Name: _____ Date: _____

Pop Science: Inside a Popcorn Kernel

Circle group

Most corn will not pop, but one special kind will. A popcorn kernel looks like a tiny stone. But it is a sealed package with three parts. The hard, shiny shell is the hull. Inside is a starchy center. In the starch is a small bit of water.

When the kernel gets hot, the water turns to steam. Steam takes up much more room than water. So pressure builds up inside the hull. The hull of popcorn is strong and almost waterproof. It holds the pressure a little longer than other corn would. Meanwhile, the hot starch gets soft like gel.

At last, the pressure is too much. The hull breaks with a pop. The soft starch bursts out and puffs into foam. In the air it cools and turns hard. It becomes the light, crunchy snack we know. Bits of hull often stay stuck on, and they can get stuck in your teeth.

Some kernels never pop. They may be too dry, so there is not enough water to make steam. Or they may have a tiny crack that lets the steam out. So popcorn should be kept in a sealed container. A fresh bag usually pops better than an old one.

Questions

1. What are the three parts of a popcorn kernel?

_____

_____

2. What does the water turn into when the kernel gets hot?

_____

_____

3. Why is the strong hull of popcorn important?

_____

_____

4. What happens when the pressure is too much?

_____

_____

5. Why might a kernel with a tiny crack not pop?

_____

_____

6. Why should popcorn be kept in a sealed container?

_____

_____

Words to know

kernel: a single hard seed of corn
hull: the tough outer shell of a seed
starchy: full of a soft food substance found in grains
pressure: a pushing force on the inside of something

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: _____

Pop Science: Inside a Popcorn Kernel

Triangle group

Most corn does not pop, but one special type does. Popcorn kernels look like tiny stones, yet each one is a sealed package with three main parts. The hard, shiny outer shell is called the hull. Inside is a starchy center, and within that starch is a small amount of water.

When the kernel is heated, the water inside starts to turn into steam. Steam takes up much more room than liquid water, so pressure builds inside the sealed hull. The hull of popcorn is unusually strong and nearly waterproof, so it holds the pressure for a moment longer than the hull of other corn would. Meanwhile the hot starch softens into a gel-like state.

At last the pressure becomes too great. The hull ruptures with a pop, and the soft starch bursts out and expands into a foam. As it cools in the air, the foam hardens into the light, crunchy shape we know. Pieces of the hull often stay attached, and sometimes they get stuck in your teeth.

Some kernels never pop. They may have dried out too much, so there is not enough water to make steam, or they may have a tiny crack in the hull that lets steam leak out. That is why popcorn should be stored in a sealed container instead of an open bag, and why a fresh bag usually pops better than an old one.

Questions

1. What are the three main parts of a popcorn kernel?

_____

_____

2. What does the water inside the kernel turn into when it is heated?

_____

_____

3. Why is the strong hull of popcorn important?

_____

_____

4. What happens when the pressure becomes too great?

_____

_____

5. Why might a kernel with a tiny crack in its hull fail to pop?

_____

_____

6. Why should popcorn be stored in a sealed container?

_____

_____

Words to know

kernel: a single hard seed of corn
hull: the tough outer shell of a seed
starchy: full of a soft food substance found in grains
pressure: a pushing force on the inside of something
ruptures: breaks open suddenly

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: _____

Pop Science: Inside a Popcorn Kernel

Square group

Most varieties of corn never pop, but one special type does so reliably. Popcorn kernels resemble tiny stones, yet each is a sealed package with three principal parts. The hard, glossy outer shell is called the hull; inside it lies a starchy center; and within that starch is a small quantity of water.

As the kernel is heated, the water inside begins to turn into steam. Steam occupies far more space than liquid water, so pressure steadily builds within the sealed hull. The hull of popcorn is unusually strong and nearly waterproof, which allows it to withstand the pressure for a moment longer than the hull of other corn could. In the meantime, the hot starch softens into a gel-like state.

Eventually the pressure becomes too great to contain. The hull ruptures with a pop, and the softened starch bursts outward and expands into a foam. As it cools in the air, the foam hardens into the light, crunchy shape that everyone recognizes. Pieces of the hull often remain attached, and they sometimes become lodged between your teeth.

A few kernels never pop. They may have dried out too much, leaving too little water to produce steam, or they may have a tiny crack in the hull that allows the steam to escape. That is why popcorn ought to be stored in a sealed container rather than an open bag, and why a fresh bag usually pops better than an old one.

Questions

1. Which three principal parts does a popcorn kernel have?

_____

_____

2. What does the water inside the kernel become as it is heated?

_____

_____

3. Why does the unusually strong hull of popcorn matter?

_____

_____

4. What happens once the pressure becomes too great to contain?

_____

_____

5. Why might a kernel with a tiny crack in its hull fail to pop?

_____

_____

6. Why is it better to store popcorn in a sealed container?

_____

_____

Words to know

kernel: a single hard seed of corn
hull: the tough outer shell of a seed
starchy: full of a soft food substance found in grains
pressure: a pushing force on the inside of something
ruptures: breaks open suddenly

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: Pop Science: Inside a Popcorn Kernel

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

Circle: Pop Science: Inside a Popcorn Kernel

Easier · 203 words · Flesch-Kincaid grade 2.2

1. The hull, the starchy center, and a little water.
2. Steam.
3. It holds the pressure a little longer before it breaks.
4. The hull breaks and the soft starch bursts out and puffs into foam.
5. The steam leaks out, so the pressure cannot build up.
6. It keeps the water inside the kernels, so they can still make steam.

Triangle: Pop Science: Inside a Popcorn Kernel

This passage · 234 words · Flesch-Kincaid grade 5.7

1. The hull, the starchy center, and a small amount of water.
2. Steam.
3. It holds the pressure a moment longer before it bursts.
4. The hull ruptures and the soft starch bursts out and expands into foam.
5. Steam leaks out, so pressure cannot build up.
6. It keeps the moisture inside the kernels, so they can still make steam.

Square: Pop Science: Inside a Popcorn Kernel

Harder · 243 words · Flesch-Kincaid grade 8.1

1. The hull, the starchy center, and a small quantity of water.
2. Steam.
3. It withstands the pressure for a moment longer before bursting.
4. The hull ruptures, and the softened starch bursts outward and expands into a foam.
5. The steam escapes, so pressure cannot build up.
6. It keeps moisture inside the kernels, so they can still produce steam.