Name: _____ Date: _____

The Cold Spots Inside a Microwave Oven

Circle group

Leftover pasta comes out of the microwave. The edge is steaming. The middle is cold. Almost everyone has seen this. The reason is in how a microwave works.

Inside the oven, a part called a magnetron makes microwaves. These are invisible waves of energy, a bit like radio waves. The waves bounce off the metal walls and go into the food. Water molecules in the food take in the energy. They start to jiggle faster. Faster jiggling makes heat. Then the heat spreads to nearby parts of the food.

The waves do not fill the oven evenly. Where they bounce and overlap, some spots get strong waves and some get weak waves. It is like ripples on a pond. A plate that sits still may have a hot spot in one place and a cold spot in another. That is why most microwaves have a turntable. The plate turns. The food moves through the strong and weak spots. The heat gets more even.

You can help too. Stir the food halfway through. Let it rest for a minute after. The warm parts share heat with the cool parts. Dry foods, like a cracker, heat up less than soup. They have less water to take in the waves.

Questions

1. What part of the oven makes microwaves?

_____

_____

2. What do water molecules do when they take in the energy?

_____

_____

3. What does a turntable do for the food?

_____

_____

4. What are two things you can do to help food heat evenly?

_____

_____

5. Why does soup heat up more than a dry cracker?

_____

_____

6. Why might a cold spot show up in pasta while the oven is running?

_____

_____

Words to know

magnetron: the part of a microwave oven that makes microwaves
molecules: the tiny particles that everything is made of
turntable: a flat plate that spins around slowly
overlap: to lie partly on top of each other

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: _____

The Cold Spots Inside a Microwave Oven

Triangle group

Leftover pasta comes out of the microwave steaming at the edge and cold in the middle. Almost everyone has seen it. The reason has to do with the way a microwave oven actually works.

Inside the oven, a part called a magnetron produces microwaves, which are invisible waves of energy, a bit like radio waves. The waves bounce around the metal walls of the oven and move into the food. Water molecules in the food absorb this energy and start to jiggle faster. Faster jiggling means more heat, and the heat then spreads to nearby parts of the food.

The waves do not fill the oven evenly. Where they bounce and overlap, some spots get strong waves and some get weak ones, like the hills and valleys of ripples on a pond. A plate left sitting still might have a hot spot in one place and a cold spot in another. That is why most microwaves have a turntable. As the plate turns, the food moves through the strong and weak spots, which evens out the heating.

You can help, too. Stirring food halfway through spreads the heat around. Letting it rest for a minute afterward gives the warm parts time to share their heat with the cool parts. Foods with little water, such as a dry cracker, heat up less than a bowl of soup, because there is less water to absorb the waves.

Questions

1. What part of the oven produces microwaves?

_____

_____

2. What do water molecules do when they absorb the energy of the waves?

_____

_____

3. What does a turntable do for the food?

_____

_____

4. What are two things a person can do to help food heat evenly?

_____

_____

5. Why does a bowl of soup heat up more than a dry cracker?

_____

_____

6. Why might a cold spot appear in pasta even while the oven is running?

_____

_____

Words to know

magnetron: the part of a microwave oven that makes microwaves
absorb: to soak up or take in
molecules: the tiny particles that everything is made of
turntable: a flat plate that spins around slowly
overlap: to lie partly on top of each other

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: _____

The Cold Spots Inside a Microwave Oven

Square group

Leftover pasta often comes out of the microwave steaming around the edge yet still cold in the middle. Almost everyone has encountered this frustrating result at some point. The explanation lies in the way a microwave oven actually works.

Inside the oven, a component called a magnetron produces microwaves, which are invisible waves of energy somewhat similar to radio waves. The waves bounce around the metal walls of the oven and then travel into the food. Water molecules in the food absorb this energy and begin to jiggle faster. Faster jiggling means more heat, and that heat gradually spreads to the neighboring parts of the food.

However, the waves do not fill the oven evenly. Where they bounce and overlap, some spots receive strong waves while others receive weak ones, much like the hills and valleys of ripples on a pond. A plate left sitting perfectly still might develop a hot spot in one place and a cold spot in another. That is why most microwave ovens include a turntable. As the plate slowly turns, the food travels through the strong and weak spots, which evens out the heating.

You can also help the process along. Stirring the food halfway through spreads the heat around, and letting it rest for a minute afterward gives the warm parts time to share their heat with the cooler parts. Foods containing little water, such as a dry cracker, heat up less than a bowl of soup, because there is less water available to absorb the waves.

Questions

1. What component of the oven produces microwaves?

_____

_____

2. What do water molecules do after they absorb the energy of the waves?

_____

_____

3. What does the turntable accomplish for the food?

_____

_____

4. What are two ways a person can help food heat evenly?

_____

_____

5. Why does a bowl of soup heat up more than a dry cracker?

_____

_____

6. Why might a cold spot appear in pasta even while the oven is running?

_____

_____

Words to know

magnetron: the part of a microwave oven that makes microwaves
absorb: to soak up or take in
molecules: the tiny particles that everything is made of
turntable: a flat plate that spins around slowly
overlap: to lie partly on top of each other

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: The Cold Spots Inside a Microwave Oven

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

Circle: The Cold Spots Inside a Microwave Oven

Easier · 207 words · Flesch-Kincaid grade 2.6

1. A part called a magnetron.
2. They jiggle faster, which makes heat.
3. It moves the food through strong and weak spots so the heating is more even.
4. Stir it halfway through and let it rest for a minute after.
5. The soup has more water to take in the waves.
6. The waves are weak in some places, so those parts get less energy.

Triangle: The Cold Spots Inside a Microwave Oven

This passage · 235 words · Flesch-Kincaid grade 5.8

1. A part called a magnetron.
2. They jiggle faster, which makes heat.
3. It moves the food through the strong and weak spots so the heating is more even.
4. Stir it halfway through and let it rest for a minute afterward.
5. The soup has more water to absorb the waves.
6. The waves are weak in some places, so those parts of the food get less energy.

Square: The Cold Spots Inside a Microwave Oven

Harder · 253 words · Flesch-Kincaid grade 8.4

1. A component called a magnetron.
2. They begin to jiggle faster, which produces heat.
3. It moves the food through the strong and weak spots so that the heating is more even.
4. Stir it halfway through and let it rest for a minute afterward.
5. The soup contains more water available to absorb the waves.
6. The waves are weak in some places, so those parts of the food receive less energy.