

§112.14. Science, Grade 3, Beginning with School Year 2010-2011.

(b) Knowledge and skills.

(2) Scientific investigation and reasoning

(B) collect data by observing and measuring using the metric system and recognize differences between observed and measured data;

(C) construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data;

(F) communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.

(4) Scientific investigation and reasoning. 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 hand lenses, metric rulers, Celsius thermometers

(9) Organisms and environments. The student knows that organisms have characteristics that help them survive and can describe patterns, cycles, systems, and relationships within the environments

(B) identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem such as removal of frogs from a pond or bees from a field;

(10) Organisms and environments. The student knows that organisms undergo similar life processes

(C) investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs.

Suggested classroom procedure.

1. How many of you have raised caterpillars into butterflies before? Tell me about your experiences.
2. You can write words on the board from their discussion to include caterpillar (larvae), cocoon or chrysalis (pupae), adult butterfly and then launch into the life cycle to include the egg.
3. They can then label their worksheet with the appropriate names.
4. Do all the caterpillars make it to the chrysalis stage? Why not?
Some don't have enough food, some get too cold, some get poisoned, some get eaten. Draw a simple food chain of
plant → larvae (caterpillar) → predator (bird, wasp, lizard)
5. Show a picture of an eaten plant leaf. What happened here? Somebody ate the plant.
6. Well, what if somebody poisoned the larvae? The larvae would die, the plant wouldn't get eaten by that larvae, but the predator who ate the poisoned larvae might die or get sick. The predator would also have less food. So, in life, everything we do has consequences. Instead of poisons, better to mechanically kill a pest if you want to get rid of it. Food Chain worksheet and bar graph
7. Food Chain worksheet and bar graph

Have students measure with a metric ruler the caterpillars every 3 days and record on a bar graph the growth of the caterpillar.

Length of larvae

2.5 cm									
2 cm									
1.5 cm									
1 cm									
½ cm									
Days	1	3	5	7	9	11	13	15	17

§112.15. Science, Grade 4, Beginning with School Year 2010-2011.

(b) Knowledge and skills.;

(2) Scientific investigation and reasoning

(B) collect data by observing and measuring using the metric system and recognize differences between observed and measured data;

(C) construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data;

(F) communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.

(4) Scientific investigation and reasoning. 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 hand lenses, metric rulers, Celsius thermometers

(9) Organisms and environments. The student knows that organisms have characteristics that help them survive and can describe patterns, cycles, systems, and relationships within the environments

(A) investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food; and

(B) describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web such as a fire in a forest.

(10) Organisms and environments. The student knows that organisms undergo similar life processes

(C) explore, illustrate, and compare life cycles in living organisms such as butterflies,

Suggested classroom procedure.

1. How many of you have raised caterpillars into butterflies before? Tell me about your experiences.
2. You can write words on the board from their discussion to include caterpillar (larvae), cocoon or chrysalis (pupae), adult butterfly and then launch into the life cycle to include the egg.
3. They can then label their worksheet with the appropriate names.
4. Do all the caterpillars make it to the chrysalis stage? Why not?
Some don't have enough food, some get too cold, some get poisoned, some get eaten. Draw a simple food chain of
plant → larvae (caterpillar) → predator (bird, wasp, lizard)
Where does the plant get its energy? The sun. Then include the sun in the energy chain. Plants are independent producers, they can make their own food from the sun, but the larvae and its predators are consumers because they must eat their food, they cannot make their own.
5. Show a picture of an eaten plant leaf. What happened here? Somebody ate the plant.
6. Well, what if somebody poisoned the larvae? The larvae would die, the plant wouldn't get eaten by that larvae, but the predator who ate the poisoned larvae might die or get sick. The predator would also have less food. So, in life, everything we do has consequences. Instead of poisons, better to mechanically kill a pest if you want to get rid of it.
7. Food Chain worksheet and bar graph

Have students measure with a metric ruler the caterpillars every 3 days and record on a bar graph the growth of the caterpillar.

Length of larvae

2.5 cm									
2 cm									
1.5 cm									
1 cm									
½ cm									
Days	1	3	5	7	9	11	13	15	17

§112.16. Science, Grade 5, Beginning with School Year 2010-2011.

(b) Knowledge and skills.

(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory

(C) collect information by detailed observations and accurate measuring;

(F) **communicate valid conclusions** in both written and verbal forms; and

(G) **construct appropriate simple graphs**, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information.

(4) Scientific investigation and reasoning. 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 calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, meter sticks, magnets,

collecting nets, and **notebooks**; timing devices, including clocks and stopwatches; and materials to **support observations of habitats or organisms such as terrariums and aquariums**;

(9) Organisms and environments. The student knows that there are **relationships, systems, and cycles** within environments. The student is expected to:

(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements;

(B) describe how the flow of energy **derived from the Sun**, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers;

(C) predict the effects of **changes in ecosystems caused by living organisms**, including humans, such as the overpopulation of grazers

(10) Organisms and environments. The student knows that organisms undergo similar life processes

(C) describe the differences between **complete and incomplete metamorphosis of insects**. **Suggested classroom**

procedure.

1. How many of you have raised caterpillars into butterflies before? Tell me about your experiences.
2. You can write words on the board from their discussion to include caterpillar (larvae), cocoon or chrysalis (pupae), adult butterfly and then launch into the life cycle to include the egg.
3. They can then label their worksheet with the appropriate names. Butterflies have four major life stages and therefore is an example of complete metamorphosis. (grasshoppers only have 3 stages ---egg, nymph and adult, so they have incomplete metamorphosis)
4. Do all the caterpillars make it to the chrysalis stage? Why not?
Some don't have enough food, some get too cold, some get poisoned, some get eaten. Draw a simple food chain of
plant → larvae (caterpillar) --- → predator (bird, wasp, lizard)
Where does the plant get its energy? The sun. Then include the sun in the energy chain. Plants are independent producers, they can make their own food from the sun, but the larvae and its predators are consumers because they must eat their food, they cannot make their own.
5. Show a picture of an eaten plant leaf. What happened here? Somebody ate the plant.
6. Well, what if somebody poisoned the larvae? The larvae would die, the plant wouldn't get eaten by that larvae, but the predator who ate the poisoned larvae might die or get sick. The predator would also have less food. So, in life, everything we do has consequences. Instead of poisons, better to mechanically kill a pest if you want to get rid of it.
7. Food Chain worksheet and bar graph
Have students measure with a metric ruler the caterpillars every 3 days and record on a bar graph the growth of the caterpillar.

Length of larvae

2.5 cm									
2 cm									
1.5 cm									
1 cm									
½ cm									
Days	1	3	5	7	9	11	13	15	17