Environmental Science Institute
The University of Texas at Austin

Dinosaurs in the Digital Age
Facts, Fictions, and Forgeries

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This file contains suggestions for incorporating material from this CD-ROM into curriculum using the Texas Essential Knowledge and Skills for Science.

§112.2. Science, Kindergarten.

(K.1) Scientific processes. The student participates in classroom and field investigations following home and school safety procedures. The student is expected to:
(A) demonstrate safe practices during classroom and field investigations; and
(B) learn how to use and conserve resources and materials.
Slide 10 features a person using a globe. The person touches the globe lightly in order to treat it properly. Slide 19 features a fossil which is made up of many broken parts. It is important to be very careful with fossils because they can be very fragile.

(K.2) Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom. The student is expected to:
(A) ask questions about organisms, objects, and events;
Ask questions about the fossils in slide 14.
How do fossils help scientists understand the past?
Ask questions about the dinosaurs shown on slides 5 and 6.
How do we know anything about dinosaurs?
What would it be like to be a dinosaur?
Which of the dinosaurs on slide 5 and/or 6 would you like to be?
What would you eat?
(B) plan and conduct simple descriptive investigations;
Slide 31 shows a picture of a dinosaur that has bird characteristics. Which parts of the dinosaur look like a bird?
Describe the organisms that are seen in the fossils in slide 14. How are they alike and different?
(C) gather information using simple equipment and tools to extend the senses;
Slide 10 shows a person using the globe in order to see Eastern China. Which body part is this person using, and what senses?

How would a hand lens help this person? What sense would a person be using if they were using a hand lens?
(D) construct reasonable explanations using information; and
(E) communicate findings about simple investigations.
Slide 27 shows a drawing of a fossil and the rocks that surround it. The different colors of the rocks represent different kinds of rock. Scientists were able to discover that a person made this fossil by putting together pieces of several different animals. Identify which parts go together and explain why.

(K.3) Scientific processes. The student knows that information and critical thinking are used in making decisions. The student is expected to:
(A) make decisions using information;
The fossil on Slide 27 is made of parts of different fossils. The person who did this did so to trick people into thinking that it was just one fossil in order to sell the fossil for more money. This person lied. Is it ok for a person to lie to get money?
(B) discuss and justify the merits of decisions; and
Why was lying a bad decision?
(C) explain a problem in his/her own words and propose a solution.
Explain why lying about fossils is a problem and propose a solution.

(K.4) Scientific processes. The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described, and measured. The student is expected to:
(A) identify and use senses as tools of observation; and
Slide 22 shows a picture of a fossil. If you touched it with your hand, how do you think it would feel? Do you think it would feel rough or smooth?
What sense are you using?
(B) make observations using tools including hand lenses, balances, cups, bowls, and computers.
Slide 14 shows fossils. How would a hand lens help a person to examine these fossils?
Slide 13 shows a girl holding fossils. How would cups and bowls help this girl organize her fossils? How could the girl examine her fossils with a balance?
The dinosaur shown on slide 19 was about as big as a turkey. Demonstrate with your hands how big a turkey is.
Slide 23 shows two pictures of a fossil. The one on the left is the real fossil. The one on the right is a type of x-ray. With this x-ray, you can see with your eyes very clearly the bone structure of the animal. Do the bones look hard or soft? Sharp or smooth? In what other ways to the two pictures of the fossil look different?

(K.5) Science concepts. The student knows that organisms, objects, and events have properties and patterns. The student is expected to:
(A) describe properties of objects and characteristics of organisms;
Describe characteristics of the different organisms shown in slide 9.

(B) observe and identify patterns including seasons, growth, and day and night and predict what happens next; and
(C) recognize and copy patterns seen in charts and graphs.
Slides 5 and 6 feature a family tree of dinosaurs. Where are the oldest dinosaurs? Where are the newest?
Slide 9 shows drawings of a modern bird (living today), a primitive bird (an example of a bird that lived millions of years ago), and a small dinosaur. Which side of the page is the dinosaur on? The pictures are on a timeline – which side represents the present?

(K.6) Science concepts. The student knows that systems have parts and are composed of organisms and objects. The student is expected to:
(A) sort organisms and objects into groups according to their parts and describe how the groups are formed;
Sort the organisms seen in slide 14 into groups according to their body parts and describe how the groups were formed.
(B) record observations about parts of plants including leaves, roots, stems, and flowers;
Slide 11 has a picture of a landscape. What kind of plants do you see on this landscape? How can you tell the difference between grass and trees?
What part of a plant is in the top right corner of slide 14?
(C) record observations about parts of animals including wings, feet, heads, and tails;
Identify the different body parts of the penguin on slide 3.
Identify and describe the different body parts of the organisms seen in the fossils on slide 14.
(D) identify parts that, when separated from the whole, may result in the part or the whole not working, such as cars without wheels and plants without roots; and
(E) manipulate parts of objects such as toys, vehicles, or construction sets that, when put together, can do things they cannot do by themselves.
If a dinosaur did not have feet, could it walk? Could a dinosaur chew food without its teeth?

(K.8) Science concepts. The student knows the difference between living organisms and nonliving objects. The student is expected to:
(A) identify a particular organism or object as living or nonliving; and
Slide 3 has a picture of 4 penguins. Are these penguins living or nonliving?
Slides 8 and 14 have pictures of fossils. Are these fossils living or nonliving?
(B) group organisms and objects as living or nonliving.
Group organisms and objects in slides 11 and 13 as living or nonliving.

(K.9) Science concepts. The student knows that living organisms have basic needs. The student is expected to:
(A) identify basic needs of living organisms;
What are the basic needs of penguins in order to survive? [slide 3]
(B) give examples of how living organisms depend on each other; and

How does the baby penguin depend on his parents? [slide 3]
(C) identify ways that the Earth can provide resources for life.
What kind of resources does the Earth provide for life? Which of these resources do you see in this picture? [slide 11]

(K.10) Science concepts. The student knows that the natural world includes rocks, soil, and water. The student is expected to:
(A) observe and describe properties of rocks, soil, and water; and
What are the properties of rocks, soil, and water? [slide 11]
Observe and describe the properties of the rocks in slides 15 and 16.
(B) give examples of ways that rocks, soil, and water are useful.
How are rocks, soil, and water useful to penguins? [slide 3]

§112.3. Science, Grade 1.
(1.1) Scientific processes. The student conducts classroom and field investigations following home and school safety procedures. The student is expected to:
(A) demonstrate safe practices during classroom and field investigations; and
(B) learn how to use and conserve resources and materials.
Slide 10 features a person using a globe. The person touches the globe lightly in order to treat it properly. Slide 19 features a fossil which is made up of many broken parts. It is important to be very careful with fossils because they can be very fragile.

(1.2) Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom. The student is expected to:
(A) ask questions about organisms, objects, and events;
Ask questions about the fossils shown in slide 14.
How do fossils help scientists understand the past? How do we know that dinosaurs existed?
What would it be like to be a dinosaur? Which of the dinosaurs on slide 5 and/or 6 would you like to be? What would you eat?
(B) plan and conduct simple descriptive investigations;
Slide 31 shows a picture of a dinosaur that has bird characteristics. Describe which parts of the dinosaur look like a bird.
(C) gather information using simple equipment and tools to extend the senses;
How would a hand lens help the person examining the rocks in slide 15? What sense would a person be using if they were using a hand lens?
(D) construct reasonable explanations and draw conclusions; and
(E) communicate explanations about investigations.
Slide 27 shows a drawing of a fossil and the rocks that surround it. The different colors of the rocks represent different kinds of rock. Scientists were able to discover that a person made this fossil by putting together pieces of several different animals. Identify which parts go together and explain why.

(1.3) Scientific processes. The student knows that information and critical thinking are used in making decisions. The student is expected to:
(A) make decisions using information;
The fossil on Slide 27 is made of parts of different fossils. The person who did this did so to trick people into thinking that it was just one fossil in order to sell the fossil for more money. This person lied. Is it ok for a person to lie to get money?
(B) discuss and justify the merits of decisions; and
Why is lying a bad decision?
(C) explain a problem in his/her own words and identify a task and solution related to the problem.
Explain the problem just posed and think of a solution to this problem.

(1.4) Scientific processes. The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described, and measured. The student is expected to:
(A) collect information using tools including hand lenses, clocks, computers, thermometers, and balances;
Slide 14 shows many different fossils. How could you use hand lenses, clocks, computers, thermometers, and balances to examine these fossils? What kind of information would you collect?
(B) record and compare collected information; and
How would you record the information that you collected? How would you compare it?
(C) measure organisms and objects and parts of organisms and objects, using nonstandard units such as paper clips, hands, and pencils.
Slide 14 shows a dragonfly fossil and a spider fossil on the left-hand side of the slide. What kind of units would you use to measure these?
Other fossils on this slide include a salamander and a turtle. What kind of units would you use to measure these fossils? Would these units be bigger or smaller than those used for the spider and dragonfly? Why?

(1.5) Science concepts. The student knows that organisms, objects, and events have properties and patterns. The student is expected to:
(A) sort objects and events based on properties and patterns; and
Sort the organisms seen in slide 14 into groups according to their body parts and describe how the groups were formed.
(B) identify, predict, and create patterns including those seen in charts, graphs, and numbers.
Slides 5 and 6 feature a family tree of dinosaurs. Where are the oldest dinosaurs? Where are the newest?
Slide 9 shows drawings of a modern bird (still living today), a primitive bird (an example of a bird that lived millions of years ago), and a small dinosaur. Which side of the page is the dinosaur on? The pictures are on a timeline – which side represents the present?

(1.6) Science concepts. The student knows that systems have parts and are composed of organisms and objects. The student is expected to:
(A) sort organisms and objects according to their parts and characteristics;
Sort the dinosaurs in slides 5 and 6 into groups according to their body parts and describe how the groups were formed.
(B) observe and describe the parts of plants and animals;
Describe the parts of the penguin. [slide3]
Describe the parts of the small dromaeosaur dinosaur. [slide31].

(C) manipulate objects such as toys, vehicles, or construction sets so that the parts are separated from the whole which may result in the part or the whole not working; and
(D) identify parts that, when put together, can do things they cannot do by themselves,such as a working camera with film, a car moving with a motor, and an airplane flying with fuel.
If a dinosaur did not have feet, could it walk?
Slide 2 shows a mouth with big teeth. Can the teeth chew without the mouth? Can the mouth chew without the teeth?

(1.8) Science concepts. The student distinguishes between living organisms and nonliving objects. The student is expected to:
(A) group living organisms and nonliving objects; and
Slide 3 has a picture of penguins. Are these penguins living or nonliving?
Slides 8 and 14 have pictures of fossils. Are these fossils living or nonliving?
(B) compare living organisms and nonliving objects.
Compare the living organisms and nonliving objects in slides 11 and 13.

(1.9) Science concepts. The student knows that living organisms have basic needs. The student is expected to:
(A) identify characteristics of living organisms that allow their basic needs to be met;
What are the basic needs of these penguins in order to survive? What are the characteristics that allow them to eat, sleep, and breathe? [Slide 3]
and
(B) compare and give examples of the ways living organisms depend on each other for their basic needs.
How does the baby penguin depend on its parents in order to survive?
How do these penguins depend on fish in order to survive? [Slide 3]

(1.10) Science concepts. The student knows that the natural world includes rocks, soil, and water. The student is expected to:
(A) identify and describe a variety of natural sources of water including streams, lakes,and oceans;
What are some natural sources of water?
What types of natural sources of water are probably near these penguins? [Slide 3]

(B) observe and describe differences in rocks and soil samples; and
Describe differences in the soil and rock layers shown in slides 15 and 16. Compare and contrast the rocks in slide 14 that are holding fossils.

§112.4. Science, Grade 2.

(2.1) Scientific processes. The student conducts classroom and field investigations following home and school safety procedures. The student is expected to:
(A) demonstrate safe practices during classroom and field investigations; and
(B) learn how to use and conserve resources and dispose of materials.
Slide 10 features a person using a globe. The person touches the globe lightly in order to treat it properly. Slide 19 features a fossil which is made up of many broken parts. It is important to be very careful with fossils because they can be very fragile.

(2.2) Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom. The student is expected to:
(A) ask questions about organisms, objects, and events;
Slide 14 has five fossils. Ask questions about these fossils (e.g., what kind of environment did they live in? What did they eat?) and then think of hypotheses about these fossils. What kind of equipment and technology or approach would you use in order to test this hypothesis?
(B) plan and conduct simple descriptive investigations;
Describe which parts of the dinosaur in slide 31 look like a bird.
(C) compare results of investigations with what students and scientists know about the world;
How is this animal different from the normal birds and dinosaurs that you have seen (slide 31)?
(D) gather information using simple equipment and tools to extend the senses;
How would a hand lens help a person gather information about a fossil? What sense would a person be using if they were using a hand lens?
(E) construct reasonable explanations and draw conclusions using information and prior knowledge; and
(F) communicate explanations about investigations.
Slide 27 shows a drawing of a fossil and the rocks that surround it. The different colors of the rocks represent different kinds of rock. Scientists were able to discover that a person made this fossil by putting together pieces of several different animals. Identify which parts go together and explain why.

(2.3) Scientific processes. The student knows that information and critical thinking are used in making decisions. The student is expected to:
(A) make decisions using information;
The fossil on Slide 27 is made of parts of different fossils. The person who did this did so to trick people into thinking that it was just one fossil in order to sell the fossil for more money. This person lied. Is it ok for a person to lie to get money?

(B) discuss and justify the merits of decisions; and
Why is lying a bad decision?
(C) explain a problem in his/her own words and identify a task and solution related to the problem.
Explain why lying about a fossil is a problem and propose a solution.

(2.4) Scientific processes. The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described, and measured. The student is expected to:
(A) collect information using tools including rulers, meter sticks, measuring cups, clocks, hand lenses, computers, thermometers, and balances; and
Look at the fossil in slide 8. How could you use rulers, meter sticks, measuring cups, clocks, hand lenses, computers, thermometers, and balances to study this fossil? Would all of the tools listed be helpful or just some of them?
(B) measure and compare organisms and objects and parts of organisms and objects,using standard and non-standard units.
Look at the fossils in slide 14. Would you use a ruler or a yardstick to measure them? Would you use a ruler for some and a yardstick for others? Why?
What other things could you use to measure these fossils? Paperclips? Human hands? How would this be helpful?

(2.5) Science concepts. The student knows that organisms, objects, and events have properties
and patterns. The student is expected to:
(A) classify and sequence organisms, objects, and events based on properties and patterns; and
Slide 9 shows three heads in a row. Each head is a little different from the last. The head on the left is the most like a dinosaur. The head on the right is most like a bird. The head in the middle is in between the two. Why? Why are the organisms classified in this sequence?
(B) identify, predict, replicate, and create patterns including those seen in charts, graphs, and numbers.
The diagram in slide 5 shows dinosaurs from oldest at the bottom to youngest at the top. The youngest are descendents from the oldest. The same thing happens in human families. If you were to make a diagram of your family, like this one, who would be at the bottom? Who would be at the top?

(2.6) Science concepts. The student knows that systems have parts and are composed of organisms and objects. The student is expected to:
(A) manipulate, predict, and identify parts that, when separated from the whole, may result in the part or the whole not working, such as flashlights without batteries and plants without leaves;
Predict what would happen if a dinosaur did not have feet.
(B) manipulate, predict, and identify parts that, when put together, can do things they cannot do by themselves, such as a guitar and guitar strings;
Would a dinosaur be able to survive without teeth?

Can teeth do anything without the mouth? Slide 2 is a picture of teeth.
(C) observe and record the functions of plant parts; and
What part of a plant is shown in the fossil in the top right-hand corner of slide 14?
What are the functions of the different parts of living plants?
(D) observe and record the functions of animal parts.
Describe the animal's body parts show on slide 31 and their functions. Which parts are bird-like and which are dinosaur-like?

(2.8) Science concepts. The student distinguishes between living organisms and nonliving objects. The student is expected to:
(A) identify characteristics of living organisms; and
Slide 3 is a picture of penguins. Is it alive? How do you know it is alive?
(B) identify characteristics of nonliving objects.
Slide 14 has pictures of many fossils. Are they alive? How do you know they are not alive?
(2.9) Science concepts. The student knows that living organisms have basic needs. The student is expected to:
(A) identify the external characteristics of different kinds of plants and animals that allow their needs to be met; and
What are the external characteristics of this penguin that allow its needs to be met? [slide 3]
What are the external characteristics of this animal that allow its needs to be met? [slide 31]
What are the different characteristics of these different plants and animals that allowed their needs to be met when they were alive? [slide 14]
(B) compare and give examples of the ways living organisms depend on each other and on their environments.
How does the baby penguin depend on its parents in order to survive? [slide3]
How do these penguins depend on fish in order to survive?

§112.5. Science, Grade 3.

(3.1) Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil in slide 19 is very fragile. How must you treat this fossil? Some of the edges of this fossil could be sharp. How do you make sure to protect yourself from sharp edges?
Slide 15 shows a man exploring some terrain. What kind of safety precautions should he take?
Slides 4-6 are very nice charts that someone has made. If you had a paper copy of these charts, how would you treat them in order to keep them clean?

(3.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:
(A) plan and implement descriptive investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;
Slide 14 has five fossils. Ask questions and think of a hypothesis about these fossils (e.g., what type of environment did the creatures live in? What did they eat?). What kind of equipment and technology would you use in order to test your hypothesis?
(B) collect information by observing and measuring;
How would you collect information about these fossils?
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
What kind of explanations can you make for your hypothesis using direct and indirect evidence?
(D) communicate valid conclusions; and
Present your conclusions to the class.
(E) construct simple graphs, tables, maps, and charts to organize, examine and evaluate information.
Would graphs, tables, maps, or charts be helpful in organizing, examining, or evaluating this information? Which ones? How would you make it?

(3.3) Scientific processes. The student knows that information, critical thinking, and scientific problem solving are used in making decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Critique the scientific explanation that birds descended from dinosaurs. Give examples of the strengths and weaknesses using scientific evidence and information.
(C) represent the natural world using models and identify their limitations;
Slide 23 shows a fossil and a computer-generated model of the fossil that was made using the high resolution X-ray scanner. What are the benefits and limitations of this technology?
(D) evaluate the impact of research on scientific thought, society, and the environment; and
What have we learned from the discovery of fossils?
(E) connect Grade 3 science concepts with the history of science and contributions of scientists.
What do you know about Charles Darwin? [slide 3 notes]

(3.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:
(A) collect and analyze information using tools including calculators, microscopes, cameras, safety goggles, sound recorders, clocks, computers,

thermometers, hand lenses, meter sticks, rulers, balances, magnets, and compasses; and
Slide 8 shows a fossil. What tools would you use to study this fossil and how would you use them?

(3.5) Science concepts. The student knows that systems exist in the world. The student is expected to:
(A) observe and identify simple systems such as a sprouted seed and a wooden toy car;
What are some systems in the landscape shown in slide 11?
and
(B) observe a simple system and describe the role of various parts such as a yo-yo and string.
What are the roles of the parts of the mouth shown in slide 2? This mouth is a part of what whole system?

(3.7) Science concepts. The student knows that matter has physical properties. The student is expected to:
(B) identify matter as liquids, solids, and gases.
Look at the ground on the landscape shown in slide 12. What kind of information would you gather in order to determine if it was a liquid, solid, or a gas? Is this ground a liquid, solid, or gas? Are the clouds in the background liquid, solid, or gas?

(3.8) Science concepts. The student knows that living organisms need food, water, light, air, a way to dispose of waste, and an environment in which to live. The student is expected to:
(A) observe and describe the habitats of organisms within an ecosystem;
Imagine the organisms that live in the landscape in slide 11. Pick an organism, and describe its habitat within this landscape. (Example: Bird in tree)
(B) observe and identify organisms with similar needs that compete with one another for resources such as oxygen, water, food, or space;
Look at the different organisms that make the fossils in slide 14. Which of these organisms have similar needs? Which of these organisms would compete for resources?
(C) describe environmental changes in which some organisms would thrive, become ill,or perish; and
What kind of environmental changes would be good for the penguin [slide 3], and what kind would be bad?
(D) describe how living organisms modify their physical environment to meet their needs such as beavers building a dam or humans building a home.
How have humans modified this landscape shown in slide 11 to meet their needs?

(3.9) Science concepts. The student knows that species have different adaptations that help them

survive and reproduce in their environment. The student is expected to:
(A) observe and identify characteristics among species that allow each to survive and reproduce; and
What are the characteristics of the species shown in slide 31 that allowed it to survive and reproduce?
(B) analyze how adaptive characteristics help individuals within a species to survive and reproduce.
Hypothesize what adaptive characteristics may have helped this animal survive and reproduce.

(3.10) Science concepts. The student knows that many likenesses between offspring and parents
are inherited from the parents. The student is expected to:
(B) identify some inherited traits of animals.
What traits did the baby penguin in slide 3 inherit from its parents?

(3.11) Science concepts. The student knows that the natural world includes earth materials and objects in the sky. The student is expected to:
(A) identify and describe the importance of earth materials including rocks, soil, water,and gases of the atmosphere in the local area and classify them as renewable, nonrenewable, or inexhaustible resources;
What important roles do rocks, soil, water, and gas play in this picture? [slide 11]
Which are renewable, nonrenewable, or inexhaustible resources?
(B) identify and record properties of soils such as color and texture, capacity to retain water, and ability to support the growth of plants;
Describe the colors of the soils seen in slide 15. Does the soil have the ability to support the growth of plants?

§112.6. Science, Grade 4.

(4.1) Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? Some of the edges of this fossil could be sharp. How do you make sure to protect yourself from sharp edges?
Slide 15 shows a man exploring some terrain. What kind of safety precautions should he take?
Slides 4-6 are very nice charts that someone has made. If you had a paper copy of these charts, how would you treat them in order to keep them clean?

(4.2) Scientific processes. The student uses scientific inquiry methods during field and

laboratory investigations. The student is expected to:
(A) plan and implement descriptive investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;
Slide 14 has five fossils. Ask questions and think of a hypothesis about these fossils (e.g., what type of environment did the creatures live in? What did they eat?). What kind of equipment and technology would you use in order to test your hypothesis?
(B) collect information by observing and measuring;
How would you collect information about fossils?
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
What kind of explanations can you make for your hypothesis using direct and indirect evidence?
(D) communicate valid conclusions; and
Present your conclusions with your classmates.
(E) construct simple graphs, tables, maps, and charts to organize, examine, and evaluate information.
Would graphs, tables, maps, or charts be helpful in organizing, examining, or evaluating this information? Which ones?

(4.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Critique the scientific explanation that birds descended from dinosaurs. Give examples of the strengths and weaknesses using scientific evidence and information.
(C) represent the natural world using models and identify their limitations;
Slide 23 shows a fossil and a computer-generated model of the fossil that was made using the high resolution X-ray scanner. What are the benefits and limitations of this technology?
(D) evaluate the impact of research on scientific thought, society, and the environment; and
What have we learned from the research of these fossils?
(E) connect Grade 4 science concepts with the history of science and contributions of scientists.
What contributions has Charles Darwin made to the field of science? [slide 3].

(4.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:
(A) collect and analyze information using tools including calculators, safety goggles, microscopes, cameras, sound recorders, computers, hand lenses, rulers, thermometers, meter sticks, timing devices, balances, and compasses;
What tools would you use to study the fossil in slides 13 and 29?

and
(4.5) Science concepts. The student knows that complex systems may not work if some parts are removed. The student is expected to:
(A) identify and describe the roles of some organisms in living systems such as plants in a schoolyard, and parts in nonliving systems such as a light bulb in a circuit; and
(B) predict and draw conclusions about what happens when part of a system is removed.
What are the roles of these trees in slide 11? What happens if the trees are removed? What are the roles of the houses in this picture? What happens if the roofs are removed?

(4.7) Science concepts. The student knows that matter has physical properties. The student is expected to:
(B) conduct tests, compare data, and draw conclusions about physical properties of matter including states of matter, conduction, density, and buoyancy.
What are some tests you could perform and data you could gather in order to compare data and draw conclusions about the conduction, density, and buoyancy of matter in the landscape shown in slide 11?

(4.8) Science concepts. The student knows that adaptations may increase the survival of members of a species. The student is expected to:
(A) identify characteristics that allow members within a species to survive and reproduce;
What are characteristics of these penguins that allow them to survive and reproduce? [slide 3]
(B) compare adaptive characteristics of various species; and
Compare the adaptive characteristics of the organisms seen in slide 14.
(C) identify the kinds of species that lived in the past and compare them to existing species.
Compare the adaptive characteristics of the ancient dinosaur on Slide 31 and the present-day penguins on slide 3.

(4.9) Science concepts. The student knows that many likenesses between offspring and parents are inherited or learned. The student is expected to:
(A) distinguish between inherited traits and learned characteristics; and
(B) identify and provide examples of inherited traits and learned characteristics.
Describe the traits that the baby penguin inherited from its parents. Hypothesize what characteristics the baby penguin learned from its parents.

(4.10) Science concepts. The student knows that certain past events affect present and future events. The student is expected to:
(A) identify and observe effects of events that require time for changes to be noticeable including growth, erosion, dissolving, weathering, and flow; and
Use slide 11 and 12 for reference.

(B) draw conclusions about "what happened before" using fossils or charts and tables.
Refer to slides 4-6.

(4.11) Science concepts. The student knows that the natural world includes earth materials and objects in the sky. The student is expected to:
(A) test properties of soils including texture, capacity to retain water, and ability to support life;
Describe the colors of the soils seen in slide 15. Does the soil have the ability to support the growth of plants? How would you test the texture of soil and the soil's capacity to retain water?

§112.7. Science, Grade 5.

(5.1) Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? Some of the edges of this fossil could be sharp. How do you make sure to protect yourself from sharp edges?
Slide 15 shows a man exploring some terrain. What kind of safety precautions should he take?
Slides 4-6 are very nice charts that someone has made. If you had a paper copy of these charts, how would you treat them in order to keep them clean?

(5.2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(A) plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;
(B) collect information by observing and measuring;
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
(D) communicate valid conclusions; and
(E) construct simple graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information.
Images from the PowerPoint presentation can be used as materials for a scientific investigation [slides 22-27]. The students can be given pictures of two different fossils – one authentic and one forgery. They can formulate a hypothesis about which fossil is authentic and which one is a forgery. Students can then make observations based on the imagery from the CT scanner. Students can then construct reasonable explanations and communicate their

conclusions to the rest of the class. Students can also draw a map of how the bones fit together.

(5.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Critique the scientific explanation that birds descended from dinosaurs. Give examples of the strengths and weaknesses using scientific evidence and information. How have digital technologies allowed scientists to understand fossils in ways never before thought possible?
(C) represent the natural world using models and identify their limitations;
Slide 23 shows a fossil and a computer-generated model of the fossil that was made using the high resolution X-ray scanner. What are the benefits and limitations of this technology?
(D) evaluate the impact of research on scientific thought, society, and the environment; and
How does the research presented in this PowerPoint impact scientific thought?
(E) connect Grade 5 science concepts with the history of science and contributions of scientists.
When did Charles Darwin publish “The Orgin of Species”? [slide 3]
What kinds of contributions did Charles Darwin make to the field of science? [slides 3-9]

(5.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:
(A) collect and analyze information using tools including calculators, microscopes, cameras, sound recorders, computers, hand lenses, rulers, thermometers, compasses, balances, hot plates, meter sticks, timing devices,
What tools would you use to study the fossils in slides 13 and 29?

(5.5) Science concepts. The student knows that a system is a collection of cycles, structures, and processes that interact. The student is expected to:
(A) describe some cycles, structures, and processes that are found in a simple system; and
(B) describe some interactions that occur in a simple system.
What are the roles of these trees in slide 11? What would happens if the trees were removed?

(5.7) Science concepts. The student knows that matter has physical properties. The student is expected to:
(A) classify matter based on its physical properties including magnetism, physical state, and the ability to conduct or insulate heat, electricity, and sound;

Classify the organisms seen in the fossils in slide 14 based on physical properties (i.e. - plants and animals, reptiles and insects, and/or flying and non-flying).

(5.9) Science concepts. The student knows that adaptations may increase the survival of members of a species. The student is expected to:
(A) compare the adaptive characteristics of species that improve their ability to survive and reproduce in an ecosystem;
What are some characteristics of penguins that allow them to survive and reproduce? [slide 3]
(B) analyze and describe adaptive characteristics that result in an organism's unique niche in an ecosystem; and
Pick one organism in slide 14. Hypothesize, analyze, and describe adaptive characteristics that result in the organism's unique niche in an ecosystem.

(C) predict some adaptive characteristics required for survival and reproduction by an organism in an ecosystem.
Predict the adaptive characteristics required for survival and reproduction by an organism seen in slide 14.

(5.10) Science concepts. The student knows that likenesses between offspring and parents can be inherited or learned. The student is expected to:
(A) identify traits that are inherited from parent to offspring in plants and animals; and
Describe traits that the baby penguin inherited from its parents
(B) give examples of learned characteristics that result from the influence of the environment.
Provide examples of characteristics penguins learn as a result from the influence of their environment.

(5.11) Science concepts. The student knows that certain past events affect present and future events. The student is expected to:
(A) identify and observe actions that require time for changes to be measurable, including growth, erosion, dissolving, weathering, and flow;
Refer to slides 11, 12, 15, and 16.
(B) draw conclusions about "what happened before" using data such as from treegrowth rings and sedimentary rock sequences; and
Draw conclusions about “what happened before."

(12) Science concepts. The student knows that the natural world includes earth materials and objects in the sky. The student is expected to:
(A) interpret how land forms are the result of a combination of constructive and destructive forces such as deposition of sediment and weathering;
Hypothesize what types of weathering process(es) influence the land forms seen in slide 12. Describe how a combination of constructive and destructive forces created the ancient lakebeds seen in slide 16.

(C) identify the physical characteristics of the Earth and compare them to the physical characteristics of the moon; and
Compare physical characteristics of the Earth [seen in slides 11, 12, 15, and 16] to physical characteristics of the moon.

§112.22. Science, Grade 6.

(6.1) Scientific processes. The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? Some of the edges of this fossil could be sharp. How do you make sure to protect yourself from sharp edges?
Slide 15 shows a man exploring some terrain. What kind of safety precautions should he take?
Slides 4-6 are very nice charts that someone has made. If you had a paper copy of these charts, how would you treat them in order to keep them clean?

(6.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;
(B) collect data by observing and measuring;
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
(D) communicate valid conclusions; and
(E) construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.
Images from the PowerPoint presentation can be used as materials for a scientific investigation [slides 22-27]. The students can be given pictures of two different fossils – one authentic and one forgery. They can formulate a hypothesis about which fossil is authentic and which one is a forgery. Students can then make observations based on the imagery from the CT scanner. Students can then construct reasonable explanations and communicate their conclusions to the rest of the class. Students can also draw a map of how the bones fit together.

(6.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

Critique the scientific explanation that birds descended from dinosaurs. Give examples of the strengths and weaknesses using scientific evidence and information. How have digital technologies allowed scientists to understand fossils in ways never before thought possible?

(C) represent the natural world using models and identify their limitations;

Slide 23 shows a fossil and a computer-generated model of the fossil that was made using the high resolution X-ray scanner. What are the benefits and limitations of this technology?

(D) evaluate the impact of research on scientific thought, society, and the environment; and

How does the research presented in this PowerPoint impact scientific thought?

(E) connect Grade 6 science concepts with the history of science and contributions of scientists.

When did Charles Darwin publish “The Orgin of Species”? [slide 3]

What kinds of contributions did Charles Darwin make to the field of science? [slides 3-9]

(6.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:

(A) collect, analyze, and record information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, timing devices, hot plates, test tubes, safety goggles, spring scales, magnets, balances, microscopes, telescopes, thermometers, calculators, field equipment, compasses, computers, and computer probes

Have students do a search on the internet to find out more about dinosaurs and the theory that birds evolved from dinosaurs.

(6.6) Science concepts. The student knows that there is a relationship between force and motion. The student is expected to:

(C) identify forces that shape features of the Earth including uplifting, movement of water, and volcanic activity.

What forces were involved in creating the landscape on slide 12? How did volcanic activity help preserve the fossils found in the ancient lake on slide 16?

(6.10) Science concepts. The student knows the relationship between structure and function in living systems. The student is expected to:

(A) differentiate between structure and function;

Have students describe the structures of the dinosaur nicknamed ”Dave”[slides 19 and 20]. Students can then make inferences about the functions of these structures.

Which structures of the Archaeopteryx resemble modern birds? Which traits resemble traits of the extinct predatory dinosaurs? [slide 9]

(6.11) Science concepts. The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:

(A) identify some changes in traits that can occur over several generations through natural occurrence and selective breeding;
Have students look at the Phylogeny charts (family trees) on slides 5 and 6 and describe what traits of the theropods dinosaurs are similar to traits of modern birds?

(6.14) Science concepts. The student knows the structures and functions of Earth systems. The student is expected to:
(A) summarize the rock cycle;
Hypothesize what types of weathering process(es) influence the landscape seen in slide 12. Summarize the rock cycle.

§112.23. Science, Grade 7.

(7.1) Scientific processes. The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil?
Slide 15 shows a man exploring some terrain. What kind of safety precautions should he take?
Slides 4-6 are very nice charts that someone has made. If you had a paper copy of these charts, how would you treat them in order to keep them clean?

(7.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;
(B) collect data by observing and measuring;
(C) organize, analyze, make inferences, and predict trends from direct and indirect evidence;
(D) communicate valid conclusions; and
(E) construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.
Images from the PowerPoint presentation can be used as materials for a scientific investigation [slides 22-27]. The students can be given pictures of two different fossils – one authentic and one forgery. They can formulate a hypothesis about which fossil is authentic and which one is a forgery. Students can then make observations based on the imagery from the CT scanner. Students can then write reasonable explanations and communicate their conclusions to the rest of the class. Students can also draw a map of how the bones fit together.

(7.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Students can write a critique of the presentation by pretending they are a journalist for a popular science magazine or paper. Evidence is needed to back up their argument and an explanation for their critique.
(C) represent the natural world using models and identify their limitations;
Slides 22-27 show a fossil and a computer-generated model of the fossil that was made using the high-resolution X-ray CT (Computed Tomography) scanner.
What are the benefits and limitations of this technology?
(D) evaluate the impact of research on scientific thought, society, and the environment; and
How does the research presented in this PowerPoint impact scientific thought?
(F) connect Grade 7 science concepts with the history of science and contributions of scientists.
What discoveries have been made in the past 10 years that have advanced the field of paleontology? [slide 2]
What kind of information can a paleontologist obtain from a CT (computed tomography) scanner? [slide 2]
What type of materials does a CT scanner work on? [slide 2]

(7.4) Scientific processes. The student knows how to use tools and methods to conduct science inquiry. The student is expected to:
(A) collect, analyze, and record information to explain a phenomenon using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, timing devices, magnets, and compasses;
Which tools and methods would you use if you were testing the hypothesis that larger fossils weigh more than smaller ones?

(7.8) Science concepts. The student knows that complex interactions occur between matter and energy. The student is expected to:
(A) illustrate examples of potential and kinetic energy in everyday life such as objects at rest, movement of geologic faults, and falling water; and
What type of energy do the fossils that the girl is holding in slide 13 possess?
What type of energy would this be converted to if she dropped the fossils?

(7.10) Science concepts. The student knows that species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:

(B) compare traits of organisms of different species that enhance their survival and reproduction; and
What traits do the theropod dinosaurs have that are found today only in modern birds? [slide 6] Hypothesize how these traits might have helped their survival and reproduction.

(7.12) Science concepts. The student knows that there is a relationship between organisms and the environment. The student is expected to:
(A) identify components of an ecosystem;
Identify components of the ecosystem seen in slide 11 or 12.
(B) observe and describe how organisms including producers, consumers, and decomposers live together in an environment and use existing resources;
Give an example of potential producers, consumers, and decomposers that could live in this environment and describe how they could use existing resources. Could the consumers live without the producers? [slide 11 or 12]
(C) describe how different environments support different varieties of organisms;
Describe how the environments seen in slides 11 and 12 would support different varieties of organisms than would the environment seen in slide 3.
and
(D) observe and describe the role of ecological succession in ecosystems.
If the quarry featured in slide 15 were filled back up with rocks and soil, describe the process of ecological succession that you would expect to occur.

(7.14) Science concepts. The student knows that natural events and human activity can alter Earth systems. The student is expected to:
(A) describe and predict the impact of different catastrophic events on the Earth;
Predict what the landscape seen in slide 11 would look like after a volcanic eruption.
(B) analyze effects of regional erosional deposition and weathering; and
How have humans altered the landscapes seen in slides 11 and 12? Describe how weathering has altered the landforms in slide 12. Describe how natural events, such as volcanic eruptions and the process of deposition, created the landform seen in slide 16.

§112.24. Science, Grade 8.

(8.1) Scientific processes. The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? How have new technologies enabled paleontologists to look inside fossils without destroying them? Why is this important?

(8.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;
(B) collect data by observing and measuring;
(C) organize, analyze, evaluate, make inferences, and predict trends from direct and indirect evidence;
(D) communicate valid conclusions; and
(E) construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.
Formulate a testable hypothesis inspired by material covered by this presentation. Collect data, analyze the results, communicate conclusions, and if applicable, represent your data using graphs, tables, maps, and/or charts.

(8.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Students can write a critique for the presentation by pretending they are a journalist for a popular science magazine or paper. Evidence is needed to back up their argument and an explanation for their critique.
(C) represent the natural world using models and identify their limitations;
Slides 22-27 show a fossil and a computer-generated model of the fossil that was made using the high-resolution X-ray CT (Computed Tomography) scanner. What are the benefits and limitations of this technology?
(D) evaluate the impact of research on scientific thought, society, and the environment; and
(E) connect Grade 8 science concepts with the history of science and contributions of scientists.
When Darwin's book came out, why did the first critics challenge that science couldn't explain the origin of birds, or flight or their feathers? What evidence was missing? What did Darwin predict scientists would find that would support his theory? Were there later discoveries that further supported Darwin's theory? Describe these discoveries and what kind of contribution they made to the field of science. [slides 6, 7, 8, and 9]

(8.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:
(A) collect, record, and analyze information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, water test kits, and timing devices; and

What tools would you use to conduct research on fossils?
(B) extrapolate from collected information to make predictions.
Do you think more “missing links” will be found? Why?

(8.6) Science concepts. The student knows that interdependence occurs among living systems. The student is expected to:
(C) describe interactions within ecosystems.
Describe how the different dinosaurs in slides 5 and 6 may have interacted.

(8.11) Science concepts. The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:
(B) distinguish between inherited traits and other characteristics that result from interactions with the environment; and
Distinguish between inherited traits of the turkey-sized dromaeosaur and other characteristics that result from interactions with the environment. [slide 31]

(8.14) Science concepts. The student knows that natural events and human activities can alter Earth systems. The student is expected to:
(B) analyze how natural or human events may have contributed to the extinction of some species; and
Analyze how natural events may have contributed to the extinction of the dinosaurs.
(C) describe how human activities have modified soil, water, and air quality.
Describe how humans have modified the soil seen in slides 11, 12, and 15.

§112.42. Integrated Physics and Chemistry.

(1) Scientific processes. The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? How have new technologies enabled paleontologists to look inside fossils without destroying them? Why is this important?

(2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(B) collect data and make measurements with precision;
(C) organize, analyze, evaluate, make inferences, and predict trends from data; and
(D) communicate valid conclusions.

Students can form a hypothesis from material given in the presentation and write a report on a specific topic about a dinosaur with evidence and details covering everything from where the dinosaur lives, its body parts and functions and how it reproduces and eats. The students can present their conclusions to the class.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Hold a debate or have the students write a short paper on a topic from the lecture. Do they think enough information was given? Is the information sufficiently accurate? Students review and give their analysis and show what should be changed/not changed.
(C) evaluate the impact of research on scientific thought, society, and the environment;
When Darwin's book came out, why did the first critics challenge that science couldn't explain the origin of birds, or flight or their feathers? What evidence was missing? What did Darwin predict scientists would find that would support his theory? Were there later discoveries that further supported Darwin's theory? Describe these discoveries and what kind of contribution they made to the field of science. [slides 6, 7, 8 and 9]

§112.43. Biology.

(1) Scientific processes. The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? How have new technologies enabled paleontologists to look inside fossils without destroying them? Why is this important?

(2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(B) collect data and make measurements with precision;
(C) organize, analyze, evaluate, make inferences, and predict trends from data; and
(D) communicate valid conclusions.
Formulate a testable hypothesis inspired by material covered by this presentation. Collect data, analyze the results, and communicate conclusions.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Students can write a critique for the presentation by pretending they are a journalist for a popular science magazine or paper. Evidence is needed to back up their argument and an explanation for their critique.
(C) evaluate the impact of research on scientific thought, society, and the environment;
(F) research and describe the history of biology and contributions of scientists.
When Darwin's book came out, why did the first critics challenge that science couldn't explain the origin of birds, or flight or their feathers? What evidence was missing? What did Darwin predict scientists would find that would support his theory? Were there later discoveries that further supported Darwin's theory? Describe these discoveries and what kind of contribution they made to the field of science. [slides 6, 7, 8 and 9]

(7) Science concepts. The student knows the theory of biological evolution. The student is expected to:
(A) identify evidence of change in species using fossils, DNA sequences, anatomical similarities, physiological similarities, and embryology; and
Write a report that identifies evidence that birds evolved from dinosaurs.
(B) illustrate the results of natural selection in speciation, diversity, phylogeny, adaptation, behavior, and extinction.
Discuss why natural selection may have favored bird-like characteristics.

(8) Science concepts. The student knows applications of taxonomy and can identify its limitations. The student is expected to:
(A) collect and classify organisms at several taxonomic levels such as species, phylum, and kingdom using dichotomous keys;
Create a dichotomous key in order to classify the dinosaurs featured in slides 5 and 6.

(10) Science concepts. The student knows that, at all levels of nature, living systems are found within other living systems, each with its own boundary and limits. The student is expected to:
(A) interpret the functions of systems in organisms including circulatory, digestive, nervous, endocrine, reproductive, integumentary, skeletal, respiratory, muscular, excretory, and immune;
Interpret the functions of the skeletal systems seen in the dinosaurs in slides 5 and 6.

(12) Science concepts. The student knows that interdependence and interactions occur within an ecosystem. The student is expected to:

(B) interpret interactions among organisms exhibiting predation, parasitism, commensalism, and mutualism;
Find out more information about the dinosaurs on slides 5 and 6. Provide examples of predation. Did you come across any examples of mutualism?

§112.44. Environmental Systems.

(1) Scientific processes. The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? How have new technologies enabled paleontologists to look inside fossils without destroying them? Why is this important?

(2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(B) collect data and make measurements with precision;
(C) organize, analyze, evaluate, make inferences, and predict trends from data; and
(D) communicate valid conclusions.
Formulate a testable hypothesis inspired by material covered by this presentation. Collect data, analyze the results, and communicate conclusions.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Have the students conduct a debate with supporting evidence against an idea or statement they disagree with in the presentation.
(C) evaluate the impact of research on scientific thought, society, and the environment;
When Darwin's book came out, why did the first critics challenge that science couldn't explain the origin of birds, or flight or their feathers? What evidence was missing? What did Darwin predict scientists would find that would support his theory? Were there later discoveries that further supported Darwin's theory? Describe these discoveries and what kind of contribution they made to the field of science. [slides 6, 7, 8 and 9]

§112.45. Chemistry.

(1) Scientific processes. The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? How have new technologies enabled paleontologists to look inside fossils without destroying them? Why is this important?

(2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(B) collect data and make measurements with precision;
(C) express and manipulate chemical quantities using scientific conventions and mathematical procedures such as dimensional analysis, scientific notation, and significant figures;
(D) organize, analyze, evaluate, make inferences, and predict trends from data; and
(E) communicate valid conclusions.
Formulate a testable hypothesis inspired by material covered by this presentation. Collect data, analyze the results, and communicate conclusions.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Have the students conduct a debate with supporting evidence against an idea or statement they disagree with in the presentation.
(C) evaluate the impact of research on scientific thought, society, and the environment;
How have the discoveries described in this presentation impacted scientific thought?

§112.46. Aquatic Science.

(1) Scientific processes. The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.

The fossil shown in slide 19 is very fragile. How must you treat this fossil? How have new technologies enabled paleontologists to look inside fossils without destroying them? Why is this important?

(2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(B) collect data and make measurements with precision;
(C) express and manipulate quantities using mathematical procedures such as dimensional analysis, scientific notation, and significant figures;
(D) organize, analyze, evaluate, make inferences, and predict trends from data; and
(E) communicate valid conclusions.
Formulate a testable hypothesis inspired by material covered by this presentation. Collect data, analyze the results, and communicate conclusions.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Have the students conduct a debate with supporting evidence against an idea or statement they disagree with in the presentation.
(C) evaluate the impact of research on scientific thought, society, and the environment;
How have the discoveries described in this presentation impacted scientific thought?

§112.47. Physics.

(1) Scientific processes. The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? How have new technologies enabled paleontologists to look inside fossils without destroying them? Why is this important?

(2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(A) plan and implement experimental procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(B) make quantitative observations and measurements with precision;

(C) organize, analyze, evaluate, make inferences, and predict trends from data;
(D) communicate valid conclusions;
(E) graph data to observe and identify relationships between variables; and
Formulate a testable hypothesis inspired by material covered by this presentation. Collect data, analyze the results, communicate conclusions, and if applicable, represent your data using graphs, tables, maps, and/or charts.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Have the students conduct a debate with supporting evidence against an idea or statement they disagree with in the presentation.
(C) evaluate the impact of research on scientific thought, society, and the environment;
How have the discoveries described in this presentation impacted scientific thought?

§112.48. Astronomy.

(3) Scientific processes. The student uses critical thinking and scientific problem solving skills to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Have the students conduct a debate with supporting evidence against an idea or statement they disagree with in the presentation.
(C) evaluate the impact of research on scientific thought, society, and the environment;
How have the discoveries described in this presentation impacted scientific thought?

§112.49. Geology, Meteorology, and Oceanography.

(1) Scientific processes. The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during field and laboratory investigations; and
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
The fossil shown in slide 19 is very fragile. How must you treat this fossil? How have new technologies enabled paleontologists to look inside fossils without destroying them? Why is this important?

(2) Scientific processes. The student uses scientific methods during field and laboratory investigations. The student is expected to:
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(B) collect data and make measurements with precision;
(C) organize, analyze, evaluate, make inferences, and predict trends from data; and
(D) communicate valid conclusions.
Formulate a testable hypothesis inspired by material covered by this presentation. Collect data, analyze the results, and communicate conclusions.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
Have the students conduct a debate with supporting evidence against an idea or statement they disagree with in the presentation.
(C) evaluate the impact of research on scientific thought, society, and the environment;
How have the discoveries described in this presentation impacted scientific thought?

(4) Science concepts. The student knows the Earth's unique characteristics and conditions. The student is expected to:
(B) analyze conditions on Earth that enable organisms to survive.

(8) Science concepts. The student knows the processes and end products of weathering. The student is expected to:
(A) distinguish chemical from mechanical weathering and identify the role of weathering agents such as wind, water, and gravity;
Hypothesize what the major weathering agents are for the landform featured in slide 12.