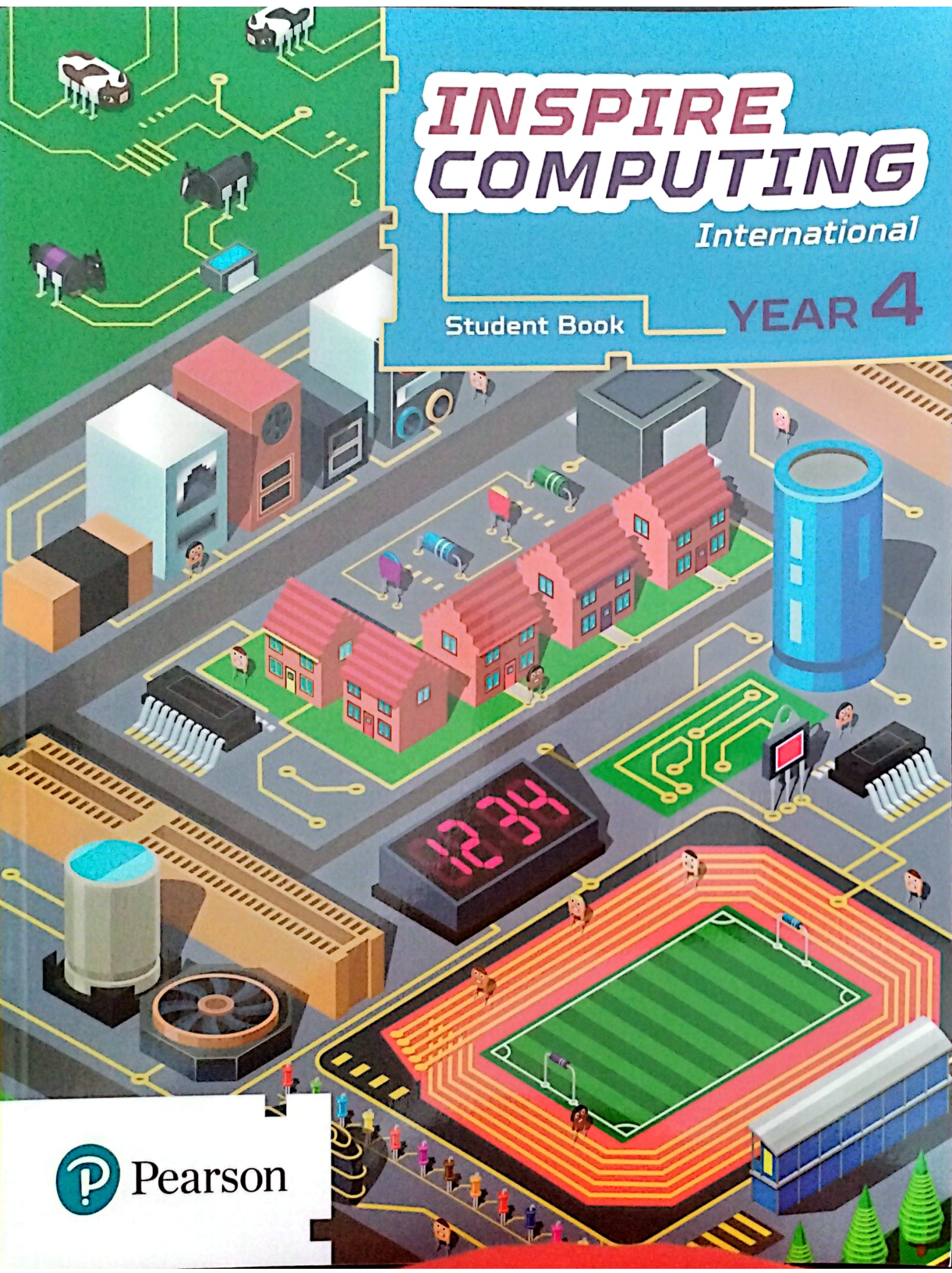
INSPIRE COMPUTING

International

Student Book YEAR 4



Pearson

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Pearson

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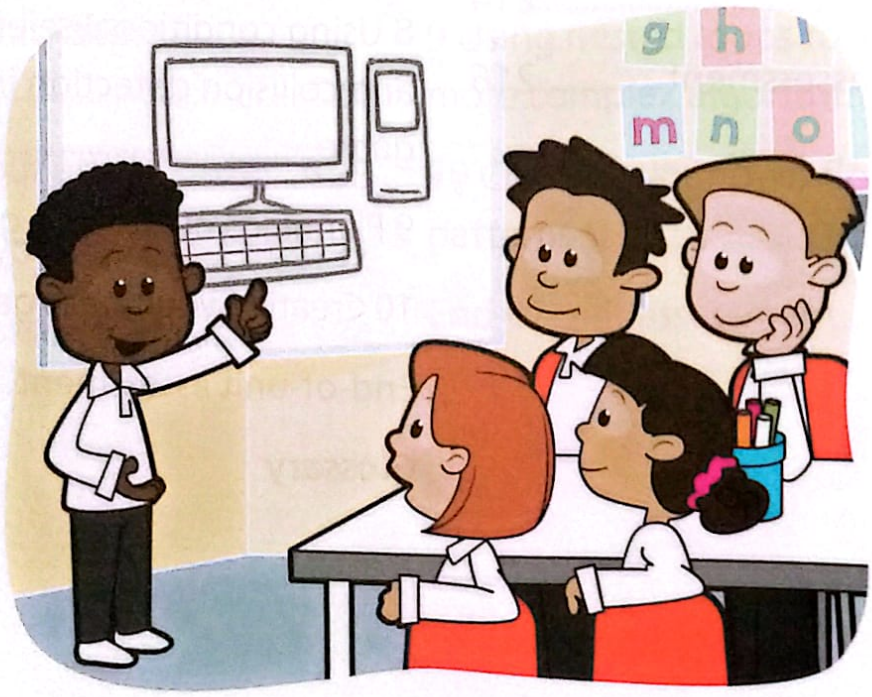
Welcome to Inspire Computing

We are all living in a continually evolving digital world. By supporting learners in becoming confident and knowledgeable users of technology we can ensure they are prepared for the future.

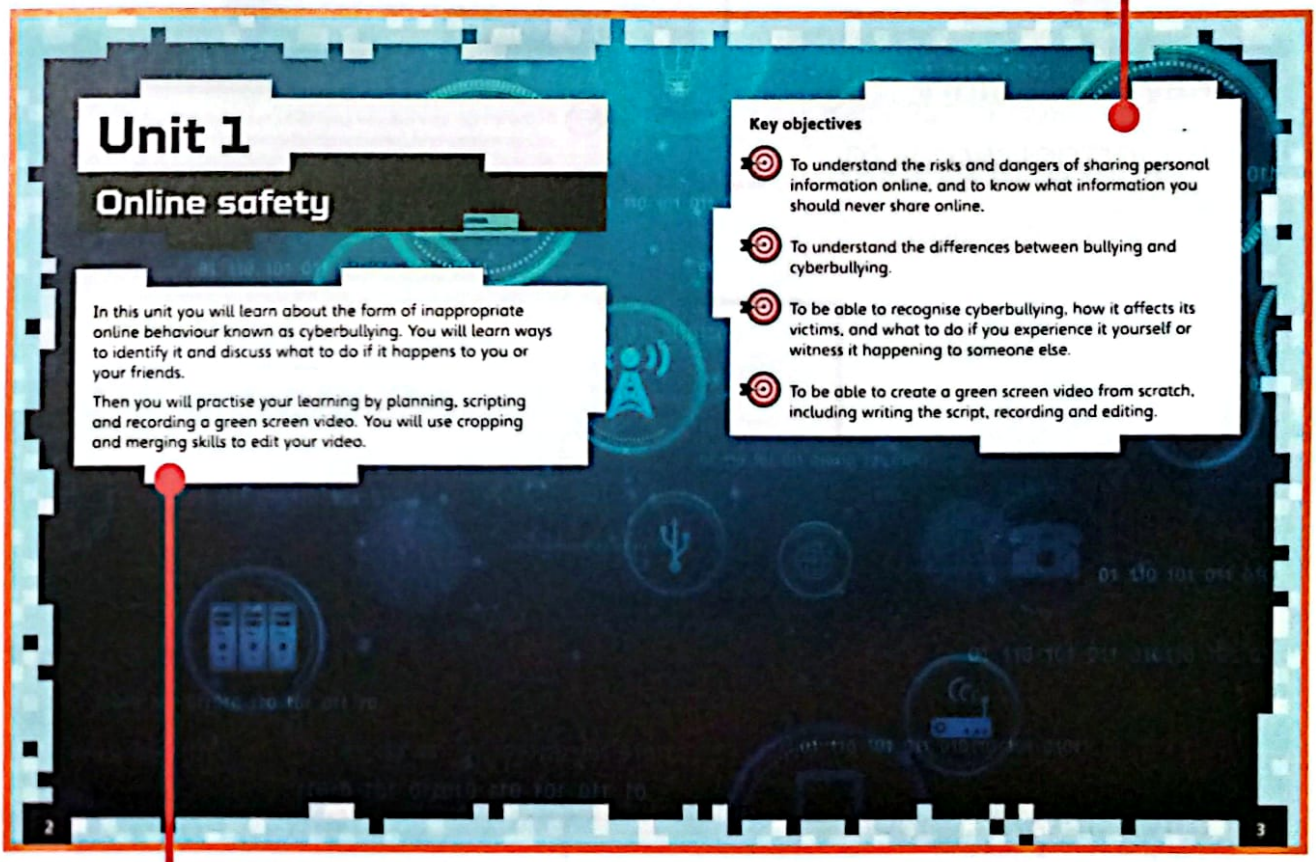
Inspire Computing makes important topics accessible for all learners. Understand how to stay safe online while still enjoying the freedom to explore the World Wide Web. Delve deeper into understanding algorithms through creative approaches, exploring networks and systems, and create and film exciting animation projects!

Each topic includes easy to understand theory, real-world examples, and ideas for further investigation. You will also have the chance to show off your knowledge and understanding through supportive assessments and student checkpoints!



Key objectives

What you will know or be able to do by the end of the unit.



Introduction

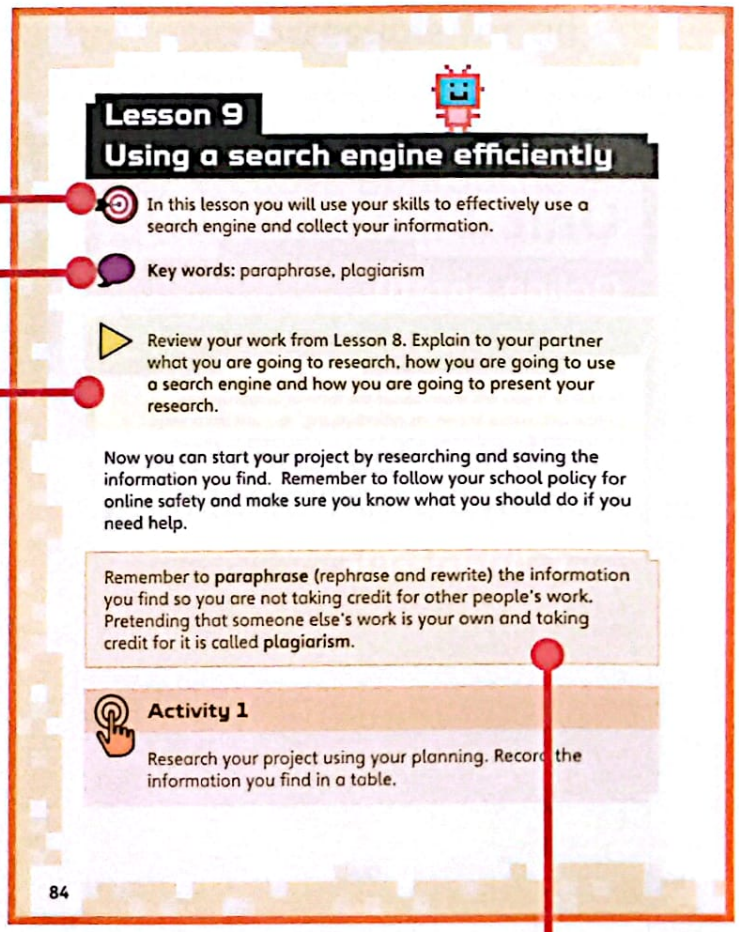
Here you can find out what this unit will be all about.

In this lesson you will:

This is what you will know or be able to do by the end of the lesson.

Key vocabulary

Important words to know.



Lesson 9

Using a search engine efficiently

In this lesson you will use your skills to effectively use a search engine and collect your information.

Key words: paraphrase, plagiarism

Review your work from Lesson 8. Explain to your partner what you are going to research, how you are going to use a search engine and how you are going to present your research.

Now you can start your project by researching and saving the information you find. Remember to follow your school policy for online safety and make sure you know what you should do if you need help.

Remember to **paraphrase** (rephrase and rewrite) the information you find so you are not taking credit for other people's work. Pretending that someone else's work is your own and taking credit for it is called **plagiarism**.

Activity 1

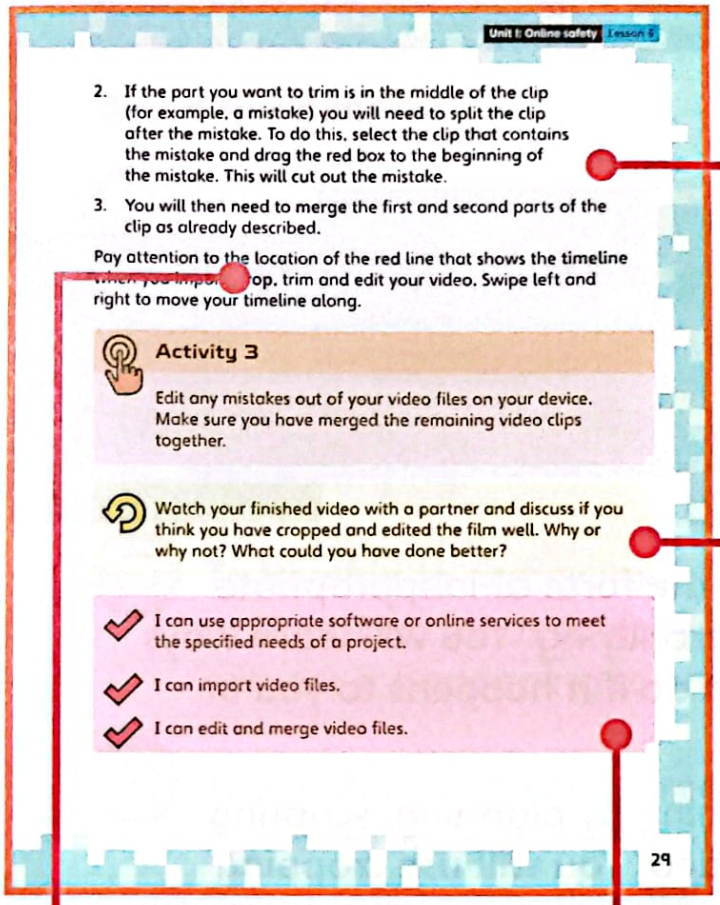
Research your project using your planning. Record the information you find in a table.

84

Starter

An introduction to the activity or information to start a discussion.

Look out for these boxes for extra information and for key reminders.



Activity

You may need to write or draw an answer, circle pictures or words; tick or match answers.

Refresher

To make sure that learning is secure.

Key vocabulary

Some tricky words are in **bold**. Find out what these mean in the Glossary at the back of the book.

Checklist

A handy list with the key parts of this lesson.

Unit 1

Online safety

In this unit you will learn about the form of inappropriate online behaviour known as cyberbullying. You will learn ways to identify it and discuss what to do if it happens to you or your friends.

Then you will practise your learning by planning, scripting and recording a green screen video. You will use cropping and merging skills to edit your video.

Key objectives

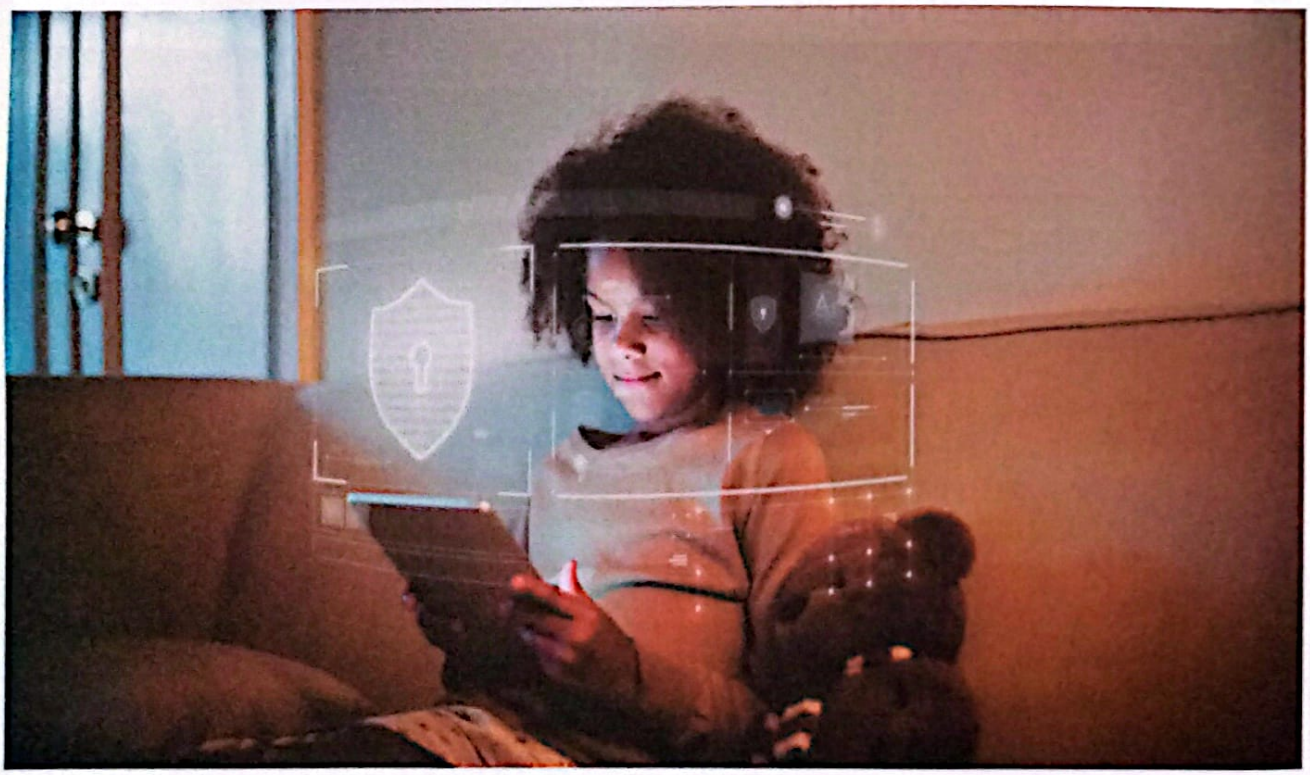
- To understand the risks and dangers of sharing personal information online, and to know what information you should never share online.
- To understand the differences between bullying and cyberbullying.
- To be able to recognise cyberbullying, how it affects its victims, and what to do if you experience it yourself or witness it happening to someone else.
- To be able to create a green screen video from scratch, including writing the script, recording and editing.

Lesson 1
Explaining e-safety

In this lesson you will review your e-safety learning and think about how to stay safe when using online technologies.

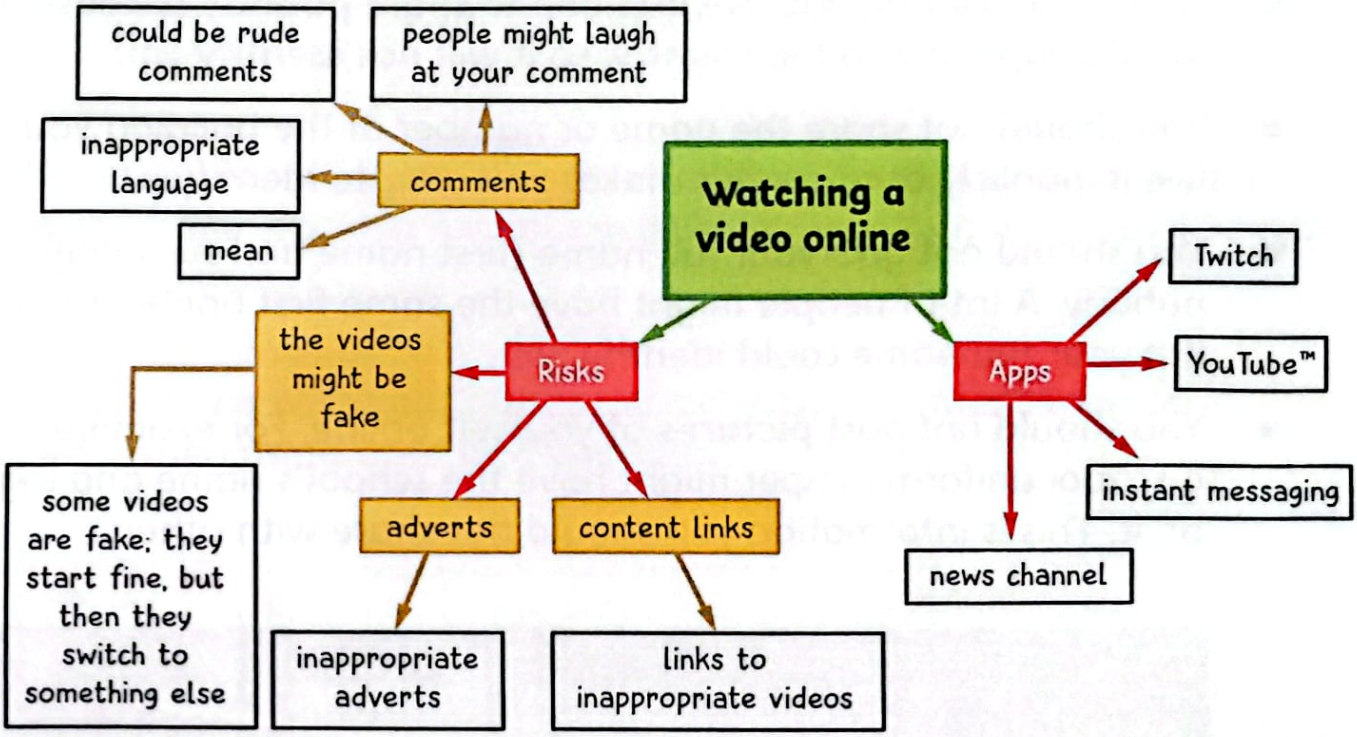
Key words: app, e-safety, identify, online, pictures, publicly

E-safety is about the safe and responsible use of technology. With a partner, discuss what you can remember about **e-safety** from your previous learning. What tips do you know?



When you are using a smartphone, tablet or laptop, there are different risks and dangers. Using a mind map will help you think about the risks and dangers for each **app**.

Here is an example of a mind map for when you are watching a video **online**.



You can see the main activity is in the middle. The yellow branches are some of the types of risks and dangers that could happen. Connected to these are examples of risks. On the right, there are some examples of apps you might use to watch online videos.

Activity 1

Create your own mind map listing the apps you might use. Think about the risks and dangers of using those apps.

It is important that you understand when it is safe to share personal information about yourself and when it is not.

When you sign up to games or websites, they often ask you for a lot of information. You should keep information private which can identify you.

- Giving the country you live in is fine to share **publicly** because a lot of people live in the country, so it will not **identify** you.
- You should not share the name or number of the building you live in publicly because this makes you easy to identify.
- You should not give your full name (first name and surname) publicly. A lot of people might have the same first name as you, but your full name could identify you.
- You should not post **pictures** of yourself online. For example, a school uniform jumper might have the school's name and logo on it. This is information you should not share with others.

Activity 2

Look at the apps on the mind map you made in Activity 1. Make a list of three tips that could help others stay safe when they use these apps. Think about who uses these apps, and the information that might be shared publicly on them.

If you see something online which makes you feel uncomfortable, or someone is asking for information about you, always tell an adult who you trust.

Discuss with your partner some ways to protect yourselves when using apps and websites.

I know how to use digital technologies safely, responsibly and respectfully.

I know the risks and dangers of using different apps.

Lesson 2
What is cyberbullying?

In this lesson you will understand what the word bullying means, and compare it to cyberbullying.

Key words: apps, behaviour, bullying, cyberbullying, messaging

You will have heard the word **bullying** before. Explain to your partner what you think bullying is. Think of some examples of where bullying happens.

Bullying is repeated behaviour which is done to hurt someone. This could be by hurting their feelings or their body. If someone is mean once or twice, they are being unkind. It is important to understand that bullying often happens over time.

Activity 1

Discuss with your partner how it would feel to be bullied. Make a list of the words you think of.

Cyberbullying is **behaviour** that happens online through a smartphone, tablet or laptop. This could be using **apps** or **messaging** someone. It is also known as online bullying.

Bullying	Cyberbullying
Calling someone names	Sending hurtful messages online
Pushing – physically hurting someone	Sending threats to someone

Activity 2

With your partner, think of three examples of a person acting unkindly towards another person or persons. Discuss whether the examples are bullying or cyberbullying. Are there any examples that could be both?

Activity 3

Here is an online conversation after someone has posted a picture of their holiday online:

I love being in the pool on holiday!

Comment 1: *Wow! Looks great!*

Comment 2: *Why? You can't swim. Ha ha!*

Comment 3: *Wish I could be in a pool right now!*

How do you think the person felt when they read Comment 2?

The person who wrote Comment 2 often leaves hurtful comments on this person's online posts.
Is this cyberbullying?

Discuss your ideas with your partner.

Activity 4

Imagine that you are the person who shared the holiday photo in Activity 3. Write two sentences explaining how you felt when you saw the hurtful comment, and why.

Discuss with your partner what you should do if you read hurtful comments or messages when you are online.

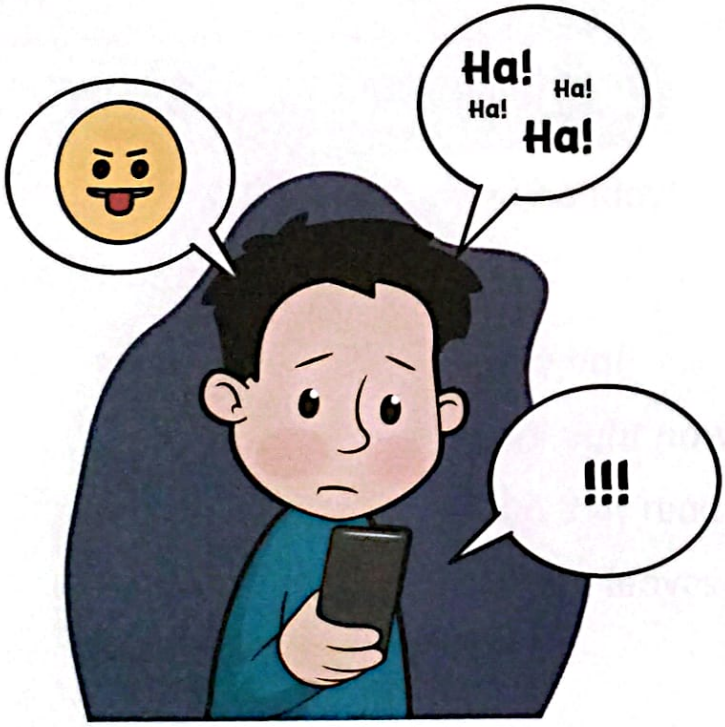
- I know how to use digital technologies safely, responsibly and respectfully.
- I can recognise unacceptable behaviour and know who to talk to when I see it.
- I know what cyberbullying is.

Lesson 3
Exploring what cyberbullying looks like

In this lesson you will think about how to recognise cyberbullying and how it can affect the people being bullied.

Key words: bullying, cyberbullying, feelings, messaging, social media

Recap your understanding of **cyberbullying** with your partner. Think about how you can recognise cyberbullying and how people might feel if they are being cyberbullied.



Activity 1

Which of these actions are considered to be cyberbullying? Discuss your answers with your partner.

- sharing a photo of someone for others to laugh at
- writing an unkind message on a piece of paper and giving it to someone
- **messaging** someone with hurtful comments
- saying hurtful things to someone on the playground that hurts their **feelings**.

Cyberbullying is very harmful because:

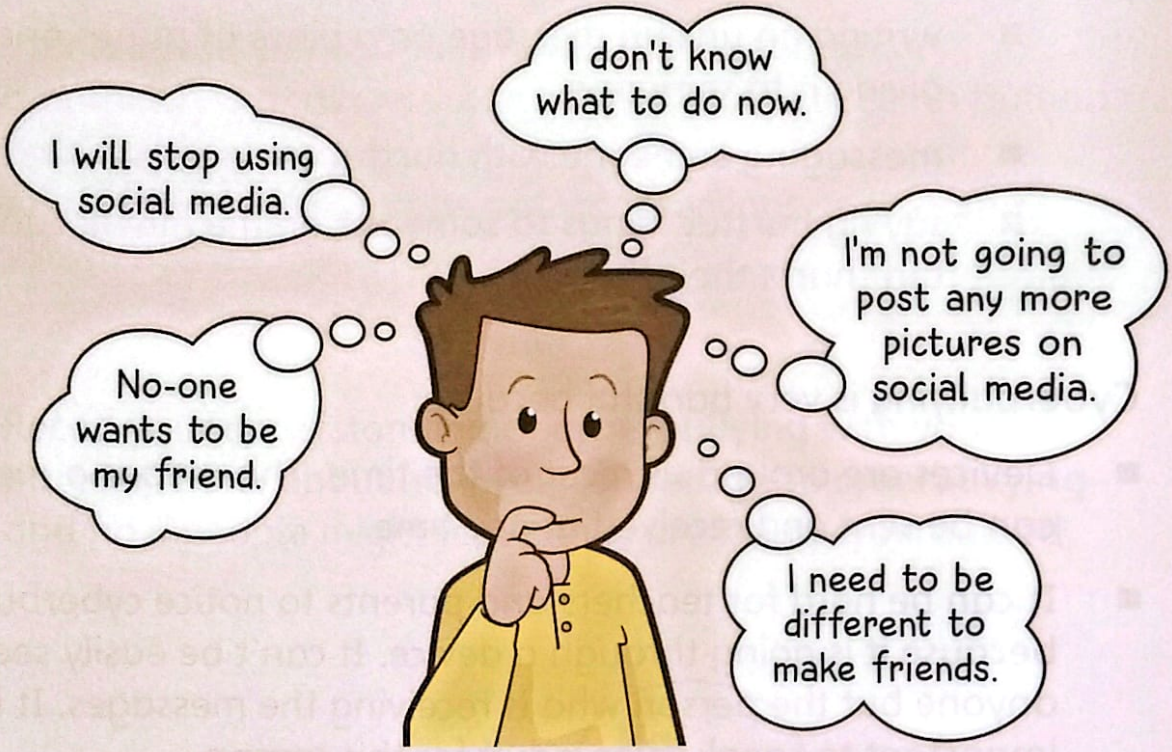
- Devices are around us most of the time. This means a message can be sent and received at any time.
- It can be hard for teachers and parents to notice cyberbullying because it is going through a device. It can't be easily seen by anyone but the person who is receiving the messages. It is very important to speak to an adult for this reason.

Bullying can cause a lot of problems. Children who have been bullied might:

- feel sad all the time
- have fewer friendships and struggle to make new friends
- feel lonely
- find it hard to trust people
- become nervous or shy and not want to take part in activities.

Activity 2

A **social media** user posts a photo on social media and gets hurtful comments about their photo. Here are some of the things that they think.



For each of the thought bubbles above, discuss with your partner what this social media user might be feeling.

Activity 3

With a partner, discuss why you think some people may bully others.

Do you think bullies are feeling lonely themselves? Are they jealous or scared about something? Could something have happened to them in the past to make them act like this?

- ✓ I know safe, responsible and respectful practice when using digital technologies.
- ✓ I know the difference between bullying and cyberbullying.

Lesson 4
Knowing what to do if someone is being cyberbullied

In this lesson you will interview someone who has been cyberbullied and learn what to do to help them.

Key words: apps, cyberbullying, hardware, software

Today, you will listen to someone who has been cyberbullied to help you understand what steps others could have taken to help prevent it and make it stop. Discuss with your partner how you should word your questions to them. Remember, this would have been a sad time in the person's life. Are there some questions you shouldn't ask?

Cyberbullying is no less hurtful to bullying someone in real life. The only difference is they are using an internet-connected device to harass or send hurtful messages.

When you are interviewing the person, you should try to learn from their experience. Think about what you would do if you were in their situation. You can use their experience (for example, what they wish they had done) to learn what to do and what not to do.

Here are some examples of good questions and why they are useful:

Question	Why is it useful?
What **apps** did you like to use on your device?	This tells you what kind of things the person likes to do.
What were you doing? What app were you using when you were bullied?	This tells you where and how the cyberbullying was done and what **software** they were using.
What device were you using?	This tells you what **hardware** they were using.
When you first experienced the cyberbullying, did you tell someone straight away or hope it would go away on its own?	This helps you to plan what to do, and how a friend or an adult can help you.
What do you wish you had done first?	This helps you understand the choices you have and understand who will be there to support you.
When did the cyberbullying stop?	This will show that it will stop and guide you through the steps you could take to make it stop as quickly as possible.
Did your parents/carers or teachers find out by themselves, or did you tell them?	This will help you understand why you should tell a trusted adult.

Activity 1

Write some appropriate questions you want to ask the person who was cyberbullied.

Tips to think about when interviewing the person

Show respect for them by:

- not talking when they are talking
- making eye contact when you ask a question
- listening to the answer
- keeping an open mind and not letting an idea you have about them affect your judgment
- waiting for the person to finish talking before adding anything to your question.

Activity 2

Interview the person with your class. Make notes about the responses they give which you think might be helpful. Think about how they felt, how the cyber bullying might have changed their behaviour, how they got it to stop and what they would do differently if it happened again.

A person who has been bullied might want to react to bullies in a negative way. This could be sending unkind messages back or writing hurtful comments to the bully. Often, this will make things worse. By reacting to a bully in this way, you are giving them a reason to be unkind.

Remember, if you get or see a hurtful message, tell a trusted adult to help you. Save any messages or comments to show adults who are trying to help you.

With your partner, think of a sentence to explain how the person felt when they were cyberbullied.

I can recognise unacceptable behaviour and choose safe adults to tell about it.

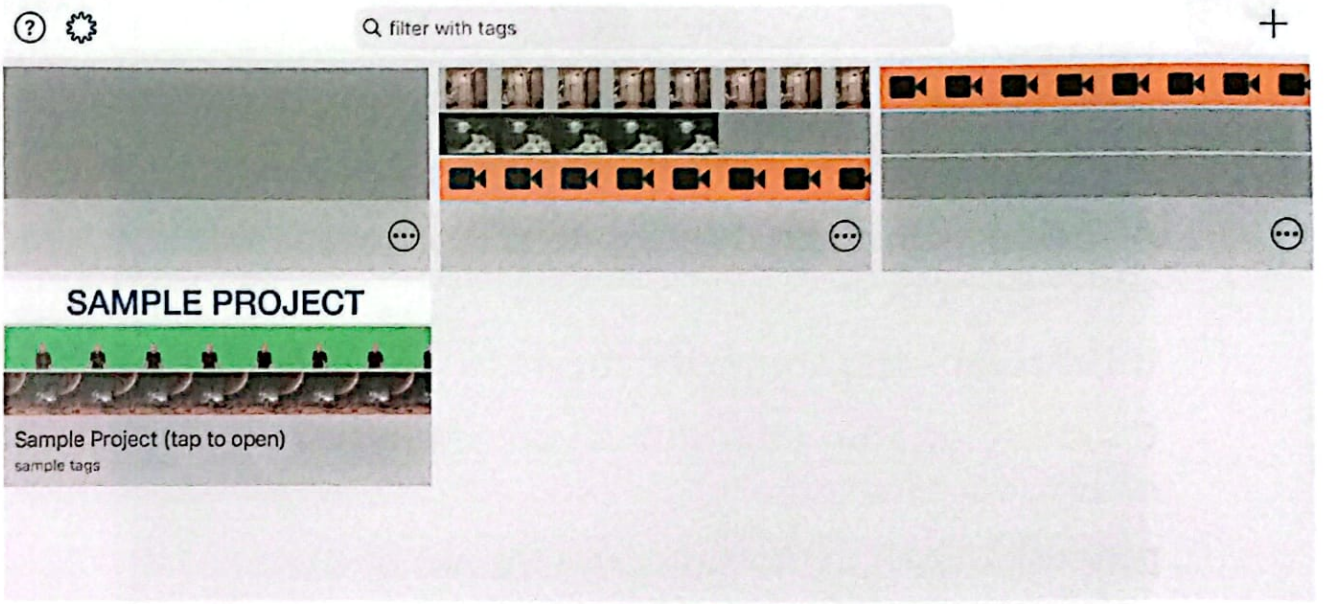
Lesson 5
Creating a green screen video about cyberbullying

In this lesson you will look again at the green screen video application you used in Year 2.

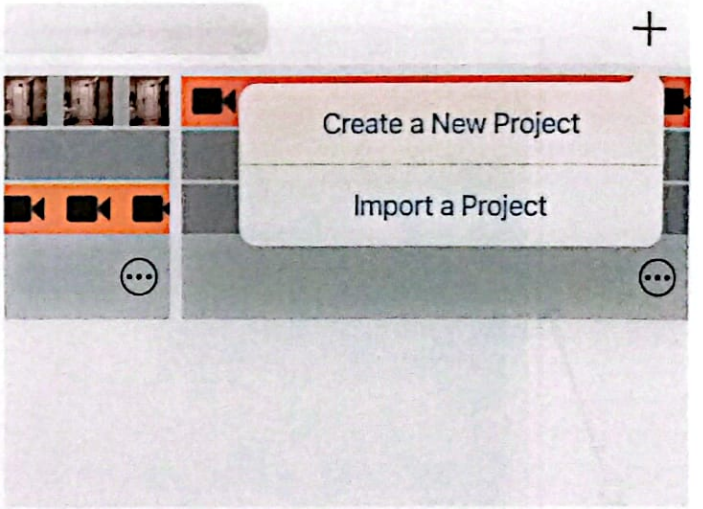
Key words: green screen, timeline

Using a green screen in a video replaces the background with a digital backdrop. This is a recording technique which uses layers to create interesting effects. Discuss with your partner what you can remember about using **green screens** from your previous learning.

When you open your green screen application you should see a screen like the one below.



Here you can see the other projects on the device. To add a new project, tap the + sign in the top right corner. Then select 'Create a New Project'.



Activity 1

With a partner, look at your green screen application and experiment with the features. Think about which features you remember and any new features you have discovered.

Activity 2

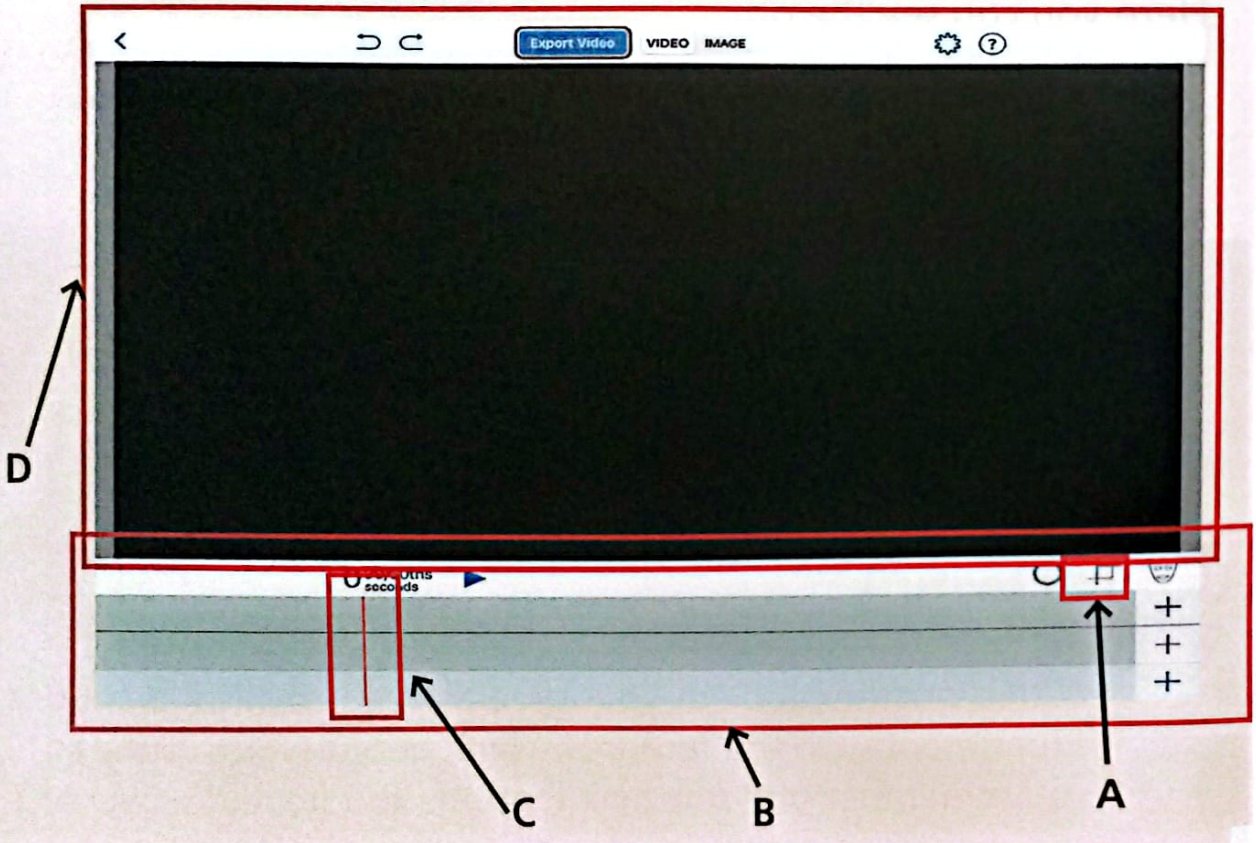
Here is a screenshot of a green screen application. From the statements below, choose the correct letter to label each part of the screen.

A Toolbar – this opens the options you have, such as cropping.

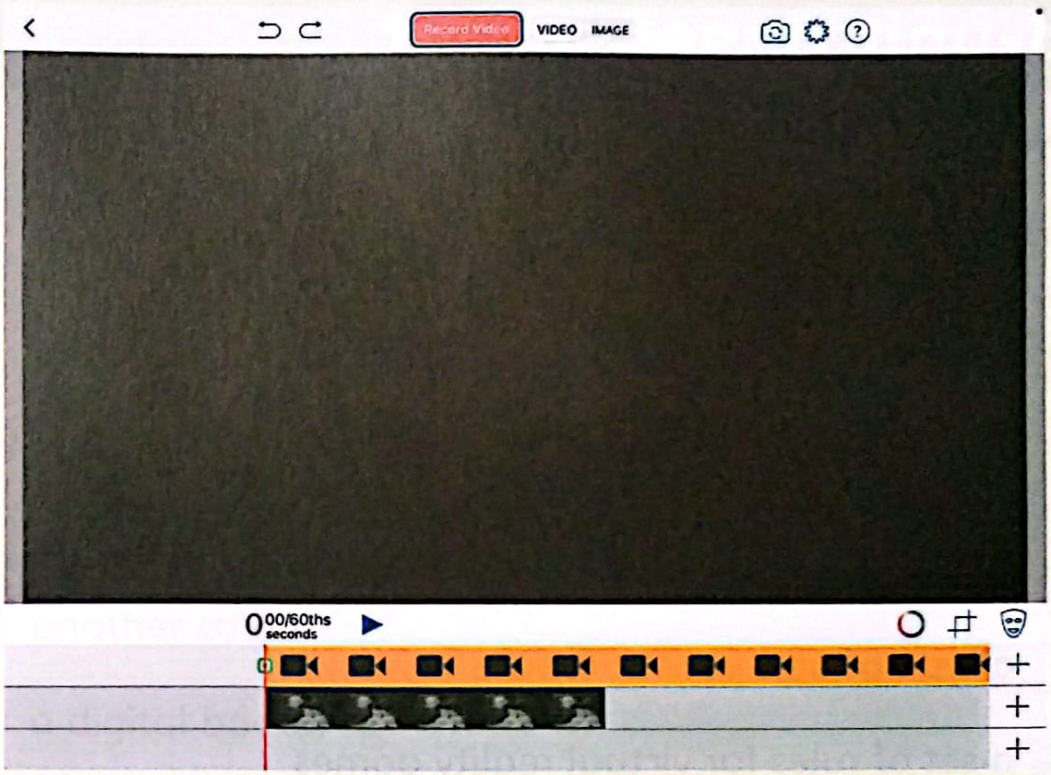
B Timeline – this shows the layers to your video.

C Video indicator – this shows you where you are in your timeline.

D Preview area – this shows the frames of the video you have made.



Look at this screenshot.



How can the user turn the camera around?

Explain to your partner how they would do this.

- I can recall the features of a green screen application.
- I can use some features of a green screen application.

Unit 1
Mid-unit assessment

Write your answers in your notebook.

1 Write one example of personal information.

(1 mark)

2 What is e-safety?

A an app to keep you safe

B the safe and responsible use of technology

C a type of anti-virus software

D a set of rules for virtual reality games

(1 mark)

3 What information is safe to share online?

A your first and last name together

B your username

C your home address

D the school you go to

(1 mark)

4 a) What is cyberbullying?

b) How is cyberbullying different to normal bullying?

c) Kwame shares a picture of himself on social media. A user makes a hurtful comment about him on the picture. Explain how Kwame might feel.

d) Explain how cyberbullying might affect how Kwame acts in the future.

(4 marks)

5 A green screen in a video replaces the background with:

A plain text

B another colour

C a digital backdrop

D clip art

(1 mark)

6 Describe two benefits of using a green screen.

(2 marks)

Lesson 6
Cropping and merging scenes on your green screen application

In this lesson you will practise cropping and merging video files.

Key words: crop, cropping, edit, importing, merge, merging, timeline, trim

Recording is only one stage of making a video. The next stage is to edit your video so that it is easy to watch and understand. You will do this by cropping and merging clips together.

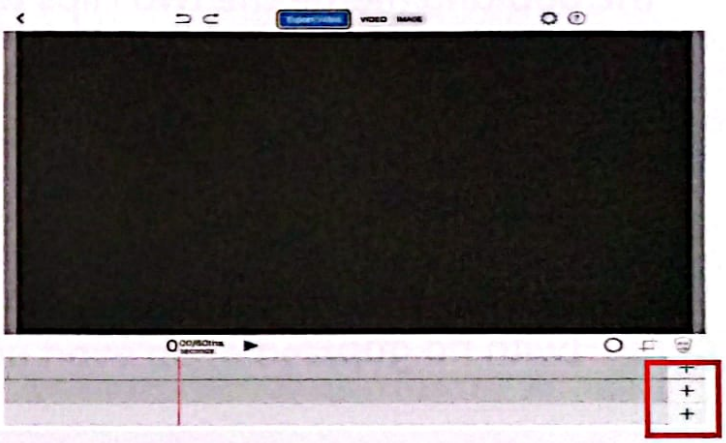
Cropping means cutting something out. **Merging** means joining two things together. **Importing** means to bring something into the application.

Activity 1

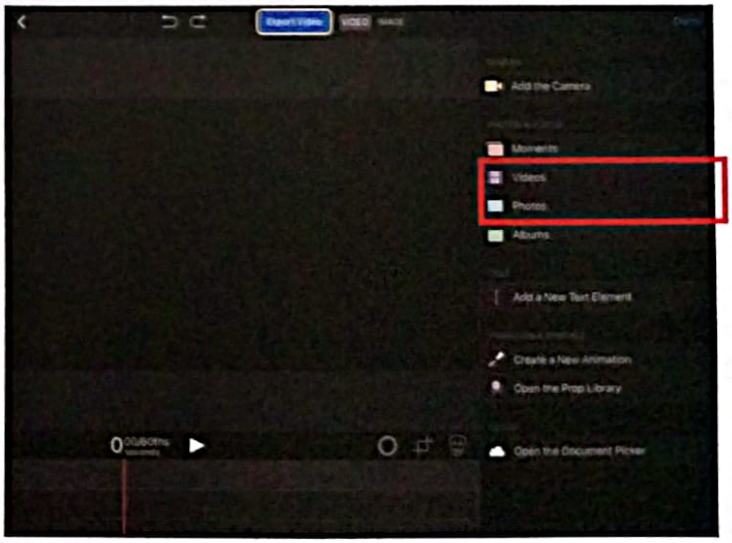
Discuss with your partner why it is important to **edit** videos. Think about what would happen if videos showed everything that happened during filming.

How to import a video into your green screen app

1. Open your green screen application and tap the + sign on one of the layers. Usually, it is best to choose the bottom layer as the backdrop layer.



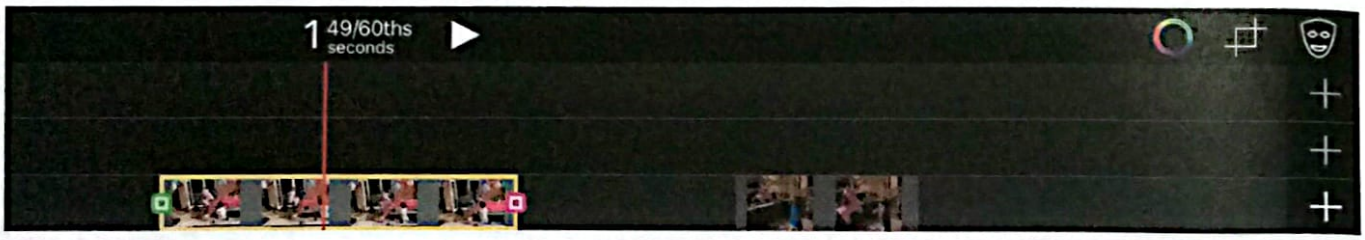
2. Select the video option to display the videos on the device.



Activity 2

Practise importing a video file as a background on your device. Use what you have learned to import two videos.

Once you have imported your two video files, your screen should look something like this:



Here you can see there is a gap between the two files. To remove the gap and merge the two clips together:

1. Tap the video clip you want to move.
2. The yellow box will show you it is selected.
3. Then tap and hold the clip and drag it to where you want it.
4. Release the clip and it will remain in the new position (with no gap).

To **trim** a clip, follow these steps:

1. Select the clip and drag the red button to the part where you want the clip to end.

2. If the part you want to trim is in the middle of the clip (for example, a mistake) you will need to split the clip after the mistake. To do this, select the clip that contains the mistake and drag the red box to the beginning of the mistake. This will cut out the mistake.
3. You will then need to **merge** the first and second parts of the clip as already described.

Pay attention to the location of the red line that shows the **timeline** when you import, **crop**, trim and edit your video. Swipe left and right to move your timeline along.

Activity 3

Edit any mistakes out of your video files on your device. Make sure you have merged the remaining video clips together.

Watch your finished video with a partner and discuss if you think you have cropped and edited the film well. Why or why not? What could you have done better?

I can use appropriate software or online services to meet the specified needs of a project.

I can import video files.

I can edit and merge video files.

Lesson 7
Planning a recording script

In this lesson you will plan your recording script for your green screen video.

Key words: character, cyberbullying, event, feelings, script

It is important to plan your video so you know what you are going to say before you start recording. For your video, you will be planning a **script** about a **cyberbullying event** which should contain all the details you want to include. A script is a written version of what will be said and done in your video. You have learned about scripts in your English lessons but here are some key points:

- **Character** names are written on the left side of the page.
- The words that the character will say are written on the right side of the page.
- The setting describes where the action takes place. For example: Characters seated at a desk in a library
- Write the actions for each character in brackets. For example:

  [Mina folded her arms and stamped her feet].

Activity 1

With a partner, think about cyberbullying and what you have learned so far in this unit. Think of some ways that cyberbullying impacts people's **feelings**.

A recording script template like this will help you plan what you want to say and do.

Scenario: _____

Characters: _____

_____

_____

_____

Setting: _____

Name: _____

_____ : _____

_____

_____

_____

_____

_____ : _____

_____

_____

_____

_____

Scenario: describe what is going on in this scene

Characters: who is involved in this scene

Setting: describe where the scenario is taking place

Name: the character who is speaking or acting

Lines for what the character will say.

Remember you can add acting directions in square brackets [ ].

The first part of your script should act out a cyberbullying situation. You will need to show what has happened, and what hardware and software has been used in the cyberbullying. You should also clearly show how the victim feels.

The second part of your script will be a news report. This will have a person describing the events as if they were not there at the time. This part should explain what the victim did to deal with the situation.

Activity 2

Write your script. Then discuss the following questions with your partner.

- What do you like about your script?
- Does it describe an incident and have a news report summary?
- How could the script be improved?

Suggestions for scenarios:

- playing an online multiplayer game
- receiving messages from a friend of a friend.

Suggestions for settings:

- at home, school or an after-school club
- on holiday
- a playground or park.

What did you find most difficult when writing your script? Discuss with your partner.

- I understand how to use digital technologies safely, responsibly and respectfully.
- I can plan my green screen video.
- I can recognise unacceptable behaviour and know who to talk to when I see it.

Lesson 8
Designing the backdrop for your green screen video

In this lesson you will be designing and creating your backdrop to the scene you planned in the previous lesson.

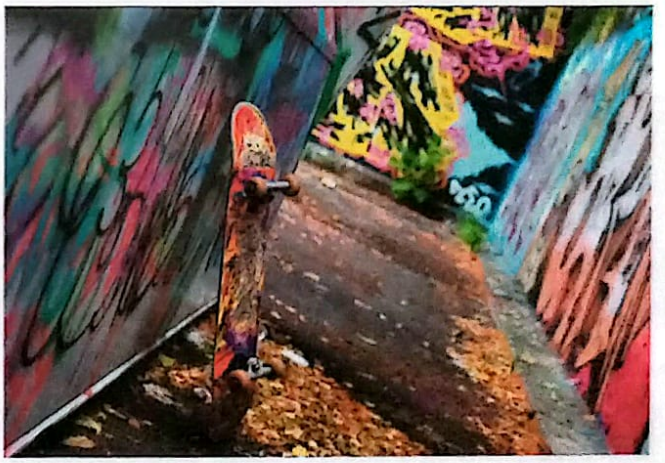
Key words: backdrop, internet, scenes

A **backdrop** is the name for the background in a green screen video. You can change the background of the video to make it look like different places or settings. Discuss with your partner which application you will need to use to create your backdrop. What e-safety risks do you need to be aware of before you start?

Library backdrop

Deciding how to get your backdrop **scenes** is an important part of planning your video.

Ways to get a backdrop	Positive	Negative
Draw your own backdrop	You can create exactly what you want.	It might look like animation.
Take a photo	You can use a real setting in the exact way you want to use it.	It can be difficult to get a photo of the area you want if it is being used or if it is far away.
Get an image from the **internet**	The available choices are nearly limitless.	The size might be wrong so the characters look out of place in the video.



Activity 1

This picture shows why an image from the internet might not work well for your video. With a partner, discuss three reasons why this image would be a poor choice for a background.

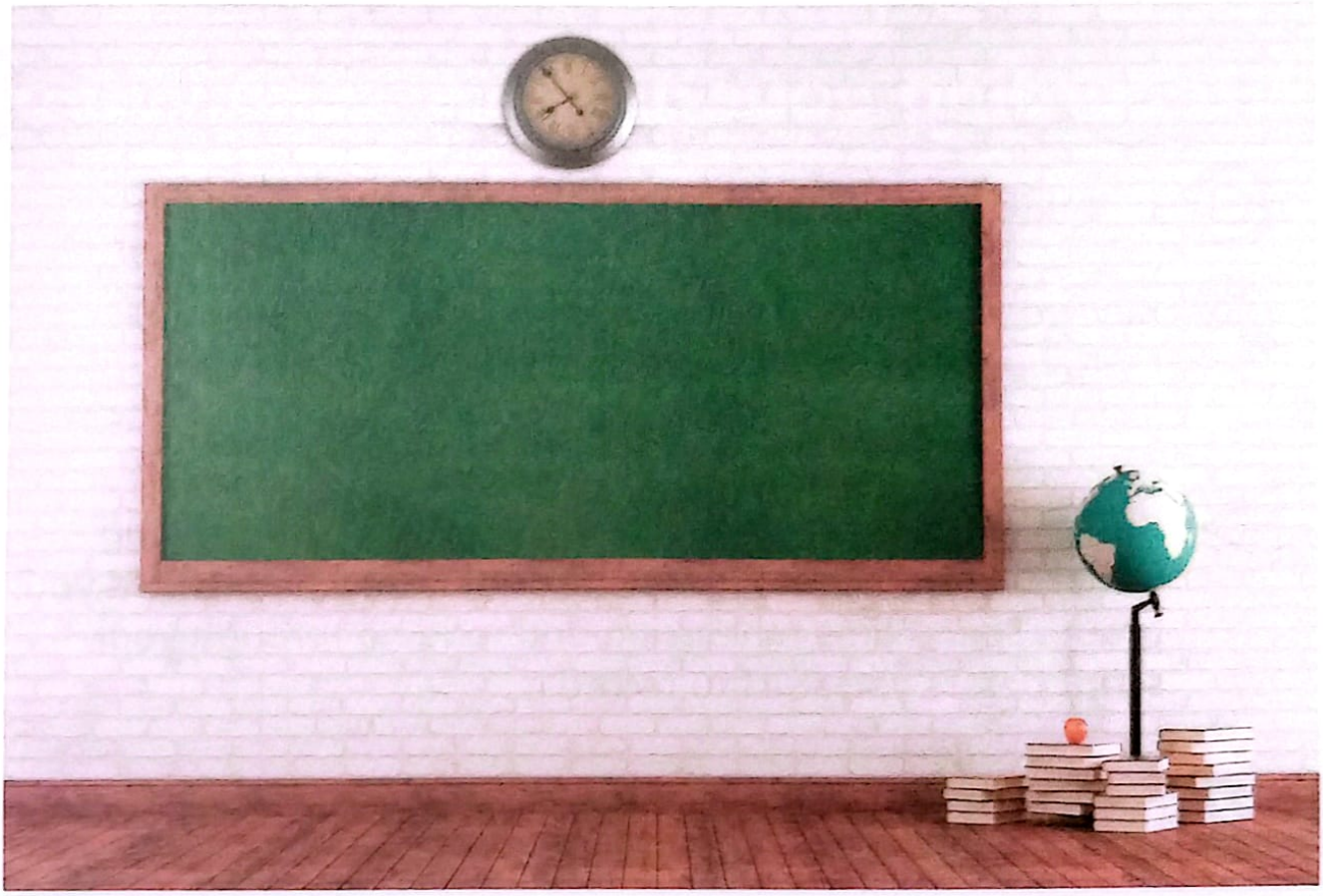
Activity 2

Decide with your group how you are going to get your backdrops. Work together to find or create them.

Carefully choose images which will fit your video setting. You will need to find a backdrop for each of your scenes and check that the image fits with the size of your actors.

If you are using a camera to take a digital image, remember to think about how far away you need to be. This will help the characters not to look too small or too big for the backdrop. Here the image is too close, the people are too large and they would distract from the actors on the green screen.

Here is an example of a good backdrop.



In your groups, discuss these questions:

- Do the backdrops you chose clearly show the setting?
- Why did you choose your backdrops?
- Could your backdrops be improved?
- Do you need to use any of the backdrops created by other groups for a different scene?

I can choose an appropriate backdrop image for my video project.

Lesson 9
Recording your green screen video

In this lesson you are going to record your video.

Key words: backdrop, credits, crop, edit, green screen, merge, script

Get ready to record your **green screen** video by thinking about the tasks that need to be done by each person in your group. Spend time rehearsing and reading through your **script** before you start to record it.

Top tips for recording a green screen video

- Keep the camera still – a tripod may help you.
- Do not cover the microphone.
- Speak in a loud, clear voice.
- Look directly at the camera.
- Use appropriate body language/actions.
- Make sure the whole **backdrop** is green.
- Make sure you know what you need to say.

Activity 1

Use your scripts and digital backdrops to record and produce your green screen video. Discuss the following questions with your group.

- How well did the backdrops work?
- What did you find easy to use about the green screen application? What did you find difficult?
- What do you feel you need to spend more time on?
- Was there anything you didn't know how to do?
- How useful was your script?
- What else would you include if you had to do make the video again?

Activity 2

Create a **credits** scene to put at the end of the video. You can use your backdrop and add text to show who did each task in your project.

Look at your video in your groups. Now you need to plan your **edit**. Make a list of editing jobs ready for the next lesson. What sections will you need to **crop** or **merge**? This list should contain what mistakes need cropping or which clips need merging together to make a smooth video.

I can record a green screen video using an appropriate script and background.

Lesson 10
Completing your green screen video

In this lesson you will edit and complete your green screen video.

Key words: crop, edit, improve, merge, refine

Review your list of **edits** you made last lesson with your group and decide the order in which they need to be done. Editing can take time and it is important to stick to your plan. It can be easy to make unplanned changes as you edit, but this might affect something later in your video. Do you need to **refine** your list?

Activity 1

Review your video and discuss it with your group.
Think about these questions:

- What do you like best about your video?
- Did your video explain what happened well?
- Would you make any more changes to your video?
- What advice would you give someone who was making a green screen video?

Activity 2

Look at the **crop** and **merge** instructions from Lesson 4. Now create your final edit of your video.

If you make a mistake and want to go back a few steps, use the undo arrow at the top left of the screen.

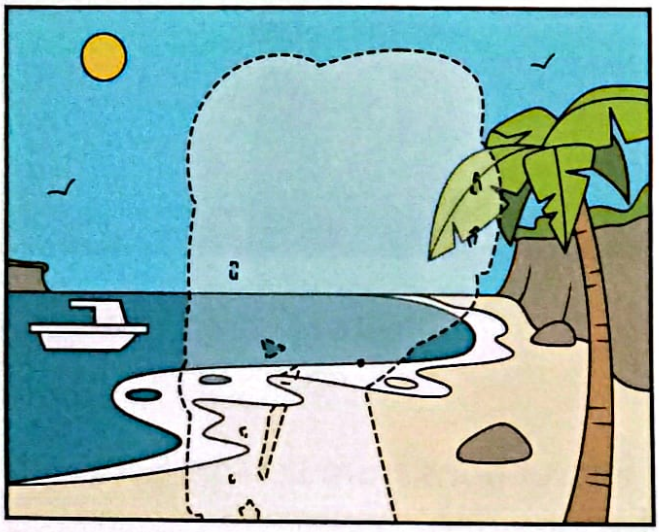
Activity 3

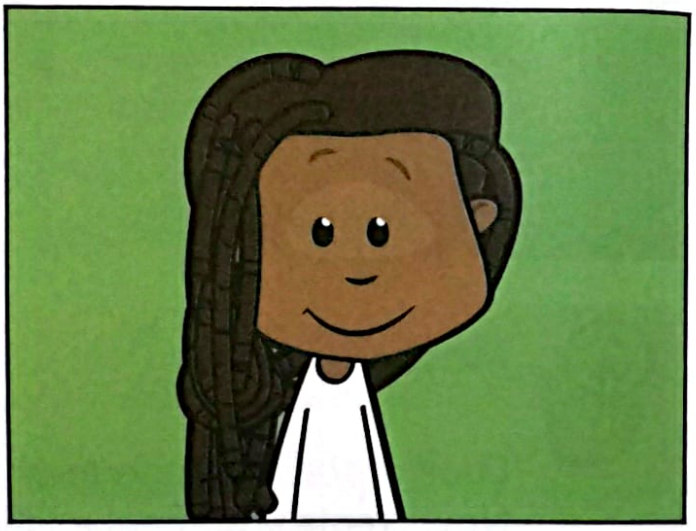
Imagine you have been asked to send your video to other schools so it can be shown to help other students. Choose an appropriate title and a two sentence description for your video.

With a partner, discuss these questions.

- What was most effective about the video?
- Did the green screen backdrop suit the video?
- Did the video make the story of the cyberbullying clear?
- What could be **improved**?

I can edit a green screen video.





Unit 1
End-of-unit assessment

Write your answers in your notebook.

1 What should you do if you receive a hurtful message online?

A send a hurtful message back

B send a nice message back

C tell a trusted adult

D ignore it

(1 mark)

2 Nala is interviewing Maya, who has been cyberbullied.

Write two ways Nala can show respect when she is interviewing Maya.

(2 marks)

3 What is a script?

A a written plan of what you will say and do

B a type of device

C a kind of cyberbullying

D an application which records video

(1 mark)

4 What is the word for the image in the background of a greenscreen video?

A photo

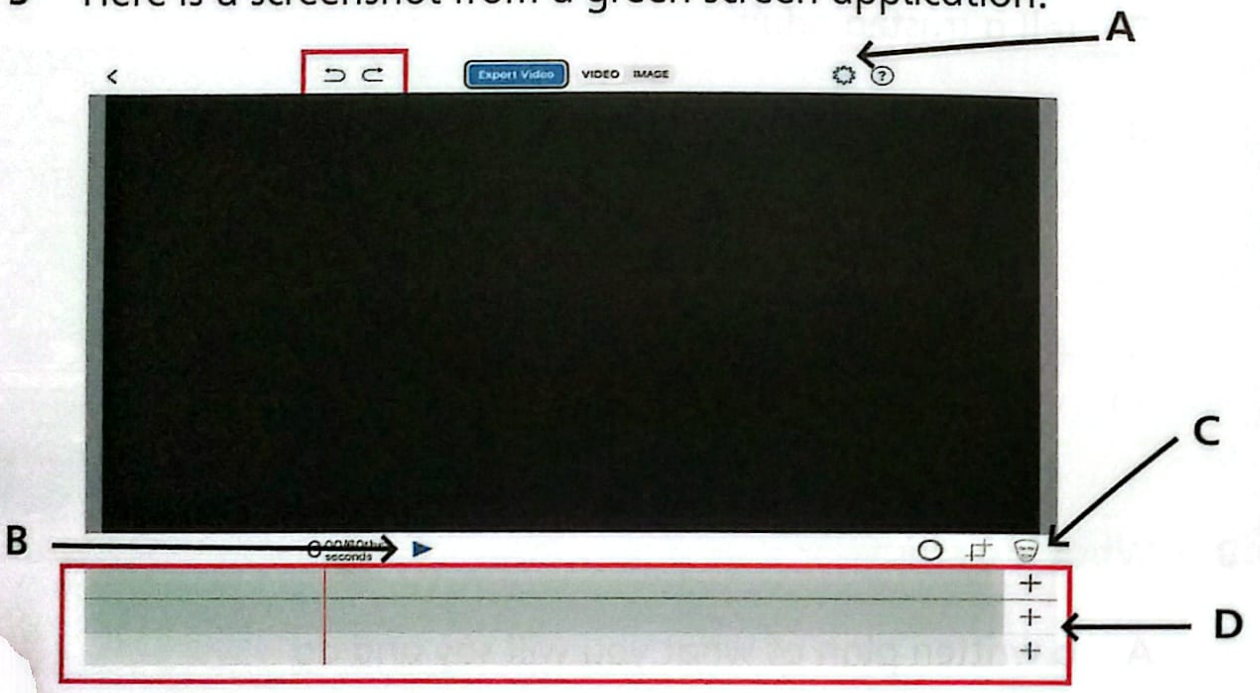
B backdrop

C storyboard

D drawing

(I mark)

5 Here is a screenshot from a green screen application.



a) What do the three rows highlighted at the bottom of the screen show?

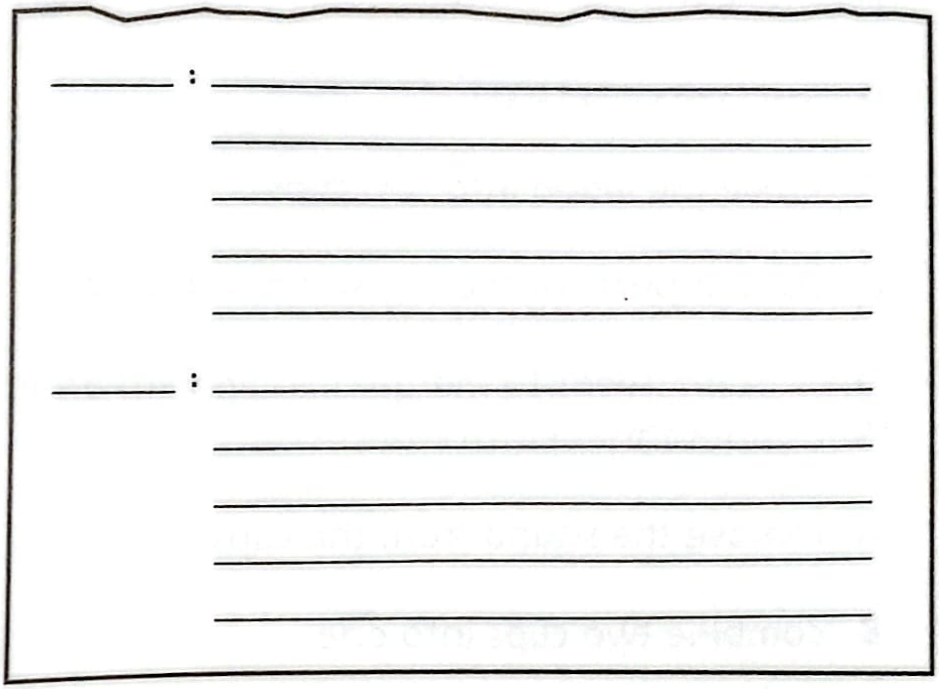
b) Where do you need to click on the screen to add a video you have already recorded? Choose from options A-D.

c) What do the arrows highlighted at the top of the screenshot do?

(3 marks)

6 Yared is writing a script about cyberbullying.

a) What should go down the left side in the recording script template?



b) Yared adds brackets to some of the text in his script. What does the text in brackets show?

A the actions for each character

B who is speaking

C the background of the scene

D the words for each character

(2 marks)

7 Saira is editing a video.

a) She needs to trim a clip. What does this mean?

A make the clip clearer

B put two clips together

C make the video into two clips

D cut out parts of the clip she doesn't want

b) Then, Saira needs to merge this clip with another. What does this mean?

A remove the sound from the clips

B combine two clips into one

C remove the background image

D make the clips clearer

(2 marks)

8 What are the credits in a film?

Include where you would expect to see them and the type of information they contain.

(2 marks)

Read the sentences. Do you agree? Think about what you have learned.

- I can say what e-safety means and know what is safe to share and what is not.
- I can explain the difference between bullying and cyberbullying.
- I can make and edit a green screen video about cyberbullying.
- I can crop and merge media.
- I can recognise unacceptable behaviour and report concerns about content, contact and conduct.

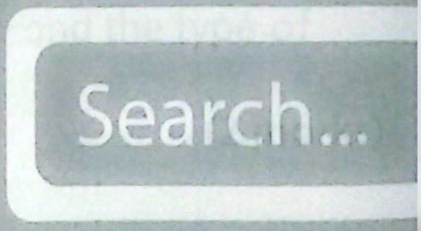
Unit 2

Searching and comparing

In this unit you will develop your understanding of how search engines can be used well, using commands that help make your searches more effective.

You start by thinking about the reliability of online information and whether sources of information can be trusted. To help you find better results, you will learn how to use advanced search techniques.

You will also learn about tables and how to put them into a text document and format them to help present the text. Finally, you will use these skills to plan and present a research topic.



Key objectives

- To be able to decide if an online source is reliable, by considering the content, design, authorship and the presence of any errors.
- To decide if information online is biased or fair.
- To be able to use document formatting techniques, including tables, alignment and shading.
- To learn how to use advanced techniques when searching for information online to fine-tune the search results.
- To be able to plan and execute an online research project.

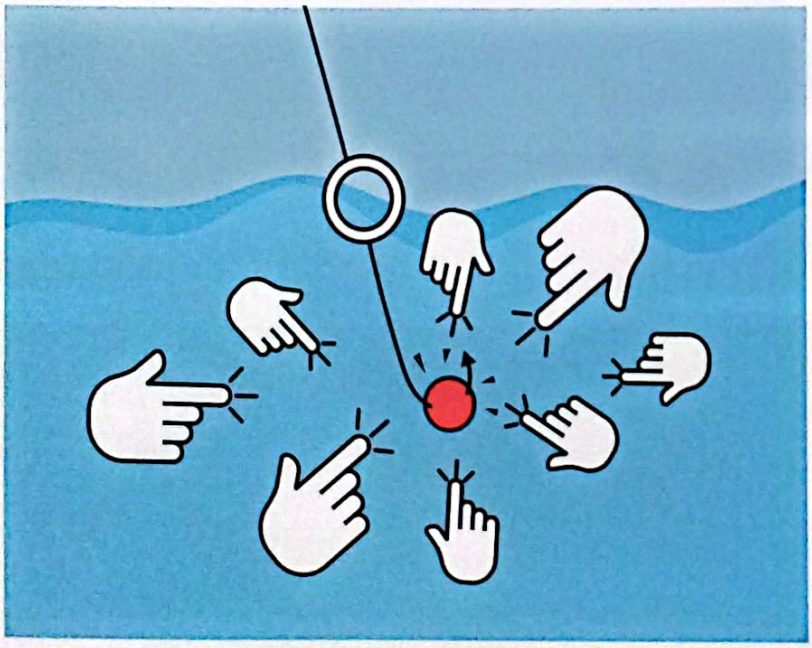
Lesson 1
How do I know if an online source is reliable?

In this lesson, you will look at different sources of information and decide if they are reliable or not.

Key words: information, reliability, reliable, source, unreliable

The World Wide Web has a lot of information available to you. When you are viewing this information, you need to think about whether or not it is reliable.

What websites do you visit? How **reliable** do you think they are? What do you think is suggested by the illustration below?



To decide a web page's **reliability** you should think about:

Things to think about	Questions to ask	How to tell if the web page is unreliable
The date the web page was written	Is the web page recent or old?	An old web page might show **information** that is out of date.
Who wrote it	Was the writer an expert, a student, or someone with a hobby?	A student or person who has a hobby does not know as much as an expert.
How realistic the information is	Does the web page show facts or opinions?	Facts show what is true, but opinions are just a person's ideas.
Spelling and grammar	Is the spelling and grammar clear and accurate?	Poor spelling and grammar might mean the person is not an expert.
The design of the web page	Is the information easy to follow, with sensible diagrams or pictures?	Silly or unrealistic pictures might mean the information is not reliable.

Activity 1

Discuss with your partner which you think is a more reliable **source**. Why?

TJ WEBSITE!!!!!!

Rare and engandered giant green kat spotted outside food shop. Causing trubel with locals!!! these peepel can't buy their food anymore in case they are chased by big cat! everyone should b careful when walkihng aroud the shops!

article by Tobie Jacobs (Cat lover, 5 years old, 2001)

Activity 2

Look at some websites about the same topic, such as endangered animals or your local area. Use the table on page 51 to help you decide if the sources are reliable or **unreliable**.

Look again at the factors for deciding whether or not a website is reliable. Which one do you think is the most important?

With a partner, put the factors in order from the most important to the least important and explain why you have chosen your order.

I know how to check if information is reliable.

Lesson 2
Understanding how to question information

In this lesson you will use some questions to help decide if information is reliable or unreliable.

Key words: critical, critique, question, reliable

Think about the five factors you learned in Lesson I which will help you decide how **reliable** information is.

Discuss with your partner as many of the factors as you can remember. Which one did you think was the most important?

You are going to use some **critical questions** to help you decide if information is reliable or unreliable. These questions will help you **critique** your information source and help you decide how reliable it is.

Here are some examples of critical questions you can ask yourself when you are evaluating information:

Date

- When was it written?
- Was it written near the event or a long time after?
- What has happened since it was written? Is the information out of date?

Author

- Who is the author?
- How old are they?
- Was the author writing at the time of the event or after?
- Has the author written any other information?
- Are they an expert?

Does it sound realistic?

- Are there any facts that surprised you?
- Are there opinions?
- Can you check the facts using another source?

Spelling and grammar

- Are the key words about the topic spelled correctly?
- Is there good use of vocabulary?
- Do they use a range of punctuation?

Design

- Are the pictures and photos appropriate to the subject?
- Are there links to find more information?
- Are the images taken from somewhere else?
- Does the design make the information easy to follow?

Activity 1

What other critical questions could you ask which may help you evaluate information?

Activity 2

Take a look at the example T-Rex fact file. Study the content and layout and then answer the critical questions that follow. With your partner, discuss how reliable this source of information is.

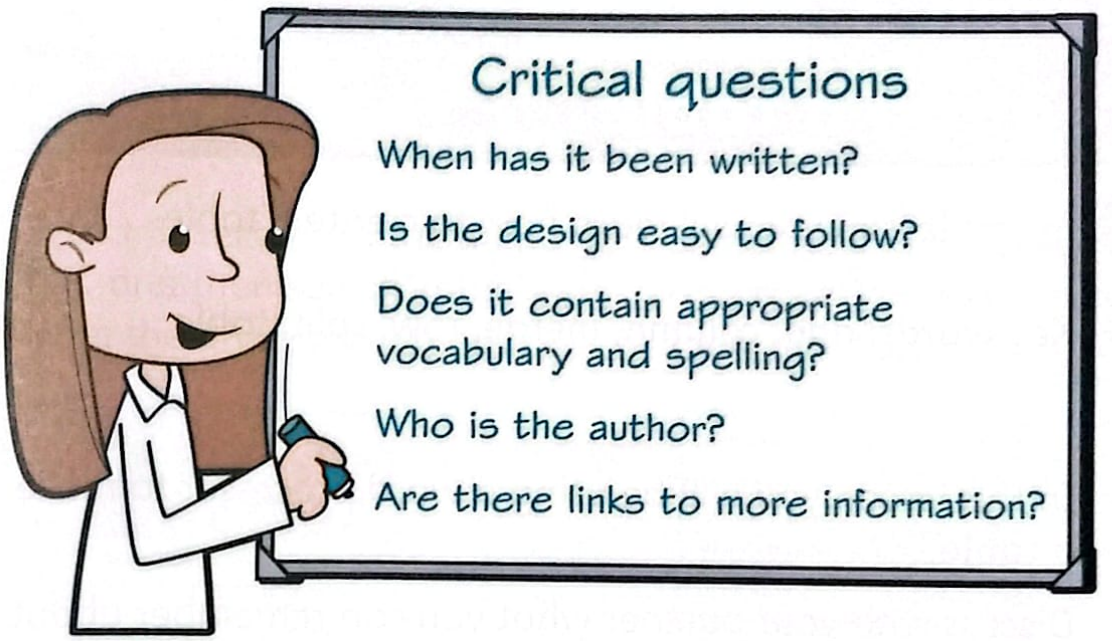
Home page

T-Rex fact file

- Full name — Tylanasaraus Redge
- Age — 15 billion years old
- Habitat — bottom of the sea
- Diet — 1 elephant a day
- Key features — 3 teeth and purple scaley skin
- Height — tall as a sky scraper

Written by Priti (7 ½ years old)
3 July 2009

previous next



Discuss with your partner your top five critical questions. Are they the same five as this student has chosen? Explain your ideas.

I can ask questions to help decide how reliable information is.

Lesson 3
Creating a table

In this lesson you will learn how to create a table.

Key words: add, column, merge, row, split, table

In this lesson you will be using a word processor to make a **table**.

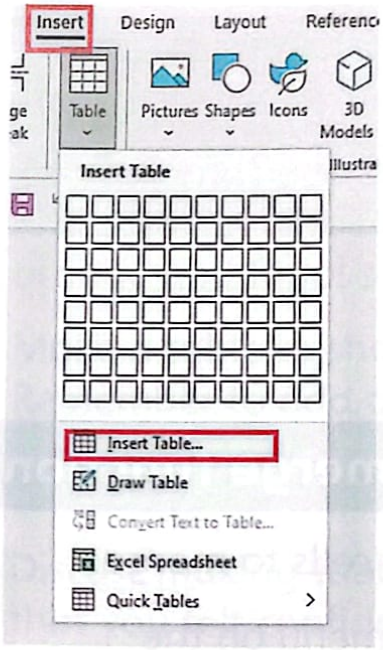
Discuss with your partner what you can remember about word processors. Think about these questions:

- What are they?
- What do they do?
- Why do people use them?
- What word processing applications have you used before?

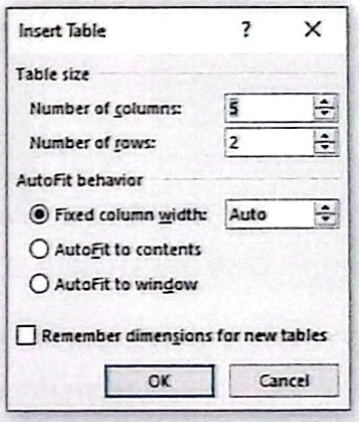
How to insert a table

Follow the instructions to make a table in a word processing application.

1. Select 'Insert' from the menu bar, and then select 'Table' from the drop-down menu.



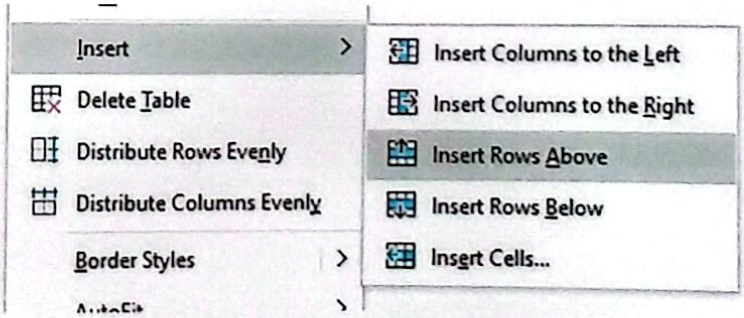
2. Select how many **columns** and **rows** you would like and then click 'OK'.



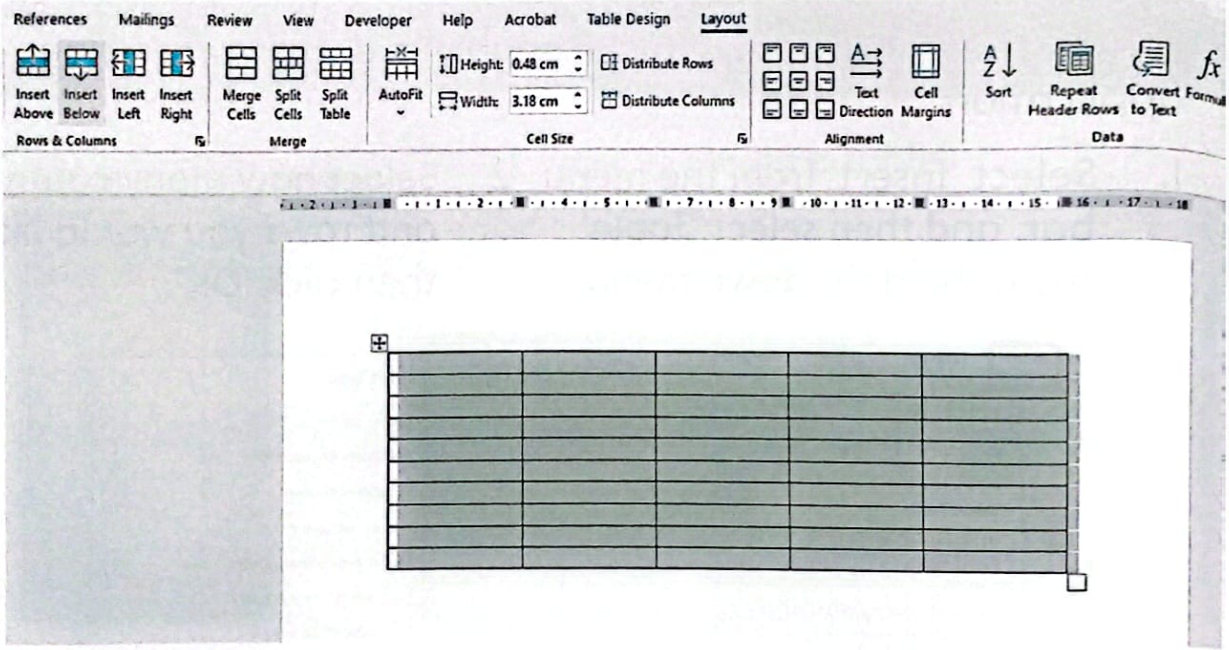
3. Now you will see your table and an options toolbar you can use to edit it.

How to add rows and columns

1. Right-click on the table you have inserted.
2. Click 'Insert'. Here the user has selected to insert a row.
3. The application will ask to insert above or below. It will insert one.

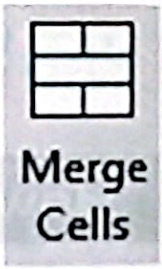


4. You can also insert from the 'Layout' tab in the ribbon that will appear if you have the table selected.



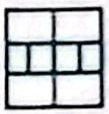
How to combine cells with the merge function

1. Click and drag to choose two or more cells to **merge**.
2. Select 'Merge cells' from the 'Layout' menu on the ribbon, or right-click.



How to split cells with the split function

You can break a cell into more cells by using the **split** function.



Split Cells

1. Select the cell you want to split.
2. Select 'Split Cells' from the 'Layout' menu on the ribbon, or right-click.

Activity 1

Three friends are talking about their favourite colours. Ava says her favourite colour is blue, Sara says hers is orange and Iqbal says his favourite colour is red.

Make a table to show the students' favourite colours. Remember to add a title for each column.

Discuss making tables with your partner. Choose one thing that you felt confident doing, and one thing that you need to practise.

I understand what cells, rows and columns are in a table.

I can add rows and columns, and merge and split cells.

Lesson 4
How to edit a table

In this lesson you will learn how to edit a table by adding borders, changing text alignment in a cell and adding shading to cells.

Key words: borders, cell, column, row, table, text alignment

Review with your partner how you make a **table** in a word processing application. Think about these questions:

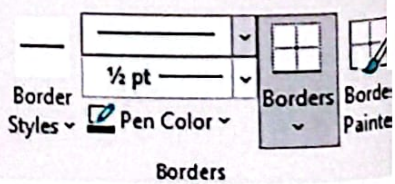
- How do you add a **row** or **column**?
- What is a **cell**?
- What is meant by merging cells?
- What happens when you split a cell?

Formatting a table makes the information easier for the reader to understand. There are lots of ways to format a table.

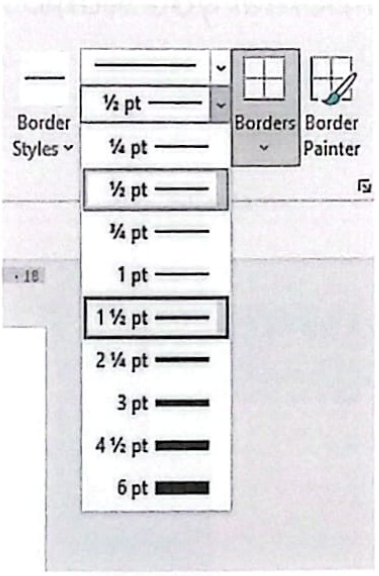
How to use borders

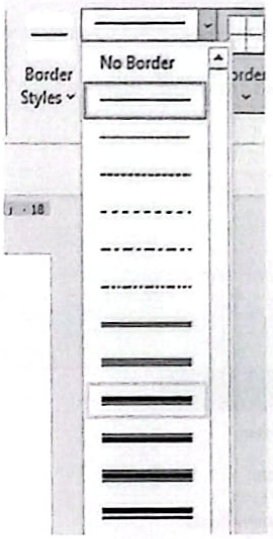
Borders are the lines in and around the edge of a table.

1. Click and drag to choose the cells you want to have borders.
2. Use the 'Table Design' tools in the ribbon to edit the border styles.



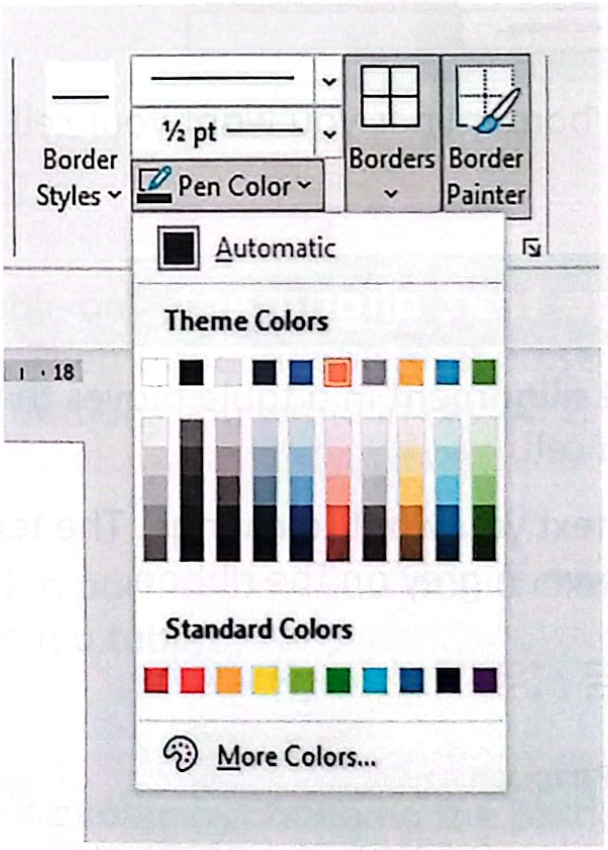
3. Select the style and thickness of the border you want to use.



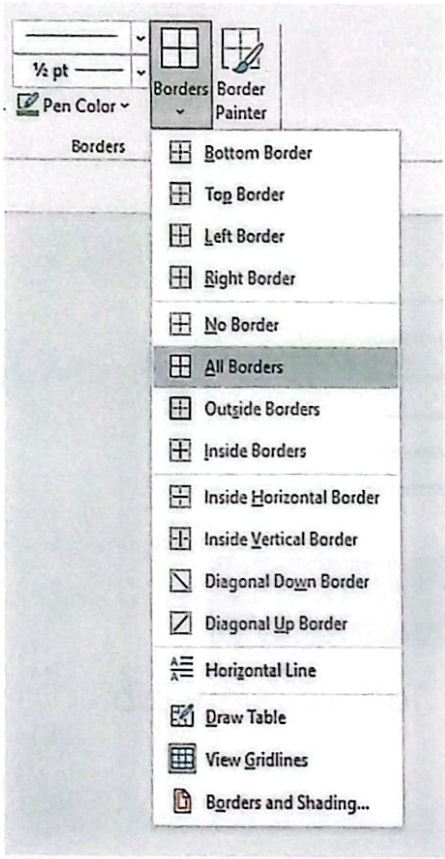


How to change the colour of borders

1. Find the 'Pen Colour' button in the 'Table Design' tab.



2. Select the cells you want to change the border on, and choose from the 'Borders' button what type of border you want.

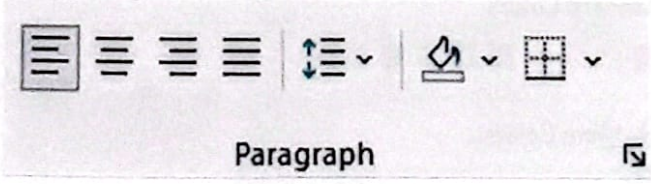


3. Choose which border lines you want your cell or table to have from the list.

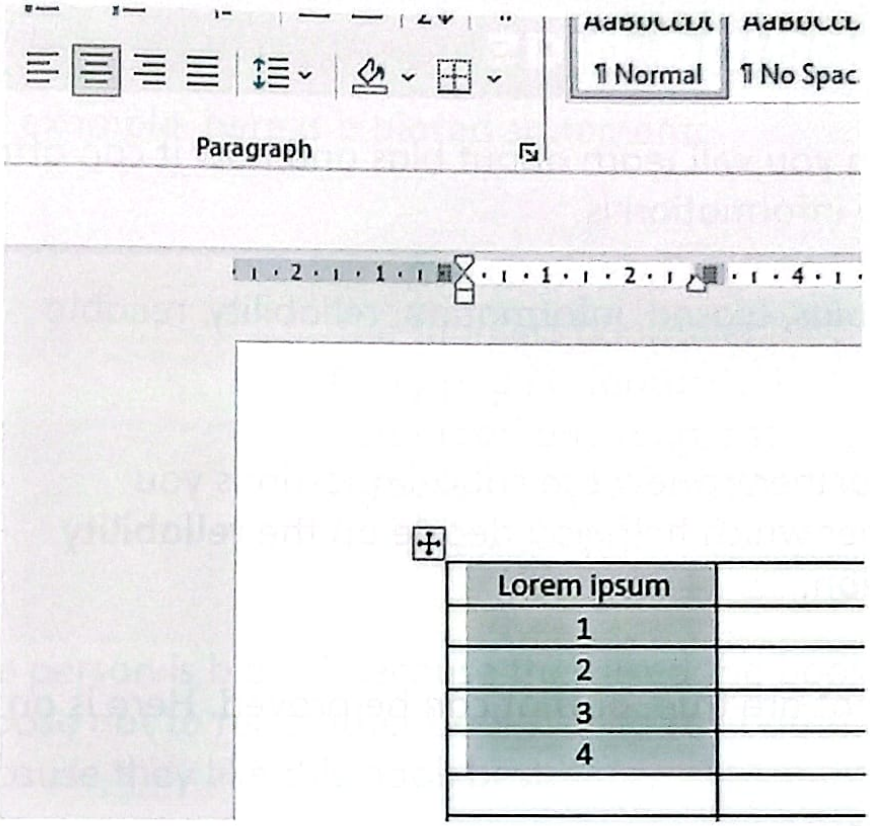
How to change text alignment

Changing the **text alignment** in a table moves the text to the right, left or middle of a cell.

1. Highlight the text you want to change. The text alignment of the cells is shown in grey on the ribbon.



2. Select where you want the text in the cell. Here, the numbers in each cell have been horizontally centred.



Activity 1

Create a table on your device and practise changing the formatting. Then create a table that presents the checklist of critical questions you wrote in Lesson 2.

Discuss with a partner how you would change the thickness of a border in a table.

I can format a table by changing the borders, text alignment and background colours.

Lesson 5
Understanding bias

In this lesson you will learn about bias and how it can affect how reliable information is.

Key words: bias, biased, information, reliability, reliable

With your partner, review the critical questions you can remember which help you decide on the **reliability** of **information**.

Facts are things that are true, or that can be proved. Here is an example of a fact:

Red is a colour.

Opinions are people's ideas or feelings about things. People can have lots of different opinions. Here is an example of an opinion:

Red is the best colour.

Bias is when you see something only from your point of view. When you write something, you may accidentally write with bias. This is showing a like or dislike towards your subject. If a statement shows a personal opinion, it is **biased** and is less **reliable**.

For example, here is a biased statement:

Clive
The Magic Cat is the funniest book ever! Every page is fantastic. I don't read anything else because all other books are rubbish.

The person is biased because they liked the book. They might choose not to read other books, or to say bad things about them, because they like this book best.

Activity 1

Discuss with a partner if the following statements are biased.

- Monkeys have thumbs like humans.
- Tigers are the most interesting big cats in the world.
- A rabbit is the best pet you can have.
- Polar bears are carnivores.

How can we recognise biased information?

Information you find on the Web may contain bias. Here are some ways to recognise bias:

1. Check your information with other websites. This way you get a clear idea of the facts and what might have been left out.
2. Think about the opposite opinion. Ask yourself: what is the opposite of this statement? For example, *Fox Burrow Primary School is the best!*
3. Ask yourself if you disagree with the statement. You cannot disagree that monkeys have thumbs. This is not bias. You could disagree that monkeys are the best animals on Earth because it is something you cannot measure.

Activity 2

Read the text below with a partner. Is the author biased? Explain how you know.

Carrots are the best tasting food ever. They grow under the ground and are found all over the world. Meals without carrots are boring and you shouldn't eat them. They are much nicer than other vegetables like broccoli and peas.

Biased information is less reliable. You should try to use information sources which are not biased (unbiased), or check information with several sources before you start believing what you read.

Explain in your own words what bias is and how it can change how reliable information is.

- I know what bias is.
- I understand how bias can affect how reliable information is.

Unit 2
Mid-unit assessment

Write your answers in your notebook.

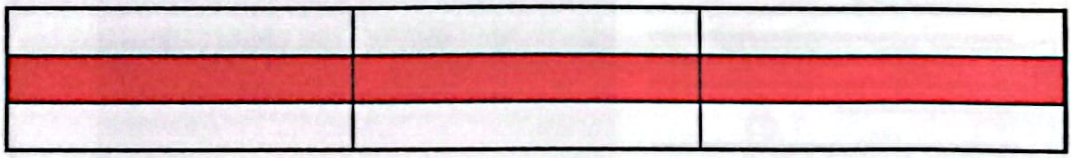
1 In computing, what does 'reliable' mean?

(1 mark)

2 List three things you should check to help you decide if a web page is reliable.

(3 marks)

3 Here is part of a table.



Which statement is true?

A The columns and rows are red.

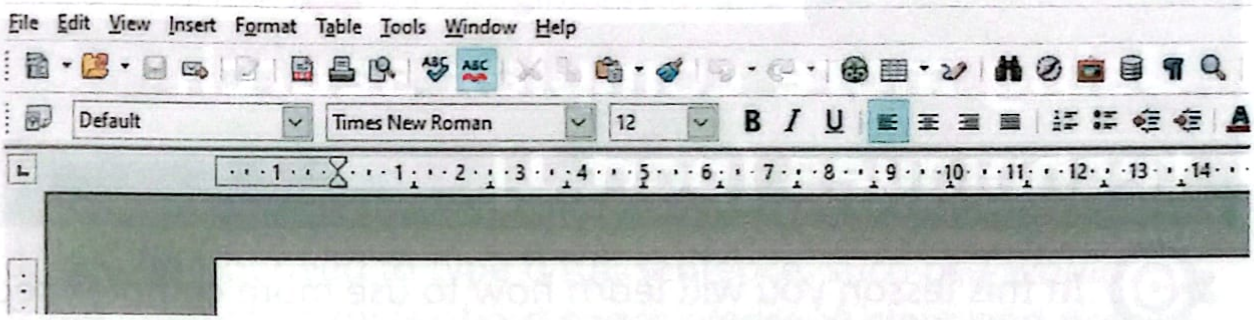
B One row is red.

C One column is red.

D The columns and rows are white.

(1 mark)

4 Here is a toolbar from a word processing application.



Where should you select to draw a table in your document?

(1 mark)

5 Jay has made a table. Now he is formatting it.

Which icon should he click to change the colour of the background in a cell?

A 

B 

C 

D 

(1 mark)

Lesson 6
Using more complex search techniques (part 1)

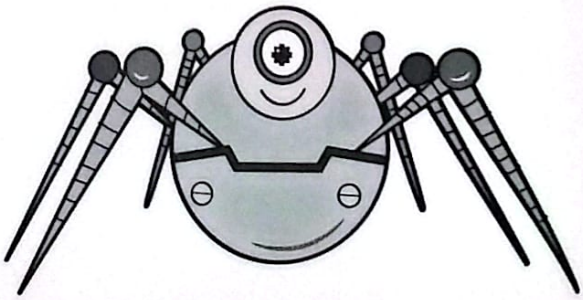
In this lesson you will learn how to use more complex search techniques to help you find exactly what you want.

Key words: appropriate, command, define/definition, index, inverted commas, precise, search engine, spider program, term, web page

Discuss with your partner what you can remember about **search engines** and how they work. Think about the key words **spider program**, **index** and **web page** in your discussion.

Search engines work on keyword searches. They use a program known as a spider program (also known as web crawler) to search web pages for the **term** you typed into the search engine.

1. The spider program sends the web page address to the search engine to index it (organise it).
2. The search engine will then sort the web pages which contain the terms you searched for and show you a list.
3. The search engine ranks the list of websites in different ways, such as how appropriate they are to what they search.

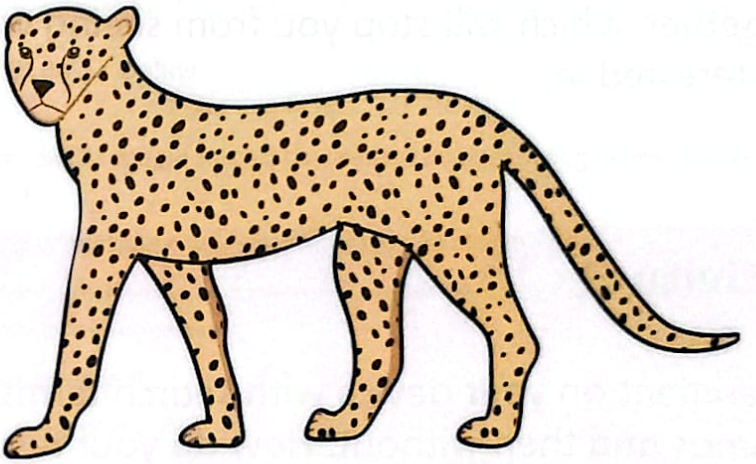


A search engine only searches for words. You do not need to use full sentences and many search engines will ignore these words.

What is the top speed of a cheetah?

A search engine will only search the words in green.

To search for information about space, just type *space* as your key word. You do not need to type a full sentence, such as *I would like some interesting facts about space please*. A clear and **precise** search term will give you more **appropriate** information.



Activity 1

Read the search sentences below. Discuss with your partner how you could make these searches more precise.

a) I would like to know how many species of turtle there are in the whole world.

b) Please can you tell me what the weather will be like tomorrow?

Search engines take each term that you enter and look for them on web pages. For example, look at this search:

book shop

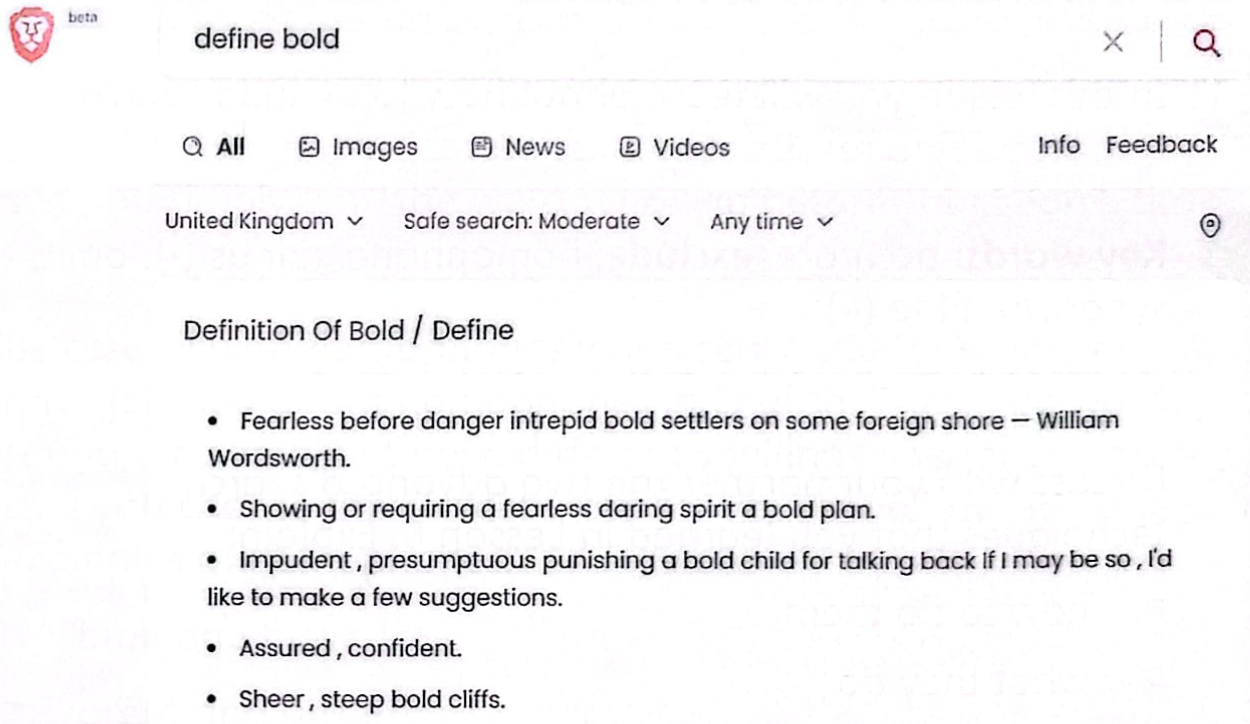
The search engine will search for all pages containing *book* and *shop*. This search might show you pages related to books about shops, as well as information about shops that sell books.

You can use more advanced search techniques to group these words so the search engine treats them as one phrase. "*Book shop*" (using **inverted commas**) will only show web pages which have the two words together, which will stop you from seeing web pages that you are not interested in.

Activity 2

Experiment on your device with search terms using inverted commas and then without. How do your results change?

You can use *define* before a word in a search engine. This **command** shows you the meaning of that word without having to find a dictionary site first.



Explain to your partner how inverted commas help you find more **useful** results from a search engine.

- I can use inverted commas to search for a specific phrase.
- I can use the define function to find the meaning of a word.

Lesson 7
Using more complex search techniques (part 2)

In this lesson you will learn about how to exclude search terms and find results for similar words.

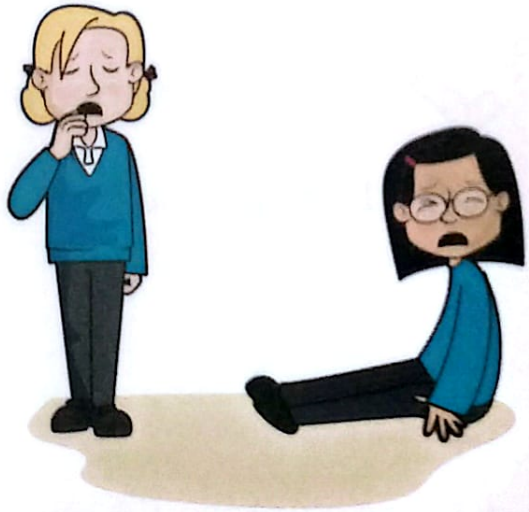
Key words: accurate, exclude, homophone, minus (-), omit, synonym, tilde (~)

Discuss with your partner the two advanced search techniques that you learned in Lesson 6. Explain:

- how to do them
- what they do
- when they might be useful.

A **synonym** is a word or phrase which means the same – or nearly the same – as another word or phrase. You can search using a **tilde (~)** before the word you want to find synonyms for.

For example, synonyms for *tired* are *fatigued, worn out, exhausted, weary.*



Tired Fatigued

You might be doing research for a project on climate change. You may wish to include alternate words by using the following search:

~climate

This may return the following:

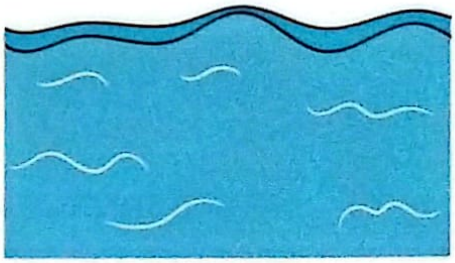
weather pattern, conditions, weather, atmospheric conditions.

If your search engine doesn't recognise the use of the tilde symbol, simply type the word *synonym* before your search term.

Be careful with **homophones** when searching for synonyms! You have learned about homophones in English. These are words that sound the same, but have different spellings and meanings. Make sure you choose the correct word for your searches. Here are some examples of homophones:

- blue and blew
- great and grate
- see and sea
- right and write

See



Sea

Activity 1

Practise searching terms with and without a tilde and compare your results. Which search gave the best and most useful results?

Using a **minus (-)** symbol in your search **excludes** (leaves out) the word which comes after it. This means that you will not see web pages with the excluded word. This is useful when the word you are searching for is a homophone or there are a lot of different examples of the subject you are looking for.

For example, if you search for an image of a keyboard, the search engine will show many images of musical keyboards and computing keyboards. You could make your search more **accurate** by using the minus (-) symbol:

```
keyboards -music
```

Now the search will exclude web pages which have the term *music*.

If you wanted to find out about ball sports but not football or rugby you could use the search query:

```
'ball sports' -football -rugby
```

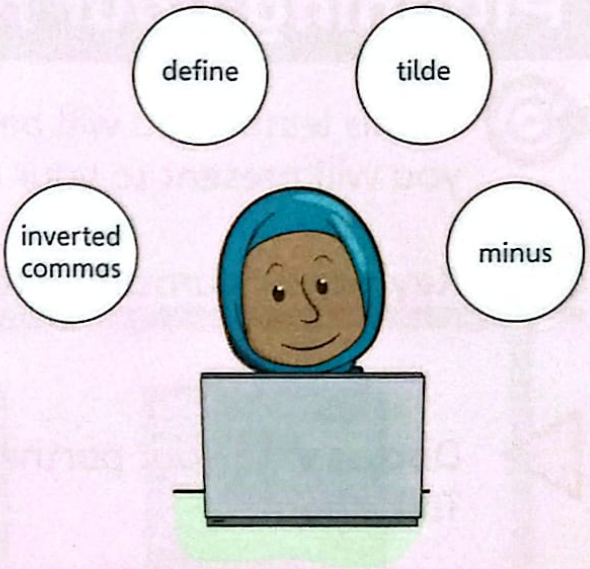
This search would return only the web pages which **omit** football and rugby.

Activity 2

Search terms using a minus (-) symbol and then without to see how the results you receive differ. Work with a partner to explain why and when this would be a useful technique to use.

Activity 3

Make a poster explaining the advanced search techniques you have learned in this unit: inverted commas, define, tilde and minus.



Look at the following search:

cars red ~fast

Do any of the words in this search term have synonyms? Share ideas with your partner.

- I can use tilde (~) to find synonyms.
- I can use minus (-) to exclude web pages from results.

Lesson 8
Planning your research project

In this lesson you will be planning your research project that you will present to your class.

Key words: curriculum topic, research, vocabulary

Discuss with your partner what you have learned so far. Talk about:

- creating and formatting tables
- advanced search techniques.

Explain which of the features you enjoyed using. Which ones you would like to use when you are planning your project?

Decide on the topic you plan to **research** and present. You should try to link this to some of your other **curriculum topics** such as history, science or geography.

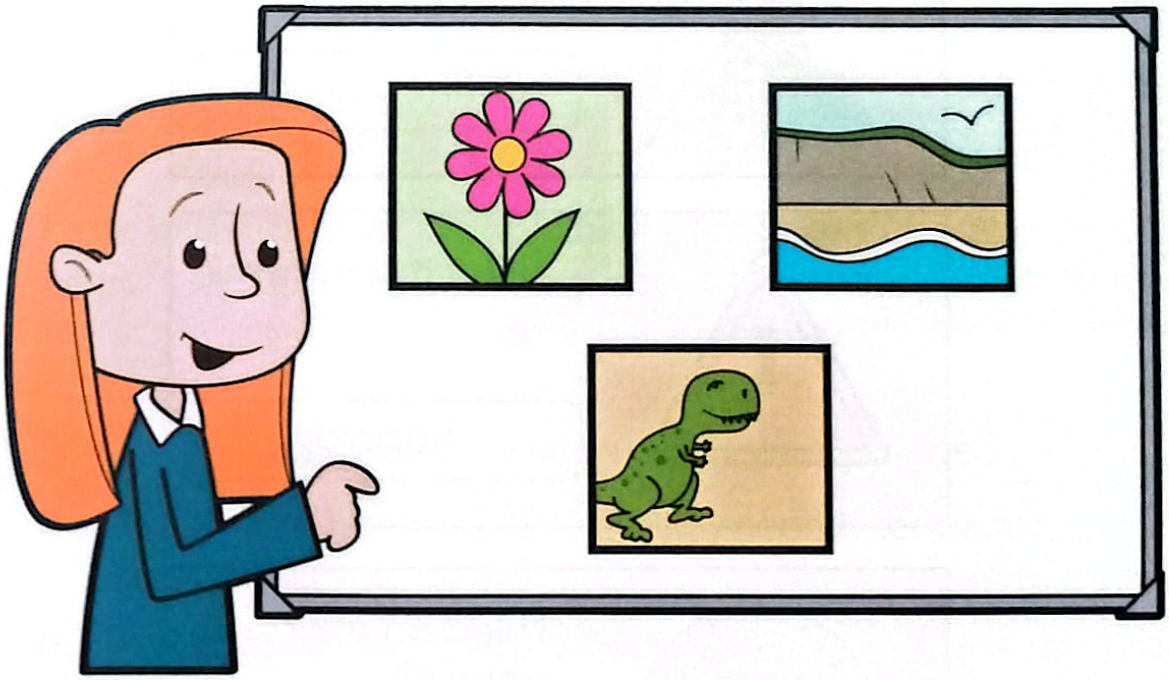
List questions which you could answer with your presentation. Think about how to use the key question **vocabulary**: *who*, *where*, *when*, *why*, *what*, *how*.

Activity 1

Choose a research topic with your partner. Think about your learning in different subjects at school.

Now you need to decide how you are going to present your research. You could:

- create a poster
- give a presentation to your class
- record a video
- record a podcast episode.



Activity 2

Discuss with your partner some of the programs you have both used for school work. For each program, list some of the things it does really well, such as editing text or creating graphics. This will help you decide which ones to use in your project.

Next, you must decide how you are going to research your topic. Start thinking about the new techniques you have learned and which search terms you may need to use to get the best results from the search engine.

Here is a reminder of the search techniques you should use:

Need background information?

define volcano

Need a synonym?

hazard

Need an exact phrase?

"World Wide Web"

Need to omit a word?

computers -laptop

Activity 3

Make a list of your terms you will search.

- Can you use different words in the search to make it more accurate?
- Can you leave out any word or words to make it more accurate?

Activity 4

Look in the class or school library for books about your topic. Use the ideas from the books to choose search terms.

Discuss the following questions with your partner.

- Have you thought of all the key search terms for your topic?
- What other terms could you add?
- How can you make sure you get the results you need to help you research your topic?
- Which search engine command will be most useful and why?

I can plan my research project.

I can plan how to use a search engine effectively.

Lesson 9
Using a search engine efficiently

In this lesson you will use your skills to effectively use a search engine and collect your information.

Key words: paraphrase, plagiarism

Review your work from Lesson 8. Explain to your partner what you are going to research, how you are going to use a search engine and how you are going to present your research.

Now you can start your project by researching and saving the information you find. Remember to follow your school policy for online safety and make sure you know what you should do if you need help.

Remember to **paraphrase** (rephrase and rewrite) the information you find so you are not taking credit for other people's work. Pretending that someone else's work is your own and taking credit for it is called **plagiarism**.

Activity 1

Research your project using your planning. Record the information you find in a table.

Getting used to working in two or more applications on your device at the same time is a useful skill to develop. This is called multi-tasking.

You may need to have a word processor and a web browser running at the same time. This way you can easily switch from one window to another.

Whichever applications you are using, remember to save your work as soon as you start, using a sensible filename which clearly identifies your work. Then save your work regularly.

Remember! When you find information you like, check for bias and check another source before assuming that it is true.

Discuss these questions with your partner:

- What did you find out?
- How did you organise your findings?
- How did you make your table of information clear?
- How did you make the most important information stand out?
- What images do you need for your project?

I can research a project using appropriate software.

I can use search engines effectively.

Lesson 10
Presenting your research

In this lesson you will create and present your research to your class.

Key words: information sheet, leaflet, reliability, script

Discuss with your partner how you are going to present your project to the class. What equipment will you need? Which applications will you need to use?

Activity 1

Create your presentation in the format you have decided.

Work together with your partner by sharing tasks. You will need to:

- find images to use
- find more information that you want to include
- create the presentation (slides, video or document)
- write a **script** to go with the presentation
- hold the camera if you are filming.

Activity 2

Make a **leaflet** or **information** sheet to hand out to your audience with the key information from your presentation.

With a partner, discuss these questions.

- What have you learned about tables and how to format them?
- What do you know about the **reliability** of the information you can find on the Web?
- Which advanced search technique did you find the most useful?

I can create a presentation.

I can present my research to an audience.

Unit 2
End-of-unit assessment

Write your answers in your notebook.

1 What is 'bias'?

A Bias is a type of device used to access the World Wide Web.

B Bias is a type of website written by only one person.

C Bias is when you see something from only your point of view.

D Bias is when you see something from other people's point of view.

(1 mark)

2 Explain why it is good to check information by reading a few different websites.

(1 mark)

3 Which sentence best explains what a spider program does?

A A spider program searches web pages for key words you type into a search engine.

B A spider program checks for bias in key words you type into a search engine.

C You use a spider program to draw pictures.

D You use a spider program to make spreadsheets.

(1 mark)

4 Prisha has typed this text into a search engine.

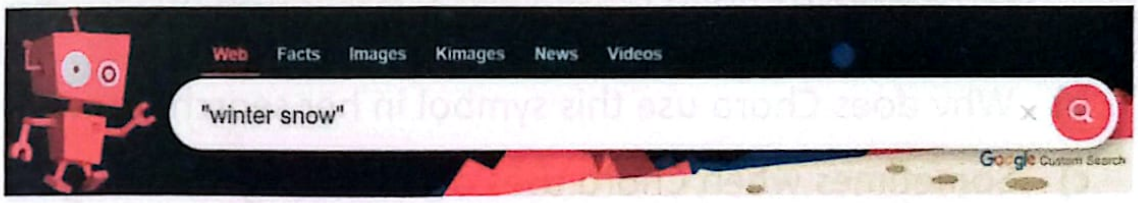
a) What do you think Prisha wants to find out?

b) Why isn't Prisha's search term very useful?

c) Write a search term which will help Prisha get some useful search results.

(3 marks)

5 Nitin is using a more complex search technique.



Why has he used inverted commas in the search query?

A to make the search faster

B so that the search engine can search for 'winter' and 'snow' separately

C so that the search engine will treat 'winter snow' as one phrase and search for the words together

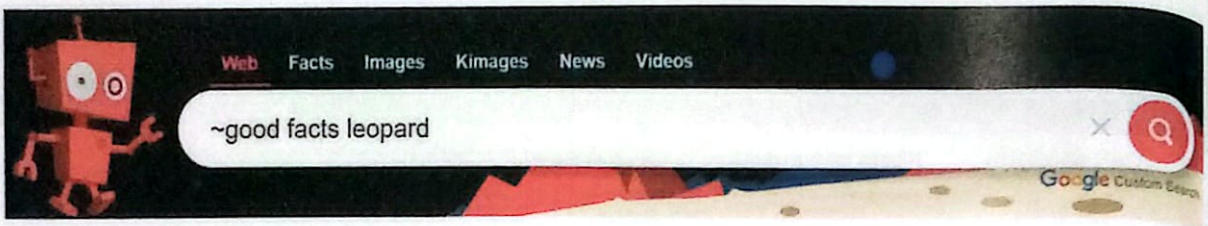
D to make the search slower

(1 mark)

6 Why would you use 'define' before a word in a search engine?

(1 mark)

7 Chara is using a complex search technique.



a) What symbol has Chara used in this search?

A tilde

B inverted commas

C parenthesis

D asterisk

b) Why does Chara use this symbol in her search term?

c) Sometimes when Chara uses a search engine, she gets unwanted results. For example, when she searched for images of a music keyboard using the search term 'keyboards' she got results showing music keyboards and results showing computer keyboards.

Chara knows the search will leave out computer images if she adds the word 'computer' to her search term and uses a symbol before computer. What symbol should she use?

(3 marks)

Read the sentences. Do you agree? Think about what you have learned.

- I understand how to check if information is reliable by asking critical questions.
- I understand what cells, rows and columns are in a table.
- I can add rows and columns to a table, and can merge and split cells.
- I can use a search engine effectively.
- I can use advanced search features like inverted commas, define, tilde (~) and minus (-).
- I can research a project using appropriate software.

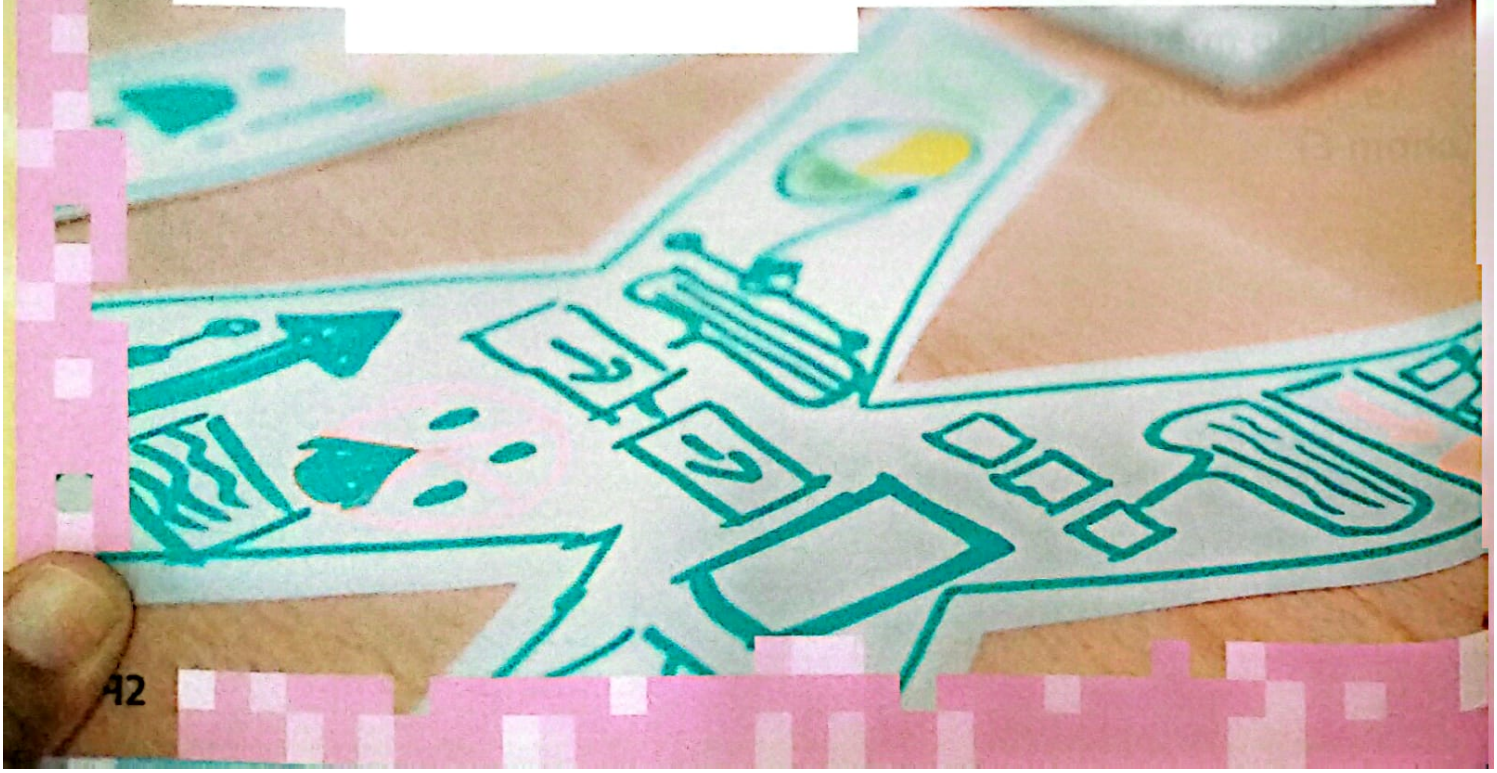
Unit 3

Desktop publishing

In this unit you will develop your understanding of the different tools available in desktop publishing software. You will learn how to insert text boxes, images and shapes into text documents and how to manipulate (change) them in different ways.

Next, you will learn how to shade, rotate and resize text boxes, rotate and resize images and shapes, and also how to manipulate digital shapes.

In addition, you will learn about layers of objects and how to group lots of objects together. As you develop these skills you will plan, draft and write a news article about an event that has taken place in your classroom.



Key objectives

- To be able to recognise the main components of a news article.
- To be able to work with text and images in a word processor or desktop publishing software.
- To learn how to plan and write a news article, including the collection of notes and evidence to support your ideas.

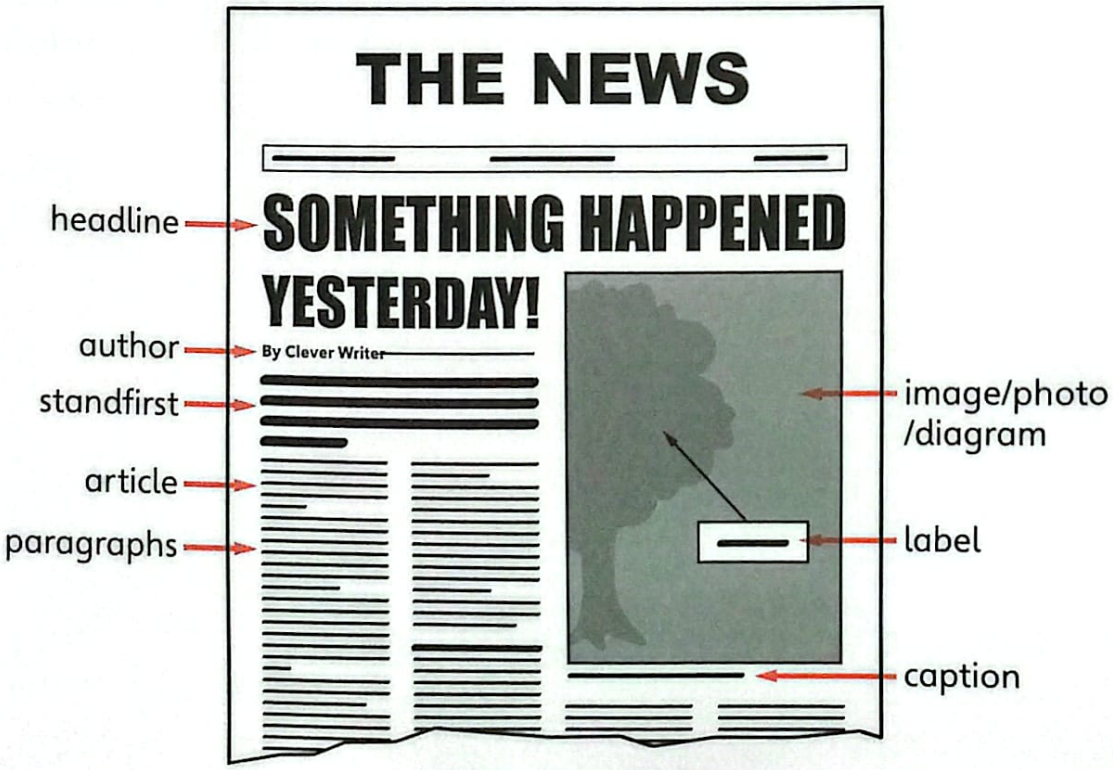
Lesson 1
Recognising the features of a news article

In this lesson you will learn about the main features of a news article.

Key words: article, chronological order, news, recount, text, writing

Discuss with your partner what a **recount** is. What types of recounts have you written before? What key features can you remember from your **writing**?

A **news article** has several key features.



Activity 1

With a partner, look at different online news articles on your device and see how many of the features on the previous page you can spot.

As you have seen, lots of different features are used in a news article. Here are some of them:

- The headline is the title of the article.
- The author or reporter is the person who wrote the article.
- The standfirst **text** is the opening paragraph which explains what the article is about.
- The date is when the article was published. This is not the same as the date the event happened.
- Images, photographs or diagrams help the reader imagine the story or explain parts of the article.
- A caption is the text used to describe an image or picture, usually written under the image.
- Labels explain parts of the image or diagram. You would not normally label photographs in a news article.
- Paragraphs structure the text to tell the story in a sensible way.
- News articles are written in a **chronological order**. This means the article is organised in the order in which the events happened.

Activity 2

Your teacher will give you a newspaper or online news article which has been cut up into sections. Your task is to organise the article into what you would expect it to look like. Pay close attention to key time words to help you order the sections. They should be arranged so that the story is told in chronological order.

When you have finished, write a standfirst to go with the article you have organised.

Discuss with your partner the main features of a news article and how you can write and make one using a device in school. What sort of applications would be useful to create a news article? What styles of text might you use? Think about bold, italics and other ways that you can change the appearance of your text. How can these be used to make the article interesting and easy to read?

I know the main features of a news article.

Lesson 2
Revisiting word processors and desktop publishing applications

In this lesson you will look at word processors and desktop publishing applications to help you understand how you can use them to create a news article. Desktop publishing software is often referred to simply as 'DTP software' or 'publishing software'. You may also see the words 'software', 'program', 'application' and 'apps' used to describe the same thing.

Key words: bold, desktop publishing, font, italic, style, text, underline, word processor

Review the features of a news article with your partner. Use the word bank to help you.

headline	standfirst	image	caption
date	author	paragraphs	

Desktop publishing applications and **word processors** are very similar. Word processors are designed for documents with lots of **text**, but they can also do many of the things that a publishing application can do.

Using a publishing application can make it easier to design projects with images, shapes and sections of text. Publishing applications use text boxes to input text.

Features	Desktop publishing applications	Word processors
Check spelling and grammar	✔	✔
Enter and edit text	✔	✔
Save, print, open, insert links, cut, copy, paste	✔	✔
Format text (alignment, bold, italics, underline, bullet points, change font styles and size)	✔	✔
Insert images, shapes and photos	✔	✔
Type words on a page	✘	✔
Easily change the page layout	✔	✔

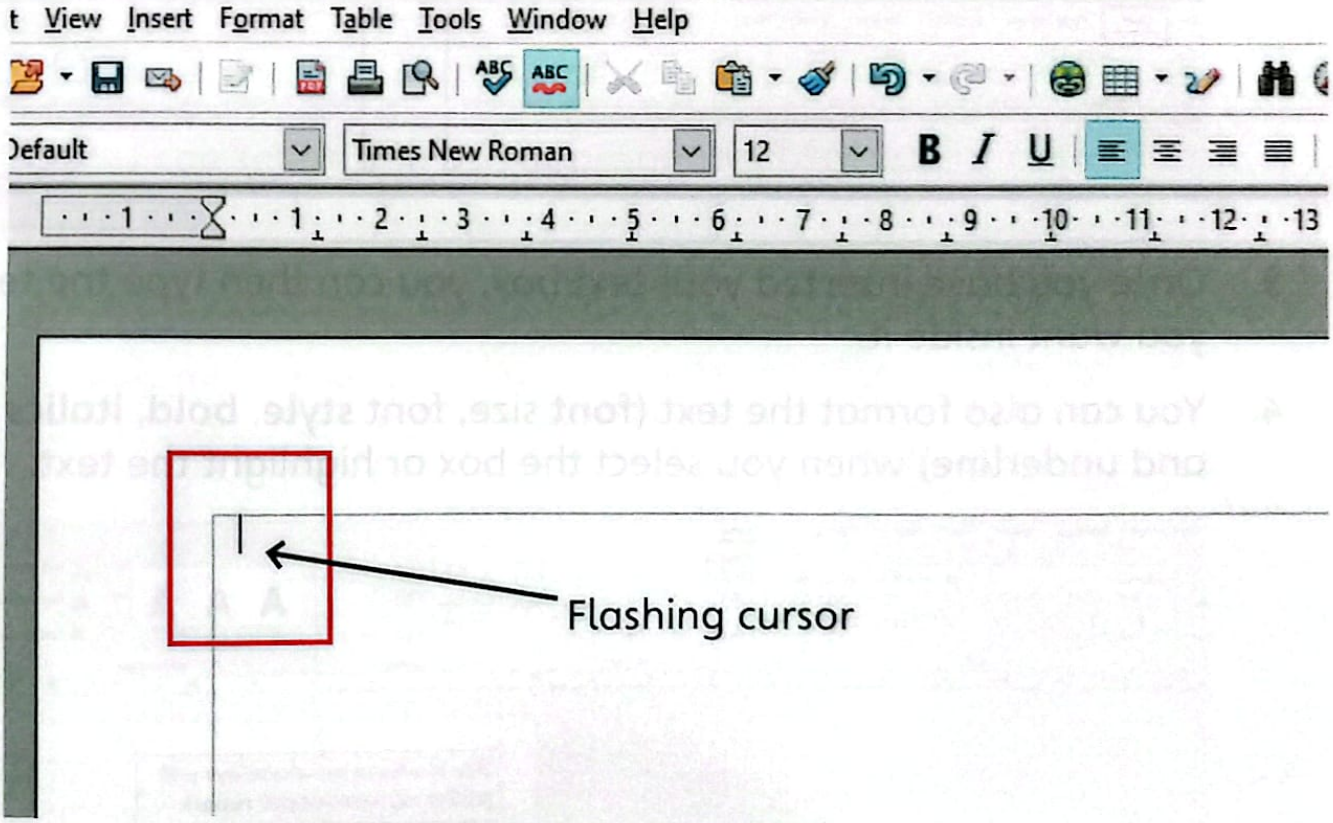
Activity 1

With a partner, discuss how you have used word processing or publishing applications before. Think of lessons or projects where you have used these applications. How were they useful? Was there anything that you found difficult to do?

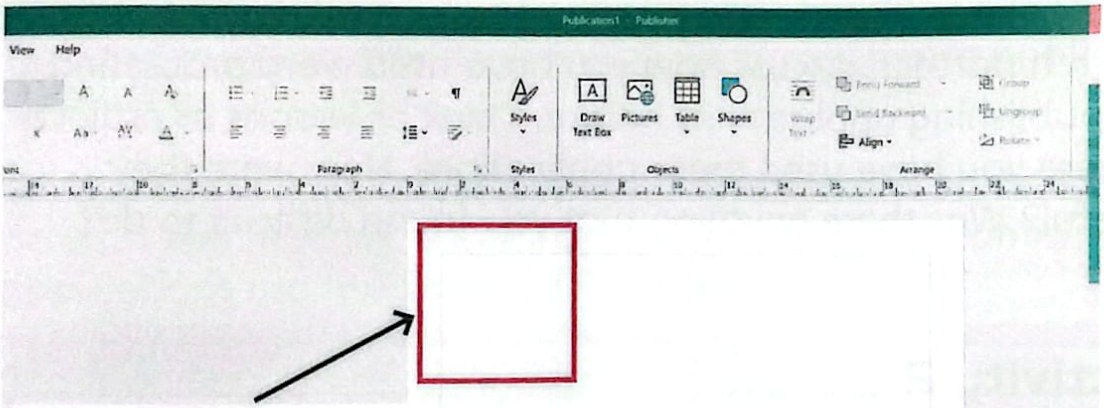
Activity 2

A student wants to create a document which is mainly text. Which type of program should they use – a word processor or a publishing application? Discuss the reasons for your answer with your partner.

When you open a new document in a word processor, there is a flashing cursor that shows you where you are in the document.



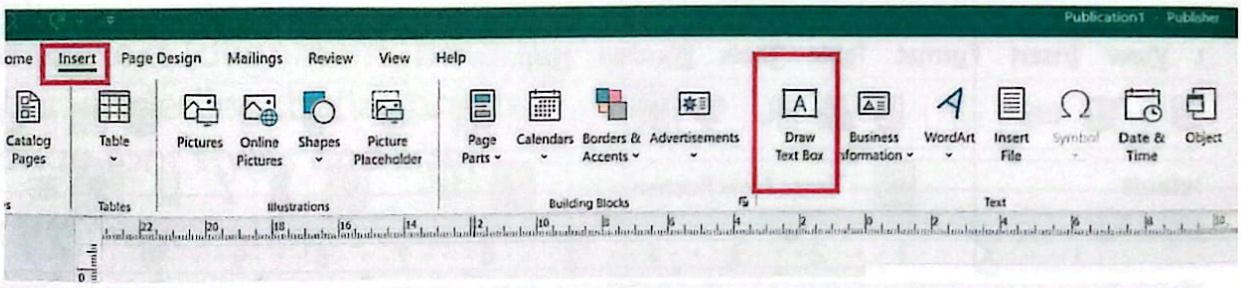
When you open a new document in a publishing application, there is no flashing cursor to show you where you are in the document.



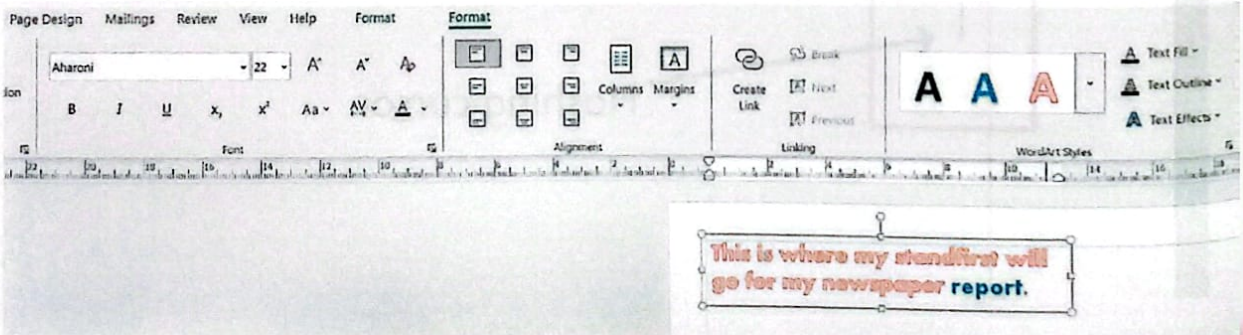
No flashing cursor

This is because in a publishing application you need to insert a text box before you can type.

1. Click the 'Insert' tab on the toolbar.
2. Select 'Draw Text Box' from the menu.



3. Once you have inserted your text box, you can then type the text you want inside it.
4. You can also format the text (**font** size, font **style**, **bold**, ***italics*** and **underline**) when you select the box or highlight the text.



Activity 3

In this unit you will be using a desktop publishing application to create an article. Discuss with your partner why this is a better choice than a word processor.

Activity 4

Experiment with using some of the features in a desktop publishing application. Use the application to insert different kinds of text and images. Think about how you can format these for your news article.

Create a poster for your classroom that illustrates how to insert a text box and how to change the font of the text in a publishing application.

I can select and use appropriate software for a given task.

Lesson 3
Using text boxes

In this lesson you will be organising your notes and recording details of an event.

Key words: evidence, report, reporter, standfirst

An event has taken place in your school which your teacher will give you more details about. You will need to act as the **reporter** and collect evidence to try to understand what has happened. Look for clues to support your ideas.

Before writing a news article, you need to collect notes about the story. In real life, reporters may travel to the location to collect as much information as they can. They do this by looking around and talking to witnesses and local people.

There are several questions to think about when you are collecting **evidence**.

Key questions	What you need to do
What has happened?	Keep to the facts. Don't try to solve what happened yet.
Where has the event happened?	Write as many details as you can.
When did the event happen?	There might be evidence that tells you this. If there is no evidence, you might be able make an estimate of the time when the event happened. If you do this, remember to explain that it is just an estimate in your news article.
Why did the event happen?	It can be difficult to find out why something has happened. For example, if you are reporting on a storm, explaining why the storm is happening is very difficult. Instead, explain why there's a problem.
Who was involved with the event?	Use the evidence to say who was involved and who was affected by the event. If there is no evidence then you should not guess because you could make a mistake.

Activity 1

Look carefully at the **report** that your teacher will give you. Use it to make notes that answer all of the key questions. Remember to report the facts, not your opinions.

Activity 2

Look at the evidence you have collected. Number the boxes to show the order that you will write about them in your news article.

Activity 3

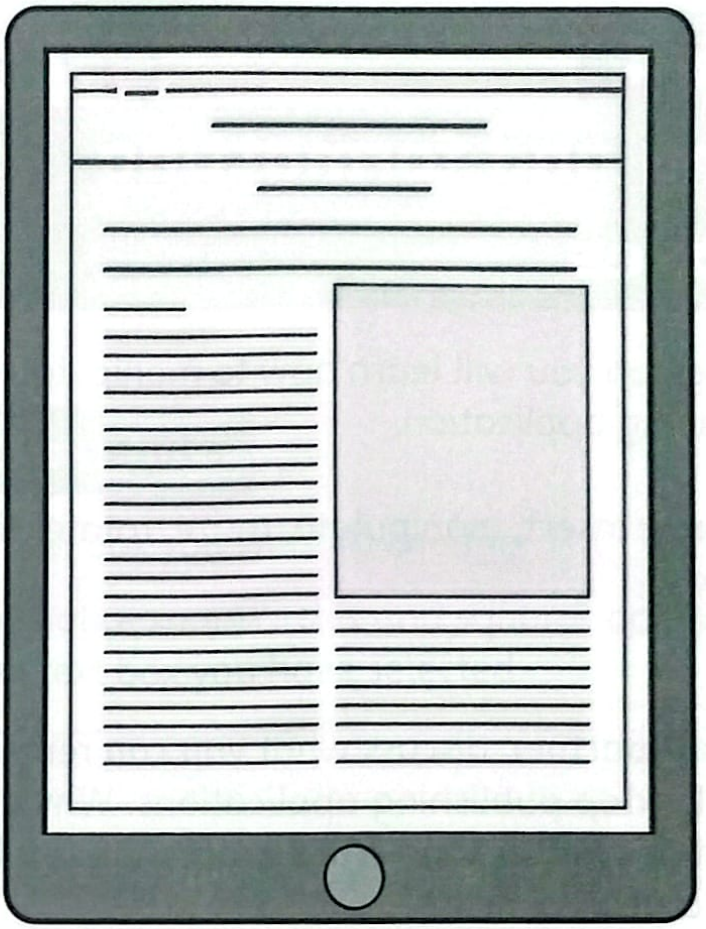
Discuss with your partner the order of your boxes and explain why you have put them in that order.

Ask:

- Who wants to read this article and why?
- How have you designed your news article to interest the reader?
- How do you think your news article will make people feel about the event?

Why?

- Why have you chosen to make this the first piece of information the reader reads?
- Why have you chosen this order for the text?
- Which information was the hardest to place, and why?



Activity 4

With a partner, discuss what information should be in the **standfirst** of your article. Why have you chosen this information?

Discuss with your partner your article about what has happened. Check that the information you have written is accurate.

I can record information about an event accurately.

Lesson 4
Creating and formatting text boxes

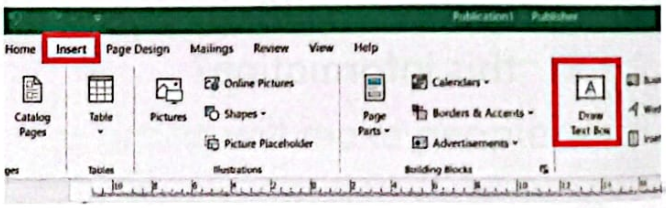
In this lesson you will learn how to manipulate text boxes in a publishing application.

Key words: insert, manipulate, resize, rotate, shade, text, text box

With your partner, discuss what you can remember about desktop publishing applications. Why are these applications better than word processing applications for writing a news article?

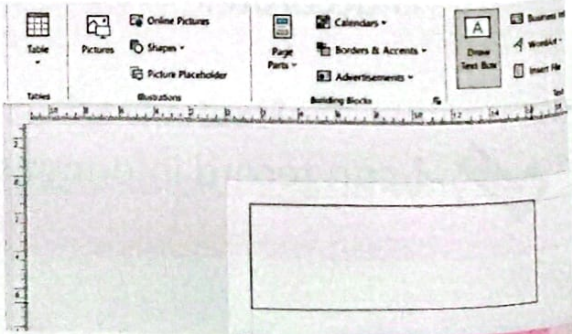
Adding a text box

Find the **Insert** tab in the toolbar menu, then select 'Draw **Text Box**'.



When the 'Draw Text Box' option is chosen, it is highlighted and the cursor will change to a cross. Now you can draw a text box.

1. Click the left mouse button.
2. Drag the text box to the size you want it.
3. Release the left mouse button.



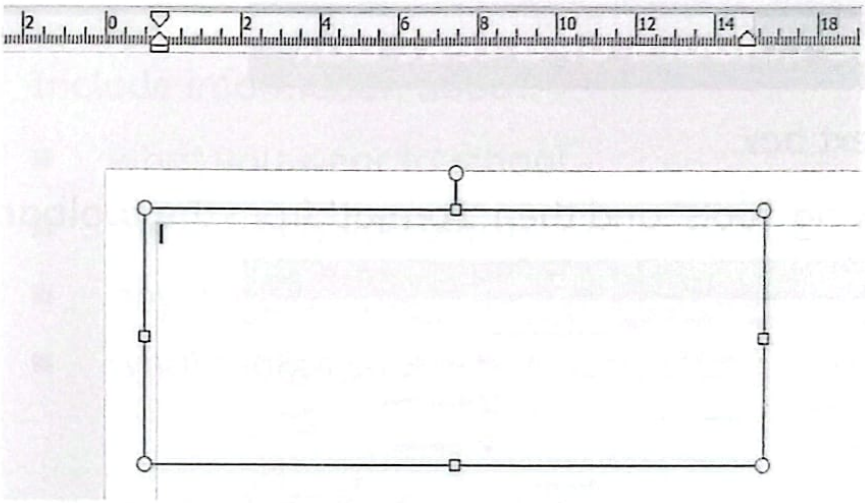
Now the text box has been created, click inside it to start adding your **text**.

Activity 1

Open a new document in your desktop publishing application. Practice adding text boxes to the document. Save your work using a sensible filename.

Resizing a text box

1. Select the text box you want to change.
2. You should notice some circles and squares appear around the edge of the text box you have selected.

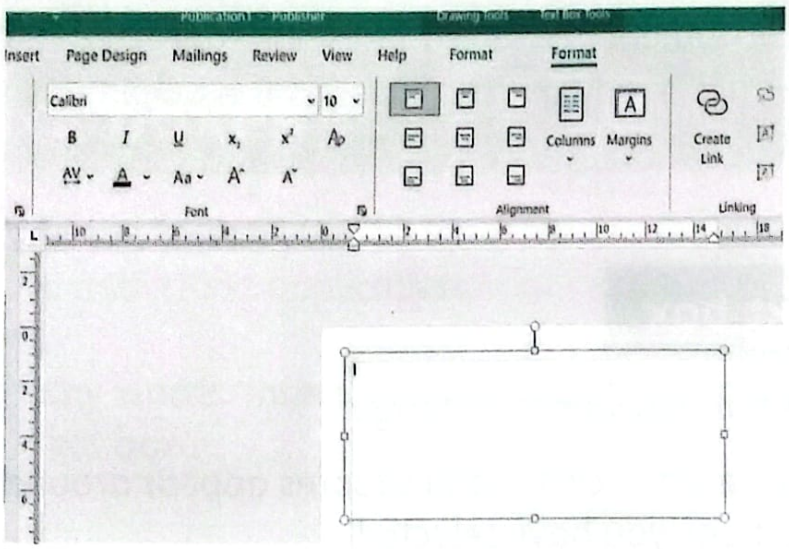


3. Left-click the mouse on one of these and drag it to **resize** it.
4. When you have the size you want, release the left mouse button and the new size will remain in place.

Rotating a text box

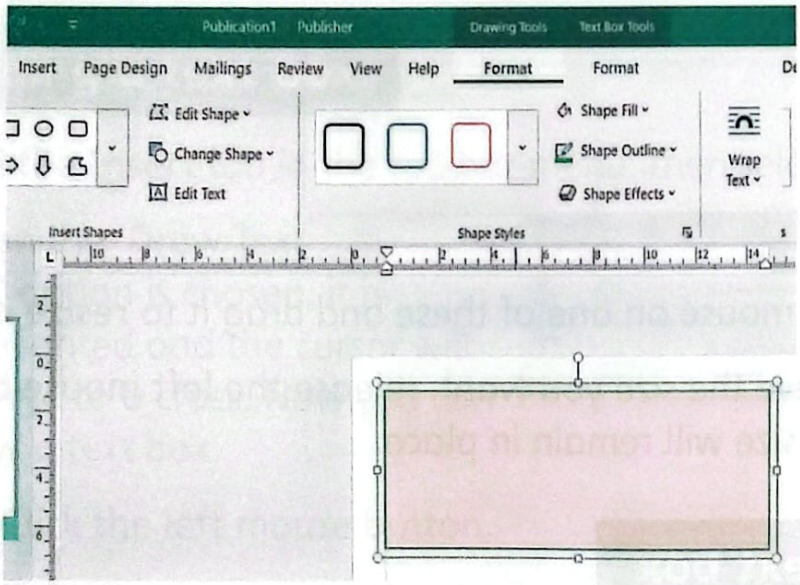
1. Select the circle away from the edge of the text box.
2. When you click this circle, you will see arrows showing how it can be **rotated**.

3. Rotate to the position you want.
4. Release the left mouse button to keep the new position.



Changing the colours of a text box

1. Select the text box.
2. Select 'Drawing Tools' and then 'Format' from the toolbar.



Here, you can change the inside colour of the text box by using shape fill in the menu.

You can also change the outline of the text box using the shape outline option from the menu.

Activity 2

Practise **manipulating** the text box to create interesting effects. Make a text box and:

- resize it
- rotate it
- **shade** it.

Activity 3

Use a desktop publishing application or a word processor to create a document with information about your school. Include information about:

- what you wear to school
- the subjects you learn
- any clubs or sports that you can do
- what makes your school interesting or special.

Discuss with a partner which feature or action you have found the most useful in the desktop publishing application. How can it be used in your news article about the event at your school?

I can create text boxes.

I can manipulate text boxes by changing the colour, rotating and resizing them.

Lesson 5
Using appropriate images in news articles

In this lesson you will learn how to select appropriate images.

Key words: image, diagram, photo, picture

Discuss with your partner how you created and manipulated text boxes in your last lesson. What could you change about the text boxes?

Most articles will contain a **photo**, **image** or **diagram** to help the reader understand the story. This is because images can:

- catch the reader's eye to make them want to read the article
- keep the reader interested
- add detail to the article
- show something which could be hard to describe in words.

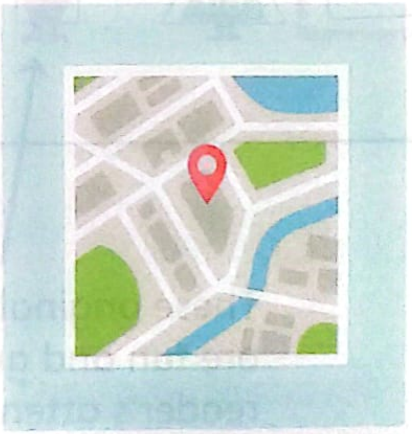
Activity 1

Discuss with a partner what type of **pictures** would be useful for your article. Remember that pictures should help the reader understand what has happened.

Make a list of image ideas in your notebook.

Below are examples of the sorts of images you might use. Remember to think about using:

- clear, relevant images
- high quality images that don't look blurry
- images free of too many objects or people
- images you have permission to use.

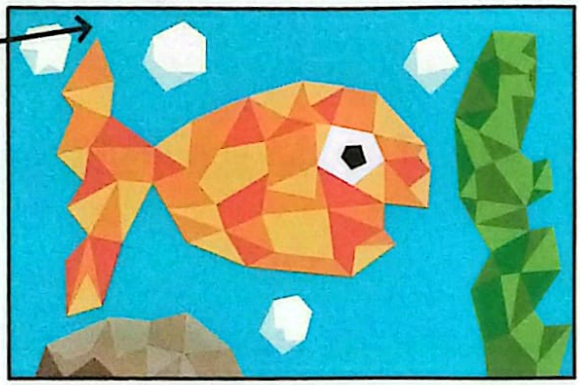


There is a good balance of text and images

This image relates to the story

Art and Craft

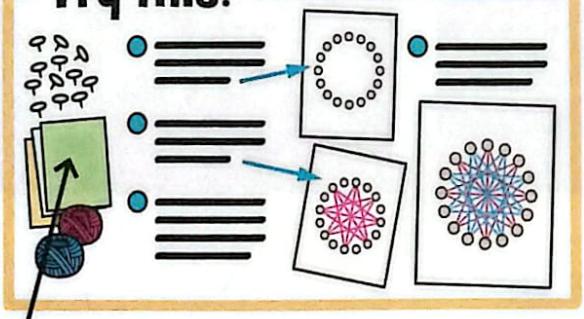
Competition Winner!



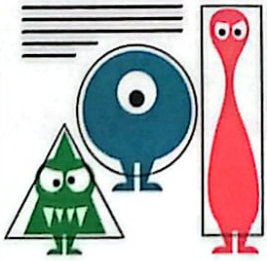
This week's competition...

Win a bicycle

Try this!



Monster shapes



These original diagrams support the text

These original drawings are fun and grab the reader's attention

Activity 2

Review the plan for your article and decide what images, pictures or diagrams could keep your reader interested. With a partner, choose your two best ideas and explain why you have chosen them.

With your partner, look at the images you have both decided to use. Tell each other two things you like about their choice and one thing they could include to make it better.

- I know why images are used in news articles.
- I can create appropriate images which improve my news article.

Unit 3
Mid-unit assessment

Write your answers in your notebook.

1 What is the first paragraph of a news article called?

(1 mark)

2 A news article is usually written in the order that events take place. What is this known as?

A chronological order

B non-chronological order

C descending order

D ascending order

(1 mark)

3 Write two reasons why images are used in news articles.

(2 marks)

4 What is the flashing line called that shows where you are in a word processing document?

A mouse

B cursor

C keyboard

D algorithm

(1 mark)

5 How do you start typing in a publishing application?

A Insert a text box, then type.

B Insert a table, then type.

C Add a picture, then type.

D You can't type in a publishing application.

(1 mark)

6 What is the name given to different styles of text?

A edit

B border

C cursor

D font

(1 mark)

7 When would you use a word processor to write an article rather than a publishing application?

A When there are more pictures in the article than text.

B When there are only pictures and no text.

C When there is only text and no pictures.

D When you want to include lots of weblinks.

(1 mark)

Lesson 6
Inserting and manipulating images and shapes

In this lesson you will learn how to insert and manipulate images and shapes.

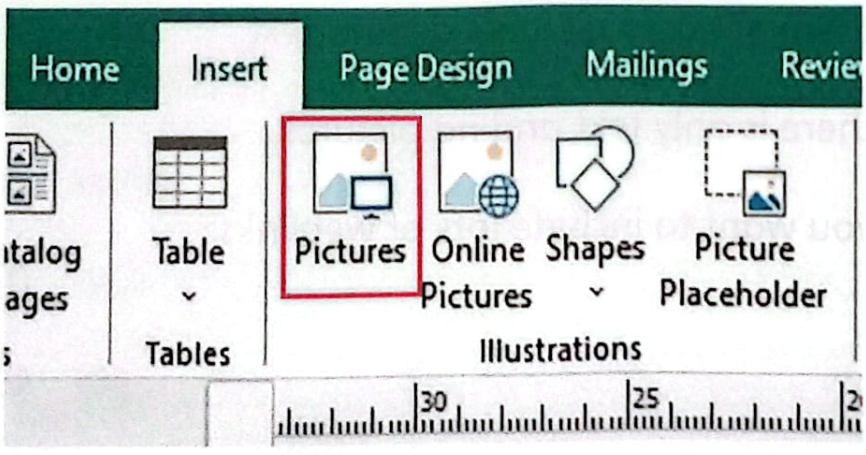
Key words: image, insert, manipulate, shape

Discuss with your partner what **manipulate** means. How have you manipulated text boxes in previous lessons?

Inserting images in a desktop publishing application

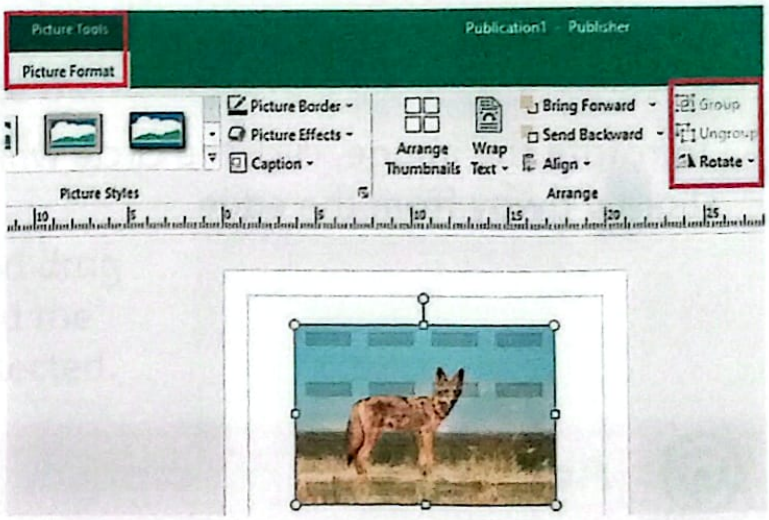
Inserting images is similar to inserting text boxes.

1. Select the 'Insert' tab from the toolbar.
2. Select pictures or images which are on your device or network, or 'Online Pictures' if you are going to use a picture from an online source.



Editing your images

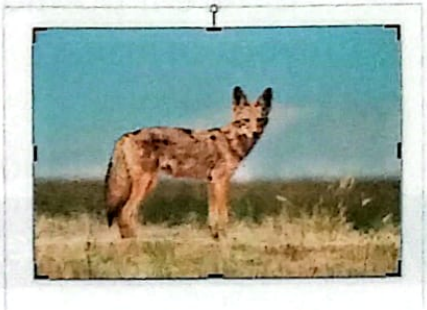
To remove any parts of an image that you do not want, you crop them.

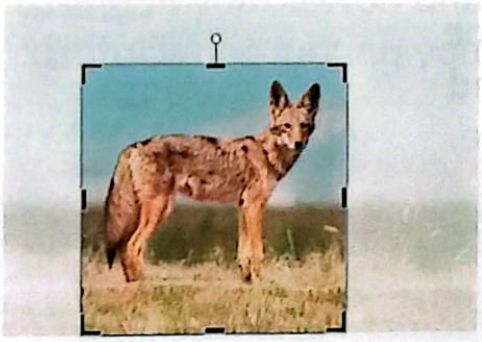


1. Select the image.
2. Select 'Picture Format' under 'Picture Tools'.
3. Select 'Crop'.

When you select 'Crop', thick black lines appear along the edges of the image. These are the cutting lines, which can be used to choose the part of the image you want to cut.

1. With your mouse, left-click a line and drag it to where you want the new edge to be.
2. Release the left mouse button. This will crop the image to the new edge. Notice that the part of the image that you are keeping stays the same size when you are cropping.

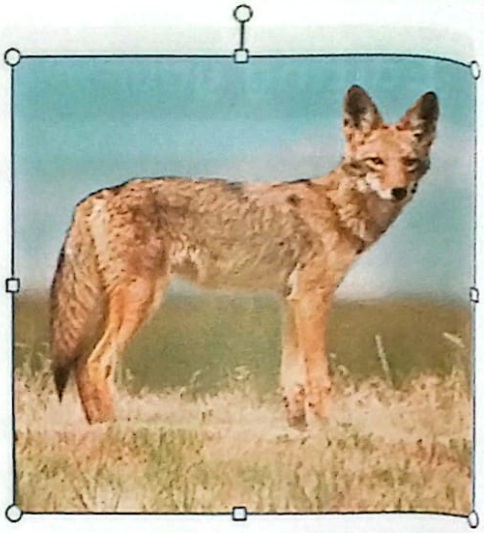




When you are happy with the cropped image, press 'Enter' on the keyboard or click the 'Crop' button again to save the new cropped image.

To resize the cropped image, click and drag the circles or squares around the edges. The process is similar to resizing a text box.

To rotate the image, click the circle which is slightly away from the edge.

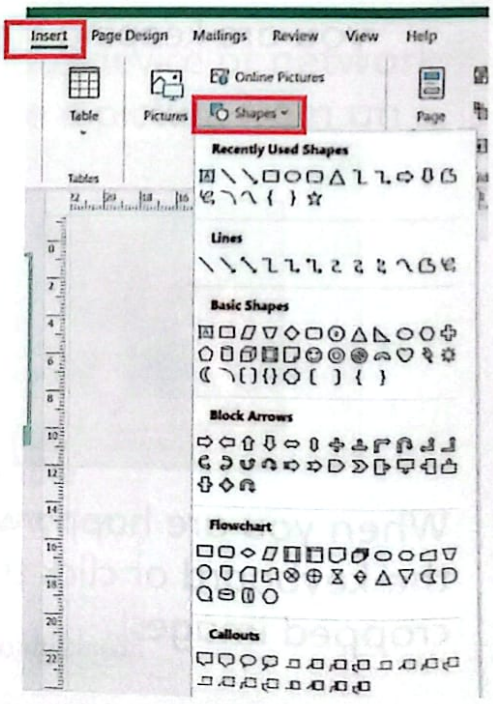


Activity 1

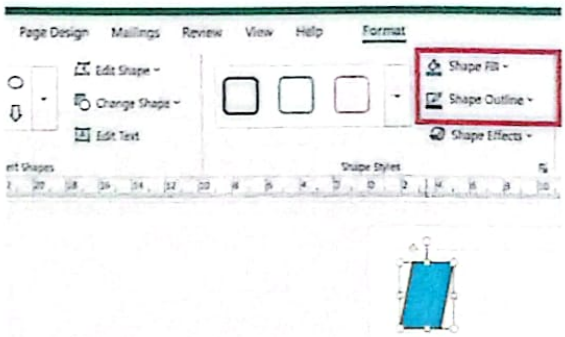
Insert an image for your article into your publishing application and then crop it. Resize and rotate the image in different positions to see which layout you think is best for your article.

Inserting shapes in a publishing application

1. Click on the 'Insert' tab.
2. Select 'Shapes' from the toolbar.
3. When you have selected the shape you want, left-click the mouse and drag the **shape** to the desired size.
4. Release the left mouse button.



With the shape selected, you can change its colour or outline. Change the colour inside the shape by selecting 'Shape Fill'. Change the outline of the shape by selecting 'Shape Outline'.



To resize the shape, click and drag the circles or squares around the edges when the shape is selected.

Activity 2

Practise inserting shapes in your desktop publishing application by making the following:

- A small green triangle
- A large red star with a blue outline
- A blue square with a dashed black outline
- A long green arrow with a thick yellow outline

Explain to your partner which of the features you enjoyed using in your lesson and which you think would be most useful when writing your news article.

- I can insert and manipulate images in a publishing application.
- I can insert and manipulate shapes to create a pattern in a publishing application.

Lesson 7
Planning a news article

In this lesson you will plan a news article.

Key words: article, diagram, image, news, photo, writing

Discuss with your partner the event that happened in your classroom. Make a note of three key points about the event.

Activity 1

Plan a **news** article using your notes from the event that happened in your classroom. Use a desktop publishing application to set out your notes like the example on the next page. Make each box separately, and resize the boxes so that they cover the whole page.

You can use bullet points for each of the sections when you are planning – you do not need to write in full sentences. Organise your notes into the appropriate sections.

In your news article you will need to check that you have included all of these features:

- headline
- standfirst
- author
- date
- **photo/image/diagram**
- labels
- captions
- paragraphs

Headline	
Standfirst: Author: Date:	
Paragraph 1: main details about who, what, when, where and why.	**Paragraph 4:** How did the event end?
Paragraph 2: detailed description of the event and where it happened.	**Paragraph 5:** What will happen next?
Paragraph 3: interview with a person who saw the event- what do they think about it?	**Picture**

Remember to add photos and diagrams to your plan. These will help you to tell the story.

Activity 2

In pairs, improve your work by taking turns to discuss your article with each other. You should share ideas on how to edit each other's work and make changes using these ideas.

Discuss these key questions to help you improve your work:

- Are all the important features and information included?
- Is there an exciting headline?
- Is the information in a sensible order?
- Does the article give all of the information needed to tell the full story?
- Do the images help to tell the story?

Activity 3

Design and make a logo for your news outlet. Look at the logo below to help you. Your logo should show the name of your news outlet clearly, and could include a small, sensible drawing.

Review your planning sheet and start **writing** your standfirst paragraph. Your standfirst paragraph is the introduction for your story so it should explain the important details about the event.

I can plan a news article.

Lesson 8
Adding layers to and grouping objects in a publishing application

In this lesson you will learn about layering and grouping objects.

Key words: bring forward, bring to front, group, layer, send backward, send to back

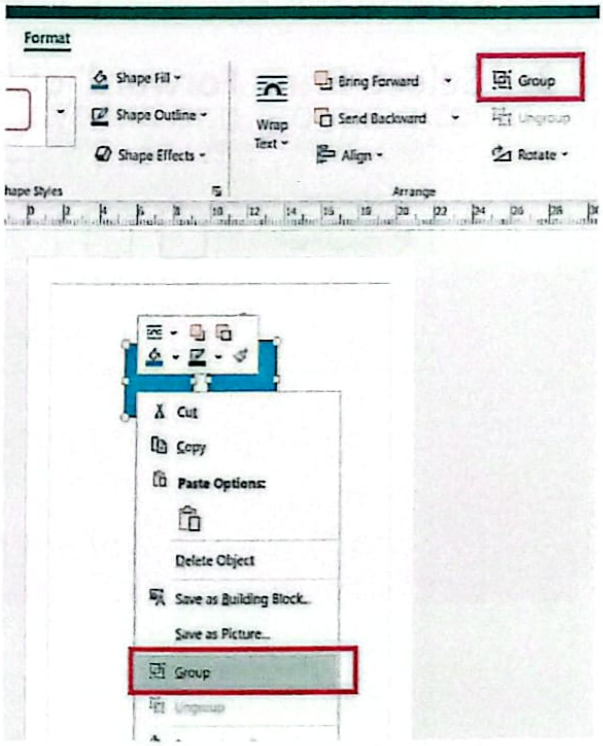
Discuss with your partner the features of news articles and test each other on what they are.

Desktop publishing applications have **group** and **layer** functions which help you to organise your work. Grouping objects allows them to be treated as one big object. Doing this makes resizing them or moving them much easier.

Layers help you organise your text boxes and images. As you work on your article, you might find something has 'disappeared', but actually it has been hidden by something which has been placed on top of it.

To select multiple objects for grouping, you use the keyboard and the left mouse button.

1. On the keyboard, press and hold the Ctrl key and select the objects you want to group with the left mouse button.
2. When you have selected all the objects you want to group, release the Ctrl key and right-click the selected shapes.
3. Select 'Group' from the menu or the toolbar.

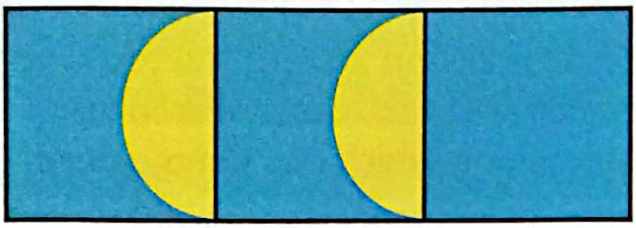


Activity 1

On your device, practise drawing shapes and then grouping them to resize or rotate them.

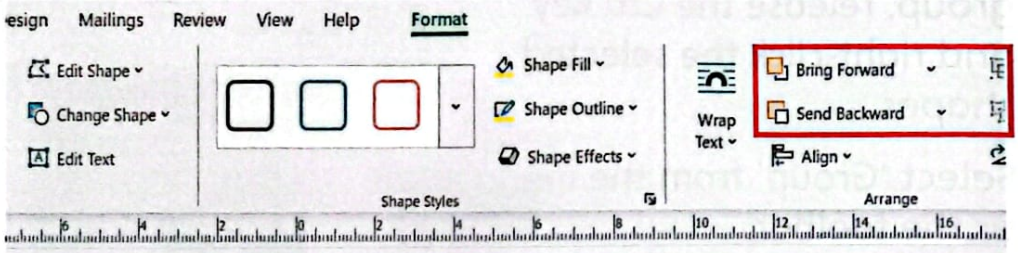
Using layers is a way to help you organise your work.

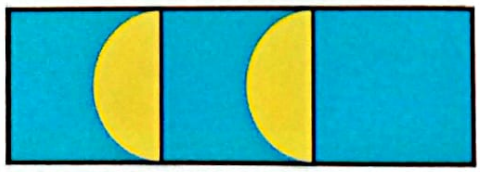
Here, the rectangles and circles have been organised to create an interesting effect.



It is simple to move an object (like a text box or image) forward or backward by one layer.

1. Select the object.
2. On the toolbar, select 'Format' under 'Drawing Tools'.
3. Select '**Bring Forward**' or '**Send Backward**'.





The arrows at the side also have an extra option – **Send to back** which will move the object to the last layer, or **Bring to front** which will move the object to the first layer.

Activity 2

On your device, practise moving different shapes forward and backward using the layering buttons. Try to create the image of overlapping rectangles and circles shown on page 126.

Activity 3

Explain to your partner how you can select more than one object in a document.

Discuss with your partner how layering and grouping could help you create your news article.

I can create images using 2D shapes.

I can manipulate objects using the grouping function.

I can manipulate objects using the layering function.

Lesson 9
Drafting your article

In this lesson you will use your skills to draft your news article.

Key words: article, chronological order, diagram, draft, image, photo, writing

Review your planning from Lesson 7 and check your story has a clear **chronological order**.

A **draft** version of any document is a plan that can be developed to create a final version. It might not contain the final content but can help spot any early design problems.

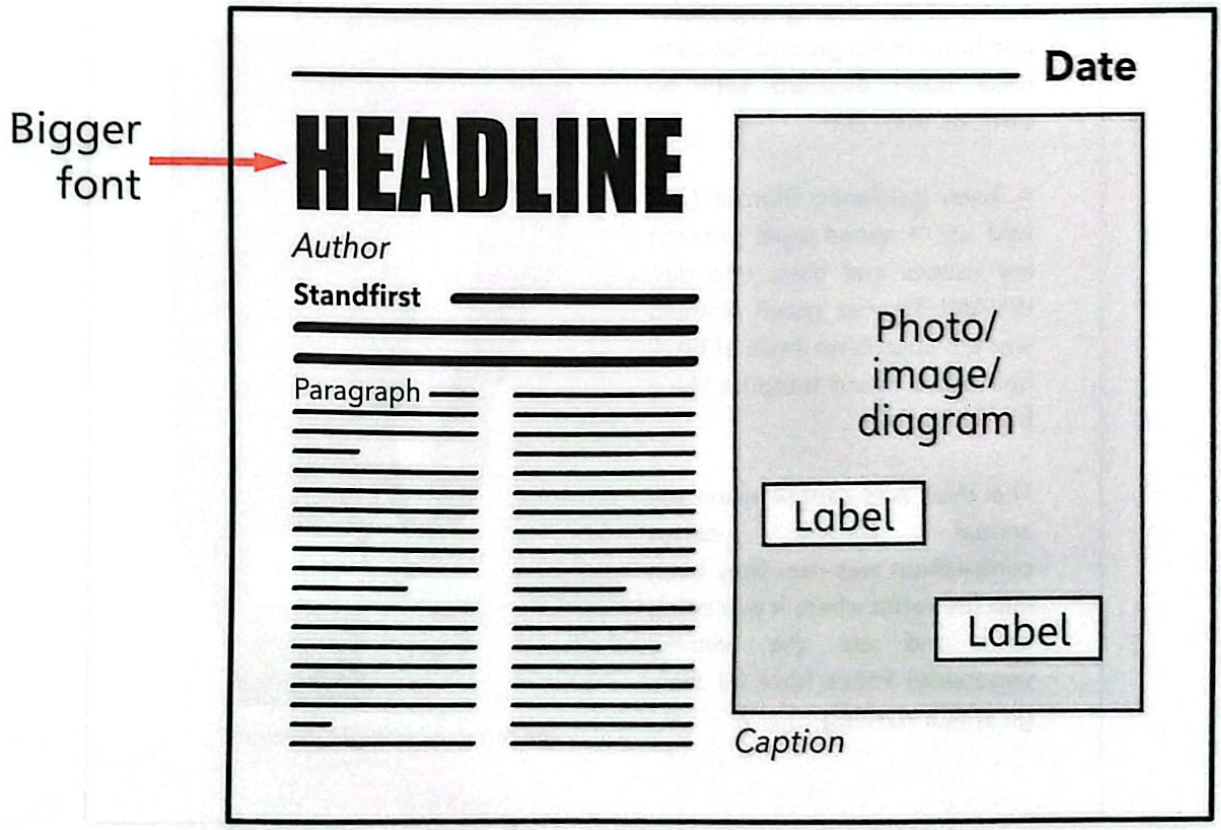
It can include:

- the layout and position of text and images
- annotation describing thoughts and decisions made
- font and style ideas
- colour and image suggestions.

Activity 1

Draft your **article** on paper or using a word processor. This will help you to see how it will look on your desktop publishing application. Include all of these features from your planning:

- headline
- standfirst
- author
- date
- **photo/image/diagram**
- labels
- captions
- paragraphs



Activity 2

Once you have drafted your article, start planning which features of a publishing application you will use to make it. Label your drafted article to show which feature you will use for each section.

The News

29.04.2022

Vegetable thief caught!

By Ted Hiatt

Mysterious series of thefts from gardens solved!

Gardeners have been left confused by missing vegetables and holes in the ground. Gardens have been emptied with no obvious clues left!

A keen gardener, Bhavna (26), told us: "I spend ages growing my carrots and then, one day, WHAM! They've gone! Nothing was left apart from a pile of black hair and a round footprint like a big 'U'."

The thief was caught when the annual **largest carrot** competition was run. They burst into the room where it was being held and ate the winning vegetable! Police have let them go with a warning.

The carrot thief caught in action!

Discuss with your partner the following questions about your article draft.

- Is the information clear?
- Is the information in a sensible order?
- Is it properly punctuated?
- Is the **writing** descriptive enough?
- Does it tell the whole story?
- Have you used exciting vocabulary to engage the reader (such as a range adjectives, verbs and adverbs)?
- Have you shown where suitable images or diagrams can go to help tell the story?

I can draft a news article.

Lesson 10
Creating your article

In this lesson you will create your news article.

Key words: article, image, news, text box

In this unit you have improved your manipulation skills and learned how to insert **text boxes**, images and shapes.

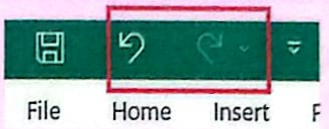
Discuss with your partner two skills you feel confident doing and a skill you need help with. Work together to share tips on the things you may need help with as you create your **news article**.

Activity 1

Create your news article. Remember to show some of the skills you have learned, such as:

- inserting text boxes
- inserting **images**
- rotating and resizing objects
- shading text boxes and borders
- grouping objects
- changing an object layer.

Remember, you can make use of the Undo Typing (Ctrl + Z) and Redo Typing (Ctrl + Y) buttons to undo and/or redo one or more actions. These commands also have buttons in the toolbar:



Activity 2

Check your news article and make any edits. Carefully read the text that you have typed. Are the spelling and grammar correct? Can you easily see which parts of the text are the headline, standfirst and story? Does the picture add interesting details to the story?

Remember to save your work! Use a sensible filename and include your name if you are saving to a shared area.

With a partner, discuss the following questions:

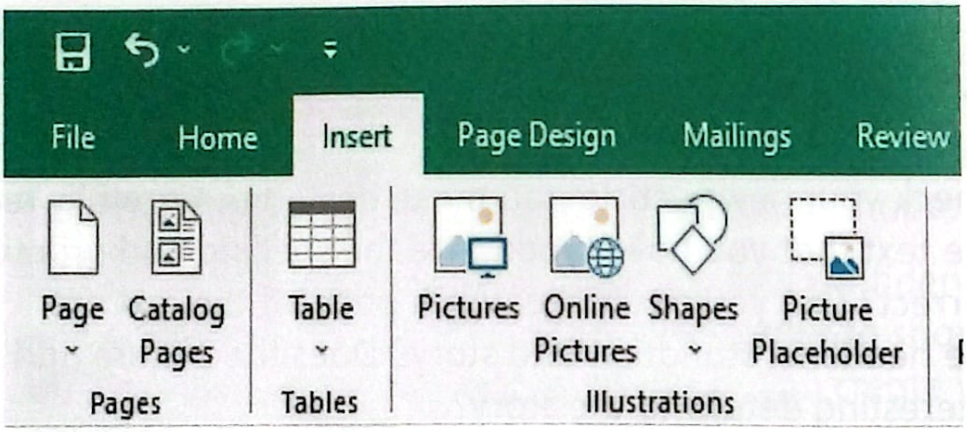
- What do you like the most about your news article?
- Which skill have you found to be the most useful?
- Is there anything you still need to practise doing?
- How would you improve your news article next time?

I can create a news article.

Unit 3
End-of-unit assessment

Write your answers in your notebook.

1 Tej is using a publishing application.



a) He has selected the 'Insert' tab. Which button should he use to add a picture?

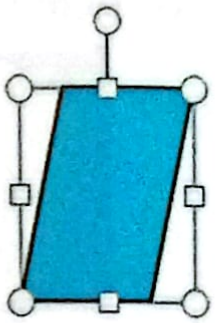
b) What does the  button do?

(2 marks)

2 Robert is grouping images together in a desktop publishing application. Why would Robert want to group images?

(1 mark)

3 Yasmin has drawn a shape in a publishing application.



There is a circle on its own at the top of the shape. What is this circle for?

A to delete the shape

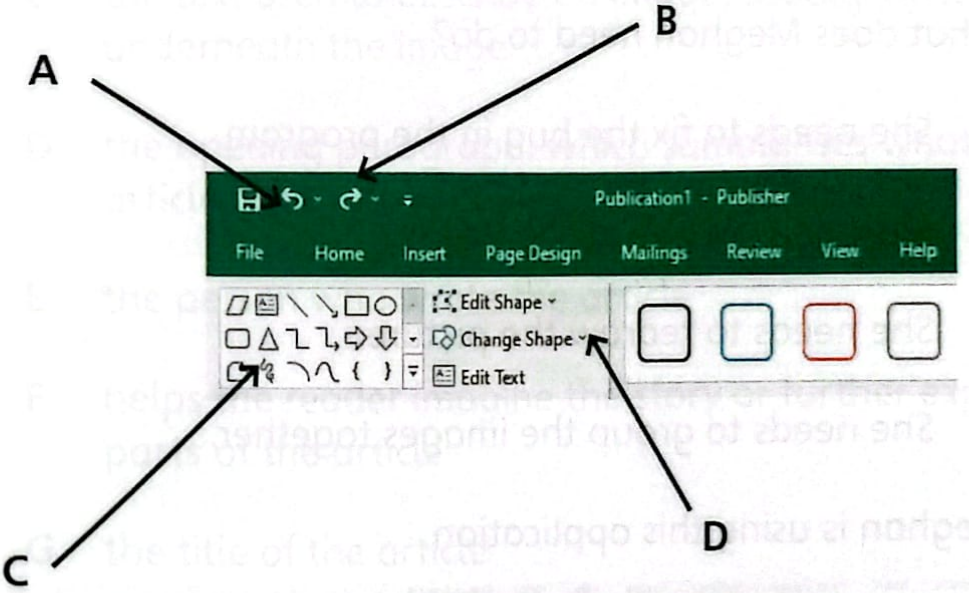
B to resize the shape

C to change the colour of the shape

D to rotate the shape

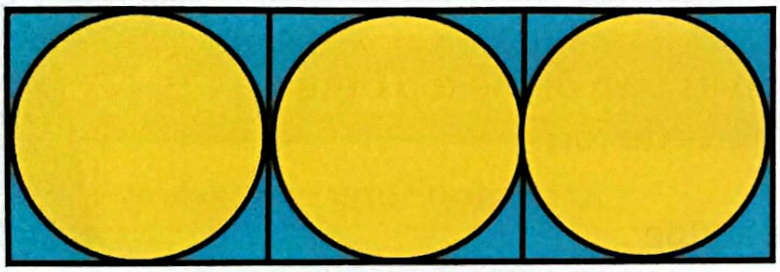
(1 mark)

4 Ranjeet is working in a publishing application and has made a mistake. He needs to use the undo arrow. Where should he click?

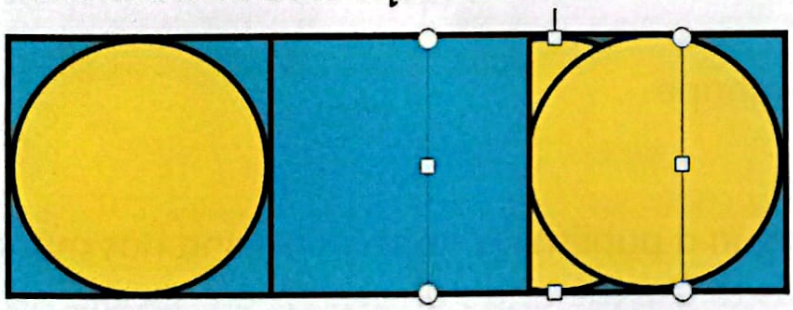


(1 mark)

5 Here are some squares and circles.



Meghan wants to make the yellow circles look like this on her device. However, one of the yellow circles keeps disappearing behind the middle square.



a) What does Meghan need to do?

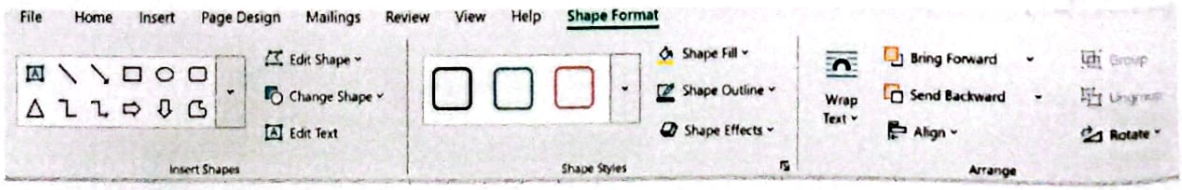
A She needs to fix the bug in the program.

B She needs to adjust the layers.

C She needs to redraw the picture.

D She needs to group the images together.

b) Meghan is using this application.



Where does she need to click to sort out the problem?

(2 marks)

6 Why might you choose a desktop publishing application rather than a word processing application?

(1 mark)

7 Match each feature in the box with its description below.

Features			
author or reporter	caption	date	headline
labels	photographs	standfirst text	

A explains parts of an image or diagram

B says when the article was published

C the text used to describe an image, usually written underneath the image

D the opening paragraph, which summarises what the article is about

E the person who wrote the article

F helps the reader imagine the story or further explain parts of the article

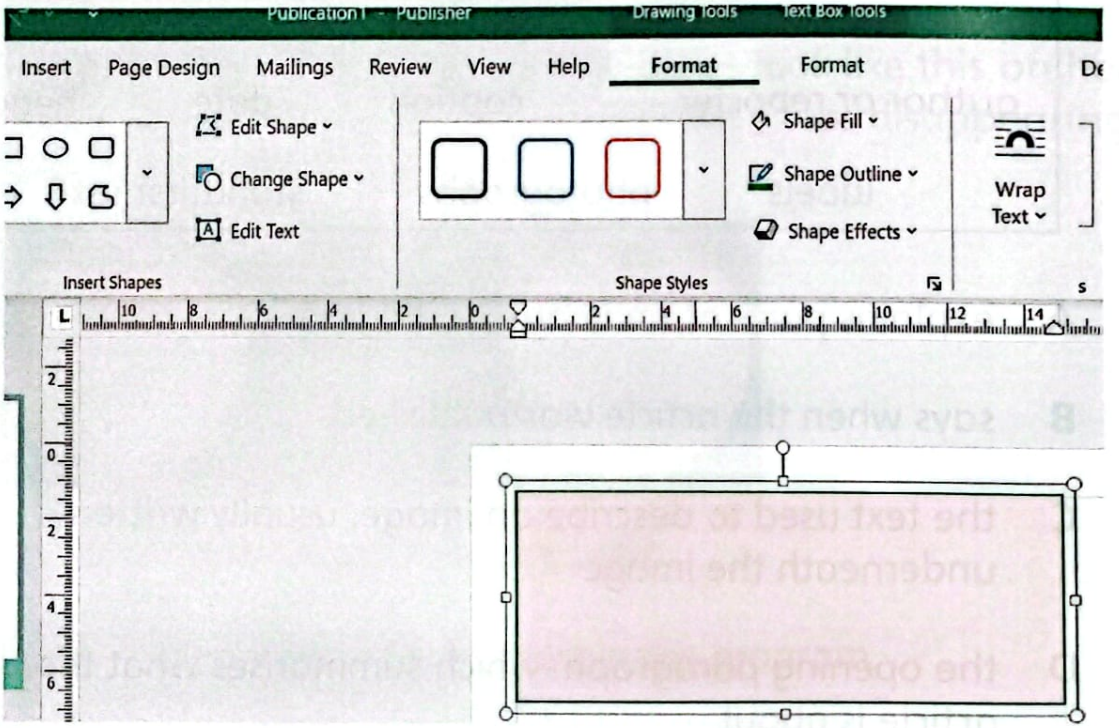
G the title of the article

(7 marks)

8 What five key questions should you ask when you are gathering evidence for a story? Remember, they all start with the letter W.

(1 mark)

9 Look at the text box.



a) What are the circles around the edge of the text box for?

b) Where would you click to change the inside colour of the text box to blue?

(2 marks)

Read the sentences. Do you agree? Think about what you have learned.

- I can recognise the main features of a news article.
- I can select appropriate software for a given task.
- I can record information about an event accurately.
- I can create and manipulate text boxes by changing the colour, rotating and resizing them.
- I can create appropriate images.
- I can insert and manipulate images and shapes in a publishing application.
- I can plan and draft a news article.
- I can create images using 2D shapes.
- I can manipulate objects using the grouping and layering function.
- I can create a news article using a publishing application.

Unit 4

Programming (part 1)

In this unit you will develop your understanding of algorithms and programming. You will learn about sequencing, repetition, selection and variable use in programming through everyday examples.

You will design algorithms and turn these into code to use in programming software.

Throughout the unit you will learn how to predict what algorithms do and explain why. Finally, you will write algorithms containing nested loops.

Key objectives


To understand what an algorithm is.


To be able to create an algorithm using a looped set of commands.


To be able to look at a set of code and identify any errors (debugging).


To learn how to convert a set of written instructions (code) into a stack of Scratch blocks.

Lesson 1
Understanding what an algorithm is

In this lesson you will learn what algorithms are and practise following them.

Key words: algorithm, instructions, sequence

Discuss with your partner what you can remember about **algorithms** from your previous learning. Write a sentence explaining what an algorithm is in your notebook.

Computers do only what they are told in their program. A program should be planned using algorithms to think through problems. An algorithm is a specific set of **instructions**.

Here is a simple algorithm for you to follow:

```
Stand
Wave
Sit down
Clap
Stand
```

The order that you do the instructions is called the **sequence**. If you do not get the sequence correct in your algorithm, you will get incorrect results.

Activity 1

Create your own simple algorithm for your partner to follow. Take turns following each other's algorithm.

Think about the algorithms that you have practised with your partner. When your partner followed your algorithm, did they do anything that you didn't expect?

For example, think about the 'wave' instruction. You might have been thinking about a one-handed wave, but your partner might have done a huge two-handed wave as if they were signalling to a passing ship from a lonely island!

This is because your algorithm didn't have specific instructions. Here are some examples of more specific instructions:

Stand → stand tall and straight with both feet together and arms by your side.

Wave → wave with your right hand at shoulder height.

Sit down → sit down on your chair.

Activity 2

Write a second set of instructions for your partner, but this time add numbers of actions and maybe even time.

For example:

```
Stand
Wave 3 times
Turn around 2 times
Count to ten
Sit down
```

Look back at the sentence you wrote about algorithms at the beginning of the lesson. Discuss with your partner if you would make any changes to your description. Does it include the word *specific*?

I know that algorithms are a specific set of instructions.

I can follow simple algorithms.

Lesson 2
Using sequencing to create accurate algorithms

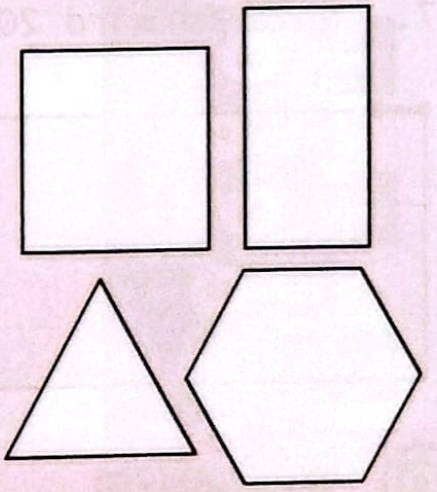
In this lesson you will write an algorithm for a 2D shape and then use it to draw the shape in Scratch.

Key words: 2D shapes, algorithm, instructions, sequence

Discuss with your partner some of the **instructions** you used in your **algorithms** in the last lesson.

Activity 1

Look at the **2D shapes**. How many can you name? With your partner, describe as many features of each as you can.

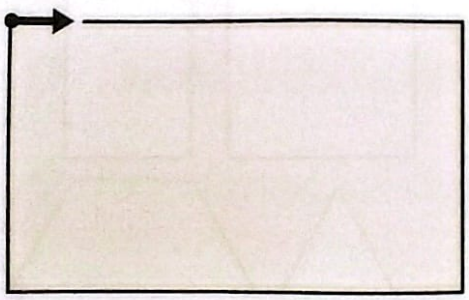


You will have used Scratch in previous years, combining blocks to create stacks that form a program. Here are some of the key terms used in this section:

Move 10 steps	Forward 10 steps
Move -10 steps	Backward 10 steps
Turn clockwise 90 degrees	Turn to the right
Turn anticlockwise 90 degrees	Turn to the left

A **sequence** of instructions to create the 2D rectangle below might look like this:

```
1.  Move 40 steps
2.  Turn clockwise 90 degrees
3.  Move forward 20 steps
4.  Turn clockwise 90 degrees
5.  Move forward 40 steps
6.  Turn clockwise 90 degrees
7.  Move forward 20 steps
```

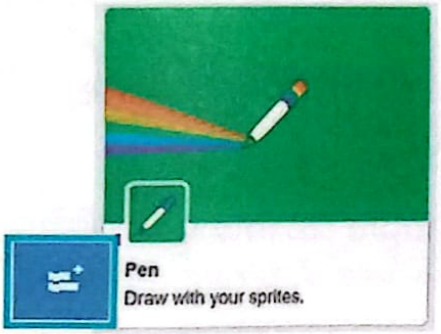


Activity 2

Work with a partner to act out the movements to make different 2D shapes. Use the terms on this page to help you. Record the instructions you give.

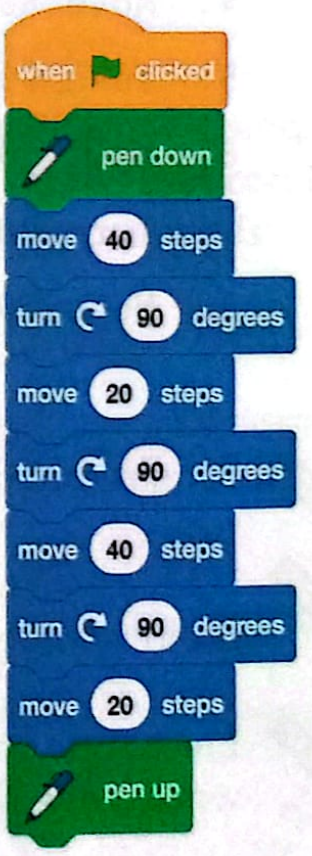
To create the algorithm on the previous page in Scratch, you need to add a Pen Extension. This is simply an extra set of Scratch commands.

Look for the 'Add Extension' button at the bottom left of the screen and select the extension called 'Pen'.



Here is the rectangle on the previous page created in Scratch:

1. When green flag clicked
2. Put the pen down
3. Move 40 steps forward
4. Turn 90 degrees clockwise (right)
5. Move 20 steps forward
6. Turn 90 degrees clockwise (right)
7. Move 40 steps forward
8. Turn 90 degrees clockwise (right)
9. Move 20 steps forward
10. Lift pen up



Activity 3

Create your algorithms from Activity 2 to draw the 2D shapes in Scratch.

Look at the following algorithm. Discuss with your partner why it *wouldn't* draw a square in Scratch:

1. When green flag clicked
2. Move 50 steps
3. Turn 90 degrees right
4. Move 50 steps
5. Turn 90 degrees right
6. Move 50 steps
7. Turn 90 degrees right
8. Move 50 steps

- I can record a sequence algorithm.
- I can use a written algorithm to create a digital image using Scratch.
- I recognise that algorithms have to be accurate in order to work properly.

Lesson 3
Predicting the outcome of a program

In this lesson you will follow algorithms written as Scratch programs and use logical reasoning to predict their outcome.

Key words: algorithm, degrees, polygon

Explain to your partner how you would add the Pen extension when using Scratch.

A polygon is a 2D shape with three or more straight sides. Using the pen tools in Scratch, here are a selection of shapes that can be created using the turn clockwise and anticlockwise commands:

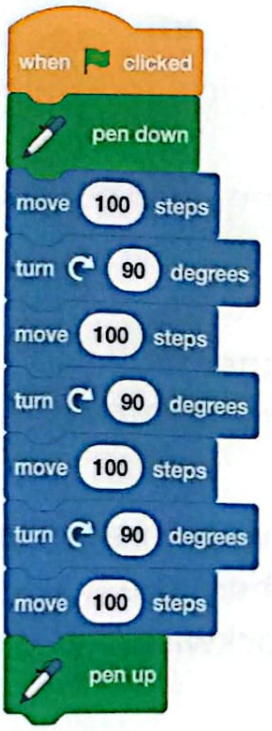
- squares
- rectangles
- triangles
- made-up shapes of your own.

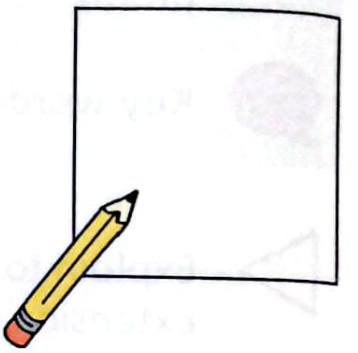
When opening Scratch, the cat sprite always appears. When creating a drawing you might try using a different sprite, a pencil for example.

Open a new file and change the sprite to a pencil, or another suitable sprite for creating 2D shapes. You might also wish to change the sprite's size.

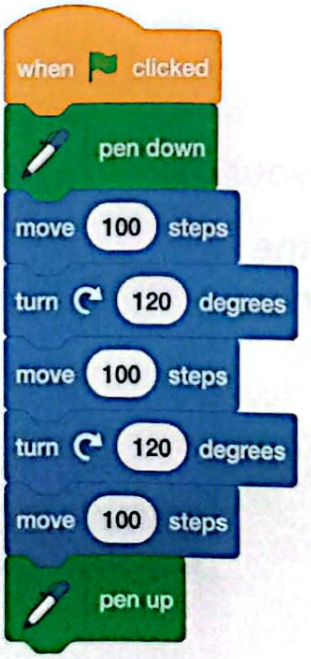
Lesson 2 demonstrated how to create a rectangle with two opposite equal sides. This program creates a polygon with four equal sides, or a square.

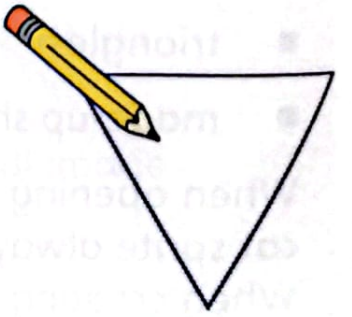
The 2D shapes you have created so far have all used a right-angled (90 degree) turn left or right. By changing the angle, different shapes can be created.





This program creates a triangle with three equal sides. Each turn uses an angle of 120 degrees. This is because all of the angles in the shape should add up to 360 degrees. 360 divided by 3 is 120.





Activity 1

Create a square and triangle of your own in Scratch.

Practise changing the sizes by altering the number of steps.

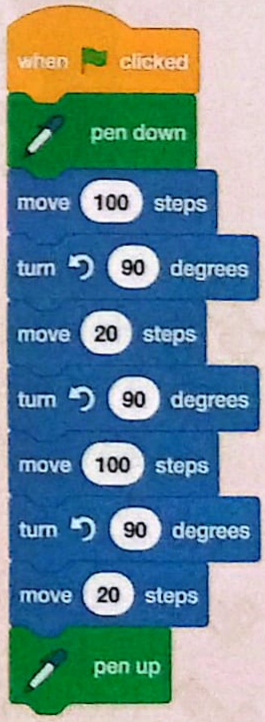
Predicting a shape

By looking at a program before running it, you can predict the sort of shape that will be created by looking for patterns in the following:

- the number of corners and straight lines it includes
- the number of clockwise (right) or anticlockwise (left) turns
- the angle of the turn (90 degrees for rectangles, 120 degrees for triangles).

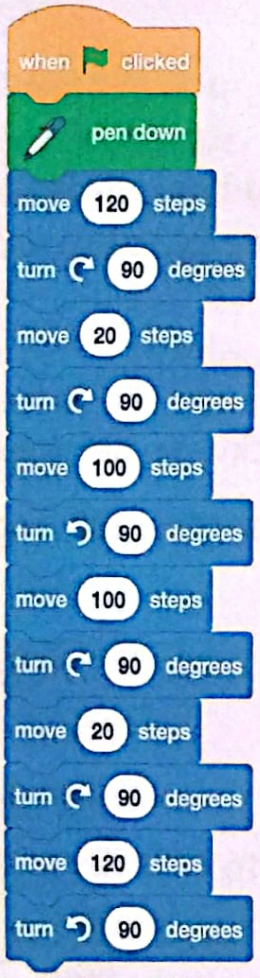
Activity 2

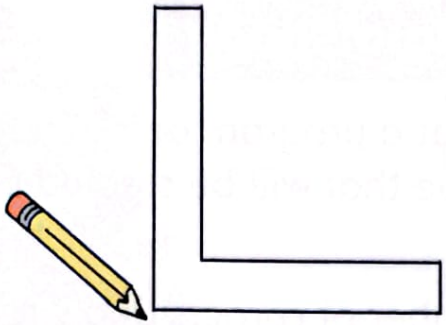
Study the program provided. Using the advice on looking for patterns, describe to a partner the shape it will create.



Activity 3

Using the techniques in this lesson, create a 2D shape of your own. Here is an example of what you might try.





How did you predict the shape in Activity 2? Create a Top Tips poster with your partner explaining how you made your predictions.

- I can predict what an algorithm will do using reasoning.
- I can create a range of 2D polygons in Scratch.

Lesson 4
Writing programs following a set of rules

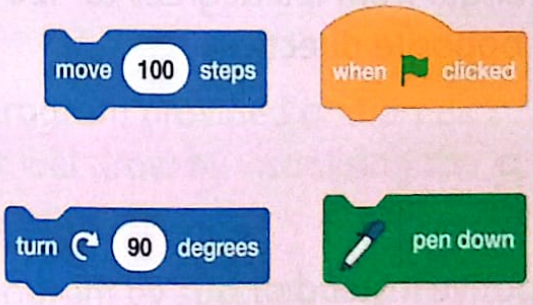
In this lesson you will practise writing instructions following some rules and debugging them.

Key words: blocks, bug, debug, error

Explain to your partner how to look for patterns in a 2D shape program.

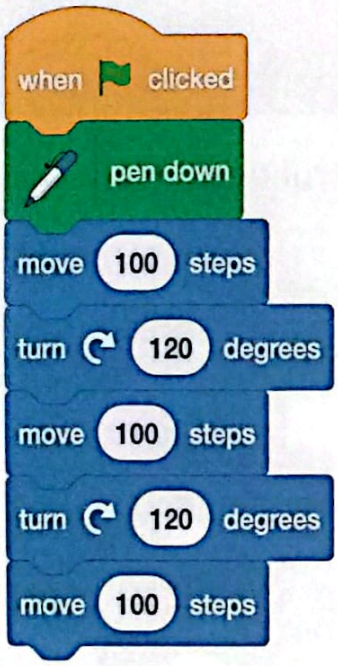
Activity 1

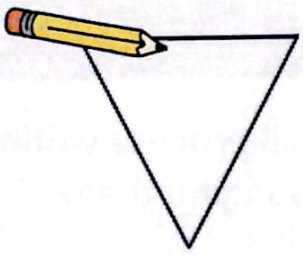
The following four **blocks** are all you need to create a square in Scratch.



Create a square and a rectangle using these blocks. You can change the number of steps and degrees if you need to.

The following program will create a triangle as shown. At each corner the pen will rotate 120 degrees clockwise before drawing the next edge.



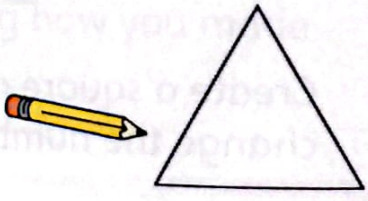


What if the drawing needed to point up instead of down? This would normally be easy to do by using the anti-clockwise block, but the rules said only the clockwise block can be used.

By changing the angle from 120 degrees to -120 degrees, the pen will rotate in the opposite direction.

Activity 2

Using a negative instead of a positive angle, create a triangle like the example shown.



Debugging your program

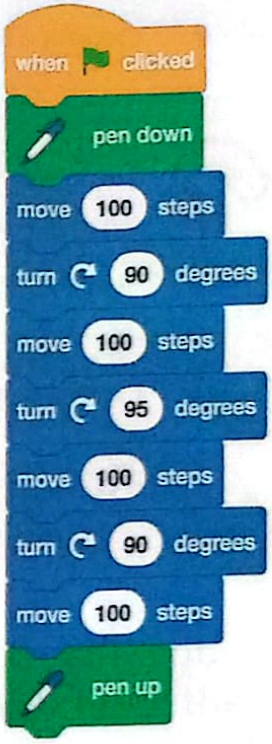
Sometimes you will find errors in your programs and the results are not what you were expecting. Some common errors when drawing in Scratch are:

- using an incorrect step distance
- using an incorrect angle
- using the wrong block.

Spotting and correcting these **errors**, or **'bugs'** is called **debugging**.

To debug this program, you should check each block in the stack carefully and imagine what the sprite would do.

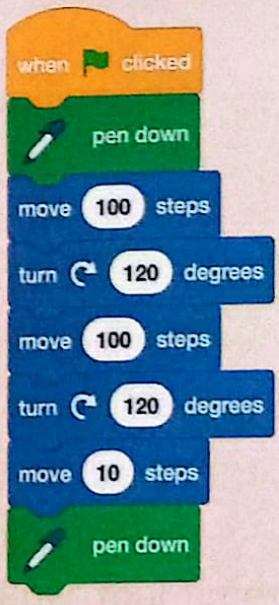
You will quickly see that it is drawing a square but that one of the angles is not correct (95 degrees instead of 90). This is the error, or 'bug'. Changing this to 90 degrees would debug the program.



Activity 3

Look at the program provided and predict what shape it will draw by visualising the blocks one by one.

Debug the program by spotting the incorrectly used blocks. If it helps, draw the shape using pen and paper.



Activity 4

Create a 2D shape program with two errors and ask your partner to try to debug it. Then ask your partner to do the same for you.

Explain to your partner what the term debugging means and how you do it.

I can create programs following rules.

I can debug programs.

Lessons 5 and 6 Understanding repetition in an algorithm

In this lesson you will learn about repetition in an algorithm, and how to create programs containing repetition.

Key words: algorithm, code, loop, repeat, repetition, sequence

Discuss with your partner how you would get a Scratch sprite to draw a rectangle.

Using **repetition** in your programs will make them more efficient. This means they will be quicker for you to write and will create the same output using less **code**.

Repetition is when you tell the program that some instructions are **looped**, or **repeated**. Looped means a **sequence** starts again from the beginning.

The steps which are going to be looped are written underneath each other and moved to the right.

```
Loop 4 times
    Stand
    Wave
    Bow
End Loop
```

This would loop through the sequence 'Stand, Wave, Bow' four times.

Activity 1

Say some looped **algorithms** out loud for your partner to act out.

Using the word 'repeat' in an algorithm means an action is done more than once. The instruction which comes after the repeat instruction is the one which would be repeated.

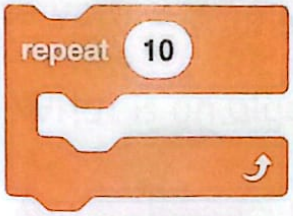
```
Stand
Repeat 4 times
    Wave
Bow
Sit down
```

In this example, you would stand, then wave four times, then bow and sit down.

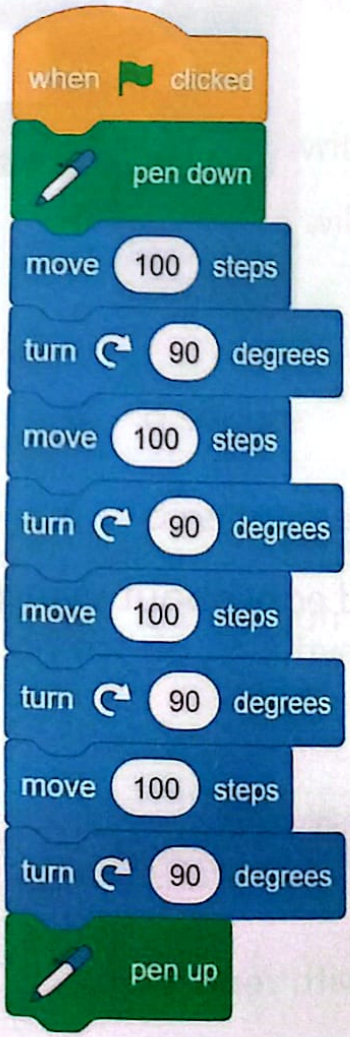
Activity 2

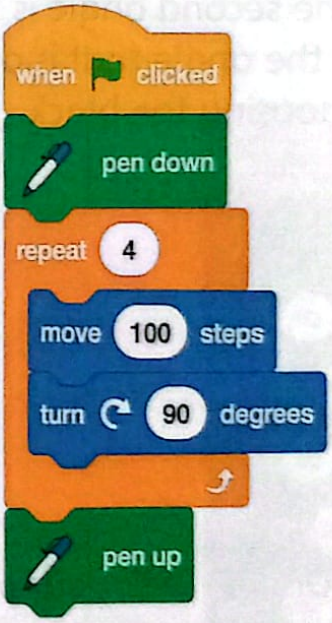
With a partner, create some algorithms with repeats in them. Write them down and take it in turns to perform them.

Scratch contains a 'repeat' block inside the Control section. This is used to repeat, or loop, any blocks placed inside the repeat block. It automatically contains a value of 10, but this can be changed to whatever you need.



The example below shows a program from Lesson 3 that creates a square. As you can see, using the 'repeat' block repeats the move and clockwise turn four times. This reduces the number of blocks required, making it more efficient.





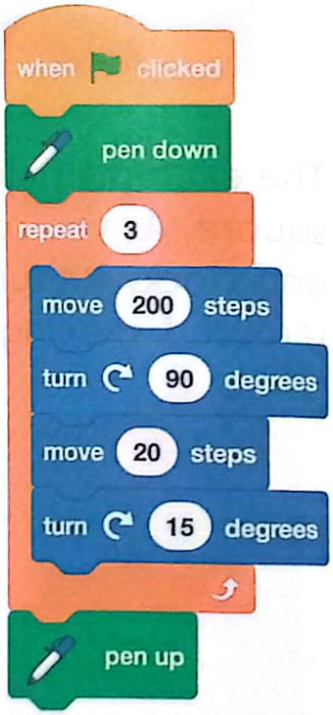
Activity 3

Using the triangle program from Lesson 3, create a program similar to the one shown to draw a triangle. Remember to change the number of repeats and degree turn.

This program was written to create a rectangle with a height of 50 and length of 200. But the student has made two errors.

These errors are:

- Three repeats have been made when only two are needed.
- The second angle is set to 15, not 90. This is the angle that is automatically set when choosing the block.



Discuss with your partner what you found easy about using repetition in your programs. Was there anything you found difficult?

- I can create programs with repetition.
- I can predict the outcome of algorithms with repetition.

Unit 4
Mid-unit assessment

Write your answers in your notebook.

1 What is an algorithm?

A a clear set of instructions

B a programming language

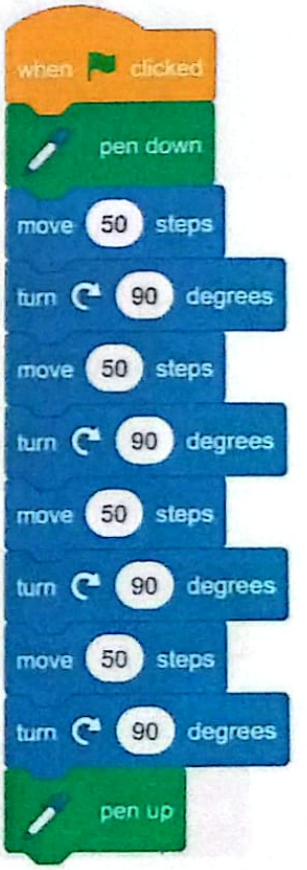
C a type of digital device

D a type of software

(1 mark)

2 Devina has written this code in Scratch.

What shape will it draw?



A a triangle

B a square

C a rectangle

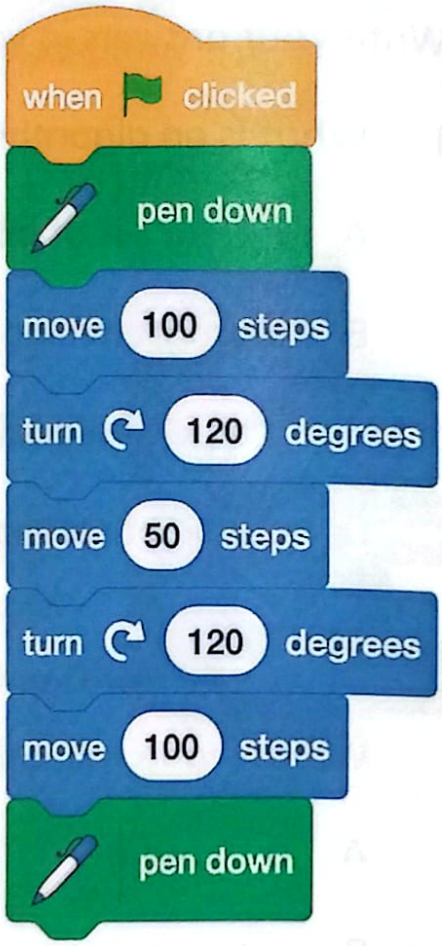
D a hexagon

(1 mark)

3 Write an algorithm to draw a rectangle. Use repetition in your algorithm if you can.

(3 marks)

4 Ajay has written this code in Scratch.



The program does not work because there is an error in it.

a) What do you call an error in a program?

A a spider

B a bit

C a bug

D a fly

b) Where is the error in this program?

c) What should the code say?

d) What is the name of the process you have just completed?

(4 marks)

Lesson 7
Identifying repetition in Scratch

In this lesson you will practise finding repetition in programs and reading the commands to predict what shape would be drawn.

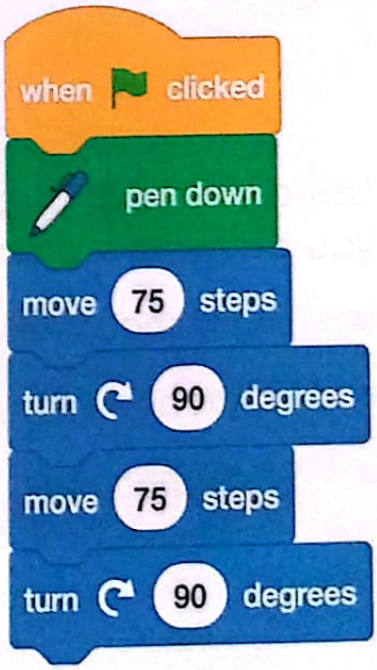
Key words: code, polygon, repeat

Discuss with your partner which blocks are needed to program the sprite to draw a 2D shape using repetition.

A **polygon** is a 2D shape with three or more straight sides. Knowing the number of sides and corners in a shape will help you identify what shape will be drawn.

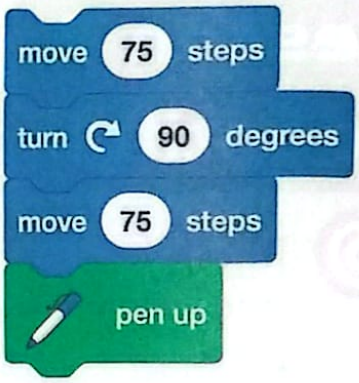
Remember, a full turn has 360 degrees and a half turn is 180 degrees. When you read the program, think about how far around the sprite will turn to help you decide how large the corner will be.

What shape do you think should be drawn with the following program? Remember the program will follow the sequence of blocks from top to bottom.



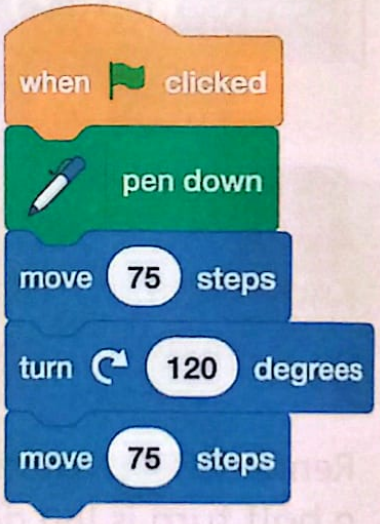
This stack of blocks is incomplete, but you can still predict which polygon it will create as you have already been told two sides and the angles. The missing blocks are:

Adding the missing blocks completes the program, drawing a square.



Activity 1

If you are given part of a program, predict what the shape was going to be and then complete the program, writing the missing steps in your notebook.



Using your skills from the last lesson and the Control block (**repeat**), you can write a shorter version of the **code** for regular shapes.

- Think about which sections of the code appear more than once.
- Count how many times they have been used.
- Write them out.

Activity 2

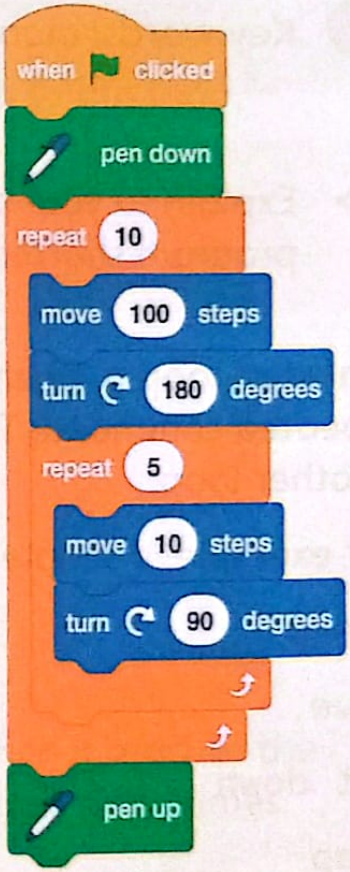
Using repetition, write a Scratch program that creates a square with sides equal to 150 steps.

Ask your partner to check it when you have finished.

Here is an extra challenge program. It uses repetition, but has an angle different to any polygon you have created so far.

If you need to, look at the advice on predicting a shape in Lesson 3 of this unit.

Discuss with your partner what this shape might be.



- I can identify repetition in programs.
- I can predict the outcome of algorithms with repetition.

Lesson 8
Recognising nested loops within an algorithm

In this lesson you will learn about nested loops in algorithms.

Key words: algorithm, loop, nested loop, repeat

Explain to your partner how loops can be used to make a program shorter and more efficient.

A **nested loop** is when there is a **repeated** command inside a repeated command. Think of a nested loop as one loop within another loop.

For example, a simple **algorithm** is:

```
Stand
Wave
Sit down
Clap
Stand
```

You could add a loop here, such as:

```
Loop 5 times
    Stand
    Wave
    Sit down
    Clap
    Stand
```

A nested loop would be adding another loop to this loop, as shown here for example:

```
Loop 5 times
    Stand
    Wave
    Sit down
    Loop 3 times
        Clap
    Stand
```

The whole algorithm loops as before, but when it reaches the 'Loop 3 times' instruction, it loops its commands three times before moving on.

The nested loop contains just one command: 'Clap'. The person following this algorithm would clap a total of 15 times (5 × 3).

Activity 1

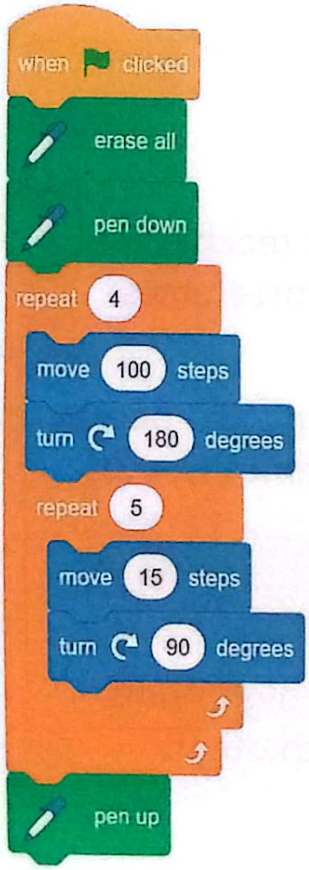
With your partner, create some nested loop algorithms. Write them down and try them out with each other.

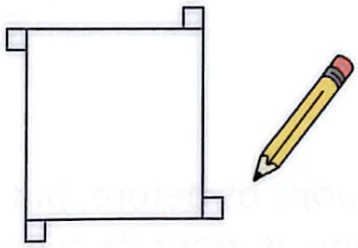
Let's turn the following algorithm into a program that could be understood in Scratch.

```
Loop 4 times
    Move 10 steps
    Turn right 180 degrees
    Loop 5 times
        Move 1 step
        Turn right 90 degrees
```

This means the whole algorithm loops three times, but after each 180 degree turn (turning right to face the opposite way) there is a five times loop of moving forward 15 steps and turning right 90 degrees.

This is how the algorithm would look as a Scratch program, using the pen tool to illustrate the steps:





The 'erase all' block is a stack block and a Pen block. The block removes all marks made by the pen or stamping. It is the only Pen block that the stage can use.

Activity 2

Create a similar nested loop using Scratch. Ask a partner to check your work, and you should check theirs.

Look at the following nested loop.

```
Loop 5 times
    Stand
    Loop 5 times
        Wave
        Sit down
        Clap
        Stand
```

Discuss these questions with your partner:

- How many times would the person wave?
- How many times would the person sit down?
- How many times would the person clap?
- How many times would the person stand?

I know what a nested loop is.

I can use nested loops in algorithms.

I can create a program containing a nested loop.

Lesson 9
Using nested loops to write more complex algorithms

In this lesson you will practise writing more complex algorithms by including nested loops.

Key words: loop, repeat

Discuss with your partner what the term 'nested **loop**' means. Give them an example.

Using nested loops in your programs has interesting results. A key thing to remember when you are using nested loops is that the program will follow the commands from the top down. This is called the sequence of commands.

We can look at the commands in a program to predict what its output will be. When looking at a program, think about:

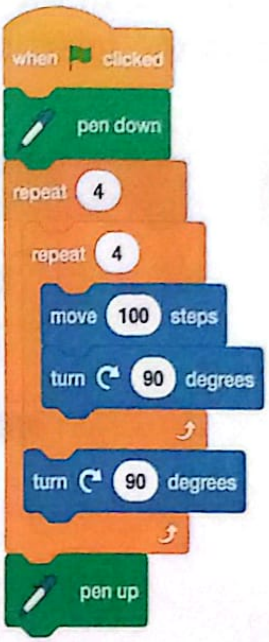
- how many times the commands have been **repeated**
- whether the colour has been changed
- whether the size of the pen has been changed
- which types of angle have been used
- how long the different sides are.

To create interesting patterns in Scratch, you can experiment with angles and loops.

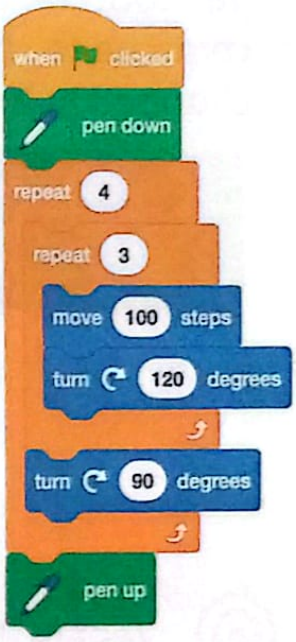
Shape A: This example contains a square, created using a loop. This loop is placed inside another loop, creating the same square four times.

Shape B: The same method can be used with four triangles, turning the pen 90 degrees clockwise after each triangle.

Shape A



Shape B



Activity 1

What shapes do you think the Scratch programs above make? Draw them in your notebook.

Activity 2

Recreate the two programs in Scratch. Once you have created the same drawings, experiment with the number of loops and angle of rotation in the outer block.

Discuss the results with your partner and ask the following questions:

- Which values created interesting drawings?
- Which values resulted in a messy pattern?

In addition to creating patterns, the colour and line thickness of the pen tool can be changed. In the example below, the pen has been changed to red using the selection tool and the pen size has been changed to 10.

Activity 3

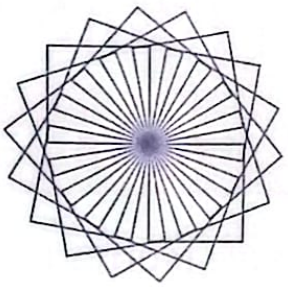
Using the example shown, create your own simple pattern and experiment with the colour and pen size option. Try to create the following versions:

- a yellow square with pen size of 5
- a green triangle with pen size of 15.

Discuss your examples with your partner and make a note of the values used to create each colour.

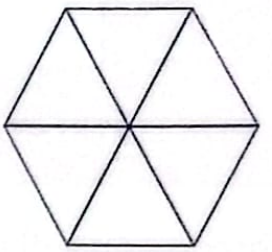
More complex patterns and compound shapes can be created using only squares and triangles. If your algorithm loops through a total of 360 degrees then the pattern will be complete.

Number of repeated loops = 360 divided by chosen angle of rotation.



Square

```
Turn clockwise 20 degrees
Loop 18 times
```



Triangle

```
Turn clockwise 60 degrees
Loop 6 times
```

Activity 4

In the next lesson, you will be creating your own flower or snowflake design using the skills in this unit. Start thinking about the design you would like to make and sketch two designs in your notebook.

Discuss your ideas with your partner. Make sure you are both including the following:

- the type of pattern you want to design
- the shapes to be used
- the colours you might use
- the line thickness you might use.

I understand how to use nested loops in algorithms.

I understand how complex patterns can be created using nested loops.

Lesson 10
Creating your own flower patterns

In this lesson you will be using the skills you have learned over the unit and create your own flower patterns.

Key words: algorithm, loop, nested loop

With your partner, each write a definition of the following terms: **algorithm**, **loop**, **nested loop**. See how they compare.

Activity 1

Create your own flower or snowflake pattern on your device. Use your designs from Lesson 9, Activity 3 to help you. Used a nested loop in your program, and try not to add any overdrawing.

With a partner, discuss these questions:

- What did you like the most in this unit of programming?
- What have you found the most useful skill?
- Is there anything you need to practise?
- How do you think you will use repetition in the future?

I can write algorithms to create interesting patterns.

Unit 4
End-of-unit assessment

Write your answers in your notebook.

1 Explain what repetition is.

(1 mark)

2 What colour are the repetition blocks in Scratch?

A green

B yellow

C orange

D blue

(1 mark)

3 Here is an algorithm that uses repetition.

```
When green flag clicked
Pen down
Loop 4 times
    Move 100 steps
    Turn right 90
Pen up
```

a) How many lines will this algorithm draw?

b) How loops are there?

c) How is this program started?

(3 marks)

4 Why is repetition used in programming?

A To keep the speed of the program fast.

B To let programs use different paths.

C To make a program smaller in size.

D To make a program more complex.

(1 mark)

5 Ivan is trying to use repetition in his Scratch code.

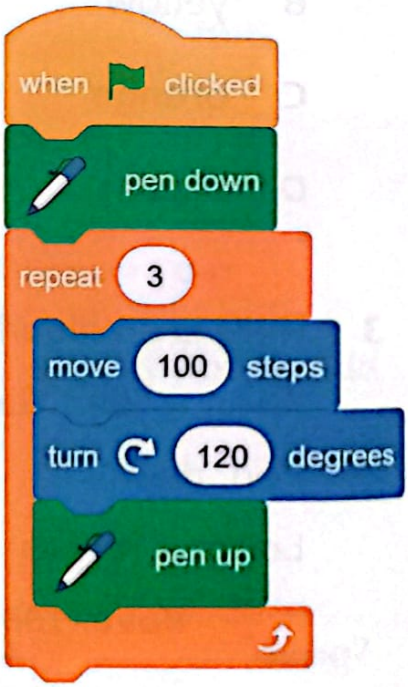
a) In the code stack below, which block is in the wrong place?

A Move 100 steps

B Turn 120 degrees

C Repeat 3

D Pen up



b) What 2D shape is Ivan trying to draw?

(2 marks)

6 Myra has made a loop within a loop in Scratch.

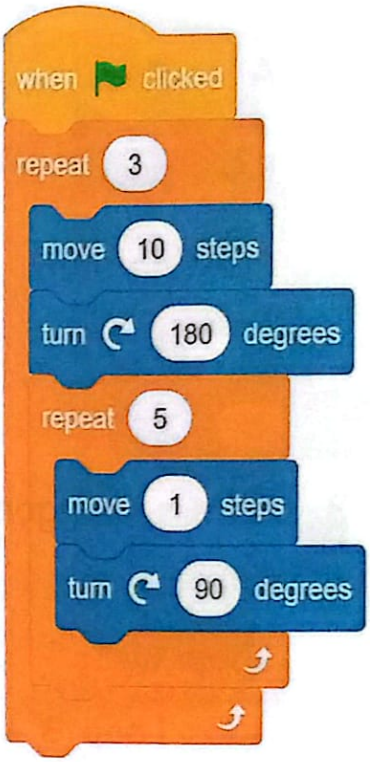
a) What is another name for a loop within a loop?

A Nested condition

B Nested loop

C Nested algorithm

D Nested repetition



b) How many loops are in this code?

A 1

B 3

C 5

D 2

c) How many lines will the program draw?

A 5

B 8

C 15

D 18

(3 marks)

7 In computing, what is another term for the drawing that a program makes when it follows commands?

A output

B input

C algorithm

D sprite

(1 mark)

8 Here is an algorithm.

```
Pen down
Loop 6
    Loop 3
        Move 50 steps
        Right turn 120 degrees
    Right turn 60 degrees
Pen up
```

a) What shape is being repeated?

A triangle

B hexagon

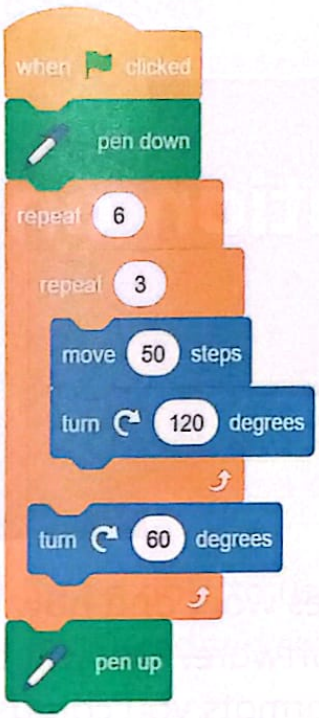
C pentagon

D rectangle

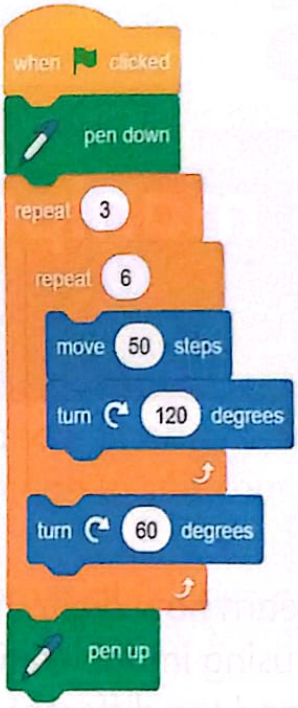
b) How many times will the shape be repeated?

c) What is the correct code for this algorithm?

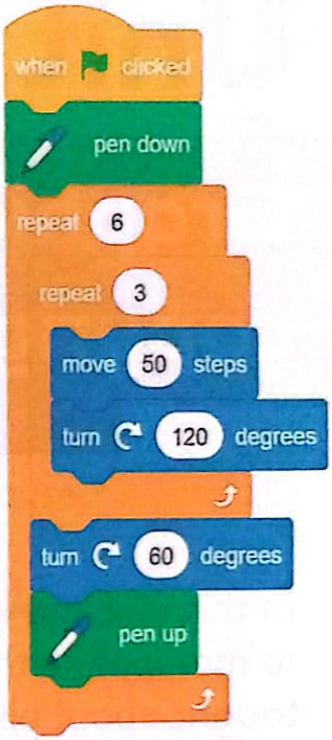
A



B



C



Read the sentences. Do you agree? Think about what you have learned.

- I understand that algorithms are a specific set of instructions.
- I can follow simple algorithms.
- I can predict what an algorithm will do using reasoning.
- I can create and debug programs.
- I can create algorithms with repetition.
- I can predict the outcome of algorithms with repetition.
- I can create programs with repetition.
- I understand what a nested loop is.
- I understand how to use nested loops in algorithms.

Unit 5

Graphics manipulation and copyright

In this unit you will learn how digital images work and how to manipulate them using image editing software. You will be taught about pixels and the different file formats you can use for graphic files.

You will also learn about copyright and ownership of created content, as well as how to search effectively for images that can be reused under a Creative Commons licence.

Using the knowledge and skills gained throughout the unit, you will create a magazine cover for a topic of your choice.

Key objectives


To understand that digital images are made up of picture elements called pixels.


To understand that graphic images can be saved in a variety of file formats, depending on their intended use.


To be able to create and edit original documents, combining text and image to suit your purpose.


To be able to use appropriate desktop publishing and image edited software.


To understand what copyright is and why it is important.


To be able to search for appropriate images and filter results for a purpose.

Lesson 1
Understanding digital images

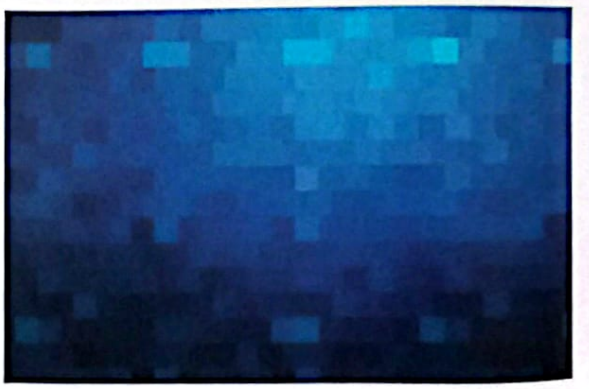
In this lesson you will learn about digital images and create your own pixel artwork.

Key words: binary code, digital image, pixel, zoom

Discuss with your partner what you can remember about **digital images**. Can you remember any that you have made? What are they? What applications have you used before?

A digital image is an image that is stored electronically. This means that the information about the colours and shapes of the picture will be changed into Is and 0s, so that a computer can understand them.

Digital images are made up of pixels. The word pixel was coined from the term **pic**ture **el**ement. A **pixel** is a tiny dot in a digital image. Each pixel will show one colour. All the pixels together will show the image. To show pixels in digital images you need to **zoom** very closely into the picture.



A computer stores each pixel as a series of 0s and Is. This is called **binary code**.

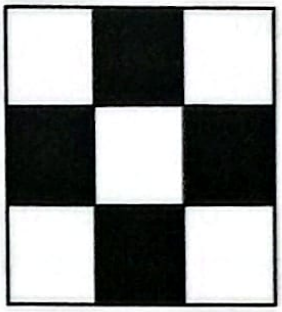
A computer only 'sees' 0s and Is which tell it what to display on the screen (the output).

A white pixel is 0 and a black pixel is 1. Other colours are made of a group of 1s and 0s.

You can think of binary code as an 'on' or 'off' switch for each pixel. 0 is off so the pixel is empty, white. 1 is on so the pixel is black.

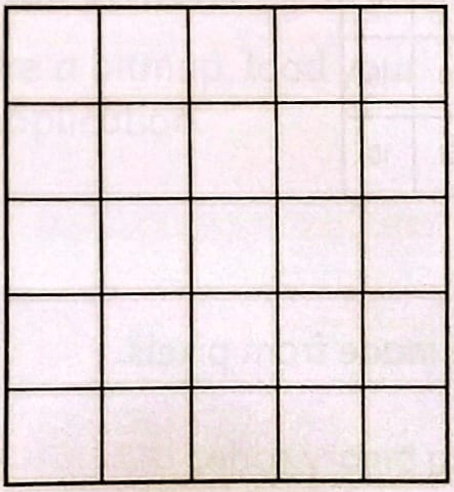
The binary code given in the image below left describes how to draw the black and white image below right.

1	0	1
0	1	0
1	0	1



Activity 1

Make a pattern using a grid like this in your notebook. Work with a partner to swap patterns and write their binary code for them. Check your partner's work to see if they have written your binary code correctly.



Binary code

_____

_____

_____

_____

_____

To show colours in binary code, you need to use more 1s and 0s. The example below shows how new colours are created with new binary code numbers.

00 = white

01 = black

10 = yellow

11 = blue

10	10	10	10	10	10
10	00	10	10	00	10
10	11	10	10	11	10
10	10	10	10	10	10
10	01	01	01	01	10
10	10	10	10	10	10

Discuss with your partner what the binary code would show in the example below. Sketch it in your notebook.

11	00	11	11	11
11	11	11	11	11
11	11	11	11	11
10	10	10	10	10
10	10	10	01	10

- I know that digital images are made from pixels.
- I can create pixel artwork using binary code.

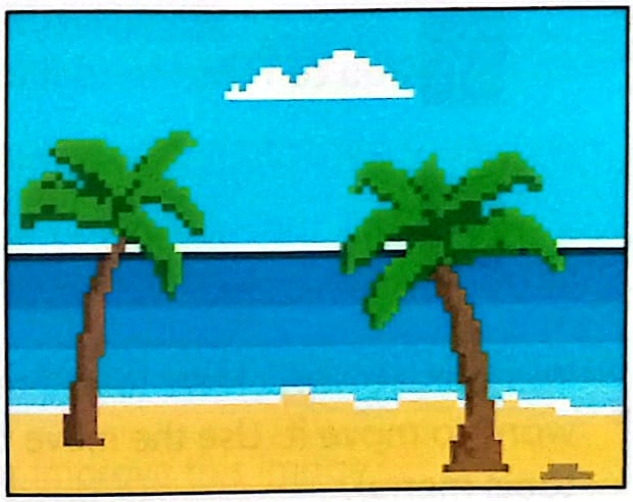
Lesson 2
Creating pixel artwork

In this lesson you will be creating pixel artwork on your devices.

Key words: bitmap, pixel

Discuss with your partner what a **pixel** is and how a computer saves the information in a digital image.

Images which are made of a grid of pixels are called **bitmaps**. This is one of the many kinds of digital image file that can be used to save images.



This beach image is an example of bitmap artwork.

To make a bitmap, load your pixel application.

The row of squares across the top of the tools menu shows the size of the pen selected, ranging from smallest to largest. The currently selected size is highlighted in yellow.

To draw

1. Move the selected pen across to the drawing area in the middle.
2. Left mouse click to draw.
3. Click and drag to draw lines.

To edit your drawing

You can use the eraser tool to delete parts of your drawing.

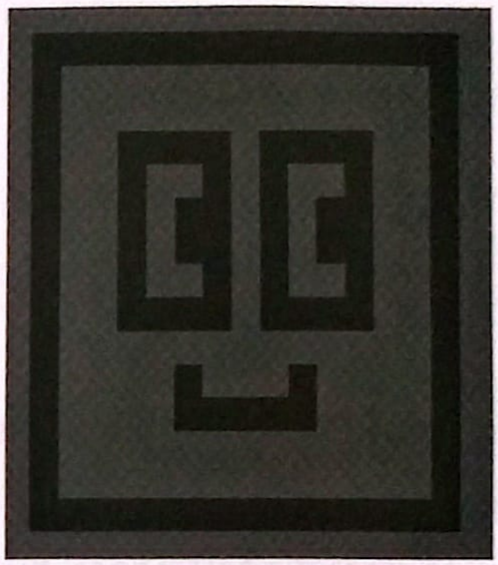
You can use this tool to paint all the pixels the same colour.

This tool allows you to lighten or darken your pixel art.

You don't always have to delete your drawing if you want to move it. Use the move tool instead (highlighted in red in the tools menu).

Activity 1

Create a bitmap showing a pixel artwork.



Discuss these questions with your partner:

- What does this pixel art image show?
- Do you think that this image was difficult to create? Explain why.
- How could you change or improve this image?

I can create pixel artwork on my device.

Lesson 3
Graphic file formats

In this lesson you will learn about the most popular and frequently used graphic file formats.

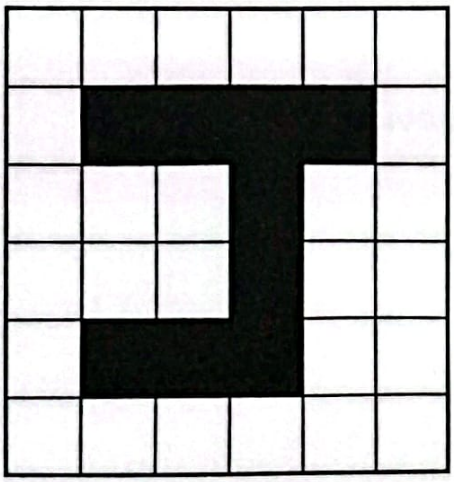
Key words: bitmap, binary code, BMP, GIF, JPG, lossless compression, lossy compression, PNG, TIFF, vector

Discuss with your partner what a **bitmap** is.

Bitmaps are one way to store digital images, but there are lots of other ways to store them. Data about images can be compressed (made smaller) to save space on devices so they can hold more files.

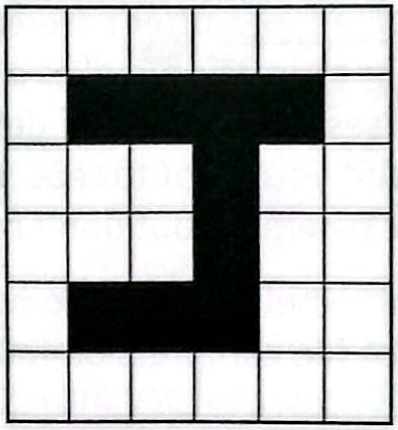
One kind of compression is **lossless compression**. This means all the data is there, but it is stored in a way which makes it smaller so that it takes up less space and is faster to read.

For example, this image in **binary code** would look like:



0 0 0 0 0 0
0 1 1 1 1 0
0 0 0 1 0 0
0 0 0 1 0 0
0 1 1 1 0 0
0 0 0 0 0 0

In lossless compression it would look like:



In lossless compression, the numbers in each row of data swap between white and black pixels.

The numbers represent how many uninterrupted white then black pixels appear in that row.

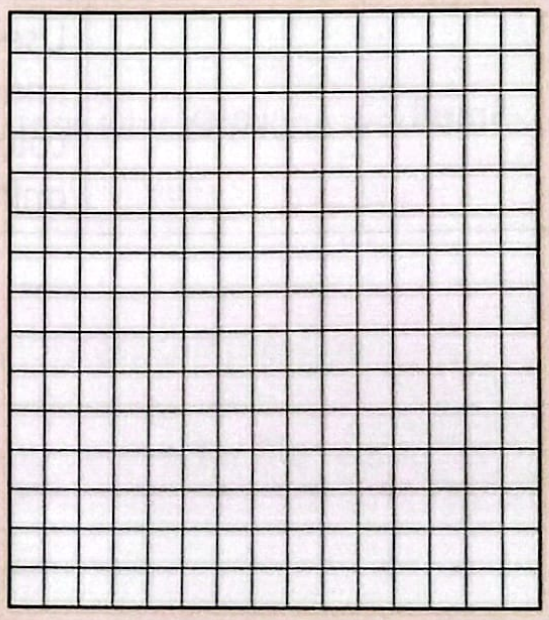
So in the image showing the letter J, the lossless sequence is as follows:

- 6 white pixels
- 1 white, then 4 black, then 1 white pixel
- 3 white, then 1 black, then 2 white pixels, and so on.

You can see in this example the lossless compression code is about half the size of the binary code version, but the images are exactly the same. Depending on the image though, lossless compression doesn't always reduce the amount of code.

Activity 1

Read the lossless compression data on the right of the image. Then in your notebook, draw a grid like the one shown here and colour it in to show what the image would look like on a device.



15
5, 4, 6
3, 8, 4
2, 10, 3
1, 3, 2, 4, 2, 1, 2
1, 3, 2, 4, 2, 6
1, 2, 2, 4, 2, 2, 2
3, 2, 4, 2, 3, 1
4, 2, 4, 2, 2, 1
0, 15
0, 15
0, 15
0, 15
0, 2, 1, 3, 2, 3, 1, 2, 1
0, 1, 3, 2, 2, 2, 3, 1, 1

Other file types offer different kinds of compression. **Lossy compression** makes a file smaller, but it also decreases the amount of detail in an image. This is helpful if you want to reduce the file size so you can send it by email, but don't need lots of detail.

The table below shows some of the more popular types of file compression format.

Format	File size	Compression	Usage
BMP	Large	Lossless	Used mainly by the Microsoft Windows® operating system. Not used much anymore.
JPG	Small	Lossy	Used by digital cameras and for images on the internet.
PNG	Small to medium	Lossless	Used for images with lots of colour or images that have transparent backgrounds.
TIFF	Very large	Lossless	Used in the printing industry for printing large posters or magazine covers, etc.
GIF	Small	Lossy	Used on the internet for images that have very few colours. Also used to store animations.

Activity 3

Read the challenges below and write your answers in your notebook.

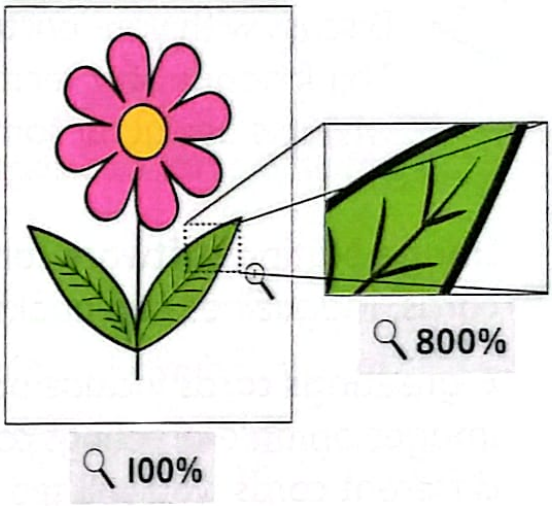
a) A cafe wants a new logo. It will be used on signs, menus and adverts in newspapers in different sizes. Which image type should the cafe use for their logo?

b) A library wants to create a picture for their website. What image type should they use?

Vector files do not save their image data as pixels. They save image data as lines, curves and shapes.

When you zoom in on a vector image, you will not see large dots. It will look just as clear as the image.

This is useful for logos and detailed diagrams, because the image will not become blocky or 'pixelated'.



Explain to your partner why someone would use lossless compression to save an image.

- I understand what lossless compression is.
- I know about bitmap and vector file types.

Lesson 4
Formatting an image

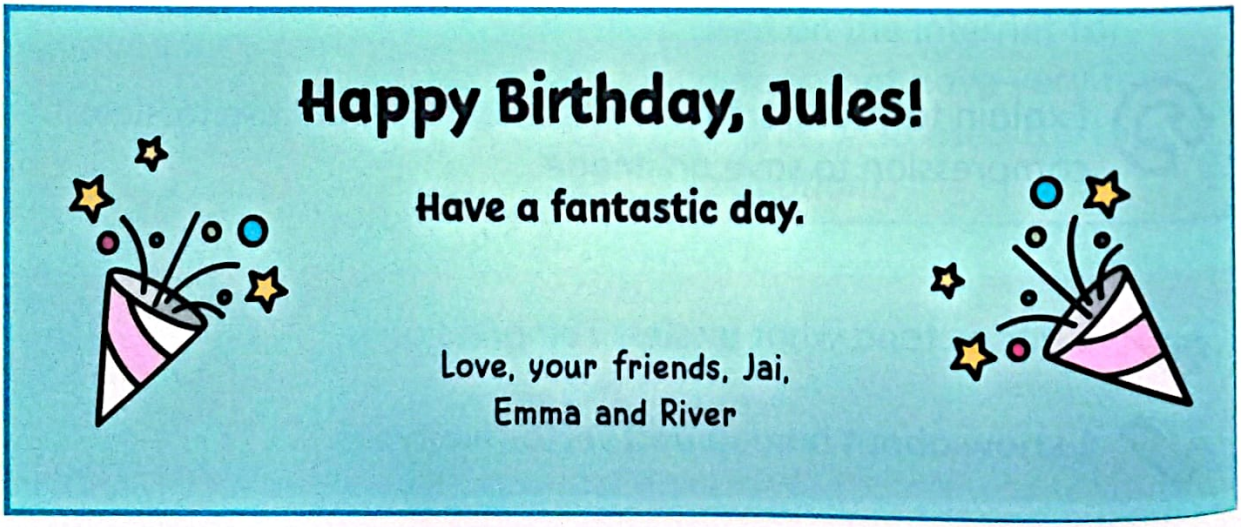
In this lesson you will learn how to crop, resize and overlay text to an image.

Key words: colour, crop, e-greetings card, font, image editing software, layout, text overlay

Discuss with your partner what a vector image is. Think about how vectors store image data and why it is useful for some images.

Image editing software can be used to create posters, leaflets, cards, magazines and books.

E-greetings cards include both text and images. It is important that images on an e-greetings card are nice to look at. If you look at different cards, you will see that the images are clear and crisp.



The text on an e-greetings card is also clear and will usually be written in a style to suit the message of the card. This means the **colours** used are similar. The e-greetings card might use more than one **font**, but it is still clear to read.

Finally, these cards have a clear **layout**. A layout means the position of the text and images. E-greetings cards can have lots of different layouts, but are always clear to read.

Activity 1

Look at examples of e-greetings cards and think about the layout, images and text.

Layout:

- What is the layout of the images and text? Why might that be?

Text:

- What font styles, sizes and colours have been used?
- Are there any other text effects – such as shadows, 3D text effects, or a handwriting effect?

Images:

- How does the image link to the message on the card?
- Has the image been **cropped** to show a part of the picture?

Here are some tools which will be helpful when you are creating your e-greetings card.

Crop

Remember, cropping lets you select the part of the image you want to use and delete the rest. This remaining part of the image will stay the same size.

Resize

This function changes the size of an image so it can fit where you want it to go. If the image is blurry when you make it bigger, this means that it is not high quality and you should use another image.

Text overlay

Use this tool to add text on the image. Depending on the software, this may be added as an additional layer. Be sure to select the layer with text to see the options for formatting.

Font

This option is used to change the style of writing. The tool will be visible as soon as you have written the text, and you will be able to change it.

Colour

This changes the colour of the text. You can select the colour to use for text before you start typing, but you can also change the colour of any text after you type it.

Activity 2

Use image editing software (such as Pixlr) to create your e-greetings card. The topic could be a birthday, a thank you, an invitation, a seasonal holiday or a festival. You can choose pictures, colours and fonts that suit the occasion.

Remember to save your work regularly, so you don't lose any of your work if something happens to your device or file.

Once you have created your card, discuss the following questions with your partner.

- How did you choose your images?
- Did you have any problems resizing the images?
- Why did you choose the fonts and colours that you did?
- What problems did you find when creating your e-greetings card? How did you solve them?

I can create digital content.

I can crop and resize images.

I can add text to images.

Lesson 5
What is copyright?

In this lesson you will learn about copyright and the ownership of created content.

Key words: content, copyright, Creative Commons licence, ownership, permission

Discuss with your partner how you would feel if someone copied your work. What if they were rewarded for the work you had done and you weren't?

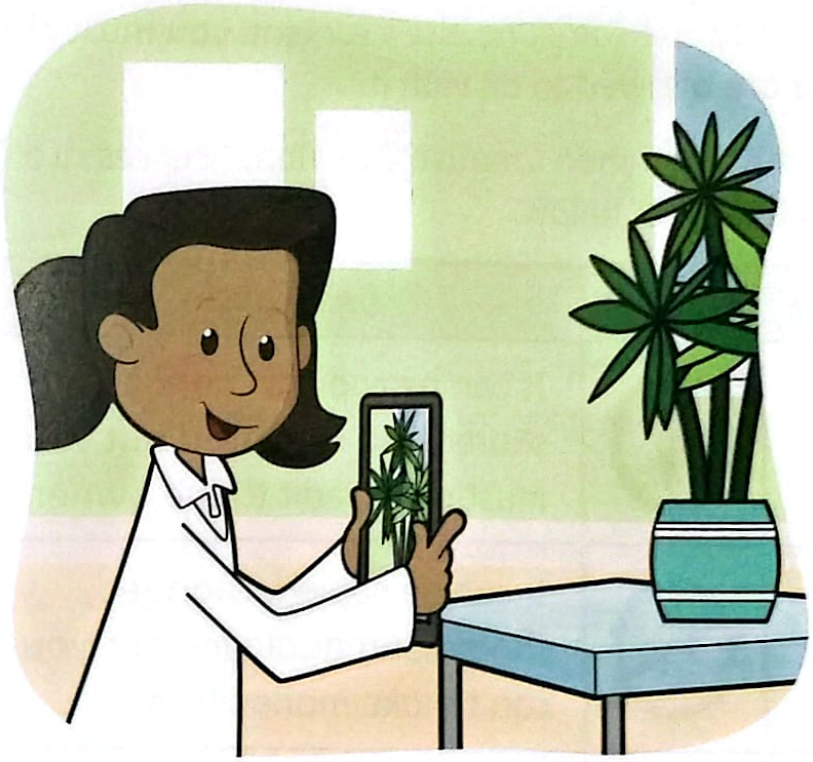
When you create work and post it online, what are you allowing other people to do with it? If you take a picture and post it online, are you letting anyone copy that picture and use it however they want? What happens if someone puts it on a T-shirt and sells it?

Copyright for online content is a serious issue and you should understand what is allowed and what isn't.

Copyright is a protection for people who make **content**.

When you create content, you can:

- make copies of your work
- give copies of your work to others
- perform your work publicly (for other people)
- display your work publicly
- make changes to your work.



If you didn't create the content, you do not always have the **permission** to do those things, as it would be unfair to the person who created it.

Each country has its own copyright laws. To deal with this, there is a system called the **Creative Commons licence**.

Activity 1

Explain to your partner what five things you can do with your own content.

There are many kinds of Creative Commons licence available. If you want to use someone else's content, you must check what you are allowed to do with it.

The four most common Creative Commons licences are shown in the table below.

Licence	Symbol	Description
BY		It can be copied, changed, shared and displayed but you must give credit to the owner.
NC		It can be copied, changed, shared and displayed but you can't make money from it.
ND		It can be copied, shared and displayed but you can't make changes to it.
SA		It can be changed and shared but you must keep the original licence.

Activity 2

Create a leaflet about copyright and each kind of Creative Commons licence you can find. Include information about each kind of Creative Commons licence, and why copyright is important. Use images to make your leaflet interesting to look at.

Activity 3

Read the sentences carefully. Match each one to the symbol of the Creative Commons licence described.

Licence	Symbol
BY	
NC	
ND	
SA	

A Samir finds an image for his presentation online. He is allowed to change and share the image, but he must keep the original licence.

B Amelia sees a picture on a website that she wants to save. She is allowed to share, copy or display the image, but she cannot change it.

C Mason wants an image for an e-greetings card. He finds a picture that he can change, copy, display and share, but he must credit the owner of the image.

D Priti finds an image for a poster she is making. She can copy, change, share or display the image, but she cannot make any money from it.

Discuss with your partner why it is important to respect the **ownership** of content. How can you make sure that other people get credit for their work?

I understand how copyright affects the use of digital content.

I understand the role of Creative Commons licences.

Unit 5
Mid-unit assessment

Write your answers in your notebook.

1 What is a pixel?

A a tiny dot in a digital image that shows colour

B a feature that can be used to format a digital image

C a type of device which stores digital images

D a type of software used in digital images

(1 mark)

2 Which statement best explains what binary is?

A Binary is a type of digital device.

B Binary is a type of app for digital photos.

C Binary is a type of digital image.

D Binary is a type of code that uses 1s and 0s.

(1 mark)

3 What is a bitmap artwork?

A an image made from a grid of pixels

B an image made from curves and lines

C an artwork that is stored electronically

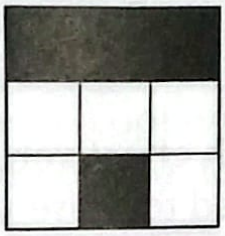
D an artwork that isn't stored electronically

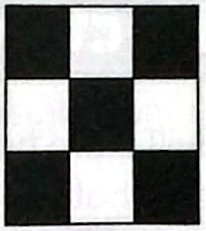
(1 mark)

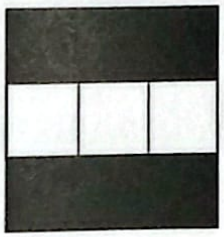
4 Daljit has written some code for an image:

1	0	1
0	1	0
1	0	1

Which image will Daljit's code make?

A 

C 

B 

D 

(1 mark)

5 Explain why images are sometimes compressed.

(1 mark)

6 Below is the lossless compression code for a 5 × 5 grid.

What will the 5 × 5 grid look like?

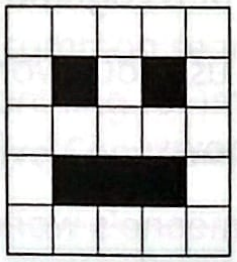
5

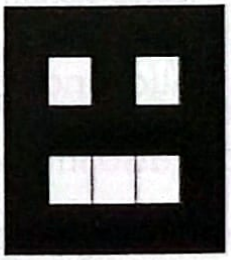
11111

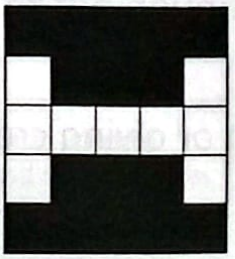
5

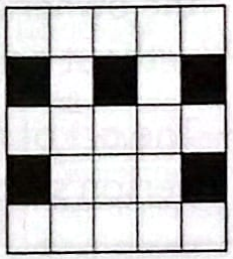
131

5

A 

C 

B 

D 

(1 mark)

Lesson 6
Searching effectively for images

In this lesson you will learn how to search effectively for colour splash images that you are allowed to reuse under the Creative Commons licence.

Key words: Creative Commons licence, filter, images, search engine

Discuss with your partner what you can remember about the kinds of **Creative Commons licence** you learned about in Lesson 5.

Let's recap some of the key terms used so far in this unit:

Copyright:	A form of protection given to the authors or creators of 'original works', such as original **images**.
Creative Commons:	A system that allows people to share their work freely in return for recognition of their work.
Permission:	Allowing someone to use your work.

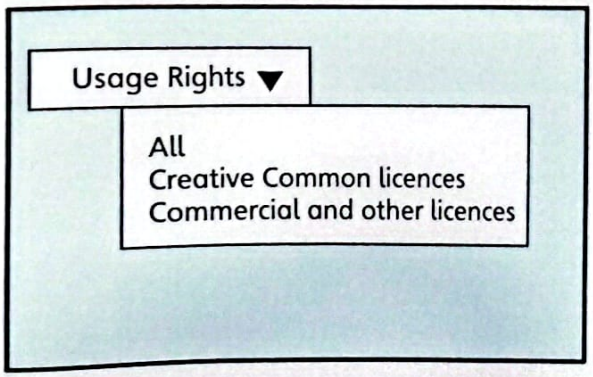
These terms are also important to know:

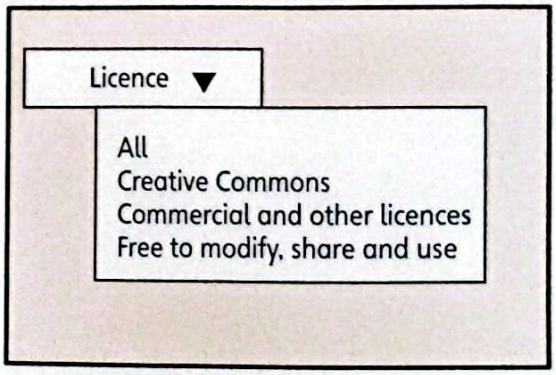
Respect:	Having respect for someone's work means you treat the owner and care enough not to use their work without permission.
Attribution:	The act of recognising or giving credit to another person's work.

In the next lesson, you will be creating an image containing a colour splash. A colour splash is a black and white image with one part in colour that really stands out.

You will start with a suitable image. Most **search engines** have an image search option and the results from a search can be **filtered** (narrowed down), to find an appropriate image.

Two of the most common search engines contain the following options when searching for images. As you can see, both offer filtering by Creative Commons.





Activity 1

Take a look at the image search options in your search engine of choice. If possible, open more than one and see how they compare.

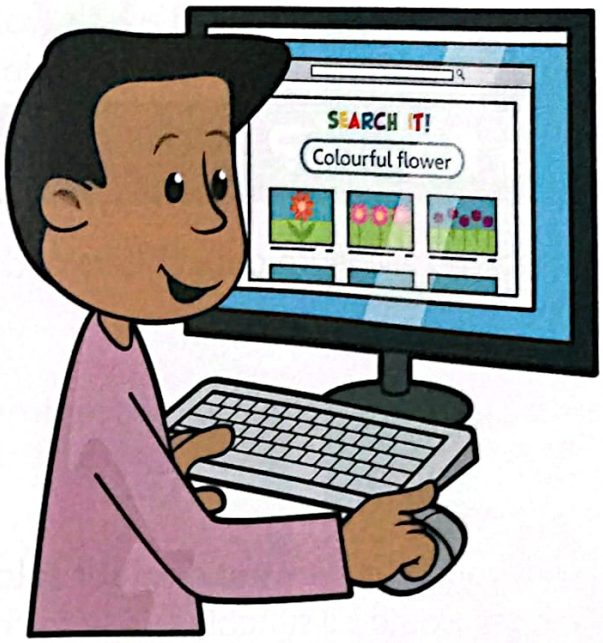
When selecting an image it is important to think about the following:

- What do you want to do with the image? Remember there are different Creative Commons licences for sharing and modifying.
- Where has the search engine found the image? It is always a good idea to click on the image and find out where it came from. Sometimes images can be incorrectly labelled and not suitable for use after all.

Activity 2

Using the techniques in this lesson, find an example of a colourful image that you could use in later work. Find one of each of the following:

- a flower
- a bar, bus or bicycle
- a flag of your choice
- a traditional meal where you live.



Discuss with your partner which search engine you might use to search for Creative Commons licenced images.

I can search for images with the Creative Commons licence I need.

Lesson 7
What are filters?

In this lesson you will learn about filters and start to create your own colour splash photo.

Key words: brightness, colour splash, contrast, filter

Discuss with your partner what a **colour splash** is and what sort of images would be suitable to use to create one.

Filters are settings which can be used to change an image quickly. There are lots of different filters and they can be used to make images look older, brighter, darker, bigger or smaller.

Filters are often used on social media sites, where users will change how an image looks before they post it online. Changing the **contrast**, for example, can make the image either look duller or more colourful. If you change the **brightness**, the image will look lighter or darker.

The example below shows how changing the brightness and contrast can change an image.

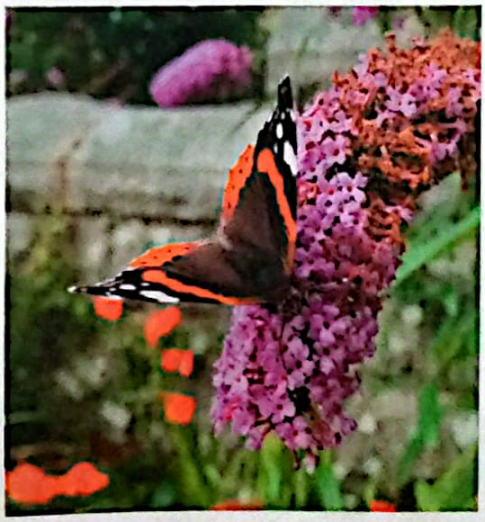
original

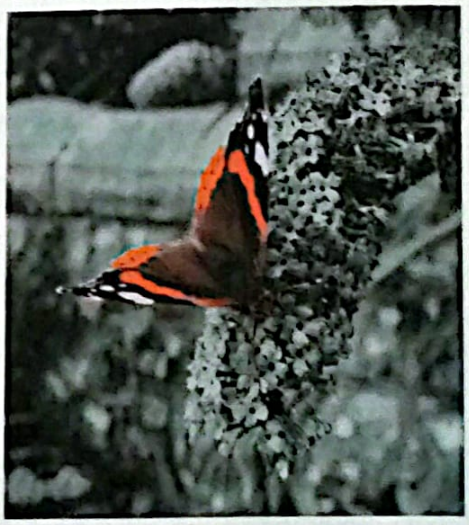
high brightness and contrast

low brightness and contrast

How to create a colour splash in Pixlr

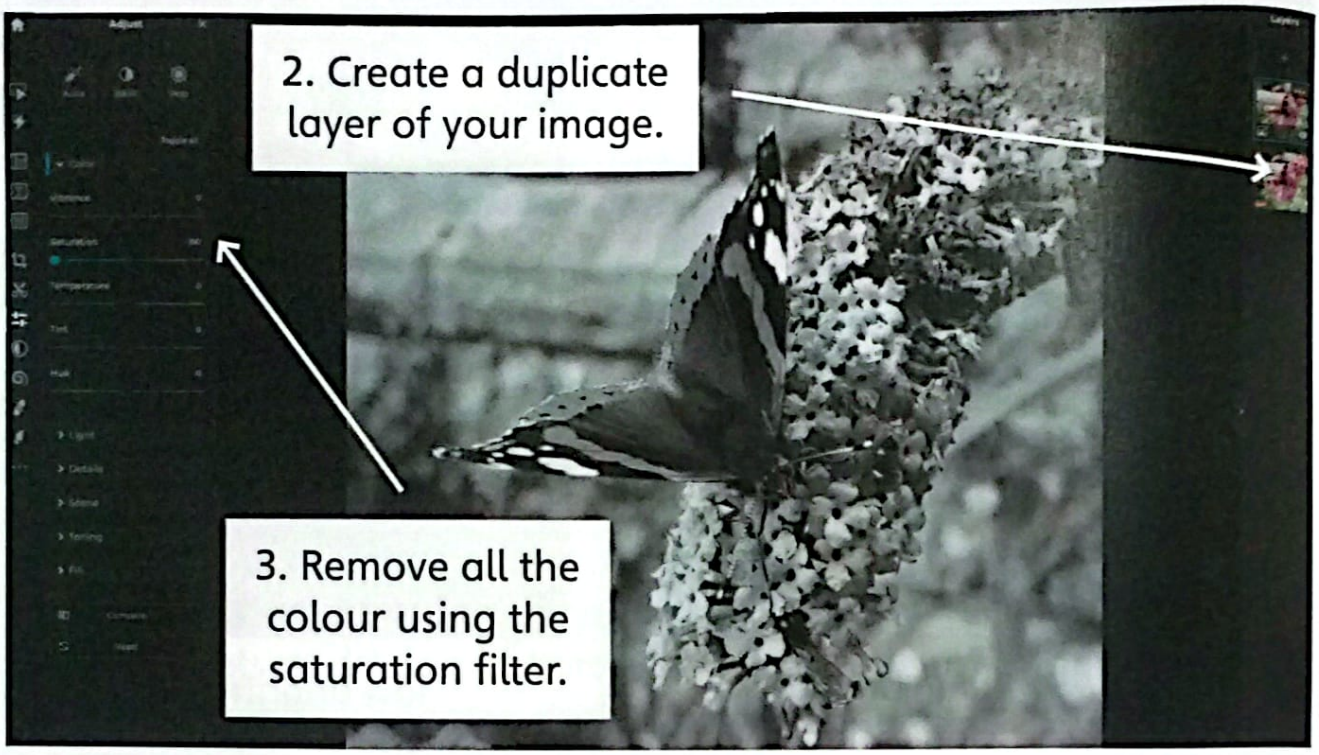
Pixlr is a free online image editing application that runs in a web browser. Using some of the filters in Pixlr, a colour splash image like this can be created.

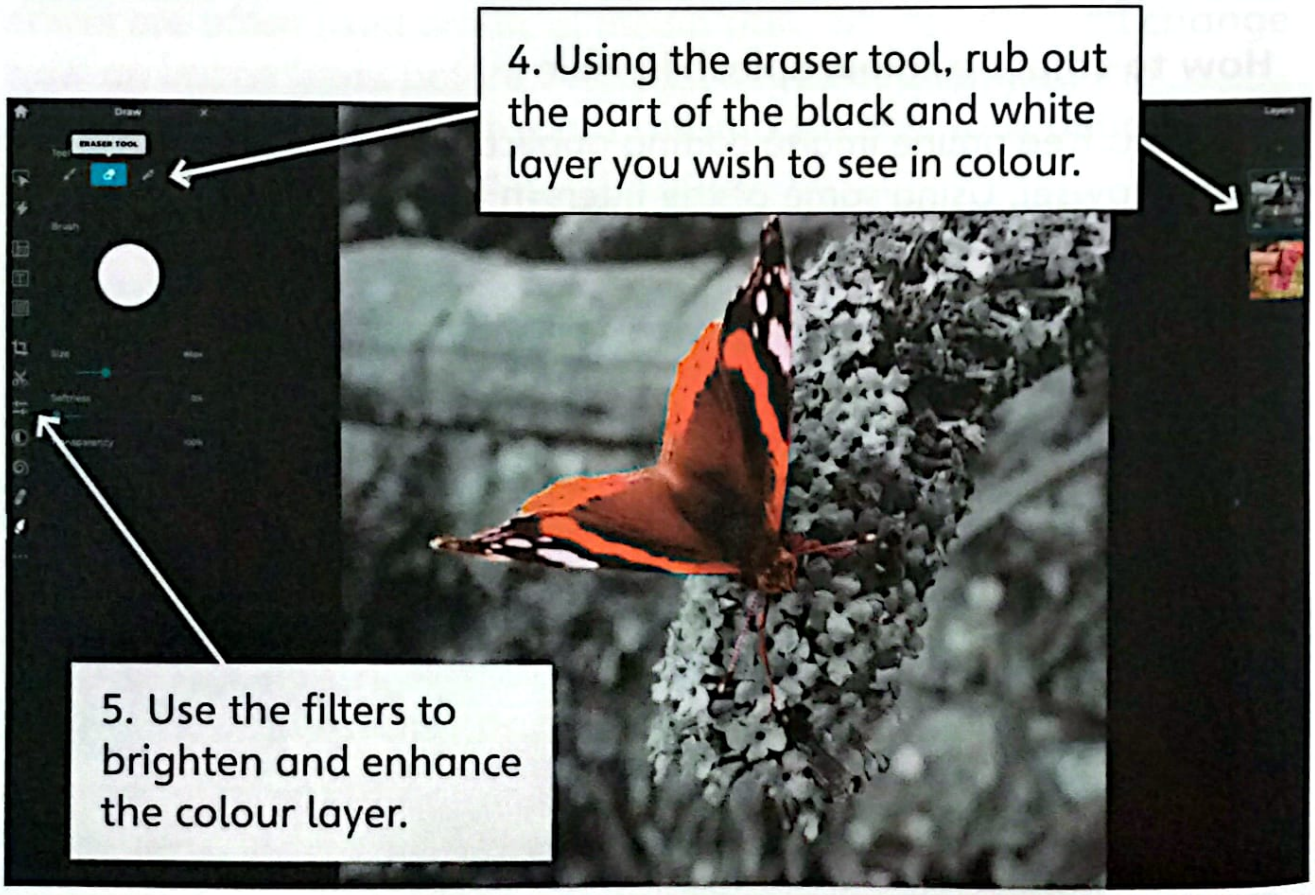




Here are the steps to create a colour splash in Pixlr:

1. Open your selected image in Pixlr.





Activity 1

Create your own colour splash photo on your device. Try to pick something with colour and a plain background, such as a toy on a table or a boat in the sea. Discuss ideas with your partner.

Tell your partner some of the filters you have used in the lesson and what they do. Which ones worked well and which ones didn't? What did you find easy or difficult when using layers?

I can create a colour splash image on my device.

Lessons 8 and 9
Designing a magazine cover

In this lesson you will learn about the features of a magazine cover and start designing your own on a topic of your choice. You will search for an appropriate image to use on your magazine cover.

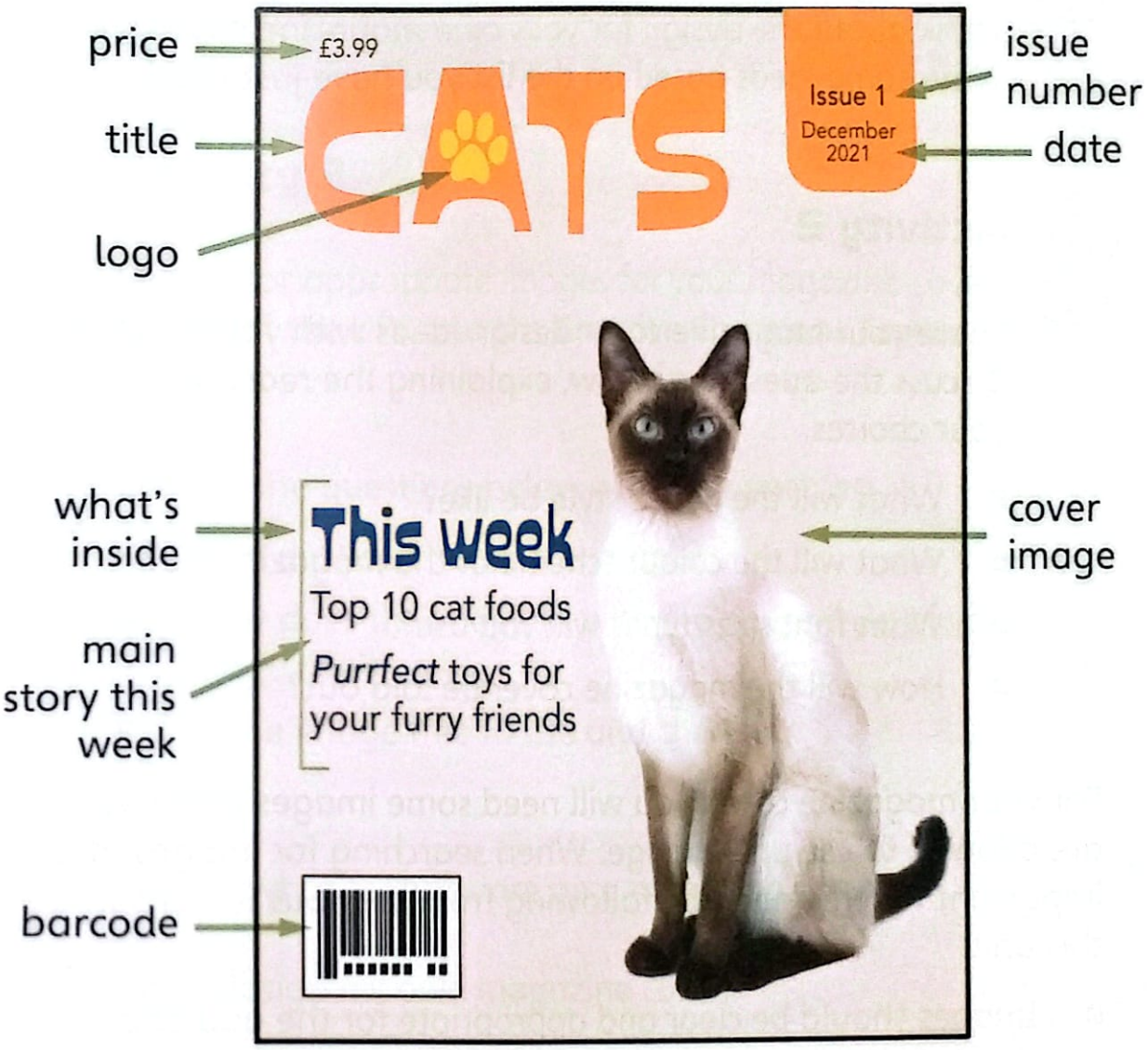
Key words: Creative Commons licence, house style, magazine

Discuss with your partner the skills you have gained so far that will help design a **magazine** cover.

Here are some things to think about when designing a magazine cover:

- What is the name of the magazine?
- What is the magazine about?
- What are the main stories?
- Who will read it?
- What will be the main image on the cover of the magazine?
- What is the house style of the magazine (colour scheme, font sizes/styles)?
- How much will the magazine cost?

Here is an example of a magazine cover and the features you may have recognised.



A magazine will use the same features in each issue.
This is called the **house style**.

The title, font style and logo will always be the same.
This is so the magazine is recognisable and will stand out.

Activity 1

Think about the design for your own magazine cover. Write some ideas based on the list you have just read.

Activity 2

Share your magazine cover design ideas with your partner. Discuss the questions below, explaining the reasons for your choices.

- What will the house style be like?
- What will the colour scheme of the magazine be?
- What font sizes/types will you use?
- How will the magazine cover be laid out?

For your magazine cover, you will need some images that you are allowed to use and change. When searching for images, it is important to remember the following from previous lessons in this unit:

- Images should be clear and appropriate for the audience.
- Images should make people want to pick up the magazine and read it!
- You should use search engine filters to find images with the correct Creative Commons licence.

Remember: If you see anything inappropriate or upsetting when you are searching for images, tell your teacher straight away. You should always follow your school's online safety policy.

Activity 3

Search for appropriate images for your magazine cover. Make a note of the URL and the **Creative Commons licence**.

Discuss the questions below with your partner:

- Why did you choose the image?
- How does the image fit with the house style of your magazine?
- Is the image free to use and change?

I know what features are on a magazine cover.

I can design my own magazine cover.

I can use a search engine effectively.

Lesson 10
Creating your magazine cover

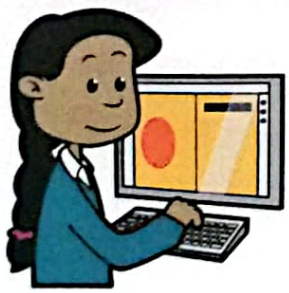
In this lesson you will use the skills you have learned over the unit and you will create a magazine cover.

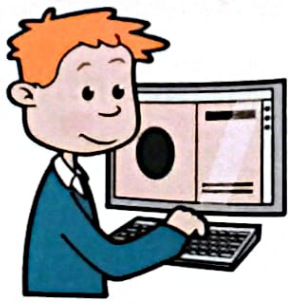
Key words: crop, filter, resize

Discuss with your partner the key features of a magazine cover you should include in your design. Can you remember them all?

Now, you will create your magazine cover! Remember to include:

- an appropriate title
- a main story
- other stories to find inside
- a house style
- common magazine elements such as issue numbers and barcodes.



Activity 1

Create your magazine cover. Use the features you have learned about in this unit, like **filters**, colour splash, **cropping** and **resizing**.

Review your partner's magazine cover. Think about these questions and discuss them with your partner:

- Does the magazine cover include all of the features?
- How could the magazine cover be improved?
- What did they enjoy or feel they were confident or skilful in doing?
- What one thing would they like to develop more (and why do they want to develop that skill)?

I can create a magazine cover.

Unit 5
End-of-unit assessment

Write your answers in your notebook.

1 Explain what the purpose of copyright is.

(1 mark)

2 Why is there a Creative Commons licence?

A Because copyright laws are the same in different countries.

B Because copyright laws are not complex enough.

C Because copyright laws are different in different countries.

D Because there are no copyright laws.

(1 mark)

3 When you are searching for images on the Web, you can tell some search engines to only show you images that you are allowed to reuse.

What is the name of the button you need to click to use this feature?

(1 mark)

4 What is another name for the settings that you can quickly apply to a digital image to change the way it looks?

(1 mark)

5 Here are two images of a red panda, the original image and an edited version. Parveen has done three things to the edited version.

Original image

Edited image

Write down three edits Parveen has made to the image.

(3 marks)

6 To make a colour splash image, what do you need to add to your digital image?

A a plain background

B a second image

C a flower

D a layer

(1 mark)

7 a) You are searching for images to use on a magazine cover. Which statement is true?

A Make the images as bright as possible.

B Make the images as dark as possible.

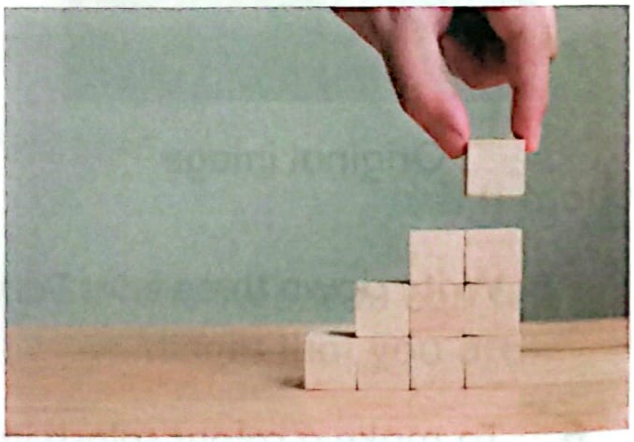
C Choose images that are linked to the content.

D Use images from your favourite film.

b) List three key things to consider when you are designing a magazine cover.

(4 marks)

8 Bianca has made a magazine about different things you can build with wooden blocks. She wants to use this image on the cover.



Suggest how you would crop this photo and two places where Bianca could place the title of the magazine.

(3 marks)

9 Explain why someone might use vector images instead of bitmap artworks.

(1 mark)

Read the sentences. Do you agree? Think about what you have learned.

- I understand that digital images are made from pixels.
- I can create pixel artwork using binary code.
- I understand what lossless compression is.
- I know about bitmap and vector file types.
- I can crop and resize images.
- I can add text to images.
- I understand how copyright affects the use of digital content.
- I can search for images with the Creative Commons licence needed.
- I can create a colour splash image on my device.
- I know what features are on a magazine cover.
- I can design my own magazine cover.
- I can use a search engine effectively.

Unit 6

Programming (part 2)

In this unit you learn about three kinds of conditional selection. You will create your own examples of these, then learn how two kinds of conditional selection can be changed by adding a forever loop.

You will also write your own games and act them out. Finally, you will design and create a maze game in Scratch using what you have learned.

Key objectives

To understand how conditional statements work and how to use them as part of an algorithm.

To learn how to use blocks of Scratch code to write conditional statements.

To understand how various Control blocks in Scratch can be used to carry out instructions while a condition is met, or until a condition is met.

To learn how to plan and create a simple game in Scratch that uses the conditional statement blocks.

To be able to identify what factors contribute to making an enjoyable Scratch game.

Lesson 1
Understanding conditional actions

In this lesson you will learn about conditional actions in an algorithm.

Key words: action, algorithm, condition, indentation, program

Discuss what you have learned about **algorithms** so far. Discuss the following questions with your partner.

- What is an algorithm?
- What is meant by the term 'loop'?
- Can you give an example of a 'nested loop'?
- What is an error in a **program** or algorithm called?

Conditional **actions** are actions which start if a **condition** happens. For example, if it is raining – wear a coat.

The condition happens first – then the action.

Here are some more everyday examples.

If a room is dark – switch on a light.

If you are thirsty – have a drink.

If your teacher says 'look this way' – turn your head.

The correct condition must be met for the action to happen. This is what lets a conditional action happen.

These are known in programming as IF/THEN statements. IF the condition is met, THEN do the following action.

IF condition met THEN action.

Activity 1

With a partner, practise giving out conditions and then do the correct action. Say which part is the condition and which part is the action for each example, like the one below.

If your partner touches their head, clap five times.

condition action

To write conditional actions as an algorithm, you should indent the actions. This means they should be written to the right of the rest of the algorithm. For example:

```
IF your partner touches their head, THEN
    Clap five times
```

Activity 2

Write two algorithms where a condition starts an action. Remember to use **indentation** to show what action should come next after the condition has been met.

Review your algorithms with a partner. Do they act out the action correctly? Debug any issues you find in your algorithm. Check that your algorithms contain:

- a condition that starts an action
- a condition that is clearly separate from the actions
- indented actions.

- I know what a conditional action is.
- I know how a conditional action is structured.

Lesson 2
Using conditional actions in Scratch

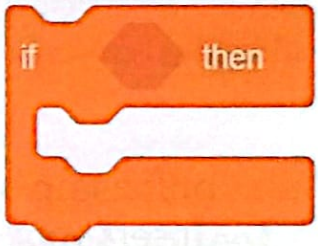
In this lesson you will learn how to use conditional actions in Scratch.

Key words: action, condition, loop, program

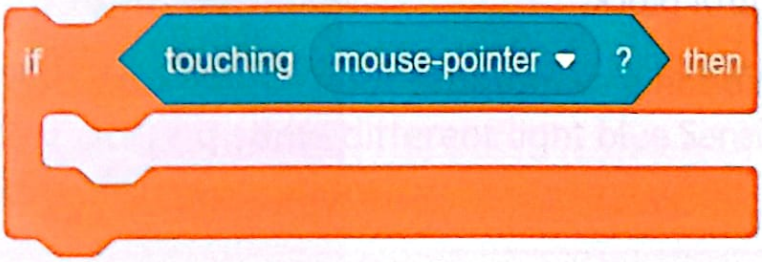
Discuss with your partner what conditional actions are.

Give your partner an example of one using an 'IF... THEN...' command.

To write conditional actions, we use the 'IF... THEN...' orange Control block.



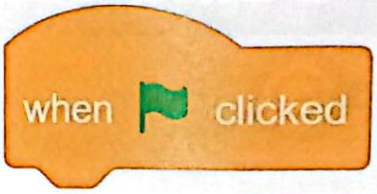
The 'IF... THEN...' block is where you insert the condition.



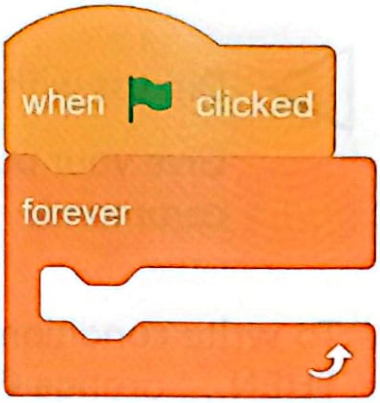
How to create a conditional action in Scratch

Now, you will create a program so that IF the sprite touches the mouse cursor, THEN it will change colour.

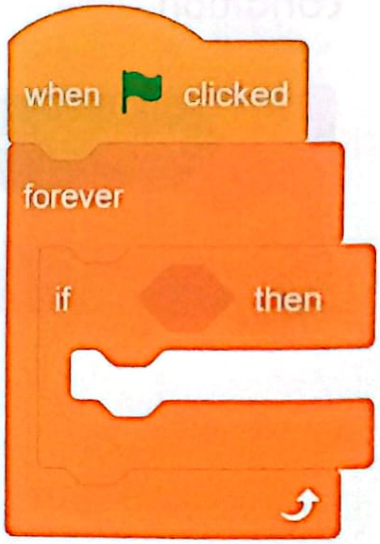
1. Start your program as you normally would with an Event block.



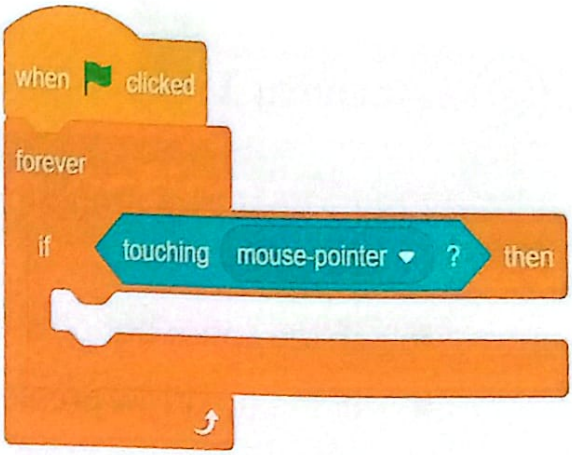
2. You need to use a 'forever' Control block so that the program is always running when you click the green flag. If you do not use this repeat forever block, the program will only run once.



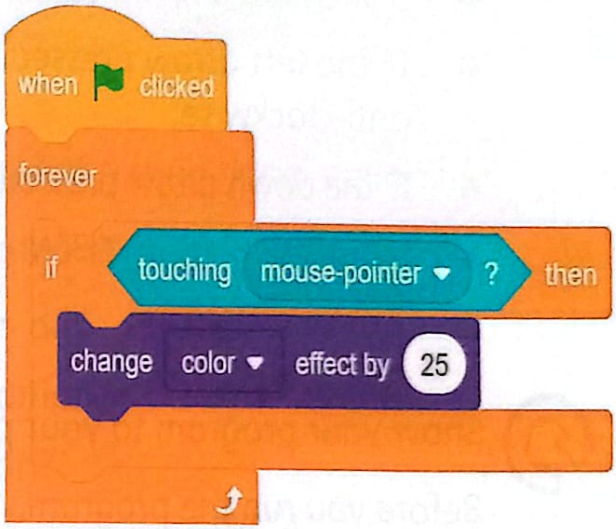
3. Insert your condition and action block – the 'IF... THEN...' Control block.



4. Set the condition. This example shows 'touching mouse-pointer' Sensing blocks, which are light blue.



5. Finally, you need to add the action. This example shows changing the colour by 25. Try using different numbers to see how this changes the colour. This colour change block is found in the purple Looks blocks.



6. Test to see if your program works by clicking the green flag. Move your mouse-pointer over the sprite several times to see what happens.

You can add to your program so it has different conditions. Try adding some different light blue Sensing blocks to create different conditions.

Think about how you could create a game. For example, have the sprite move to random positions every two seconds and move the mouse to touch the sprite to make it change colour.

Activity 1

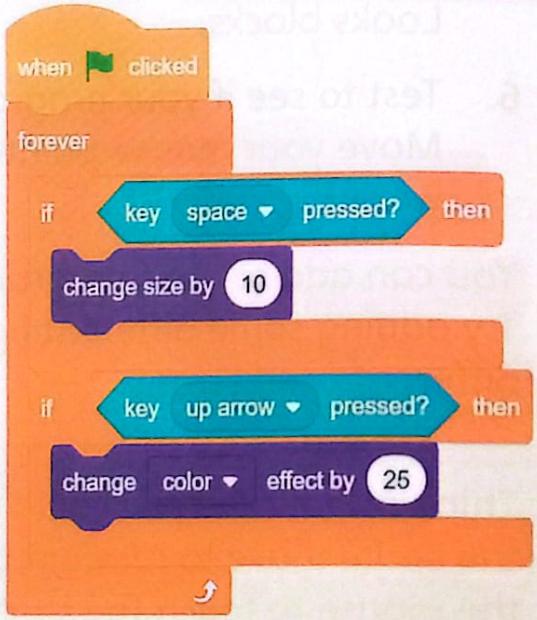
Create your own program with one of the following conditional actions:

- IF the space bar pressed, THEN increase sprite's size.
- IF the up arrow pressed, THEN move 10 steps.
- IF the right arrow pressed, THEN turn 90 degrees clockwise.
- IF the left arrow pressed, THEN turn 90 degrees anti-clockwise.
- IF the down arrow pressed, THEN move 10 steps backwards.
- IF touching edge, THEN change colour.

Show your program to your partner.

Before you run the program, your partner should read the program and predict what will happen. Run the program and see if they are correct. Could they spot where the conditional action has been used?

Then in pairs, think and share ideas to extend the code, for example: add multiple commands so that your program will check for more than one condition.



I can use conditional actions in Scratch.

Lesson 3
Switching between actions

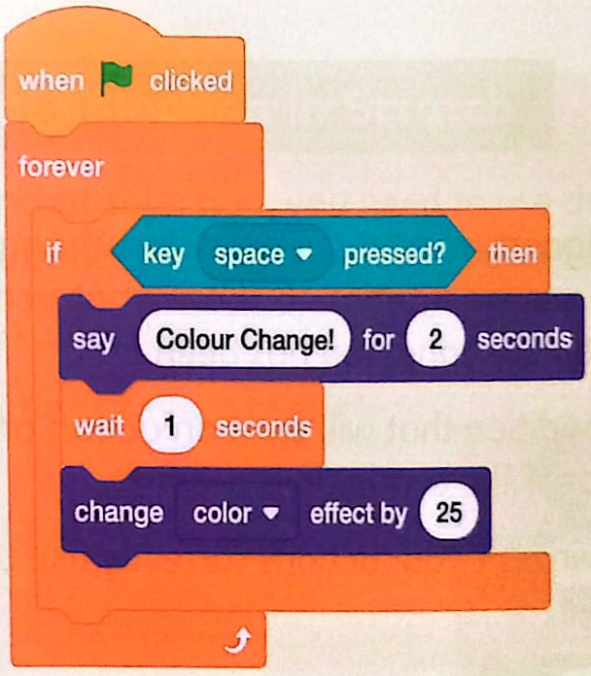
In this lesson you will learn about a conditional selection that changes an action.

Key words: algorithm, condition, indentation, loop, selection

Discuss with your partner what a conditional action is.

Look at this program and discuss these questions:

- What will the program do?
- Which part is the **condition**?
- Which part is the action?



The next stage of conditional actions is using an 'IF... THEN... ELSE...' block. This is called conditional selection – where a condition changes what the action is.

In the example below, if the 'IF' condition is not met, then the program will switch conditions and follow the 'ELSE' action.

Example:

```
IF you have glasses on THEN
    Clap your hands three times
ELSE
    Stand on one leg
```

The **indentation** is the same for the actions which follow the IF or ELSE action.

In this **algorithm**, if the glasses condition is met, you should clap your hands three times; if you do not have glasses on, you should stand on one leg.

Activity 1

Write three algorithms where a condition changes an action. Remember to use indentation to show what action should come next after the condition has been met.

Use a clear condition that will start an action and then a different action if the condition is not met.

Remember to indent your actions correctly like the example above.

In the following example, the condition would only be checked once when the algorithm is started.

```
IF the teacher says 'right' THEN
    Shout 'left!'
ELSE
    Stand up
```

We can use a forever **loop** so the algorithm is checked over and over again.

The 'IF' and 'ELSE' can be put in a nested loop, as shown below.

```
Loop forever
    IF the teacher says 'right' THEN
        Shout 'left!'
    ELSE
        Stand up
```

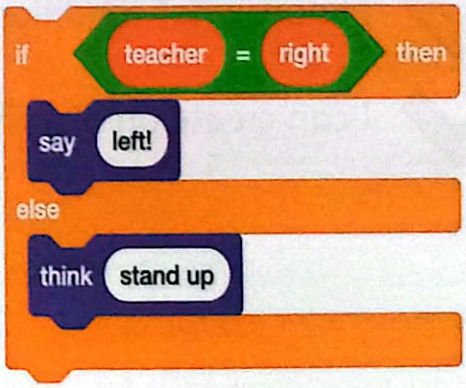
Conditional selection in Scratch

To use this kind of **selection**, you need to use the 'IF... THEN... ELSE...' block found in the orange Control section.

Look at this example:

```
IF the teacher says 'right'
THEN
    Shout 'left!'
ELSE
    Stand up
```

The algorithm would look like this:



Here, the condition switch is the teacher saying 'right'.

The actions are 'shout left' and 'stand up'. You should stand up until you hear the teacher say, 'right', then you would shout, 'left!'

Activity 2

Write three 'IF... THEN... ELSE...' examples, in the style of a Scratch block, in your notebooks.

Look at the following algorithm. Discuss with your partner what the action would be if the condition is met.

```
Loop forever
        IF car detected THEN
            Show red 'Do not cross' message
        ELSE
            Show green 'Cross' message
```

Then explain what the action would be if the condition is not met.

Where do you think this kind of algorithm would be useful?

I know what conditional selection is.

I can create an algorithm which uses conditional selection.

Lesson 4
Using conditional switches in Scratch

In this lesson you will learn how to use conditional switches in Scratch.

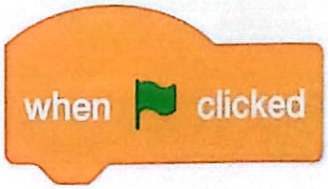
Key words: condition, forever loop, nested loop

With a partner, practise giving each other one of the conditional selection commands you learned about in Lesson 3. Use 'IF... THEN... ELSE...' commands.

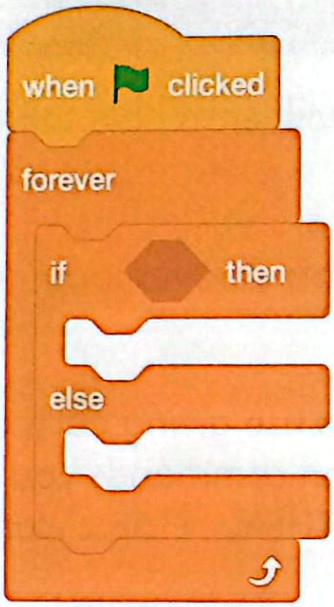
Here is an example of a conditional switch in Scratch.

The two actions are to turn 90 degrees and glide to a random position.

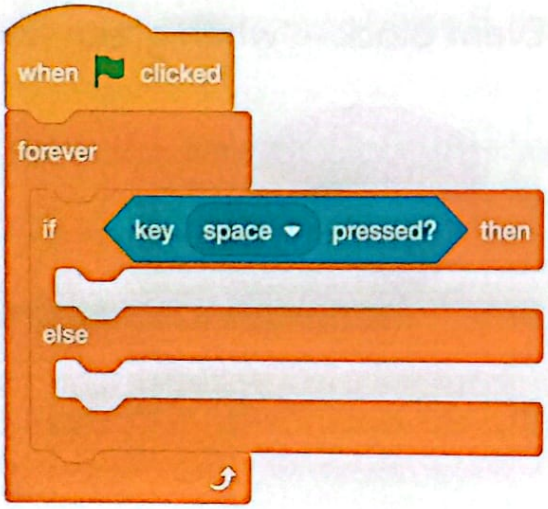
1. Add a yellow Event block – 'when green flag clicked'.



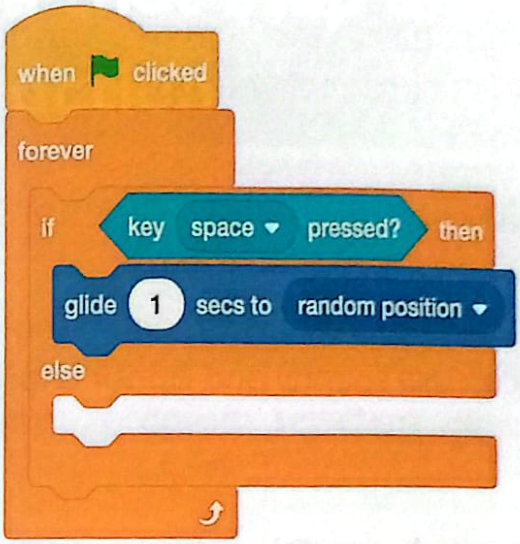
2. Add a 'repeat forever' block so that the program will continually check the **conditions**. Then add the 'IF... THEN... ELSE...' block and drag it into the 'repeat forever' block to make a **nested loop**.



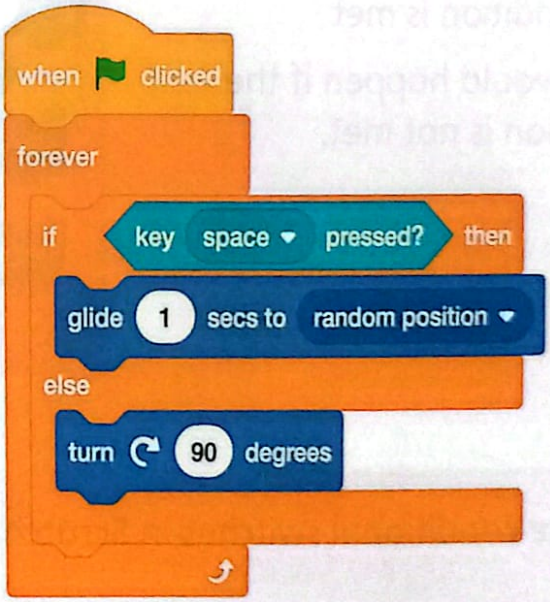
3. Add the condition which will switch the actions. In this example, select 'when the space key is pressed' from the Sensing blocks.



4. Add the actions you want the program to do. In the example, select 'glide to a random position' from the Motion blocks.



5. Add the action that you want the sprite to do when the condition is not met. Turn clockwise 90 degrees is a good example to use.



Don't forget to change the number for the degrees of turn you want.

6. Now the program is ready for testing. When you click the green flag, the sprite should spin around. When you press the space key, it should stop spinning and move to a different position.

You can create a game with this kind of program by trying to stop the sprite when it is the correct way up!

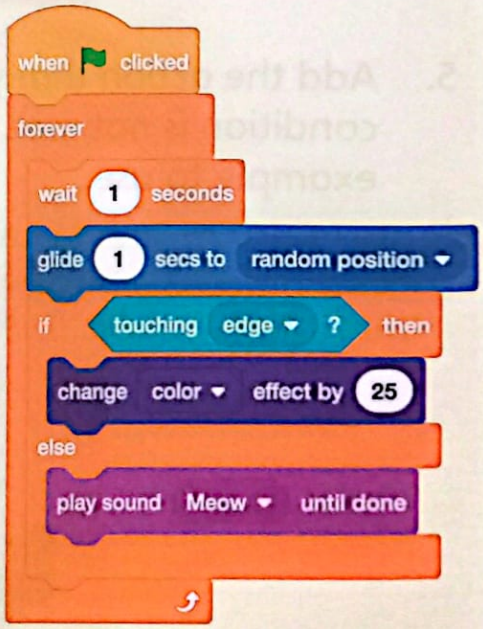
Activity 1

Create your own programs with conditional switches on your device. You can use sounds and colour changes if you want to!

Here is an example conditional switch.

Explain to your partner:

- what the program will do if the condition is met
- what would happen if the condition is not met.



I can create conditional switches in Scratch.

Lesson 5
Conditions that stop a repeated action

In this lesson you will learn how to use conditions which stop a loop.

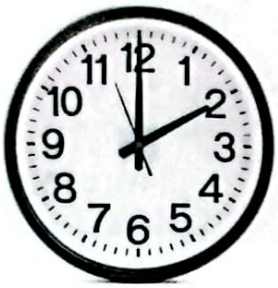
Key words: action, algorithm, condition, forever loop, indentation, loop, program, selection

In Lesson 4, you created **conditions** that can change an **action**. Look at the following conditional switch and tell your partner what the condition is and what the action is:

```
IF your partner touches your shoulder THEN
    Stand up
ELSE
    Wave
```

The final kind of conditional **selection** is a condition that stops a repeated action.

These are called conditional **loops**. As you have learned, you can use **forever loops** in your **programs** so they will keep running until a condition is met.



Examples of forever loops in our home include refrigerators and clocks, both mechanical and electronic. They run constantly and are designed to never be turned off.

However, conditions can be added to tell a forever loop to stop. For example, if a fridge becomes too cold it will stop cooling for a while.

The buzzer in an alarm clock is a forever loop that responds to a condition.

At a set time, the buzzer will sound and continue forever until the stop button is pressed – this is the condition:

```
Loop until stop button is pressed
    Sound buzzer
```

Here is an example you can perform with your partner:

```
Loop until partner says '20'
    Count from 1
```

Activity 1

Write your own conditions that stop a repeated action **algorithm**. Remember that your algorithm should:

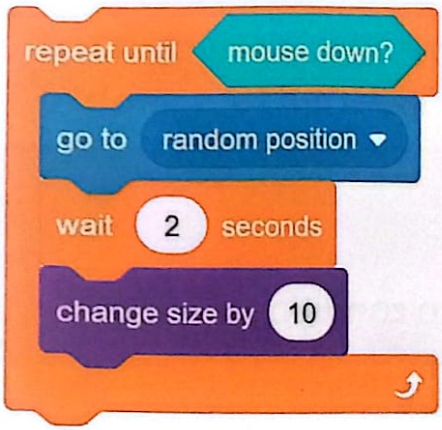
- start with a condition that stops a repeated action
- have actions which are clearly different
- use **indentation**.

Review your examples with a partner.

How does this look on Scratch?

In Scratch, you will need to use the 'repeat until' Control block to stop a repeated action.

Here is an example of a 'repeat until' block that will carry out the instructions until the user clicks the mouse.



Activity 2

Write five examples of conditions that stop an action in your notebook, in the style of the blocks used in Scratch.

Look at the following algorithm:

```
REPEAT UNTIL partner claps their hands
    Hop five times
    Clap twice
```

Does this meet the following success criteria? Discuss with a partner.

1 Must start with a condition that stops an action or actions.

2 The condition must be clearly separate from the action.

3 Must indent the actions.

I know what a conditional loop is.

I can create an algorithm which uses a conditional loop.

Unit 6
Mid-unit assessment

Write your answers in your notebook.

1 When you are programming, what is selection?

A Selection is when there are different paths that a program can take.

B Selection is a type of programming language.

C Selection is a type of algorithm.

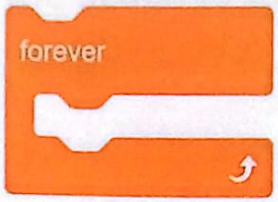
D Selection is when there is only one way through a program.

(1 mark)

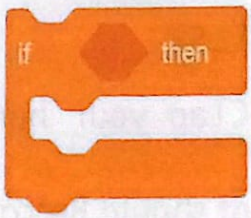
2 Which Scratch block would you use to run the following code?

```
IF the countdown reaches zero THEN stop counting
down, otherwise continue countdown.
```

A



C

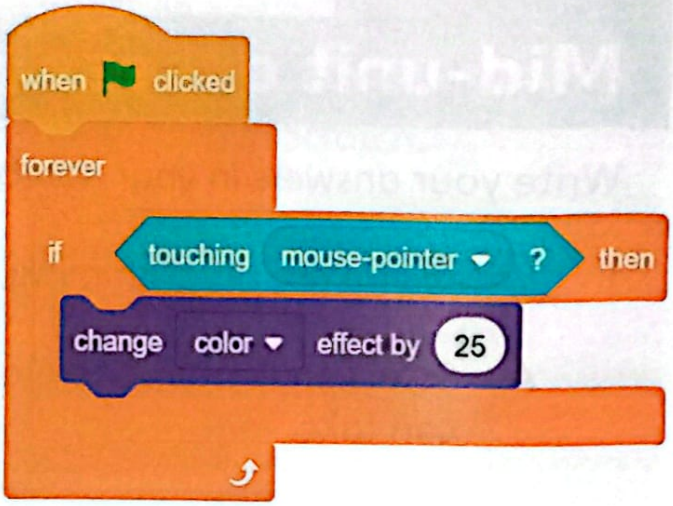


B

D

(1 mark)

3 a) What happens in this Scratch program?



A change colour effect by 10

B touching mouse pointer

C play a sound at 25

D change colour effect by 25

b) What is the condition in this code?

(2 marks)

4 Becca has written this algorithm.

```
Start
Loop forever
IF the teacher says 'fold your arms' THEN
Fold your arms
ELSE
Clap your hands
```

What should Becca have used in her algorithm?

A a different font

B bold type

C indentation for the loops

D more steps

(1 mark)

Lesson 6
Creating a simple game in Scratch

In this lesson you will combine what you have learned about conditional switches to create a simple game in Scratch.

Key words: algorithm, condition, forever, loop, REPEAT UNTIL, sequence

Look at this **algorithm** which uses conditional selection to stop an action:

```
REPEAT UNTIL lights go off
    Do 5 star jumps
    Clap your hands twice
    Sit on the floor
```

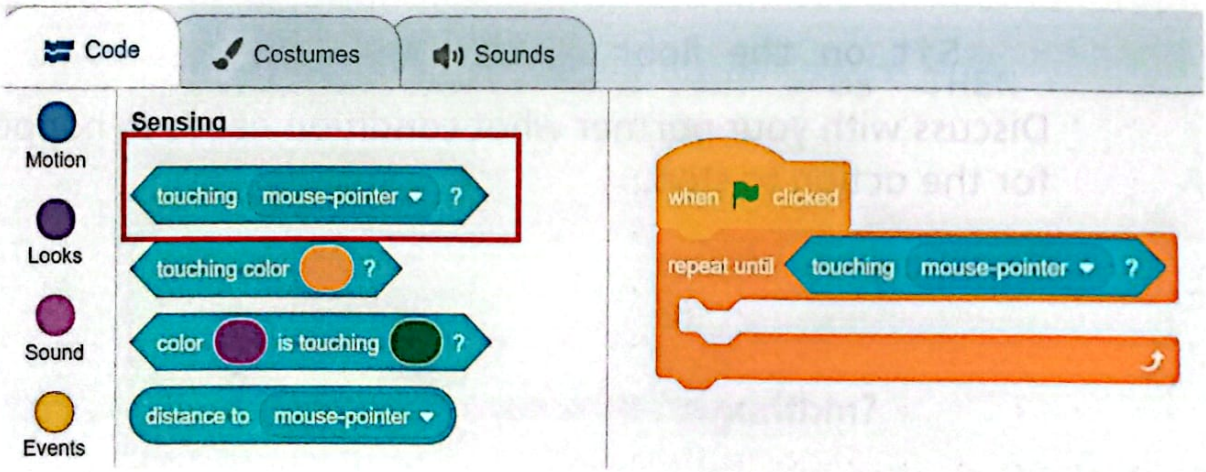
Discuss with your partner what **condition** needs to happen for the action to stop.

Here is an example of how to create a game in Scratch using a conditional **loop**.

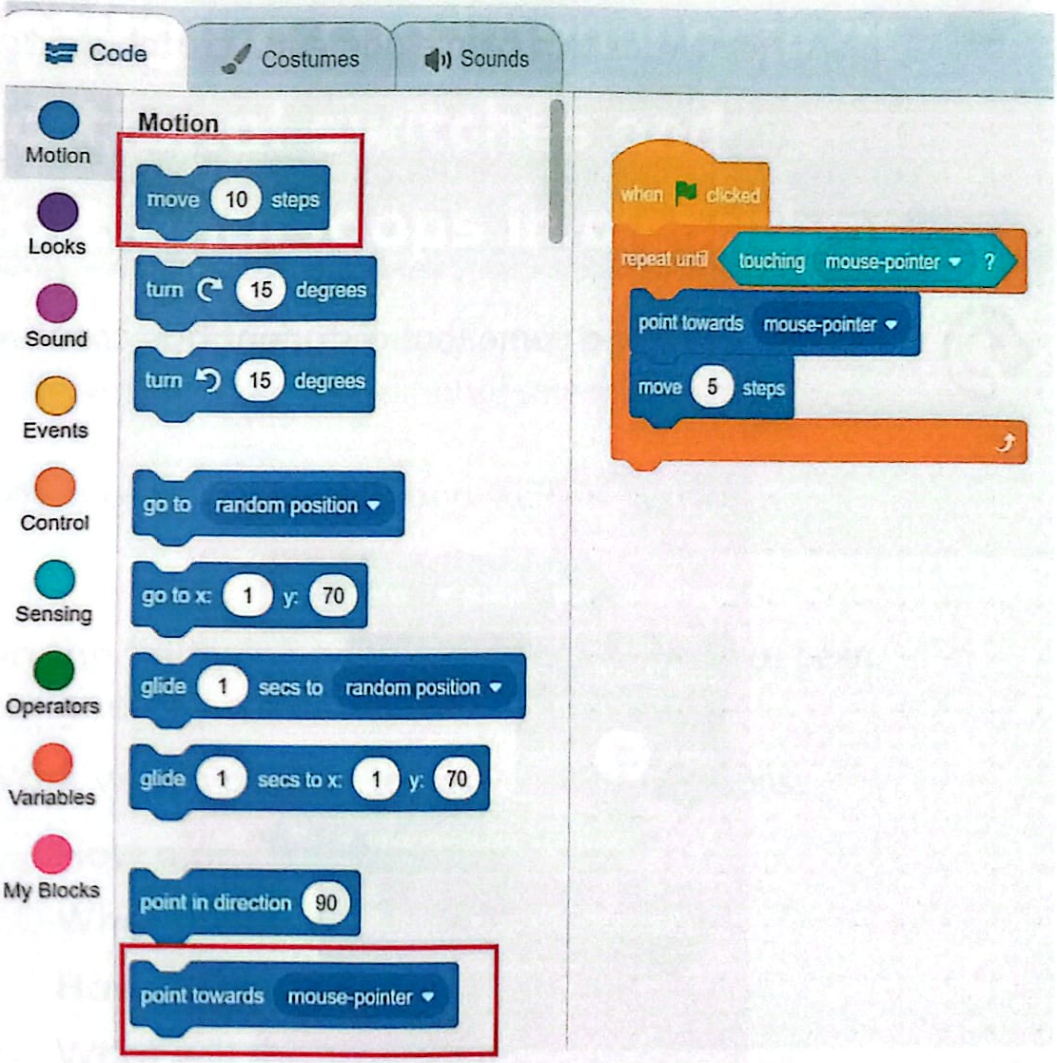
In this example you will program the sprite to chase the mouse-pointer. If the sprite gets the mouse-pointer, the game should end.

1. Add a 'when green flag clicked' block and a 'repeat until' block. The 'repeat until' block will run until its condition is met.

2. Set the condition you want to stop the action. In this example you will stop the action when the sprite touches the mouse-pointer.



3. Set the action the sprite will perform. In this example, you will get the sprite to point towards the mouse cursor and move five steps.



Make sure the **sequence** of the commands in your loop is in the correct order. You want the sprite to turn towards the cursor before it moves.

4. Check your program is working by running it.

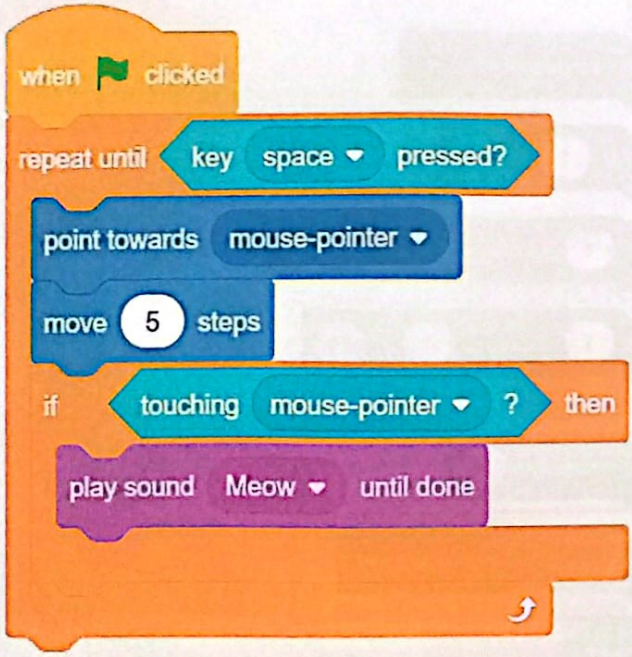
5. You can add more commands to your program. For example, the cat could say '*Game over!*' using a purple Looks block. You could also add a timer using a light blue Sensing block, then restart the game.

Activity 1

In pairs, create your own simple game in Scratch using the 'repeat until' command.

Can you include 'repeat **forever**' and 'IF' commands too?

Here is a preview of a game that a student has created.



Discuss with your partner what you think will happen when the program is started. How will the program be stopped?

I can create a simple game in Scratch using conditional selection.

Lesson 7
Identifying conditional actions, conditional switches and conditional loops in algorithms

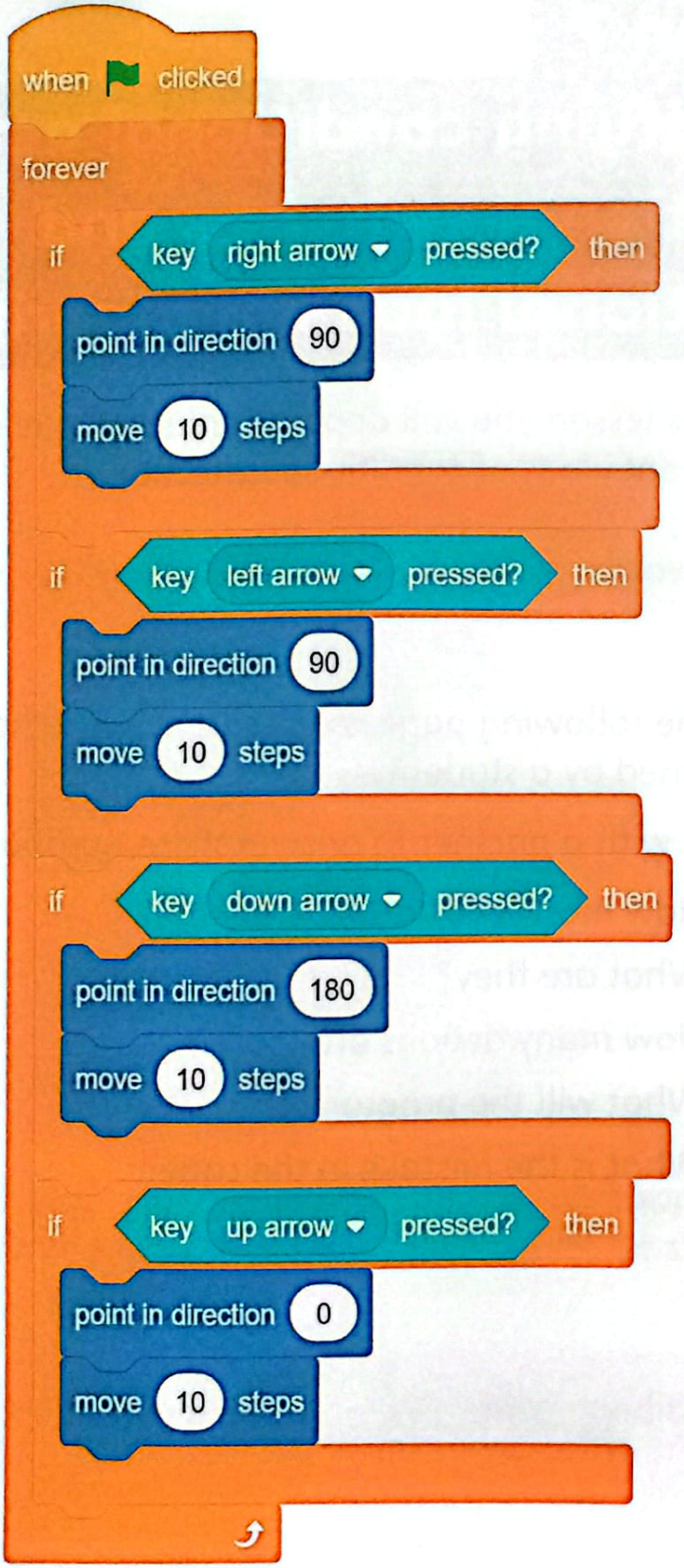
In this lesson you will apply your learning to find the different kinds of conditional selection.

Key words: condition, loop, REPEAT UNTIL

On the following page is a program which has been designed by a student.

Work with a partner to answer these questions:

- How many **conditions** are there?
- What are they?
- How many actions are there?
- What will the program do?
- What is the mistake in the code?


when clicked
forever
if key right arrow pressed? then
point in direction 90
move 10 steps
if key left arrow pressed? then
point in direction 90
move 10 steps
if key down arrow pressed? then
point in direction 180
move 10 steps
if key up arrow pressed? then
point in direction 0
move 10 steps

Here is an overview to help you with the next task.

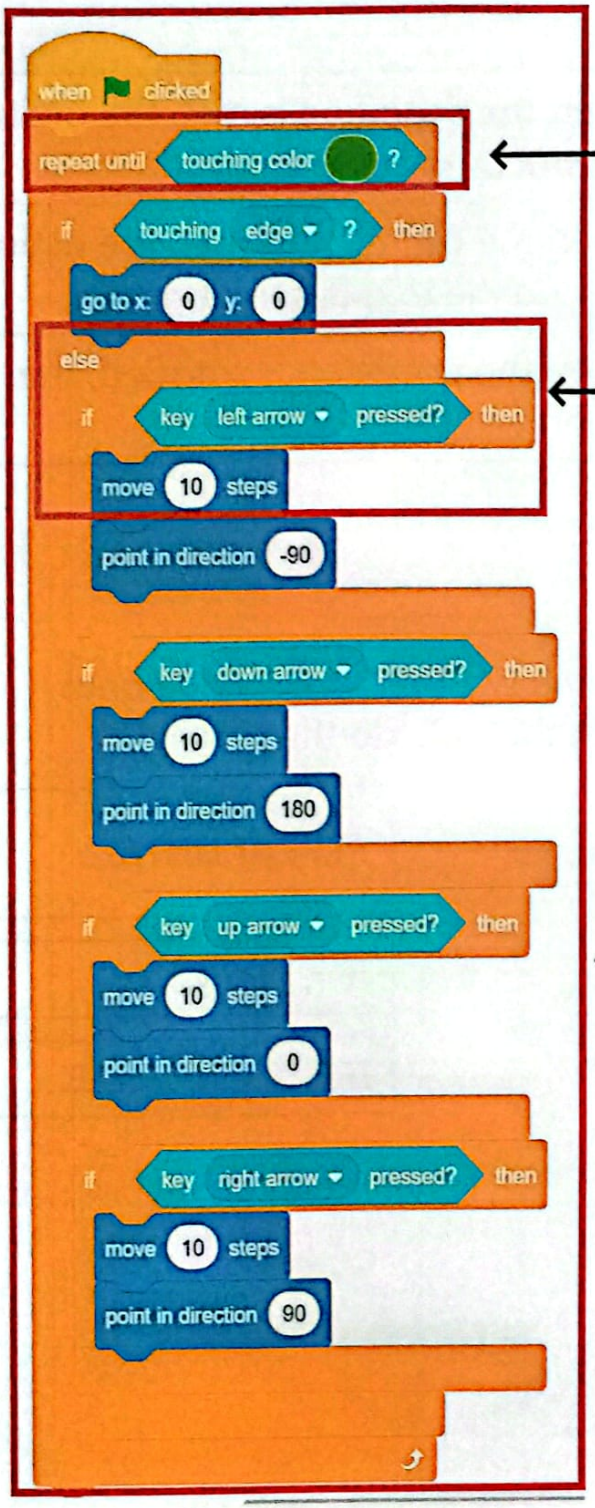
Kinds of conditional selection	Description of selection
Conditions that start an action	When the condition is met, the action will start.
Conditional switches	When the condition is met, the action will change to a different action.
Conditional **loop**	When the condition is satisfied, the action will stop.

Activity 1

In your notebook, write down which kind of conditional selection matches the block that will do the action.

Conditions that start an action	**REPEAT UNTIL...**
Conditional switches	IF... THEN...
Conditional loop	IF... THEN... ELSE...

Here is an example of a program which is using all three kinds of conditional selection.



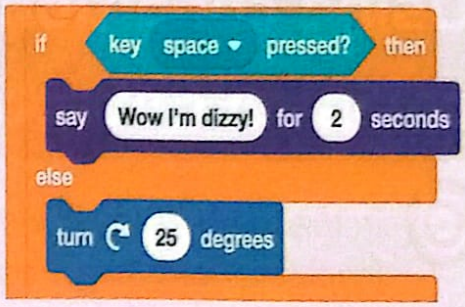
condition to stop an action

condition to switch an action

condition to start an action

Activity 2

Look at this program. Discuss with your partner which part is the condition and which is the action. Explain how you know.

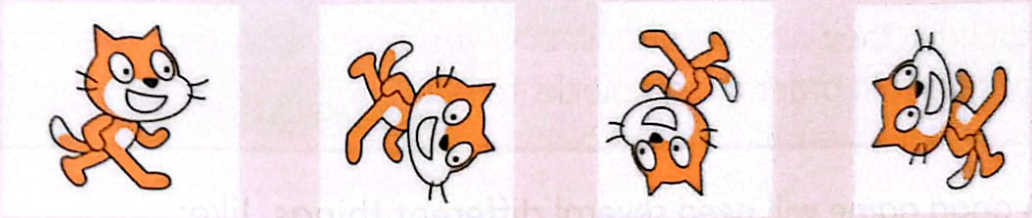


Activity 3

Sometimes you will want to change the angle of a sprite.

Work out the direct angle of each version of the cat sprite below. The first one has been done for you.

You can use Scratch to check your answers.



Direction: 90

Explain to your partner what four conditions start an action in a maze game. What other actions would you need to include?

I can identify the different kinds of conditional selection in algorithms.

Lesson 8
Using conditional selection and collision detection in your game

In this lesson you will learn how to use collision detection (avoiding areas of the screen) with your conditional selection.

Key words: backdrop

Discuss with your partner what you think makes a good maze game. Write your ideas in your notebook. This will help you to make a checklist for your maze game.

It's important to remember when using multiple sprites that each can have their own programs, and you need to select the correct sprite first in order to add blocks for it.

A good game will need several different things, like:

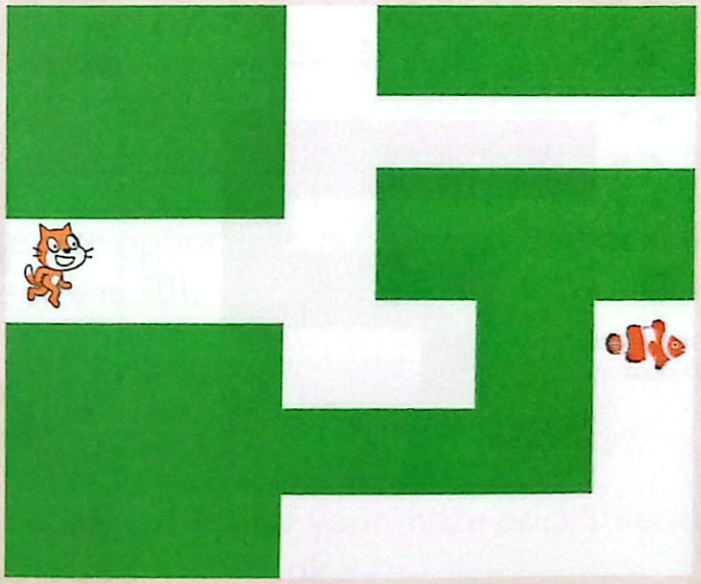
- visual appeal
- difficulty level to match age level
- a variety of outcomes.

Activity 1

Look at this maze game.

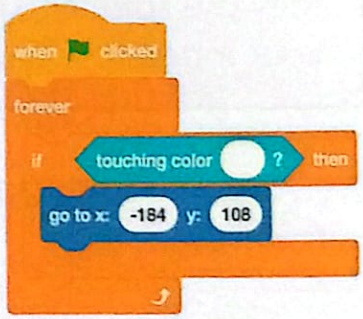
The object of the game is to move your sprite through the maze to the fish, without touching the green area.

Do you think this is a good maze game? With your partner, explain the reasons for your answer and suggest improvements.



Adding collision detection

Collision detection responds to one sprite interacting with something else on the stage. For example, for a maze game this can be the background colour of the stage outside of the maze.

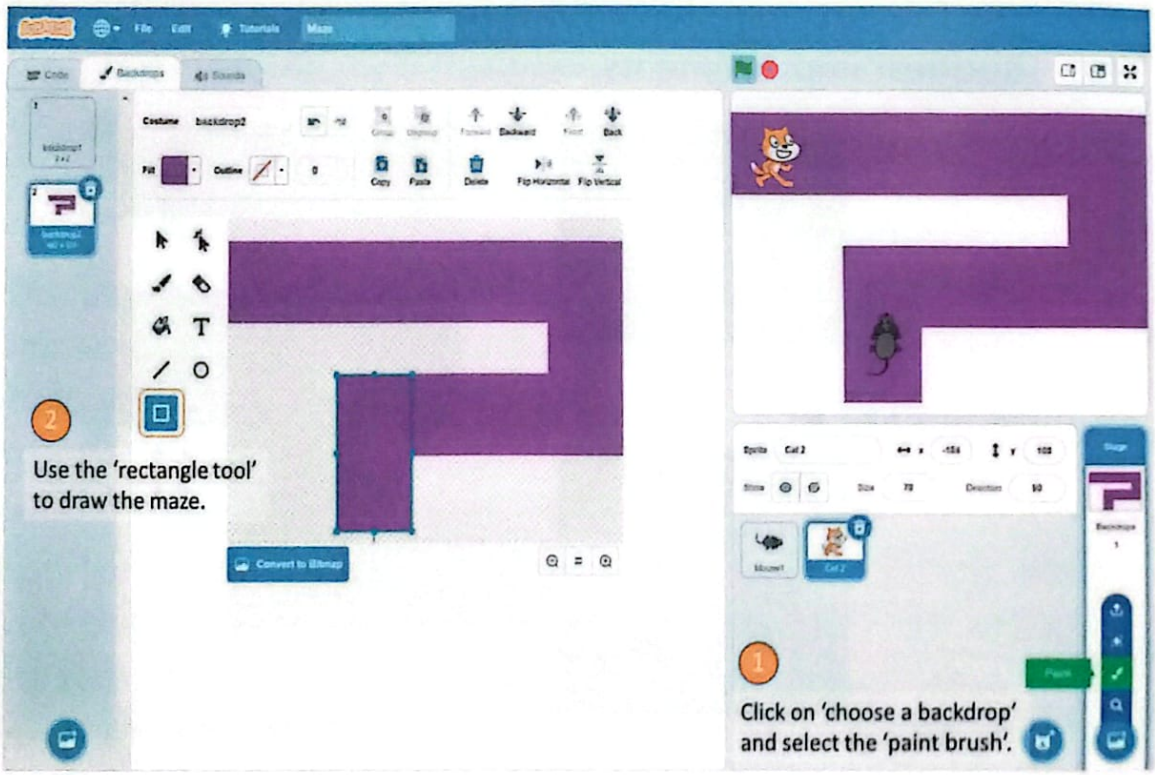


In this example, where the background is white, the sprite can be returned to any point on the stage if it is moved into a white area.

Create your maze game in Scratch

1. Set the maze outline. To do this you need to create the **backdrop**.
2. Use the fill and outline options to change the colours of your maze.

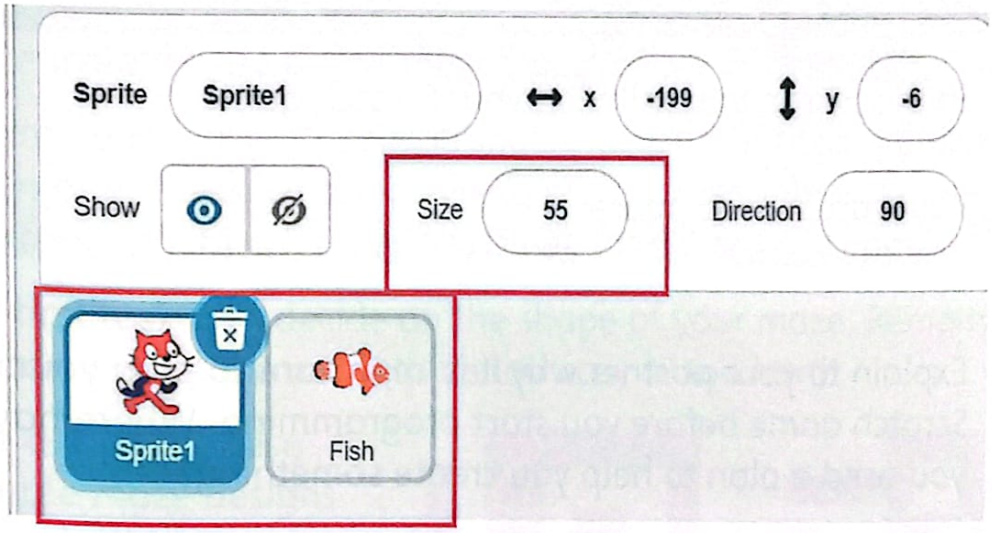
1 Creating the backdrop



To make your maze more difficult, you can shrink your sprites so they are smaller. Then, you can use more of the space to create your maze.

How to shrink your sprites

1. Select the sprite you want to change.



2. Click on the size option and put a new number in (it is set to 100, so half the size is 50).

Activity 2

Think of some designs for your maze background. Sketch two ideas in your notebook.

With a partner, review your maze background designs. Discuss these questions:

- Are the maze backgrounds challenging enough?
- Is it possible to get to the end of the mazes?
- Which design will make the best maze game?

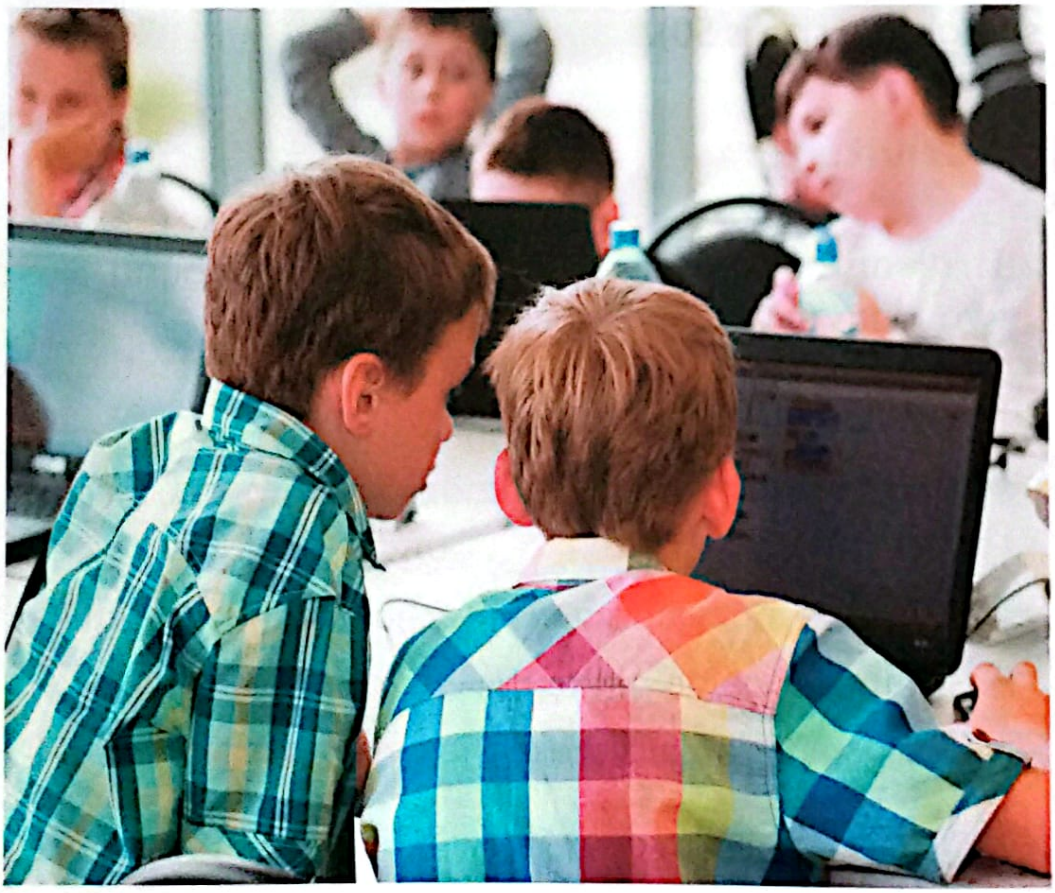
I can create my own maze game in Scratch.

Lesson 9
Planning your Scratch game

In this lesson you will plan your Scratch game.

Key words: decompose

Explain to your partner why it is important to plan your Scratch game before you start programming. Where have you used a plan to help you create something?



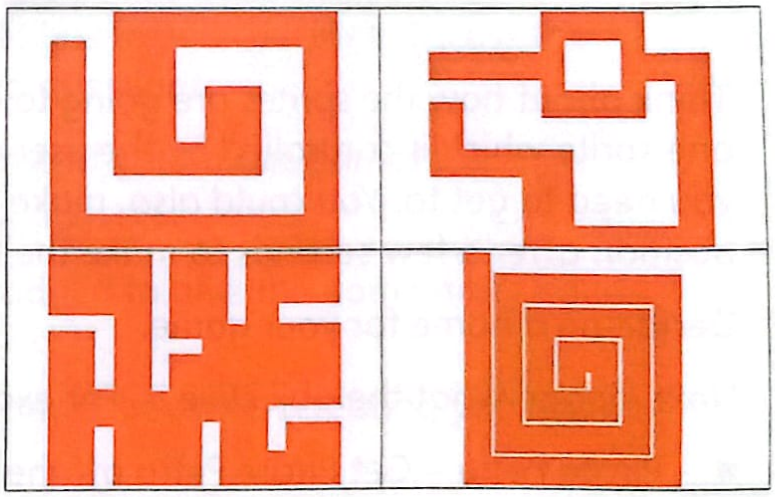
Making a clear plan is important so that the programming part of your game goes well.

It is difficult to plan and program at the same time. Use this lesson to think about what you want your game to be like. Later you can concentrate on the programming part of your game.

To plan your maze game, you should **decompose** the problem into smaller tasks. Decomposing a problem is done while you are programming, and it means to break tasks down into parts.

Your first task is to decide on the shape of your maze. Remember, you don't want the maze to be too easy or too hard!

Have a look at these example maze designs for inspiration.



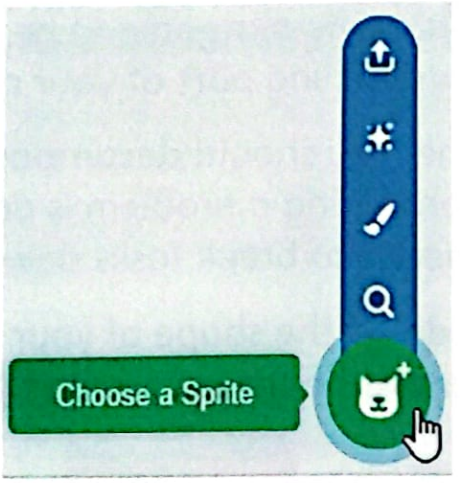
Activity 1

a) Choose the maze background design for your game and draw the final version of it in your notebook. Think about what colours you want to use for your maze.

Do you want the path to be white and to use a different colour for the areas to avoid?

b) Think about the theme you want to use in your maze game. You do not have to use the cat and the mouse sprites.

There are lots of different sprites available for you to use in Scratch. To find them, click on 'Choose a Sprite'. You can search for the sprite you want or create one using the paint brush option!



Think about how the sprites are going to move. You could have one sprite which is controlled by the user and the other as a target you need to get to. You could also make the target sprite change position after a few seconds to make the maze more challenging.

Decide on a name for your game.

Next, decide what the objective is. For example:

- Pirate Petra – Get Pirate Petra off the island.
- Cheese Hunt – Get the mouse to the cheese.

Activity 2

Decide which sprites you are going to use in your game. Think about which ones fit your game objective and your theme. Make a note of these.

Activity 3

Make a plan for the rest of your maze game.

To make your maze game more challenging, change the size of the sprites.

When you have finished, start planning where you are going to use the different kinds of selection in your game. Label these on your plan.

Show your game designs to your partner. Discuss the following points and questions:

- What is the theme of your maze game?
- What will the sprites do?
- What could be added to give the game an extra challenge?
- Do you predict any issues when creating your game in Scratch?
- What do you think will take the most amount of time to do in your program?
- Are you confident that you will be able to draw out the maze in Scratch?
- What do you think you might need help with?

I can plan my Scratch game.

Lesson 10
Creating your maze game

In this lesson you will be using your planning and programming skills to create your maze game.

Key words: backdrop, program, sprite

Good time keeping is important in today's lesson. You have one lesson to create your maze game using your planning.

With a partner, discuss your planning from Lesson 9. What is your first task? What do you think will take the most time, the designing or the coding?

Activity 1

Now you will create the maze game that you planned in Lesson 9. Use the checklist to organise your work.

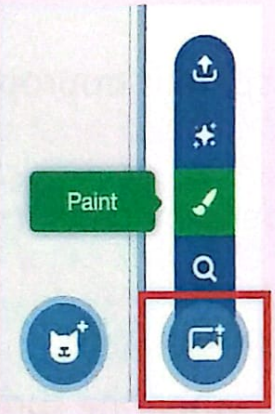
- What is your game called?
- Is the objective of your game clear?
- Design your maze **backdrop**.
- Design your **sprite**.
- Make sure that the size of your sprite is appropriate.
- **Program** your sprite.
- Check your program works properly by playing your game.
- Does the sprite move as it is supposed to?
- Does the program work properly when the sprite gets to where it should get to?
- Does the program run properly when the sprite goes off course?
- Are the colours and theme appropriate?

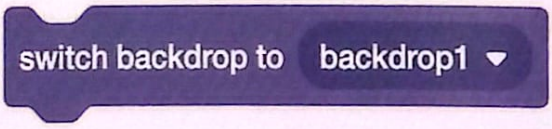
Start by adding sprites and creating the backdrop. These steps need to be done to help you with the programming.

Activity 2

Add a second painted backdrop and create a harder level for your maze game.

1. Select the 'add backdrop' button at the bottom right corner.
2. Add the 'switch backdrop' block to your program.





With a partner, try each other's maze games.

Right-click and select 'Add Comment' in their coding section. In the comment, write at least one thing you enjoyed about the game and one improvement they could make.

Discuss these questions after reviewing each other's games.

- What skill do you feel the most confident using?
- Which skill do you want to improve or develop and why?
- What could you do to develop this skill?

I can create a maze game.

Unit 6
End-of-unit assessment

Write your answers in your notebook.

1 Which computing term means the order of the commands?

A sequence

B condition

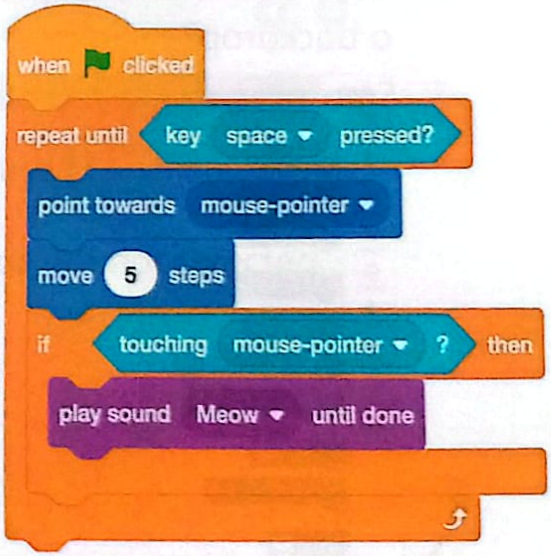
C repetition

D iteration

(1 mark)

2 Fernando is working on a game:

a) How many actions are carried out in the program blocks shown?



A 0

B 1

C 6

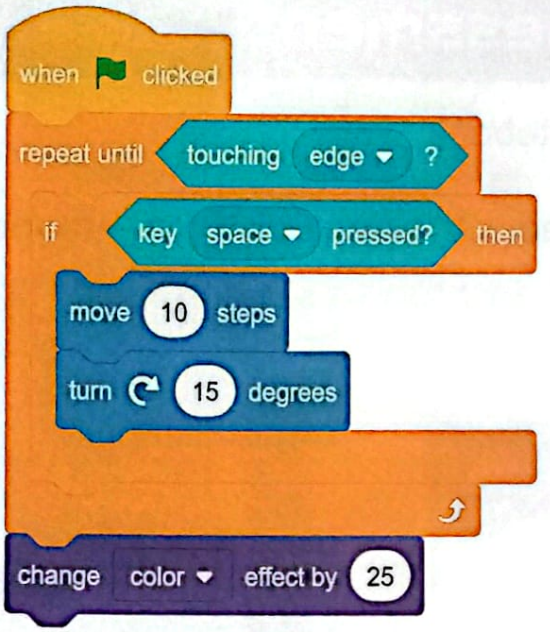
D 3

b) How do you start the program?

c) How do you stop the program?

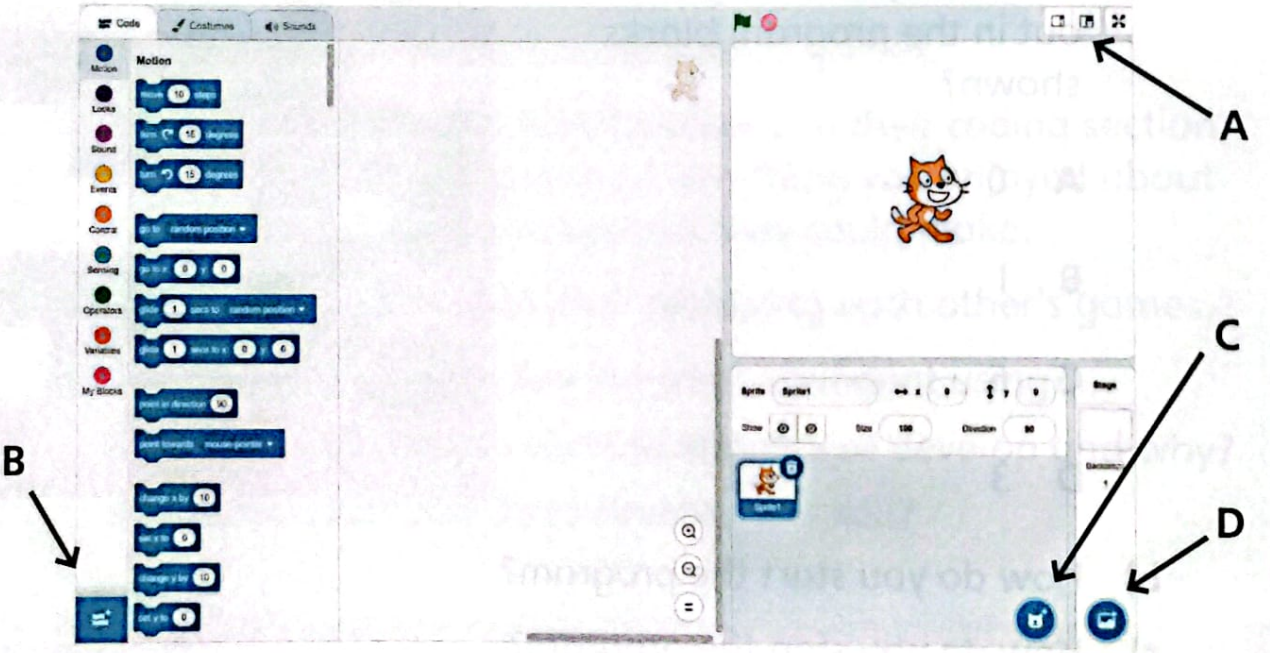
(3 marks)

3 How many types of conditional selection are in the following program?



(1 mark)

4 Look at this Scratch program. Where do you need to click to add a backdrop?



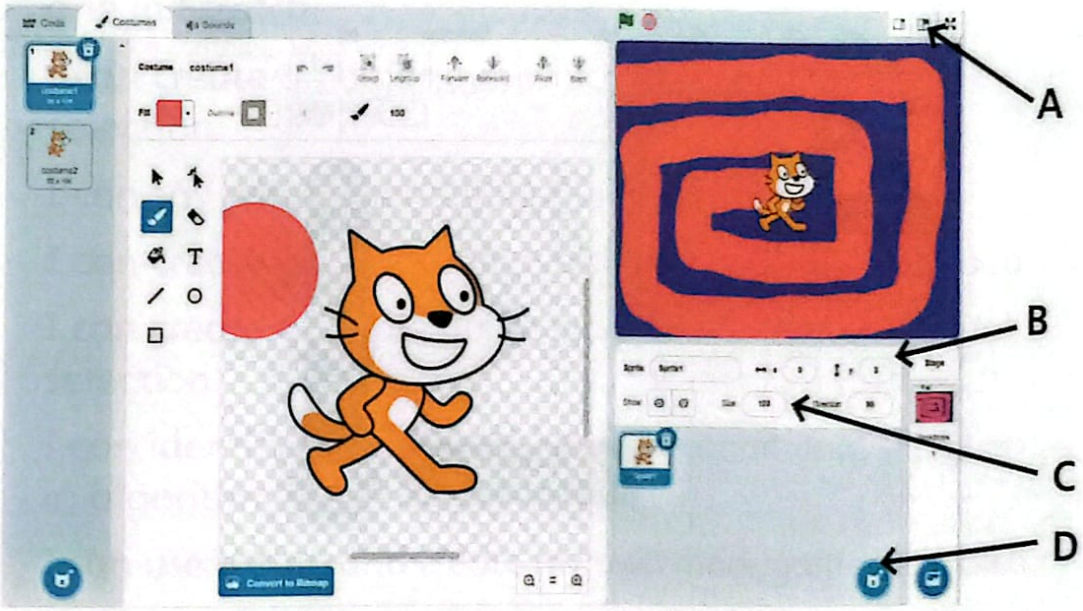
(1 mark)

5 List three things that a good game should have.

(3 marks)

6 Lena is working on a maze.

a) The sprite is too big. Where should Lena click to change the size of the sprite?



b) How many costumes has the sprite got in this program?

c) How many backdrops are being used?

A You can't tell as the backdrops are not selected.

B 1

C 6

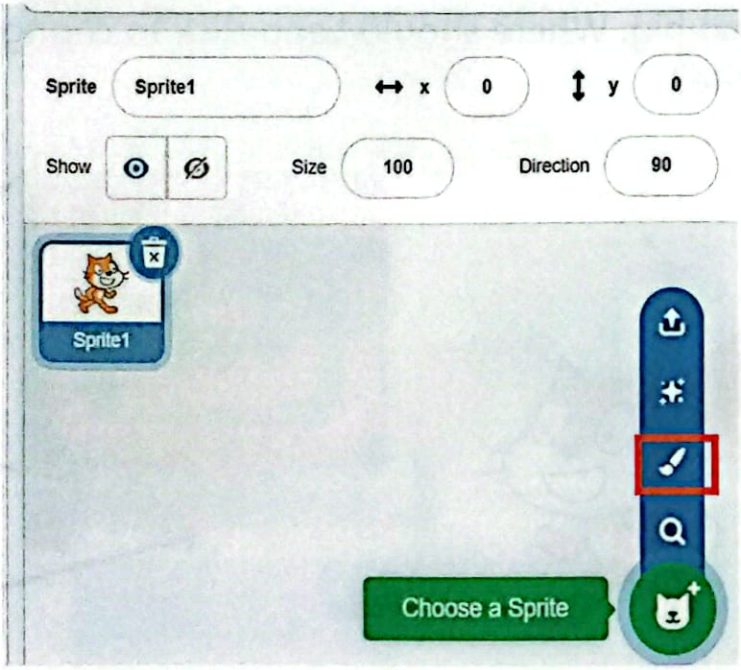
D 0

(3 marks)

7 What does decomposing a problem mean?

(1 mark)

8 Why would you click on the paint brush icon in Scratch?



(1 mark)

9 Aron is making a game with multiple sprites. He can't find some of his code and knows he hasn't deleted it.

Why might Aron not be able to see his code?
Describe what he would need to do to see it again.

(2 marks)

Read the sentences. Do you agree? Think about what you have learned.

- I can say what a conditional action is, and how to use one in Scratch.
- I can say what conditional selection is, and how to use one in Scratch.
- I can create an algorithm which uses conditional selection.
- I can say what a conditional loop is.
- I can create an algorithm which uses a conditional loop.
- I can create a simple game in Scratch using conditional selection.
- I can identify the different kinds of conditional selection in algorithms.
- I can use a plan and create my own maze game in Scratch.

Glossary

2D shape	a shape drawn in two dimensions (2D) on paper or on screen; for example: a triangle on a piece of paper
accurate	correct, exact and without any mistakes
action	a command or commands that a computer program carries out
add	to join something to something else, so as to increase the size, number, or amount
algorithm	a set of instructions
appropriate	correct or suitable for a particular situation
apps	software applications
article	a piece of writing about a particular subject in a newspaper or magazine
backdrop	the background in a green-screen video
behaviour	the way in which one acts or conducts oneself, especially towards others.
bias	when you only see something from your point of view
biased	unfairly preferring one person or group over another based on personal opinion
binary code	a form of coding that uses only the numbers 0 and I to represent text or any other form of data, etc.
bitmap	a computer image that is stored or printed as an arrangement of bits (the smallest units of information that can be used by a computer)
block	an individual puzzle piece used to create code

	in Scratch
BMP	a type of computer file that contains images; short for Microsoft Windows Bitmap Format
bold	a font style that makes text look darker and bigger
borders	the lines around the cells of a table
brightness	an editing tool used to make an image lighter or darker
bring forward	a function used to move a object up by one layer so that it appears in front of another object
bring to front	a function used to move an object to the top layer so that it appears in front of all other objects
bug	an error in a computer program that produces an incorrect or unexpected result
bullying	repeated behaviour that is intended to hurt someone
cell	a single area within a table or spreadsheet that contains text or data
character	a person in a book, play, film, etc.
chronological order	arranged according to when things happened
code	a set of instructions that tells a computer what to do
colour	the property of an object defined by the way it reflects light.
colour splash	a tool for adding an area of colour to a black and white image
column	a line of numbers or words written under each other that goes down a page

command	an instruction to a computer to do something
compression	to make something smaller so that it takes up less space
condition	a statement that a program can decide is true or false, and which can be answered yes or no; the answer to an IF condition, for example, decides what happens next
conditional selection	a process used in computer programming when a program needs to make a decision, for example, based on whether something is true or false
content	text, images, etc. that appear in a document, book, etc.
contrast	an editing tool that adjusts the degree of difference between the light and dark parts of an image - low contrast decreases the difference (making an image duller); high contrast increases the difference (making an image more vibrant)
copyright	a protection for the creators of content
Creative Commons licence	a licence that allows people to use and share someone else's copyrighted work without paying a fee
credits	a list of names of people and organisations who helped to make a film or television programme, usually shown at the end of the film or programme
critical question	an important question
critique	a detailed explanation of the problems of something
crop	to cut a part off an image so that it is a particular size or shape

curriculum topic	a subject that is taught by a school, college, etc., such as history, science and geography
cyberbullying	the activity of sending internet or text messages that threaten or insult someone
debug	identify and remove errors from an algorithm or program
decompose	to break down tasks in to smaller parts
define	a command in an internet search that will find a definition of a word without you having to find a dictionary website first
degrees	a unit of measurement of angles
diagram	a simple drawing or plan that shows where something is, what something looks like or how something works
digital image	an image that is stored electronically
draft	an early version of a piece of work that usually needs improvements
edit	the final version of a video after all changes have been made
efficient	working well without wasting time, money, or energy
e-greeting card	a greeting card that is sent electronically
e-safety	the safe and responsible use of technology
event	an action that can be identified by a computer program
evidence	facts or signs that show clearly that something exists or is true
exclude	to leave out

loop	a set of operations in a computer program that are continuously repeated
lossless compression	a form of file compression that makes a file smaller without losing any data
lossy compression	a form of file compression that makes a file smaller but loses some of the original data, so for example, an image will be less detailed than the original
magazine	a large thin book with a paper cover that contains news stories, articles, photographs, etc. and is sold weekly or monthly
manipulate	to change, move, etc. information on a computer
merge	to join two things together, for example, two cells in a table to make one cell
merging	joining two things together
messaging	the system or process of sending messages using electronic equipment
minus (-)	the symbol used in an internet search to exclude (leave out) the the word that comes after it
nested loop	an operation in a computer program that has a repeated command within a repeated command
news	information about something that has happened recently
omit	to not include something or someone, either deliberately or because you forgot to do it
online	connected to the internet; on the internet
ownership	the fact of owning something

paraphrase	to express in a shorter, clearer, or different way what someone has said or written
permission	if you have permission to use something made by someone else (music, text, images, etc.), you are officially allowed to use it
photo	a picture created using a camera; short for photograph
picture	a drawing, painting or photograph
pixel	the smallest unit of an image on a computer screen
plagiarism	pretending someone else's work is your own
PNG	a type of digital image file used for images that have lots of colour or images that have a transparent background; short for Portable Network Graphics
polygon	a 2D shape
precise	exact and accurate
program	a series of instructions that can be put into a computer in order to make it perform an operation
publicly	in a way that is intended for anyone to know, see or hear
recount	to describe how something happened, or to tell a story
refine	to improve an idea, a method, a system, etc. by making small changes
reliability	the quality of being able to be trusted or believed because of working or behaving well
reliable	[illegible]worthy; dependable

repeat	to happen, or to do something, more than once
REPEAT UNTIL	a command in a piece of code that tells the program to keep doing something until something else happens
repetition	the act of doing or saying something again
report	a written or spoken description of a situation or event, giving people the information they need
reporter	someone whose job is to write about news events for a newspaper, or to tell people about them on television or on the radio
research	study of a subject to discover new facts or test new ideas
resize	to make something bigger or smaller
reuse	to use something again
rotating	turning or causing something to turn in a circle, especially around a fixed point
row	a horizontal collection of cells in a table or spreadsheet
scenes	parts of film or video in which the action stays in one place for a continuous period of time
script	the written version of what will be said and done in a film or video
search engine	a computer program that helps you find information on the internet
selection	a choice or range of different types of something
send backward	a function used to move a object back by one layer so that it appears behind another object

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send backward	a function used to move a object back by one layer so that it appears behind another object

send to back	a function used to move an object to the bottom layer so that it appears behind all other objects
sequence	the order in which instructions are carried out
shade	to add colour to a text box
shape	lines, arrows, and other geometric objects added to a word processing document or desktop publishing document
social media	ways of sharing information, opinions, images, videos, etc. using the internet, especially social networking sites
software	the programs in a computer than make it do particular tasks
source	someone or something that supplies information
spider program	a computer program that searches the internet for websites based on the key words you type into a search engine
split	to divide or separate something into different parts or groups, or to be divided into different parts or groups
sprites	images on a Scratch computer program screen, such as shapes, characters, animals and more
standfirst	a brief introduction or a summary that comes before a news article
synonym	a word or phrase that means the same – or nearly the same – as another word or phrase
table	a list of numbers, facts or information arranged in rows across and down a page
term	a word or phrase that you type into a search engine

text	the words in a book, magazine, document, etc. rather than the images
text alignment	the way text is positioned on a page, for example, in line with the left or right margins, or in the centre
text box	an object you can add to your document that lets you type and position text anywhere in your file
text overlay	a tool in image editing software that lets you add text on top of an image
TIFF	a digital image format used for high-quality images with a large file size; often used for printing large posters or magazine covers; short for Tagged Image File Format
tilde (~)	a special character that can be used in an internet search to find synonyms for a particular word; the tilde is placed before the word used in the search
timeline	the area of the screen in video editing software that shows your sequence of clips and the edits you want to make
trim	to take out part of a video clip, for example, to remove a mistake
unreliable	not trustworthy
vector	a vector graphic is a computer-made image that is made up of points, lines and curves that are based upon mathematical equations, not pixels
vocabulary	the collection of words known to an individual person
web page	all the information that you can see in one part of a website
writing	putting words together into sentences

zoom in	to (cause a camera or computer to) make the image of something or someone appear much larger and nearer