



6. The science of stopping

Age: 10-12



Learning objectives

1. I know the **Green Cross Code**, and safe crossing places on the road.
2. I understand risk and the effects of risky behaviour.
3. I can develop strategies to cope with dangerous situations caused by others.

Learning outcomes

By the end of this lesson pupils will have explored the impact of distractions on their behaviour. Many will have noted that when they are distracted their reaction times get slower.

Pupils will have also analysed how the speed a car is travelling impacts both the thinking and braking times of the driver. Most pupils will be able to discuss how these facts will impact their behaviour when crossing the road.

Parental/guardian engagement

- Pupils can be filmed participating in the activities and these films could be sent home to parents/guardians.
- The information about stopping distances could be circulated as part of the school newsletter.
- Consider asking the parents/guardians and children to make a quick video 'pledge' or to take a pic of themselves holding up a piece of paper with their pledge about making sure that they're not distracted when they're using the road. The school could put them up on the school website (with the right permissions).
- Ask the parents/guardians to help their children measure stopping distances on their bicycles and scooters at home. So children can learn about why they need to consider their speed in crowded areas such as parks.

You'll need:

- ✓ Teacher notes
- ✓ Stopwatch, measuring stick, whistle, phone, headphones, flipchart paper, chalk/masking tape
- ✓ [Road ready? Expect the unexpected](#) film

Introduction

Ask pupils how many of them cross the road somewhere that isn't at a crossing or traffic lights? Or cross the road when they're chatting to a friend, or using a mobile phone? Ask what makes them think it is okay to do this – are they confident that they can get across and be alert and aware of cars, trams or motorcycles and trust that drivers/motorcyclists will see them? Ask them if they think it is more or less likely that they, or their friend, might have an accident if they do this?

Tell pupils that they will be learning the surprising truth about taking what seems to be small risks and everyday shortcuts to the **Green Cross Code**. Explain that the experiments in this lesson will help them to understand how distractions can increase the risk of danger – but how simple steps that everyone can use, can reduce it.

The surprising facts and tips for safety are things that they can talk to their parents/guardians and friends about, to help them stay safer too.

Split the class into two groups to participate in the upcoming activities.

Teacher-led activity

(The following activities are best carried out outside or in a large hall)

Confidence and self-efficacy - ask pupils to rate their confidence levels before and after the session. Encourage them to feel more confident during the session using the behaviour change technique about recalling past successes; and ask them to remember times when they coped well with a challenge before, or learned something new?

Depending on your class/room size and the time you have available, complete each activity in turn or select the one most appropriate for your class.

Activity 1: How quickly can you step back to safety?

✓ **Required:** Stopwatch, measuring stick, whistle, phone, headphones, flipchart paper

In a small group, choose a safety spot and then measure a point two metres away. This activity seeks to mimic a situation where you may have stepped into the road and quickly needed to make your way back to the pavement (safety spot). During the activities, the impact of distraction on reaction times will be highlighted. Pupils should be warned about the need to maintain balance when they are moving back to their safety spot.

Gather baseline data for all participants, one by one, by asking them to stand on the two metre mark. The whistle should be blown at a random time to indicate that the pupil needs to retreat to the safety spot.

Once the whistle is blown, the stopwatch should be activated and stopped as soon as the individual is back on their safety spot. Pupils should note the range of reaction times on a large record sheet that is visible to all.

Group 1

Ask pupils to repeat the test, this time holding a mobile phone and reading the messages that they are receiving out loud (this should be a school phone and the phone should be used in line with school policy). Should a mobile phone be unavailable pupils can be handed a note that they must read out loud. The pupil's reaction times should be noted against their baseline result.

Group 2

Ask pupils to repeat the test with headphones in (if possible listening to music). An alternative activity is to introduce a friend who should demand the participant's attention by asking them a range of questions:

1. What is the date today?
2. How many days does February have?
3. What is the capital city of France?
4. Can you name three fairy tales?
5. What is the name of the Prime Minister?
6. Name a nocturnal animal.
7. What is half of 24?
8. Name three different puddings.

Once again blow the whistle at a random time and the pupil's reaction times noted.

Teacher-led plenary

Reflection and embedding learning: Ask pupils what they have learned from the distraction exercises, based on the reaction time data? If pupils have not watched [Road ready?](#) [Expect the unexpected](#) they may want to watch it as part of a plenary. Given what they know about reaction times and stopping distances, how has this affected their attitude to the **Stop, Look, Listen, Think** sequence?

Ask them to talk about what they will make sure they do whenever they're around roads as pedestrians, cyclists, scooter users e.g. always look for a safer place to cross, like a crossing or away from parked cars and not near a bend; always take out headphones before crossing the road; always **Stop, Look, Listen, Think** before crossing; and finish a phone call or text message before crossing a road.

Activity 2: Introducing stopping distances

✓ **Required:** Measuring sticks, chalk/masking tape, markers

Now pupils should consider what it's like for someone driving a car to deal with a pedestrian who is distracted and steps out between parked cars, or hasn't heard them and steps in front of their car. What would the driver need to do? (Stop very quickly).

Ask how many of the pupils have heard about stopping distances? (*Stopping distances usually refer to the thinking and braking time a driver needs to be able to stop their vehicle, depending on what speed it is going and the weather conditions – rain, fog and snow/ice can greatly increase the stopping distance*).

This is a good opportunity to assess current levels of understanding. You may want to use [Brake's Stopping Distances Calculator](#).

Tell pupils that they will now do an experiment to help them understand more about how stopping distances are an important part of road safety.

Group work

Pupils to use data about stopping distances to mark out thinking and braking distances.

The group should establish a road crossing using masking tape/chalk if outside. Using the data on the stopping distance calculator, they should then mark out both the thinking time and the braking time, of a range of stopping distances:

E.g. calculate the stopping distance for a car that is 12 metres away from the crossing travelling at: 20, 25, 30 and 40 mph.

Use markers to show where the different cars were able to stop. Ask pupils to discuss what they think might have happened if someone who was distracted had been crossing the road at this time? Ask pupils what they will do to make sure that they are doing all they can to keep themselves safer as pedestrians?

Teacher-led plenary

Once pupils have participated in both activities, ask them to think about the stopping distances activity again. Ask them to imagine if they were a passenger, rather than a pedestrian, and distracting a driver? Can they predict how being distracted will impact a driver's stopping times?

Differentiation

High attainers can look at the impact of wet weather on stopping distances. Lower attainers may need more support to collect data and in the measuring activities.

Helping the learning stick

- In the final plenary, help pupils to imagine themselves in a situation and find problems ahead of time.
- Ask pupils if – when they are passengers in a car – they can think of any ways that they can help the driver not to be distracted?
- The next day, or later in the week, remind pupils about the experiments that they did. Ask pupils what facts and tips they have, or are going to talk to their families and friends about, now that they've learned about distraction and stopping distances?
- In art, ask pupils to make posters or a digital infographic, explaining why stopping distances are something that you need to think about, when you're around roads, in order to stay safer. What do other children need to do to keep as safe as possible e.g. **Stop, Look Listen and Think**.

Further recommended resources



Resource name	Format	Summary	Age range	Link
Speed matters with Maddie Moate	Film	This short film gives a simple introduction to kinetic energy and stopping distances, and ends with children talking about what they would like grown-ups to do to help keep them safer near roads.	KS2	https://youtu.be/ZKrejuEtP5w

