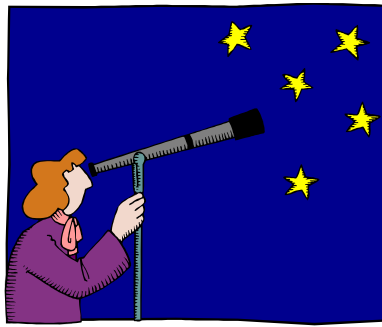


Sixth Grade Science Knowledge Map



Good News Sixth Grade Scientists!

Mr. Dadante, Mr. Ehrbar, and Mr. Paydo are going to tell you everything you need to know during the first week of school! It's all in this packet. The attached list is the important information you need to know about Sixth Grade Science. We will have a Learning Check over this list every Friday throughout the year. Each Friday, your science teacher will randomly select ten statements from the list that questions will be made from.

Information about the "Learning Check":

1. This is not a grade. It is to track growth and show improvement.
2. The learning check will be given every Friday.
3. You are responsible for marking your score on the Learning Check Run Chart.
4. Class totals will be collected each week and graphed on a class chart.
5. To prepare, read through the list twice a week and whenever there is no science homework.
6. Time will be given during science once a week to read through the Knowledge Map.

Name _____

Class Period _____

NATURE OF SCIENCE

1. The three major fields of science are Life Science, Physical Science, and Earth Science. **Life science** is the study of all things that are living. **Earth science** is the study of all non living aspects of the earth. **Physical science** is the study of the way things work.
2. **Biology** is the study of life.
3. **Chemistry** is the study of matter.
4. **Geology** is the study of the structure and processes of the Earth.
5. **Science** is the search for answers to questions.
6. **Technology** refers to the tools, techniques, and processes people make and use to survive and prosper.
7. An **observation** is a record of what you see.
8. An **inference** is a conclusion based on what you observe.
9. In an experiment, the **purpose** defines the questions trying to be answered.
10. In an experiment, the **hypothesis** is an educated guess as to what will happen. The words if, then, and because should be used when writing a hypothesis.
11. An **experiment** is a trial or test to verify a hypothesis.
12. The first step of the scientific method is to ask a question you can answer by performing an experiment.
13. When you conduct a science experiment, the observations you make may lead you to ask new questions.
14. In an experiment, the **conclusion** analyzes the observations to prove the hypothesis, make an inference or ask more questions.
15. A **controlled experiment** has all variables controlled but one. This experiment tests one factor at a time.
16. A **variable** is a factor in an experiment that can affect the outcome.
17. A **controlled variable** is a factor that is not changed.
18. An **independent variable** is a factor that is purposely changed by the experimenter. The independent variable is found on the X-axis.
19. A **dependent variable** is a factor that might change as a result of the independent variable. The dependent variable is found on the Y-axis.
20. The **procedure** is your step by step directions written clearly enough that someone else could do the experiment
21. Information you gather in an experiment is known as **data**. These pieces of information are acquired through observation and experimentation.
22. Each set of repeated measurements in an experiment are known as a **trial**.
23. A **balance** is used to determine mass of an object. The gram (g) measures mass. Equal amounts of different substances usually have different masses.
24. Volumes of different substances usually have different masses.
25. A meter stick is used to determine the length of an object. The **meter** (m) measures length or distance in the metric system.
26. A graduated cylinder is used to determine the volume of a liquid. The **liter** (L) measures volume or capacity in the metric system.

27. A thermometer is used to measure temperature. Degrees **Celsius** (°C) measures temperature in the metric system.
28. The **second** (s) measures time.
29. Before beginning an experiment, students should always know safety procedures and take precautions to keep themselves and their classmates safe.
30. If you get hurt in science, you should inform your science teacher immediately.

LIFE SCIENCE

31. **Unicellular** organisms are made up of one cell. This cell has the structures to help the organism move, get food, reproduce, and respond to its surroundings. Most organisms on our planet are unicellular. About 99.9% of all living things are unicellular.
32. **Multicellular** organisms are made up of many cells. These cells work together to keep the organism alive and help it reproduce. Humans and plants are examples of multicellular organisms.
33. The **cell** is the basic unit of all life.
34. All cells breathe, consume food, eliminate waste, grow, reproduce and die. An organism's basic jobs are carried out by cells.
35. All cells reproduce either **sexually** or **asexually**. Reproduction is a necessity for a species' continuation and how traits pass to the next generation.
36. In **sexual reproduction**, cells from two organisms must unite to form a cell that develops into a new organism. In sexual reproduction, an offspring is never identical to either parent.
37. In **asexual reproduction**, reproduction involves only one parent organism. Inherited traits come from a single parent in asexual reproduction. In asexual reproduction, an offspring is always identical to the parent.
38. **Organelles** carry out the activities for a cell and keep it alive.
39. A thin covering called a **cell membrane** encloses every cell and allows substances to pass in and out of the cell. (Plant cells also have a cell wall which provides extra support for the cell and gives it shape. Animal cells do not have cell walls)
40. The **nucleus** contains the cell's genetic program. It is the brain for the cell.
41. Proteins are made on **ribosomes**.
42. **Mitochondria** change chemical energy contained in food into a form of energy the cell can use.
43. The **endoplasmic reticulum** stores proteins and helps transport substances to various parts of the cell.
44. **Lysosomes** are round bodies containing enzymes that can break down many substances.
45. **Vacuoles** act as storage centers for the cell, but are usually found only in plants.
46. **Cytoplasm** is a gel-like fluid that takes up the space inside a cell.
47. **Chloroplasts** are organelles that contain a green substance called chlorophyll. This chemical allows plants and some organisms to make their own food through photosynthesis. Animal cells do not have chloroplasts.

48. Groups of cells that work together to do a specific job are called **tissues**.
49. **Genetics** is the study of heredity. **Heredity** is the passing on of traits from one generation to the next.
50. The **offspring** is the child or children of a parent or parents.
51. Likenesses between parents and offspring are **inherited** (eye color) or **learned** (manners).
52. **Genotype** is the gene makeup for a particular trait and **phenotype** is the physical expression of a particular trait.
53. Different forms of the same gene are called **alleles**.
54. **Traits** are characteristics of organisms that are passed from parents to offspring. **Dominant** traits are stronger than **recessive** traits.
55. A **Punnett Square** is a graphic way to see possible combinations of gene pairs.
56. An organism that carries two dominant or two recessive alleles for a given trait is said to be **pure** for that trait.
57. An organism that carries both a dominant allele and a recessive allele for a certain trait is called a **hybrid**.

EARTH SCIENCE

58. Most rocks that make up the Earth's crust are made up or primarily of the elements silicon and oxygen. The crust also holds small amounts of aluminum, iron, calcium, and other elements.
59. The Earth has four layers – the crust, the mantle, the outer core, and the inner core. Every time you walk outdoors, you are in contact with Earth's outermost layer, the **crust**.
60. **Rocks** are solid earth materials formed from a mixture of minerals and sometimes other materials.
61. Rocks are classified into three groups based on **how they are formed**.
62. **Igneous** rocks form when magma or lava cools and becomes a solid. Two types of igneous rocks include intrusive igneous rock and extrusive igneous rock.
63. When sediment becomes a solid material, it makes a **sedimentary** rock.
64. **Metamorphic** rock is a rock that has been changed in form by pressure and heat.
65. The constant changing in the form and structure of rocks is called the **rock cycle**. The set of natural processes that form, change, breakdown, and reform rocks is called the rock cycle.
66. **Minerals** are the most common solid material found on the earth. A **mineral** is a naturally formed solid substance with a crystal structure.
67. Minerals have four characteristics that include forms in nature, is a solid, have a crystal structure, and have a definite chemical makeup. A mineral can be identified by its properties or characteristics.
68. Minerals can be identified by their properties. A mineral's properties include color, streak, luster, cleavage, fracture, density, and hardness.

69. Minerals can come in almost any **color**. Color should not be solely used to identify a mineral. Some of the same minerals can be different colors. Many minerals can be the same color – such as black.
70. **Luster** of a mineral may be metallic or nonmetallic. A mineral's luster is the way in which light reflects from its surface. Minerals with metallic luster shine like metal. Minerals with nonmetallic luster vary in appearance and can be glassy, pearly or claylike.
71. A mineral's **streak** is the color of the powder left behind when the mineral is scraped across a plate. Some minerals have a different color when they are ground into fine powder than when they are left whole.
72. **Cleavage** is the splitting of a mineral into pieces that have flat surfaces.
73. **Fracture** is the tendency of a mineral to break into irregular pieces.
74. **Hardness** is the ability of a mineral to resist being scratched. The scale of hardness is called the Mohs scale
75. The **Mohs hardness scale** compares 10 selected minerals, with hardness of 1-10, to all other minerals. The hardest mineral on the Mohs hardness scale have a value of 10. Diamonds are minerals that have a value of 10. The softest mineral on the Mohs hardness scale has a value of 1. Talc is an example of a mineral that has a value of 1.
76. Some minerals have special properties. Some minerals are fluorescent and glow when they are exposed to ultraviolet light. A few minerals respond to magnets. Some rare minerals have a property known as radioactivity.
77. The most common group of minerals are known as **silicates**. They contain oxygen and silicon. The second most common group of minerals are known as **carbonates**. They contain carbon and oxygen.

PHYSICAL SCIENCE

78. **Matter** is anything that takes up space and has mass. All matter has the following characteristics: mass, weight, volume, and density
79. **Mass** is the amount of matter.
80. **Weight** is a measurement of the gravitation pull on an object.
81. **Volume** is the amount of space an object takes up.
82. In a **physical change**, the physical properties of a substance (its size and shape) have been changed, but not its chemical properties. One example of a physical change is ice melting.
83. In a **chemical change**, the chemical properties of a substance have changed, producing new substances. One example of a chemical change is metal rusting.
84. In a **solution** the substance that dissolves is the **solute**. The substance that a solute dissolves in is called a **solvent**. An example would be dissolving salt (solute) in water (solvent).
85. In a chemical change the substances that undergo the changes are called the **reactants**. The reactants in a chemical change would be combining baking soda and vinegar. A **precipitate** is a solid that forms from a chemical change.

86. In a chemical change the substances that result from the change is called the **product**. The product in a chemical change would be carbon dioxide gas produced from combining baking soda and vinegar.
87. The **law of conservation of matter** states that matter can't be created or destroyed, it can only change form.
88. A **natural resource** is any natural material that is used by humans. Examples of natural resources are water, petroleum, minerals, forests and animals.
89. A **renewable resource** is a natural resource that can be replaced at the same rate at which the resource is used. Plants, animals and water are all renewable resources. They are probably available forever. **Conservation** is the wise use of renewable resources.
90. A **nonrenewable resource** is a resource that forms at a rate that is much slower than it can be replaced. Nonrenewable energy (oil, coal, natural gas) originally came from the sun and may take millions of years to be replaced.
91. A **fossil fuel** is a nonrenewable energy resource formed from the remains of plants and animals that lived long ago. Examples of fossil fuels include petroleum, coal, and natural gas.
92. A liquid mixture of complex hydrocarbon compounds is called **petroleum**. Petroleum is also commonly known as crude oil. Petroleum can be separated into gasoline, jet fuel, and kerosene. More than 40% of the world's energy comes from crude oil, which is also called black gold.
93. **Coal** is a fossil fuel that is formed underground from partially decomposed plant material.
94. One way to protect limited energy resources is to find alternatives that do the same job. Examples are solar energy, geothermal energy (energy from the heat of the Earth), biomass (the energy of plant and animal materials). These are called **alternative energy resources**.
95. **Solar energy** is energy directly from the sun. This is energy received by the Earth from the sun in the form of radiation. The Earth receives more than enough solar energy to meet all of our energy needs.
96. **Wind power** is the use of a windmill to drive an electric generator.
97. **Hydroelectric energy** comes from falling water. This energy can be used to generate electrical energy.
98. **Geothermal energy** is energy that comes from the heat produced in the earth's crust. The heat from the Earth usually heats water and the steam can be used to turn a turbine to generate electrical energy.
99. **Nuclear energy** is energy comes from the splitting of the nucleus of atoms. Nuclear energy produces large amounts of dangerous radioactive waste.
100. **Biomass** is organic matter that can be a source of energy. Living things absorb energy from the sun. So animal wastes, leaves, and other parts of plants contain stored energy.