Name: _____ Date: _____

Lettuce That Grows Without Dirt

Circle group

Picture a farm with no tractor, no mud and no fields. You walk into a bright room with tall shelves. Each shelf is full of lettuce. The roots hang in water, not soil. This is a hydroponic farm. Hydroponic means working with water.

How does it work? Plants do not need soil itself. They need water, light, air and nutrients. Nutrients are minerals that act as plant food. In a field, soil holds the nutrients. The roots take them in. On a hydroponic farm, the grower mixes the nutrients into the water. The roots drink them up.

Field farming has some problems. Rain may be too heavy, or it may not come. Winter freezes the ground. A hydroponic farm keeps its plants indoors. The grower controls the light and the warmth. Rows of special lamps take the place of the sun.

These farms often use less water than a field. The water runs in a loop and gets used again. They can also be built inside a city, close to the people who will eat the lettuce. The greens do not have to travel far.

Hydroponics works best for small, quick crops. Lettuce, herbs and some berries grow well this way. Wheat and corn still grow in big fields.

Questions

1. What does hydroponic mean?

_____

_____

2. What do plants need besides water?

_____

_____

3. How do the roots get nutrients on a hydroponic farm?

_____

_____

4. What takes the place of the sun in the room?

_____

_____

5. Why can a hydroponic farm grow food in winter?

_____

_____

6. Why are wheat and corn still grown in fields?

_____

_____

Words to know

hydroponic: grown in water with plant food instead of in soil
nutrients: substances that plants and animals need to grow
minerals: natural materials found in soil and rock that living things need
indoors: inside a building
loop: a path that goes around and comes back to its start

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Lettuce That Grows Without Dirt

Triangle group

Picture a farm with no tractor, no mud and no fields. Instead, you walk into a bright room that is lined with tall shelves. Each shelf is full of lettuce, and the roots hang in water instead of soil. This is a hydroponic farm, and the word hydroponic means working with water.

Why does it work? Plants do not really need soil itself. They need water, light, air and a set of nutrients, which are the minerals that act as plant food. In a field, soil holds the nutrients and the roots take them in. On a hydroponic farm, the grower mixes the nutrients right into the water. The roots can drink them up directly.

There are some clear problems with farming in an ordinary field. Rain may be too heavy or may not come at all. Winter freezes the ground. A hydroponic farm solves these problems by keeping its crops indoors, where growers control the light and the warmth. Rows of special lamps take the place of the sun.

These farms often use less water than a field, because the water runs in a loop and gets used again. They can also be built inside a city, close to the people who will eat the lettuce. That means the greens do not have to travel far to reach a store.

Hydroponics works best for small, quick crops such as lettuce, herbs and some berries. Wheat and corn are still grown in big fields.

Questions

1. What does the word hydroponic mean?

_____

_____

2. What do plants need besides water?

_____

_____

3. How do the roots get nutrients on a hydroponic farm?

_____

_____

4. What takes the place of the sun in a hydroponic room?

_____

_____

5. Why can a hydroponic farm grow food in winter?

_____

_____

6. Why does the author say wheat and corn are still grown in fields?

_____

_____

Words to know

hydroponic: grown in water with plant food instead of in soil
nutrients: substances that plants and animals need to grow
minerals: natural materials found in soil and rock that living things need
indoors: inside a building
loop: a path that goes around and comes back to its start

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Lettuce That Grows Without Dirt

Square group

Imagine a farm without a single tractor, patch of mud or open field. Instead, you step into a brightly lit room lined with towering shelves. Each shelf is crowded with lettuce, and the roots dangle in water rather than soil. This is a hydroponic farm, and the word hydroponic literally means working with water.

Why does this succeed? Plants do not truly require soil itself. What they need is water, light, air and a collection of nutrients, which are the minerals that serve as plant food. In an ordinary field, the soil holds those nutrients and the roots absorb them. On a hydroponic farm, the grower dissolves the nutrients directly into the water, so the roots can drink them up without any digging.

Conventional field farming faces several obvious difficulties. Rain may fall too heavily or fail to arrive, and winter freezes the ground solid. A hydroponic farm avoids these problems by keeping its crops indoors, where growers control both the light and the warmth. Rows of special lamps substitute for the sun.

Such farms frequently use less water than a field, since the water circulates in a loop and is used over and over. They can also be built within a city, close to the people who will eventually eat the lettuce, which means the greens do not have to travel far to reach a store.

Hydroponics works best for small, fast-growing crops such as lettuce, herbs and certain berries. Wheat and corn are still grown in vast fields.

Questions

1. What does the word hydroponic literally mean?

_____

_____

2. Besides water, what do plants need in order to grow?

_____

_____

3. How do the roots obtain nutrients on a hydroponic farm?

_____

_____

4. What substitutes for the sun in a hydroponic room?

_____

_____

5. Why can a hydroponic farm grow food through the winter?

_____

_____

6. Why does the passage say wheat and corn are still grown in vast fields?

_____

_____

Words to know

hydroponic: grown in water with plant food instead of in soil
nutrients: substances that plants and animals need to grow
minerals: natural materials found in soil and rock that living things need
indoors: inside a building
loop: a path that goes around and comes back to its start

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: Lettuce That Grows Without Dirt

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: Lettuce That Grows Without Dirt

Easier · 209 words · Flesch-Kincaid grade 2.5

1. Working with water.
2. Light, air and nutrients.
3. The grower mixes nutrients into the water.
4. Rows of special lamps.
5. The plants are indoors, where the grower controls light and warmth.
6. Hydroponics works best for small, quick crops.

Triangle: Lettuce That Grows Without Dirt

This passage · 244 words · Flesch-Kincaid grade 4.2

1. Working with water.
2. Light, air and nutrients.
3. The grower mixes the nutrients into the water.
4. Rows of special lamps.
5. It keeps crops indoors where the light and warmth are controlled.
6. Hydroponics works best for small, quick crops, not big grain crops.

Square: Lettuce That Grows Without Dirt

Harder · 251 words · Flesch-Kincaid grade 7.1

1. Working with water.
2. Light, air and nutrients.
3. The grower dissolves the nutrients directly into the water.
4. Rows of special lamps.
5. It keeps crops indoors, where growers control the light and the warmth.
6. Hydroponics works best for small, fast-growing crops rather than big grain crops.