

Oklahoma's Berry Best

Objective

Students will conduct a variety of activities related to berries grown in Oklahoma, including math word problems, data analysis, poetry, maps, etc.

Background

Fresh berries are an Oklahoma treat in farmer's market and roadside stands throughout the summer. All berries are an excellent source of Vitamin C, fiber and antioxidants. They are the best of all fruits and vegetables for antioxidant activity. Foods containing antioxidants may prevent cancer, heart disease, and other ailments.

Most of the berries grown in Oklahoma are processed into jams, jellies and preserves. Most of the berry production in our state is in eastern Oklahoma, where growing conditions are best for this delicious and valuable product.

STRAWBERRY FACTS

- In 2005 a group of fifth graders from Skiatook petitioned to make strawberries Oklahoma's state fruit, and the Legislature passed a bill approving the measure.
- Birds plant more strawberries than people. When birds eat wild strawberries the seeds pass through them intact and in good condition. The germinating seeds respond to light rather than moisture and therefore need no covering of earth to start growing.
- Eight strawberries (a serving size) provide 140 percent of the Vitamin C a kid needs each day. Vitamin C is vital to the production of collagen, which is involved in the building and health of cartilage, joints, skin, and blood vessels. It helps protect the fat-soluble vitamins A and E as well as fatty acids from oxidation, aids in neutralizing pollutants, is needed for antibody production and has natural antihistamine properties.
- Ninety-four per cent of US households consume strawberries. Over 53 percent of seven to nine-year-olds picked strawberries as their favorite fruit.
- Strawberries are grown in every state in the US. Oklahoma-grown strawberries are available from farmer's markets in May.
- The flavor of a strawberry is influenced by weather, the variety and the stage of ripeness when the strawberry is harvested and eaten. Strawberries eaten at the peak of ripeness are usually the most flavorful.

Oklahoma Academic Standards

GRADE 1

English Language Arts—1.R.1,2,3,4; 3.R.1,4,5;
4.R.1,3,5; 6.R.2,3; 1.W.1; 3.W.1,2; 6.W.2,3;
2.PA.6; 2.PWS.2
Math—GM.2.5; D.1.1,2,3
Social Studies PALS—2.C.7,8; 3.B.4
Social Studies Content—1.4; 2.2; 3.2, 3; 4.4;
2.F.1
Science—LS1.1

GRADE 2

English Language Arts—1.R.1,2,3,4;
3.R.1,4,5,7; 4.R.1,3,5; 6.4.2,3; 1.W.1; 3.W.1,2;
6.W.2,3; 2.PWS.2; 2.F.1
N.2.6
Math—D.1.1,2,4
Social Studies PALS—2.C.7,8; 3.B.4
Social Studies Content—3.1,2,3,4; 4.1,3
Science—PS1.1,2,4; LS2.2

GRADE 3

English Language Arts—1.R.1,2,3,4;
3.R.1,4,5,7; 4.R.1,3,5; 6.R.2,3,4; 1.W.1;
3.W.1,2; 6.W.2,3,2.PWS.2; 2.F.1
Math—N.2.1,2,6; D.1.1,2
Social Studies PALS—1.B.5; 2.C.7,8; 3.B.4
Social Studies Content—1.2; 2.1,3; 3.1d
Science—LS1.1; 4.3

GRADE 4

English Language Arts—1.R.1,2,3,4; 3.R.1,4,5;
4.R.1,3,5; 6.R.2,3; 1.W.1; 3.W.1,2; 6.W.2,3,2.F.1
Math—N.1.1; D.1.1,2
Social Studies PALS—2.B.6,7,8,9; 3.B.4,5
Social Studies Content—1.1ab,2b,3,4; 2.1,4
Science—PS3.2; LS1.1

GRADE 5

English Language Arts—1.R.1,2,3,4; 3.R.1,4,5;
4.R.1,3,5; 6.R.2,3; 1.W.1; 3.W.1,2; 6.W.1,3,4
N.1.4
Social Studies PALS—1.A.3
Social Studies Content—1.5c
Science—LS2.2

Vocabulary

culinary—of or relating to the kitchen or cooking an agricultural or horticultural variety or strain originating and persistent under cultivation

heirloom—a piece of personal property handed down from generation to generation

hybrid—an offspring of parents with different genes especially when of different breeds

hydrocarbon—a compound containing only carbon and hydrogen

labor-intensive—requiring greater expenditure on labor than in capital

lycopene—a powerful antioxidant which fights free radicals which damage cell membranes, attack DNA, and cause disease

recessive—producing a characteristic when homozygous and not masked by a copy of the gene that is dominant

tariff—a list of taxes placed by a government on imported exported goods

tuber—a short fleshy usually underground stem (as of a potato plant) having tiny scalelike leaves each with a bud at its base that can produce a new plant

- Ripe strawberries are delicate, requiring gentle handling to prevent bruising. Strawberries grown to be shipped long distances are picked before they are ripe. Very large commercial growers have produced hybrid berries known for their ability to withstand shipping. With today's shipping technology, strawberries are available year round, but at a cost.
- Strawberry plants purchased for planting are called "crowns." Once the crown is planted it becomes the mother plant, sending out runners, which take root and form new plants. New plants from runners produce fruit the year after they take root.
- Strawberries are the only fruit with seeds growing on the outside. On average, there are 200 seeds on a strawberry.
- No one knows for sure where the strawberry got its name. Here are some theories.
 - It is named after the straw used as mulch around the plants.
 - It refers to the plant's habit of "strewing" its runners about.
 - Children in England poked straws in the berries as a convenient way to carry them in open markets and sell them.
- The American Indians were already eating strawberries when the colonists arrived. The crushed berries were mixed with cornmeal and baked into strawberry bread. After trying this bread, colonists developed their own version of the recipe, and strawberry shortcake was created.

BLACKBERRIES AND RASPBERRIES

- Blackberries and raspberries consists of clusters of tiny fruits called "drupelets," which grow around a core known as "the receptacle."
- Blackberries are bramble fruits. Bramble bushes send up long, arching canes. The canes carry short, curved, very sharp thorns. The branches root from the node tip when they reach the ground. The thorns dig into clothing and flesh when the victim tries to pull away from them.
- Blackberries grow wild all over Oklahoma. They are very pervasive and grow at fast daily rates in our woods, scrub, hillsides and hedgerows. They colonize large areas in a relatively short time.
- Since blackberries tolerate poor soil, they are early colonizers of wasteland and building sites. In some parts of the country they are considered invasive pests.

BLUEBERRIES

- The blueberry is a native American fruit. Early settlers cherished it as a staple ingredient in foods and medicines. They incorporated the berries into their diets, eating them fresh off the bush and adding them to soups, stews, and many other foods.
- Early American colonists made grey paint by boiling blueberries in milk.
- The blue paint used to paint woodwork in Shaker houses was made from sage blossoms, indigo and blueberry skins, mixed in milk.
- Unlike blackberries and strawberries, blueberries grow on bushes, not from runners or brambles.

English Language Arts

1. Read and discuss background and vocabulary.
2. Students will write their own theories of how strawberries got their name.
3. Read and discuss the poem “The Blackberry Queen,” by Cicely Mary Barker.

THE BLACKBERRY QUEEN

My berries cluster black and thick
For rich and poor alike to pick.
I'll tear your dress, and cling, and tease,
And scratch your hand and arms and knees.
I'll stain your fingers and your face,
And then I'll laugh at your disgrace.
But when the bramble-jelly's made,
you'll find your trouble well repaid.

4. Students will write poems about their favorite berries or write an acrostic poem with the word “BERRIES,” as illustrated below.

Blackberries are good in cobbler
Everyone loves strawberries
Raspberries are so good for you.
Runners are the way strawberries reproduce.
Ice cream is good with all kinds of berries
Eastern Oklahoma is where berries grow best.
Spring and summer is when berries are most delicious.

5. Ask students which of the following words they can add to the word “berry” to form a word: straw, hay, black, cow, blue, good
6. Many people who grew up in our state have fond (and not so fond) memories of picking wild blackberries in the summer. Most of the stories involve heavy clothing worn to avoid thorns, chiggers and ticks. Blackberries can also stain fingers and clothing. To prepare for this activity, read and discuss the poem “Blackberry Picking,” by Seamus Heaney.
 - Students will conduct short research projects by interviewing senior citizens in your community about their experiences picking blackberries and other experiences producing and preserving food for their families.
 - Students will include ways those interviewed display character traits such as hard work, stewardship, self sacrifice, courage, and self discipline.
 - Students will share the stories with their peers, using audio recording of the interviews or visual displays.
7. Hand out the Reading Page and the Comprehension Questions

Vocabulary

antioxidant—a substance that opposes oxidation or prevents or makes difficult reactions made easier by oxygen

crown—the region of a seed plant at which stem and root merge

bramble—any of a large genus of usually prickly shrubs (as a raspberry or blackberry) that are related to roses

germinate—to begin to grow: sprout

node—a point on a stem in which a leaf grows

runner—a slender creeping stem that arises from the base of a plant; a plant (as a strawberry) that forms or spreads by runners

staple—something in widespread and constant use or demand

What is an antioxidant?

Humans need oxygen to live. We breathe in oxygen as O₂—two oxygen molecules atomically bonded together. The biological processes in the body use oxygen for reactions, frequently creating single, or free, oxygen particles as a byproduct. Free oxygen particles have a high electric charge which can damage cells if they are not eliminated quickly. Antioxidants (anti-oxygen compounds) look for free oxygen particles to neutralize.

included with this lesson.

—Students will use the information on the Reading Page to answer the comprehension questions.

Math

1. Madame Tallien, a prominent figure in the court of the Emperor Napoleon, bathed in the juice of fresh strawberries—22 pounds of strawberries per basin. How many pounds of fresh strawberries did she use in two months if she took a bath once a month? How many in three months? Six months? A year?
2. Are strawberries the favorite in your class? Conduct a poll to find out.
—Students will brainstorm the fruits they eat and the fruits they like best to decide which to include in the poll.
—Students will design their own polling instrument and create a graph to represent their findings.
3. Students will solve the following word problem: If there are an average eight strawberries in a cup and 200 seeds on one strawberry, how many seeds are in a cup of strawberries?
4. Students will develop a strategy for counting the seeds on a strawberry.

Social Studies

1. Most of the strawberries in Oklahoma grocery stores come from California or Florida. Some come from Arkansas. Students will use a road atlas to find how many miles strawberries travel to get to grocery stores in your town?
Salinas, California, to your town _____ miles
Plant City, Florida, to your town _____ miles
Bradford, Arkansas, to your town _____ miles
nearest farmer's market to your mouth _____
2. Students will locate and label Oklahoma, California, Florida and Arkansas on a map of the US.
—Students will create a legend showing N,S,E,W.
—Students will write sentences explaining which direction they would travel from Oklahoma to each of these states.
—Students will consult a road atlas to identify which highways they would travel on to get to each state. Would they cross any major natural geographic features (mountains, rivers, deserts) as they traveled to these states?
3. Students will use online or library resources to research the climates of California, Florida, Arkansas and Oklahoma. Students will compare/contrast the climates and determine how the different climates might affect the growth of berries?
4. Students will interview the produce manager in one of your town's grocery stores to find out where they get their strawberries. Students should take notes and report on the interview.
5. Discuss ways producers are paid for their labor. How are goods & services purchased from farmers? Discuss farmers markets and berry

Fruit Basket (game)
Students sit in a circle, with a caller in the center. The caller assigns the names of the fruits in your poll (Math Activity 2) to various circle players. He/she then calls out “All apples change places with all pears,” or similar. While the two groups scramble to change places, the caller tries to get one of the seats. The caller also calls out the names of several kinds of fruits at once. “Fruit basket turn over” means all students must change seats.

orchards.

6. Students will use an online search engine to find a list of all the farmers markets and berry orchards in the state. (Oklahoma Agritourism and Made in Oklahoma websites have lists.)
—On a map of Oklahoma students will locate the cities and towns that have farmers markets and/or berry orchards. Are any of these located in major metropolitan areas in Oklahoma? Are any located in or near your town or county?
7. Discuss how growing specialty crops such as strawberries, blueberries, and blackberries help agriculture contribute to the growth of Oklahoma's economy.
8. Fifth graders in Skiatook wrote to their legislators to persuade them to choose strawberries as the state fruit. Help your students find the names of your state senator and representatives.
—Students will write friendly letters to their legislators.
9. Native Americans used berries for foods and medicines. As a class, find out when native American Heritage month is (November). Make strawberry bread (recipe at left) to celebrate.

Science

1. In Oklahoma, growers are experimenting with plasticulture to make the strawberry season longer. The soil is covered with black plastic. Holes are cut in the plastic for the plants. Experiment with plasticulture.
—On a sunny day, cover a piece of ground with black plastic.
—Measure the soil temperature in a bare spot and under the plastic.
—Why would this help make the strawberry season longer?
2. Blackberries have lots of tiny seeds that are difficult to remove. Most people just tolerate the seeds and eat them along with the blackberries in cobbler and other blackberry treats. Divide students into groups and have them develop strategies for removing the seeds from a cup of blackberries.
3. Bring blackberries, blueberries and strawberries to class for students to compare. Students will create charts showing how they are different and how they are the same.

Extra Reading

Ada, Alma Flor, Zubizarreta, Rosa, and Simon Silva, *Gathering the Sun: An Alphabet in Spanish and English*, Lothrop, 1997.
Gibbons, Gail, *The Berry Book*, Holiday House, 2002.
Gibbons, Gail, *The Fruits We Eat*, Holiday House, 2015.
Richards, Jean, *A Fruit is a Suitcase for Seeds*, Millbrook, 2003.

Berry Celebration

Make strawberry bread by adding frozen strawberries to your favorite cornbread mix. Or make strawberry shortcake in an assembly line. Use strawberries, biscuits and whipped cream. Discuss what agricultural commodities are used in making strawberry shortcake. Then share the facts and the shortcake with parents or another class.

OklaBerryNana Smoothie

In a blender place one banana, one cup of frozen berries and one cup of plain yogurt. Puree until all the ingredients are blended. Serve in small cups.

Oklahoma's Berry Best

Fresh berries are an Oklahoma treat. They can be purchased throughout the summer in farmer's markets and roadside stands. Most of the berries grown in Oklahoma are processed into jams, jellies and preserves. Most of the berry production in our state is in eastern Oklahoma, where growing conditions are best for this delicious and valuable product. All berries are an excellent source of Vitamin C, fiber and antioxidants. They are the best of all fruits and vegetables for antioxidant activity. Foods containing antioxidants may prevent cancer, heart disease, and other ailments.

STRAWBERRIES

In 2005 a group of fifth graders from Skiatook petitioned the Oklahoma Legislature to make the strawberry the Oklahoma state fruit. The Legislature passed a bill approving the measure that same year.

Birds plant more strawberries than people. When birds eat wild strawberries, the tiny seeds pass through them without being damaged. The germinating seeds respond to light rather than moisture, so they can start growing without a covering of earth. Strawberries are the only fruit with seeds growing on the outside. On average, there are 200 seeds on a strawberry.

Ninety-four per cent of US households consume strawberries. Over half of seven- to nine-year-olds picked strawberries as their favorite fruit.

The flavor of a strawberry is influenced by weather, the variety and the stage of ripeness when the strawberry is harvested and eaten. Strawberries eaten at the peak of ripeness are usually the most flavorful. Strawberries grow in every state in the US. Strawberries grown to be shipped long distances are picked before they are ripe. You can buy ripe Oklahoma-grown strawberries in May at many farmer's markets around the state.

Strawberry plants purchased for planting are called "crowns." Once the crown is planted it becomes the mother plant, sending out runners, which take root and form new plants. New plants from runners produce fruit the year after they take root.

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Name _____

Oklahoma's Berry Best

COMPREHENSION QUESTIONS

1. What was the author's purpose in writing this article?

- a. to entertain b. to persuade c. to inform

2. Is the following a fact or opinion statement?

“The blueberry is a native American fruit.”

- a. fact b. opinion

3. Which word from paragraph 1 means “prepared by special treatment?” _____

4. Which word from paragraph 1 means “bought?” _____

5. What did 5th graders from Skiatook try to do? _____

Were they successful? _____

6. In paragraph 5, what word is a synonym for “eat?” _____

7. In paragraph 6, find a word with the -ness suffix. Write the word: _____

8. What influences the flavor of a strawberry?

9. Blackberries grow _____ all over Oklahoma. Does that mean they grow on their own or people have to

plant them? _____

10. All berries are an excellent source of _____, _____, and _____.

11. Antioxidants may prevent _____, _____, and other ailments.

Oklahoma Ag in the Classroom is a program of the Oklahoma Cooperative Extension Service, the Oklahoma Department of Agriculture, Food and Forestry and the Oklahoma State Department of Education.

Name _____

Oklahoma's Berry Best (answers)

COMPREHENSION QUESTIONS

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- a. to entertain b. to persuade c. to inform

2. Is the following a fact or opinion statement?

“The blueberry is a native American fruit.”

- a. fact b. opinion

3. Which word from paragraph 1 means “prepared by special treatment?” processed

4. Which word from paragraph 1 means “bought?” purchased

5. What did 5th graders from Skiatook try to do? They tried to make strawberries the Oklahoma state fruit.

Were they successful? yes

6. In paragraph 5, what word is a synonym for “eat?” consume

7. In paragraph 6, find a word with the -ness suffix. Write the word: ripeness

8. What influences the flavor of a strawberry? weather, variety and stage of ripeness

9. Blackberries grow wild all over Oklahoma. Does that mean they grow on their own or people have to plant

them? They grow on their own.

10. All berries are an excellent source of Vitamin C, fiber and antioxidants. Antioxidants may prevent cancer,

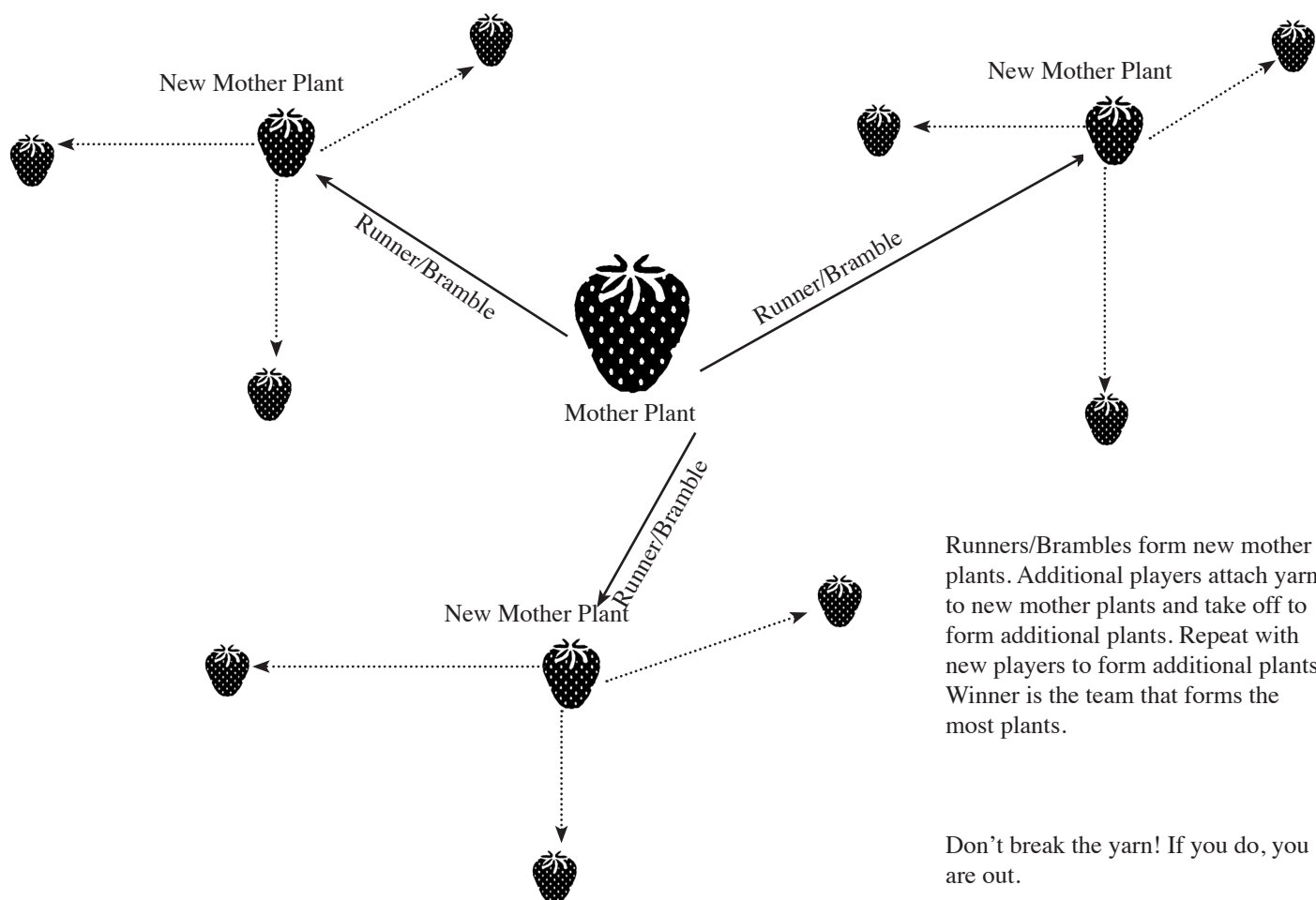
heart disease, and other ailments.

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Run, Run, Berries!

Berries spread by sending out runners (strawberries) or brambles (blackberries). Play this game to illustrate.

1. Divide the class into teams, one of Brambles and one of runners.
2. For each team, designate a “Mother Plant” to stand in the center, surrounded by three “Runners or Brambles.
3. Tie a piece of string loosely around the waist of the Mother Plant and around the waist of each Runner/ Bramble.
4. Provide all players with equal lengths of string to hold in their hands.
5. Arrange the other players on each team in clusters of three some distance from the Mother Plant.
6. When you call “Run, run, Berries,” each of the three Brambles/Runners go to one of the clusters of other team players, taking care not to break the string which connects them to the Mother Plant. If the string breaks, the Runner/Bramble carrying it is out.
7. Each Runner/Bramble from the Mother Plant forms a new Mother Plant upon reaching one of the clusters of additional players. Additional players tie their strings to the new Mother Plant and take off to form additional plants. Repeat until time is up (at teacher’s discretion).
8. The winner is the team that has established the most new plants before time is up.



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Blackberry Picking

Late August, given heavy rain and sun
For a full week, the blackberries would ripen.
At first, just one, a glossy purple clot
Among others, red, green, hard as a knot.
You ate that first one and its flesh was sweet
Like thickened wine: summer's blood was in it
Leaving stains upon the tongue and lust for
Picking. Then red ones inked up and that hunger
Sent us out with milk cans, pea tins, jam-pots
Where briars scratched and wet grass bleached our boots.
Round hayfields, cornfields and potato-drills
We trekked and picked until the cans were full,
Until the tinkling bottom had been covered
With green ones, and on top big dark blobs burned
Like a plate of eyes. Our hands were peppered
With thorn pricks, our palms sticky as Bluebeard's.

We hoarded the fresh berries in the byre.
But when the bath was filled we found a fur,
A rat-grey fungus, glutting on our cache.
The juice was stinking too. Once off the bush
The fruit fermented, the sweet flesh would turn sour.
I always felt like crying. It wasn't fair
That all the lovely canfuls smelt of rot.
Each year I hoped they'd keep, knew they would not.

—Seamus Heaney

Seamus Heaney was an Irish poet and the recipient of the 1995 Nobel Prize in Literature. He was born April 13, 1939, at the family farmhouse in Northern Ireland. He was the first of nine children. His father, Patrick, was a farmer, but his real commitment was to cattle dealing. His mother had many family members who worked in the local linen mill. Heaney commented on the fact that his parentage thus contained both the Ireland of the cattle-herding Gaelic past and the Ulster of the Industrial Revolution.

Discussion:

- What is going on in this poem?
- Is it set in past, present or future?
- What is the meter?
- What does he mean that “summer’s blood was in it?” Summer’s blood was in what?
- Explain this image: “Then red ones inked up...”
- Identify three more examples of imagery and explain them.
What is the setting for the action in this poem. Find passages in the poem that set the scene.
- Why does the protagonist feel like crying? What isn't fair? Do you agree that it wasn't fair? Why or why not?

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