

Good Grapes!

Objective

Students will use grapes to perform various math activities including sorting, graphing, and estimating. Students will read about grapes and answer questions to show their comprehension of the material read.

Background

Did you know that the first raisins were made by burying fresh grapes in the hot desert sand of Asia Minor? Or that Leif Ericsson the Lucky called the east coast of New England Vinland because of all the wild grapes he found growing there? Did you know that grapes grow wild in Oklahoma but they mostly end up as food for birds and wild animals because they grow so high up in the trees that people can't reach them?

The grapes used to make raisins are different from the table grapes you find in the grocery store. Those grapes— green, red and purple—are mainly grown in California or Chile. Some of the same varieties of grapes are used to make grape juice and wine but they are treated differently. All kinds of grapes can be grown in Oklahoma, but most Oklahoma grapes are grown for grape juice and wine.

Ancient people from Central Asia were the first people to cultivate grapes. Ancient Egyptian hieroglyphics record the cultivation of purple grapes, and the ancient Greeks, Phoenicians and Romans grew purple grapes for both eating and wine production. Later, the growing of grapes spread to Europe, North Africa, and then to North America.

Native purple grapes grow wild across North America and were a part of the diet of many of our native tribes.

Columbus brought Old World grapes from Europe to Haiti in the new World. They were introduced to the east coast by colonists but were attacked by many pests and diseases. Some of the colonists developed new American varieties by selecting and crossing the better native wild grapes with each other or by crossing wild grapes with European varieties.

The Spanish had more success with the Old World varieties they planted in California. From this region come most of the table grapes and raisins we buy in the grocery store.

In the late 1800s and early part of the 20th Century, Oklahoma had vast vineyards of domesticated table and wine grapes. The climate and soils of Oklahoma are favorable for grapes, as several species are native.

Grape-related activity declined in the state between 1919 and 1932 because of Prohibition laws that made wine illegal all over the US. Oklahoma still produced more than 1800 tons of grapes on average between 1925 and 1928—second only to Arkansas among all the states in the south central US.

A steady increase in grape production has occurred since the mid-1990s in Oklahoma. By 2011 Oklahoma had more than 60 wineries and a steadily

Oklahoma Academic Standards

PRE-KINDERGARTEN

English Language Arts—
1.R.1,2,3,4; 2.R; 2.W;
3.R.2,4; 3.W
Math—N.1.1; 2.2; A.1.1,2;
GM.2.3

KINDERGARTEN

English Language Arts—
1.R.1,2,3,4; 2.R.1,2,3;
2.W.1,2; 3.R.2,4; 3.W
Science—LS1.1; ESS3.1
Math—N.1.1,2,5,6; 2.1; 3.1;
A.1.1,2; GM.2.3,4

GRADE 1

English Language Arts—
1.R.1,2,3,4; 2.W.2; 3.4,5
Science—LS1.1,2
Math—N.1.2,3,4; 2.1; A.1.1;
GM.2.5

GRADE 2

English Language Arts—
1.R.1,2,3,4,2.R.1,2,3; 2.R.1,3;
2.W.1; 3.R.5,7
Science—LS2.1
Math—N.1.1; 2.1,2,3,5;
A.1.1; 2.1,2; GM.2.3

GRADE 3

English Language Arts—
1.R.1,2,3,4; 2.R.1,3; 3.R.7
Science—LS1.1; 4.2,3,4
Math—N.1.1; 2.1,2,3,5;
A.1.1; 2.2

Materials

green, red and purple grapes
raisins
clear containers
one cup measure

Vocabulary

breed—to produce offspring by sexual reproduction

cultivate—to raise or assist the growth of by tilling or by labor and care

domesticated—adapted to living with human beings and to serving their purposes

hermaphroditic—having both male and female reproductive organs

hieroglyphics—a system of writing mainly in pictorial characters

microclimate—the climate within a small, defined area

selective breeding—the process of breeding plants and animals for particular genetic traits

trait—an inherited characteristic

trellis—a frame used especially as a support for climbing plants

vineyard—a field of grapevines

growing number of acres of vineyards. We have many micro-climates in our state. This makes it possible for grape growers to cultivate many different varieties of grapes, depending on local conditions.

Grapes have resveratrol, phytonutrients, anthocyanins, catechins and phenols—all good for your health.

English Language Arts/Science

1. Read and discuss background and vocabulary.
2. Provide students with copies of “The Life Cycle of a Grapevine,” included with this lesson.
 - Students will read the worksheet individually as a class.
 - Students will complete the worksheet by placing the steps in the correct sequence.
3. Discuss the elements of fables (Very few characters; characters are animals with human traits; characters are wise or foolish; very simple, though interesting, plot; thought-provoking; place can be anywhere and time is real; moral or message implied or stated; reflection of human strengths, frailties, weaknesses or imperfections.)
 - Provide students with copies of “The Fox and the Grapes,” included with this lesson.
 - Students will take turns reading the story out loud.
 - Discuss the elements of fables found in the story.
 - Students will answer the questions on the worksheet.
 - Discuss students’ answers as a class.
 - Students will draw pictures to illustrate the fable or work in groups to act out the fable.

Math

1. Students will sort and count grapes.
 - Sort the grapes by color.
 - Count the number of each color of grape.
 - Record the numbers on a graph.
2. Divide students into groups.
 - Provide each group with a large bunch of grapes.
 - Students will estimate how many grapes are in the bunch.
 - Students will record estimates.
 - Students will devise strategies to find the correct number in each bunch.
 - Students will pick the grapes off the bunch and find the correct number.
 - Students will record this amount.
3. Provide a large clear container and a mixture of green, red and purple grapes.
 - Each group will estimate how many grapes they think their container will hold.
 - Students will count the grapes as they fill the container, by ones, twos, fives and tens.

- Students will estimate how many of each color grape they have.
 - Students will estimate the volume (in grapes) of another container, based on the number of grapes in the first container.
 - Students will describe the probability of drawing a red grape from the container.
4. A serving of grapes is one cup. Students will estimate how many grapes they think are in one cup, then measure and count how many grapes are in one cup.
 5. Students will repeat the above activities with raisins.
 6. Students will create patterns using grapes.
 7. Students will use grapes to construct addition and subtraction facts.
 8. Students will use grapes to construct multiplication and division facts.
 9. Students will establish benchmarks on their containers for customary and metric units and estimate the measures of the grapes.
 10. Students will select appropriate customary and metric units of measure to find the volume of the grapes.

Visual Art

1. Students will use purple and green ink or paint to make thumb print bunches of grapes. Cut leaves from construction paper and use a crayon to draw a stems.

Additional Reading

Perez, L. King, and Robert Casilla, *First Day in Grapes*, Lee & Low, 2002.

Ryan, Pam Munoz, *How Do You Raise a Raisin?*, Charlesbridge, 2003.

Stone, Lynn, *Fruit (Plant Parts)*, Rourke, 2007.

Grape Dumplings

Walakshi is a Choctaw dish made on special occasions. Wild grapes are gathered in the fall and put away on stem to dry. The grapes are boiled and then strained through a sack. Dumplings are made of corn flour and dropped in the grape juice and cooked until done. Some of the grape juice is absorbed by the dumpling and the remainder of the juice is thickened. *Walakshi* was always furnished by the bride's relatives at weddings, while the bridegroom's relatives furnished the venison.

1 cup flour
 1 1/2 t. baking powder
 2 t sugar
 1/4 t salt
 1 T shortening
 1/2 cup grape juice

1. Mix flour, baking powder, sugar, salt and shortening. Add juice and mix into stiff dough.
2. Roll dough in your hands, and break off pea-sized bits.
3. Drop bits of dough into boiling grape juice, and cook for 10-12 minutes.

Name _____

The Fox and the Grapes

A Fox one day spied a beautiful bunch of ripe grapes hanging in the branches of a tree. The grapes seemed ready to burst with juice, and the Fox's mouth watered as he gazed longingly at them.

The bunch hung from a high branch, and the Fox had to jump for it. The first time he jumped he missed it by a long way. So he walked off a short distance and took a running leap at it, only to fall short once more. Again and again he tried, but in vain.

Now he sat down and looked at the grapes in disgust.

"What a fool I am," he said. "Here I am wearing myself out to get a bunch of sour grapes that are not worth gaping for."

And off he walked very, very scornfully.

Moral of the story: There are many who pretend to despise and belittle that which is beyond their reach.

1. How did Fox try to get the grapes?
2. Could he get them?
3. Why or why not?
4. At the beginning did Fox want the grapes?
5. Why or why not?
6. Did he want them at the end?
7. Why or why not?
8. Write your own ending with a plan for getting the grapes.

Wild grapes grow high in the tops of trees where they are difficult for people (and foxes) to reach. Many varieties of wild grapes grow in Oklahoma. They are a great source of food for birds, racoons and other wildlife. Domesticated grapes are grown on trellises so they are easier for people to reach.

The Fox and the Grapes (answers)

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Moral of the story: There are many who pretend to despise and belittle that which is beyond their reach.

1. How did Fox try to get the grapes? He tried to get the bunch of grapes by jumping for it.
2. Could he get them? No
3. Why or why not? The grapes were too high up in the tree.
4. At the beginning did Fox want the grapes? Yes
5. Why or why not? The grapes seemed ready to burst with juice.
6. Did he want them at the end? He said he didn't but he probably still did.
7. Why or why not? He pretended to not want them because they were too sour.
8. Write your own ending with a plan for getting the grapes.

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Name _____

Growth Cycle of a Grapevine

The grape starts its annual growth cycle in the spring with bud break. Tiny buds on the vine start to swell and eventually tiny green shoots begin to grow from the buds. The energy for growth comes from reserves of carbohydrate stored in roots and wood of the vine from the last growth cycle. Eventually the shoots sprout tiny leaves that can begin the process of photosynthesis, producing the energy to accelerate growth. As the weather gets warmer the shoots start to grow more quickly.

If the weather is warm enough, flowering begins 40-80 days after bud break. Small flower clusters appear on the tips of the young shoots. The flower clusters look like buttons. A few weeks later, the flowers start to grow in size. Individual flowers start to take shape. During this stage of flowering the pollination and fertilization of the grapevine takes place.

Most *Vitis vinifera* grape vines are hermaphroditic. Hermaphroditic plants have both male stamens and female ovaries, so they can self-pollinate. Wind and insects play only a small role in aiding pollination. During the process of fertilization, the pollen fertilizes the ovary which produces seeds.

Fruit set follows almost immediately, when the fertilized flower begins to develop a seed and grape berry to protect the seed.

Place the following steps in the growth cycle of a grapevine in the correct order.

___ Small flower clusters appear on the tips of the young shoots.

___ Tiny buds on the vine start to swell and eventually tiny green shoots begin to grow from the buds.

___ A grape berry develops to protect the seed.

___ Pollination and fertilization of the grapevine takes place.

___ The fertilized flower begins to develop a seed.

___ The shoots sprout tiny leaves that can begin the process of photosynthesis.

Name _____

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Place the following steps in the growth cycle of a grapevine in the correct order.

3 Small flower clusters appear on the tips of the young shoots.

1 Tiny buds on the vine start to swell and eventually tiny green shoots begin to grow from the buds.

6 A grape berry develops to protect the seed.

4 Pollination and fertilization of the grapevine takes place.

5 The fertilized flower begins to develop a seed.

2 The shoots sprout tiny leaves that can begin the process of photosynthesis.