ANSWER SHEET

1. Answer the questions provided

Watch the video and answer the questions provided:

A. What is the carport roof made of? **(Solar panels)**
B. What is the difference between this house and most of the houses in Austin, Texas that have solar panels? **(The solar panels are used as a building material)**
C. What is a Solar panel made of? **(Solar cells)**
D. Where is the unused electricity go? **(Lithium-ion battery)**
E. What are the main factors that lower the power generated by solar panels? **(Clouds, season, shade)**
F. Which household appliances use the most energy according to the expert? **(non-LED lights, air conditioners, hot water)**
G. Where are the main spikes in the graph of energy consumption coming from? **(Laundry and shower)**
H. What our future homes will make us aware of? **(How our actions influence the usage of electricity)**

2. Fill in the gaps

Fill in the gaps with the words provided below:

Carbon, certification, elements, freezing, insulation, occupants, reduction, temperature, ventilation.

_____

What is Passivhaus? The gold standard in energy efficiency

Passivhaus, literally passive house in English, refers to buildings created to rigorous energy efficient design standards so that they maintain an almost constant **temperature** (1).

Passivhaus buildings are so well constructed, insulated and ventilated that they retain heat from the sun and the activities of their **occupants** (2), requiring very little additional heating or cooling.

Where did Passivhaus come from?

The Passivhaus Institute in Germany developed the energy efficient building principles, following a research project to investigate why low energy buildings often didn't deliver on their expected energy saving potential.

Builders of energy efficient homes and buildings can apply to have their buildings certified by the Passivhaus Institute. To achieve the **certification** (3), you must use the specific Passivhaus planning system, which allows you to adjust your design until your property reaches the required energy efficient standard.

While we're not all in the position of creating a new home from scratch, we can apply the principle of reducing energy demand in our homes through energy efficient design to older homes too. Here, we find out how Passivhaus buildings function and offer some tips on how to improve the energy efficiency of your home.

How are Passivhaus properties built?

The methodology behind a Passivhaus building differs from some **carbon** (4) neutral buildings, which use a combination of energy efficiency and clean energy generation to offset any energy use.

A Passivhaus building aims not to use as much energy in the first place by being effectively sealed against the **elements** (5).

The actual construction methods of Passivhaus buildings will vary but they will all have some features in common, including:

- Far greater insulation than typical UK properties.
- Triple glazing, with insulated frames.
- Impressive airtightness levels (around 20x more than a standard build).
- Mechanical **ventilation** (6), with heat recovery system attached.

Do you need to heat a Passivhaus?

A Passivhaus building aims to reduce the need to heat the building to such an extent that you don't need a conventional heating system. However, there will be some heating mechanism attached to the property – often it takes the form of a small heating element attached to the ventilation system.

These use very little energy and usually only kick in once the outside temperature drops below **freezing** (7). A passive house will also need to have a mechanism to heat water – it could be solar heating or an air source heat pump – both of which produce no emissions at the point of use.

Can you retrofit a building to Passivhaus standards?

Though the energy efficient Passivhaus building technique has higher upfront costs, it has significant cost saving and energy security implications – something that's of interest to local authorities, housing associations and individuals who are motivated to create sustainable buildings.

You can retrofit older properties so that they function along the same principles, although it's not usually possible to reach the same levels of **insulation** (8) as a specially designed property.

The Passivhaus Institute does have a separate certification that recognises appropriate retrofitting work, which has a lower threshold than for a full Passivhaus building.

What lessons can we learn from the Passivhaus principle?

If the UK is to reach its emission **reduction** (9) targets, it will need to apply some of the lessons from Passivhaus buildings to the wider housing stock.

While most of us are unlikely to be able to create fully functioning Passivhaus type buildings, we can insulate and ventilate our homes effectively, to ensure that they are as energy efficient as possible – helping to lower energy costs in the long-term.

If you've been inspired to make improvements to your property, check out our advice on home insulation or take a look at whether a low carbon heating system, such as solar water or a heat pump, could work for you.

Source: https://energysavingtrust.org.uk/passivhaus-what-you-need-know/.

3. Match the words

After reading the text, match the words in separate columns

1. Home	A. Pump
2. Heat	B. Efficiency
3. Passive	C. Insulation
4. Solar	D. Neutral
5. Energy	E. House
6. Carbon	F. Heating

Answers: 1c; 2a; 3e; 4f; 5b; 6d.

4. Answer the questions provided

After reading the text, answer the questions provided:

A. What parameter is maintained constant in a Passivhaus? **(Temperature)**
B. Do they require any heating? **(Yes)**
C. Who can apply to get the certificate of a Passivhaus? **(Builders of homes and buildings)**

D. Is it possible to retrofit and old house into a passive house? **(Yes)**
E. Is it possible to get a certificate for a retrofitted house? **(Yes)**
F. What parameter of passive house is far greater than a typical UK household? **(Insulation)**
G. What is considered low carbon heating system? **(Solar water and heat pump).**