

“The Evolution of Steam”

GO GREEN & \$AVE

BIG!

Presented by:



FRIEND OF THE
CHILD NUTRITION
FOUNDATION



ABOUT US



John Pennington,
CSC, CFSP
Chef's Move to
Schools Board
Member



Scott Swogger
President & CEO
SNA Foundation
Chairman



Kenny Walpole,
CEC

OBJECTIVES

- The history, physics, & benefits of steam cooking.
- The advantages and disadvantages of steamer classifications and how you can choose a green steamer.
- Hints and Tips for Cooking with Steam
- Reduction costs (ROI) and researching green steamers on the web.

Exciting Times for School Nutrition!

New and Changing Regulations

Breakfast Programs

Summer Feeding

Farm to School

School Gardens

Back Pack Programs

Dinner Programs

Snacks in the Classroom

Why is your job so IMPORTANT?

**National School Lunch Act passed
In 1946 due to Childhood Obesity**

- This is a problem of National Security**
- *27% of American age 17-24 are too heavy**
- *1/3 of our school age children obese**


Why is your job so IMPORTANT?

**The US has one of the highest rates
Of Children living in Poverty.**



**45 MILLION
PEOPLE
LIVE IN FOOD
INSECURE
HOUSEHOLDS
OVER 21% ARE
CHILDREN**

**Test
YOUR knowledge
of the
School
Nutrition
Association**



EVOLUTION OF STEAM

steam (stēm) *n.* 1. a. Water in the gaseous state, esp. when hot. b. The mist that forms when hot water vapor cools and condenses. 2. A heating system in which steam generated in a boiler is piped to radiators. 3. **Energy : power.** —*v.* 1. To generate or emit steam. 2. To turn into or escape as steam. 3. To move by or as if by steam power. 4. **To expose to steam, as in cooking.** 5. *Informal.* To become angry : fume. —**steam'y** *adj.*

steam-boat (stēm'bōt') *n.* A steamship.

steam engine *n.* An engine in which steam is used to produce power.

EVOLUTION OF STEAM

1950's

First Boiler-Based
Atmospheric
Steamer



STEAMER CATEGORIES

1. Boiler-Based Steamers

- Water & Drain Line
- De-lime the Boiler
- Water Filter
- Can use up to 300 Gallons of Water per day
- High Energy Costs
- High Maintenance Costs

LIMED UP



EVOLUTION OF STEAM

Invented in 1993



CONNECTIONLESS
STEAMERS
and
VACUUM
TECHNOLOGY

STEAMER CATEGORIES

2. Connectionless Technology

-  Water & Drain Line
-  De-lime the Boiler
-  Water Filtration System
-  Large Water Consumption
3 gallons per day
-  High Energy Costs
-  High Maintenance Costs

EVOLUTION OF STEAM

Introduced in 2002



Boilerless
Steamers

STEAMER CATEGORIES

3. Boilerless

- Connected to Water & Drain Line
- No Boiler to De-lime
- Most Require Water Filter
- Can use up to 120 Gallons of Water per day
- High Energy Costs
- Average Maintenance Costs

EVOLUTION OF STEAM

Introduced in 2009



BoilerFree
Steamers and
Steam Vector
Technology

EVOLUTION OF STEAM

Introduced in 2009

BoilerFree
Steamers are
essentially the
same as
Connectionless
except faster cook
times and they can
have a water and
drain line.



STEAMER CATEGORIES

4. Boiler-free

- Available Connected to water and drain line or connectionless
- No Boilers to De-lime
- No water filtration
- Uses less than 1 Gallon of Water per hour
- Variable cooking speeds
- Low utility usage

Cost Comparisons

*PER YEAR	Boiler Based Steamer	Boilerless Steamer	Connectionless or BoilerFree
<i>Water Cost</i>	\$651	\$365	\$16
<i>Sewage</i>	\$724	\$405	\$12
<i>Electricity</i>	\$3,909	\$2,606	\$1694
<i>De-liming Chemicals</i>	\$300	\$300	NONE
<i>Water Filters</i>	\$250	\$250	NONE
Total Cost to Operate	\$5,834	\$3,926	\$1,722
Switch to BOILERFREE and SAVE!	\$4,112	\$2,204	



EVOLUTION OF STEAM

QUESTIONS?

STEAM JEOPARDY!

Evolution
of Steam

Steamer
Categorie
s

Steam
Physics

Nutrition

Steamin'
Green

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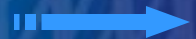
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STEAM JEOPARDY!

Steamer Categories – 100

THIS TYPE OF STEAMER USES MORE WATER AND ENERGY THAN ANY OTHER KIND AND CAN BE A MAINTENANCE NIGHTMARE

WHAT IS BOILER-BASED?



STEAM JEOPARDY!

Steamer Categories – 200

THESE TYPE OF STEAMERS HAVE NO WATER OR DRAIN LINES, AND REQUIRE NO DE-LIMING.

WHAT IS CONNECTIONLESS/BOILERFREE?



STEAM JEOPARDY!

Steamer Categories – 300

THIS TYPE OF STEAMER IS CONNECTED TO A WATER & DRAIN LINE AND HAS NO BOILER AND MEDIUM WATER CONSUMPTION.

WHAT IS BOILERLESS?



STEAM JEOPARDY!

Steamer Categories – 400

THIS TECHNOLOGY ALLOWS A STEAMER TO LOWER THE TEMPERATURE OF STEAM

WHAT IS VACUUM TECHNOLOGY?



STEAM JEOPARDY!

Steamer Categories – 500

IN WHAT YEAR DID THE NATIONAL
SCHOOL LUNCH ACT PASS.

1946



PHYSICS OF STEAM

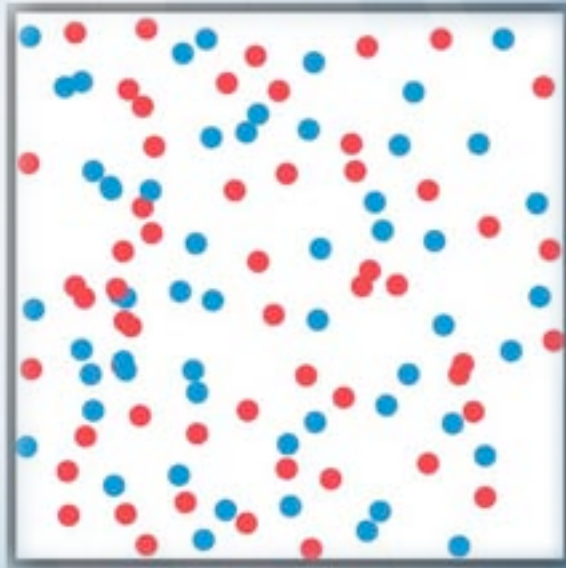
The background of the slide features a steam shower. On the left, a bright light source creates several vertical rays of light that fan out across the frame. The right side of the image is dominated by a thick, white plume of steam rising from the bottom, set against a deep blue background.

PHYSICS OF STEAM



PHYSICS OF STEAM

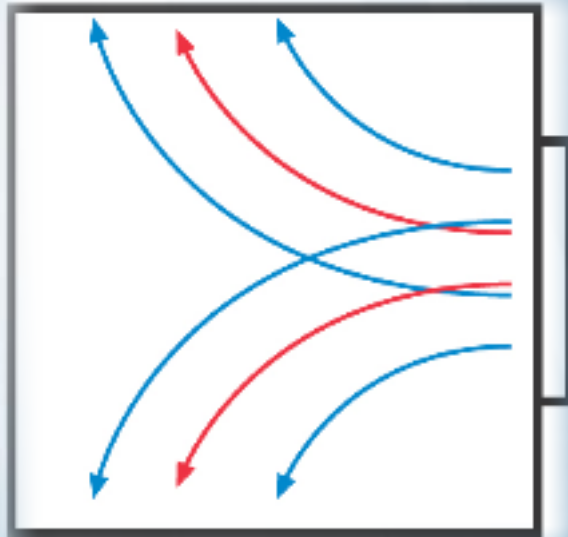
Standard Atmospheric Steamer



- Air
- Steam

PHYSICS OF STEAM

Convection Steamer

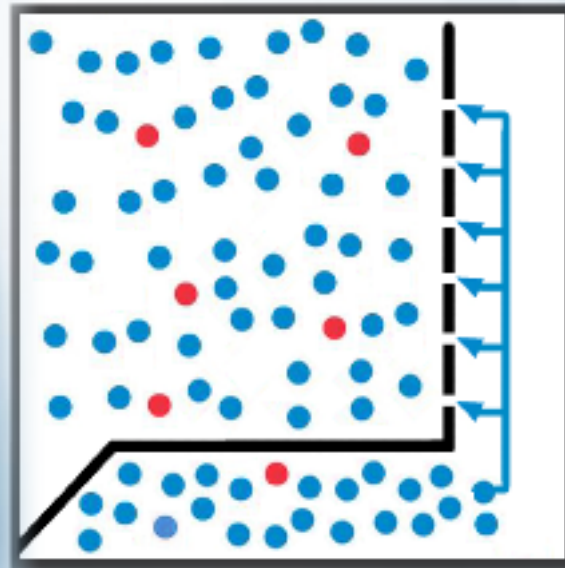


- Air
- Steam

PHYSICS OF STEAM

Steam Vector Technology™

BOILERFREE

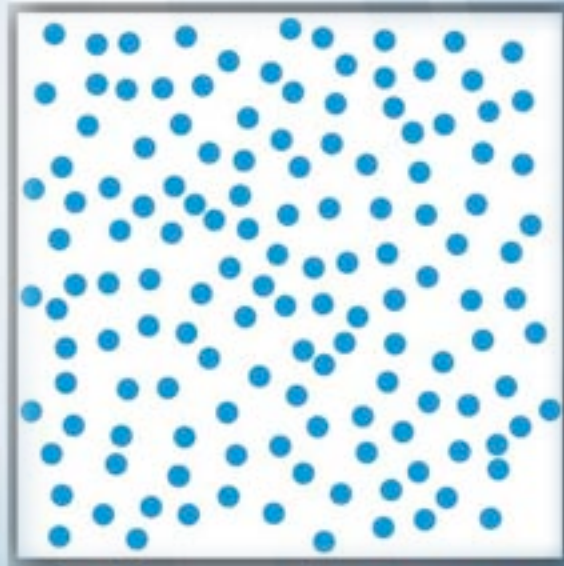


• Air

• Steam

PHYSICS OF STEAM

Vacuum Steamers



- Air
- Steam

PHYSICS OF STEAM

QUESTIONS?

STEAM JEOPARDY!

Steam
History

Steamer
Categorie
s

Steam
Physics

Nutrition

Steamin'
Green

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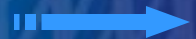
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STEAM JEOPARDY!

Steam Physics – 100

COOKING WITH STEAM IS THIS MANY TIMES MORE EFFICIENT THAN COOKING WITH DRY HEAT.

WHAT IS 100?



STEAM JEOPARDY!

Steam Physics – 200

IN MOST STEAMERS THIS ACTS AS AN INSULATOR, PREVENTING STEAM FROM RELEASING ITS HEAT ENERGY.

WHAT IS AIR?



STEAM JEOPARDY!

Steam Physics – 300

HOW MANY DUCKS WERE HARMED IN THE
MAKING OF THE “PHYSICS OF STEAM”
VIDEO

NONE, ZERO, ZILCH, NADA...

WE LOVE DUCKS!



STEAM JEOPARDY!

Steam Physics – 400

THIS STEAMER COOKS WITH STEAM VECTOR TECHNOLOGY, HAS NO MOVING PARTS, REQUIRES NO WATER FILTRATION SYSTEM, AND IS AVAILABLE IN CONNECTED, CONNECTIONLESS.

WHAT IS BOILERFREE?



STEAM JEOPARDY!

Steam Physics – 500

THIS WAS THE COLOR OF THE DUCK'S
UMBRELLA.

WHAT IS YELLOW?



NUTRITION

Antioxidants & Nutrients

Retention of Antioxidants



- Microwaving... 3%
- Stove top... 34%
- Pressure Steamer... 53%
- Atmospheric Steamer... 89%

Test
YOUR knowledge of
the
School
Nutrition
Association

The background of the slide features a dark blue field with numerous bright blue, diagonal light streaks that create a sense of motion and depth. The text is centered and rendered in a white, classic serif font.

NUTRITION
&
MENU
APPLICATIONS

BREAKFAST



LUNCH



Hints and Tips for Cooking with STEAM!

Steam seeks out anything colder
Than itself and releases it's heat energy
Into that product.

The more surface area of the product,
the quicker it will cook.

Hints and Tips for Cooking with STEAM!

- Use perforated pans whenever possible
- Shallow pans cook faster than deep pans
 - Large batches should be broken up
 - Do not cover unless you have to
- Precooked products are perfect for steamers
- Any boil in the bag product is better in the steamer
 - When doing batches don't use hold mode
 - Steam does NOT transfer flavor!

STEAMIN' GREEN

Efficient Steamer Choices: ?

- **Connectionless Steamers**

- **Boilerless Steamers**

How can you assure you are making the right decision when it comes to energy and water efficiency?



STEAMIN' GREEN Power Sources

ELECTRICITY

NATURAL GAS

PROP

RESEARCH TOOLS

Where Did the Numbers Come From?



energystar.gov



fishnick.com

FISHNICK.COM



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Promoting Energy Efficiency in Food Service

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Equipment Rebates

Get money back for purchasing energy efficient equipment.



Educational Seminars

Free seminars to increase your energy efficiency

I.Q.

What's New

Lighting Class with Special Guest, Derry Berrigan

The FSTC is hosting lighting design expert Derry Berrigan for a one-day-only specialized seminar focusing on back of house and exterior lighting applications. Learn how to transform your workhorse lighting from "energy-guzzling eye-sore" to "efficient, high-tech illumination." [\[Derry Berrigan's Bio\]](#)

Ice-Cube Machine Field Study

This project tested eight ice-cube machines to investigate the variability between water and energy usage rates.

[» more](#)

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[Appliance Reports](#)

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NICKEL** inc.

The Food Service Technology Center program is funded by California utility customers and administered by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission.

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Appliance Types

Want to learn more about how appliances use energy in your kitchen? Click an appliance for energy saving information.



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[Broilers](#)



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[Pasta Cookers](#)



[Ranges](#)



[Steam Kettles](#)



[Steamers](#)



[Warewashers](#)



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Steamers

The links below will direct you to the areas of the FSTC website with information on steamers.



Steamers that have earned the Energy Star® are up to 25% more efficient than standard models. [Click Here](#) for more information.



Utility Rebate

Get money back when you purchase a qualified high-efficiency steamer in Pacific Gas & Electric Company's service territory.



Performance Reports

Steamers are evaluated for energy and water performance by cooking red potatoes and green peas in accordance with ASTM Test Method Designation F1484-05.



Life-Cycle Cost Calculator

Calculate the total estimated cost of ownership over the lifetime of the steamer, including energy and water costs, purchase price and maintenance.



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Steamer Performance Reports

Report Title	Number	Published
AccuTemp Products, Inc, Model S62083D060 Electric Steamer Performance Test - [download] (.pdf, 700 KB)	5011.04.16	Feb 2005
AccuTemp STEAM 1' HOLD, Model 208-D12-300 Electric Steamer Performance Test - [download] (.pdf, 300 KB)	5011.03.02	Jun 2003
AccuTemp STEAM 1' HOLD, Model 208-D6-3.0 Electric Steamer Performance Test - [download] (.pdf, 385 KB)	5011.98.58	May 1998
AccuTemp STEAM 1' HOLD, Model 208-D8-300 and 400 Electric Steamers - [download] (.pdf, 580 KB)	5011.01.90	Dec 2001
AccuTemp STEAM 1' HOLD, Model 208-D8-300 Electric Steamer Performance Test - [download] (.pdf, 400 KB)	5011.99.75	Sep 1999
AccuTemp, Model 53 Electric Steamer Performance Test - [download] (.pdf, 270 KB)	5011.05.08	Apr 2005
AccuTemp, Model S62083D1701Q20 Electric Steamer Performance Test ASTM Test Method Application - [download] (.pdf, 790 KB)	5011.05.09	May 2005
Cleveland Range Inc, SteamCraft Ultra 3 Electric Steamer Performance Test - [download] (.pdf, 240 KB)	5011.00.84	Nov 2001
Crown Food Service Equipment Ltd, EPX-3 Steamer Summary Report - [download] (.pdf, 95 KB)	5012.08.21	Jan 2008
Crown Food Service Equipment Ltd, EPX-5 Steamer Summary Report - [download] (.pdf, 95 KB)	5012.08.22	Feb 2008

Table ES-1. Summary of the S62083D1701020 Steamer Performance.

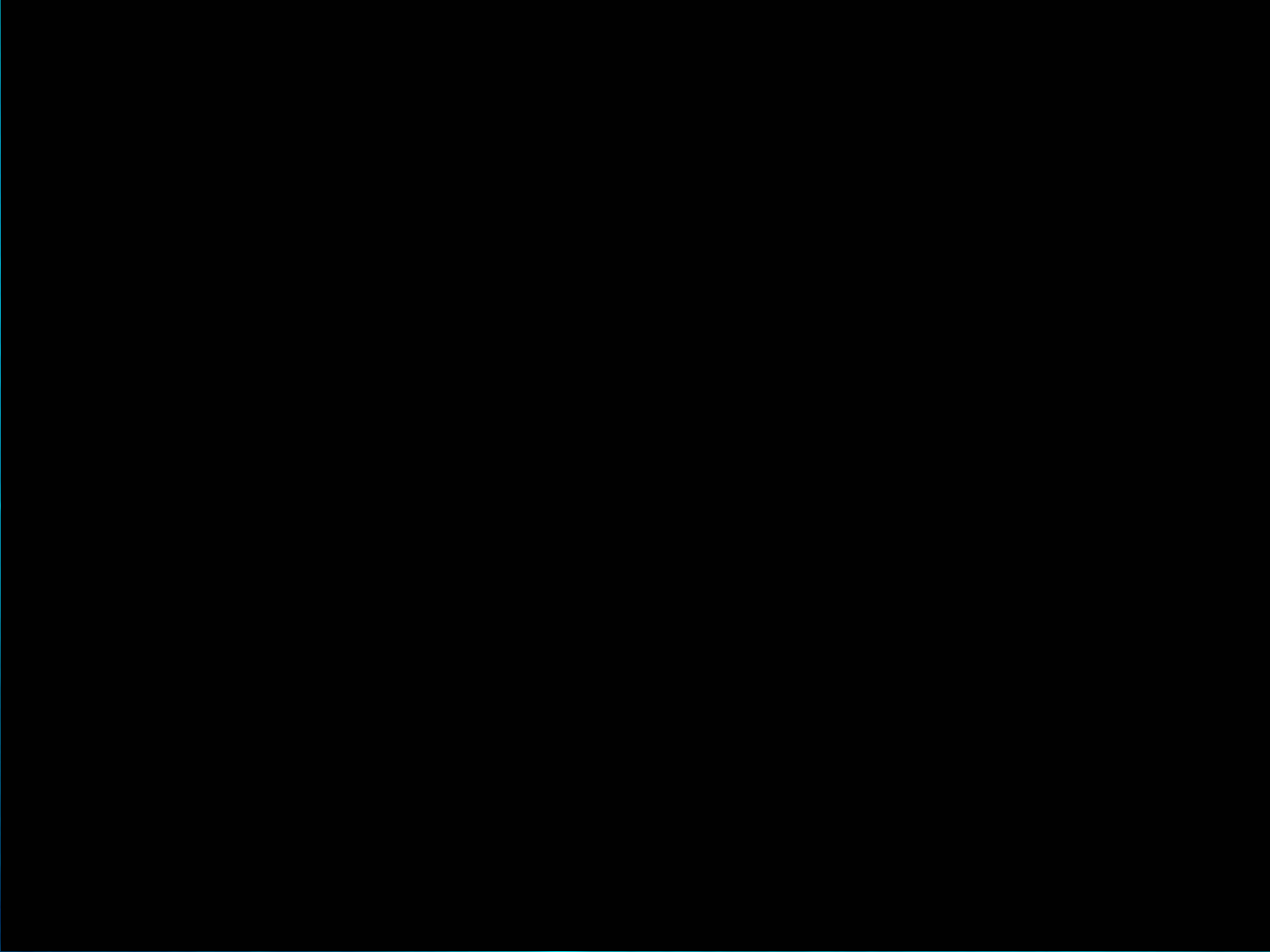
Rated Energy Input Rate (kW)	17.0
Measured Energy Input Rate (kW)	16.1
Preheat Time (min)	6.3
Preheat Energy (kWh)	1.7
Idle Energy Rate (kW)	0.16
Frozen Green Peas	
Light-Load Cooking-Energy Efficiency (%)	64.1 ± 3.3
Heavy-Load Cooking-Energy Efficiency (%)	95.0 ± 2.5
Production Capacity (lb/h)	190.4 ± 17.0
Red Potatoes	
Light-Load Cooking-Energy Efficiency (%)	31.2 ± 1.3
Heavy-Load Cooking-Energy Efficiency (%)	73.1 ± 1.8
Production Capacity (lb/h)	135.3 ± 1.0
Ice Loads	
Cook Time (min)	19.2
Maximum Temperature Difference (°F)	35.3
Maximum Time Delay (min)	6.8

STEAMIN' GREEN

WATER =

HUGE

\$SAVINGS\$



QUESTIONS?

STEAM JEOPARDY!

Evolution
of Steam

Steamer
Categorie
s

Steam
Physics

Nutrition

Steamin'
Green

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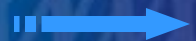
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STEAM JEOPARDY!

Steamin' Green – 100

THIS WEB SITE IS A GREAT RESOURCE FOR FINDING **THIRD-PARTY** REPORTS ON ALL TYPES OF COOKING EQUIPMENT.

WHAT IS **FISHNICK.COM**?



STEAM JEOPARDY!

Steamin' Green – 200

THIS MANY HOUSES COULD BE HEATED
ANNUALLY WITH THE ENERGY & WATER
YOU SAVE USING EITHER
CONNECTIONLESS OR BOILERFREE
STEAMER

What is 52?



STEAM JEOPARDY!

Steamin' Green – 300

THIS TYPE OF STEAMER IS ONLY 40%
COOKING EFFICIENT.

WHAT IS A GAS STEAMER?



STEAM JEOPARDY!

Steamin' Green – 400

THIS TYPE OF STEAMER TYPICALLY USES
OVER 300 GALLONS OF WATER PER DAY.

WHAT IS A BOILER BASED STEAMER?



STEAM JEOPARDY!

Steamin' Green – 500

ONE BENEFIT OF USING CONNECTIONLESS OR BOILERFREE TECHNOLOGY IS THE LOW AMOUNT OF WATER USED EACH DAY, WHICH EQUATES TO ABOUT THIS MUCH.

What is 3 GALLONS?

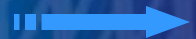


STEAM JEOPARDY!

FINAL JEOPARDY

STEAMER CATEGORIES

THIS STEAMER IS BOILERLESS, USES LESS THAN 1 GALLON OF WATER PER HOUR, COOKS & HOLDS FOOD, FEATURES STEAM VECTOR TECHNOLOGY, AND IS AVAILABLE IN BOTH CONNECTED OR CONNECTIONLESS MODELS TM.

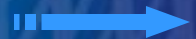


STEAM JEOPARDY!

FINAL JEOPARDY

WHAT IS THE BOILERFREE STEAMER?

Winner of the
GIFT CARD
is:



AccuTemp



THANK YOU
for your time & input today!