Higher
Computing Science

Computer Systems

Environmental Impact

Name:_____

Contents

Intelligent Systems

An intelligent system has the ability to act on behalf of a user. In the past human control was always necessary to use systems however smart heating and home systems now have the ability to allow users to establish settings by using an app or computer software.

The systems can use these settings and can often make decisions without further human interaction. They can make use of external factors to make decisions. These external factors include weather, time of day or temperature.

Heating systems

Smart heating systems use a variety of ways to control the amount of heat required in our homes. Using activity sensors, some smart systems learn the temperatures that you prefer in certain rooms and at what times. Monitoring the activity in rooms can mean that the smart system adjusts the heating up or down depending on whether there is unusual activity in the house. The thermostat is connected to Wi-Fi and can be manually controlled by using an app on your phone. This allows you to turn the heating system off if you are not going home or to turn it on so that it is at the optimum temperature if you are coming home early.

HIVE

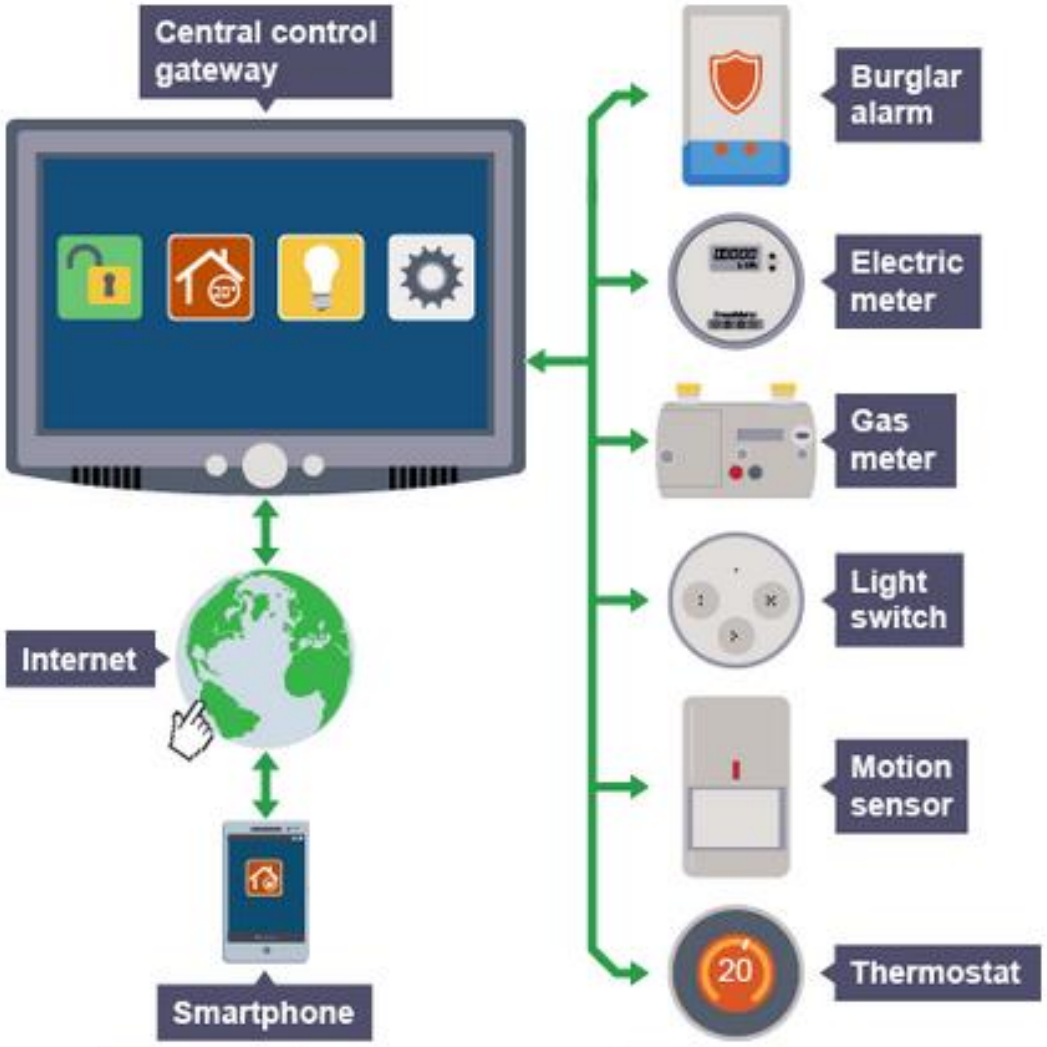
Traffic control

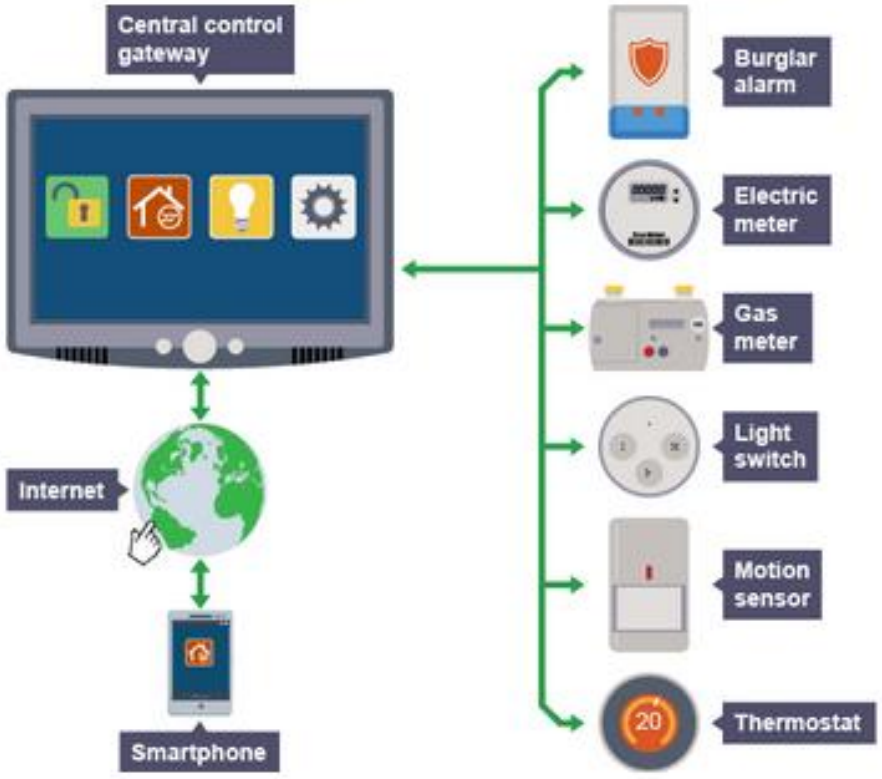
Vehicles are considered one of the main contributing sources of greenhouse gas. Studies in the European Union showed that transport causes 25% of all carbon dioxide emissions. Vehicles consume greater amounts of fuel when they are constantly accelerating and braking in traffic jams. The optimum speed for low fuel consumption and low emissions is between 45 and 65 miles per hour.

Intelligent transport systems use software and hardware, along with information and communications technologies, to improve the efficiency and safety of transport networks. They use a variety of information from cameras and sensors, along with control of traffic signals, to try to keep traffic moving, reducing the amount of harmful emissions. Cars with individual navigation systems use satellite information on traffic flow to guide drivers away from traffic congestion and on to more free-flowing routes.

Car management systems

A number of different car management systems are used to reduce the impact on the environment.
Start-stop systems automatically shut down the engine when the car is not moving — this reduces the amount of time the engine spends idling, reducing fuel consumption and emissions. The car automatically re-starts when the accelerator is pressed, which is most advantageous for vehicles that spend significant amounts of time waiting at traffic lights or frequently come to a stop in traffic jams.
Engine control units use sensors to ensure the engine's air/fuel ratio can be controlled very accurately, ensuring optimum fuel consumption and a reduction of carbon dioxide emissions.


Central control gateway
Burglar alarm
Electric meter
Gas meter
Light switch
Motion sensor
Thermostat
Internet
Smartphone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Revision Questions – Environmental Impact

1. Describe an intelligent system used on a car journey that is beneficial for the environment.

2. Bailey's Dog Kennels installed an intelligent heating system. Describe one environmental benefit to using a heating system which is intelligent.