Name: _____ Date: _____

Why Noodles Take Longer to Cook on a Mountain

Circle group

Picture camping high on a mountain. You boil water to cook noodles. The pot bubbles hard, but the noodles stay chewy for a long time. At home near sea level, the same noodles would be soft in a few minutes. The water looks like it is boiling in both places. So what is different?

The difference is air pressure. Air has weight. At sea level, a tall column of air presses down on everything below. High on a mountain, there is less air above you, so the pressure is lower. Water boils when its tiny particles move fast enough to break free as steam. With less pressure on a mountain, they break free more easily. The water starts to boil sooner.

That sounds good, but it causes a problem. The water starts to boil before it gets as hot as it would at sea level. Bubbling water cannot get hotter than its boiling point, even if you turn up the flame. So the noodles cook in cooler water. They need much more time to soften.

A pressure cooker does the opposite. Its tight lid traps steam and raises the pressure in the pot. Water then boils at a higher temperature, and food cooks faster.

Questions

1. Where are the campers boiling their noodles?

_____

_____

2. Why is the air pressure lower on a mountain?

_____

_____

3. How is boiling water on a mountain different from boiling water at sea level?

_____

_____

4. Why does a bigger flame not help the noodles cook faster?

_____

_____

5. Why do the noodles stay chewy for so long?

_____

_____

6. How does a pressure cooker help food cook faster?

_____

_____

Words to know

pressure: the push of something pressing on a surface
particle: a tiny piece of matter
steam: water that has turned into a hot gas
boiling: heated until bubbles rise and steam forms
soften: to become less hard

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: _____

Why Noodles Take Longer to Cook on a Mountain

Triangle group

Imagine camping high on a mountain and boiling water to make noodles. The pot bubbles hard, but the noodles stay chewy for a long time. At home near sea level, the same noodles would be soft in just a few minutes. The water looks as if it is boiling in both places, so what is different?

The difference is air pressure. Air has weight, and at sea level a tall column of it presses down on everything below. High on a mountain, there is less air above you, so the pressure is lower. Water boils when its particles are moving fast enough to break free as steam against the pressure on its surface. With less pressure on a mountain, the particles break free more easily, and the water starts to boil sooner.

That sounds helpful, but it causes a problem. The water starts boiling before it gets as hot as it would at sea level. Bubbling water cannot get hotter than its boiling point, even if you turn the flame up higher. So the noodles are cooking in cooler water, and they need much more time to soften.

A pressure cooker does the opposite. Its tight lid traps steam and raises the pressure inside the pot. Water then boils at a higher temperature, and food cooks faster.

Questions

1. Where are the campers boiling their noodles?

_____

_____

2. Why is the air pressure lower on a mountain?

_____

_____

3. How is the boiling water on a mountain different from boiling water at sea level?

_____

_____

4. Why does a bigger flame not make the noodles cook faster?

_____

_____

5. Why do the noodles stay chewy for so long?

_____

_____

6. How does a pressure cooker help food cook faster?

_____

_____

Words to know

pressure: the push of something pressing on a surface
particle: a tiny piece of matter
steam: water that has turned into a hot gas
boiling: heated until bubbles rise and steam forms
soften: to become less hard

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: _____

Why Noodles Take Longer to Cook on a Mountain

Square group

Imagine camping high among the peaks and boiling a pot of water to make noodles. The water bubbles vigorously, yet the noodles remain chewy for an astonishingly long time. Back home near sea level, the very same noodles would turn soft in just a few minutes. The water appears to be boiling in both locations, so what could account for the difference?

The explanation is air pressure. Air has weight, and at sea level a tall column of it presses down on everything beneath. High on a mountain, there is considerably less air overhead, so the pressure is lower. Water boils once its particles are moving fast enough to break free as steam against the pressure bearing down on its surface. Because the pressure is weaker on a mountain, the particles escape more easily, and the water begins to boil sooner.

That might sound advantageous, but it creates a difficulty. The water starts boiling before it reaches the temperature it would reach at sea level. Bubbling water cannot climb above its boiling point, no matter how high you turn up the flame. Consequently, the noodles are cooking in cooler water, and they require far more time to soften.

A pressure cooker accomplishes the opposite. Its tightly sealed lid traps steam and raises the pressure inside the pot, so the water boils at a higher temperature and the food cooks more quickly.

Questions

1. Where are the campers boiling their pot of water?

_____

_____

2. Why is the air pressure lower on a mountain?

_____

_____

3. How does the boiling temperature on a mountain compare with sea level?

_____

_____

4. Why will a bigger flame fail to speed up the cooking?

_____

_____

5. Why do the noodles remain chewy for such a long time?

_____

_____

6. How does a pressure cooker make food cook more quickly?

_____

_____

Words to know

pressure: the push of something pressing on a surface
particle: a tiny piece of matter
steam: water that has turned into a hot gas
boiling: heated until bubbles rise and steam forms
soften: to become less hard

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: Why Noodles Take Longer to Cook on a Mountain

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

Circle: Why Noodles Take Longer to Cook on a Mountain

Easier · 204 words · Flesch-Kincaid grade 3.9

1. High on a mountain.
2. There is less air above you pressing down.
3. It boils at a lower temperature, so it is not as hot.
4. Bubbling water cannot get hotter than its boiling point.
5. They cook in cooler water.
6. It traps steam and raises the pressure, so the water boils hotter.

Triangle: Why Noodles Take Longer to Cook on a Mountain

This passage · 217 words · Flesch-Kincaid grade 5.9

1. High on a mountain.
2. There is less air above you pressing down.
3. It boils at a lower temperature, so it is not as hot.
4. Bubbling water cannot get hotter than its boiling point.
5. They are cooking in cooler water.
6. It traps steam and raises the pressure, so the water boils at a higher temperature.

Square: Why Noodles Take Longer to Cook on a Mountain

Harder · 231 words · Flesch-Kincaid grade 8.4

1. High among the peaks, on a mountain.
2. There is considerably less air overhead pressing down.
3. The water boils at a lower temperature, so it is not as hot.
4. Bubbling water cannot climb above its boiling point.
5. They are cooking in cooler water.
6. Its sealed lid traps steam and raises the pressure, so the water boils at a higher temperature.