ISTEP +

Science
Grade 4

Water in Bottles

Practice Set 1
Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

A tablespoon is what he could use.

Describe ONE way Theo could improve his investigation to make the test more fair.

He could use the same types of bottles and same size bottles.

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

The more he puts in the bottle the higher sound it makes.

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

It will sound lower than bottle W.

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

Bottle W has 100 mL, but the other bottle has 50 mL, so it will sound a lot lower than bottle W.

4 pts

1 Acceptable – correct measuring tool. A “tablespoon” is not practical and is a non-metric measuring tool, but it is possible to use it for this purpose.
2 Acceptable – correct investigation improvement
3 Acceptable – correct conclusion description
4 Acceptable – correct comparison description
5 Acceptable – correct data explanation
Note: both 4 and 5 must be correct to earn credit for 1 key element
4 correct key elements
Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

**Measuring cup**

Describe ONE way Theo could improve his investigation to make the test more fair.

**Put the same amount of water in each bottle.**

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

**The more water the higher the pitch.**

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

**It would be lower less water.**

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

**Bottle W is low pitch so if W is low the new one would be very low pitch.**

---

4 pts

1 Acceptable – correct measuring tool
2 Acceptable – correct investigation improvement
3 Acceptable – correct conclusion description
4 Acceptable – correct comparison description. “less water” in part 4 covers the requirement for mentioning less water in part 5’s explanation. Either part 4 or 5 has to indicate the role of water (more water/less water) in the description.
5 Acceptable – correct data explanation
Note: both 4 and 5 must be correct to earn credit for 1 key element
4 correct key elements
Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

He most likely used a measuring cup.

Describe ONE way Theo could improve his investigation to make the test more fair.

Theo could take a bottle with no water in it and blow in that.

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

The less liquid in the bottle, the lower the pitch will be.

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

It will be lower than bottle W.

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

Because the 50 mL bottle has less liquid than bottle W.

3 pts

1 Acceptable – correct measuring tool
2 unacceptable – incorrect investigation improvement. The change listed would add another data point, but doesn’t make the test more fair.
3 Acceptable – correct conclusion description
4 Acceptable – correct comparison description
5 Acceptable – correct data explanation
Note: both 4 and 5 must be correct to earn credit for 1 key element
3 correct key elements
Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

A measuring cup

Describe ONE way Theo could improve his investigation to make the test more fair.

Use the same size bottle for each one.

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

If it is higher, there is probably more water in it. So more air would hit the water.

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

It would be lower.

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

Since there would be less water in it, when he blows across the top, not all the air hits the water.

3 pts
1 Acceptable – correct measuring tool
2 Acceptable – correct investigation improvement
3 Acceptable – correct conclusion description
4 Acceptable – correct comparison description
5 Unacceptable – incorrect data explanation
Note: both 4 and 5 must be correct to earn credit for 1 key element
3 correct key elements
**Student Response 5**

Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

**dropper**

Describe ONE way Theo could improve his investigation to make the test more fair.

**He could use the same bottle.**

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

**The more water the higher the pitch. The less the amount of water the lower the pitch.**

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

**It will be very low.**

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

**Because glass bottle W has the lowest so the new bottle will be lower.**

---

**3 pts**

1 Acceptable – correct measuring tool. A “dropper” is not practical, but it is possible.
2 Acceptable – correct investigation improvement
3 Acceptable – correct conclusion description
4 Acceptable – correct comparison description
5 Unacceptable – explanation is too vague. Water is not mentioned in either part 4 or 5, and “lowest” and “lower” could mean either pitch or water.
Note: both 4 and 5 must be correct to earn credit for 1 key element
3 correct key elements
Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

He used a measuring glass.

Describe ONE way Theo could improve his investigation to make the test more fair.

He could use the same amount of water in different jugs.

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

The more water, the shorter the sound it gives off.

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

The more water, the better the sound.

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

Is your look a 2? It has the most water and it had the biggest sound. So is he adds more than the sound will get bigger.

2 pts
1 Acceptable – correct measuring tool
2 Acceptable – correct investigation improvement
3 Unacceptable – incorrect conclusion description
4 Unacceptable – incorrect comparison description
5 Unacceptable – incorrect data explanation
2 correct key elements
A measuring cup.

Describe ONE way Theo could improve his investigation to make the test more fair.

By using the same amount of water.

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

The more water the louder the sound.

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

It would be softer than bottle W.

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

I know my description of how it sounds is right because the more water there is less water it is a softer pitch.
Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

The tool is a measuring cup.

Describe ONE way Theo could improve his investigation to make the test more fair.

Pour 100 mL in all of them.

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

The sound comes from the glass or plastic, and water makes a low, medium, high, or very high pitch.

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

Very low.

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

The one before low should be very low. Because the one after high is very high.
Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

A measuring cup.

Describe ONE way Theo could improve his investigation to make the test more fair.

Put the same amount of liquid in them.

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

It can make it sound lower.

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

The glass bottle W will have more water in it.

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

I know that because 100 is bigger than 50.

2 pts

1 Acceptable – correct measuring tool
2 Acceptable – correct investigation improvement
3 Unacceptable – incorrect conclusion description
4 Unacceptable – incorrect comparison description. There is no reference to pitch.
5 Acceptable – correct data explanation. “mL” is not required to go with the “100” or “50”.

Note: both 4 and 5 must be correct to earn credit for 1 key element
2 correct key elements
Identify the scientific tool Theo MOST LIKELY used to measure the amount of water poured into each bottle.

He most likely used mL.

Describe ONE way Theo could improve his investigation to make the test more fair.

Use the same measurement of water.

Describe ONE conclusion that could be made about how the amount of water in the bottle relates to the pitch of the sound produced.

There is not much water.

Theo has another bottle just like bottle W. He will put 50 mL of water in it and blow across the top.

Describe how the pitch produced by the bottle with 50 mL of water in it will compare with the pitch produced by bottle W.

It will make higher sound.

Use data from the table to EXPLAIN how you know your description of the pitch produced by the bottle with 50 mL of water is correct.

There is 100 mL in bottle W.