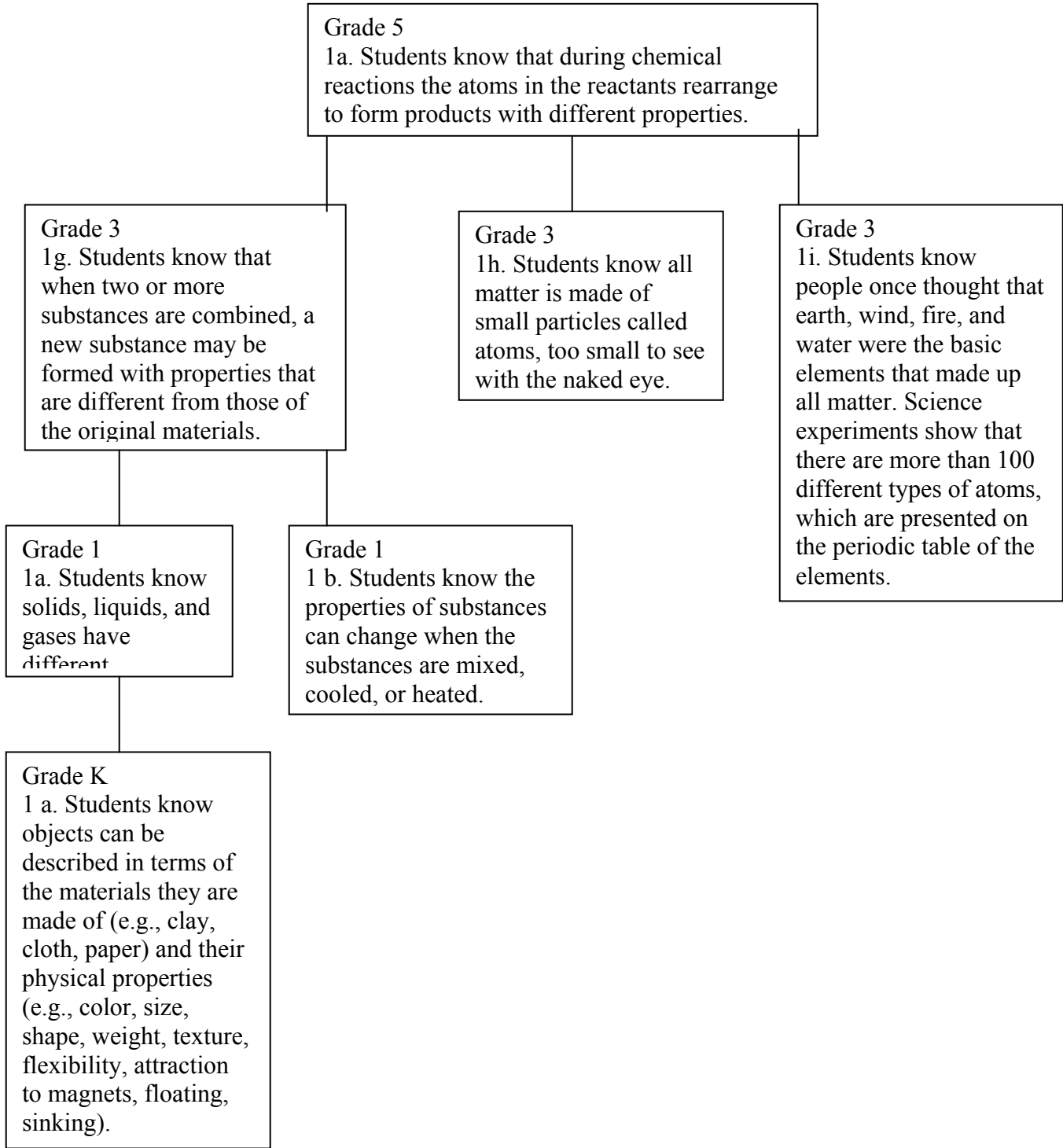


# GRADE FIVE PHYSICAL SCIENCE

1. Elements and their combinations account for all the varied types of matter in the world.  
As a basis for understanding this concept:



Grade 5

1b. Students know all matter is made of atoms, which may combine to form molecules.

Grade 3

1 h. Students know all matter is made of small particles called atoms, too small to see with the naked eye

Grade 3

1i. Students know people once thought that earth, wind, fire, and water were the basic elements that made up all matter. Science experiments show that there are more than 100 different types of atoms, which are presented on the periodic table of the elements.

Grade 5

1c. Students know metals have properties in common, such as high electrical and thermal conductivity. Some metals, such as aluminum (Al), iron (Fe), nickel (Ni), copper (Cu), silver (Ag), and gold (Au), are pure elements; others, such as steel and brass, are composed of a combination of elemental metals.

Grade 3

1i. Students know people once thought that earth, wind, fire, and water were the basic elements that made up all matter. Science experiments show that there are more than 100 different types of atoms, which are presented on the periodic table of the elements.

Grade K

1a Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).

Grade 5  
1d. Students know that each element is made of one kind of atom and that the elements are organized in the periodic table by their chemical properties.

Grade 3  
1h. Students know all matter is made of small particles called atoms, too small to see with the naked eye.

Grade 3  
1i. Students know people once thought that earth, wind, fire, and water were the basic elements that made up all matter. Science experiments show that there are more than 100 different types of atoms, which are presented on the periodic table of the elements.

Grade 1  
1a. Students know solids, liquids, and gases have different properties.

Grade K  
1a. Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).

Grade 5  
1e Students know scientists have developed instruments that can create discrete images of atoms and molecules that show that the atoms and molecules often occur in well-ordered arrays.

Grade 3  
1 h. Students know all matter is made of small particles called atoms, too small to see with the naked eye.

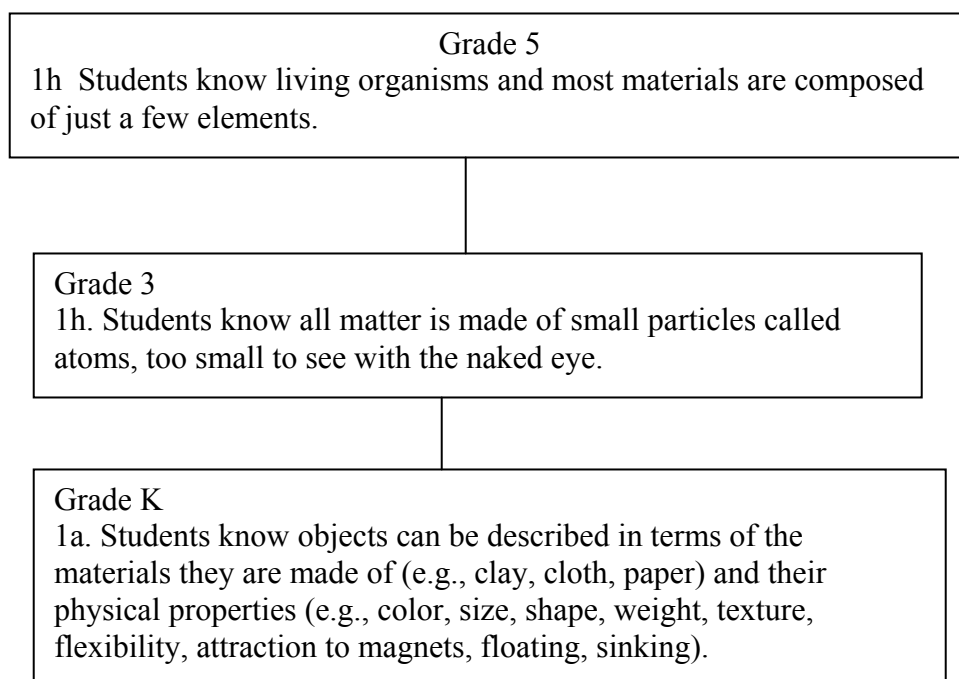
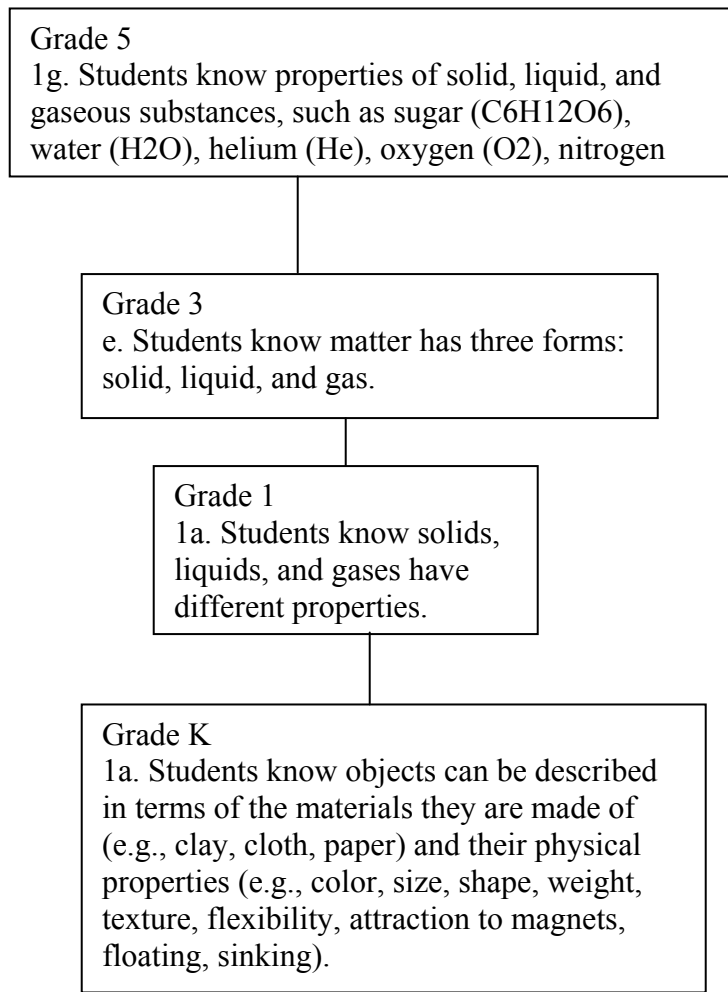
Grade 5  
1f. Students know differences in chemical and physical properties of substances are used to separate mixtures and identify compounds.

Grade 3  
1f. Students know evaporation and melting are changes that occur when the objects are heated.

Grade 3  
1g. Students know that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.

Grade 1  
1a. Students know solids, liquids, and gases have different properties.

Grade K  
1a. Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).



Grade 5

1i. Students know the common properties of salts, such as sodium chloride (NaCl).

Grade 3

1d. Students know that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.

Grade 1

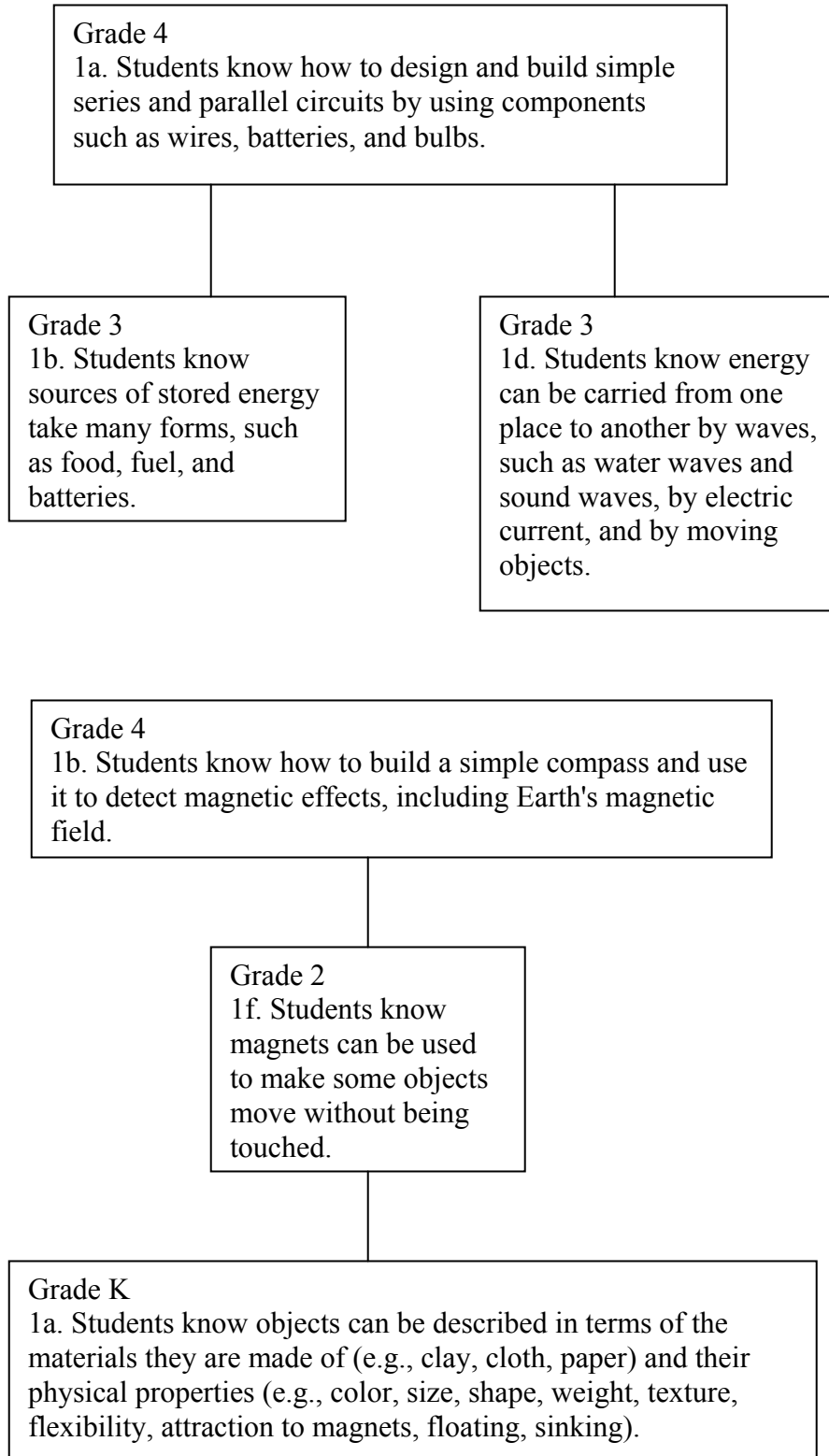
1a. Students know solids, liquids, and gases have different properties.

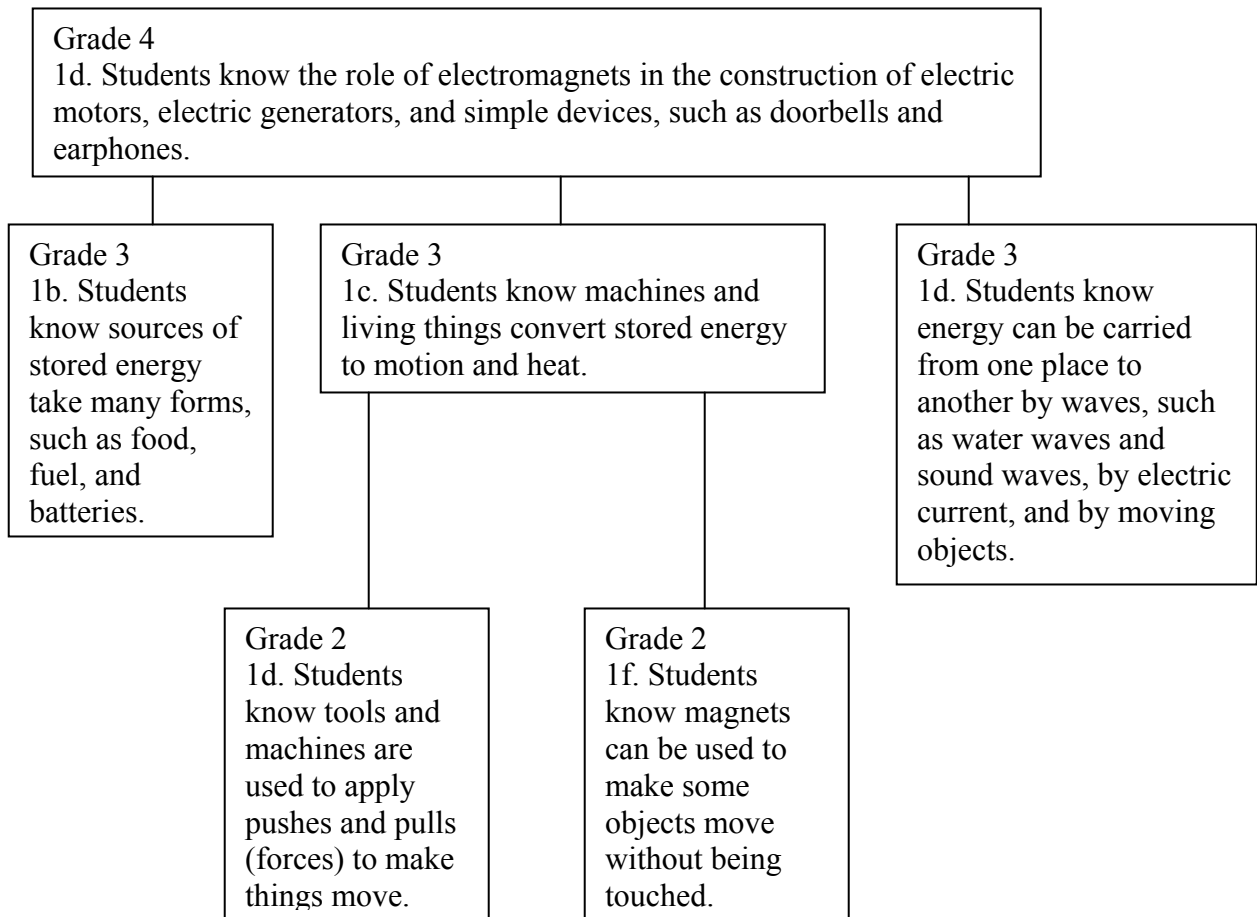
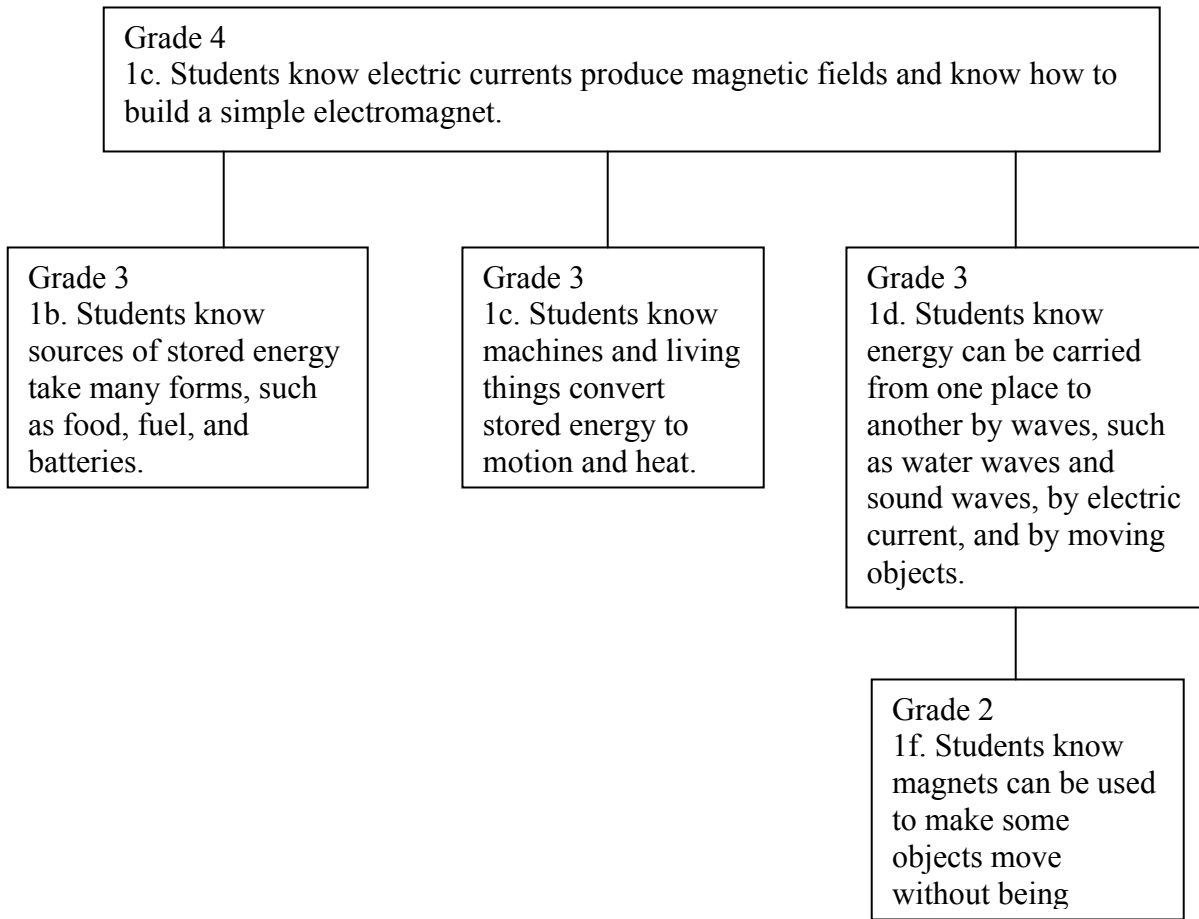
Grade K

1a. Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).

# GRADE FOUR PHYSICAL SCIENCE

1. Electricity and magnetism are related effects that have many useful applications in everyday life. As a basis for understanding this concept:





Grade 4  
1e. Students know electrically charged objects attract or repel each other.

Grade 3  
1d. Students know energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving

Grade 4  
1f. Students know that magnets have two poles (north and south) and that like poles repel each other while unlike poles attract each other.

Grade 2  
1f. Students know magnets can be used to make some objects move without being touched.

Grade K  
1a. Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).

Grade 4

1g. Students know electrical energy can be converted to heat, light, and motion.

Grade 3

1b. Students know sources of stored energy take many forms, such as food, fuel, and batteries.

Grade 3

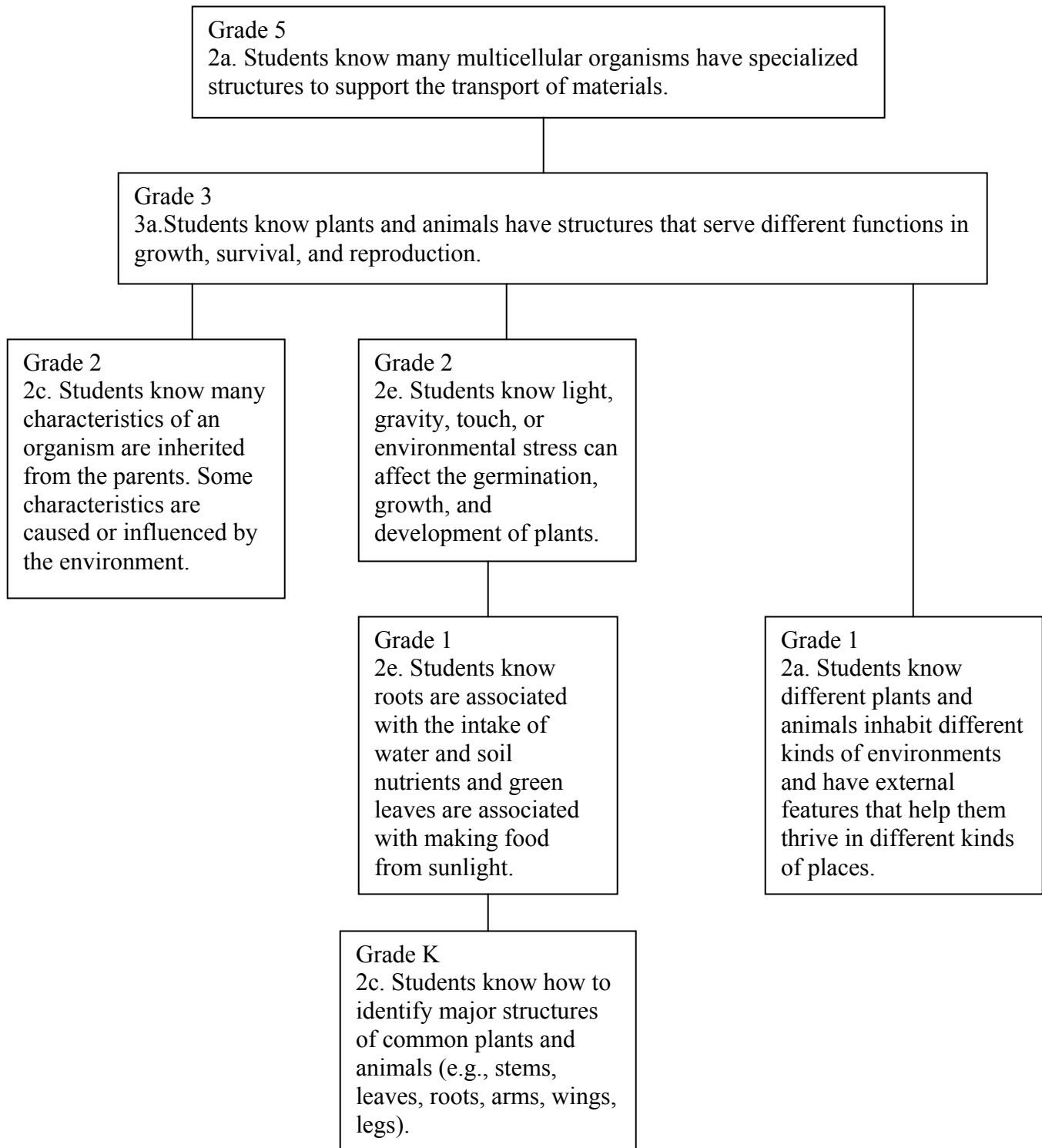
1c. Students know machines and living things convert stored energy to motion and heat.

Grade 3

1d. Students know energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving objects.

# GRADE FIVE LIFE SCIENCE

2. Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials. As a basis for understanding this concept:



Grade 5

2b. Students know how blood circulates through the heart chambers, lungs, and body and how carbon dioxide (CO<sub>2</sub>) and oxygen (O<sub>2</sub>) are exchanged in the lungs and tissues.

Grade 3

3a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Grade 2

2a. Students know that organisms reproduce offspring of their own kind and that the offspring resemble their parents and one another.

Grade 5

2c. Students know the sequential steps of digestion and the roles of teeth and the mouth, esophagus, stomach, small intestine, large intestine, and colon in the function of the digestive system.

Grade 4

3d. Students know that most microorganisms do not cause disease and that many are beneficial

Grade 3

3a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Grade 2

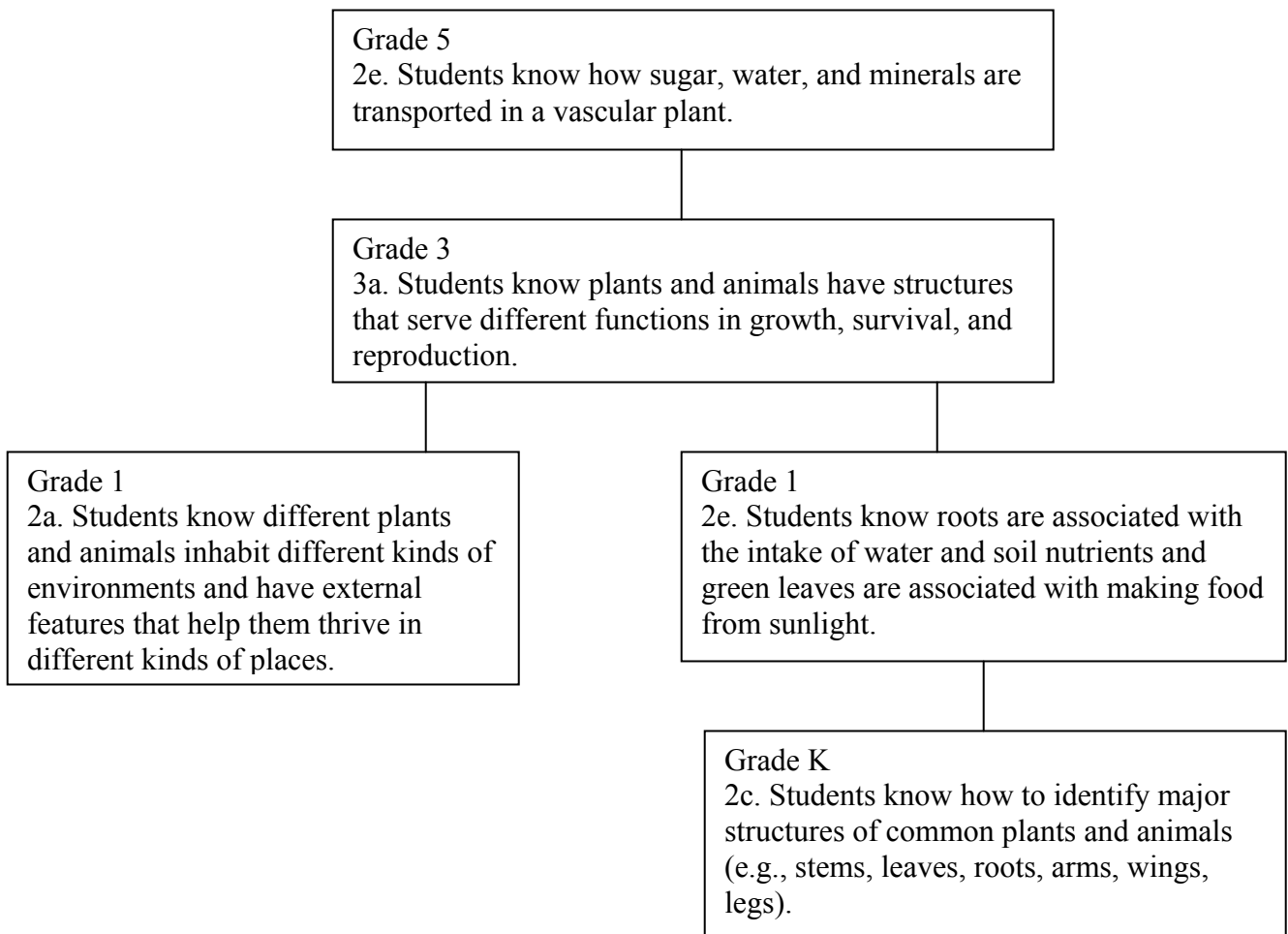
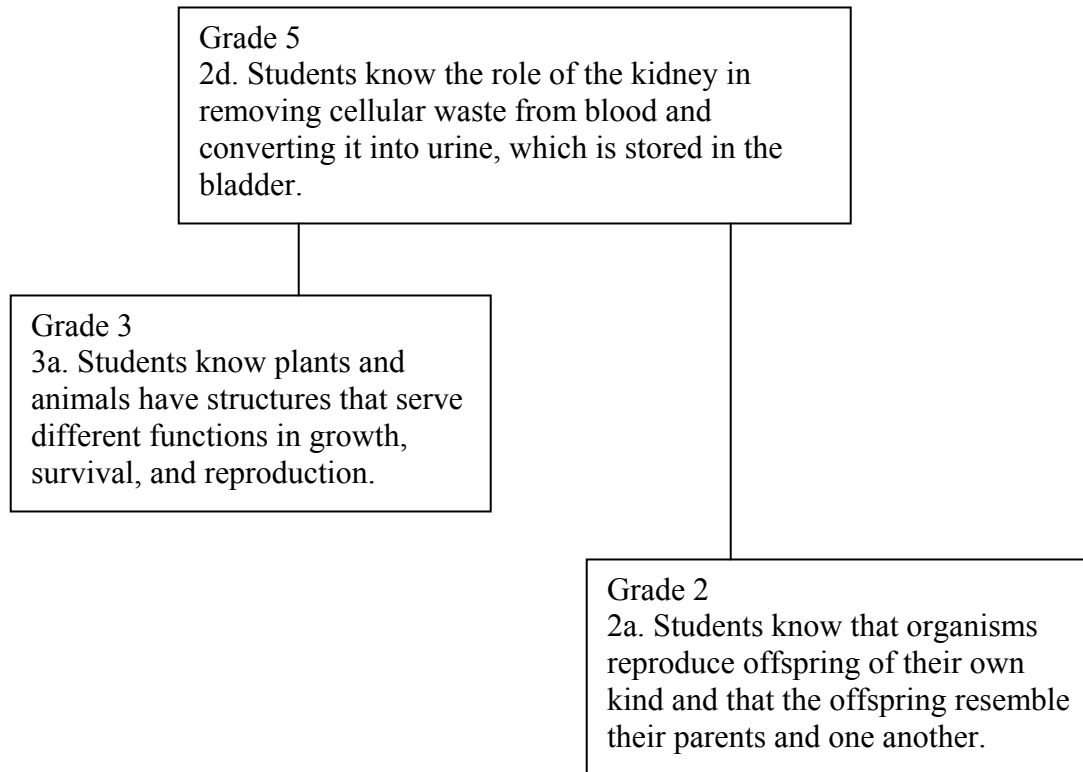
2a. Students know that organisms reproduce offspring of their own kind and that the offspring resemble their parents and one another

Grade 1

2b. Students know both plants and animals need water, animals need food, and plants need light.

Grade 1

2d. Students know how to infer what animals eat from the shapes of their teeth (e.g., sharp teeth: eats meat; flat teeth: eats plants).



Grade 5  
2f. Students know plants use carbon dioxide (CO<sub>2</sub>) and energy from sunlight to build molecules of sugar and release oxygen.

Grade 4  
2a. Students know plants are the primary source of matter and energy entering most food chains.

Grade 3  
3a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

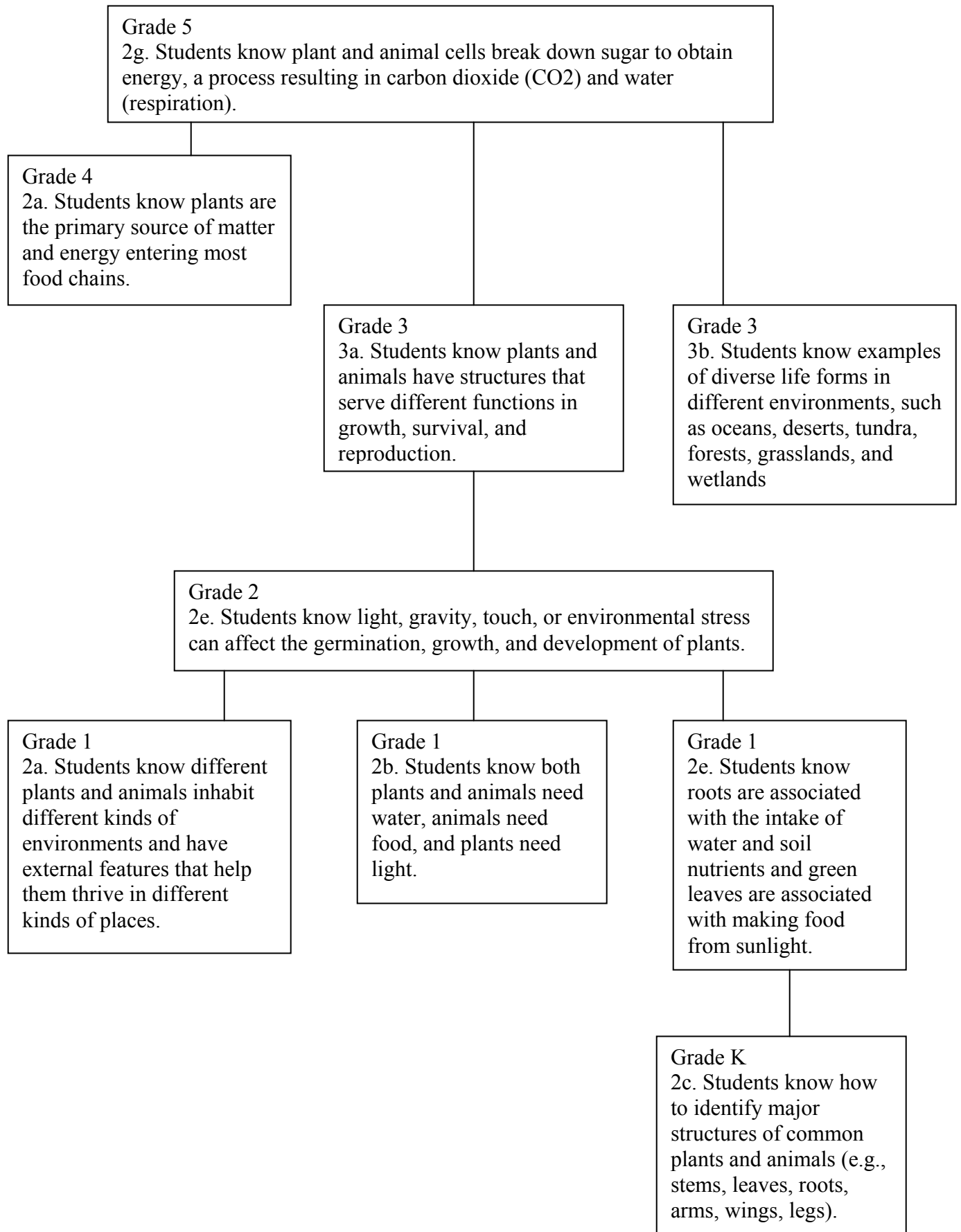
Grade 3  
3b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Grade 2  
2e. Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.

Grade 1  
2b. Students know both plants and animals need water, animals need food, and plants need light.

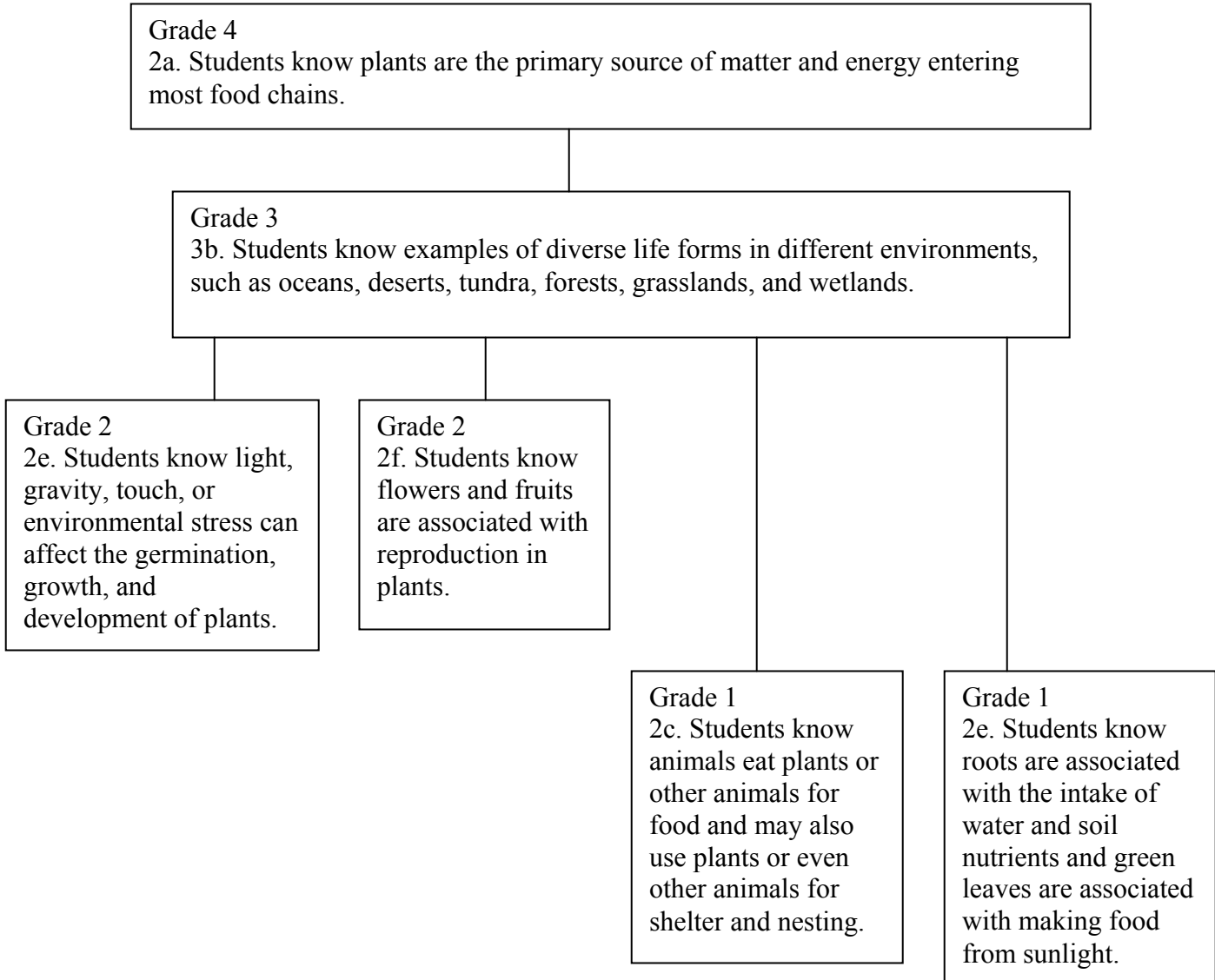
Grade 1  
2e. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.

Grade K  
2c. Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).



# GRADE FOUR LIFE SCIENCE

2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:



Grade 4  
2b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.

Grade 3  
3a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Grade 3  
3b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Grade 3  
3c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.

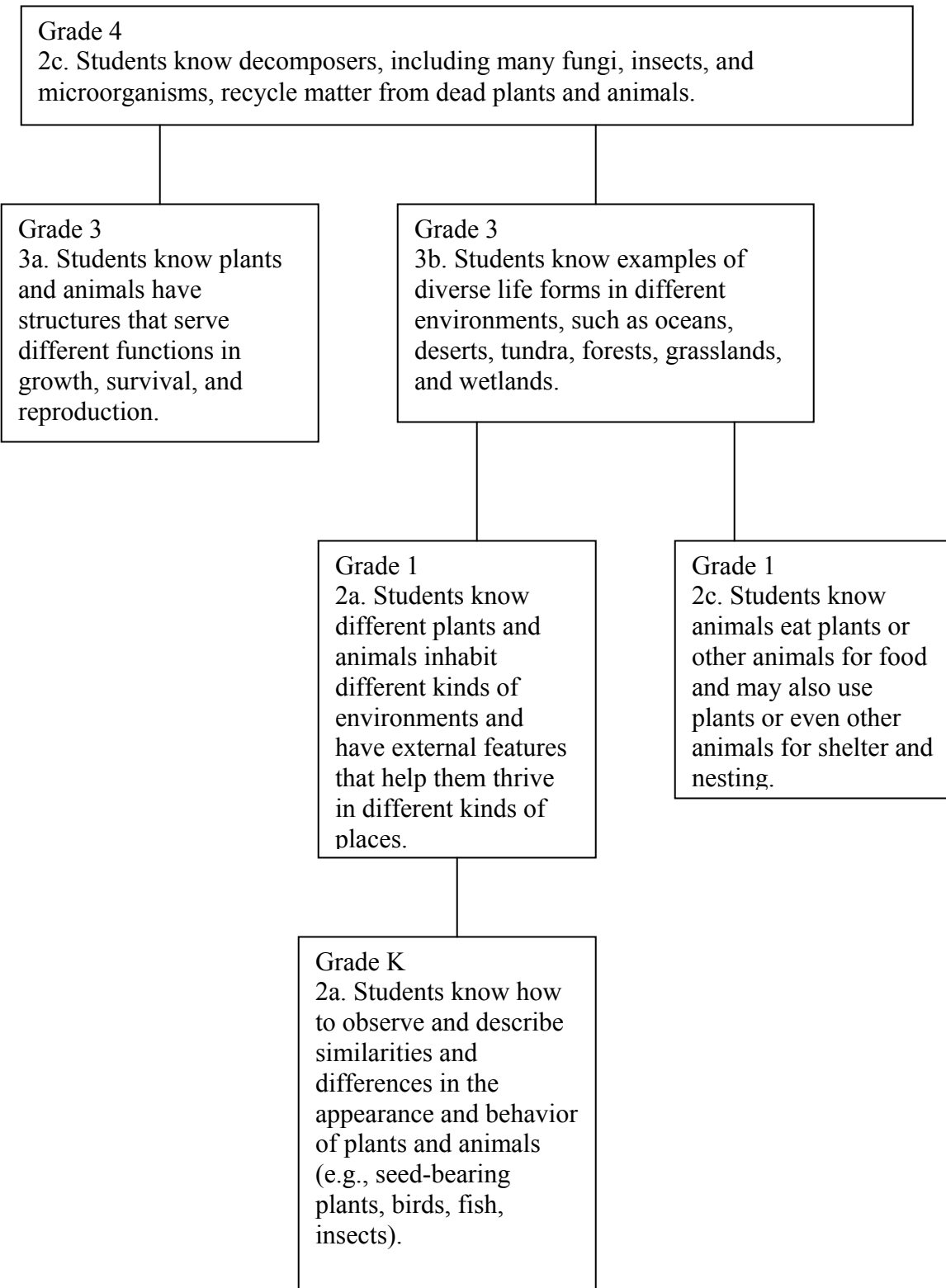
Grade 2  
2e. Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.

Grade 1  
2a. Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

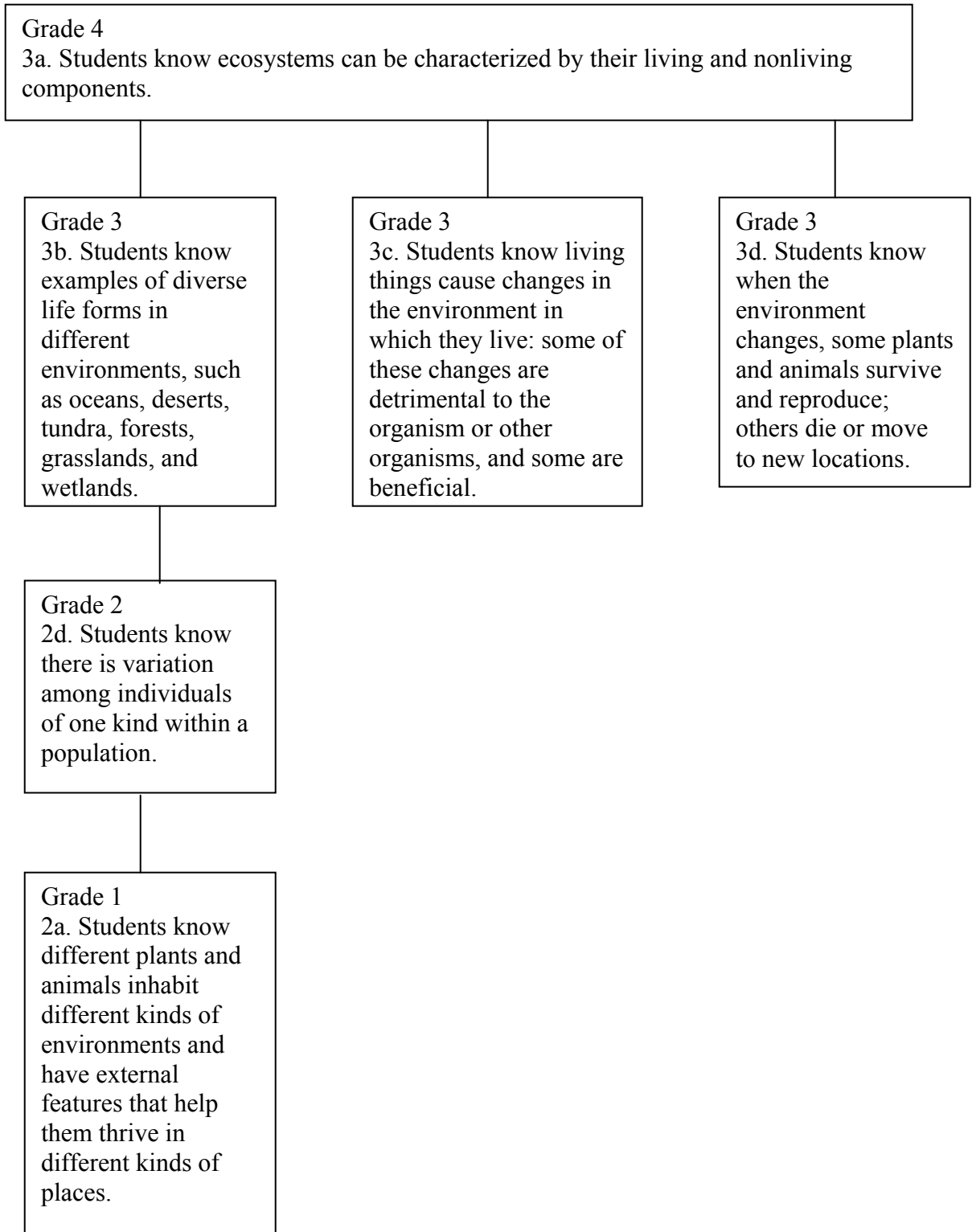
Grade 1  
2b. Students know both plants and animals need water, animals need food, and plants need light.

Grade 1  
2c. Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.

Grade K  
2a. Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).



3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:



Grade 4  
3b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.

Grade 3  
3a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Grade 3  
3b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Grade 3  
3d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.

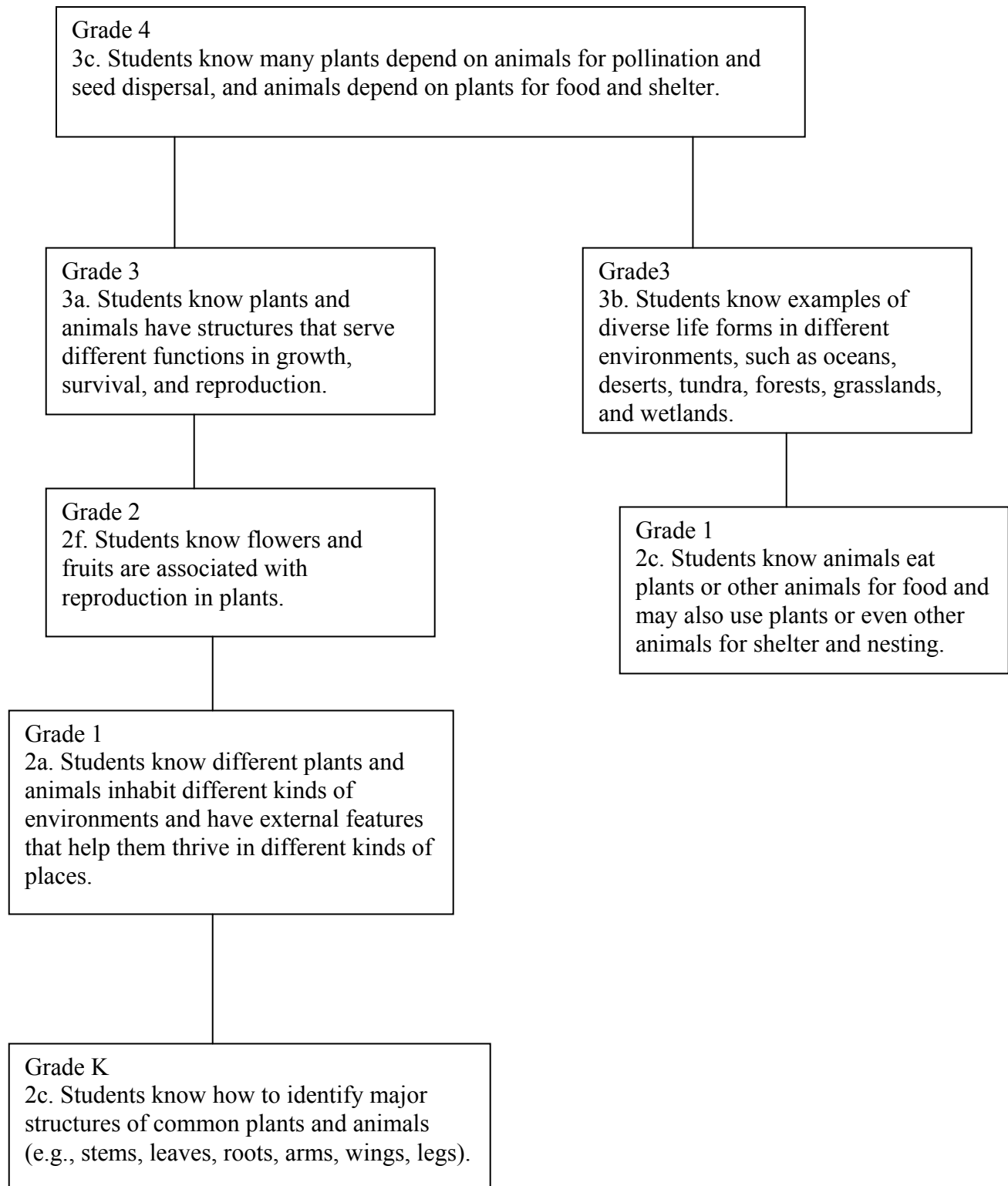
Grade 3  
3e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

Grade 2  
2e. Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.

Grade 1  
2a. Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

Grade 1  
2b. Students know both plants and animals need water, animals need food, and plants need light.

Grade K  
2a. Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).



Grade 4  
3d. Students know that most microorganisms do not cause disease and that many are beneficial.

Grade 3  
3b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Grade 3  
3c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.

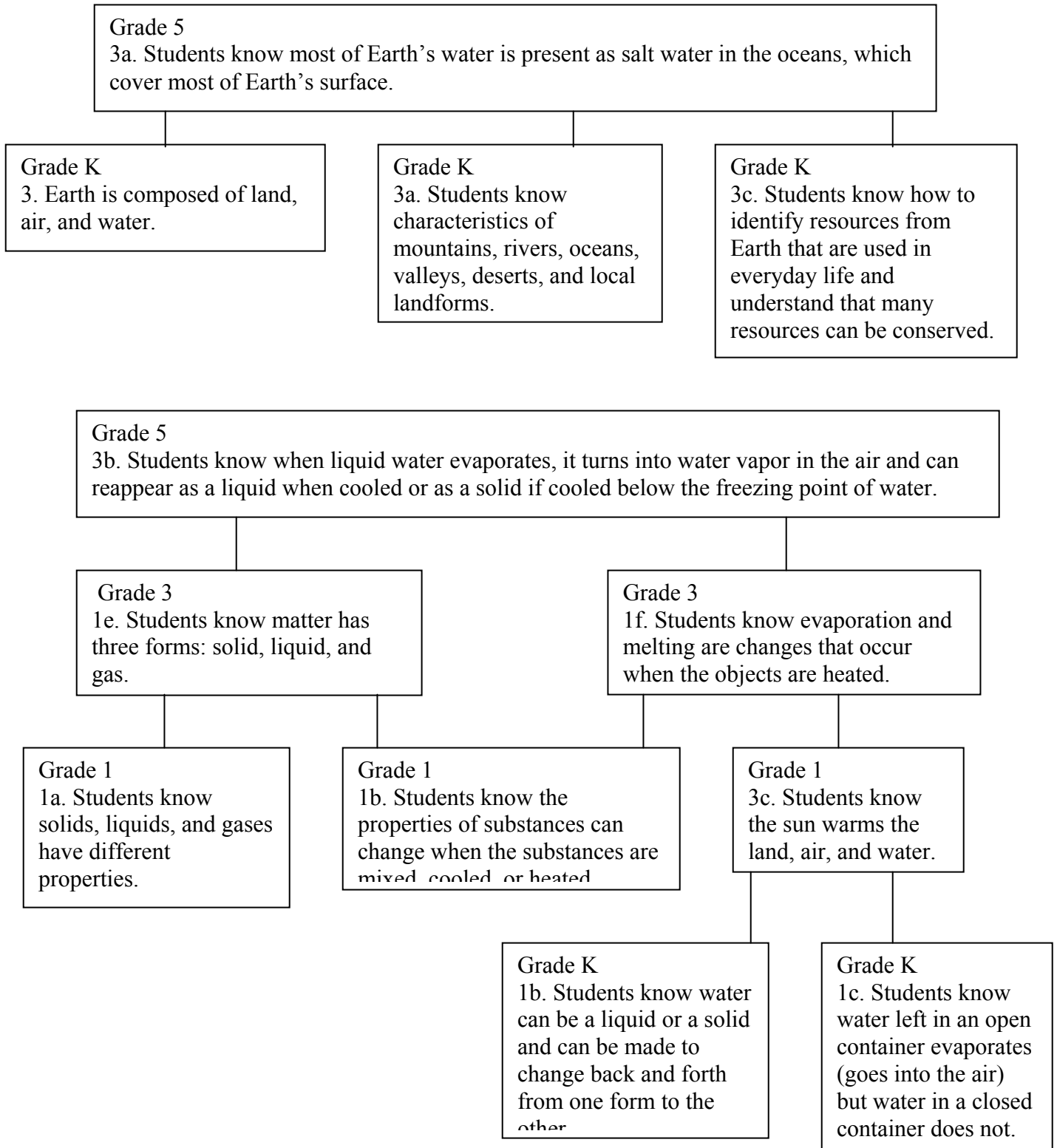
Grade 2  
2d. Students know there is variation among individuals of one kind within a population.

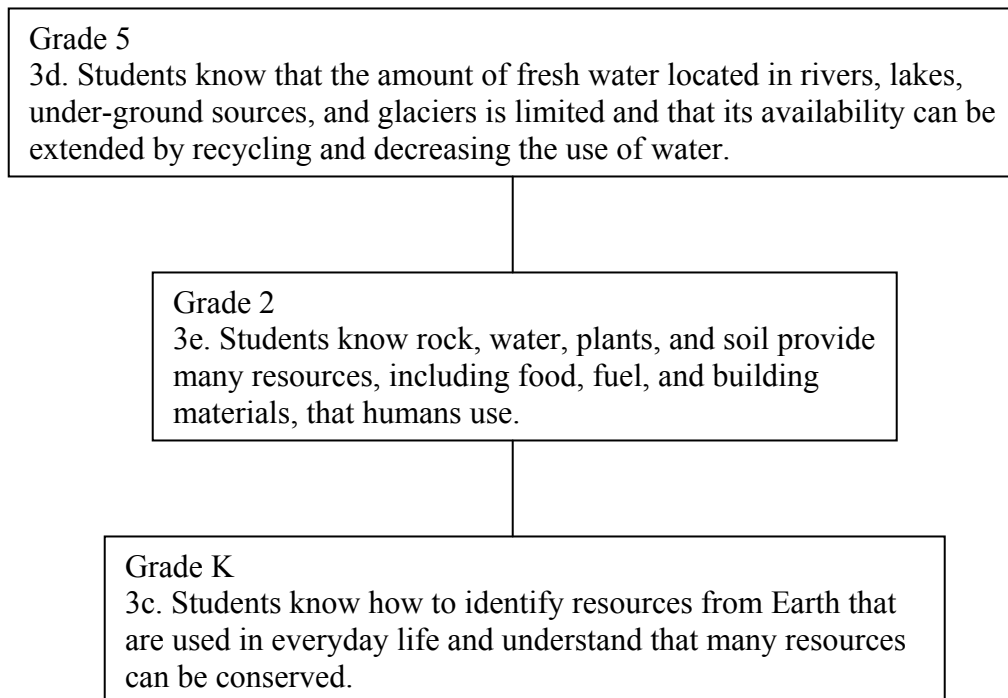
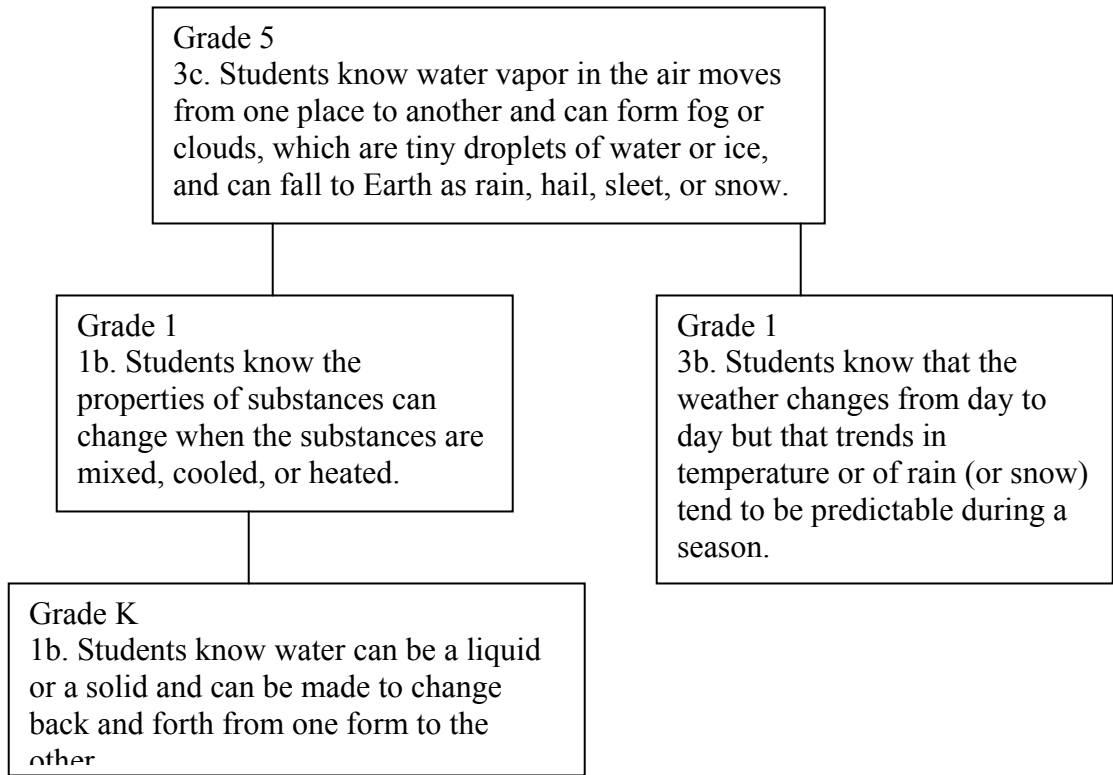
Grade 1  
2a. Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

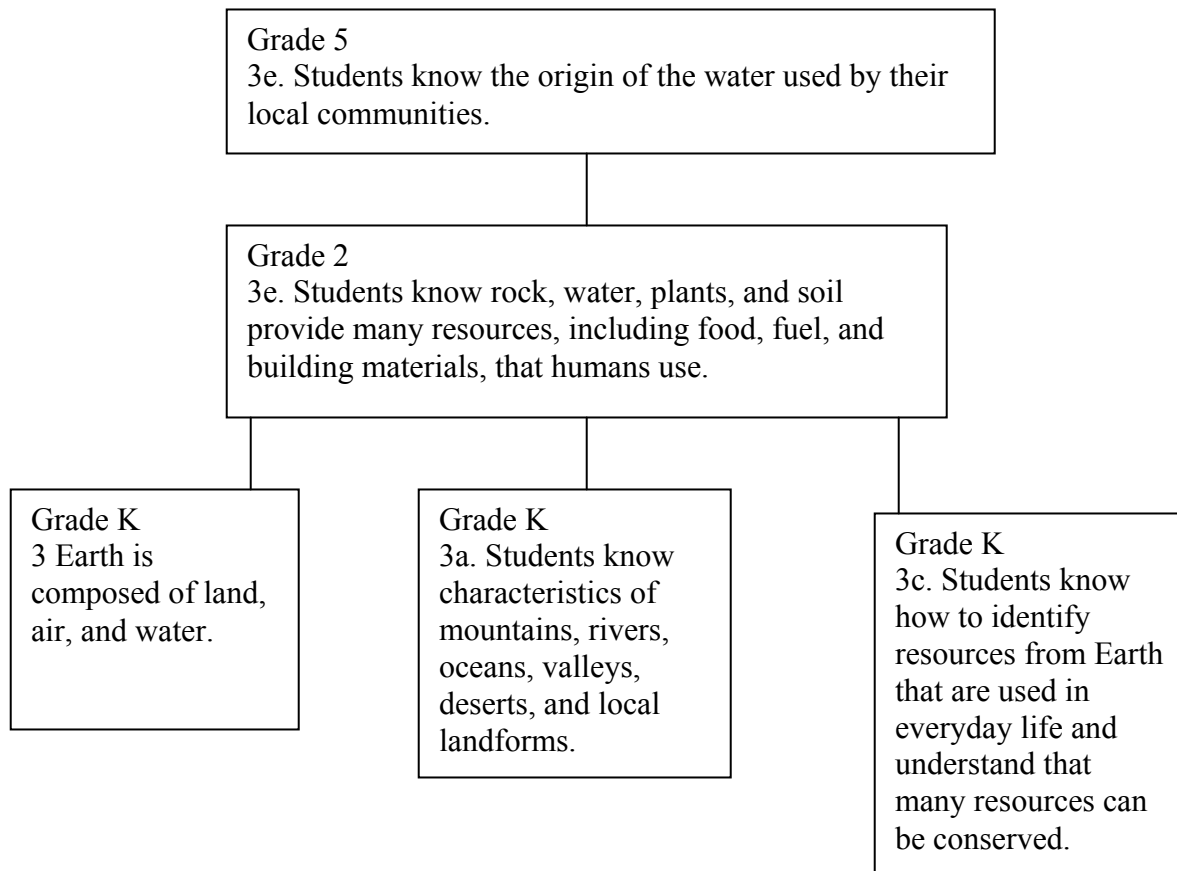
Grade K  
2a. Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).

# GRADE FIVE EARTH SCIENCE

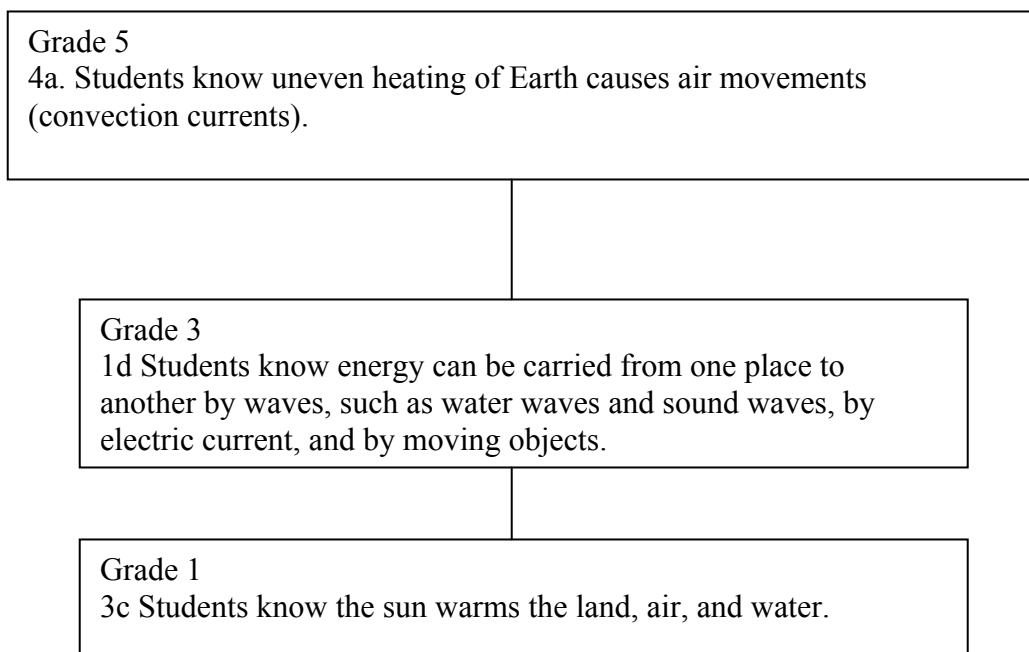
3. Water on Earth moves between the oceans and land through the processes of evaporation and condensation. As a basis for understanding this concept:







4. Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns. As a basis for understanding this concept:



Grade 5

4b. Students know the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.

Grade 3

1d. Students know energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving objects.

Grade 1

3b. Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.

Grade 1

3c. Students know the sun warms the land, air, and water.

Grade K

3b. Students know changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.

Grade K

3a. Students know characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.

Grade 5  
4c. Students know the causes and effects of different types of severe weather.

Grade 3  
1d. Students know energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving objects.

Grade 1  
3c. Students know the sun warms the land, air, and water.

Grade 1  
3b. Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.

Grade K  
3b. Students know changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.

Grade 5  
4d. Students know how to use weather maps and data to predict local weather and know that weather forecasts depend on many variables.

Grade 1  
3b. Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.

Grade 1  
3a. Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.

Grade K  
3b. Students know changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.

Grade 5

4e. Students know that the Earth's atmosphere exerts a pressure that decreases with distance above Earth's surface and that at any point it exerts this pressure equally in all directions.

Grade 1

3a. Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.

5. The solar system consists of planets and other bodies that orbit the Sun in predictable paths. As a basis for understanding this concept:

Grade 5

5a. Students know the Sun, an average star, is the central and largest body in the solar system and is composed primarily of hydrogen and helium.

Grade 3

4d. Students know that Earth is one of several planets that orbit the Sun and that the Moon orbits Earth.

Grade 3

4e Students know the position of the Sun in the sky changes during the course of the day and from season to season.

Grade 5

5b Students know the solar system includes the planet Earth, the Moon, the Sun, eight other planets and their satellites, and smaller objects, such as asteroids and comets.

Grade 3

4a. Students know the patterns of stars stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.

Grade 3

4b. Students know the way in which the Moon's appearance changes during the four week lunar cycle.

Grade 3

4d. Students know that Earth is one of several planets that orbit the Sun and that the Moon orbits Earth.

Grade 3

4e Students know the position of the Sun in the sky changes during the course of the day and from season to season.

Grade 5

5c. Students know the path of a planet around the Sun is due to the gravitational attraction between the Sun and the planet.

Grade 3

4d. Students know that Earth is one of several planets that orbit the Sun and that the Moon orbits Earth.

Grade 3

4e. Students know the position of the Sun in the sky changes during the course of the day and from season to season.

Grade 2

1a. Students know the position of an object can be described by locating it in relation to another object or to the background.

Grade 2

1b. Students know an object's motion can be described by recording the change in position of the object over time.

# GRADE FOUR EARTH SCIENCE

4. The properties of rocks and minerals reflect the processes that formed them. As a basis for understanding this concept:



Grade 2  
3. Earth is made of materials that have distinct properties and provide resources for human activities.

Grade 2  
3a. Students know how to compare the physical properties of different kinds of rocks and know that rock is composed of different combinations of minerals.

Grade 4  
4b. Students know how to identify common rock-forming minerals (including quartz, calcite, feldspar, mica, and hornblende) and ore minerals by using a table of diagnostic properties.

Grade 2  
3. Earth is made of materials that have distinct properties and provide resources for human activities.

Grade 2  
3a. Students know how to compare the physical properties of different kinds of rocks and know that rock is composed of different combinations of minerals.

5. Waves, wind, water, and ice shape and reshape Earth's land surface. As a basis for understanding this concept:

Grade 4  
5a. Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.

Grade 2  
3b. Students know smaller rocks come from the breakage and weathering of larger rocks.

Grade K  
3a. Students know characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.

Grade 4

5b. Students know natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces.

Grade 2

3b. Students know smaller rocks come from the breakage and weathering of larger rocks.

Grade 2

3c. Students know that soil is made partly from weathered rock and partly from organic materials and that soils differ in their color, texture, capacity to retain water, and ability to support the growth of many kinds of plants.

Grade 4

5c. Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

Grade 2

3a. Students know how to compare the physical properties of different kinds of rocks and know that rock is composed of different combinations of minerals.

Grade 2

3b. Students know smaller rocks come from the breakage and weathering of larger rocks.

Grade 2

3c. Students know that soil is made partly from weathered rock and partly from organic materials and that soils differ in their color, texture, capacity to retain water, and ability to support the growth of many kinds of plants.

Grade K

3a. Students know characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.