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Crash Course Biology #4: How Life is Organized

Name: _____ Date: _____

You can access the video here → <https://youtu.be/cjR5zPrVjTc?si=W3qtA5BZrk74z9mk>

1. The different layers of life's organization are known as the levels of _____.
2. All life on Earth shares a common _____, meaning we are all related in some way.
3. The idea that physical structures in living things match their purpose is known as the theme of _____.
4. The process by which populations gradually change over generations to adapt to their environment is called _____.
5. The basic building blocks of all living things are called _____.
6. Groups of similar cells working together form _____, which then make up organs.
7. The interactions between all living organisms in a particular area make up a _____.
8. The large-scale regions of ecosystems that share similar climates are called _____.
9. The total sum of all ecosystems on Earth is known as the _____.
10. The process of maintaining stable internal conditions in an organism is called _____.
11. The transfer of energy through the biosphere is a one-way process, while _____ are recycled over and over.
12. A whale's filtering bristles, a manatee's molars, and a hyena's crushing teeth are all examples of how _____ fits function.
13. The process by which genetic instructions in DNA are used to build proteins is called _____.
14. _____ is the ability of an ecosystem to regulate the population size of species based on available resources.
15. The scientist Dr. Asmeret Asefaw Berhe studies the role of _____ in supporting life and its impact on climate change.

Crash Course Biology #4: How Life is Organized - KEY

1. The different layers of life's organization are known as the levels of **biological organization**.
2. All life on Earth shares a common **ancestor**, meaning we are all related in some way.
3. The idea that physical structures in living things match their purpose is known as the theme of **form fits function**.
4. The process by which populations gradually change over generations to adapt to their environment is called **evolution**.
5. The basic building blocks of all living things are called **cells**.
6. Groups of similar cells working together form **tissues**, which then make up organs.
7. The interactions between all living organisms in a particular area make up a **community**.
8. The large-scale regions of ecosystems that share similar climates are called **biomes**.
9. The total sum of all ecosystems on Earth is known as the **biosphere**.
10. The process of maintaining stable internal conditions in an organism is called **homeostasis**.
11. The transfer of energy through the biosphere is a one-way process, while **chemicals** are recycled over and over.
12. A whale's filtering bristles, a manatee's molars, and a hyena's crushing teeth are all examples of how **form** fits function.
13. The process by which genetic instructions in DNA are used to build proteins is called **gene expression**.
14. **Regulation** is the ability of an ecosystem to regulate the population size of species based on available resources.
15. The scientist Dr. Asmeret Asefaw Berhe studies the role of **soil** in supporting life and its impact on climate change.

Crash Course Chemistry #1: The Nucleus

Name: _____ Date: _____

You can access the video here → https://youtu.be/FSyAehMdpYI?si=rzvUNEaO0fe_Vx9Y

1. Chemistry is the science of how three tiny particles—the proton, the neutron, and the _____—combine to form everything.
2. The scientific definition of "theory" is a well-tested set of _____ that explains many observations.
3. The phenomenon of pollen grains jiggling in water is known as _____ motion.
4. Atoms are made up of subatomic particles, including the proton, which is _____ charged.
5. The atomic number is the number of _____ in an atom.
6. The chemical symbol for silver is _____, derived from its Latin name.
7. Protons and neutrons are found in the _____ of an atom.
8. The _____ is about 1800 times less massive than the proton or neutron.
9. Atoms of the same element with different numbers of neutrons are called _____.
10. The mass number is the total number of _____ in an atom's nucleus.
11. The relative atomic mass of an element is an _____ of all its isotopes' masses.
12. Neutrons help stabilize the nucleus by acting as a _____ between protons.
13. The _____ force holds protons and neutrons together in the nucleus.
14. The part of the atom responsible for chemical behavior is the _____.
15. The term "isotope" means "_____ place" because isotopes occupy the same location on the periodic table.

Crash Course Chemistry #1: The Nucleus KEY

1. Chemistry is the science of how three tiny particles—the proton, the neutron, and the **electron**—combine to form everything.
2. The scientific definition of "theory" is a well-tested set of **ideas** that explains many observations.
3. The phenomenon of pollen grains jiggling in water is known as **Brownian** motion.
4. Atoms are made up of subatomic particles, including the proton, which is **positively** charged.
5. The atomic number is the number of **protons** in an atom.
6. The chemical symbol for silver is **Ag**, derived from its Latin name.
7. Protons and neutrons are found in the **nucleus** of an atom.
8. The **electron** is about 1800 times less massive than the proton or neutron.
9. Atoms of the same element with different numbers of neutrons are called **isotopes**.
10. The mass number is the total number of **nucleons** in an atom's nucleus.
11. The relative atomic mass of an element is an **average** of all its isotopes' masses.
12. Neutrons help stabilize the nucleus by acting as a **buffer** between protons.
13. The **strong nuclear** force holds protons and neutrons together in the nucleus.
14. The part of the atom responsible for chemical behavior is the **electron**.
15. The term "isotope" means "**same** place" because isotopes occupy the same location on the periodic table.

Crash Course Anatomy & Physiology #22: Muscles Part 2 – Organism Level

Name: _____ Date: _____

You can access the video here → <https://youtu.be/I80Xx7pA9hQ?si=h5pLT6DA-cwL-lQa>

1. Muscles never _____; they always _____.
2. The bone that moves when a muscle contracts is called the _____ point.
3. The bone that stays more stationary when a muscle contracts is called the _____ point.
4. Muscles that are primarily responsible for producing a specific movement are called _____ or _____ muscles.
5. Muscles that work in opposition to prime movers are called _____.
6. Muscles that assist prime movers by adding force or stabilizing joints are called _____.
7. A _____ is a group of muscle fibers controlled by a single motor neuron.
8. A quick contraction and release of a motor unit caused by a single action potential is called a _____.
9. The three phases of a twitch are the _____ period, _____, and _____ period.
10. When twitches add together due to rapid stimulation, it is called _____.
11. A sustained, fused contraction caused by rapid stimulation is called _____.
12. The gradual increase in force as more motor units are activated is called _____, or multiple motor unit summation.
13. The principle that smaller motor units are recruited first, followed by larger ones, is called the _____.
14. A contraction where the muscle changes length while producing tension is called _____.
15. A contraction where the muscle develops tension but does not change length is called _____.

Crash Course Anatomy & Physiology #22: Muscles Part 2 – Organism Level KEY

1. Muscles never **push**; they always **pull**.
2. The bone that moves when a muscle contracts is called the **insertion** point.
3. The bone that stays more stationary when a muscle contracts is called the **origin** point.
4. Muscles that are primarily responsible for producing a specific movement are called **prime movers** or **agonist** muscles.
5. Muscles that work in opposition to prime movers are called **antagonists**.
6. Muscles that assist prime movers by adding force or stabilizing joints are called **synergists**.
7. A **motor unit** is a group of muscle fibers controlled by a single motor neuron.
8. A quick contraction and release of a motor unit caused by a single action potential is called a **twitch**.
9. The three phases of a twitch are the **latent** period, **contraction**, and **relaxation** period.
10. When twitches add together due to rapid stimulation, it is called **temporal summation**.
11. A sustained, fused contraction caused by rapid stimulation is called **tetanus**.
12. The gradual increase in force as more motor units are activated is called **recruitment**, or multiple motor unit summation.
13. The principle that smaller motor units are recruited first, followed by larger ones, is called the **size principle**.
14. A contraction where the muscle changes length while producing tension is called **isotonic**.
15. A contraction where the muscle develops tension but does not change length is called **isometric**.

Crash Course Astronomy #9: Introduction to the Solar System

Name: _____ Date: _____

You can access the video here → <https://youtu.be/TKM0P3XlMNA?si=YeYNIVSZkh2TD5Jy>

1. The Solar System includes the Sun, planets, moons, asteroids, comets, dust, and very thin _____.
2. The Sun makes up more than _____ percent of the mass of the solar system.
3. The ancient Greeks knew the Earth was a sphere, but most believed it was _____.
4. Ptolemy's model of the Universe was based on a _____ system with Earth at the center.
5. Copernicus proposed a _____-centered model of the solar system in 1543.
6. Kepler discovered that planets move in _____ orbits rather than perfect circles.
7. Newton used his laws of physics and the math of _____ to explain gravity.
8. The word "solar" comes from the Latin word "_____", meaning Sun.
9. The term "planet" is hard to define clearly because any rigid _____ creates too many exceptions.
10. Pluto is one of many icy bodies found beyond the orbit of _____.
11. The planets in our solar system orbit the Sun in a relatively flat _____.
12. The region between Mars and Jupiter is filled with rocky debris called the _____ belt.
13. The Kuiper Belt lies beyond Neptune and consists mostly of _____ ice balls.
14. The _____ Cloud is a spherical region of icy objects surrounding the solar system.
15. The solar system formed from a collapsing _____ that flattened into a disk.

Crash Course Astronomy #9: Introduction to the Solar System

KEY

1. The Solar System includes the Sun, planets, moons, asteroids, comets, dust, and very thin **gas**.
2. The Sun makes up more than **98** percent of the mass of the solar system.
3. The ancient Greeks knew the Earth was a sphere, but most believed it was **motionless**.
4. Ptolemy's model of the Universe was based on a **geocentric** system with Earth at the center.
5. Copernicus proposed a **Sun**-centered model of the solar system in 1543.
6. Kepler discovered that planets move in **elliptical** orbits rather than perfect circles.
7. Newton used his laws of physics and the math of **calculus** to explain gravity.
8. The word "solar" comes from the Latin word **sol**, meaning Sun.
9. The term "planet" is hard to define clearly because any rigid **definition** creates too many exceptions.
10. Pluto is one of many icy bodies found beyond the orbit of **Neptune**.
11. The planets in our solar system orbit the Sun in a relatively flat **plane**.
12. The region between Mars and Jupiter is filled with rocky debris called the **asteroid** belt.
13. The Kuiper Belt lies beyond Neptune and consists mostly of **rocky** ice balls.
14. The **Oort** Cloud is a spherical region of icy objects surrounding the solar system.
15. The solar system formed from a collapsing **cloud** that flattened into a disk.

Crash Course Physics #5: Newton's Laws

Name: _____ Date: _____

You can access the video here → https://youtu.be/kKKM8Y-u7ds?si=3tvSQRNY1wtV-X_s

1. Newton's first law is also called the law of _____.
2. An object at rest stays at rest unless acted on by a _____.
3. _____ is a measure of an object's inertia.
4. Newton's second law is commonly written as _____.
5. A net force causes an object to _____.
6. An object in _____ has no change in velocity.
7. The acceleration due to Earth's gravity is approximately _____ m/s^2 .
8. The force of gravity is also known as _____.
9. Weight is measured in _____, not kilograms.
10. Newton's third law states: for every action, there is an equal but opposite _____.
11. The _____ force is the upward force exerted by a surface on an object.
12. The upward pulling force from a rope is called the _____ force.
13. A _____ is a diagram that shows all the forces acting on an object.
14. When solving for net force in a _____, the direction of acceleration is determined by the difference in weights.
15. To find acceleration from Newton's second law, divide net force by total _____.

Crash Course Physics #5: Newton's Laws KEY

1. Newton's first law is also called the law of **inertia**.
2. An object at rest stays at rest unless acted on by a **force**.
3. **Mass** is a measure of an object's inertia.
4. Newton's second law is commonly written as **$F = ma$** .
5. A net force causes an object to **accelerate**.
6. An object in **equilibrium** has no change in velocity.
7. The acceleration due to Earth's gravity is approximately **9.81** m/s².
8. The force of gravity is also known as **weight**.
9. Weight is measured in **Newtons**, not kilograms.
10. Newton's third law states: for every action, there is an equal but opposite **reaction**.
11. The **normal** force is the upward force exerted by a surface on an object.
12. The upward pulling force from a rope is called the **tension** force.
13. A **free body diagram** is a diagram that shows all the forces acting on an object.
14. When solving for net force in a **pulley system**, the direction of acceleration is determined by the difference in weights.
15. To find acceleration from Newton's second law, divide net force by total **mass**.