

“BOILING POINT” Crib Sheet

Suggestions for **Version 5**—ONE ACTOR, THE SCIENTIST AND THE BOX

3-25-08

Setup everything (see list) before audience enters.

Audience enters and takes seats.

AS THEY ENTER-- Pass out 2 ballots per child, 1 per parent, golf pencils for all.

A &/or S lights burner as people are entering so water will be nearly boiling when show starts.

Kazoo note; A & S sing song.

S *welcomes audience, tells kids to sit on ballots until they are told to pull them out.*

Tells parents to hold on to their own questionnaires until the end of the show.

S: *Topic for today is one of the most mysterious substances known to humankind.*

Blah, Blah. .

BOX: *lights come on and off. Grinding noise. Out comes DOING SCIENCE, followed by a DING. S. takes sign and hands it to A to put on Box.*

S: *Yes, Box. It wants to remind us that we will be doing science today.*

Box whistle.

S: *Yes, not just talking about it.*

Box whistle.

S: *But investigating. And like I said, today's show is about water.*

S: *Water does many mysterious things. I put on some water for tea and look at what it's doing!!*

S: *You say it's boiling? How do you know it's boiling?*

BOX: *lights come on and off. Grinding noise. Then, *Observations* sign, followed by a DING. S. hands each sign to A who sticks it on the Box.*

S. Takes kids' observations.

BOX: *lights come on and off. Grinding noise. Then, *Question* sign, followed by a DING. S. hands each sign to A who sticks it on the Box.*

S: *Science is about asking questions based on our observations. Based on your observations, the question for today is*

S: *What happens to water when it boils?*

[S. pulls out sign]

Then BOX [somehow] delivers a foam model of a water molecule.

S: *And to answer that question, we have to ask ourselves another one. What is water made of? What is the tiniest bit of water that is still water? And the answer is, this. [points to water molecule model].*

S: *explains about water molecule model.*

S: so what happens to the water molecules when water boils? Would you like to know the answer? (Vinnie nods).

S: I'm not going to tell you because science isn't about giving answers, it's about figuring them out.

Box whistles.

S: (to Box). Thank you. But I will give you some possibilities.

BOX: *grinding noise. *Hypothesis* sign. DING*

S: When you come up with a possible answer to a question, it's called a hypothesis. *[S. hands sign to A who sticks it on a Velcro banner hanging from rod.]*

Here are some hypotheses-- things that might happen to water when it boils.

[A picks up a water molecule, S. already has one.]

S: Option 1, maybe the water molecules disappear when water boils. *They act this out. Assistant produces a sign that says **DISAPPEARS** and hangs it on the PVC pipe.*

S: Option 2, maybe the water molecules spread apart. *They act this out. Assistant produces a sign that says **SPREADS OUT** and hangs it on the PVC pipe.*

S: Or maybe the water molecules break apart into hydrogen and oxygen atoms. *They act this out. Assistant produces a sign that says **BREAKS APART** and hangs it on the PVC pipe.*

S: Or maybe you just don't know. *Assistant produces a sign that says **DON'T KNOW** and hangs it on the PVC pipe.*

S: I'd like everyone to think about these options and choose the one that makes most sense to them. Then I'd like to know what everyone thinks.

Box whistles and/or delivers a ballot.

S: Oh, that's a great idea. The box says we should vote.

Explains how to vote and how the vote will be collected.

Children vote and vote is collected in boxes.

A whispers in S's ear.

S: You want to know the answer?

BOX: *grinding noise. *Experiment* sign, ding.*

S: I'm not going to tell you. Because in science, if we want to figure out which of our options is the best one, we have to do some experiments.

[Experiment 1, light the steam.]

[Experiment 2, put balloon on spout of teapot.]

A holds out hands to indicate “Why?”

S: Why did it happen? Would you like to know why that happened? Well, it’s a little complicated. Because water molecules are so small—

BOX interrupts!

BOX: *grinding noise. *Model* sign. DING.*

[S. hands sign to A who sticks it on a Velcro banner hanging from rod.]

S. That’s a great idea, Box. What we need is a model.

S. Explains about models. Choose a kid to be a molecule. Recruit more kids and adults to be molecules and teapot.

A: Are the water molecules going to boil now?

Dancing – practice. [Kazoo.]

S: *[Explain dancing]* Hotter till reach . . . THE BOILING POINT!

ALL: DAH-DAH-DAH!

S. continues to explain. Practice continues.

Still practicing: Two-three water molecules leave the teapot.

A: Wait, what about the balloon?

S: Oh that’s right, we need a balloon. Hmm what can we use for the balloon?

BOX: *slide whistle.*

[S opens box and picks up tape measure from shelf. Set up balloon]

S: Everyone ready? Are you ready BOX?

BOX: *slide whistle.*

S: Start the water music, please.

[Water molecule dance: narration and music. Then, boiling music.]

A: Stop! *[Music stop; dance stop.]* What about when the temperature got cold, like in the ice water?

[Backwards music, balloon into teapot. Applause applause]

A whispers in scientists ear.

S: Oh, you changed your mind. About the options. Often times that happens after an experiment.

Box whistles.

S: OK, that’s a good idea. Let’s take another vote. *[VOTE]*

A: So, what does happen to water when it boils?

S: *Goes through the possibilities until gets to right one. [Explains about choosing hypothesis based on model.]*

A: Do you have any more experiments like this?

S: Would you like to see another experiment?

[Kids respond]

S: I'm not sure **what [which one] to do....**

BOX: *slide whistle all over the place*

S: OK, let's see what the Box has in mind.

S. opens the door and there is the metal can and the cork.

S. What do we have here? A can and a cork. Let's see if we can do an experiment with them. [May need to keep talking a sec to stall for time.]

BOX: *grinding sound.*Prediction* sign. DING*

[S. hands sign to A who sticks it on a Velcro banner hanging from rod.]

Last demo: can.

S: Wouldn't you like to know why that happened. Visit our website.

BOX: *grinding sound. *website* sign. DING*

S: Did you have fun today doing science with us?

A: Why did you want me to boil water?

S: I just wanted some tea.

[S opens box and picks up teacup & saucer. Pours tea.]

A: Thanks for coming to our show.

S. Let's sing the song!

[Sing codA: "The show is done, we've gotta run"]

Can the box somehow "sing" along, too?

BOX ACTIVITY, IN ORDER:

THING	SOUND	CURTAINS
1. *OBSERVATIONS* sign	gregor-bell	open
2. *QUESTIONS* sign	gregor-bell	open
3. Green foam circle	slide whistle	closed
4. Blue foam circles	slide whistle (2)	closed
5. *HYPOTHESIS* sign	gregor-bell	open
6. *EXPERIMENT* sign	gregor-bell	open
7. *MODEL* sign	gregor-bell	open
8. Tape measure	slide whistle	closed
9. Run music	[music]	open
10. Metal can & cork	slide whistle	closed
11. *PREDICTION* sign	gregor-bell	open
12. Website sign	gregor-bell	open
13. Teacup/saucer	none	closed

PROPS FOR EXPERIMENTS

teapot

stove

matches

water in (measuring) container

balloons

ice water

tongs

safety equip:

- hot pad

- mitt

- goggles

fire extinguisher

[can & cork - in box]

OTHER PROPS [in rough order]

“What happens to water when it boils” sign

H₂O sign

Second molecule

Option signs

Kazoos

Ballots/pencils [questionnaires, bookmarks]

H's and O's and rope