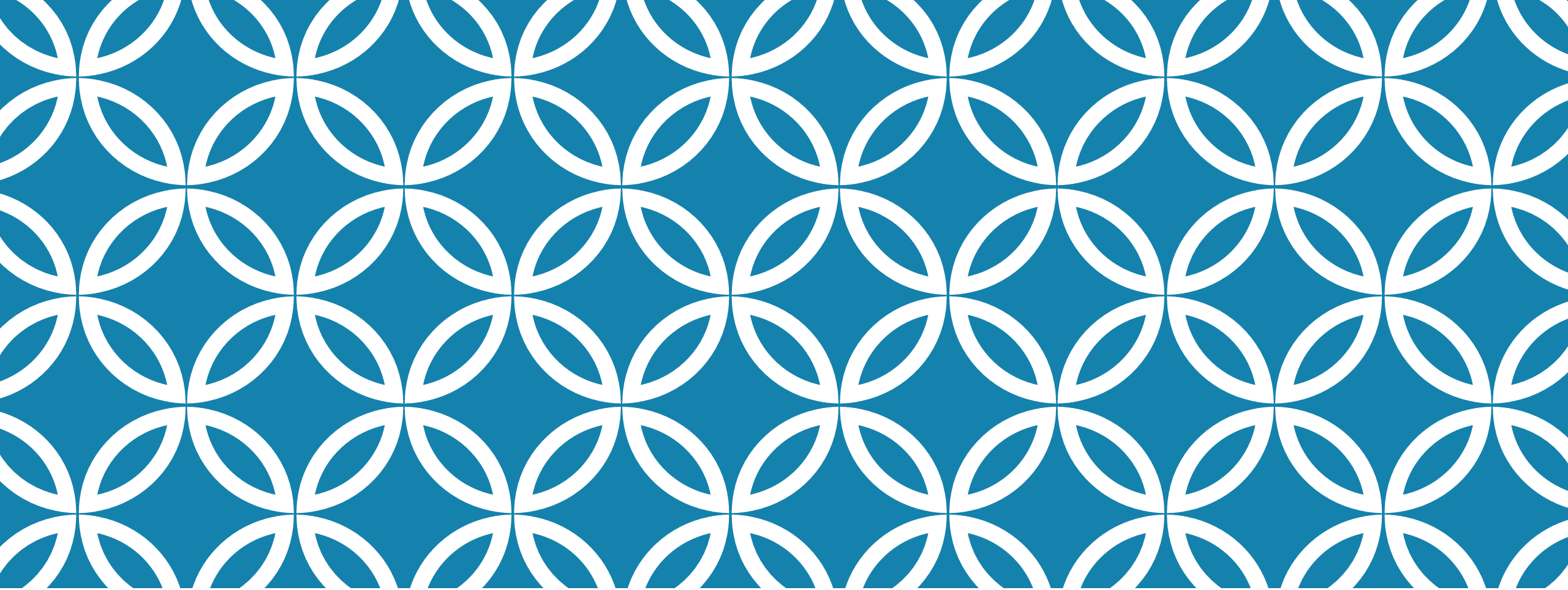
- Period: one of the horizontal rows in the periodic table
- Periodic table: the table of elements
- Polar: a molecule that has negative and positive sides
- Phase diagram: a graph of physical states of a substance under various temperatures and pressures
- Protons: positively charged nuclear particles
- Specific heat capacity: the amount of energy needed to change temperature of 1 kg of a substance by 1 degree Celsius

CONTINUED

- Sublimation: changing from a solid to a gas without becoming a liquid
- Triple point: the temperature and pressure at which solid, liquid, and vapor phases coexist
- Valence electrons: electrons in an outer orbital that can form bonds with other atoms

ACID AND BASES

- Acids and bases are common chemical reagents.
- Conjugate acid-base pairs:
  - The conjugate acid of a base is formed by adding one proton to the base.
  - The conjugate base of an acid is formed by the removal of one proton from the acid.
  - PH scale: A numerical presentation of acidity
    - A neutral solution has a PH of 7.
    - A basic solution has a PH greater than 7.
    - An acidic solution has a PH less than 7.



WISHING YOU ALL THE BEST!