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**Programme Area:** Smart Systems and Heat

**Project:** WP1 Consumer Insights

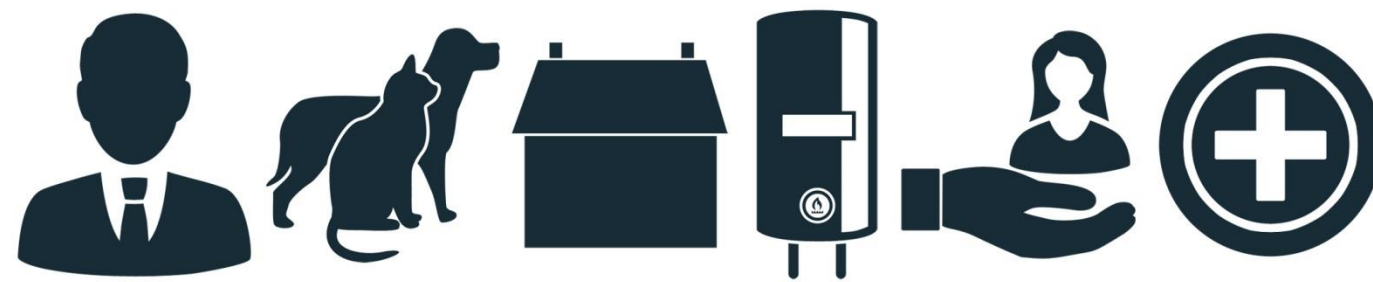
**Title:** Household Heating Design Aids - Visual Toolkit

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**Context:**

This project will provide insights into consumer behaviour relating to heat decisions. The project will be made up of four small pieces of consultancy work looking at specific issues:

- Consumer Response & Behaviour Analysis
- Literature Review Personality and Risky Heat Decisions
- Household Heating Design Aids
- Segmentation Analysis



## Consumer Insights Toolkit

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**Instructions:**

**Step 01:**

Start to build each permanent occupant by adding 'occupant icons' and 'attribute icons' to each box on the right.

**Step 02:**

Verbalise, discuss and agree on the aspects of each attribute that you think are important, noting them down in the spaces provided. If you don't think an attribute applies to the occupant e.g. they don't really have any individual priorities, leave the box blank.

**Step 03:**

Think about and record whether you think each icon or attribute is 'evidence' or 'assumption' based - do you have evidence that the attribute is important or are you just assuming it could have impact? Circle the most relevant square in top right of each box using the key below.

**Step 04:**

Think about how important each icon and attribute is to the overall issue you are interested in. Circle the most relevant square in the top right of each box using the key below.

**Step 05:**

Finally, note any links between the attributes that impact on each other at the base of each box.

**Attribute Evidence Key:**

- Evidence Based
- Assumption Based

**Attribute Importance Key:**

- High Importance
- Medium Importance
- Low Importance

Who are they? ■ ■ ■ ■ ■

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Attribute could also impact on:

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Are they employed? ■ ■ ■ ■ ■

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Attribute could also impact on:

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What is their qualification level? ■ ■ ■ ■ ■

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Attribute could also impact on:

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What do they earn? Are they willing to pay? ■ ■ ■ ■ ■

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Attribute could also impact on:

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How do they pay for their energy? ■ ■ ■ ■ ■



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Attribute could also impact on:

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What is their thermal sensitivity level? ■ ■ ■ ■ ■

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Attribute could also impact on:

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What do they individually prioritise? ■ ■ ■ ■ ■

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Attribute could also impact on:

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Are they proactive, reactive or 'hands off'? ■ ■ ■ ■ ■

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Attribute could also impact on:

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What relevant health concerns do they have? ■ ■ ■ ■ ■

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Attribute could also impact on:

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How many showers & baths do they have? ■ ■ ■ ■ ■



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Attribute could also impact on:

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What pets do they have? ■ ■ ■ ■ ■

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Attribute could also impact on:

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Anything else that is important to note? ■ ■ ■ ■ ■

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Attribute could also impact on:

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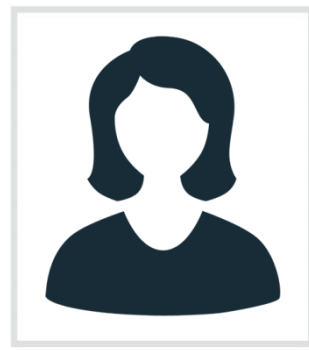
Younger Male



Younger Female



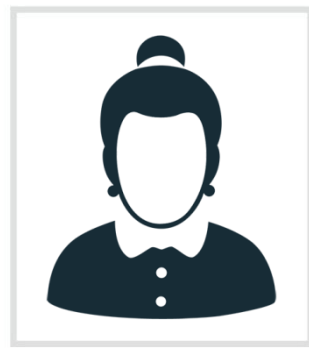
Middle-Aged Male



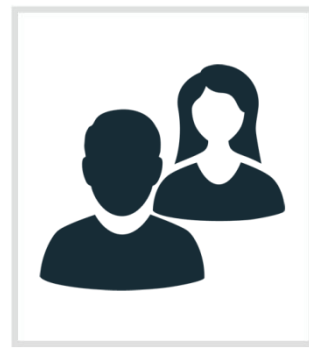
Middle-Aged Female



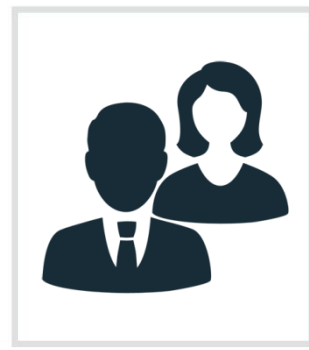
Older Male



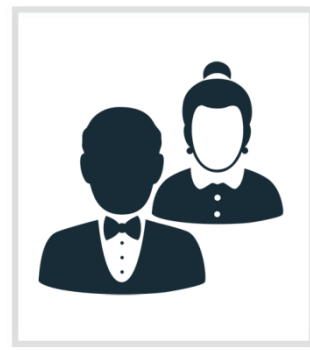
Older Female



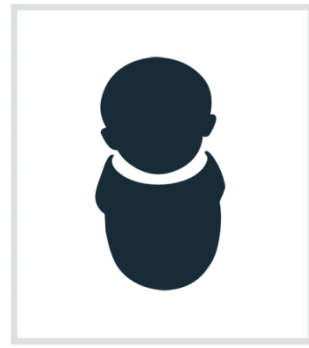
Younger Couple



Middle-Aged Couple



Older Couple



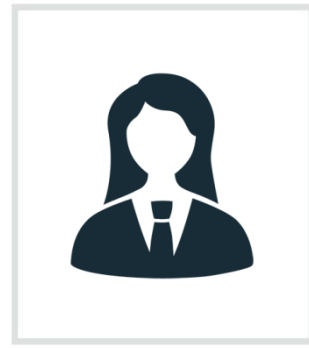
Baby



Toddler



School Age Male



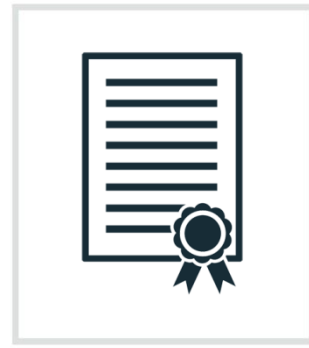
School Age Female



Pet



Occupation



Qualification Level



Income / Willingness to Pay (low)



Income / Willingness to Pay (mid-low)



Income / Willingness to Pay (mid-high)



Income / Willingness to Pay (high)



Fuel Poverty



Thermal Sensitivity: Low



Thermal Sensitivity: High



Individual Priority: Care



Individual Priority: Reduce Costs, CO2, Energy



Individual Priority: Hygiene



Individual Priority: Peace of Mind



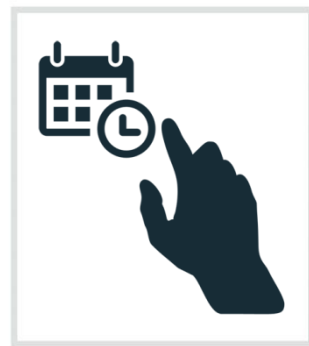
Individual Priority: Thermally Comfortable



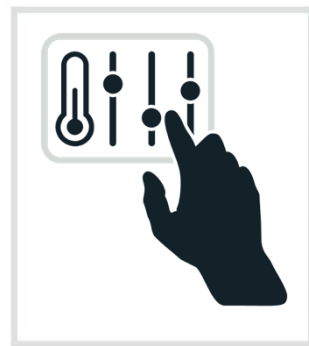
Individual Priority: Social Norms



Individual Priority: Health Concerns



Proactive Heating 'Planner'



Reactive Heating 'Controller'



Proactive Boiler 'Servicer'



Reactive Boiler 'Fixer / Replacer'



**Instructions:**

**Step 01:**

Start to build a house and current central heating system by adding 'house icons' and 'house attribute icons' to each box on the right.

**Step 02:**

Verbalise, discuss and agree on the aspects of each attribute that you think are important, noting them down in the spaces provided. If you don't think an attribute applies to the house or central heating system e.g. there is no hot water tank, leave the box blank.

**Step 03:**

Think about and record whether you think each icon or attribute is 'evidence' or 'assumption' based - do you have evidence that the attribute is important or are you just assuming it could have impact? Circle the most relevant square in top right of each box (see key).

**Step 04:**

Think about how important each icon and attribute is to the overall issue you are interested in. Circle the most relevant square in the top right of each box (see key).

**Step 05:**

Finally, note any links between the attributes that impact on each other at the base of each box. Do any of the occupants attributes impact on the house and heating system attributes?

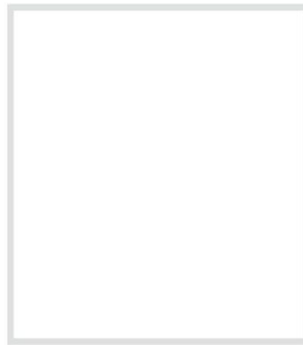
**Attribute Evidence Key:**

- Evidence Based
- Assumption Based

**Attribute Importance Key:**

- High Importance
- Medium Importance
- Low Importance

What type of house is it?  
How old is it? ■ ■ ■ ■ ■



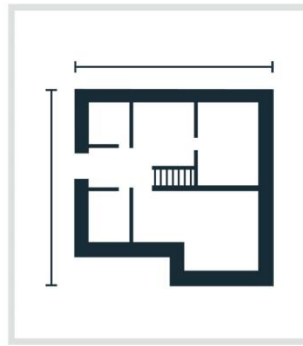
Attribute could also impact on:

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What size is the house? ■ ■ ■ ■ ■



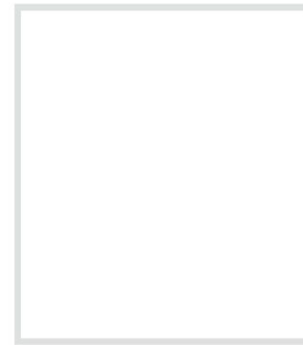
Attribute could also impact on:

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What is the state of its thermal loss? ■ ■ ■ ■ ■



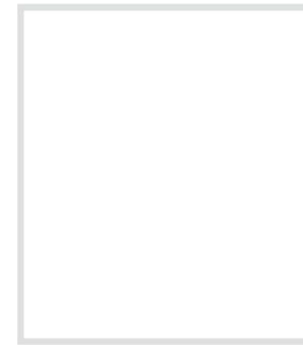
Attribute could also impact on:

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What is the state of its thermal mass? ■ ■ ■ ■ ■



Attribute could also impact on:

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What fabric-based energy saving features are there? ■ ■ ■ ■ ■



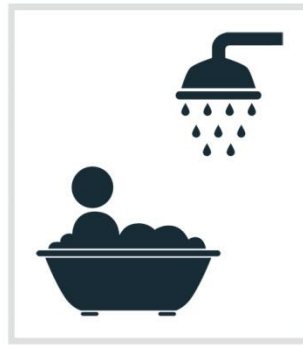
Attribute could also impact on:

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How many showers or bathrooms are there? ■ ■ ■ ■ ■



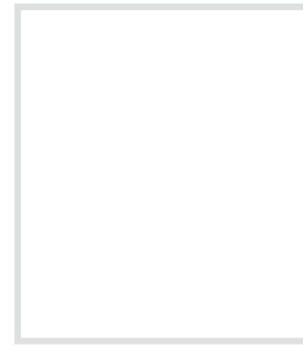
Attribute could also impact on:

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Is it on or off the gas grid? ■ ■ ■ ■ ■



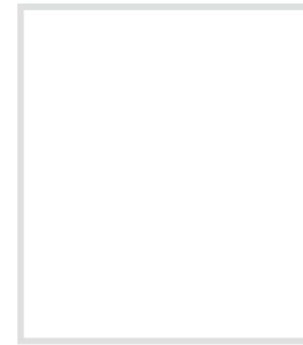
Attribute could also impact on:

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What type is its primary central heating system? ■ ■ ■ ■ ■



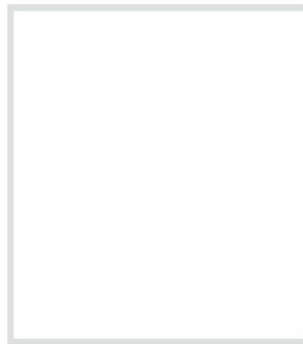
Attribute could also impact on:

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How many radiators are there? Total output? ■ ■ ■ ■ ■



Attribute could also impact on:

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How is the hot water heated? ■ ■ ■ ■ ■



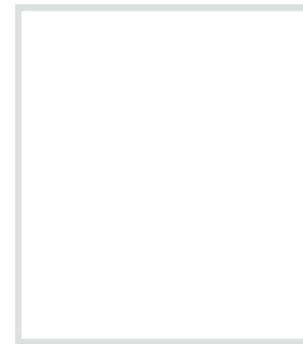
Attribute could also impact on:

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Are there any renewable energy sources? ■ ■ ■ ■ ■



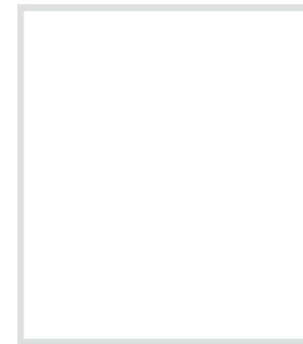
Attribute could also impact on:

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Anything else that is important to note? ■ ■ ■ ■ ■



Attribute could also impact on:

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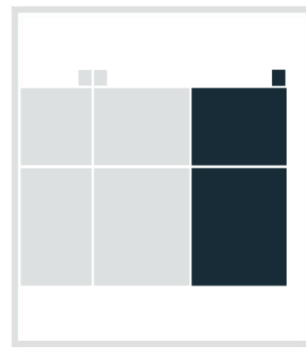
Detached



Semi-Detached



Bungalow



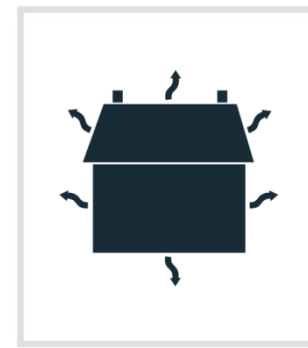
End-Terraced



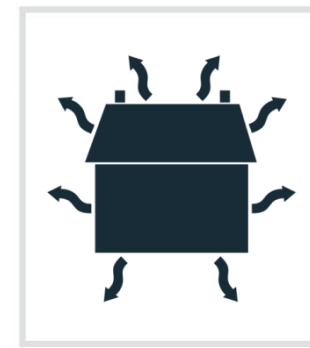
Mid-Terraced



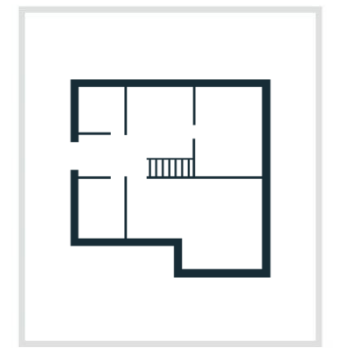
Flat / Apartment



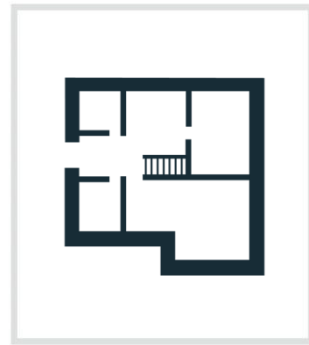
Thermal Loss: Airtight



Thermal Loss: Leaky



Thermal Mass:  
Lightweight



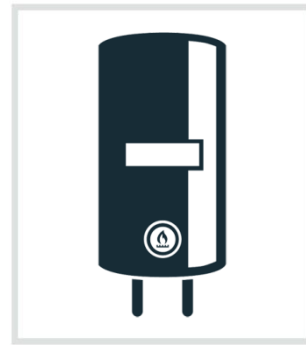
Thermal Mass:  
Heavyweight



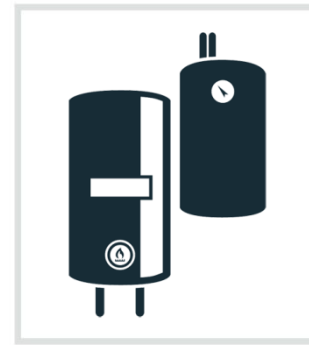
On Gas Grid



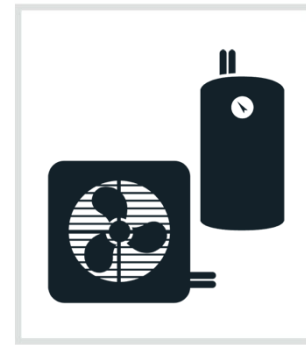
Off Gas Grid



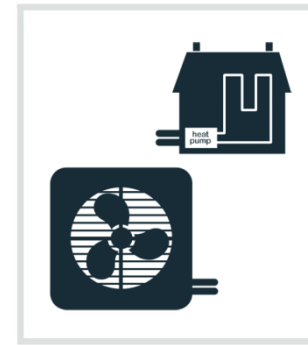
Boiler (no tank)



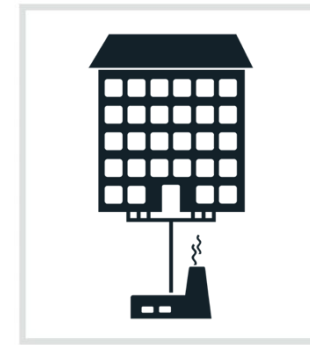
Boiler (with tank)



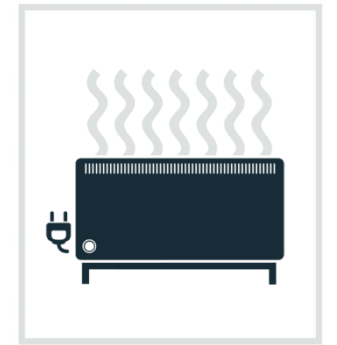
Airsource (with tank)



Hybrid Heat Pump



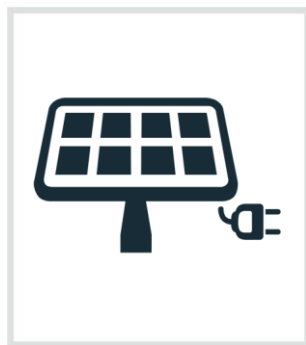
District Heating



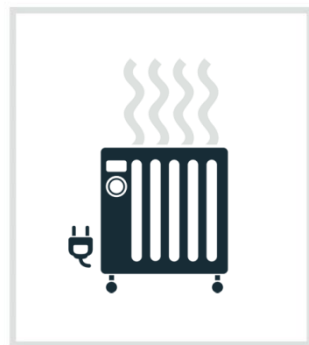
Storage Heaters



Number of Radiators



Renewables



Fixed / Portable Local  
Heating / Cooling Strategies

## Instructions:

### Step 01:

Add your floor plan to the blank space to the right.

### Step 02:

There are a number of things you can think about to help you understand the property and how it is used. We've included some examples and likely tasks below to get you going but be sure to refer back to the 'instructions' for more help with the floor plan tasks.

For example, think about the direction the houses faces, and whether it experiences any solar gain or strong winds. Perhaps indicate North on the floor plan and draw a sun or some 'gusts of wind' to show solar gain or colder areas.

You could also consider where the components of the central heating system are located throughout the property or where the original gas and electricity meters are located.

We've added a key with some 'blanks' so additional important things can be labelled and added to the floor plan.

### Key:



North



Solar Gain



Incoming Strong Winds



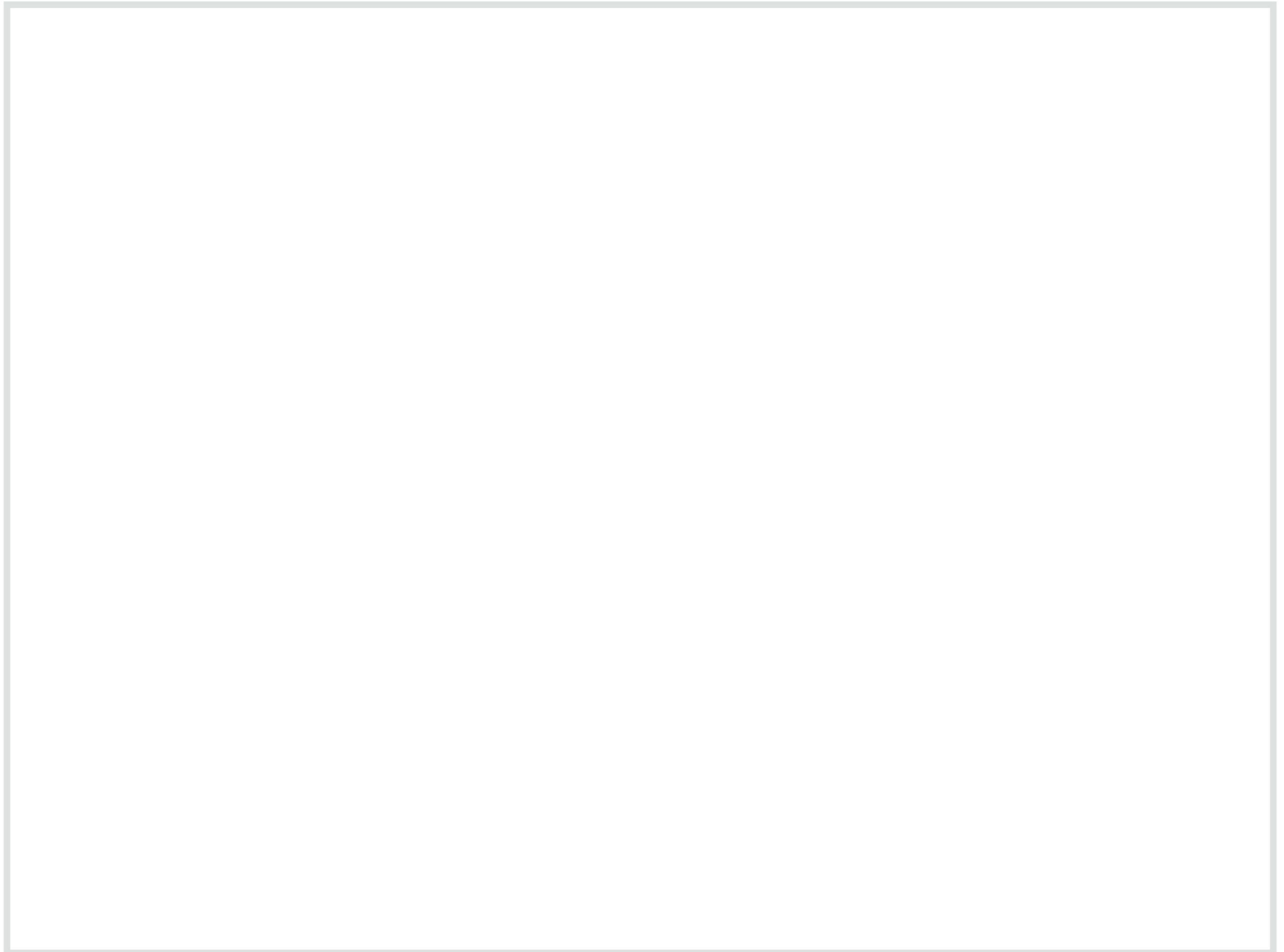
Gas Meter



Electricity Meter



Wifi Router







**Instructions:**

Use this template to explore the your 'hunt statement' across a range of different days.

**Step 01:**

Think about what days you want to look more closely into and what kinds of things might be happening. Is it a laundry day? A day when everyone is in or out? The day before a family go on holiday? You can note the type of day to the right at the top of the each timeline.

**Step 02:**

Once you have chosen your 'days of interest', use the key and blank spaces to the right to note down what you are exploring in more detail on each type of day (e.g. when an occupant is in or when the heating is on). Using the timeline chart what is happening throughout the day. You can do the same for any number of occupants, or anything that might impact on your 'hunt statement' during a range of different days.

**Step 03:**

Use the insights box at the bottom to capture anything important that comes from your explorations and discussions.

You can also refer back to the 'instructions' for more detail on how to use this template effectively.

P.S. Don't forget to give some context - note what types of days you are exploring!

Key:	Type of Day:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
<input type="checkbox"/>	E.g. When a certain occupant is in...																							
<input type="checkbox"/>																								
<input type="checkbox"/>																								
<input type="checkbox"/>																								

Key:	Type of Day:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
<input type="checkbox"/>																								
<input type="checkbox"/>																								
<input type="checkbox"/>																								
<input type="checkbox"/>																								

Key:	Type of Day:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
<input type="checkbox"/>																								
<input type="checkbox"/>																								
<input type="checkbox"/>																								
<input type="checkbox"/>																								

**Insights:**

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**Instructions:**

Use this template to explore the your 'hunt statement' across a particular month...

**Step 01:**

Think about what month you want to look more closely into and what kinds of things might be happening during that month. Which days are people out at work? When is the laundry done? Do the any of the occupants go on holiday for a short break? You can also note what day each box refers to (i.e. Monday) in the bars running along the top of the 'month' grid.

**Step 02:**

Note the type of things that happen on different days on the squares, like a calendar. You can also colour code the days based on what type of days you think they are by using the key to the right of the page. Add a colour to one of the blank boxes and note next to it what it represents (e.g. a weekend day, or 'work at home day'). You can do the same for any number of occupants, or anything that might impact on your 'hunt statement' during a particular month.

**Step 03:**

Use the insights box at the bottom to capture anything important that comes from your explorations and discussions.

**Step 04:**

Once you have created an impression of a 'typical' month you might decide you need to focus in on a particular day (e.g. a day when a relative comes to stay).

You can also refer back to the 'instructions' for more detail on how to use this template effectively.

P.S. Don't forget to give some context - note what month and year you are exploring!

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	<b>Month:</b>  <b>Year:</b>			

**Key:**

<input type="checkbox"/>	E.g. Short break on holiday...
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
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<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

**Insights:**

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**Instructions:**

Start to explore a year in the life of your occupants or rooms in their house using this template.

**Step 01:**

Think about what kinds of things might be happening during a particular year. Do any of the occupants go on holiday? When do they start putting their heating on? When are the school holidays when the children are likely to be at home more?

**Step 02:**

You can start to note or draw out the type of things that happen on different days on the squares, like a calendar. You can also colour code the days, weekends, weeks and months based on what is happening using the key across the centre of the page. Add a colour to one of the blank boxes and note next to it what it represents (e.g. a holiday or 'a work away from home period'). You can do the same for any number of occupants, activities or things they or their house might experience.

**Step 03:**

Use the insights box at the bottom to capture anything important that comes from your explorations and discussions.

**Step 04:**

Once you have created an impression of 'a year in the life of', you might decide you need to focus in on a particular day (e.g. the day when the family go on holiday) and then explore this further using the 'day in the life of' template.

You can also refer back to the 'instructions' for more detail on how to use this template effectively.

P.S. Don't forget to give some context - note what year it is!

Year:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jan
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29			Feb
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mar
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Apr
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	May
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Jun
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jul
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aug
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Sep
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Oct
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Nov
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Dec

**Key:**  E.g. Six weeks holidays...  \_\_\_\_\_  \_\_\_\_\_

\_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

**Insights:**

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**Instructions:**

Use this template to explore the your 'hunt statement' across different months.

**Step 01:**

Think about which months you want to look more closely into and what kinds of things might be happening during those months. Are you interested in comparing a summer and winter month? Or a month where an occupant was working and a month when they were off? You can also note what months you are exploring and what day each box refers to (e.g. Monday) in the bars running along the top of the 'month' grids and in the boxes provided.

**Step 02:**

Note the type of things that happen on different days during different months on the squares. You can also colour code the days based on what type of days you think they are by using the key to the right of the page. Add a colour to one of the blank boxes and note next to it what it represents (e.g. a weekend day, or a day someone visits). You can do the same for any number of occupants, or anything that might impact on your 'hunt statement' across two months.

**Step 03:**

Use the insights box (bottom right) to capture anything important that comes from your explorations and discussions.

**Step 04:**

Once you have explored two months you might decide you need to focus in on particular days (e.g. a cold day and a warmer day) using the 'day in the life of' template.

You can also refer back to the 'instructions' for more detail on how to use this template effectively.

P.S. Don't forget to give some context - note what months and years you are exploring!

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	Month: <input type="text"/>			
			Year: <input type="text"/>			

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	Month: <input type="text"/>			
			Year: <input type="text"/>			

**Key:**

<input type="checkbox"/>	E.g. Short break on holiday...
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
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<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

**Insights:**

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**Instructions:**

Use this template to explore the your 'hunt statement' across different years.

**Step 01:**

Think about which years you want to look more closely into and what kinds of things might be happening during those years that are relevant to your 'hunt statement'. E.g. are you interested in comparing a year with a cold winter against one that wasn't as cold? Begin by noting what years you are exploring (below).

**Step 02:**

Note the type of things that happen on different days during different years on the squares. You can also colour code the days based on what is happening using the key to the right of the page. Add a colour to one of the blank boxes and note next to it what it represents (e.g. a 2 week holiday, or when something like a boiler breaks). You can do the same for any number of occupants, or anything that might impact your 'hunt statement' across two years.

**Step 03:**

Use the insights box (bottom right) to capture anything important that comes from your explorations and discussions.

**Step 04:**

Once you have explored two years you might decide you need to focus in on particular days (e.g. a cold day and a warmer day) using the 'day in the life of' template.

You can also refer back to the 'instructions' for more detail on how to use this template and don't forget to give some context - note what years you are exploring!

Year 1:

Year:2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jan
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29			Feb
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mar
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Apr
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	May
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Jun
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jul
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aug
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Sep
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Oct
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Nov
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Dec

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jan
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29			Feb
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mar
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Apr
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	May
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Jun
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jul
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aug
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Sep
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Oct
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Nov
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Dec

**Key:**

E.g. 2 week holiday

**Key:**

E.g. 2 week holiday

**Insights:**

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\_\_\_\_\_

**Instructions:**

**Step 01:**

Start to build each visitor by adding 'visitor icons' and 'attribute icons' to each box on the right.

**Step 02:**

Verbalise, discuss and agree on the aspects of each attribute that you think are important, noting them down in the spaces provided. If you don't think an attribute applies to the visitor e.g. they aren't really thermally sensitive, leave the box blank.

**Step 03:**

Think about and record whether you think each icon or attribute is 'evidence' or 'assumption' based - do you have evidence that the attribute is important or are you just assuming it could have impact? Circle the most relevant square in top right of each box using the key below.



**Step 04:**

Think about how important each icon and attribute is to the overall issue you are interested in. Circle the most relevant square in the top right of each box using the key below.

**Step 05:**

Finally, note any links between the attributes that impact on each other at the base of each box.

**Attribute Evidence Key:**

-  Evidence Based
-  Assumption Based

**Attribute Importance Key:**

-  High Importance
-  Medium Importance
-  Low Importance

Who are they?



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Attribute could also impact on:

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Are they employed?



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Attribute could also impact on:

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What is their qualification level?



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Attribute could also impact on:

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What is their thermal sensitivity level?



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Attribute could also impact on:

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What do they individually prioritise?



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Attribute could also impact on:

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Are they proactive or reactive?



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Attribute could also impact on:

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What relevant health concerns do they have?



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Attribute could also impact on:

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How many showers & baths during their visit?



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Attribute could also impact on:

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What pets have they brought with them?



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Attribute could also impact on:

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How long do they stay for?





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Attribute could also impact on:

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Anything else that is important to note?



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Attribute could also impact on:

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Anything else that is important to note?



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Attribute could also impact on:

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Younger Male



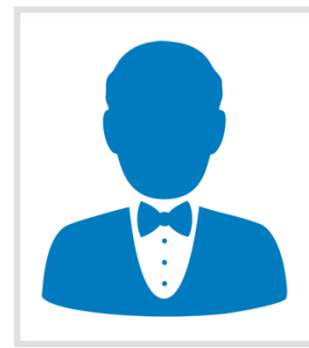
Younger Female



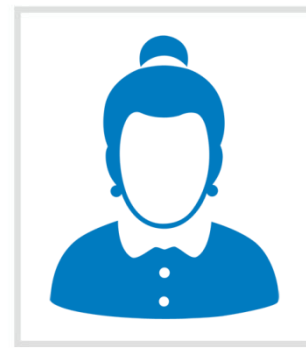
Middle Aged Male



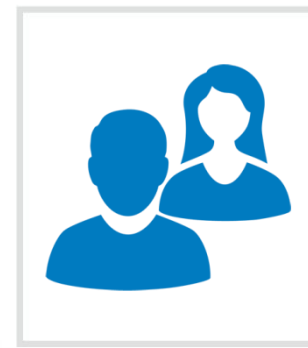
Middle Aged Female



Older Male



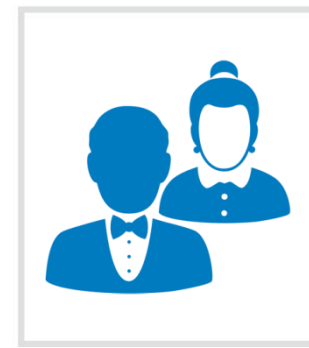
Older Female



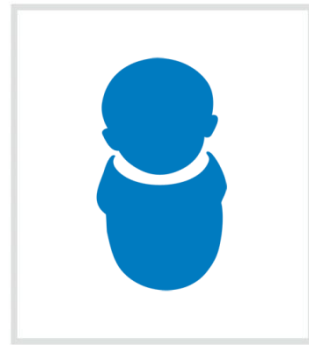
Younger Couple



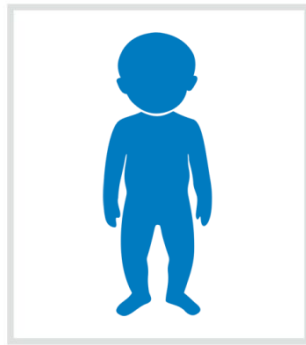
Middle Aged Couple



Older Couple



Baby



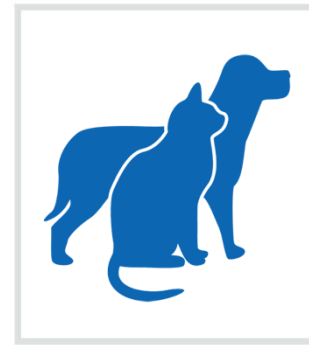
Toddler



School Age Male



School Age Female



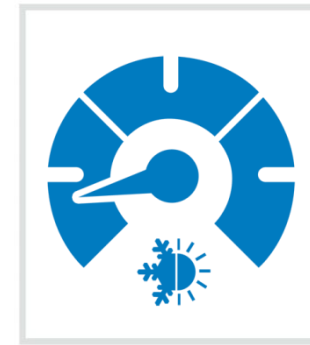
Pet



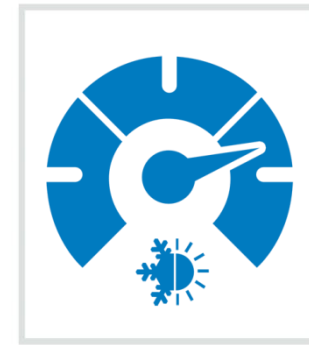
Occupation



Qualification Level



Thermal Sensitivity:  
Low



Thermal Sensitivity:  
High



Individual Priority:  
Care



Individual Priority:  
Reduce Costs, CO2, Energy



Individual Priority:  
Hygiene



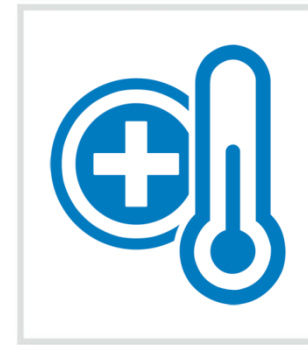
Individual Priority:  
Peace of Mind



Individual Priority:  
Thermally Comfortable



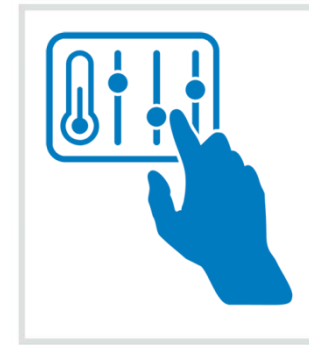
Individual Priority:  
Social Norms



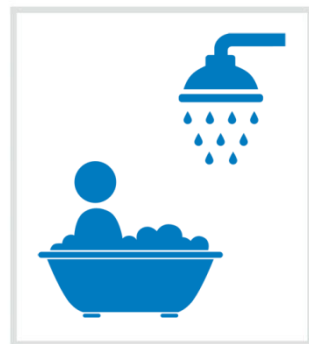
Individual Priority:  
Health



Proactive Heating  
'Planner'



Reactive Heating  
'Controller'



Number of Showers/  
Baths Taken

'Social Situation'

'Constraints imposed by socio-technical situation...'

'Technical Situation'

'Key outcomes to think about...'