

**9-12.L.1.1.** Students are able to **relate** cellular functions and processes to specialized structures within cells.

**Web Level: 2**

**Bloom: Analysis**

**Verbs Defined:**

Relate – tell in words or numbers the connections between

**Key Terms Defined:**

Cellular functions and processes – transport of materials, acquisition and use of energy,

synthesis of proteins, storage and transfer of genetic materials and cell life cycles

Specialized structure – cell membrane, chloroplast, mitochondria, endoplasmic reticulum, Golgi apparatus, vacuole, nucleus

**Teacher Speak:**

Students will be able to relate (tell in words or numbers the connections between) cellular functions and processes (transport of materials, acquisition and use of energy, synthesis of proteins, storage and transfer of genetic materials, and cell life cycles) to specialized structures (cell membrane, chloroplast, mitochondria, endoplasmic reticulum, Golgi apparatus, vacuole, nucleus) within the cell.

**Student Speak:**

I can tell in words or numbers the connections between (relate):

- transport of materials and the cell membrane, Golgi apparatus and vacuole
- acquisition of energy and chloroplasts
- use of energy and mitochondria
- synthesis of proteins and endoplasmic reticulum
- storage and transfer of genetic materials and the nucleus.

**9-12.L.1.2.** Students are able to **classify** organisms using characteristics and evolutionary relationships of major taxa.

**Webb Level: 2**

**Bloom: Analysis**

**Verbs Defined:**

Classify – assign to categories

**Key Terms Defined:**

Characteristics – cell structure, method of energy acquisition, and anatomical structure

Evolutionary relationships – physical and genetic similarities

Major taxa – kingdoms and phyla

**Teacher Speak:**

Students will be able to classify (assign to categories) organisms using characteristics (cell structure, method of energy acquisition, and anatomical structure) and evolutionary relationships (physical and genetic similarities) of major taxa (kingdoms and phyla).

**Student Speak:**

I can assign (classify) organisms to categories of kingdoms and phyla (major taxa) using  
- cell structure, methods of energy acquisition, and anatomical structures (characteristics)  
- physical and genetic similarities (evolutionary relationships).

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**9-12.L.1.3.** Students are able to **identify** structures and function relationships within major taxa.

**Web Level: 1**

**Bloom: Analysis**

**Verbs Defined:**

Identify – select from given information

**Key Terms Defined:**

Structures – different parts of an organism

Function – a specific job of parts

Major taxa – kingdoms and phyla

**Teacher Speak:**

Students will be able to identify (select from given information) structures (different parts of an organism) and functions (specific job of parts) relationships within major taxa (kingdom and/or phylum).

**Student Speak:**

I can select from given information (identify) relationships between different parts of an organism (structures) and specific jobs of the parts (function) within kingdoms and phyla (major taxa).

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**9-12.L.2.1.** Students are able to **predict** inheritance patterns using a single allele.

**Web Level: 2****Bloom: Application****Verbs Defined:**

Predict – to use information to make a best guess

**Key Terms Defined:**

Inheritance patterns –simple dominance, co-dominance and sex-linked genes

Allele – contrasting forms of a gene

**Teacher Speak :**

Students are able to predict (use information to make a best guess) inheritance patterns (simple dominance, co-dominance and sex-linked traits) using alleles (contrasting forms of a gene).

**Student Speak:**

I can use information to make a best guess (predict) about simple dominance, co-dominance, sex-linked traits (inheritance patterns) using contrasting forms of a gene (alleles).

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**9-12.L.2.2.** Students are able to **describe** how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.

**Web Level: 2****Bloom: Synthesis****Verbs Defined:**

Describe – tell in words or numbers

**Key Terms Defined:**

Genetic recombination – crossover, independent assortment and random fertilization

Mutations – change in the DNA sequence that alters a trait

Natural selection – survival and reproduction of organisms with favorable variations

Adaptations – characteristics that improve the chances for survival  
Evolution – change in a species over time  
Extinction – the elimination of an entire species  
emergence – development

**Teacher Speak:**

Students will be able to describe (tell in words or numbers) how genetic recombination (crossover, independent assortment and random fertilization) mutations (change in the DNA sequence that alters a trait), and natural selection (survival and reproduction of organisms with favorable variations) lead to adaptations (characteristics that improve the chances for survival), evolution (change in a species over time), extinction (the elimination of an entire species), or the emergence (development) of a new species.

**Student Speak:**

I can tell in words or numbers (describe) how

- crossover, independent assortment and random fertilization (genetic recombination), and/or
- change in the DNA sequence that alters a trait (mutations), and/or
- survival and reproduction of organisms with favorable variations (natural selection)

all may lead to

- characteristics that improve the chances for survival (adaptations),
- changes in a species over time (evolution),
- elimination of an entire species (extinction),
- and development of a news species (emergence).

**9-12.L.3.1.** Students are able to **identify** factors that cause changes in stability of populations, communities, and ecosystems.

**Web Level: 2**

**Bloom: Comprehension**

**Verbs Defined:**

Identify – select from

**Key Terms Defined:**

Factors – weather, climate, resources and human activity

Populations – groups of organisms of the same species in the same area

Communities – populations living and interacting in the same area

Ecosystems – the organization and interaction of communities with their physical environment

**Teacher Speak:**

Students are able to identify (select from) factors (weather, climate, resources and human activity) that cause changes in stability of populations (groups of organisms of the same species in the same area), communities (populations living and interacting in the same area), and ecosystems (the organization and interaction of communities with their physical environment).

**Student Speak:**

I can select from (identify) weather, climate, resources and human activity (factors) that cause changes in stability of

- groups of organisms of the same species in the same area (populations),
- populations living and interacting in the same area (communities), and
- the organization and interaction of communities with their physical environment (ecosystems).

**9-12.N.1.1.** Students are able to **evaluate** a scientific discovery to **determine** and **describe** how societal, cultural, and personal beliefs influence scientific investigations and interpretations.

**Webb Level: 4**

**Bloom: Evaluation**

**Verbs Defined:**

Evaluate - judge the value of

Determine – find appropriate information

Describe - tell in words or numbers

**Key Terms Defined:**

Scientific discovery – a finding based on experiments

Societal beliefs - opinions of people living together

Cultural beliefs - views based on religion or race

Personal beliefs - ideas of the scientist

Scientific investigations - experiments designed to find out about something

Scientific interpretations - explanations of what experiment results mean

**Teacher Speak:**

Students will be able to evaluate (judge the value of) a scientific discovery (a finding based on experiments) to determine (find appropriate information) and describe (tell in words or numbers) how societal beliefs (opinions of people living together), cultural beliefs (views based on religion or race), and personal beliefs (ideas of the scientist) influence scientific investigations (experiments designed to find out about something) and interpretations (explanations of what experiment results mean).

**Student Speak:**

I can judge the value of (evaluate) a finding based on experiments (scientific discovery) to find appropriate information about (determine) and tell in words or numbers (describe) how

- opinions of people living together (societal beliefs)

- views based on religion or race (cultural beliefs) and

- ideas of the scientist (personal beliefs)

influence experiments designed to find out about something (scientific investigations) and explanations of what experiment results mean (scientific interpretations).

**9-12.N.1.2.** Students are able to **describe** the role of observation and evidence in the development and modification of hypotheses, theories, and laws.

**Webb Level: 2**

**Bloom: Synthesis**

**Verbs Defined:**

Describe – tell in words or numbers

**Key Terms Defined:**

Observation – information gathered by use of senses and instruments

Evidence – experimental results used to support a conclusion

Hypotheses – explanations that can be tested

Theories – well-tested explanations based on observation, experimentation, and reasoning

Laws – generalizations that describe recurring facts or events in nature

**Teacher Speak:**

Students will be able to describe (tell in words or numbers) the role of observation (information gathered by use of senses and instruments) and evidence (experimental results used to support a conclusion) in the development and modification of:

- hypotheses (explanations that can be tested)
- theories (well-tested explanations based on observation, experimentation, and reasoning)
- laws (generalizations that describe recurring facts or events in nature).

**Student Speak:**

I can tell in words or numbers (describe) the role of information gathered by use of senses and instruments (observation) and experimental results used to support a conclusion (evidence) in the development and modification of:

- explanations that can be tested of (hypotheses)
- well-tested explanations based on observation, experimentation, and reasoning (theories)
- generalizations that describe recurring facts or events in nature (laws).

**9-12.N.2.1.** Students are able to **apply** science process skills to **design** and **conduct** student investigations. (Synthesis)

**Web Level: 4**

**Bloom: Synthesis**

**Verbs Defined:**

Apply - to use what you know

Design - plan

Conduct – perform

**Key Terms Defined:**

Science process skills - form a hypothesis, develop a procedure, select and correctly use appropriate instruments, revise explanations based on evidence, form conclusions, and communicate and defend the results

Investigations - experiments

**Teacher Speak:**

Students will be able to apply (to use what you know) science process skills (form a hypothesis, develop a procedure, select and correctly use appropriate instruments, revise explanations based on evidence, form conclusions, and communicate and defend the results) to design (plan) and conduct (perform) investigations (experiments).

**Student Speak:**

I can use what I know (apply) to:

- form a hypothesis
- develop a procedure
- select and correctly use appropriate instruments
- revise explanations based on evidence
- form conclusions
- communicate and defend the results

(science process skills) to plan (design) and perform (conduct) experiments (investigations).



**9-12.N.2.2.** Students are able to **practice** safe and effective laboratory techniques.

**Webb Level: 3**

**Bloom: Application**

**Verbs Defined:**

Practice – perform repeatedly

**Key Terms Defined:**

Laboratory techniques – calibrations, measurements and handling of chemicals and instruments

**Teacher Speak:**

Student will be able to practice (perform repeatedly) safe and effective laboratory techniques (calibrations, measurements and handling of chemicals and instruments).

**Student Speak:**

I can perform repeatedly (practice) safe and effective calibrations, measurements and handling of chemicals and instruments (laboratory techniques).

**9-12.S.1.1.** Students are able to **explain** ethical roles and responsibilities of scientists and scientific research.

**Webb Level: 3**

**Bloom: Application**

**Verbs Defined:**

Explain - give reasons for

**Key Terms Defined:**

Ethical roles and responsibilities of scientists - behavioral standards in the conduct of scientific inquiry involving the sharing and accuracy of data, acknowledgement of sources and following applicable laws

Ethical roles and responsibilities of scientific research - consideration of ethical issues involving animal and human subjects and dealing with the management of hazardous materials and wastes.

**Teacher Speak:**

Students will be able to explain (give reasons for):

- ethical roles and responsibilities of scientists (behavioral standards in the conduct of scientific inquiry involving the sharing and accuracy of data, acknowledgement of sources and following applicable laws),
- ethical roles and responsibilities of scientific research (consideration of ethical issues involving animal and human subjects and dealing with the management of hazardous materials and wastes)

**Student Speak:**

I can give reasons for (explain):

- behavioral standards in the conduct of scientific inquiry involving the sharing and accuracy of data, acknowledgement of sources and following applicable laws (ethical roles and responsibilities of scientists)
- consideration of ethical issues involving animal and human subjects and dealing with the management of hazardous materials and wastes (ethical roles and responsibilities of scientific research).

**9-12.S.1.2.** Students are able to **evaluate** and **describe** the impact of scientific discoveries on historical events and social, economic, and ethical issues.

**Webb Level: 4**

**Bloom: Evaluation**

**Verbs Defined:**

Evaluate - judge the value of

Describe - tell in words or numbers

**Key Terms Defined:**

Impact of scientific discoveries - changes caused by findings based on experiments

Historical events - things that happened in the past

Social issues - how people live and interact

Economic issues - ways people trade goods and services

Ethical issues - what is considered to be right or wrong

**Teacher Speak:**

Students will be able to evaluate (judge the value of) and describe (tell in words or numbers) the impact of scientific discoveries (changes caused by findings based on experiments) on historical events (things that happened in the past) and social issues (how people live and interact), economic issues (ways people trade goods and services), and ethical issues (what is considered to be right or wrong).

**Student Speak:**

I can judge the value of (evaluate) and tell in words or numbers (describe) changes caused by findings based on experiments (impact of scientific discoveries) on

- things that happened in the past (historical events)
- how people live and interact (social issues)
- ways people trade goods and services (economic issues)
- what is considered to be right or wrong (ethical issues).

**9-12.S.2.1.** Students are able to **describe** immediate and long-term consequences of potential solutions for technological issues.

**Web Level: 4**

**Bloom: Evaluation**

**Verbs Defined:**

Describe - tell in words or numbers

**Key Terms Defined:**

Potential solutions\_ - possible corrections

Technological issues-problems related to applications in science

**Teacher Speak:**

Students will be able to describe (tell in words or numbers) immediate and long-term consequences of potential solutions (possible corrections) for technological issues (problems related to applications in science).

**Student Speak:**

I can tell in words or numbers (describe) the immediate and long-term consequences of possible corrections (potential solutions) for problems related to applications in science (technological issues).

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**9-12.S.2.2.** Students are able to **analyze** factors that could limit technological design.

**Webb Level: 3**

**Bloom: Analysis**

**Verbs Defined:**

Analyze - separate into parts

**Key Terms Defined:**

Factors - environmental problems, expenses, manufacturing processes, and ethical issues

Technological design -making products by applying scientific principles

**Teacher Speak:**

Students will be able to analyze (separate into parts) factors (environmental problems, expenses, manufacturing processes, and ethical issues) that could limit technological design (making products by applying scientific principles).

**Student Speak:**

I can separate into parts (analyze) how environmental problems, expenses, manufacturing processes, and ethical issues (factors) could limit making products by applying scientific principles (technological design).

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**9-12.S.2.3.** Students are able to **analyze** and **describe** the benefits, limitations, cost, and consequences involved in using, conserving, or recycling resources.

**Webb Level: 4****Bloom: Synthesis****Verbs Defined:**

Analyze - separate into parts

Describe - tell in words or numbers

**Key Terms Defined:**

Resources - materials taken from the earth such as minerals, trees, and fuels

**Teacher Speak:**

Students will be able to analyze (separate into parts) and describe (tell in words or numbers) the benefits, limitations, cost, and consequences involved in using, conserving, or recycling resources (materials taken from the earth such as minerals, trees, and fuels).

**Student Speak:**

I can separate into parts (analyze) and tell in words or numbers (describe) the benefits, limitations and consequences involved in using, conserving and recycling materials taken from the earth such as minerals, trees, and fuels (resources).