

Garden Grid

Objectives

Students will:

- Read information about various garden plants and answer comprehension questions.
- Write paragraphs comparing and contrasting at least two of the vegetables described.
- Write essays and acrostic poems about favorite vegetables.
- Research to find recipes for preparing the vegetables.
- Work in groups to plan a garden on a grid as a group and then as a class.
- Order seed catalogs and fill out order forms.
- Sort seeds and use them to create math facts.
- Find the area and perimeter of their garden and other objects.

Key Words

garden, grid, vegetables, Oklahoma, plants,

Background

Plants that are crowded do not grow well. They rob one another of the space, fertilizer, water and sun necessary for healthy growth. Some plants need more space to grow than others. Pumpkins, cucumbers and melons, need room to sprawl along the ground. Some gardeners build trellises and train vining plants to climb in order to save space. Radishes require very little space and can be interplanted among plants that need more room. Good gardeners plan their gardens to make sure every plant has all the space it needs.

Language Arts

1. Read and discuss background and vocabulary.
2. Hand out copies of the reading pages included with this lesson.
 - Students will read independently or listen as the teacher reads the page aloud
 - Students will complete the worksheet included with this lesson to test understanding of the reading pages.
3. Students will write paragraphs comparing and contrasting at least two of the vegetables described in the reading pages.
4. Each student will write an essay beginning with the

Oklahoma Academic Standards

GRADE 1

Speaking and Listening: R.1; W.1,2. Foundations:
2. Reading and Writing Process: R.1. Critical
Reading and Writing: R.4,5; W.1,2,3. Vocabulary:
R.1. Research: R.1,2,3; W.2,3
Numbers and Operations: 1.2,4,6,8; 2.1,3.
Geometry and Measurement: 1.2; 2.1
Life Science: 1-1,2
Visual Art Expression: 1. Connection: 3
Physical Education— 1.1,3; 2.2;
3.1; 5.4; 7.1,3,4

GRADE 2

Speaking and Listening: R.1,2,3,4; W.1,2.
Foundations: 2. Reading and Writing Process:
R.2; W.1,2,3. Critical Reading and Writing:
R.5,7; W.1,2,3. Vocabulary: 4.R.1,3,5. Research:
6.R.2,3; W.2,3
Numbers and Operations: 2.1,2,5,6; A.2.2.
Geometry and Measurement: 2.1
Life Science: 2-1,2
Visual Art Expression: 1. Connection: 3
Physical Education— 1.1; 2.2; 3.1; 5.2; 7.1,2,3

GRADE 3

Speaking and Listening: 1.R.1,2,3,4; W.1,2
Foundations: 2. Reading and Writing Process:
R.1. Critical Reading and Writing: R.7; W.1,2,3
Vocabulary: 4.R.1,3,5, Research: R.2,3,4; W.2,3.
Numbers and Operations: 2.5,7. Geometry and
Measurement: 2.1,2,3,4,5,8
Science— LS1.1; 4.3
Visual Art Expression: 1. Connection: 3
Physical Education— 1.3; 5.1,3; 7.3

GRADE 4

Speaking and Listening: R.1,2,3,4; W.1,2.
Foundations: 2. Reading and Writing Process:
R.4. Critical Reading and Writing: R.7; W.1,2,3.
Vocabulary: R.1,3,5. Research: R.2,3; W.2,3
Numbers and Operations: 1.1,5. Geometry and
Measurement: M.2.2,4,5
Life Science: 1-1
Visual Art Expression: 1. Connection: 3
Physical Education— 5.1,2; 6.3; 7.1

Vocabulary

blueprint—a detailed plan of action

ceremony—a formal act or series of acts performed in some regular way according to fixed rules

economic—of, relating to, or based on the production, distribution, and consumption of goods and services

fertilizer—a substance (as manure or a chemical) used to make soil produce larger or more plant life

frost—the temperature that causes freezing; a covering of tiny ice crystals on a cold surface

grid—a pattern of regularly spaced horizontal and vertical lines forming squares on a chart

interplant—to plant a crop between (plants of another kind)

native—grown, produced, or having its beginning in a particular region

pith—the loose spongy tissue that forms the center of the stem in most plants and probably functions chiefly in storage

pollinate—to place pollen on the stigma of

sprawl—to spread out in an uneven or awkward way

stalk—a plant stem especially of a plant that is not woody

trellis—a frame of lattice used especially as a screen or a support for climbing plants

vine—a plant whose stem requires support and which climbs by tendrils or twining or creeps along the ground

phrase “In my garden there must be”

—Students will share their writing with classmates.

—Students will illustrate their essays.

5. Bring cookbooks to class.

—Students will use online sources or find recipes in the books you have provided for preparing each of the vegetables listed in the reading pages.

—Students will write their own recipes for their favorite vegetables to be included in a class veggie cookbook.

6. Students will write acrostic poems using the names of their favorite vegetables and adjectives that describe them

Math

1. Students will work in groups to plan gardens, using the information and pictures provided.

—Provide each group with six sheets of grid paper, copies of the veggie pictures and the pages showing space requirements for each vegetable. Tell students the grid paper will be the blueprints for their gardens.

—Students will read the information about space needed for different vegetables and discuss what plants they want to grow and what shape they would like their gardens to take.

—Students will tape the grid sheets together in the desired shape.

—Students will color the plants they want to grow, cut them out and place them on the grid, allowing the required amount of space for each plant.

—Students will work in pairs to discuss their spacing decisions and agree or disagree.

2. Bring seed catalogs to class or find seed catalogs online. Make copies of order forms.

—Students will practice filling out the forms and totaling the order for seeds that interest them.

3. Bring an assortment of garden seeds to class.

—Students will sort the seeds by size.

—Students will count how many seeds are in each group.

—Students will count by ones, twos, fives, and tens.

—Students will determine which groups have an odd number of seeds and which have an even number.

—Students will determine which group of seeds is greater than or less than another.

4. Students will find the perimeter and area of their gardens.

—Explain that each square on the grid sheet garden equals one square foot.

—Students will determine that the perimeter for each square is four feet.

—When their garden grids are complete, students will count the number of square feet (area) in their gardens by counting how many squares they used to create their gardens.

- Students will measure the perimeters of their gardens. This number will depend on the shape each group chose for its garden.
 - Discuss how the area and perimeter of the gardens vary depending on the shape of garden each groups chose and the crops they decided to plant.
5. Working together as a class, students will create various shapes of gardens and find the area and perimeter of each garden.
 - Discuss ways to measure the amount of space that a large garden would cover.
 - Discuss measuring area and inform students that we use square feet to measure area.
 - Each student will need at least three 12- by 12-inch squares of construction paper. (Laminate the squares for durability). Explain that each piece of paper is a square foot because it measures 1 foot by 1 foot. The area of one piece of paper is one square foot.
 - Each student will measure the perimeter of one sheet of paper by using a ruler to measure all four sides. The perimeter is four feet.
 - Clear a space in the classroom, or go to a room with an open area where students can lay all of the squares on the floor to view them.
 - Explain that as a class you are going to create a garden with the squares. Explain the rules for creating the garden:
 - a) All squares must touch another square completely on at least one side.
 - b) Students can't tell others where to put their squares.
 - c) Students cannot move the squares once they are laid down.
 - After all squares are laid down, each student will find the perimeter (the edge) and the area of the garden. Students will sketch a diagram of the garden and record both.
 - Students will rearrange the garden. Challenge them to find the smallest perimeter of garden that is possible using all squares. Students will sketch a diagram and record the area and perimeter.
 - Discuss why the perimeter changes but the area remains the same.
 6. Tell students that an acre is approximately 43,000 square feet (about the size of a football field without the end zones).
 - Work together as a class to calculate the square footage of the classroom. Calculate the number of classrooms it would take to fill one acre of land.
 - Students will calculate the square footage of their bedrooms. Calculate how many bedrooms it would take to fill one acre of land.
 7. Using the 12 x 12 squares, allow students to work in groups to find the square footage and perimeter of common objects at school such as sidewalks, doors, windows, table tops, playground equipment, parking spaces.

Science

1. Bring seeds for each of the vegetables listed in the reading pages.
 - Students will guess which seed goes with which vegetable.
2. In the spring or early fall, students will plan and plant a small outdoor garden, using cool weather plants like radishes, lettuce, spinach and peas. For spring gardens, students may start the plants indoors in February to get a head start or plant vegetables in pots and take them home for planting outdoors. Instructions for containers made from newspaper are included with this lesson.
3. Provide seed catalogs and gardening books.
 - Students will select vegetables or other plants they would like to grow.
 - Students will determine if the plants they have chosen are suitable for planting in your area, based on number of days to harvest, length of season, growth requirements, etc.
4. Bring samples of each of the vegetables listed in the reading pages for a tasting party.
5. Students will sort the edible parts of the plants listed into the following categories: root, fruit, seed.

Visual Art

1. Provide seed catalogs or garden books.
 - Students will draw pictures of their favorite vegetable plants.
2. Provide dried forms of several vegetables (dried beans and peas, dried okra, dried sunflower heads, dried pumpkin seeds, etc.)
 - Students will use the dried vegetables to create art.

Physical Education

1. Play “Garden is Ready,” as follows:
 - Write the names of a variety of garden vegetables on small pieces of paper, or cut out pictures from the worksheets included with this lesson.
 - Hand out the names or pictures to students.
 - Students sit in chairs scattered around a room.
 - One player serves as the gardener. He or she stands and says: “The garden is ready to harvest.”
 - Walking around the room, the gardener calls out the name of a garden vegetable. Play music to accompany the movement.
 - As players hear the names of their vegetables called, they get up and follow the gardener around the room.
 - With each round, the gardener calls another vegetable and switches from walking to hopping, skipping, etc. The followers mimic the gardener’s motions.
 - When most of the vegetables have been called out of their seats, the gardener shouts: “Salad.”
 - At this the players must find new seats.
 - The last player to find a seat becomes the new gardener.

Extra Reading

Cherry, Lynne, *How Groundhog’s Garden Grew*, Blue Sky, 2003.

Darbyshire, Tom, *Who Grew My Soup?*, Publications International Ltd, 2009.

Eclare, Melanie, *A Harvest of Color: Growing a Vegetable Garden*, Ragged Bears, 2002.

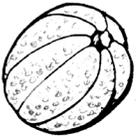
Garden Grid

Bell Pepper (pimienta)



One bell pepper has more vitamin C than an orange or a cup of strawberries. Peppers love warm soil and cannot tolerate frost. The pepper is another vegetable introduced to Europeans by natives to the Americas. Bell peppers belong to a different family from that of black pepper, but they belong to the same family as the pepper from which chili powder is made.

Cantaloupe (cantalupo)



Cantaloupe needs plenty of space to grow, too. Like the pumpkin, it grows on a vine that spreads out along the ground. Cantaloupe are also called muskmelon. They need plenty of sun and water and, like carrots, are a very good source of vitamins A and C. Each vine produces three or four fruits. When the fruit is ready it will break off the vine.

Carrots (zanahoria)



Carrots only need a small amount of space and are very easy to grow. They need well-worked, sandy soil so they will grow long, straight roots. Lumps and stones in the soil will cause the carrots to grow crooked. Carrots are a good source of Vitamins A and C. Carrots grow well in cool weather.

Corn (maiz)



Native Americans taught the European settlers to plant corn. Corn is pollinated by wind, so it must be planted in small blocks of three or four rows rather than in single rows. There are many different kinds of corn. Popcorn is made from one kind of corn that is allowed to dry on the stalk. The corn on the cob you like to eat is called “sweet corn.”

Okra (quingombo)

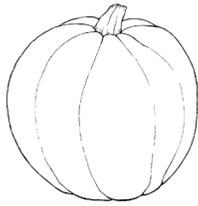


Okra is more common in Oklahoma and other southern gardens than it is in other parts of the country. That's because it needs plenty of sunshine and won't even poke its head out of the ground unless the weather is very warm. In Louisiana okra is called “gumbo” because it is an important ingredient in a kind of soup by that name.

Peas (guicante)



Peas are usually the first vegetable to be planted in the garden in the early spring. They like cool weather and must be harvested before it starts getting hot. Peas are an excellent source of vitamins A, B complex and C. Peas grow on vines. They grow best when they have something to climb, like a fence, a trellis or even dried tree branches stuck in the ground.



Pumpkin (calabaza) Have you ever heard anyone talk about frost on the pumpkin? Since pumpkin is one of the last vegetables in the garden, it may get frost on it. However, pumpkins store better if they are cut from their vines during the warm days of mid-Autumn, before the first frost. Pumpkins need plenty of space to grow into sprawling vines. Pumpkins are native to the Americas.



Radishes (rabano) Radishes grow well when the weather is cool. They are easily started from seed after the last spring frost. Seeds should be sown three to four inches apart. Radishes produce bright red swollen roots that are white inside. Their bright color and spicy taste make them a fun addition to a tossed salad. Radishes are a good source of Vitamin C.

Sunflower (girasol)



The sunflower is native to the Americas. To the Incas of Peru the sunflower represented the sun in their religious ceremonies. Sunflower seeds are a valuable source of many vitamins and minerals. When sunflower plants are young, their heads will turn to the sun each morning. Every part of the sunflower plant has an economic use. The flowers can be used to make yellow dye. The pith from the stalks floats better than cork, so it is sometimes used in life preservers.

Tomato (tomate)



In August, 1820, Robert Gibbon Johnson stood on the steps of the Salem, New Jersey, courthouse and ate a tomato. His doctor had advised him against it. American colonists thought tomatoes were poisonous because they are related to belladonna and mandrake. Those plants are in the nightshade family and are very poisonous. Tomato leaves are poisonous to many insects and some livestock, and the earliest forms of this plant did have poisonous fruits. Fortunately, the tomato Robert Gibbon Johnson ate on the courthouse steps was not poisonous. In fact, tomatoes are another excellent source of vitamins A and C. Tomatoes are native to the Americas.



Name _____

Garden Grid

Read about vegetables on the Reading Page or listen as your teacher reads.
Write the answers to these questions.

COMMON OKLAHOMA GARDEN VEGETABLES

bell pepper
cantaloupe
carrots
corn
okra
peas
pumpkin
radish
sunflower
tomato

1. _____ grow crooked if there are lumps and stones in the soil?

2. Name three vegetables that are native to the Americas.

_____, _____, and

_____.

3. Name three vegetables that are a good source of Vitamins A and C.

_____, _____, and

_____.

4. Name two vegetables that grow on vines. _____, and _____.

5. Which plant has a flower that turns toward the sun? _____

6. Explain why sunflowers are used in life preservers.

7. Which plant is pollinated by the wind? _____

8. Name two vegetables that grow well in cool weather. _____ and _____

9. Which vegetable is used to make gumbo? _____

10. Explain why people thought tomatoes were poisonous.

Name _____

Garden Grid (answers)

Read about vegetables on the Reading Page or listen as your teacher reads.
Write the answers to these questions.

1. Carrots grow crooked if there are lumps and stones in the soil?
2. Name three vegetables that are native to the Americas.
corn, tomatoes, sunflower, pumpkin, bell pepper
3. Name three vegetables that are a good source of Vitamins A and C.
tomatoes, peas, carrots, cantaloupe
4. Name two vegetables that grow on vines. pumpkins, cantaloupe, peas
5. Which plant has a flower that turns toward the sun? sunflower
6. Explain why sunflowers are used in life preservers. Sunflowers are used in life preservers because the pith in their stalks float.
7. Which plant is pollinated by the wind? corn
8. Name two vegetables that grow well in cool weather. peas, radishes, carrots
9. Which vegetable is used to make gumbo? okra
10. Explain why people thought tomatoes were poisonous. American colonists thought tomatoes were poisonous because they are related to belladonna and mandrake. Those plants are in the nightshade family and are very poisonous.

COMMON OKLAHOMA GARDEN VEGETABLES

bell pepper
cantaloupe
carrots
corn
okra
peas
pumpkin
radish
sunflower
tomato

Name _____

Garden Grid

Name _____

Garden Grid

Vegetables need space between them so they can get all the water and food they need. Some plants need more space than others. Plants like pumpkin and melons need plenty of space to spread out. Other plants, like radishes and onions, don't need as much space. Gardeners usually plant their vegetables in rows. That way they can walk between the plants and take care of them.



Use this chart to decide how much space to leave between your vegetables. In addition, three feet should be allotted between each plant for tilling and a three foot border on each side of the garden for tilling.

1 inch = 1 foot

Plant



cantaloupe
(*cantalupa*)

and



pumpkin
(*calabaza*)

2 feet apart, with 10 feet between rows.

Plant



carrots
(*zanahoria*)

and



peas
(*guicante*)

less than 1 foot apart, with 2 feet between rows.

Plant



tomatoes
(*tomate*)

3 feet apart, with
5 feet between
rows.

Plant



okra
(*quingombo*)

1 foot apart, with
2 feet between
rows.

Plant



radishes
(*rabano*)

less than 1 foot
apart, with 1 foot
between rows.

Plant



corn
(*maiz*)

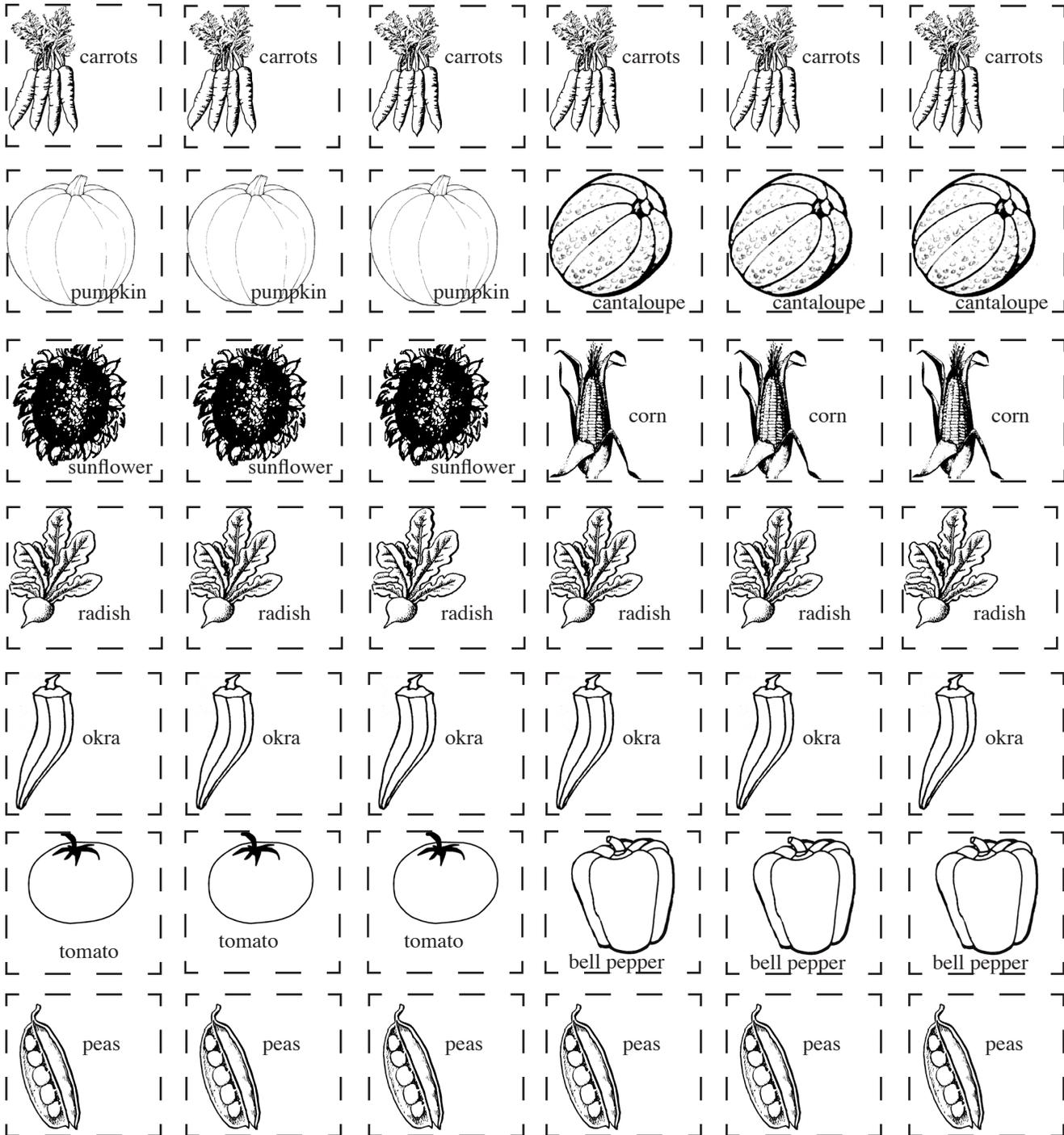
1 foot apart, with
3 feet between
rows.

Name _____

Garden Grid

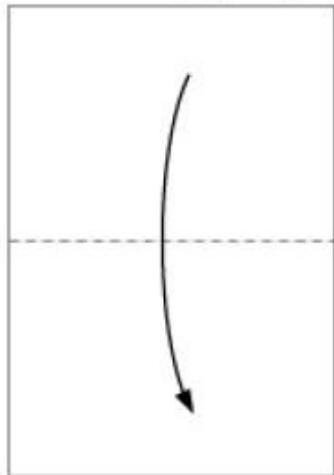
Color the vegetables, and cut the ones you want to plant in your garden. Place the vegetables in the grid your teacher provides. Use the chart on worksheet B to decide how much space each vegetable needs.

1 inch = 1 foot

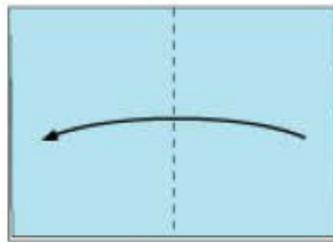


Newspaper Pot

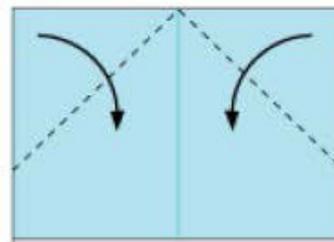
★ Use two-page spread of broadsheets newspaper



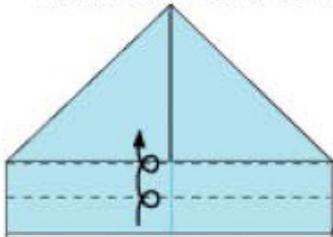
1 Fold in half



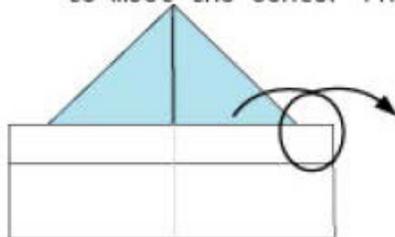
2 Fold in half to make a crease and fold back



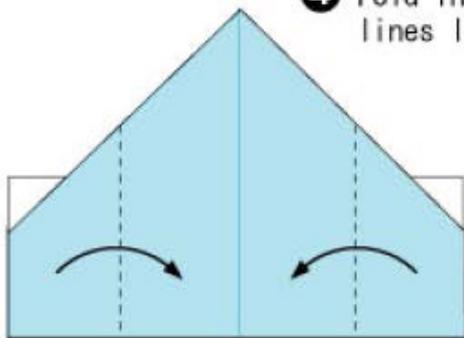
3 Fold in the dotted lines to meet the center line



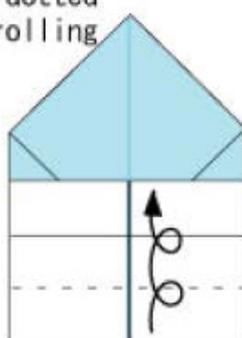
4 Fold in the dotted lines like rolling



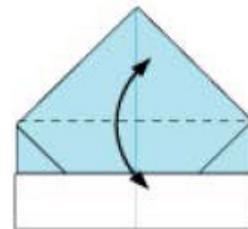
5 Turn over



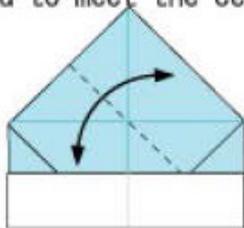
6 Fold to meet the center line



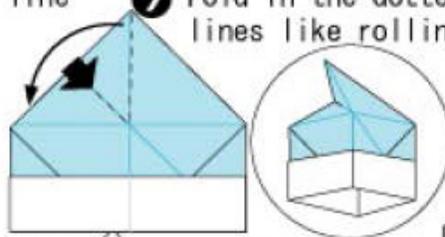
7 Fold in the dotted lines like rolling



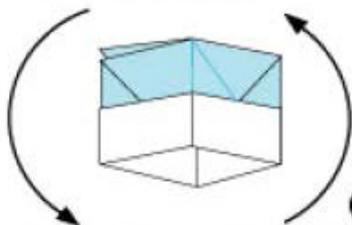
8 Fold to make a crease and fold back



9 Fold to make a crease and fold back



10 Open the pocket from  and flatten



11 Turn around

12 Finished

