

TAKE ^A DEEP BREATH

Born in Bradford's Air Quality Workbook for Schools

CITIZEN SCIENTISTS

OUR HEALTH

ENVIRONMENT

CLEAN AIR

POLLUTION



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DID YOU KNOW?




Air pollution can contribute towards someone becoming seriously ill or dying. That's not good!

Poor air quality is linked to:


- 
- Babies being born with a low weight
 - Illnesses connected to the heart
 - Illnesses connected to breathing (such as asthma)
 - Lung diseases
 - Brain development

When there are very high levels of pollution, we see a lot more people attending hospital with breathing difficulties. We can reduce this!




33% of asthma cases in children are linked to air pollution. That's a staggering 1 in 3 children with asthma.

In the UK, approximately 64 thousand deaths are linked to air pollution each year. That is a lot of people



It can cost the NHS up to 20 billion pounds to treat illnesses linked to poor air quality every year. That's a lot of money!



The World Health Organisation (WHO) has said the UK has very high pollution levels in some areas which needs tackling. Unfortunately Bradford is one of those areas.





Born in Bradford have been doing some research on pollution in the Bradford district since 2018. Our first project was called BiB Breathes. There are a lot of new projects starting soon so look out for those on our website: www.borninbradford.co.uk



**EXPOSURE TO POLLUTED
AIR DURING PREGNANCY
INCREASES THE RISK
OF BABIES BORN WITH**

**A LOW BIRTH WEIGHT
AND A SMALLER
HEAD CIRCUMFERENCE**



**IN BRADFORD
55%**

**OF THE POPULATION ARE
EXPOSED TO LEVELS OF
AIR POLLUTION ABOVE EU
EXPOSURE GUIDELINES**

**THIS EXPOSURE
ACCOUNTS FOR AROUND
17 PREVENTABLE
DEATHS
EACH YEAR**

**IN BRADFORD
UP
TO 687**

**ANNUAL CHILDHOOD ASTHMA
CASES MAY BE ATTRIBUTED TO
AIR POLLUTION**

**POLLUTION IN
BRADFORD IS HIGH.**

**WE WANT TO
MONITOR WHAT
OUR CHILDREN ARE
BREATHING IN.**

BRADFORD CLEAN AIR ZONE (CAZ)

FREQUENTLY ASKED QUESTIONS (FAQS):

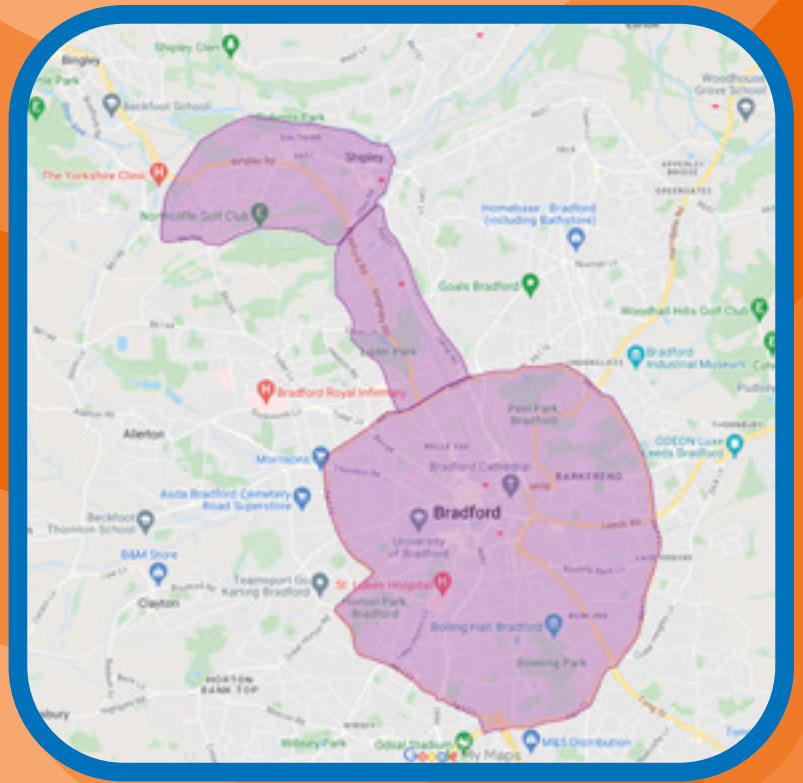
WHAT IS A CAZ?

A CAZ is specific area where vehicles that cause a lot of pollution are charged a penalty if they enter that zone. The government directed Bradford Council to have a CAZ to try and reduce the amount of pollution there is in the city.

ARE VEHICLES THE ONLY POLLUTERS?

No. Many things contribute to air pollution such as home/ factory chimneys, log burners, old boilers, fireworks and so on. However, the majority of outdoor pollution is caused by vehicles which is why a CAZ is important. There are small changes that people can make on their own to reduce pollution in the air.

**MARK AN X ON
THE MAP WHERE
YOU LIVE.**



FREQUENTLY ASKED QUESTIONS (FAQS):

ARE ALL VEHICLES THAT ARE HIGH POLLUTERS CHARGED FOR ENTERING THE CAZ?

No, only lorries, buses, vans, coaches and taxis will be charged. Most of them are now electric or hybrid so they are not big polluters anymore however there are some that will be and they will get charged for entering Bradford's clean air zone. Private cars that are owned by citizens are not charged in Bradford's CAZ. However, some other CAZs in the UK do charge private cars as well so be careful when travelling!

WHAT ARE THE CHARGES?

Lorries, coaches and buses: £50 per day

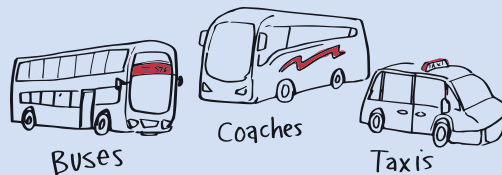
Vans, minibuses: £9 per day

Taxis: £7 per day

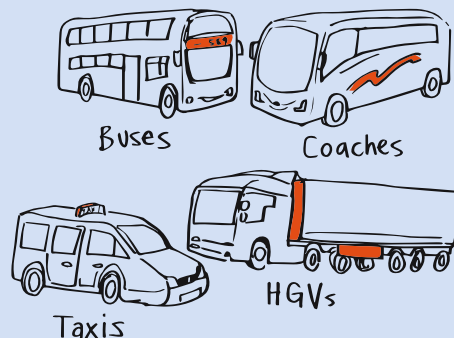
WHAT AREAS OF THE DISTRICT ARE COVERED BY THE CAZ?

The CAZ includes the area inside the Bradford outer ring road (ring road is also included). It also includes the Aire Valley corridor up to Shipley and Saltaire.

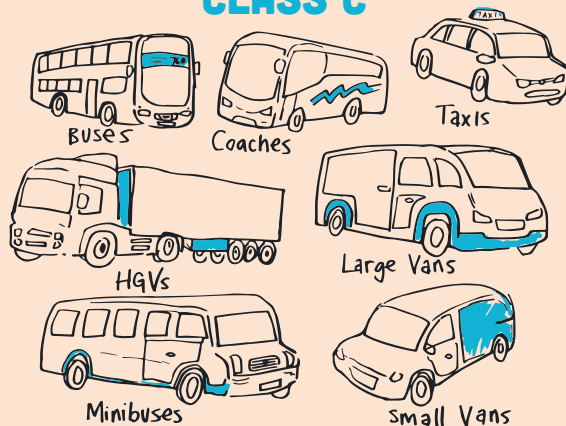
BELOW ARE 4 DIFFERENT TYPES OF CAZ THAT THE COUNCIL CONSIDERED CLASS A



CLASS B

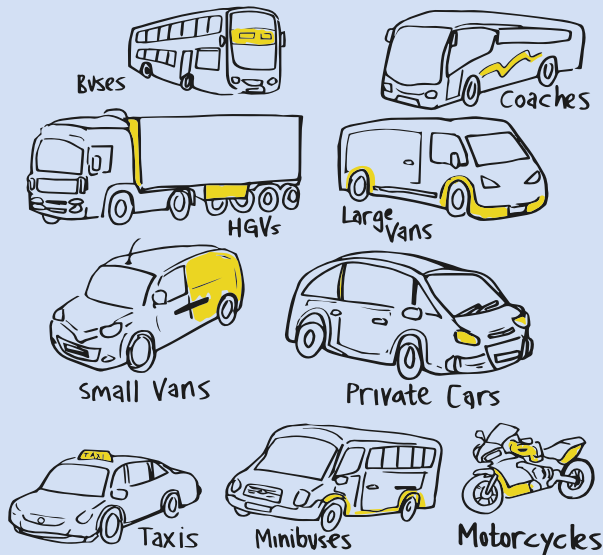


CLASS C



Bradford will have a Class C CAZ

CLASS D



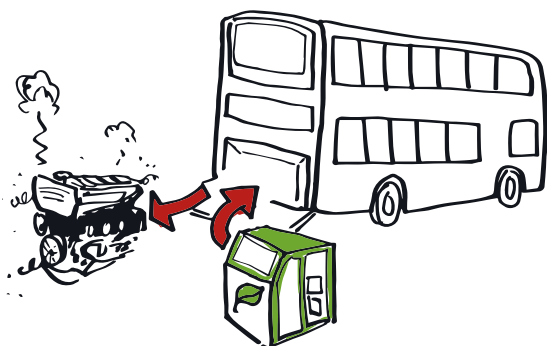
EMISSIONS AND TRANSPORT

ACTIVITY 1

Below are some other ideas that can help lower emissions. Mark an X on the option you think would be useful. Write a persuasive letter to the council to say why you think this is a good idea and why it should be considered.

1. WORKING WITH BUS COMPANIES

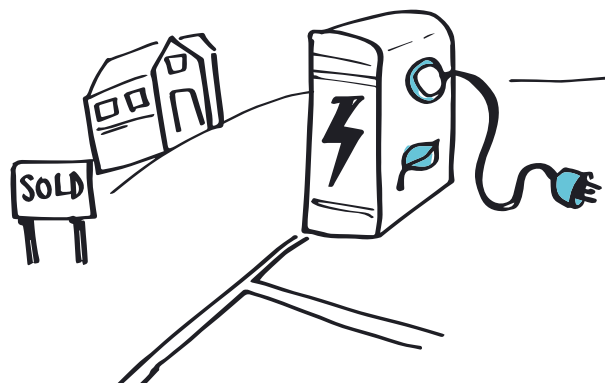
E.g. replacing old engines with new ones



Ask bus companies if they can replace all their old vehicles with new electric vehicles.

2. BUILD ELECTRIC CAR CHARGING POINTS WITH HOUSES

E.g. charging points in new housing developments



Install more electric charging points where new homes are being built.

3. ELECTRIC TAXI SCHEME

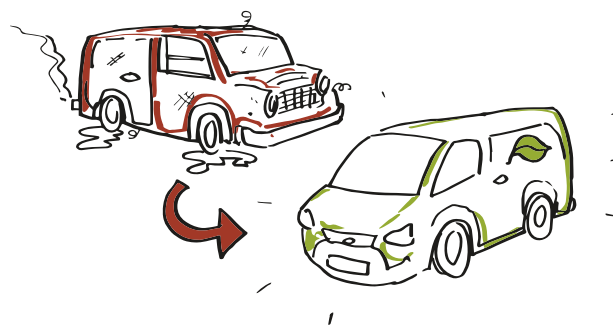
E.g. replacing old vehicles



As with buses, it may be helpful to replace all taxis with electric taxis.

4. ASK THE COUNCIL TO UPGRADE ALL OF THE VEHICLES THEY OWN

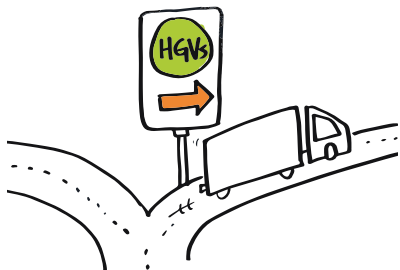
E.g. replacing old vehicles with new low emission ones



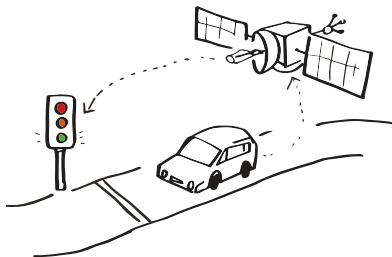
The council have a lot of vehicles such as bin lorries, vans, minibuses etc. It may be helpful for the council to replace all their vehicles.

There are also some options that can help people change their transport and travel behaviours. Mark an X on all the options you think can work. Again, write a persuasive letter to the council about why they should consider these options.

1. DIVERT THE MOST POLLUTING VEHICLES AWAY FROM BUSY ROUTES.

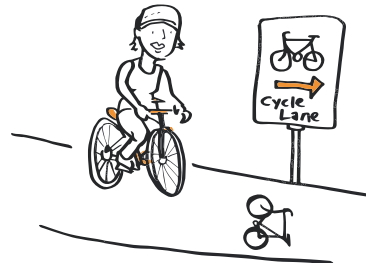


2. PUT SENSORS ON TRAFFIC LIGHTS SO DRIVERS KNOW WHEN TO EXPECT RED LIGHTS



E.g. "Scoot" using GPS

3. ADD MORE CYCLE LANES



4. PLAN JOURNEYS AHEAD AND CAR SHARE WHERE POSSIBLE



5. PARK AND RIDE A BUS

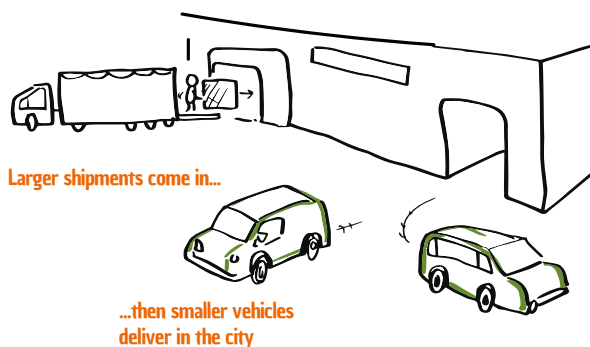


6. DISCOURAGE PEOPLE FROM DRIVING

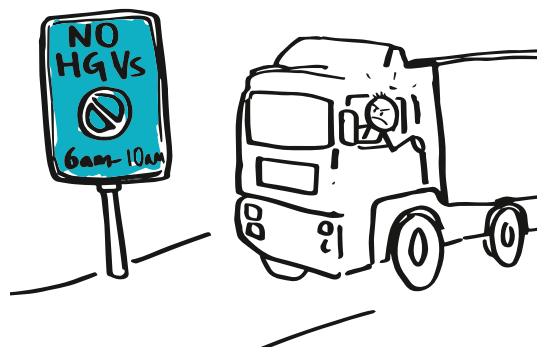


E.g. increasing parking charges in city centre

7. PARK GOODS LORRIES AND LOAD SMALLER CARS TO TRAVEL IN THE CITY



8. RESTRICTING DELIVERY TIMES FOR LORRIES



**DESIGN
YOUR OWN
IDEA**



**Bradford City Council
Britannia House,
Hall Ings,
Bradford
BD1 1HX**

DATE

Dear Bradford City Council,

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.....

.....

Yours Sincerely

NAME

.....

CLEAN AIR INVESTIGATORS

ACTIVITY 2

DESIGN A QUESTIONNAIRE

STEP 1

Use Microsoft Word to create a survey to investigate different modes of transport. Please see overleaf for an example of a questionnaire. You may want to brainstorm as a class and think of some different questions to use too. This is YOUR survey so make it as creative as you like, as long as the questions explore the topic of your choice.

Consider the design of your questionnaire i.e. the type of questions you will include (open/closed, tick box, 'on a scale of 1-10'), and how long you want your questionnaire to be. Aim for no more than 10 questions.

STEP 2

Print out your survey and distribute it to your teachers and adult members of your household and neighbourhood. Think about the amount of people you wish to ask and make sure you print enough copies for everyone. If your questionnaire goes across more than 1 page, you may wish to staple these together. Set a deadline for when you want completed questionnaires back.

STEP 3

Now it's time to analyse! This means describing what you have found. Firstly, count the responses you received for each question. For example, if a question asks 'How do you travel to work?' – count how many people said car, bike, walk, public transport etc. Make a note of the most popular option and the least popular option.

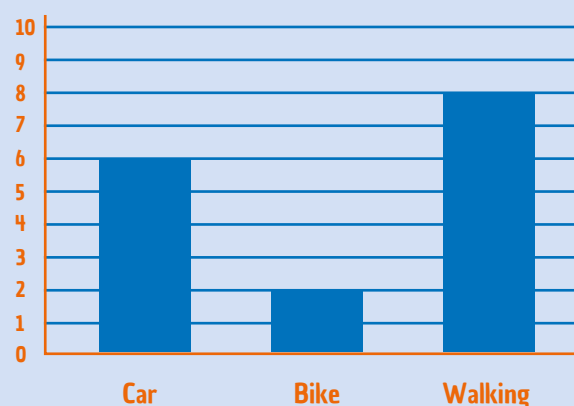
STEP 4

Draw a bar chart or table of your findings. For example, if 6 people said car, 2 people said bike, and 8 people said walking then your chart and table should look like this:

TRAVEL METHOD	NUMBER OF PEOPLE
Car	2
Bike	6
Walking	8

Do this for all the questions on your questionnaire.

Example



SAMPLE QUESTIONNAIRE TO GET YOU STARTED

We would like to hear your views on how you travel around Bradford. Please can you help us by completing this short questionnaire. It should take no more than 10 minutes of your time.

The information you provide will really help us understand how we can reduce pollution and create a healthier environment around schools.

1) Are you a teacher or a parent/guardian?
(please tick)

☐

Teacher

☐

Parent/Guardian

2) How do you travel to school?
(please tick all that apply)

☐

Car

☐

Bus

☐

Walk

☐

Cycle

☐

Other

3) Do you always travel this way to school?
(please tick)

☐

Yes

☐

No

4) Have you considered other ways of travelling?
(please tick)

☐

Yes

☐

No

5) Is there anything else you would like to tell us about travel to school or travel in Bradford generally?
(this is an open text question– please use as much space as you like)

.....

.....

.....

.....

.....

WHAT DID YOU FIND?

Use this space to present your results in graphs or tables.
Continue on a separate sheet if needed.

WORLD POLLUTION: PURPLEAIR

ACTIVITY 3

The amount of pollution in the air can be measured

STEP 1

Visit the following website: [Purpleair.com/map](https://purpleair.com/map)

Born in Bradford have put Purple Air sensors outside some schools in Bradford to constantly measure how polluted the air in the playground is. Is your school/ or a nearby school on the map?

STEP 2

In groups or as a class, explore what the air quality is like in the UK compared to the rest of the world.

STEP 3

Answer the following questions:

- 1) Which country has the highest pollution of the day?
- 2) Which country has the lowest pollution of the day?
- 3) What is causing high pollution?
- 4) Which countries don't have PurpleAir sensors? Why do you think that is?
- 5) What do you think about air quality in Bradford compared to the rest of the UK?

This is what a PurpleAir sensor looks like.
See if you can spot one in your school:



POLLUTION CATCHERS

ACTIVITY 4

STEP 1

Cut out a piece of card or cardboard.



STEP 2

Create a small hole near one edge. Loop a string through the hole and tie a knot in it.



STEP 3

Add a generous amount of Vaseline (petroleum jelly) to one side of the card.



STEP 4

Attach the card to a pole or fence in your garden.



STEP 5

Leave it outside for 24 hours.

STEP 6

Take the card down. You will be able to see all the pollutants that have stuck to the Vaseline. If you want, you can leave it outside for longer.

How does it look after 2 days? 3 days? A week? Discuss your findings with your friends who have also done the same experiment.

BUILDING GREEN SPACES

ACTIVITY 5

Look around your school and answer the following questions:

1) Is there any green space ?

.....

2) Where is it?

.....

3) How much is there? Is it enough or could there be more?

.....

4) If you would like to add more green space, where would it be?

.....

5) How would you do it? Which plants would you want to add? Is it safe to add plants? Will your plans cause any obstructions?

.....

6) Who will be responsible for looking after your green space?

.....

7) What is required to care for your new green space?

.....

8) How much will it cost?

.....

9) What are the benefits of green spaces?

.....

10) What can go wrong?

.....

11) Who would use this space?

.....

Now that you have noted down all your answers, use them to write a persuasive letter to your school about your idea and why they should consider it.

SCAVENGER HUNT: INDOOR AIR QUALITY

ACTIVITY 6

Below is a list of things that may be found in a 'clean air school'. Hunt around your school and the surrounding area to see which ones you can spot.

- Air Purifiers to improve the air indoors
- Closed windows during rush hour, but opened windows throughout the day
- Double-glazed windows
- Playgrounds away from main roads
- No direct parking outside school gates
- Electric car charging points
- Anti-idling (when drivers leave their engine running but are not moving) posters
- Bike and scooter shed
- Wide, clean pavements
- A cycle lane
- Trees and plants surrounding the outside

How many did you spot?/11

AIR POLLUTION WORD SEARCH

ACTIVITY 7

E	C	I	V	F	U	M	E	S	M	S	P	S	O
P	A	D	O	F	S	H	T	U	O	E	E	N	R
E	S	L	I	R	B	L	M	R	S	N	A	M	A
H	A	I	S	S	A	O	S	L	S	N	I	T	S
V	N	N	E	M	M	C	A	O	A	O	R	N	P
T	H	G	O	M	O	C	R	R	T	I	Y	E	B
F	O	E	E	E	I	K	I	R	M	T	O	M	E
R	R	K	A	M	P	R	E	F	O	U	R	N	R
S	E	C	E	L	S	R	N	N	S	L	I	O	R
P	R	H	L	L	T	I	I	A	P	L	N	R	Y
I	C	N	R	L	E	H	N	C	H	O	O	I	P
F	A	C	T	O	R	I	E	S	E	P	S	V	I
S	C	A	R	S	N	S	I	G	R	Y	P	N	S
U	P	G	A	S	E	S	E	I	E	L	K	E	E

IDLING
CHEMICALS
ATMOSPHERE
RASPBERRYPI
FACTORIES

HEALTH
POLLUTION
SENSOR
GASES
SMOKE

ENVIRONMENT
CARS
AIR
FUMES

CLEAN AIR: MULTIPLE CHOICE ASSESSMENT

ACTIVITY 8

1 WHEN WE TALK ABOUT POLLUTION, WHAT COUNTS AS "POLLUTION"? (CHOOSE ONE)

- A** Only gases and particles we can see, like smoke or steam
- B** Only gases and particles in the air outside, nothing indoors
- C** Any gases and particles in the air that can have harmful effects
- D** Any gases and particles that we can smell, like car exhaust or hot food

2 WHICH ONE OF THESE IS TRUE ABOUT WHERE POLLUTION COMES FROM? (CHOOSE ONE)

- A** Air pollution can only come from burning things
- B** Air pollution can come from man-made or natural things
- C** Air pollution only comes from toxic chemicals
- D** Air pollution only comes from big cities with where a lot of people live

3 IS AIR POLLUTION HARMFUL TO OUR HEALTH? (CHOOSE ONE)

- A** Yes, it can cause lots of health problems including heart and lung disease
- B** Yes, but it only causes temporary sore throats and coughing
- C** No, it's only harmful to birds and insects
- D** No, it all gets filtered out in our nose (so doesn't get deep into our body)

4 WHICH OF THESE ISN'T CAUSED BY EXPOSURE TO AIR POLLUTION? (CHOOSE ONE)

- A** Having sore or itchy eyes
- B** Coughing and/or a sore, dry throat
- C** Wheezing and shortness of breath
- D** Having sore, aching muscles

5 WHICH OF THESE IS FALSE ABOUT INDOOR AIR POLLUTION? (CHOOSE ONE)

- A** Indoor air pollution exists, just like outdoor air pollution
- B** Indoor air pollution is not harmful to our health
- C** Indoor air pollution can build up if you don't let in fresh air
- D** Indoor air pollution can come from surprising sources, like cooking and cleaning

6 DOES TURNING THE CAR ENGINE OFF WHEN YOU ARE NOT MOVING MAKE ANY DIFFERENCE TO AIR POLLUTION?

- A** No, this makes no difference to air pollution
- B** Yes, turning off the engine can reduce air pollution
- C** Keeping the engine on when not moving protects me from air pollution

7 WHO IS AFFECTED BY AIR POLLUTION?

- A** Air pollution only affects very young people or people who are already ill.
- B** Only people who work in the city centre, where there is lots of traffic, are affected by air pollution.
- C** Everyone can be affected by air pollution, but it has the most impact on young children, elderly people, and people with existing lung or heart problems
- D** No one is affected

8 WHICH OF THESE ACTIONS CAN HELP REDUCE OUR EXPOSURE TO OUTDOOR AIR POLLUTION? (CHOOSE ONE)

- A** Burning your garden waste on a bonfire
- B** Taking the car on a busy one-mile commute instead of walking
- C** Leaving the car engine running when stopped and waiting for someone
- D** Walking along quieter streets instead of busy roads

9 IN 2018, SOME STREETS WERE CLOSED ALONG A ROUTE IN LONDON FOR THE LONDON MARATHON. WHAT DO YOU THINK HAPPENED TO THE LEVELS OF AIR POLLUTION ALONG THAT ROUTE? (CHOOSE ONE)

- A** There was an 89% drop in air pollution as the streets were closed to traffic
- B** There was an 18% drop in air pollution as the streets were closed to traffic
- C** There was an 18% increase in air pollution as the streets were closed to traffic
- D** There was an 89% increase in air pollution as the streets were closed to traffic

10 WHICH OF THESE IS A GOOD WAY FOR YOU TO PERSONALLY BE MORE ENVIRONMENTALLY FRIENDLY? (CHOOSE ONE)

- A** Walking on the left side of the pavement
- B** Turning off lights and electric appliances when they aren't in use
- C** Drinking water instead of fizzy drinks
- D** Throwing paper in the rubbish if the recycling bin is far away

WORD MATCH

ACTIVITY 9

See if you can match the words to their definitions.
If there are any that you are unsure about, do the ones you know first!

ATMOTUBE

A tiny sized computer that is used in the static sensors we use to measure the air pollution in your school.

RASPBERRY PI

When a vehicle is left with the engine running whilst it is not moving.

AIR POLLUTION

A set (geographical) area where action is being taken to improve air quality there.

IDLING

Weather conditions.

ENVIRONMENT

A wearable device that monitors the quality and safety of the air we breathe. It detects pollutants like dust, pollen, soot and mould.

CLEAN AIR ZONE

A breathing illness which can be caused by too much exposure to pollution.

CLIMATE

All the things that surround us.

ASTHMA

A substance in the air which has harmful or poisonous effects.

BACK TO THE FUTURE

ACTIVITY 10

Invent a vehicle for the future. Draw your design in the space below and label all the features. Think about your eco-friendly credentials! Don't forget to give it a cool name.



NOW DESIGN A POSTER TO ADVERTISE YOUR NEW CAR.

To help you develop an effective advertising campaign, you could use a behaviour change model. This is a model that helps us think about how we can change behaviour. For this exercise, you may wish to use the COM-B model.

Use the next page to design your poster.

WHAT IS THE COM-B MODEL?

C= CAPABILITY

Will people be capable of purchasing your car? Is it affordable? Is it practical? Is it easy to use?

O= OPPORTUNITY

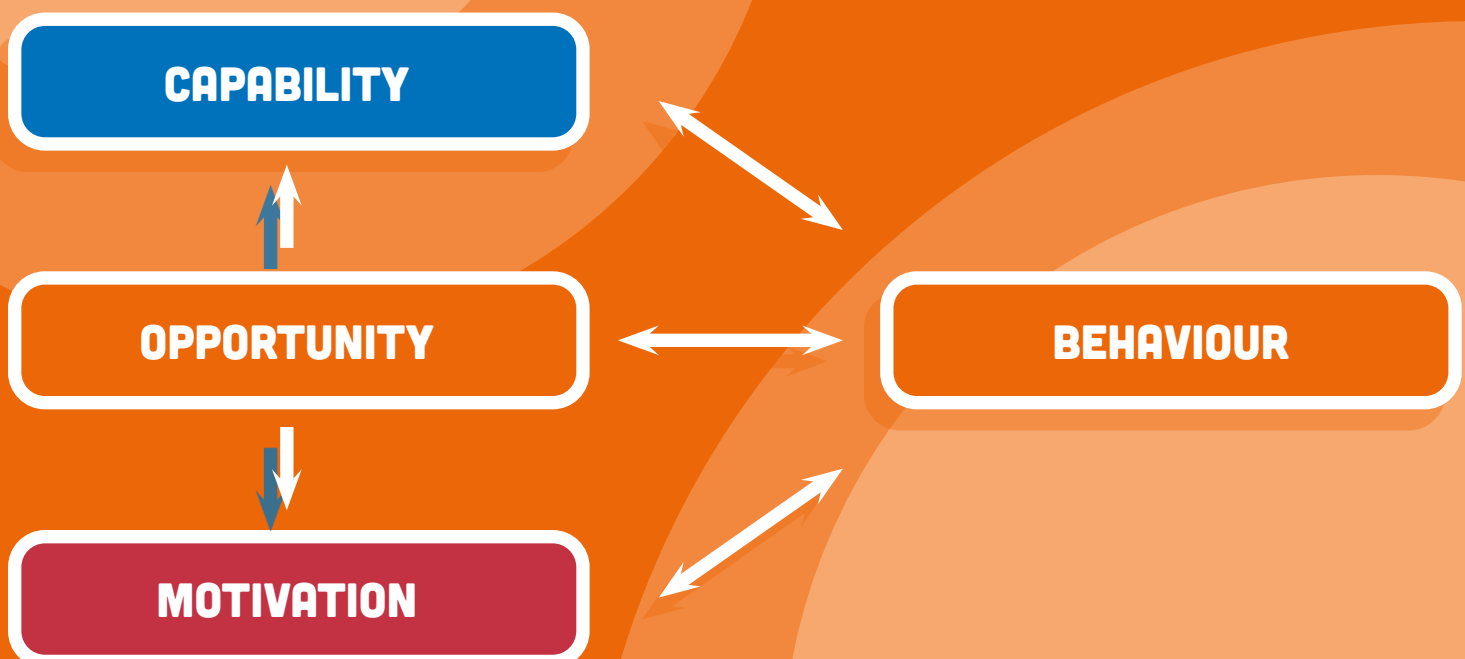
Where is the opportunity in the market for this? Why should people purchase this car? What opportunity have you identified?

M= MOTIVATION

How can you motivate people to purchase your vehicle? (E.g. think about what features it has that are not available on other cars.)

B= BEHAVIOUR

A successful campaign with the right information can encourage people to stop buying old polluting vehicles and buy your new eco-friendly car. If you are able to do this, you will have created a successful advert campaign.



DESIGN YOUR POSTER

SPOT THE DIFFERENCE

ACTIVITY 11

There are 7 differences to find



GUIDANCE FOR FACILITATORS

ACTIVITY NO	1
ACTIVITY TITLE	Lower Emissions
AIMS:	Creatively describe an idea and put forward a passionate argument
OBJECTIVES:	Develop writing skills Describing and evaluating skills Critical analysis of different concepts
RESOURCES NEEDED:	Pen
TIME:	The time for this activity can vary but should be limited to 1 hour.
PREPARATION:	This activity requires no pre-preparation

ACTIVITY NO	2
ACTIVITY TITLE	Clean Air Investigators
AIMS:	To investigate the different modes of transport used by teaching staff
OBJECTIVES:	To understand how to effectively collect, manage, and pre-sent data To develop a functioning survey To develop knowledge and understand charts and graphs To understand trend patterns in data
RESOURCES NEEDED:	Microsoft Word Printer, paper and stapler, pen
TIME:	Design survey: 1 hour Collect data: 1 week
PREPARATION:	This activity requires no earlier preparation

ACTIVITY NO 3

ACTIVITY TITLE World Pollution

AIMS: Compare pollution from around the world

OBJECTIVES: To learn about the quality of air in a lived environment and what it means.

Understand and explore why the quality of air differs in different places and at different times.

RESOURCES NEEDED: A computer with internet. Website: purpleair.com/map

TIME: 1 hour group session

PREPARATION: None

ACTIVITY NO 4

ACTIVITY TITLE Pollution Catchers

AIMS: A short science experiment to discover and catch pollutants in the air

OBJECTIVES: Understand there are different types and sizes of pollutants in the air.

Develop an interest in science experiments

RESOURCES NEEDED: Card/ cardboard, scissors, string, Vaseline (petroleum jelly)

TIME: 24 hours

PREPARATION: Create your pollution catcher. This will take about 20 minutes.

ACTIVITY NO	5
ACTIVITY TITLE	Building Green Spaces
AIMS:	Develop an argument for green space
OBJECTIVES:	<p>To understand the benefits of creating a green space within a school environment</p> <p>To effectively design, plan and argue for a green space within school</p>
RESOURCES NEEDED:	<p>Pen, paper, workbooks, and clipboard</p> <p>To support pupils bring their ideas to life, applications to the Woodland Trust are recommended. For an application form, please visit: https://www.woodlandtrust.org.uk/plant-trees/schools-and-communities/</p>
TIME:	3 hours
PREPARATION:	None

ACTIVITY NO	6
ACTIVITY TITLE	Scavenger Hunt: Indoor air quality
AIMS:	Find items associated with air quality in your school
OBJECTIVES:	Encourage investigation and exploration
RESOURCES NEEDED:	<p>Activity 6 page</p> <p>Pen</p>
TIME:	1 hour
PREPARATION:	None

ACTIVITY NO	7
ACTIVITY TITLE	Air pollution word search
AIMS:	Learn words associated with air quality
OBJECTIVES:	Complete a word search
RESOURCES NEEDED:	Pen
TIME:	15 minutes
PREPARATION:	None

ACTIVITY NO	8
ACTIVITY TITLE	Multiple choice assessment
AIMS:	Test knowledge of air quality
OBJECTIVES:	Learn facts about air quality
RESOURCES NEEDED:	Pen Answers: 1=c, 2=b, 3=a, 4=d, 5=b, 6=b, 7=c, 8=d, 9=a, 10=b
TIME:	15 minutes
PREPARATION:	None

ACTIVITY NO	9
ACTIVITY TITLE	Word Match
AIMS:	Match words to their descriptions
OBJECTIVES:	Learn words associated with air quality
RESOURCES NEEDED:	Pen
TIME:	15 minutes
PREPARATION:	None

ACTIVITY NO	10
ACTIVITY TITLE	Back to the future
AIMS:	Design a car and develop an effective advertising campaign
OBJECTIVES:	Creative design Learn about behaviour change
RESOURCES NEEDED:	Pens
TIME:	15 minutes
PREPARATION:	None

ACTIVITY NO	11
ACTIVITY TITLE	Spot the difference
AIMS:	Attention to detail
OBJECTIVES:	Spot the difference
RESOURCES NEEDED:	Pen There are 8 differences to find.
TIME:	15 minutes
PREPARATION:	None





NIHR | National Institute for
Health and Care Research

**CURATED BY RUKHSANA RASHID
BORN IN BRADFORD**

With thanks to
Emma Bailey (Born in Bradford)
Meegan Worcester (Born in Bradford)
Jamie Thorpe (St Stephens C of E Primary School)

2022