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INDD 435

Research

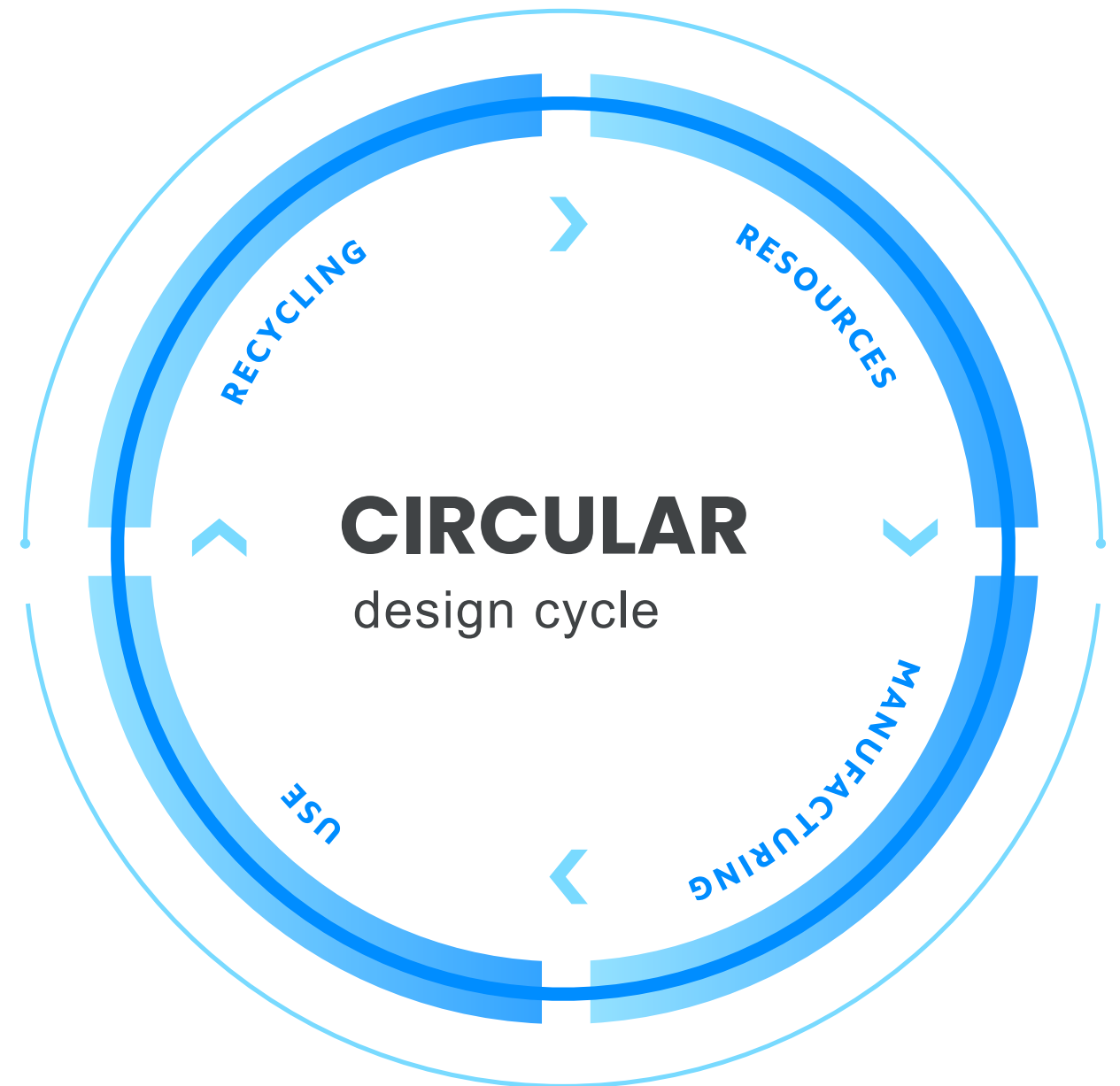
Design brief

Design Houseware product focusing on circular product design.

Circular Product Design focuses on the development of methods and tools that enable the design of products that are used more than once

Categorie Selected

Cooking + baking



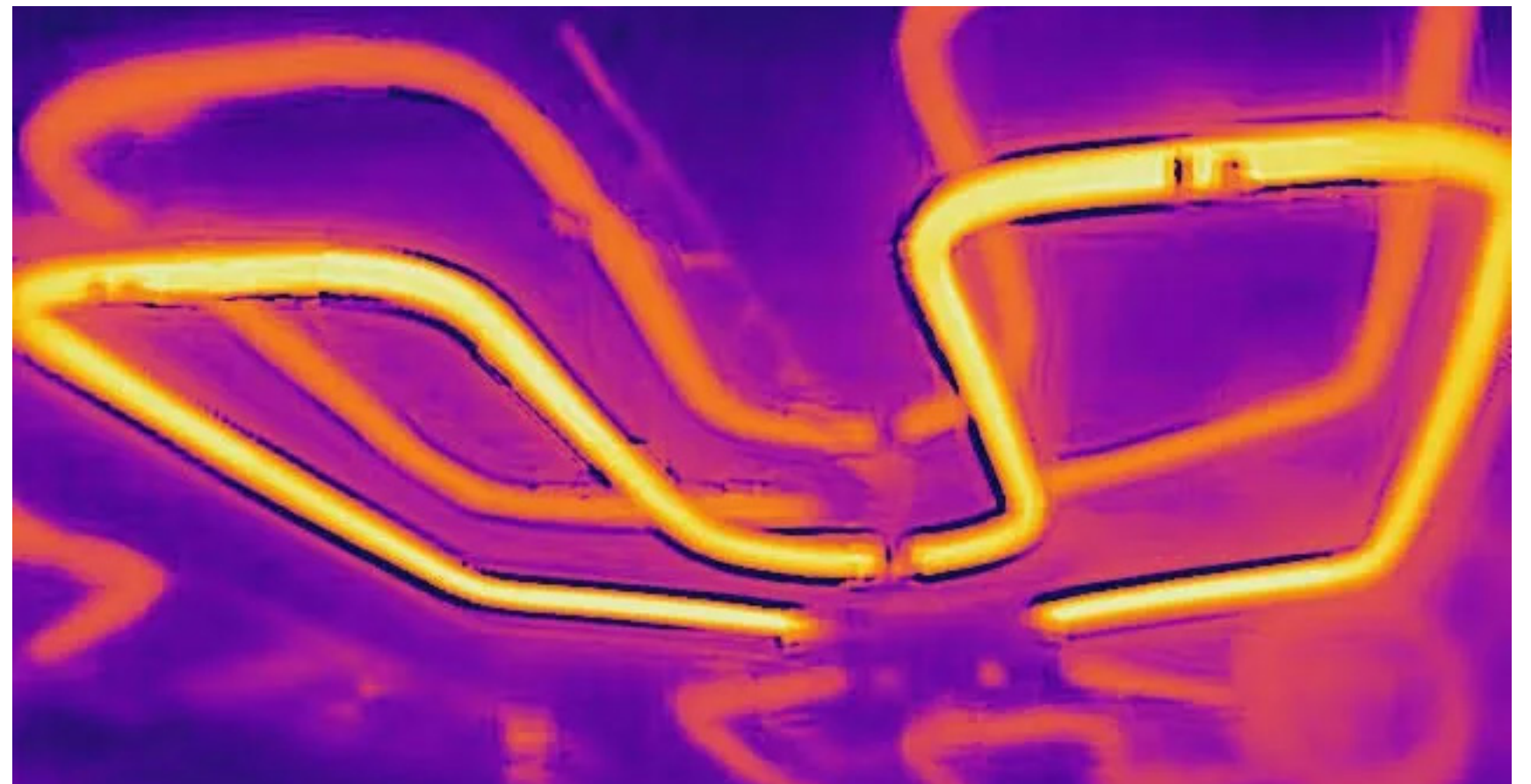
Infrared Technology

Infrared allows for accurate detection of heat. This has potential applications to cooking

The camera can tell the temperature of liquids well even clear water

Problems

Infrared does not always work correctly on shiny objects. The sensor however can be tuned to these surfaces.





The Problem

Cooking is, by far, the leading cause of home fires and home fire injuries such as burns

Cooking caused an average of 158,400 reported home structure fires per year (44 percent of all reported home fires in the US).

Common Causes of Stovetop fires and Burns



Leaving your cooking unattended

Unattended cooking is by FAR the leading factor of most kitchen fires. In fact, it was the cause of nearly 31 percent of all home fires and 53 percent of cooking fire-related deaths between 2014-2018.

Frying with oil

Anytime you fry or broil anything using oil, it needs continuous attention. Two-thirds (66 percent) of kitchen fires occurred after cooking oil, fat, grease, butter, and other cooking substances were ignited.

Setting the cooking temperature too high

You don't need to turn your stove or oven top all the way up to properly cook your food

Flammable compounds left near an open flame or other heating elements

Your kitchen is full of flammable objects. Napkins, paper towels, rags, food packages, cookbooks, recipe cards, and wooden utensils should never be left near or around your stove or oven top



Stove Sentry Cooking Safety Sensor
\$152.49

The sensor easily mounts under the vent hood or over-the-range microwave to detect when unsafe cooking temperatures are reached. Measuring the temperature and cooking surface, an alert sounds and red LED light flashes for early warning – reacting before a smoke alarm.

Overtime, the sensor learns your cooking habits as you acknowledge and disarm the alarm when preparing meals safely



BurnerAlert Stove Reminder Disc
\$79.99

The BurnerAlert emits audio and visual alerts anytime the stove knob has been turned "ON". The alerts are a preset sequence of audio beeps and flashing lights. The sequence of alerts will continue until the knob has been turned to the "OFF" position



Stove Fire Prevention by FireAvert
\$169.99

Shark Tank is plug-in ready. Your home will be protected from stove fires in minutes by simply plugging it into the back of your stove. There is always smoke before fire. This is why this fire deterrent is activated by your smoke alarm, cutting the power to your stove and oven

Stovetop types



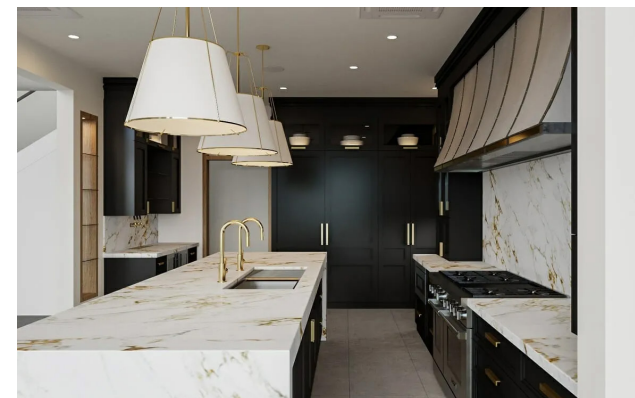
Gas, Electric and Induction



Interface of typical stove

2024 Kitchen Trends

1. The Green Revolution Embraces Eco-Friendly Materials
2. Integrated Smart Technology Dishes Up Convenience
3. More is More with Multifunctional Kitchen Islands
4. Statement Surfaces with Substance
5. Pretty Open Shelves Go Modular
6. Integrated Greenery for a Natural Touch
7. Ultra-Thin Profiles Grace Cabinets
8. Terrazzo Redux Refines Recycling
9. Seamlessly Integrated Sinks & Drainboards
10. Coastal Sage-Blue for Peaceful Chic
11. Burnished Hues Warm Kitchen Trends
12. Midnight Blue Brings Understated Luxury
13. Boho-Eclectic Fusion Injects Personality
14. Retro Revival for Timeless Style
15. Nature-Infused Hub for Good Feng Shui
16. Minimal Layered & Hidden Lighting
17. Sculptural Light Fixtures Demand Attention
18. Smart and Adaptive Lighting



Trends with kitchenware products

Sustainable and Eco-friendly Materials. There was a growing emphasis on sustainability in kitchenware, with a focus on products made from eco-friendly materials like bamboo, recycled glass, and stainless steel. Reusable and biodegradable options were also gaining popularity.

Minimalist and Scandinavian Design. Clean lines, simple shapes, and neutral color palettes were trending in kitchenware design. Scandinavian and minimalist influences were visible in items like dinnerware, flatware, and kitchen tools.

Matte Finishes. Matte finishes in various colors, especially matte black and matte white, were in vogue. These finishes gave kitchenware a sleek and modern appearance.

Multi-functional and Space-saving. With smaller living spaces and an emphasis on efficient use of space, kitchenware that served multiple functions and was designed for easy storage gained popularity. Collapsible, stackable, and nesting kitchen items were in demand.

Smart and Tech-Integrated Appliances. Kitchen appliances with smart technology, like Wi-Fi connectivity and app control, were becoming more common. These appliances allowed users to control and monitor cooking processes from their smartphones.

Vintage and Retro Styles. Nostalgia played a role in kitchenware trends, with a resurgence of interest in retro and vintage designs. Items like retro-inspired toasters and coffee makers were sought after.

Handcrafted and Artisanal Pieces. Handmade and artisanal kitchenware, including pottery and ceramic items, gained popularity for their unique, one-of-a-kind character.

Sustainable Storage Solutions. Sustainable and reusable storage options like silicone food storage bags and glass containers with bamboo lids became more prevalent as alternatives to single-use plastic.

Copper and Brass Accents. Warm metallics like copper and brass were popular choices for kitchenware accents, adding a touch of elegance and sophistication to the kitchen.

Air Fryers and Instant Pots. Multi-function appliances like air fryers and Instant Pots continued to be trendy due to their versatility and time-saving capabilities.

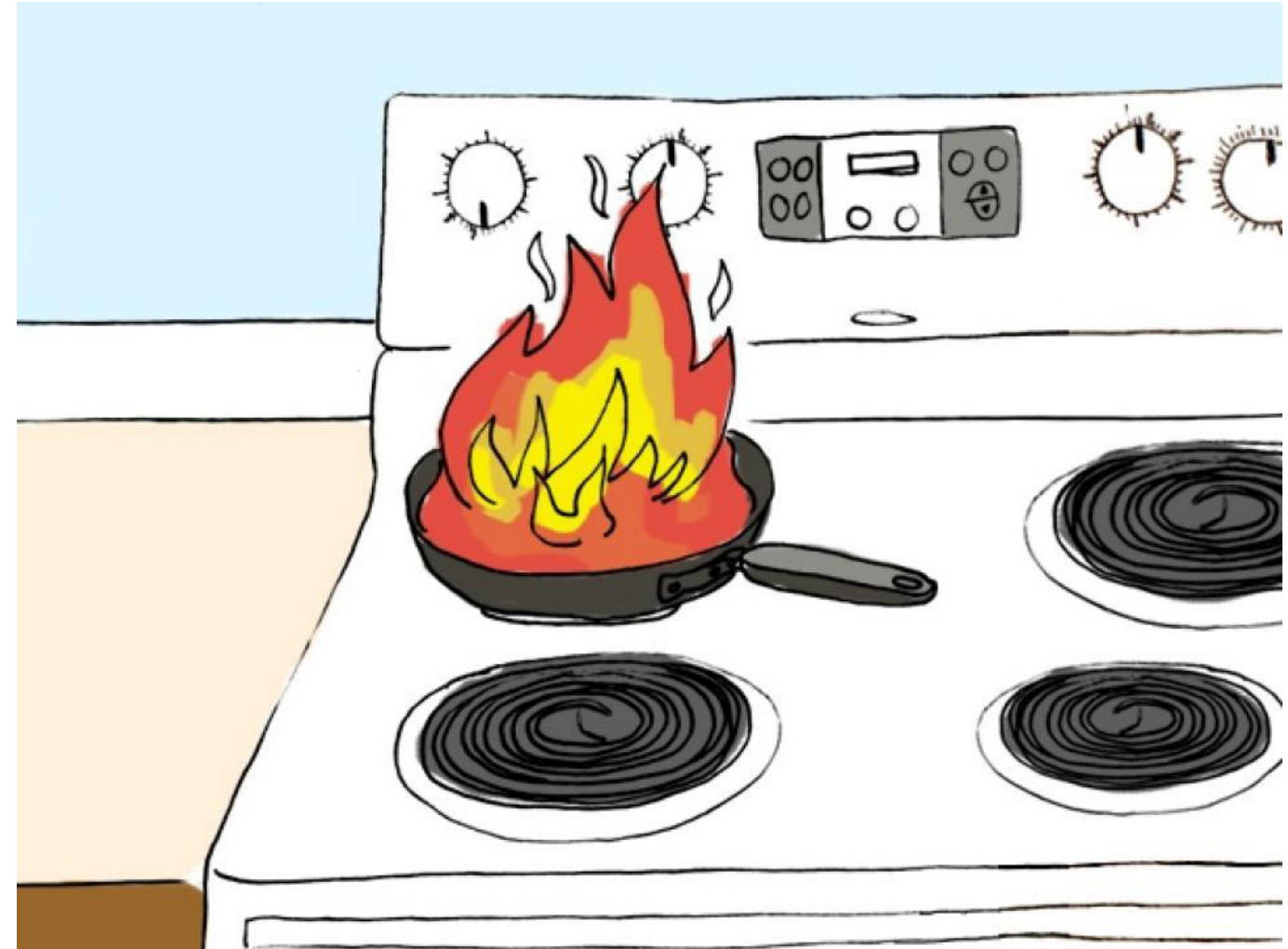
Stovetop Accessories





Problems to solve

Make it easier to cook on the stove safely, preventing, burns, fires, and ruined food.



Objective

To design and develop an innovative, user-friendly stovetop product that simplifies the cooking process, making it accessible and convenient for both beginners in the kitchen and busy individuals, particularly those with children or other distractions.

The goal is to offer a trendy and aesthetically pleasing kitchen tool that empowers users to prepare delicious and nutritious meals with ease, enhancing their cooking experience while promoting safety and efficiency.



Target Group

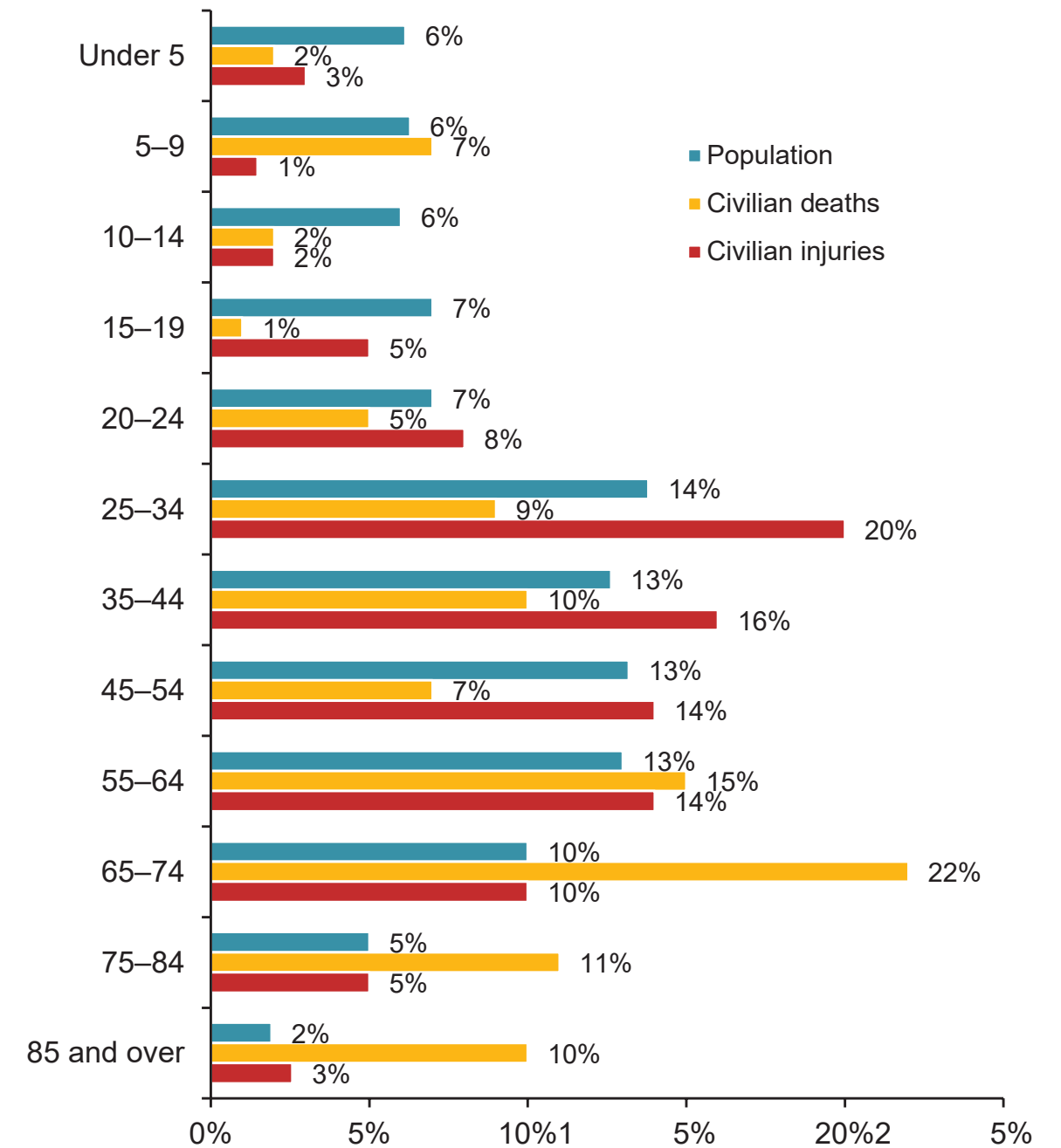
Young adults and new parents

These groups are most likely to be new to cooking or at higher risk of being distracted cooking

This age group of new parents (25-34) also has a higher risk for fires when cooking

Product can be a collection of tools needed to start your cooking journey. This will appeal to young adults are likely moving into their first place and want nice tools

Figure 6. Home cooking fire deaths and injuries by age group: 2017–2021



Why its better cook for yourself

Health and Nutrition. Cooking at home allows individuals to have control over the ingredients in their meals. They can make healthier choices, use fresh and high-quality ingredients, and avoid excessive salt, sugar, or preservatives that are often found in restaurant and processed foods.

Dietary Requirements. Cooking at home enables people with specific dietary restrictions or preferences (e.g., vegetarian, vegan, gluten-free) to prepare meals that meet their needs. It also allows individuals with food allergies to ensure their food is safe to consume.

Cost Savings. Preparing meals at home is generally more cost-effective than dining out or ordering takeout. Users can save money by buying ingredients in bulk, planning meals, and reducing food waste.

Portion Control. Cooking at home allows for better portion control, helping individuals manage their calorie intake and prevent overeating.

Creativity and Variety. Cooking offers a creative outlet, allowing individuals to experiment with different ingredients, flavors, and cuisines. They can tailor dishes to their personal taste and try new recipes.

Quality Time. Preparing and sharing meals with loved ones can strengthen bonds and provide quality time for families and friends to connect.

Independence. Cooking is a valuable life skill that promotes independence and self-sufficiency. It ensures individuals can provide for themselves and others when needed.

Improved Cooking Skills. As individuals gain confidence in the kitchen, they can develop cooking skills that are not only practical but also enjoyable. This can lead to a lifelong passion for cooking.

Cultural Preservation. Cooking traditional or family recipes helps preserve cultural and culinary heritage, passing down recipes and traditions to future generations.

Reduced Environmental Impact. Cooking at home reduces the need for disposable packaging, transportation, and energy consumption associated with dining out or ordering takeout.

Emergency Preparedness. Knowing how to cook is essential in emergencies when access to prepared foods may be limited. Being able to create meals from basic ingredients can be a valuable survival skill.

Control Over Food Safety. Cooking at home ensures proper food safety practices are followed, reducing the risk of foodborne illnesses.

Reduced Stress. Home-cooked meals can provide a sense of comfort and relaxation. The act of cooking can be therapeutic and reduce stress.

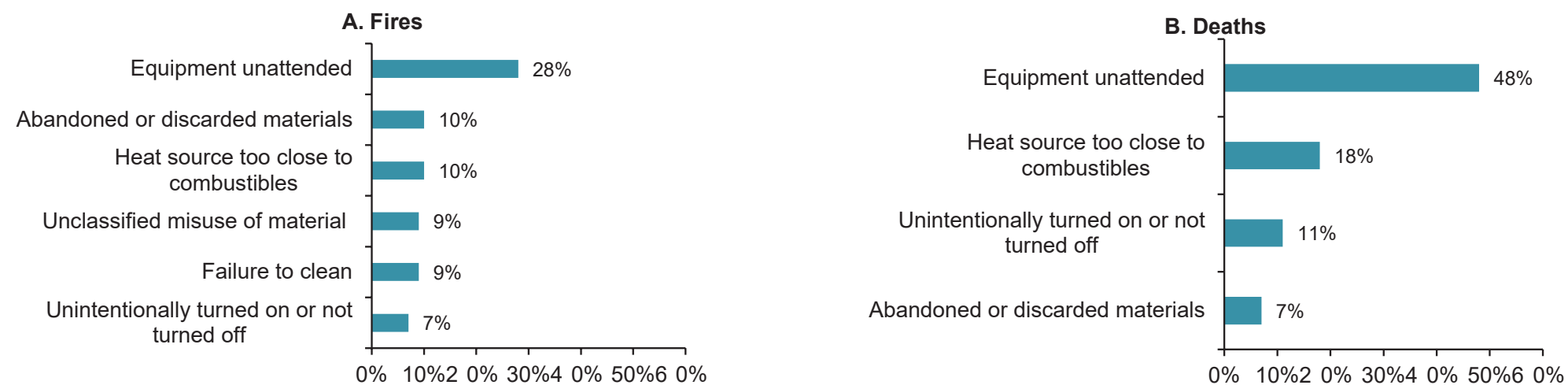
Hardest things to do when cooking on stove

Temperature Control. Maintaining the right cooking temperature is crucial. Stove burners can be too hot or too cool, and it can be challenging to get the temperature just right, especially for recipes that require precise control.

Timing. Timing is crucial in stovetop cooking. Overcooking or undercooking can affect the taste and texture of the food. It can be challenging to coordinate the cooking times of different ingredients in a recipe.

Multi-Tasking. Cooking multiple components of a meal simultaneously on the stovetop can be challenging. Juggling different pans and pots while ensuring each component is cooked correctly requires good multitasking skills.

Leading factors in home cooking fires 2017-2021



How are people learning to cook now



Family and Cultural Traditions. Many individuals learn to cook by observing and participating in family cooking traditions. They inherit recipes and techniques passed down through generations, helping them to develop culinary skills.

Home Cooking with Parents or Guardians. Parents or guardians often teach children the basics of cooking and kitchen safety by involving them in meal preparation from a young age. This hands-on learning is an essential foundation for many home cooks.

Cookbooks. Traditional cookbooks are still valuable resources for learning to cook. They provide recipes, cooking techniques, and step-by-step instructions. Many cookbooks cover a wide range of cuisines and skill levels.

Cooking Classes. Attending cooking classes, whether in person or online, is a structured and interactive way to learn cooking skills. Many culinary schools, community centers, and online platforms offer courses for beginners and experienced cooks.

Online Cooking Tutorials. The internet has revolutionized cooking education. Many websites, YouTube channels, and cooking blogs offer a vast array of cooking tutorials, from basic cooking techniques to complex recipes. Video tutorials, in particular, are popular for demonstrating cooking methods.

What do people need to learn when cooking



Knife Skills. Learning how to safely and efficiently use kitchen knives is fundamental. This includes techniques for **chopping, slicing, dicing, and mincing ingredients.**

Measuring. Accurate measuring of ingredients is essential for baking and cooking. **Familiarity with measuring cups and spoons** is a fundamental skill.

Basic Cooking Methods. Mastering basic cooking methods like **sautéing, baking, boiling, grilling, steaming, simmering, and roasting** is key to preparing a wide range of dishes.

Timing and Coordination. The ability to **manage the timing of multiple components** of a meal to ensure that everything is ready to serve simultaneously is crucial.

Seasoning. Learning how to **season food with salt, pepper, herbs, and spices** is critical to achieving balanced flavors in your dishes.

Cleanup. Proper cleanup and maintenance of a **clean kitchen are essential for safety and efficiency.**

Collection Cooking assistant products



KITCHEN MEASUREMENTS CONVERSION CHART

DRY WEIGHTS

| oz | 1/2 C | 1/4 C | 1/8 C | g | lb |
|--------|---------|-------|-------|--------|----|
| 1/2 oz | 1 Tbsp | 1/2 C | 15 g | - | - |
| 1 oz | 2 Tbsp | 1/4 C | 28 g | - | - |
| 2 oz | 4 Tbsp | 1/2 C | 57 g | - | - |
| 3 oz | 6 Tbsp | 3/4 C | 85 g | - | - |
| 4 oz | 8 Tbsp | 1 C | 115 g | 1/4 lb | - |
| 8 oz | 16 Tbsp | 2 C | 227 g | 1/2 lb | - |
| 12 oz | 24 Tbsp | 3 C | 340 g | 3/4 lb | - |
| 16 oz | 32 Tbsp | 4 C | 455 g | 1 lb | - |

EGG TIMER

| Setting | Time |
|---------|--------|
| Soft | 5 min. |
| Medium | 7 min. |
| Hard | 9 min. |

OVEN TEMP

| °F | °C | Gas Mark |
|-----|-----|----------|
| 500 | 260 | 10 |
| 475 | 240 | 9 |
| 450 | 230 | 8 |
| 425 | 220 | 7 |
| 400 | 200 | 6 |
| 375 | 190 | 5 |
| 350 | 180 | 4 |
| 325 | 170 | 3 |
| 300 | 150 | 2 |
| 275 | 140 | 1 |
| 250 | 120 | 1/2 |
| 225 | 110 | 1/4 |

For fan-forced ovens, reduce by 65°F | 20°C

LIQUID CONVERSIONS

| 1 GALLON | 1 QUART | 1 PINT | 1/2 CUP | 1 CUP |
|------------|----------|----------|---------|---------|
| 4 quarts | 2 pints | 2 cups | 4 Tbsp | 16 Tbsp |
| 8 pints | 4 cups | 16 fl oz | 2 fl oz | 8 fl oz |
| 16 cups | 32 fl oz | 470 mL | 12 tsp | 240 mL |
| 128 fl oz | 946 mL | | | |
| 3.8 liters | | | | |

LIQUID VOLUMES

| oz | 6 tsp | 2 Tbsp | 30 mL | 1/8 C | pt | qt |
|----------|--|---|--|--------------------------------------|-------------------------|--------|
| 1 oz | 2 Tbsp <td>4 Tbsp <td>60 mL <td>1/4 C <td>-</td> <td>-</td> </td></td></td> | 4 Tbsp <td>60 mL <td>1/4 C <td>-</td> <td>-</td> </td></td> | 60 mL <td>1/4 C <td>-</td> <td>-</td> </td> | 1/4 C <td>-</td> <td>-</td> | - | - |
| 2 oz | 4 Tbsp <td>8 Tbsp <td>120 mL <td>1/2 C <td>-</td> <td>-</td> </td></td></td> | 8 Tbsp <td>120 mL <td>1/2 C <td>-</td> <td>-</td> </td></td> | 120 mL <td>1/2 C <td>-</td> <td>-</td> </td> | 1/2 C <td>-</td> <td>-</td> | - | - |
| 2 1/2 oz | 5 Tbsp <td>10 Tbsp <td>150 mL <td>3/8 C <td>-</td> <td>-</td> </td></td></td> | 10 Tbsp <td>150 mL <td>3/8 C <td>-</td> <td>-</td> </td></td> | 150 mL <td>3/8 C <td>-</td> <td>-</td> </td> | 3/8 C <td>-</td> <td>-</td> | - | - |
| 4 oz | 8 Tbsp <td>16 Tbsp <td>240 mL <td>1/2 C <td>-</td> <td>-</td> </td></td></td> | 16 Tbsp <td>240 mL <td>1/2 C <td>-</td> <td>-</td> </td></td> | 240 mL <td>1/2 C <td>-</td> <td>-</td> </td> | 1/2 C <td>-</td> <td>-</td> | - | - |
| 5 1/2 oz | 11 Tbsp <td>22 Tbsp <td>330 mL <td>3/4 C <td>-</td> <td>-</td> </td></td></td> | 22 Tbsp <td>330 mL <td>3/4 C <td>-</td> <td>-</td> </td></td> | 330 mL <td>3/4 C <td>-</td> <td>-</td> </td> | 3/4 C <td>-</td> <td>-</td> | - | - |
| 6 oz | 12 Tbsp <td>24 Tbsp <td>360 mL <td>3/4 C <td>-</td> <td>-</td> </td></td></td> | 24 Tbsp <td>360 mL <td>3/4 C <td>-</td> <td>-</td> </td></td> | 360 mL <td>3/4 C <td>-</td> <td>-</td> </td> | 3/4 C <td>-</td> <td>-</td> | - | - |
| 8 oz | 16 Tbsp <td>32 Tbsp <td>480 mL <td>1 C <td>1/2 pt <td>1/4 qt </td></td></td></td></td> | 32 Tbsp <td>480 mL <td>1 C <td>1/2 pt <td>1/4 qt </td></td></td></td> | 480 mL <td>1 C <td>1/2 pt <td>1/4 qt </td></td></td> | 1 C <td>1/2 pt <td>1/4 qt </td></td> | 1/2 pt <td>1/4 qt </td> | 1/4 qt |
| 16 oz | 32 Tbsp <td>64 Tbsp <td>960 mL <td>2 C <td>1 pt <td>1/2 qt </td></td></td></td></td> | 64 Tbsp <td>960 mL <td>2 C <td>1 pt <td>1/2 qt </td></td></td></td> | 960 mL <td>2 C <td>1 pt <td>1/2 qt </td></td></td> | 2 C <td>1 pt <td>1/2 qt </td></td> | 1 pt <td>1/2 qt </td> | 1/2 qt |
| 32 oz | 64 Tbsp <td>128 Tbsp <td>1920 mL <td>4 C <td>2 pt <td>1 qt </td></td></td></td></td> | 128 Tbsp <td>1920 mL <td>4 C <td>2 pt <td>1 qt </td></td></td></td> | 1920 mL <td>4 C <td>2 pt <td>1 qt </td></td></td> | 4 C <td>2 pt <td>1 qt </td></td> | 2 pt <td>1 qt </td> | 1 qt |

Dash = 1/16 tsp
Pinch = 1/8 tsp



Tools needed

Chef's Knife. A good-quality chef's knife is one of the most important tools in the kitchen. It's versatile and can be used for chopping, slicing, and dicing.

Cutting Board. A sturdy cutting board is essential to protect your countertops and provide a stable surface for chopping and slicing.

Paring Knife. A paring knife is useful for tasks like peeling, trimming, and small precision cuts.

Measuring Cups and Spoons. These are necessary for accurately measuring ingredients for recipes.

Mixing Bowls. Have a set of mixing bowls in various sizes for mixing, prepping ingredients, and serving.

Saucepan. A small to medium-sized saucepan is handy for heating sauces, soups, and cooking grains.

Skillet or Frying Pan. A skillet with a non-stick surface is versatile for sautéing, pan-frying, and making omelets.

Pot with Lid. A medium-sized pot with a lid is essential for boiling pasta, making soups, and simmering.

Baking Sheet. Useful for roasting vegetables, baking cookies, and other oven tasks.

Tongs. Tongs are helpful for flipping food in pans, grilling, and serving.

Whisk. Whisks are used for mixing, blending, and whipping ingredients.

Wooden Spoon or Spatula. Wooden utensils are gentle on cookware and can be used for stirring, flipping, and serving.

Kitchen Shears. Useful for trimming herbs, cutting parchment paper, and other kitchen tasks.

Corkscrew and Bottle Opener. Handy for opening wine bottles and bottled beverages.

Colander. A colander is essential for draining pasta, vegetables, and other ingredients.

Can Opener. If you use canned ingredients, a can opener is necessary.

Grater. A grater is used for shredding cheese, vegetables, and citrus zest.

Peeler. A vegetable peeler is handy for peeling potatoes, carrots, and other produce.

Food Thermometer. A food thermometer is crucial for checking the internal temperature of meats and ensuring they are properly cooked.

Meat Tenderizer. Useful for tenderizing tough cuts of meat.

Timer. A kitchen timer helps you keep track of cooking times and prevent overcooking.

Ladle. A ladle is used for serving soups, stews, and sauces.

Canister Set. Canisters help you keep frequently used ingredients like flour, sugar, and coffee organized and easily accessible.

Kitchen Scale. A kitchen scale is useful for accurately measuring ingredients by weight.

Pepper Mill and Salt Shaker. Freshly ground pepper and salt can enhance the flavor of your dishes.

Designing the smart kitchen

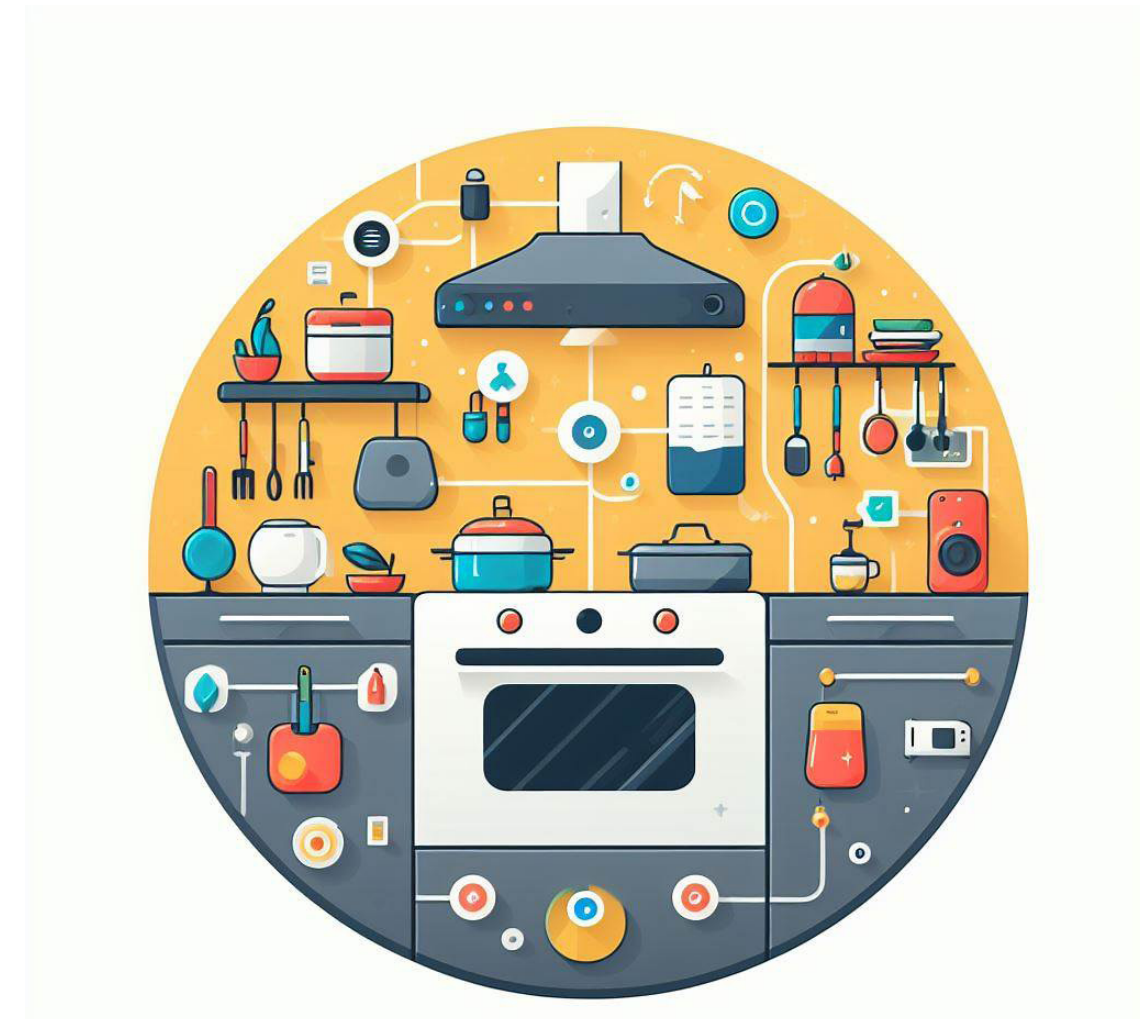
Create a device to act as a cooking assistant that will guide you through the cooking process, by correcting mistakes, telling you tool is needed, and keeping you safe.

Emphasis on traditional cooking methods, stovetop and oven

Focusing first on

Basic Cooking Methods: Mastering basic cooking methods like sautéing, baking, boiling, grilling, steaming, simmering, and roasting is key to preparing a wide range of dishes.

Timing and Coordination: The ability to manage the timing of multiple components of a meal to ensure that everything is ready to serve simultaneously is crucial.



Using AI to guide

The ai technology can do various things.

- Guide through recipes
- Tell what tool to use next
- How to use tool correctly
- Make temperature suggestions and corrections
- Correct mistakes
- Learn your kitchen and preferences
- Make suggestions such as recipes or methods

Data collection Methods

- Temperature gauge
- Camera
- Measurements



AI Ideation

