



Oxford  
International  
Primary

1

# Computing

Student Book



OXFORD





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OXFORD

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# Introduction

## Delivering computing to young learners

*Oxford International Primary and Lower Secondary Computing* is a complete syllabus for computing education for ages 5–14 (Years 1–9). By following the program of learning set out in this series, teachers can feel reassured that their students have access to the computing skills and understanding that they need for their future education.

Find out more at:

[www.oxfordprimary.com/computing](http://www.oxfordprimary.com/computing).

## Structure of the book

This book is divided into six chapters, for Year 1 (ages 5–6).

- 1 The nature of technology:** Introduction to what computers are and how they help us
- 2 Digital literacy:** Learning to use computers safely
- 3 Computational thinking:** Thinking about how we control the computer
- 4 Programming:** Running and editing a program
- 5 Multimedia:** Making pictures with a computer
- 6 Numbers and data:** Typing numbers with a computer

## What you will find in each unit

- Introduction: An offline activity and a class discussion help students to start thinking about the topic.
- Lessons: Six lessons guide students through activity-based learning.
- Check what you know: A test and activities allow you to measure students' progress.

## What you will find in the lessons

Although each lesson is unique, they have common features: learning outcomes for each lesson are set out at the start; learning content delivers skills and develops understanding.

 **Activity** Every lesson involves a learning activity for the students.

 **Extra challenge** Activities to extend students who are able to do more.

 **Think again** Questions check students' understanding of the lesson.

## Additional features

You will also find these features throughout the book:



**Word cloud** The word cloud builds vocabulary by identifying key terms from the unit.



**Be creative** Suggestions for creative and artistic work.



**Explore more** Extra tasks that can be taken outside the classroom and into the home.



**Digital citizen of the future** Advice on using computers responsibly in life.



**Glossary** Key terms are identified in the text and defined in the glossary at the end.

## Assessing student achievement

The final pages in each unit give an opportunity to assess student achievement.

- **Developing:** This acknowledges the achievement of students who find the content challenging but have made progress.
- **Secure:** Students have reached the level set out in the programme for their age group. Most should reach this level.
- **Extended:** This recognises the achievement of students who have developed above-average skills and understanding.

Questions and activities are colour-coded according to achievement level. Self-evaluation advice helps students to check their own progress.

## Software to use

We recommend Scratch for writing programs at this age. For other lessons, teachers can use any suitable software, for example: Microsoft Office; Google Drive software; LibreOffice; any web browser.

## Source files

 You will see this symbol on some of the pages.

This means that there are extra files you can access to help with the learning activities. For example, Scratch programming files and downloadable images.

To access the files, click 'Download resources' at: [www.oxfordprimary.com/computing](http://www.oxfordprimary.com/computing).

## Teacher's Guides

For more on these topics, look at the Teacher's Guide that accompanies this book.

# 1

# The nature of technology: Computers everyday

## You will learn

- what a computer is
- things we can do with computers
- how computers help us.

Computers are part of everyday life. In this unit you will learn what a computer is. You will learn how using computers can help you. You will learn how to stay safe when you are using a computer.



## Talk about...

Have you ever seen a computer?  
What did the computer look like?  
Have you ever used a computer?  
What did you use the computer for?





## Class activity

How can you stay safe and happy when you use computers at school?

Make a golden rule for using computers at school.

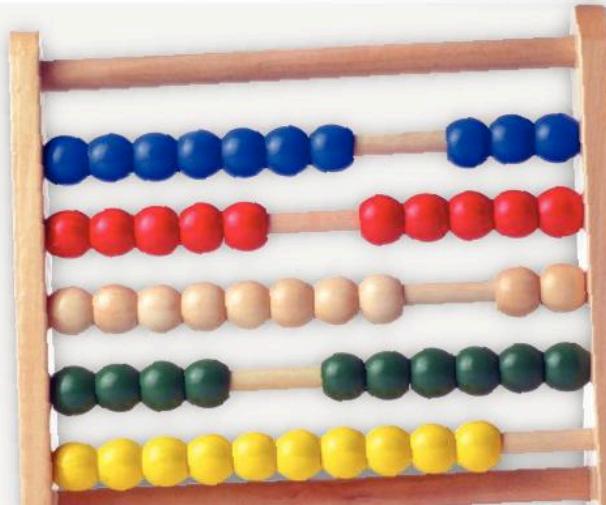
Make a poster of your rule.

computer mouse  
screen keyboard  
laptop courteous  
technology



## Did you know?

Some people think the first computer was an abacus. The abacus was invented more than 2500 years ago in Babylon. An abacus is a counting machine.



# 1.1

# What is technology?

## In this lesson

You will learn:

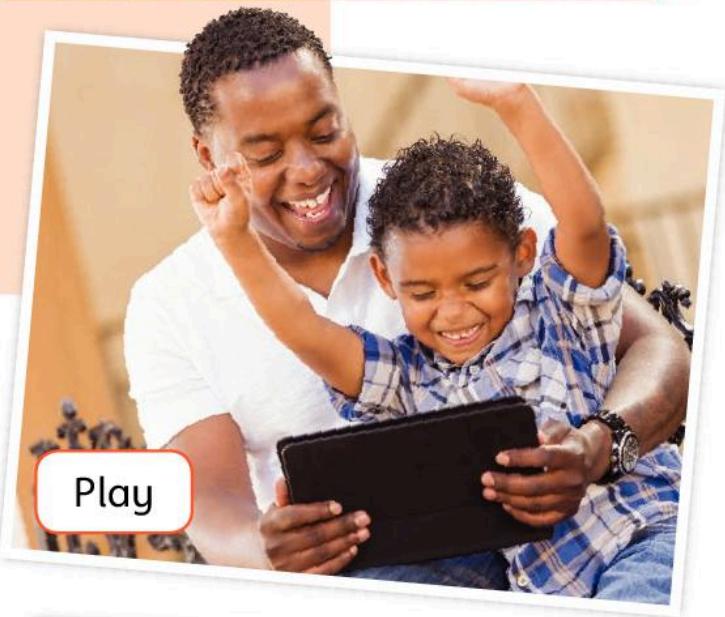
- how computers can help us.

**Technology** is any machine we can use to solve a problem.

A **computer** is a machine.

Computers can do things quickly.

People tell computers what to do.  
We can use computers to help us...



Play



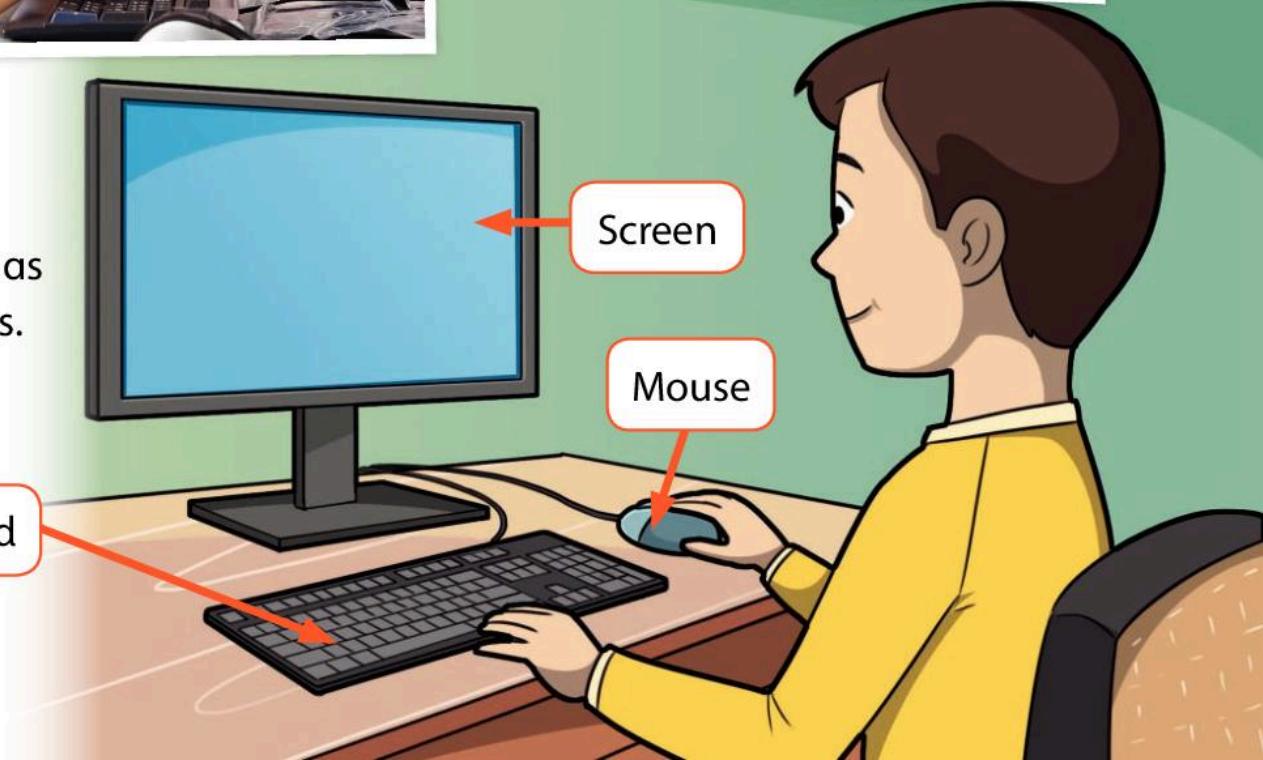
Work



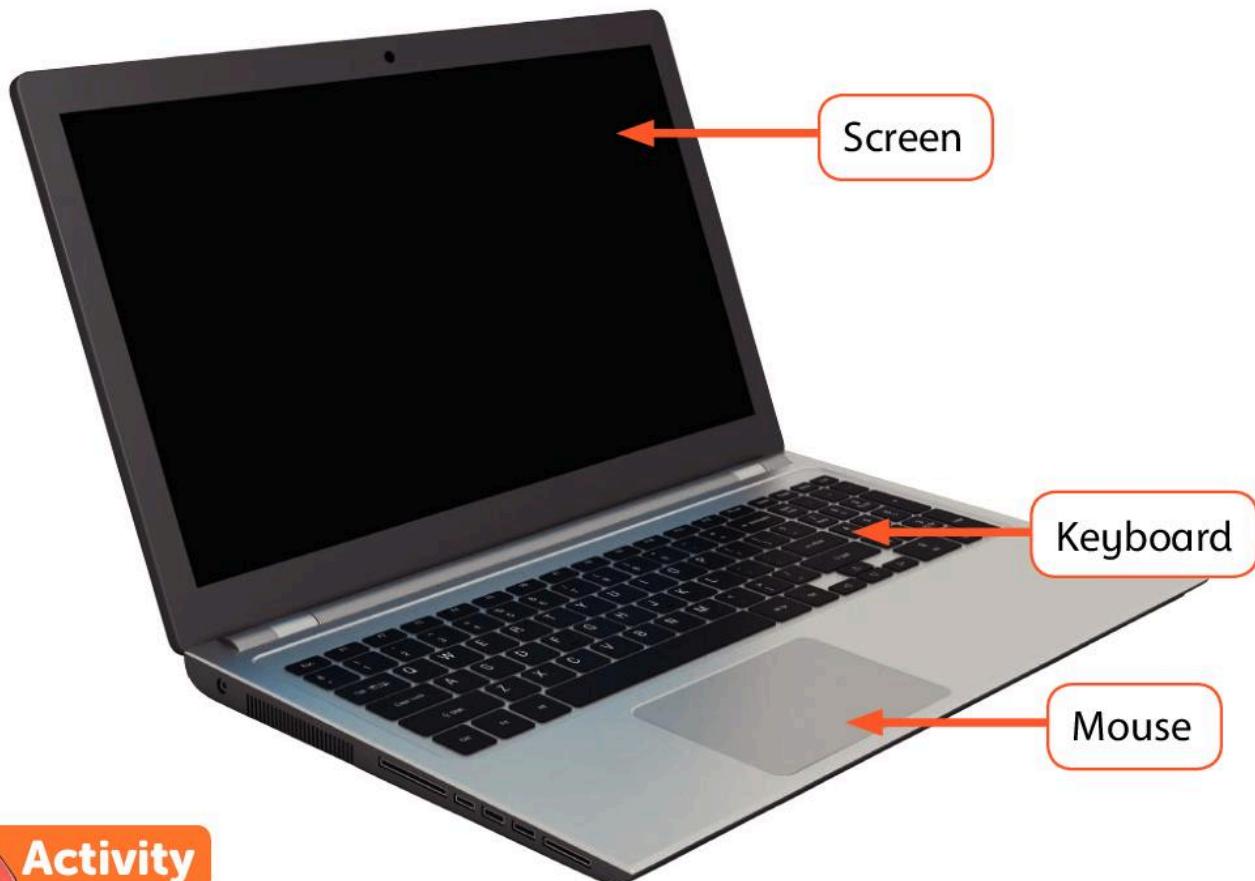
Talk

## Parts of a computer

A computer has different parts.



This computer looks different. It is a **laptop**.



### Activity

Draw a picture of a computer. In your picture, show:

- the screen
- the mouse
- the keyboard.



### Extra challenge

What is this?



### Explore more

Talk to someone at home about technologies they use. Draw pictures. Bring your pictures to school.

# 1.2

# Staying safe

## In this lesson

You will learn:

- how to stay safe when you are using a computer.

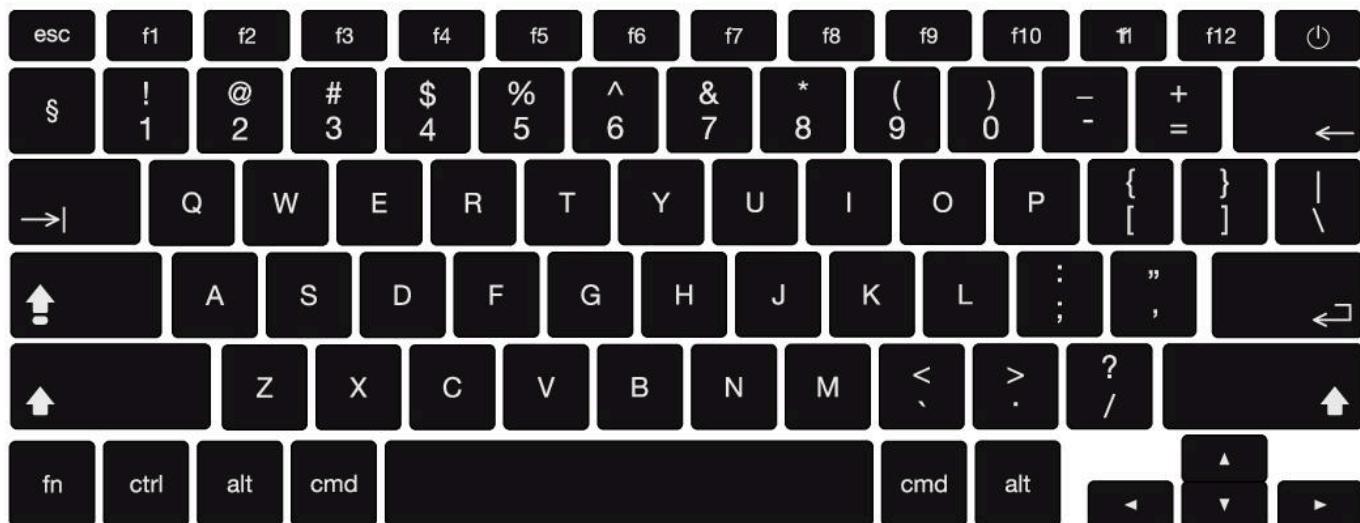


The girl is using a computer.

There is no food or drink near the computer. The girl is sitting on a chair. She can see the **screen**. She can use the **mouse**. She can reach the **keyboard**.

A keyboard has buttons on it.

What can you see on the buttons? Can you see letters, numbers and symbols?



Think again

Is your keyboard like the one in the picture?  
What is the same? What is different?



## Activity

What is wrong with the way these children are using their computers?



### Extra challenge

These children are sharing nicely. What could they do to be safer?



# 1.3

# My computing family

## In this lesson

You will learn:

- how people use computers at home.

You have asked someone outside school how they use computers. What did they say?

"I use computers to find things out."



"I use computers to play games."



"I use computers to work."



"We use computers to talk to people in our family."





## Activity

Draw a picture of one thing you can do with a computer outside school.  
For example, make a picture of a car.

Give your picture to your teacher.



### Extra challenge

What else could you do with a computer outside school?

### Think again

How will you use computers when you are grown up?



# 1.4

# Computers in school

## In this lesson

You will learn:

- how people use computers in school.

People use computers in different ways in school.

The head teacher uses computers to write letters.

The school librarian uses computers to check books in and out.

The children use computers to help them learn.



The office worker uses a computer to help run the school.



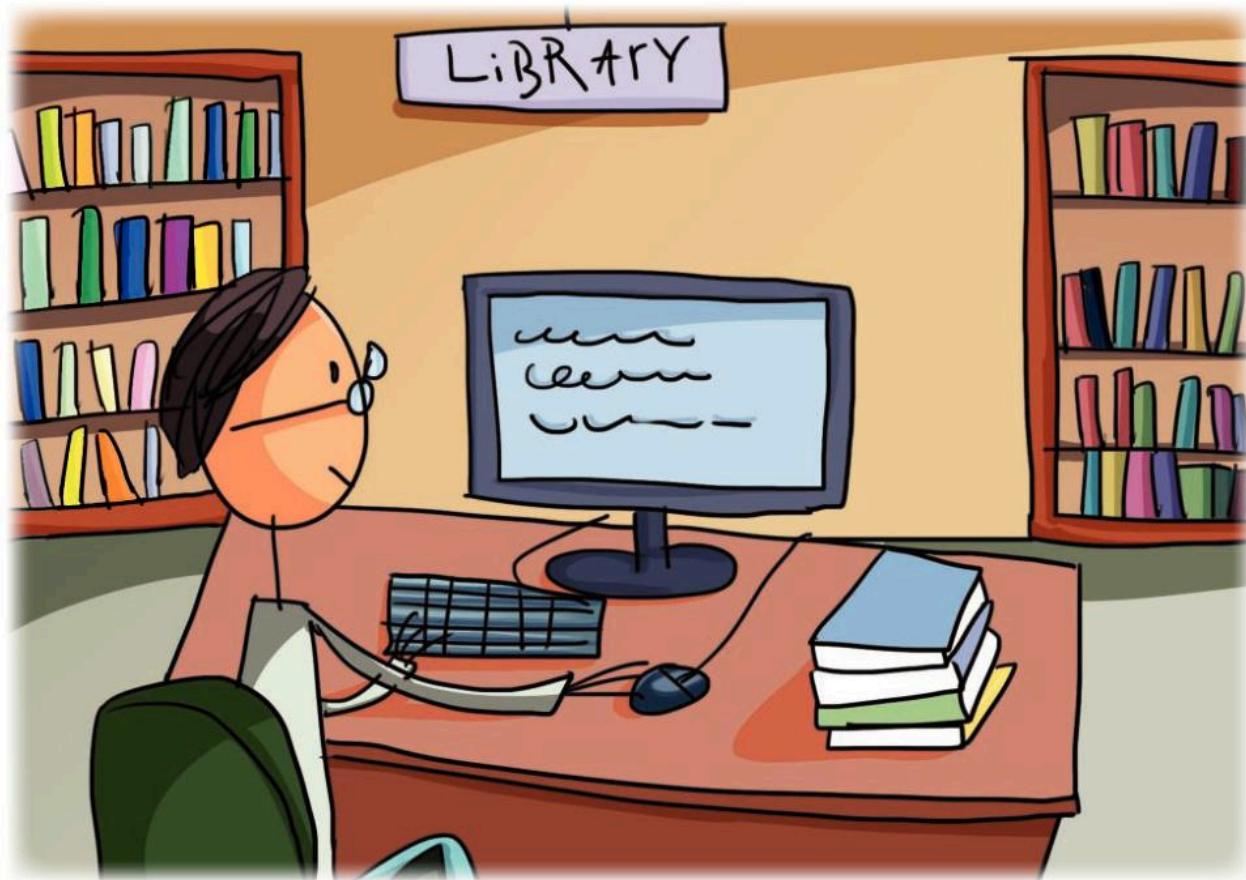


## Activity

Walk around the school with some classmates.

Ask the people you meet how they use computers.

Draw pictures of the ways people use computers in school.



### Think again

How do you think computers make it easier for adults to do their jobs in school?

### Extra challenge

Write one sentence about the ways adults use computers in school.



### Digital citizen of the future

Do you think you will use a computer in your job when you are an adult?

# 1.5

# Home and school

## In this lesson

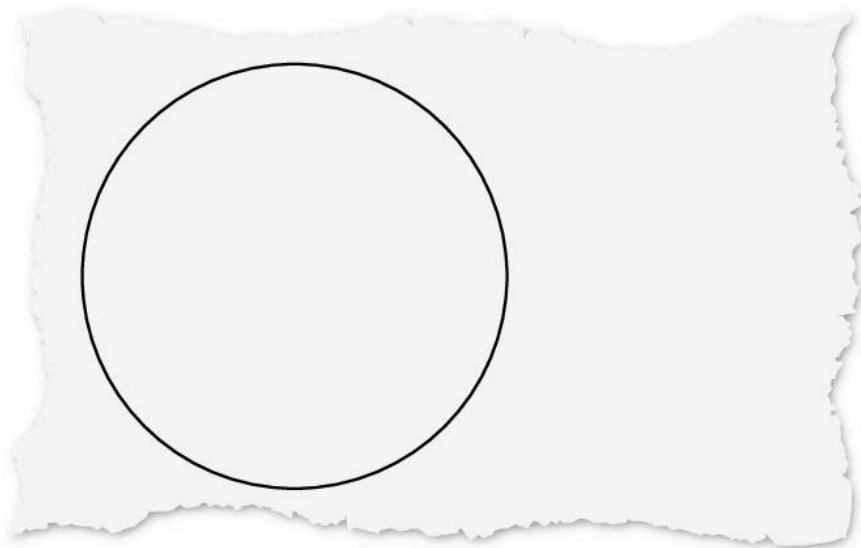
You will learn:

- how to compare the ways people use computers inside and outside school.

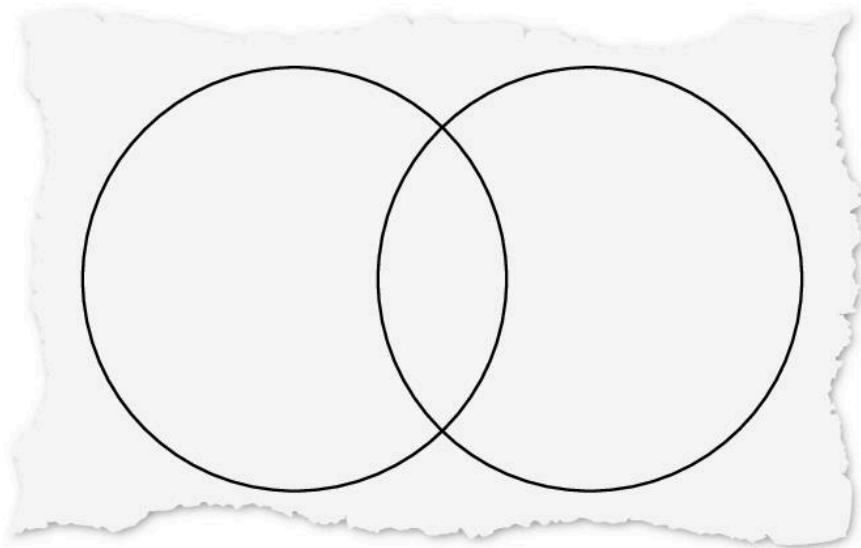


## Activity

In a group, draw a big circle on a large piece of paper, like this:



Now draw another big circle like this:



Look at the pictures you have drawn of people using computers.

Put all the pictures of people using computers outside school in one circle.

Put all the pictures of people using computers inside school in the other circle.

How do people use computers inside school?

How do people use computers outside school?



### Extra challenge

Which pictures fit inside the middle of the circles?

### Think again

What do you like to do on a computer?

# 1.6 Being courteous

## In this lesson

You will learn:

- how to be courteous when you use computers.

Sometimes people use computers to do the wrong thing.

We need to be **courteous** when we use computers.

Being courteous means being polite and thinking about other people.





## Activity

In a group, talk about these problems. What would you do if:

someone sends you a text message that makes you unhappy?

someone you know answers their phone while you are talking to them?



two people are arguing over one computer?

someone sends you a message with an angry emoji?



## Digital citizen of the future

When we use computers we should only write things we would say to the person if they were standing in front of us.



### Extra challenge

Have you ever had a problem when you used computers?  
What was your problem?  
How did you solve it?



# Check what you know

## You have learned

- what a computer is
- things we can do with computers
- how computers help us.

## Test

Show or tell to answer these questions.

- 1 Can you use a computer safely? Show or tell your teacher.
- 2 Say one way a grown-up might use a computer outside of school.
- 3 Say how computers can help people.





## Activities

- 1** Draw a picture of:
  - a computer screen
  - a keyboard
  - a computer mouse.
- 2** Write the names of the computer parts onto your picture.

## Self-evaluation

- I answered test question 1.
- I can use a computer at school.
- I answered test questions 1 and 2.
- I did activity 1.
- I answered all the test questions.
- I did activities 1 and 2.

Re-read any parts of the unit you feel unsure about. Try the test and activities again – can you do more this time?

# 2

# Digital literacy: Rainforests

## You will learn

- how to find something out using the computer
- to be safe and polite in the computer room
- who can help you if you are worried.

In this unit you will use the internet to find out about the Amazon rainforest. You will learn how to stay safe and happy when you use computers and the internet.

You will also make a poster to share information about the rainforest.



## Talk about...

What kind of place do you live in?

Is it a forest? Is it a desert? Is it a town?





## Class activity

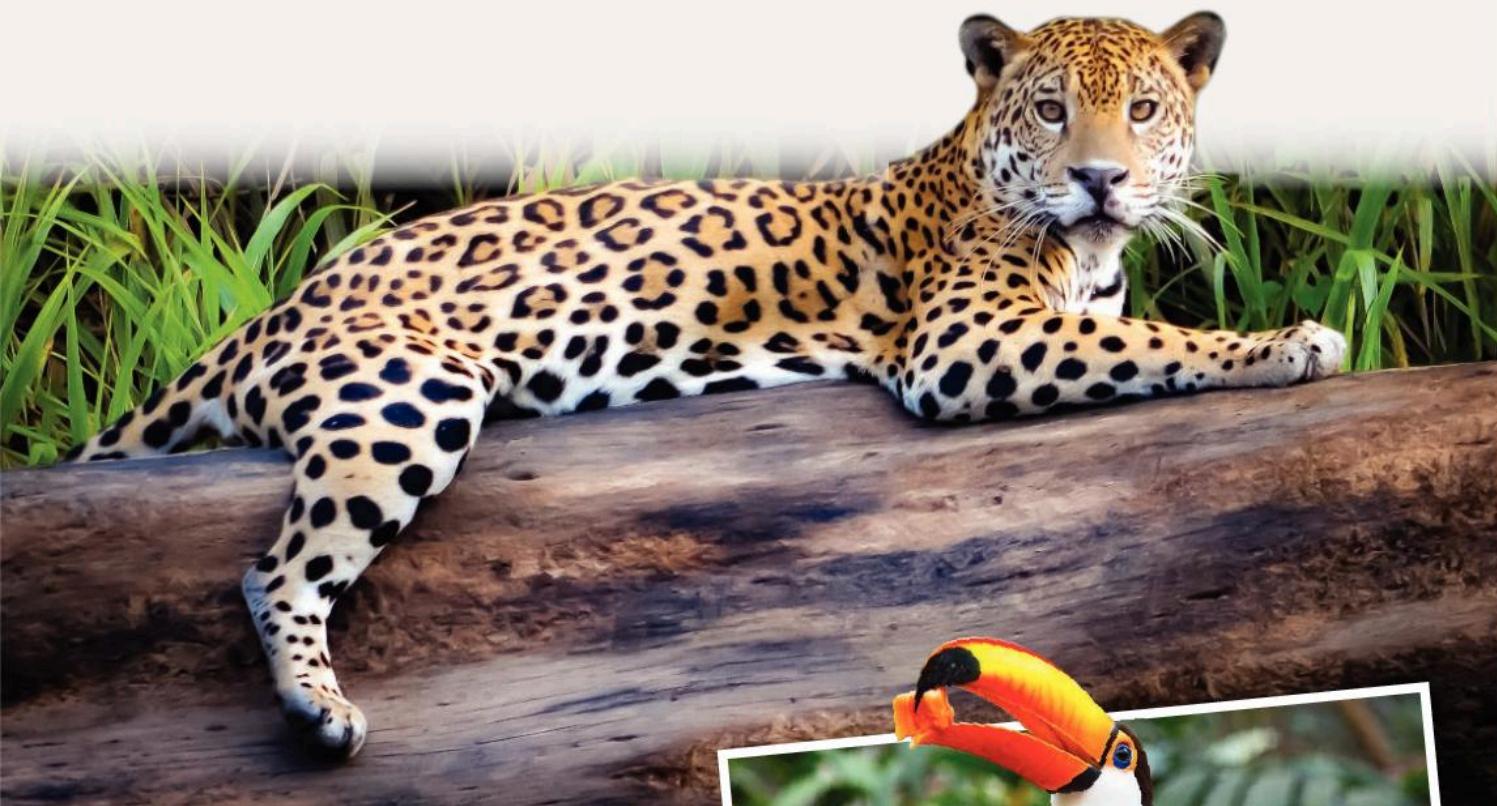
The Amazon rainforest is in South America. The rainforest is big! The long river that flows through the forest is called the Amazon River.

The rainforest is important to our whole planet. Many plants and animals live in the rainforest.

Some people do not look after the rainforest.

Look at pictures of a rainforest. What do you see that interests you?

internet web page  
website hyperlink  
browser content  
menu search engine  
scrolling



### Did you know?

Nine different countries are home to the Amazon rainforest.

# 2.1 Look at a web page

## In this lesson

You will learn:

- what a web page is.



## What is a web page?

Computers all over the world are connected. We call these connected computers the **internet**.

People make **web pages**. Using the internet you can look at web pages people made.

Your teacher will help you open a web page. Here is an example. Yours might be different.

A screenshot of a web browser window. The title bar says "Ten creatures from the rainforest". The address bar shows "https://www...". The main content area features a green tree logo and the text "Ten creatures from the rainforest". Below this is a large illustration of two toucans perched on a brown branch. To the left of the illustration is a vertical list of ten creatures: Toucan, Jaguar, Monkey, Anaconda, Frog, Tiger, Snake, Tarantula, Scorpion, and Sloth. Each creature name is in a green button-like box.

## Scrolling

This web page has many pictures. You can't see them all at once. **Scrolling** is a way to look through a big page. Turn the wheel on your mouse.

This is the mouse wheel.



### Activity

Look at a web page about rainforest animals.

Draw a picture of something you can see on this web page.



### Extra challenge

Read any words on the web page.

Write about what you found out from this web page.

### Think again

If you could make a web page on any topic, what would you choose?  
Write or draw to show your answer.

## 2.2

# Find a web page

## In this lesson

You will learn:

- how to find a web page.

You can find more web pages to look at.

A special web page called a **search engine** will help you find pages you like.

Your teacher will help you open this web page: [www.kiddle.co](http://www.kiddle.co)

There is a white box at the bottom of the screen. Type the name of your favourite animal in this box.

This student typed: 'tiger'.

You will see **links** to web pages. The links are the blue words. If you click on a link a new web page will open.



**20 facts about tigers**  
Find out more about tigers here...  
<https://www....>

**All about tigers**  
Visit our site here to learn about tigers...  
<https://www....>

**Fun tiger facts**  
Find out facts about tigers here...  
<https://www....>

The student clicked on 'Fun tiger facts' and saw this page.

Toucan

Jaguar

Monkey

Anaconda

Frog

Tiger

Snake

Tarantula

Scorpion

Sloth

# Fun tiger facts

Find out lots of fun tiger facts here!



## Activity

Find a web page about an animal you like. Draw a picture of what you found.



## Extra challenge

Read about the animal you like.  
Make a word list about that animal.



## Explore more

Click on different links to look at more web pages. Draw or write about what you found.

## 2.3

# Find some facts

## In this lesson

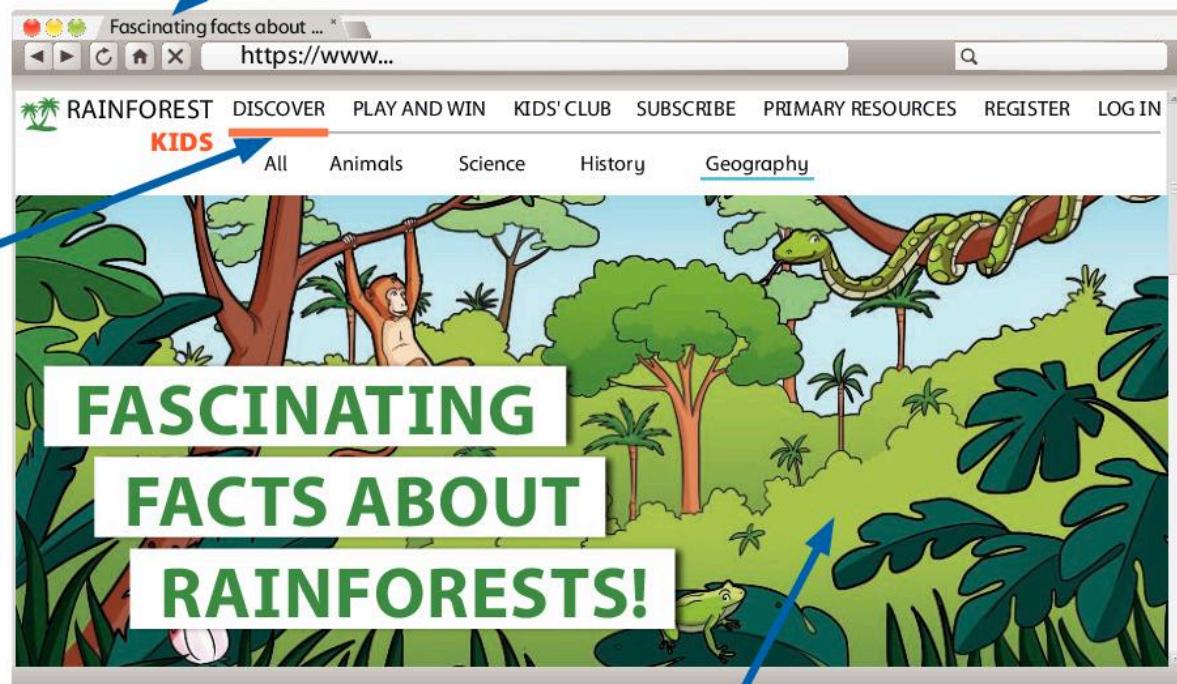
You will learn:

- how to find useful facts on a website.

Web pages are grouped together to make a **website**.

Features on the website will help you find the facts you want.

The **title bar** shows the name of the web page.



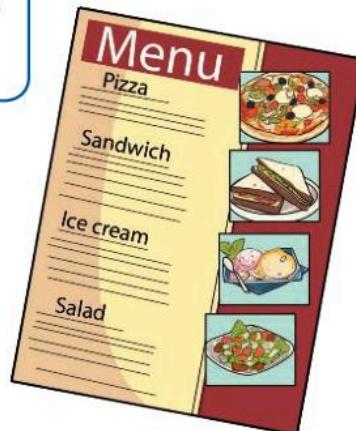
The **menu** is a list of things that you can choose on a website.

This is the **content**. Content is anything we see or create on the internet.

## What is the menu?

Have you been to a restaurant? You can choose food and drink from a list called a menu.

The menu on a web page will help you choose other pages on the same website.



Click here to go to find out more about the topics.

Click here to play games.

Some links may be harder to read. Ask an adult for help.

This is called a drop-down menu. Click to learn about monkeys, snakes or frogs.



### Activity

Use a search engine.

In the search box type: rainforest.

Find one fact about rainforests.



### Extra challenge

Use website features to find out more facts.



### Be creative

Draw a picture of a web page. Remember, you will need a title bar, a menu and some content.

### Think again

Write about the facts you found in this lesson.

## 2.4

# Using the browser

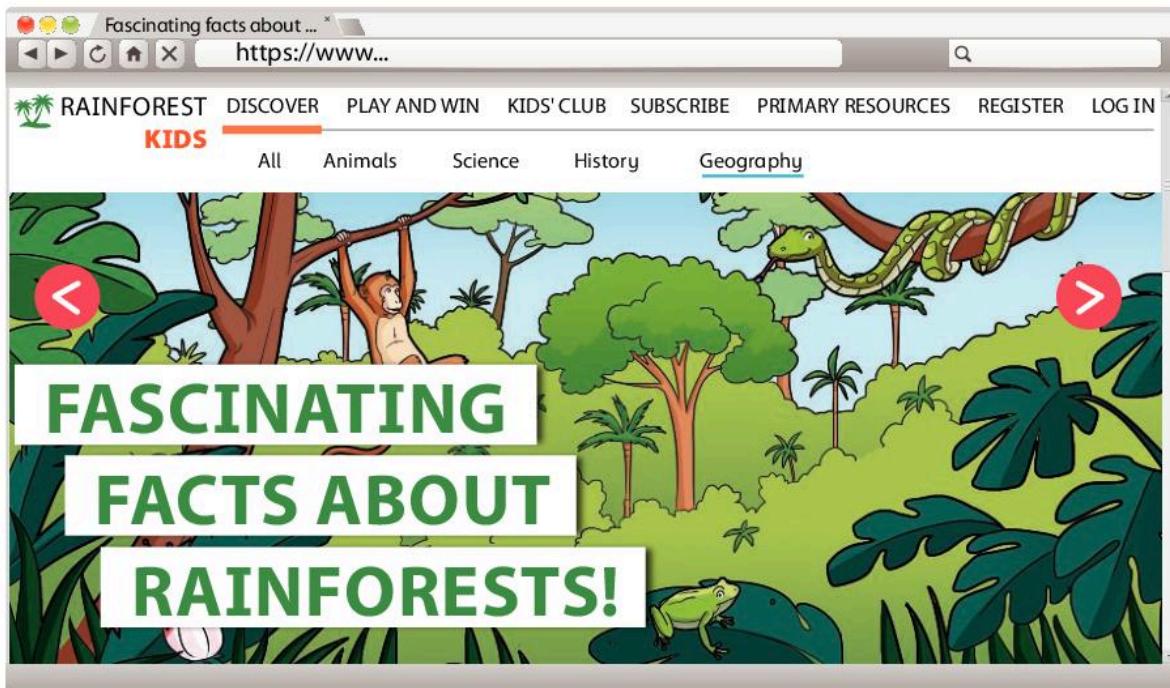
## In this lesson

You will learn:

- how to move around the web.

The software you have used to look at web pages is called a **browser**. Features of the browser will help you look at a website.

A website can have more than one page.



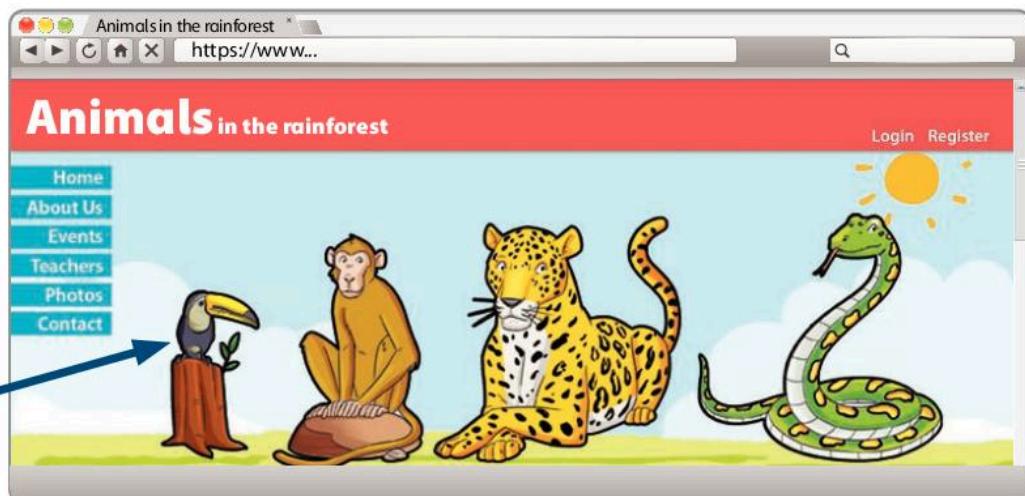
One way to move to a new web page is to click on a **hyperlink**.

A hyperlink is an electronic link. The link allows you to move from one place on a website to another place on the same website, or a different website.

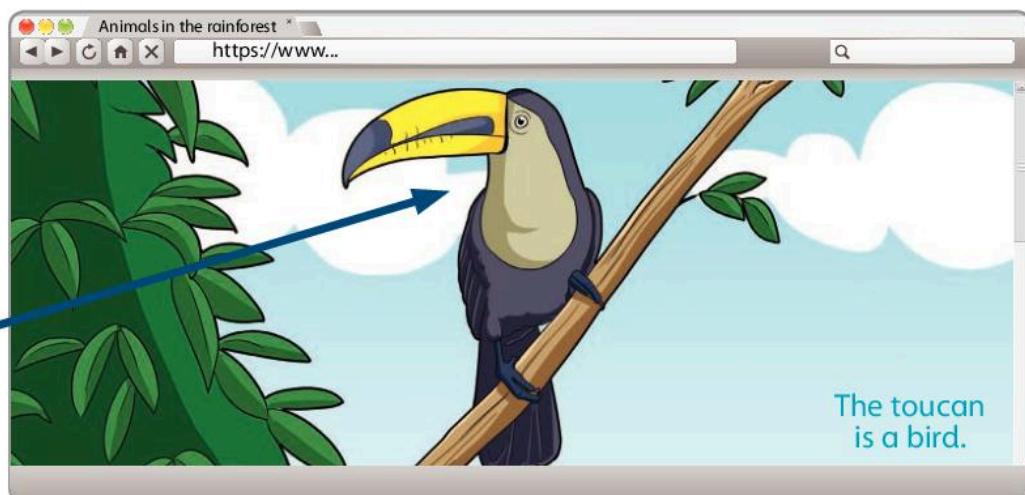
A hyperlink can be made of letters. They might be underlined or **bold** or a **different colour**. A picture can be a hyperlink, too.

## How to use links

Look at this website.



Now you see this on the screen.



If you want, you can go back again. Use the arrow buttons on your browser. You can go forward and back.



### Activity

Find out about an animal in the rainforest.

Use a hyperlink.

Use the forward and back icons.

### Think again

What makes a good website?



### Extra challenge

Find out one way we can help look after rainforests.

## 2.5

# Are you feeling worried?

## In this lesson

You will learn:

- what to do if you feel worried about something you see online.

These children are doing a project on rainforest animals.



The children have clicked on a hyperlink. They have seen some pictures of animals losing their homes.



The children are worried. They can:

Tell a teacher or an adult they trust.



You can use the report button or click on the word 'Report' on a page.

The report button tells the right people that there is something scary or worrying on a web page.

Report



### Activity

Make a poster to tell other children what to do if they are worried about something they see on a web page.



### Extra challenge

Make a poster about a rainforest animal.

Think again

Make a list of people you could tell if something worries you on a web page.



### Digital citizen of the future

What could you do if your classmate tells you they have seen something online that has scared or worried them?

## 2.6 Staying safe

### In this lesson

You will learn:

- how to stay safe when you use the internet.

The internet is like a market or shop, with lots of people.

Information about your life is called **personal information**. For example, your name, your address or your school is personal information.

You would not tell personal information to a stranger in a shop. On the internet you must not share personal information with people you do not know.

Personal information can be words.

Personal information can be pictures.

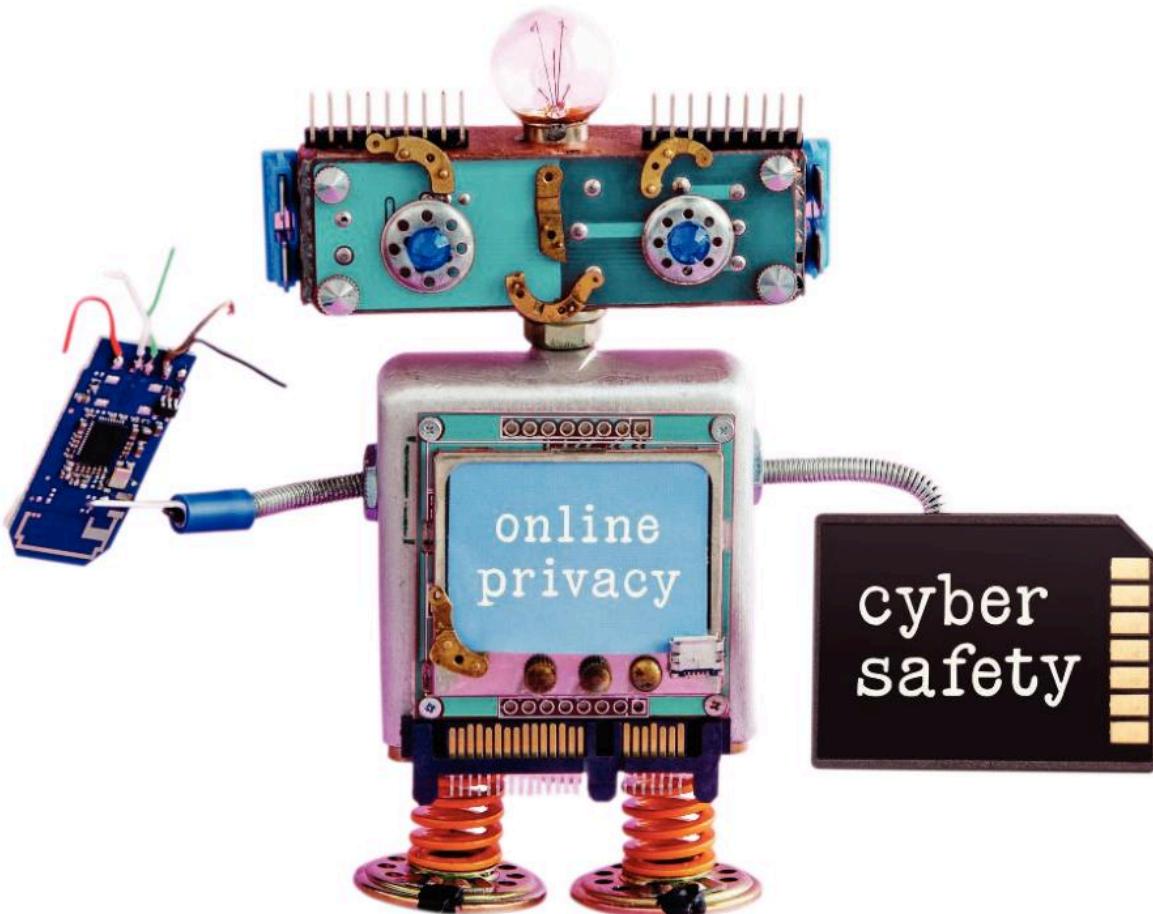


If someone asks you for personal information, tell an adult you trust right away.



## Activity

Make a drawing or write about being safe on the internet.



## Extra challenge

Use your fact-finding skills. Find out how many people use the internet.

## Think again

Say or write what you would do if someone on the internet asked for personal information.

# Check what you know

## You have learned

- how to find things out using the computer
- to be safe and polite in the computer room
- who can help you if you are worried.

## Test

A student saw something that worried them on a web page.

- 1 Show or tell what you would do.
- 2 Write the name of a grown-up you would tell if you were worried.
- 3 Say one thing that is personal information.



## Activities

- 1 Look at pictures of butterflies on a web page.
- 2 Draw a picture to show one thing you saw on a web page.
- 3 Write an interesting fact about butterflies.



## Self-evaluation

- I answered test question 1.
- I did activity 1.
- I answered test questions 1 and 2.
- I did activities 1 and 2.
- I answered all the test questions.
- I did all the activities.

Re-read any parts of the unit you feel unsure about. Try the test and activities again – can you do more this time?



# 3

# Computational thinking: Catch the mouse

## You will learn

- to use the mouse to control the computer
- to use the keyboard to control the computer
- what inputs are
- to see and hear outputs.



In this unit you will use a computer. You will use the computer mouse. You will make a cat move on the screen.



## Class activity

A computer **mouse** looks like this.  
You can move it on the table.

Have you used a computer mouse before?

Draw a picture to show how you used the mouse.





input output  
Scratch game  
mouse pointer



### Talk about...

Some computers don't have a mouse. You touch the screen instead. Have you ever done that?



### Did you know?

Doug Engelbart invented the computer mouse. His friends asked why he called it a mouse. He said, "Because it looks like a little mouse with a tail." Does your mouse have a tail or not?



### 3.1

# Hello Scratch

## In this lesson

You will learn:

- about **Scratch**. Scratch is a programming language for children.

This is Scratch the cat. He will help you learn.

Scratch will walk when you click with the mouse.  
Scratch walks inside a square. The square is called  
the **stage**.



## Activity

You will work with the Scratch website.

<https://scratch.mit.edu/projects/editor/>

A program is ready to use. The program tells Scratch to walk.

The screenshot shows the Scratch website interface. On the left, there's a palette of blocks categorized by color: Motion (blue), Looks (purple), Sound (pink), Events (yellow), Control (orange), Sensing (green), Operators (light blue), and Variables (red). In the center stage area, a yellow script is attached to a cat sprite. The script starts with a 'when green flag clicked' hat block, followed by a 'forever' control loop. Inside the loop are several blocks: 'go to x: 0 y: 0', 'point in direction 33', 'next costume', 'move (10) steps', and 'if on edge, bounce'. Below the stage, a purple arrow points upwards from the text 'This is the program.' to the script. To the right of the stage, another purple arrow points upwards from the text 'This is Scratch.' to the cat sprite.

This is the program.

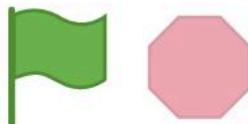
This is Scratch.

**Icons** are little pictures. They show you things the computer can do.

To use an icon do this:

- 1 Move the mouse pointer to the icon.
- 2 Click the icon.

There are two icons at the top of the stage. They look like this.



The green flag makes the program start. The red button makes the program stop.

- 1 Move the mouse pointer to the green flag. Click on the green flag to make Scratch walk.



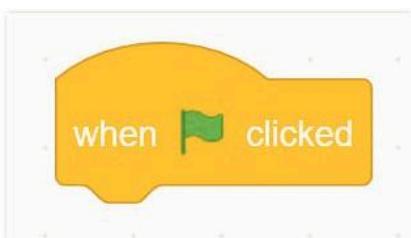
- 2 Move the mouse pointer to the red button. Click on the red button to make Scratch stop.



### Think again

Look at the program. The program is made of blocks.

What is the picture on the first block? Why do you think the block shows that picture?



## 3.2 Scratch on stage

### In this lesson

You will learn:

- how to make changes to the Scratch stage.

Last lesson you used the 'start' and 'stop' icons.

By clicking the icons you could start and stop the program. Scratch walked on the stage. In this lesson you will make changes to the stage.



You can change the size of the stage.

This icon makes the stage big. Move the pointer to the icon. Click the mouse button.



This icon makes the stage small.



Click on this icon. Make the stage small again.



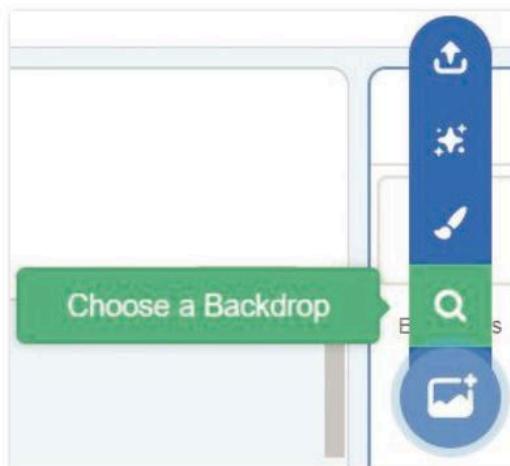
You can change the **backdrop**.

The stage can have a picture on it. The picture is called the backdrop.

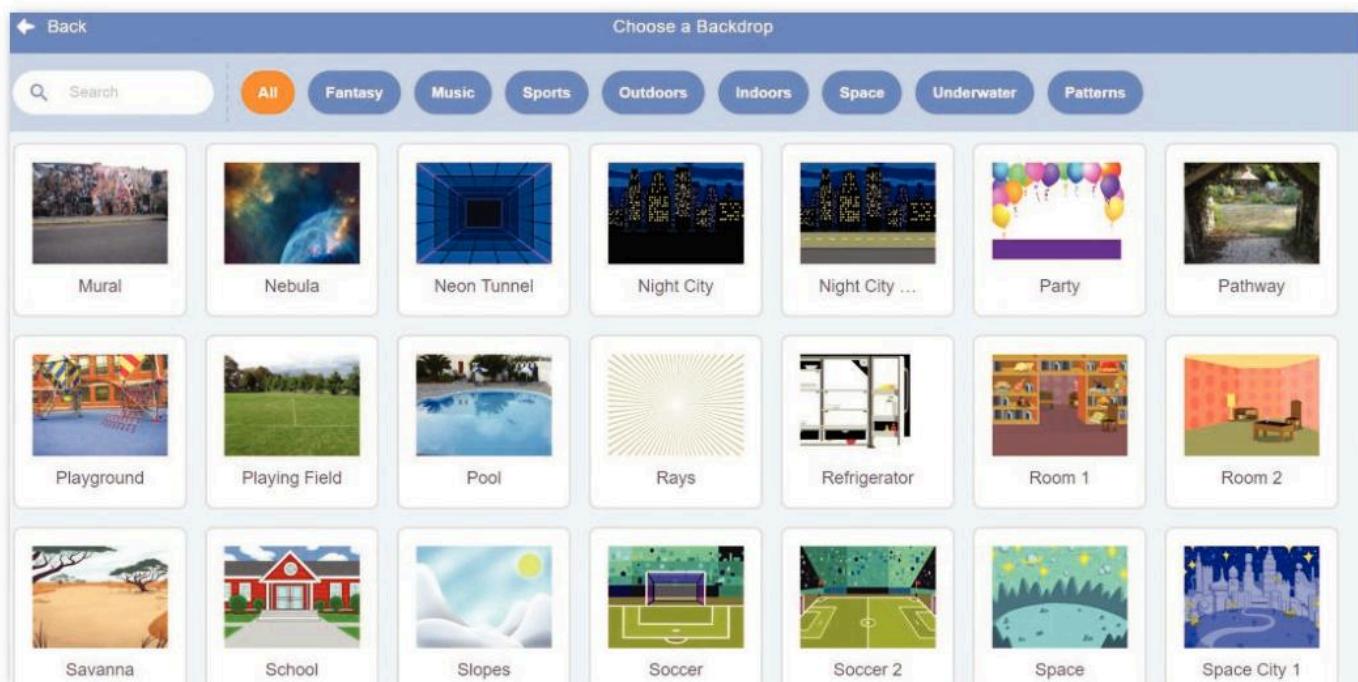
This icon lets you change the backdrop.



Click here to choose a new backdrop.



Click on any picture.



What does the stage look like now?



**Be creative**

Think of a new backdrop for Scratch. Paint a picture to show your idea.

### 3.3

## Chase the mouse

### In this lesson

You will learn:

- about input.

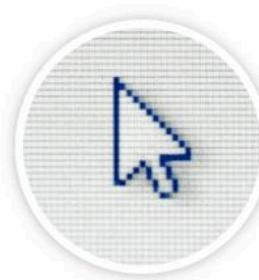
**Input** is how you control the computer. You can use a:

- mouse
- keyboard.

### Mouse

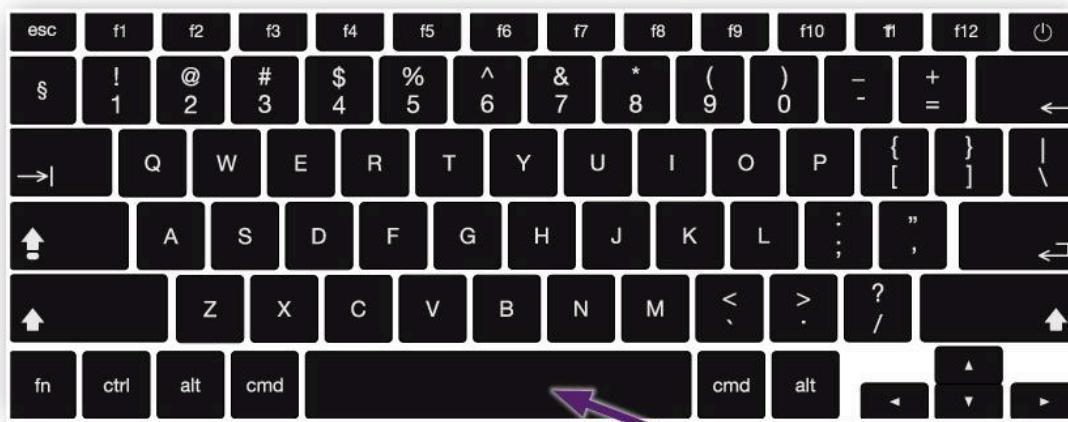
The **mouse pointer** is on the screen.

Move the mouse. The mouse pointer will move too.



### Keyboard

Your computer has a **keyboard**.



The keyboard lets you type letters.

Space bar



## Activity

You can move the mouse. Press the space bar. Scratch will start to walk.

Move the mouse pointer. Scratch will chase after it.



Keep moving the mouse pointer.  
Don't let Scratch catch it.

### Think again

You have learned two ways to control the computer.

Draw or write to show these two ways.



### 3.4

## What Scratch does

### In this lesson

You will learn:

- about output.

**Output** comes out of the computer. The computer makes output. You can see or hear output.

### Visual output

You can see some output. You see output on the computer screen.

### Sound output

You can hear some output. You can listen on headphones. Or the sound might come out of the computer.



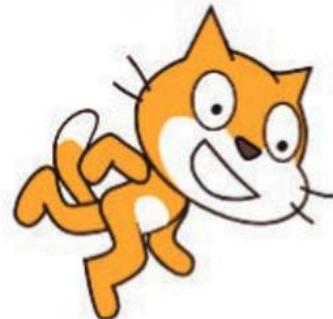


## Activity

Press the space bar. The program starts.  
Scratch will chase the mouse pointer.

Let Scratch catch the mouse pointer.  
What do you see on the screen?  
What do you hear?

I caught the mouse!



Think again

Draw and write to show the two outputs from this program.



## Digital citizen of the future

Is it noisy in your classroom when lots of children use this program? Scratch has a loud meow. Sound output can be noisy. Listening on headphones means you don't disturb anyone else.



## 3.5

# Think about input and output

## In this lesson

You will learn:

- to think about input and output.

Input is what you do to control the computer.

Output is what comes out of the computer. The computer makes the output.

The Scratch program you used had input and output.



## Activity

To make input you used:

- keyboard
- mouse.

Draw a picture to show the two types of input.





## Activity

There are two outputs:

- visual output
- sound output.

Draw a picture to show the two types of output.



## Extra challenge

Add word labels to your pictures.  
How can you control the program?



## Explore more

Different types of computer have different inputs and outputs.  
Find out as many different kinds as you can.



## Be creative

Some people have never used a computer. Think of a person like that. Write a letter to them. Tell them how you use a computer at school. Draw a picture to show them.

### 3.6

## The Hedgehog Game

### In this lesson

You will learn:

- to control the computer using inputs.

In this lesson you will play a **game**. It is called the Hedgehog Game. This game has two animals in it. They are Scratch the cat and a hedgehog.

- Scratch will follow the mouse pointer.
- The hedgehog will walk up and down.



A hedgehog is a spiky animal. If Scratch touches the hedgehog he will say "Ouch!".

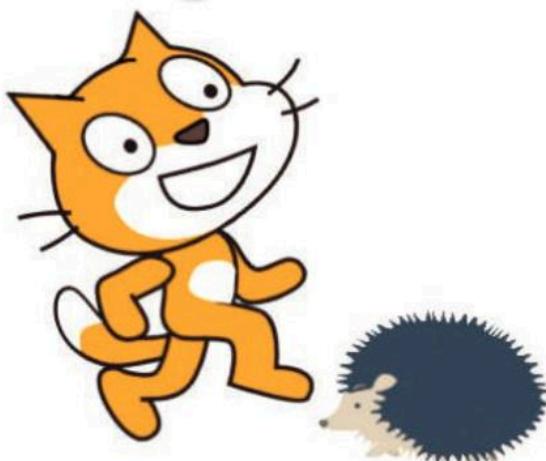
Help Scratch to keep away from the hedgehog.



### Activity

- Press any key to start the game.
- Press the space bar to make the hedgehog walk.
- Move the mouse so Scratch walks carefully.

Ouch!





## Be creative

Choose a backdrop for the Hedgehog Game.



### Think again

What are the inputs and outputs of this game? Draw or write to show them.



### Extra challenge

Talk about other computer games you know. What were the inputs and outputs? Draw or write to show them.



# Check what you know

## You have learned

- to use the mouse to control the computer
- to use the keyboard to control the computer
- what inputs are
- to see and hear outputs.

## Test

Here are some parts of a computer.

Mouse



Headphones



Screen



Keyboard



- 1 Point to a part that is used for input.
- 2 Draw or write any part that is used for output.
- 3 Draw a picture of a computer. Include all the parts used for input and output.



## Activities

- 1 Play the Hedgehog Game (or any other game on a computer).

Let your teacher see you work carefully at the computer.

- 2 Tell the teacher what you did.
- 3 Tell the teacher how you controlled the computer.



## Self-evaluation

- I answered test question 1.
- I did activity 1 quietly and safely.
- I answered test questions 1 and 2.
- I did activities 1 and 2.
- I answered all the test questions.
- I did all the activities.

Re-read any parts of the unit you feel unsure about. Try the test and activities again – can you do more this time?



### Digital citizen of the future

Computer games are good fun. But don't play a game when you are supposed to be working in class.

# 4

# Programming: Play with Scratch

## You will learn

- about blocks that make a program
- to make changes to a program.

In this unit you will look at a program made of blocks. You will learn how programs are made. You will make changes to the program.



## Class activity

Scratch the cat is a **sprite**.



Hedgehog

In the last unit you added a hedgehog sprite.

There are many other sprites.  
Here are some.

Which type of sprite do you like best?



Penguin



Duck



Monkey



Parrot



Starfish



Octopus



## Digital citizen of the future

We often use programs that other people made. But we can also make changes. We can make programs do just what we want.

sprite block  
program drag  
right-click



## Be creative

Think of a new sprite that could be friends with Scratch. Draw the new sprite.



## Did you know?

There are tutorials on the Scratch website. Look at the tutorials if you want to learn extra skills.



Getting Started



Create Animations That Talk



Animate an Adventure Game



Animate a Name



Make Music



Make a Clicker Game

## Talk about...

What computer games do you know? Which are your favourites?



# 4.1

# Green flag means start

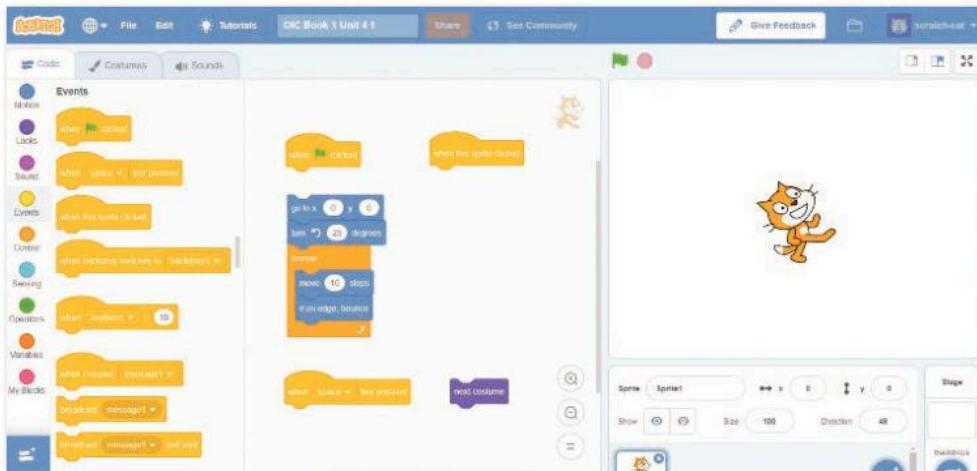
## In this lesson

You will learn:

- to make a program start.

A **program** means some instructions. The instructions tell the computer what to do.

Look at this screen. In the middle of the screen is a program. The program is made of **blocks**. The blocks are shapes that fit together. Each block makes the computer do one thing.



This block tells the computer to start the program.

It has a green flag on it.



You can move the blocks and fit them together.

To move a block do this:

- 1 Move the mouse pointer to the block.
- 2 Press your finger on the mouse button. Keep pressing.
- 3 Move the mouse.

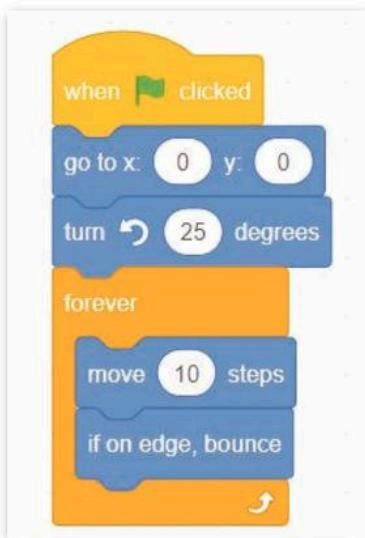
The block will move along too. This is called **dragging** the block.

When the block is in the right place, let go of the mouse pointer. The block will drop into the new place. This is called **drag and drop**.



## Activity

Drag the green flag block to the program. When it touches the program the blocks will join together. It is like a jigsaw puzzle. Here is what the program will look like.



You joined the green flag block to the program.

Now click the green flag. The program will start. Scratch the cat will walk about.

**Extra challenge**

You learned how to add a backdrop to a program. Give this program a backdrop.

### Think again

Explain what you did in this lesson. What change did you make? What happened?

## 4.2

# What is a sprite?

## In this lesson

You will learn:

- how to make a program start in a new way
- what a sprite is.

A **sprite** is a picture on screen. A program makes the sprite move. Scratch is a sprite.

The program looks like this.



Some blocks have a curved top. A block with a curved top is a **start block**. A start block makes the program start.

Here are two start blocks.



One has got the green flag. The other one says 'when this sprite clicked'.



## Activity

Join the second block to the program.



## Extra challenge

There is another start block on the screen. Can you find it? What happens if you use this start block?

### Think again

What is a sprite? Say in your own words.

Click on the green flag. Nothing happens.

Click on the sprite. The program will start.

The sprite will move on the empty screen. Or on a backdrop if you chose one. This picture is an example.



## 4.3 Costume change

### In this lesson

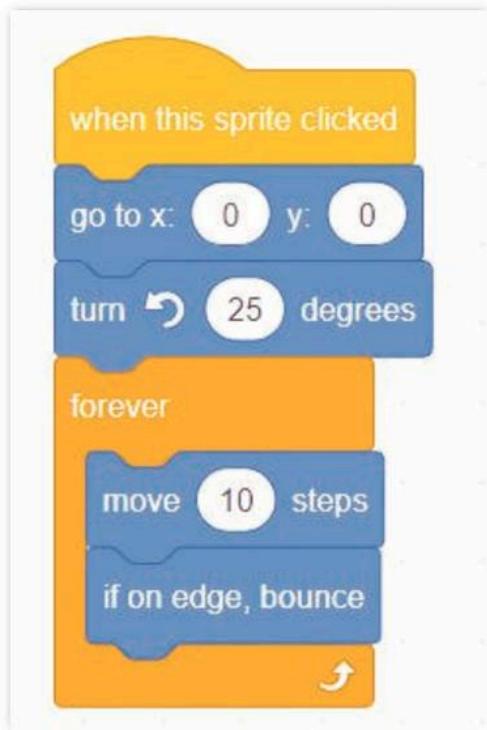
You will learn:

- to add a new block to the program.



### Activity

Fit the program to a start block. You can choose which one.

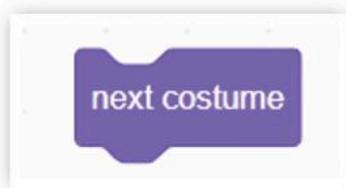


There is a purple block on the screen. Now you will add that block to the program.

Purple blocks change how Scratch looks. Scratch can swap between two looks. The looks are called **costumes**.



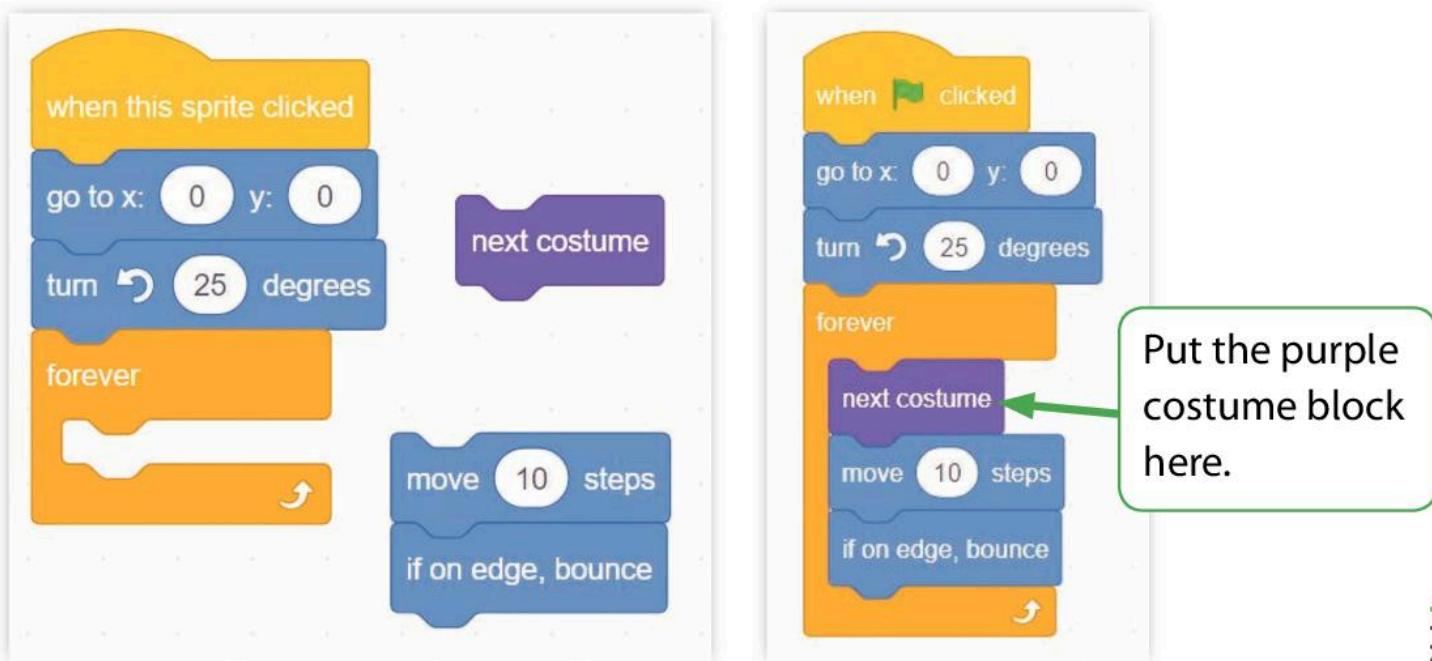
Changing costumes makes Scratch's legs move about.  
This block says 'next costume'.



You will fit the purple costume block into the program.  
First you must pull the blocks apart.

Then you can add the purple costume block. Make sure  
you put it in the right place.

Then you can put the blocks back together again.



```
when this sprite clicked
  go to x: 0 y: 0
  turn (25) degrees
forever
  move (10) steps
  if on edge, bounce
```

```
when green flag clicked
  go to x: 0 y: 0
  turn (25) degrees
forever
  next costume
  move (10) steps
  if on edge, bounce
```

Put the purple costume block here.

Make the program start. What is different?



### Extra challenge

Where else can you fit the  
purple block? What happens?

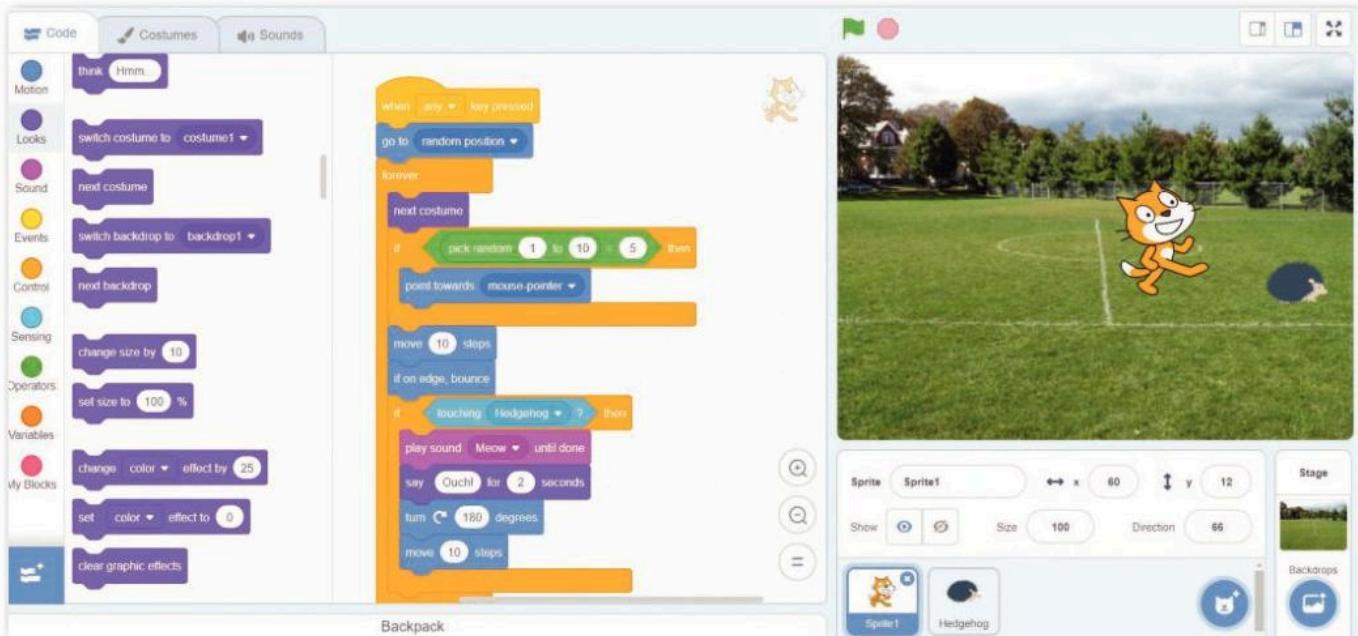
# 4.4 Extra sprites

## In this lesson

You will learn:

- to add an extra sprite to a program.

You have seen this program before. It is called the Hedgehog Game. Scratch must dodge the hedgehog.



Scratch is a sprite. The program makes the sprite move.

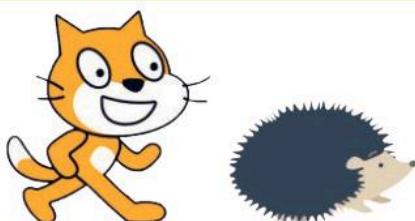
Press the space bar to start the game.

There are two sprites in this game. Now you will add an extra hedgehog to the game.



### Be creative

Draw a picture of Scratch and the hedgehogs.





## Activity

You will add another hedgehog to the game.

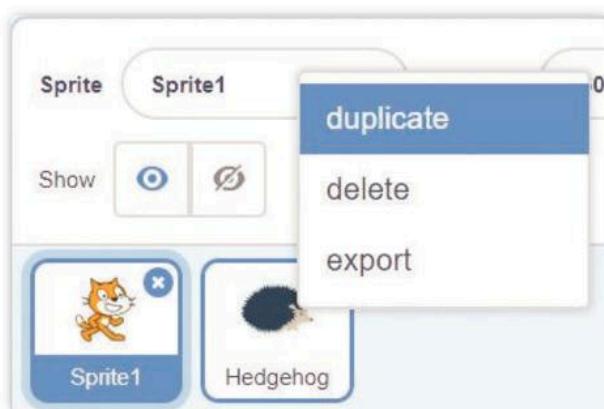
This part of the screen shows the sprites.



Move the pointer to the hedgehog.

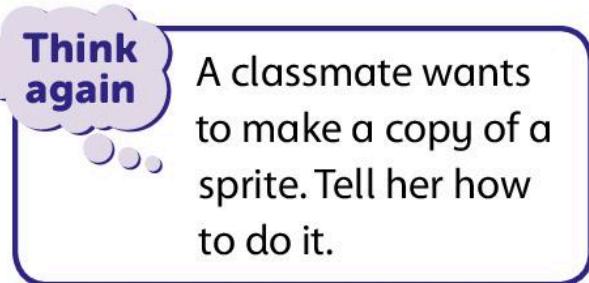
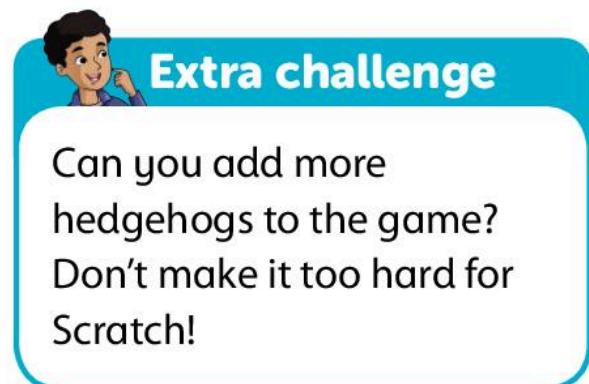
**Right-click** the mouse. Right-click means to click the right button on the mouse.

You will see this menu.



Choose **duplicate**. Duplicate means to make two.

Click anywhere on the screen, then press the space bar to start the game.  
Now there are two hedgehogs.



## 4.5

# Find a new block

## In this lesson

You will learn:

- how to find the block you want.



The program looks like this. The program will start when you press any key.



The first block is a start block.

Now you will change the start block. You will change the start block to the green flag block.

New blocks are stored on the left of the screen.



### Extra challenge

Click on the hedgehog sprite. Change the start block for the hedgehog.

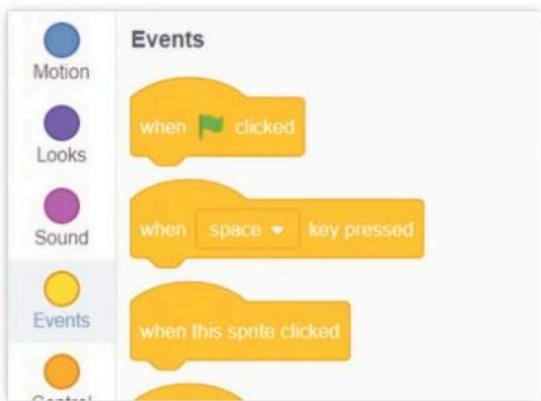
### Think again

Say the different ways you can start the game.



## Activity

On the left are coloured dots. Click on the yellow dot.

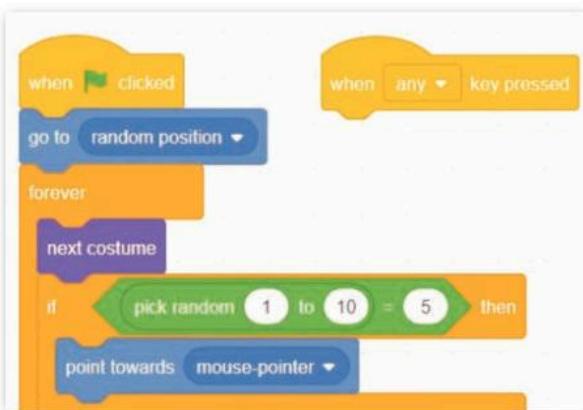


There are lots of start blocks. Find the green flag block.

**Drag** the block to the program. Drag means to hold down the mouse button and move the mouse.



Pull the program blocks away from the old start block.  
Fit the program to the green flag block.



Play the game. The green flag will start the game.

## 4.6

# What Scratch says

## In this lesson

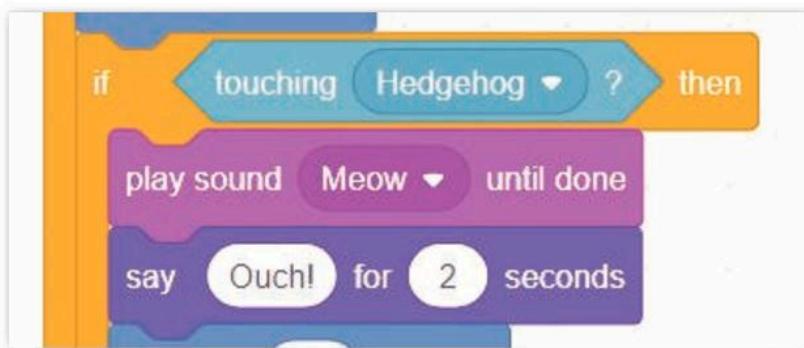
You will learn:

- how to change what Scratch says.

When Scratch touches a hedgehog, he says "Ouch!".



The block that makes Scratch talk looks like this.



Now you will change the block. Make Scratch say something else.



## Be creative

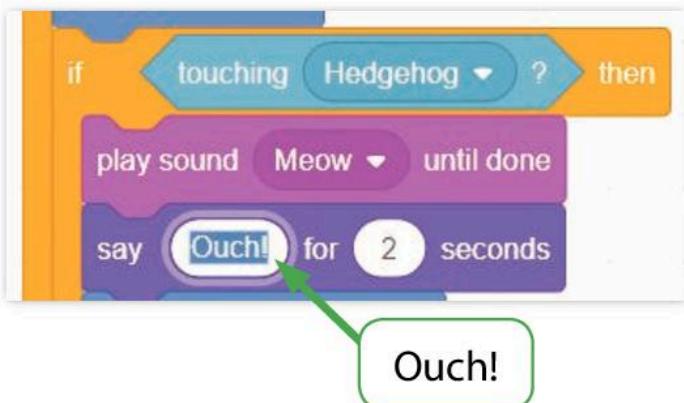
Draw Scratch saying the word you chose.



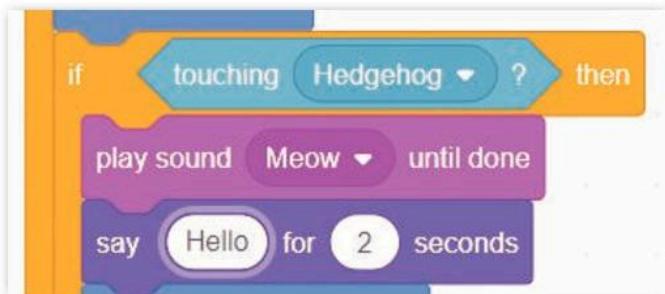
## Activity

Find the block where Scratch says: "Ouch!".

Find the word.



Click on the word. Type a new word.



Play the game. Scratch will say the new word instead of "Ouch!".



## Explore more

Talk to people about computer games. Do they like to play computer games? Find out why.



## Extra challenge

Some blocks have numbers in them. Change some numbers. See how changing some numbers changes the game.

# Check what you know

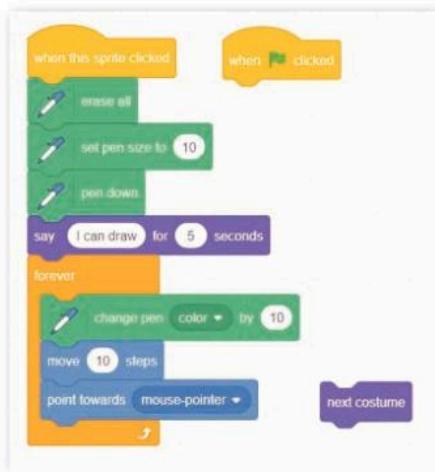
## You have learned

- about blocks that make a program
- to make changes to a program.



## Activities

Here is a Scratch program.



Do as many of these activities as you can.

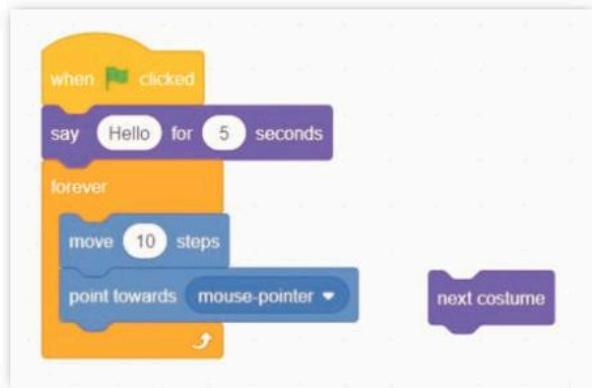
- 1 Start the program and move the mouse to see what happens.
- 2 Change the start block of this program.
- 3 Add the extra purple block to the program.
- 4 Change the program so the sprite says "Hello".

Write or tell the teacher what you did.



## Test

Here is a Scratch program.



- ➊ Point to the block that makes the program start.
- ➋ What do you do to make this program start?
- ➌ Say one change you could make to the program.

## Self-evaluation

- I answered test question 1.
- I did activity 1.
- The teacher saw me work quietly and safely.
- I answered test questions 1 and 2.
- I did more than one activity.
- I told the teacher about what I did.
- I answered all the test questions.
- I did all the activities.
- I explained what I did.

Re-read any parts of the unit you feel unsure about. Try the test and activities again – can you do more this time?

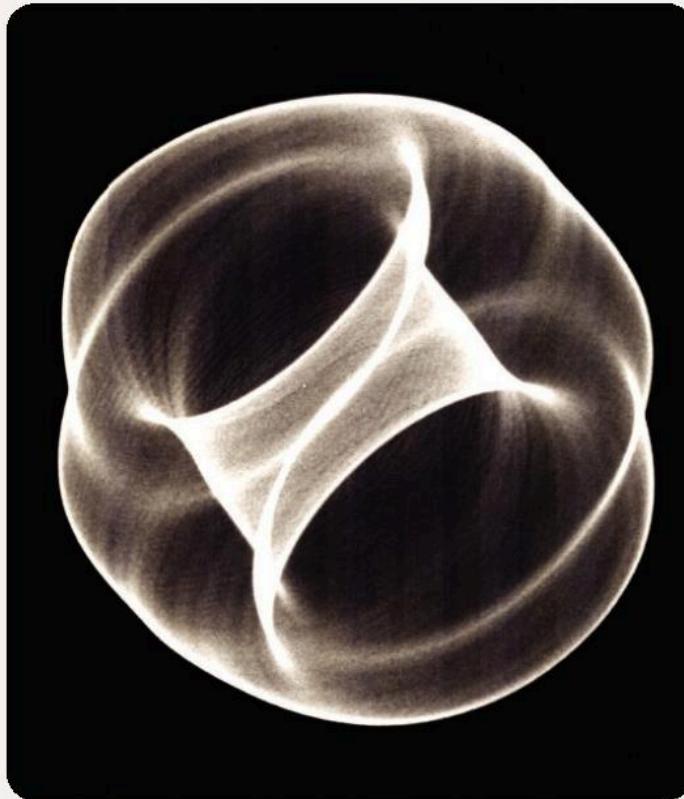
# 5

# Multimedia: Funny faces

## You will learn

- how to draw lines and shapes on a computer
- how to colour images on a computer
- how to move images around the screen.

What do you like to draw? You can use a computer to draw and paint.



## Talk about...

People use computers to change the way they look in a photograph. What do you think about this?





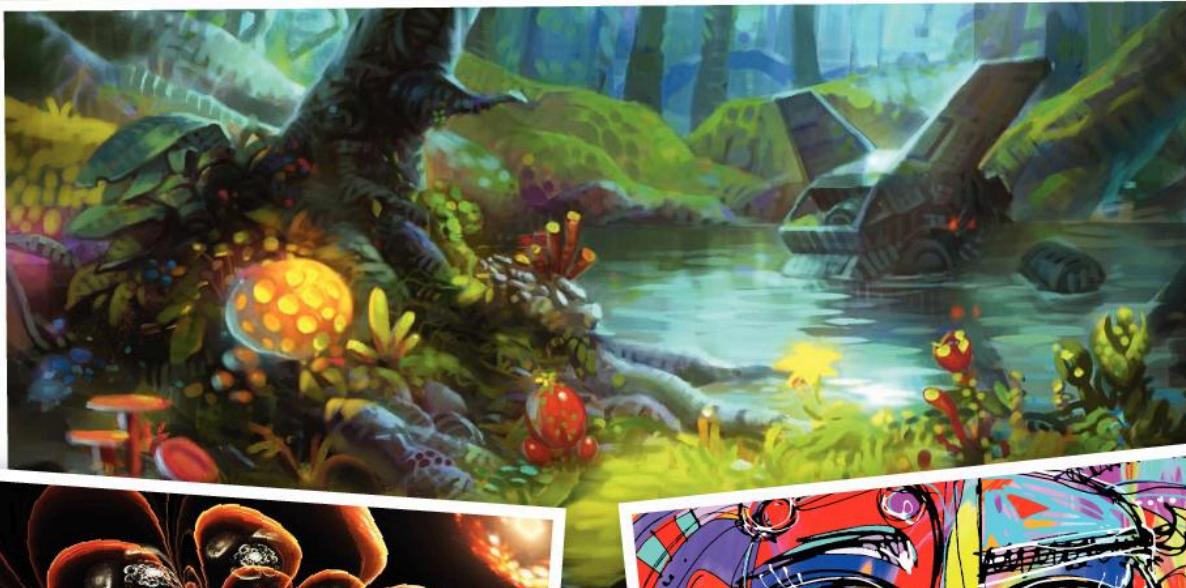
## Class activity

Look at a magazine, book or newspaper.

Which pictures were drawn using a computer?

Which pictures were drawn by hand?

canvas toolbar  
shape image file  
double-click



## Did you know?

People have been using computers to draw and colour since the 1950s. Ben Laposky used a machine for measuring electronic signals to draw a beautiful **shape**. A shape is the outline of something, for example, a circle or a square.

# 5.1 The canvas

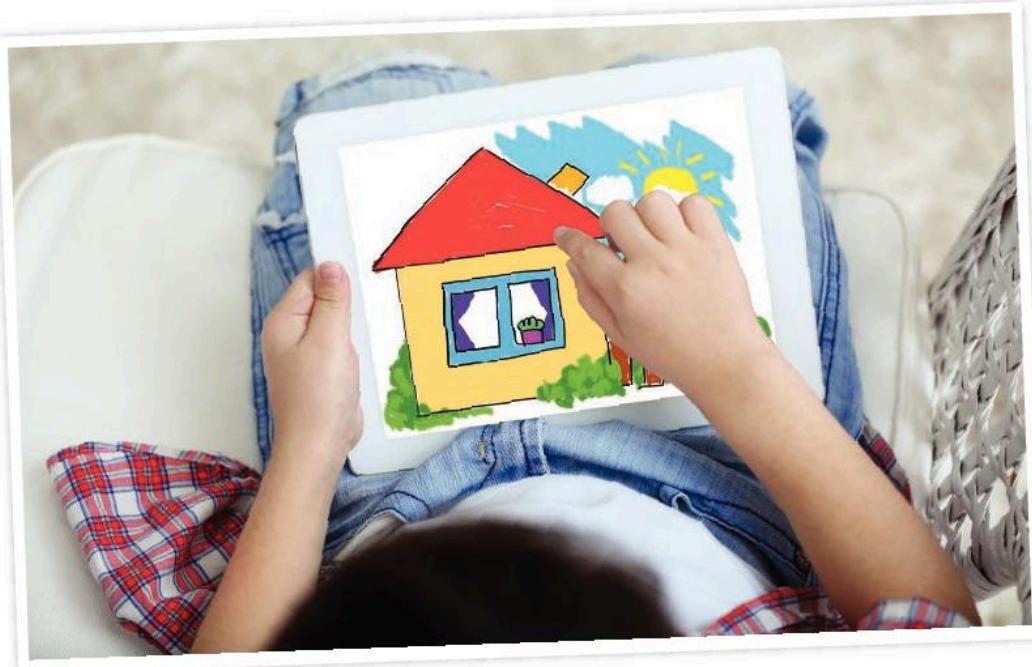
## In this lesson

You will learn:

- how to make a drawing on a computer.

## Drawing with the computer

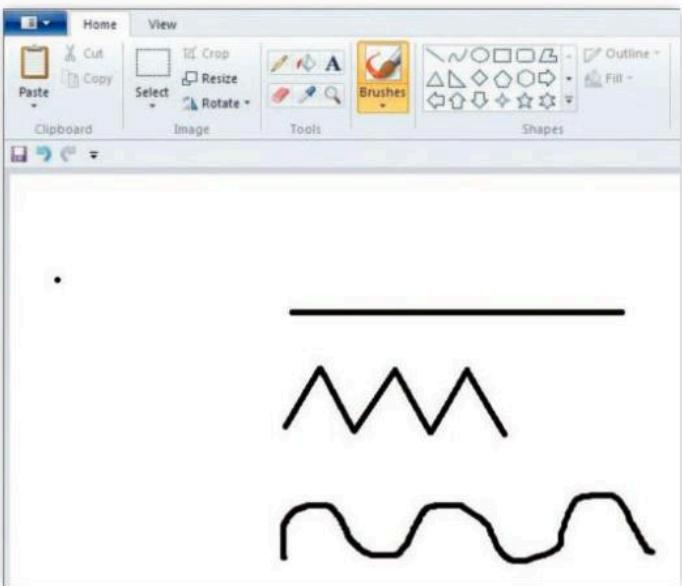
You can use your mouse to draw on a computer. If you have a tablet you can draw with your finger.



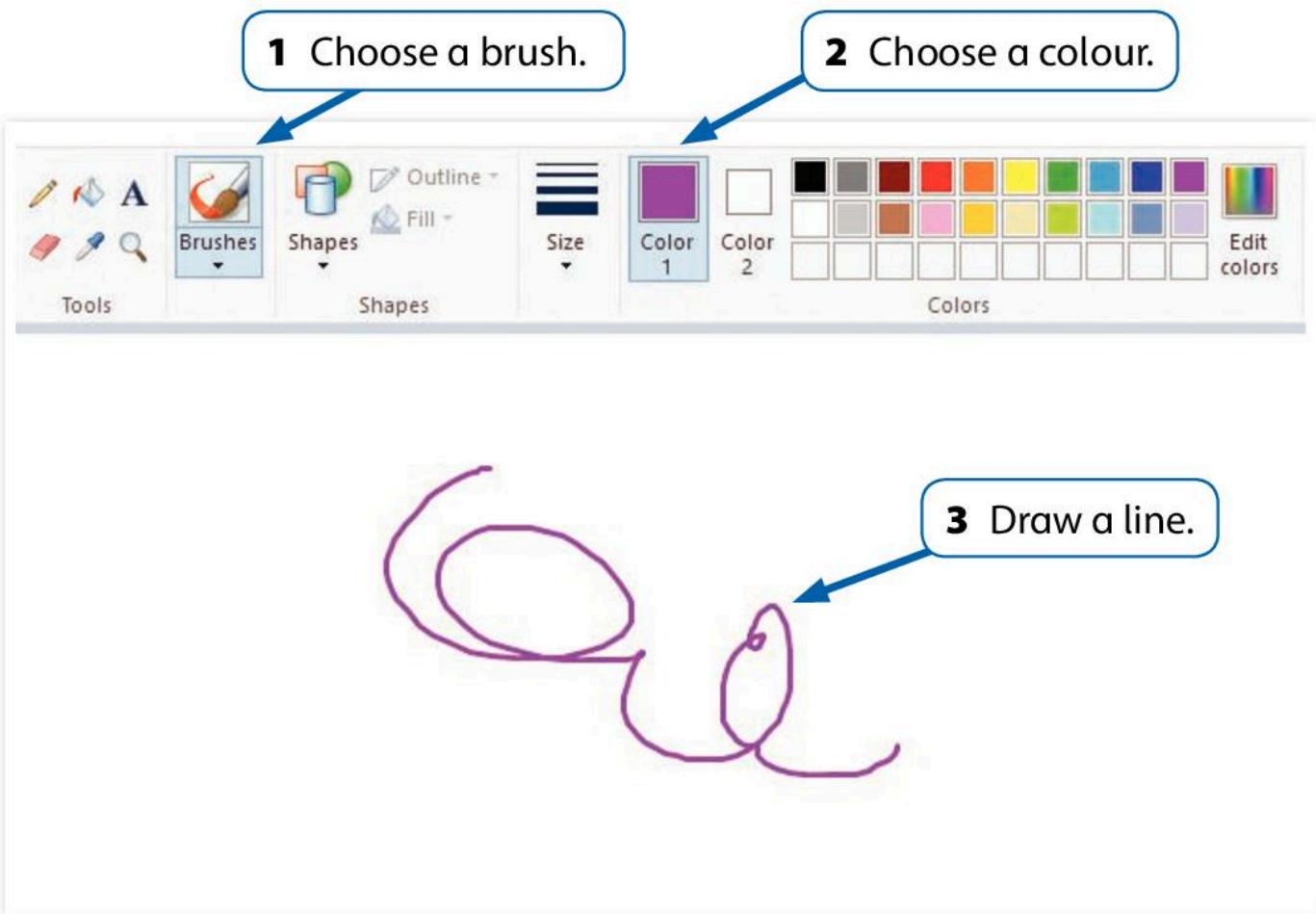
You can draw lines and shapes.

## Draw lines

Here is a drawing program. The white area is called the **canvas**. The canvas is where you can draw.



Above the canvas is a toolbar. The **toolbar** is a line of buttons. Click on a button to choose what the computer will do.



## Activity

Draw a face on the canvas.



## Extra challenge

Which button changes the size of the brush? See what happens when you click the button.

## Think again

Plan a drawing on paper, then try to make the drawing on the screen.

## 5.2

# Drawing shapes

## In this lesson

You will learn:

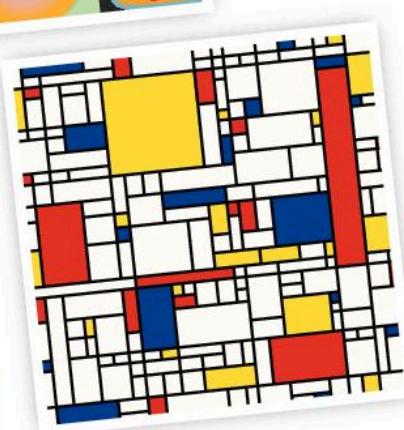
- how to draw shapes.



## Shapes

You can make amazing **images** using shapes. An image is a picture or part of a picture.

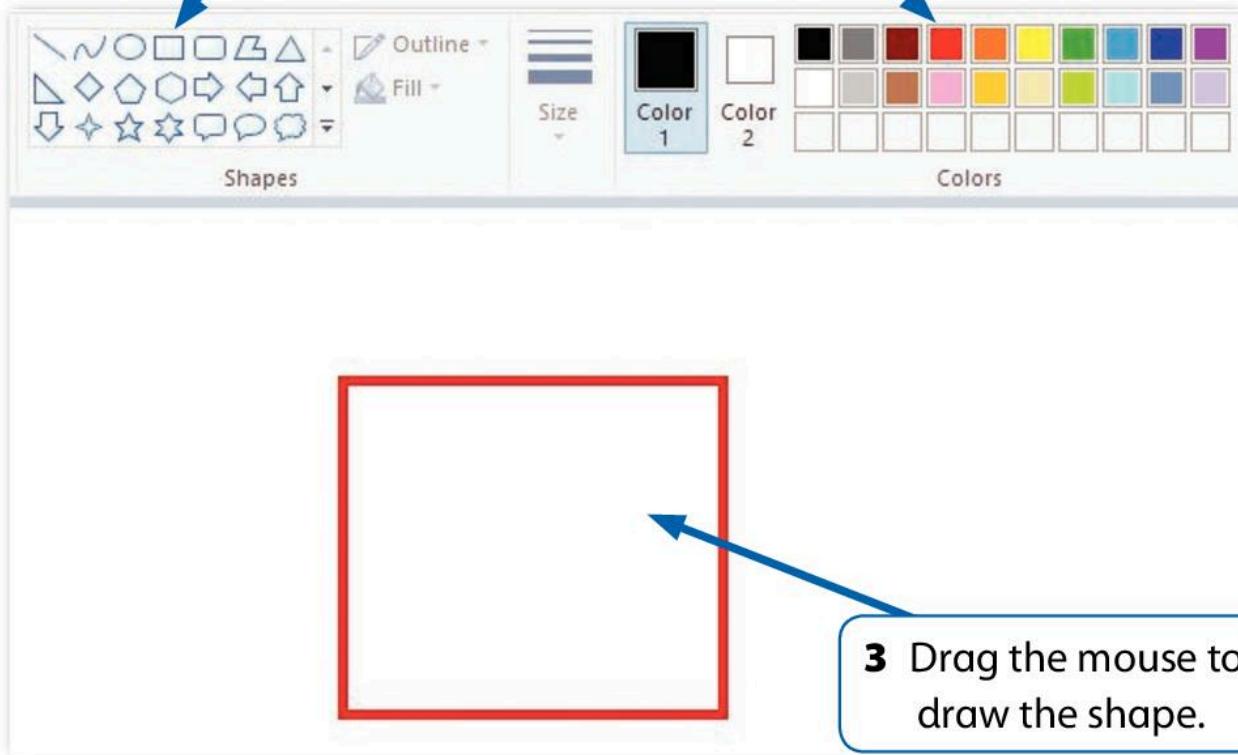
This image uses squares and rectangles.



## Draw a shape

1 Choose a shape.

2 Choose a colour.

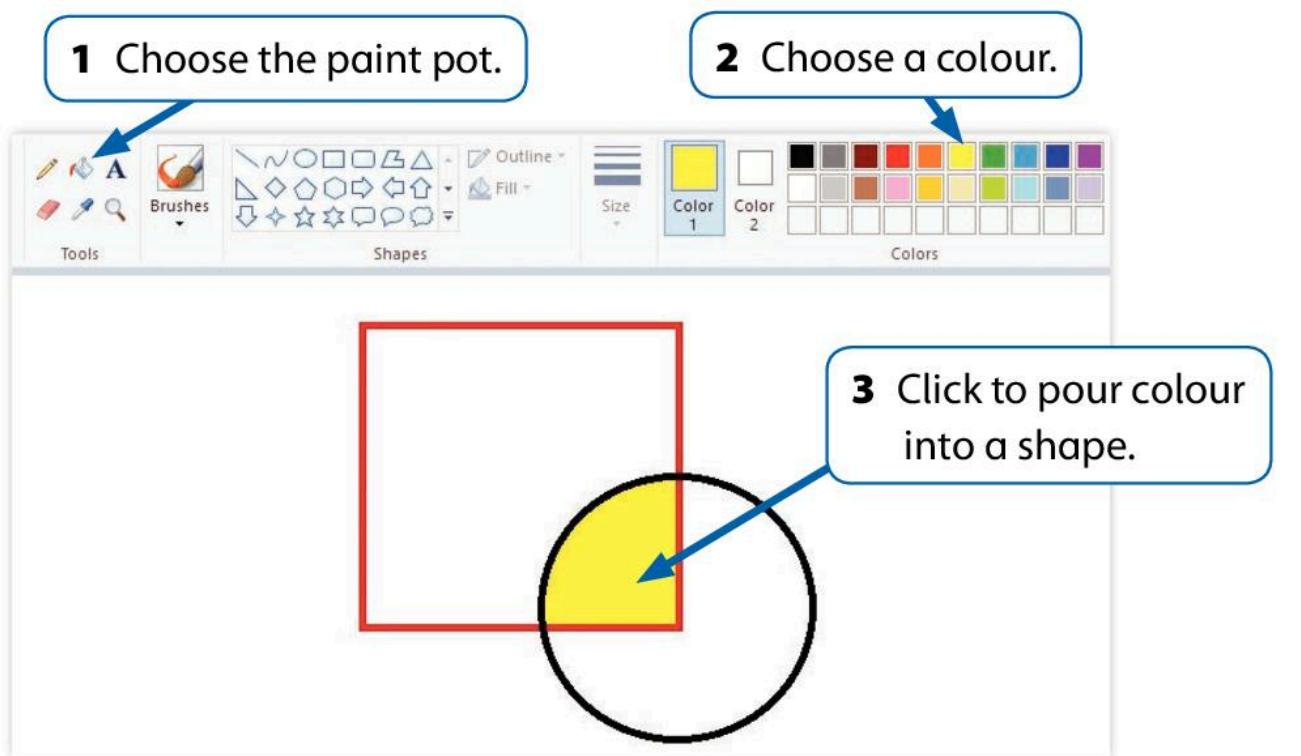


The image shows a digital drawing interface. At the top, there are two toolbars: 'Shapes' on the left containing various geometric icons and 'Colors' on the right with a color palette and sliders for 'Color 1' and 'Color 2'. A large red rectangle is drawn on the canvas below. Three numbered steps with arrows point from the text to the interface: Step 1 points to the 'Shapes' toolbar, Step 2 points to the 'Colors' toolbar, and Step 3 points to the red rectangle on the canvas.

3 Drag the mouse to draw the shape.

## Fill with colour

The paint pot shape 'pours' paint into the shapes you make.



### Activity

Draw a shape on your screen. Fill the shape with colour.



### Extra challenge

Draw shapes that overlap. Use colours to fill the areas where they overlap.

### Think again

What feeling does your image give you? Do you think different colours make you feel different feelings?

## 5.3

# Erasing and undoing

## In this lesson

You will learn:

- how to rub out mistakes.

## Making mistakes

Drawing can be hard. We sometimes make mistakes.

What do you do if you make a mistake when you draw?

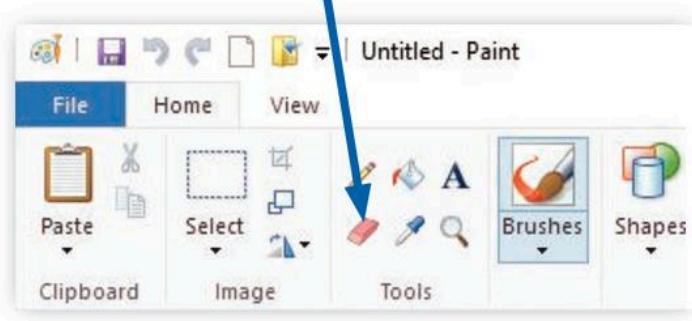
### Erase

You can use an eraser to rub out a mistake on paper.

A drawing program has an eraser too.



Eraser tool



### Undo

What if you do something wrong in an image? 'Undo' reverses what you did.

Press and hold down the 'Control' key on your keyboard.

Now press the letter 'Z' on your keyboard.





## Activity

Draw a face with a circle for a nose. Erase it and put a triangle instead. Which is best?



## Extra challenge

Draw a face by putting shapes together. Now draw one with a line. Which is best?

Think again

Artists use many different shapes for noses.



Can you see all the shapes and colours this artist has used?

## 5.4

# Save for another time

## In this lesson

You will learn:

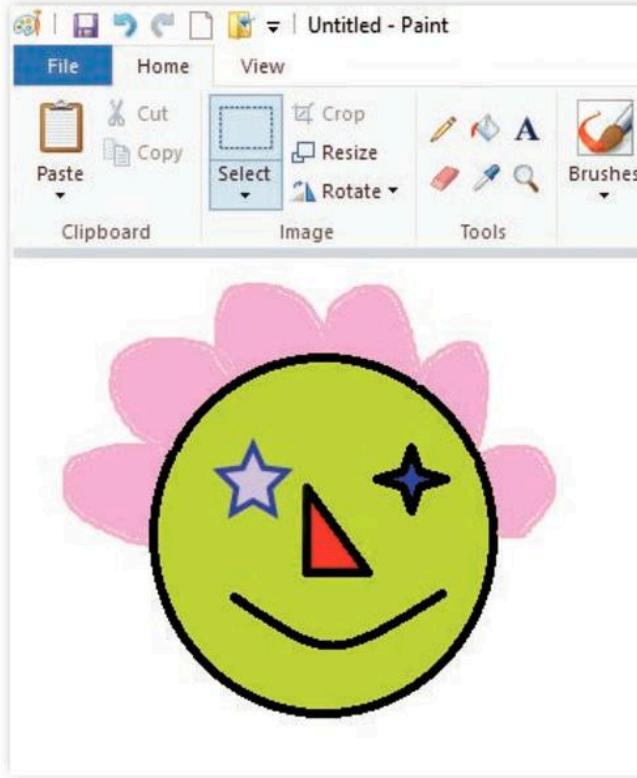
- how to save your work.

## What does save mean?

When you switch the computer off your work is lost.

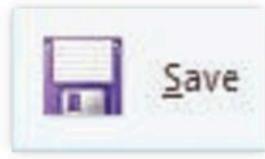
But you can save your work for another time.

Draw an image on the screen. Then save the image.



## How to save

Find the 'Save' button. The 'Save' button is at the top of the screen.



Click on the 'Save' button. The button will save your work.

## File name

Your work is saved as a **file**. A file is a place to keep information on a computer. Type a name for the file.

File name:	funny face
Save as type:	24-bit Bitmap (*.bmp;*.dib)

The file name should remind you what is in the file.

## New image

Now your work is saved you can start a new image. Click the 'New' button to make a new image.

You will see a new blank canvas ready to make your next image.



### Activity

Draw a face. Save the face using the file name: 'face'.



### Extra challenge

Start a new image. Save the new image using a new file name.

### Think again

What makes a good file name?

# 5.5

# Bring back your file

## In this lesson

You will learn:

- how to open a saved file
- how to make changes and save again.

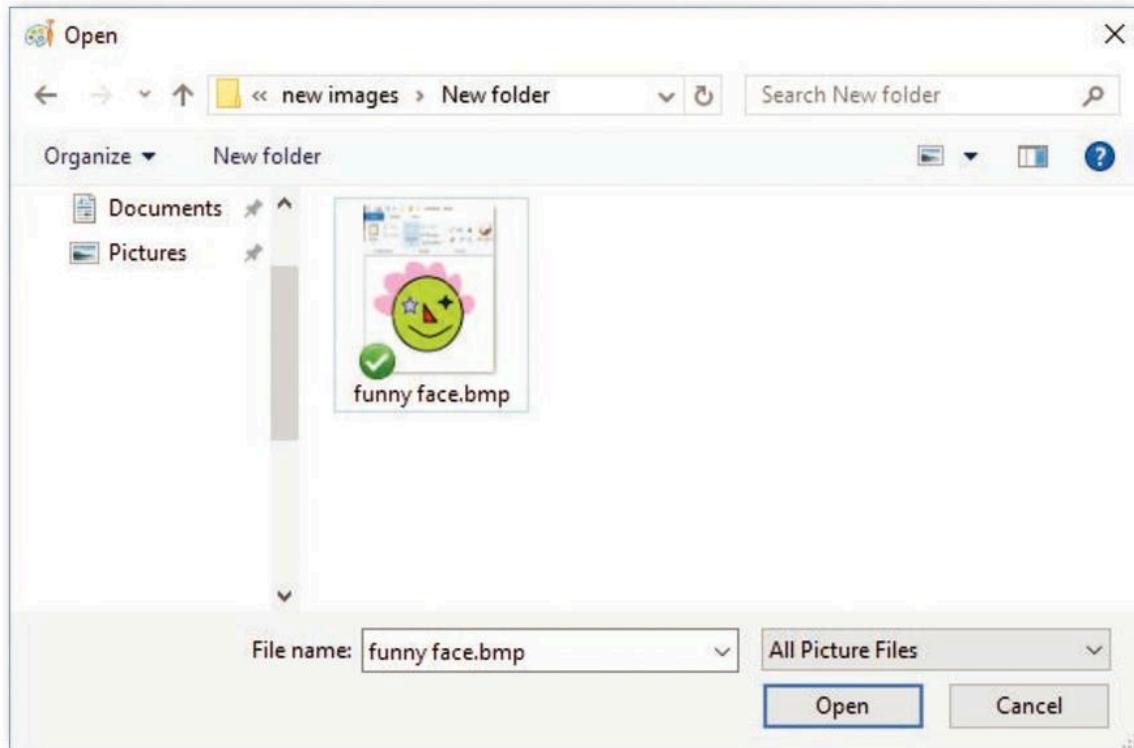
## Open a file

When you start work you see a new empty screen.

Now you will open the file you saved last time.

Click the 'Open' button.

You will see all the images you have saved.



**Double-click** the file you want to open. Double-click means click twice quickly.

## Make changes

Now you can make changes to the image. You can use the eraser to rub things out. Or you can draw on top of the old image.



## Save with a new name

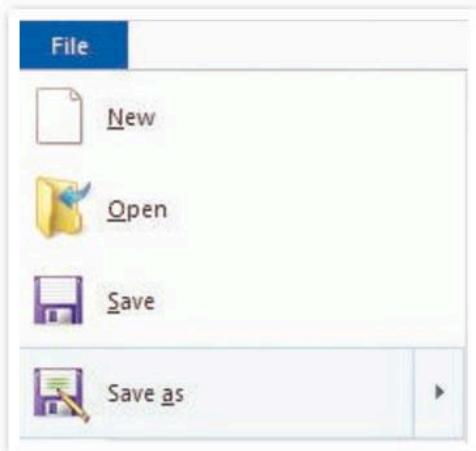
Click on the word 'File' at the top of the screen. Choose 'Save as' from the menu.

Type a new file name.



### Activity

Open the file you made last time. Make one change and save the file using the 'Save' button.



### Extra challenge

Use 'Save as' to save your file using a new file name.

### Think again

Why is it useful to be able to change a picture or slide you have made?

# 5.6

# Move and swap

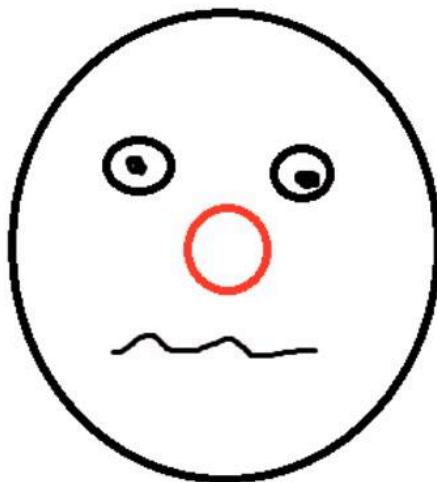
## In this lesson

You will learn:

- how to select and move parts of the image.

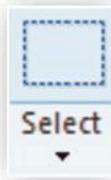
## Swap noses

A student drew two funny faces. Then she decided to swap noses.

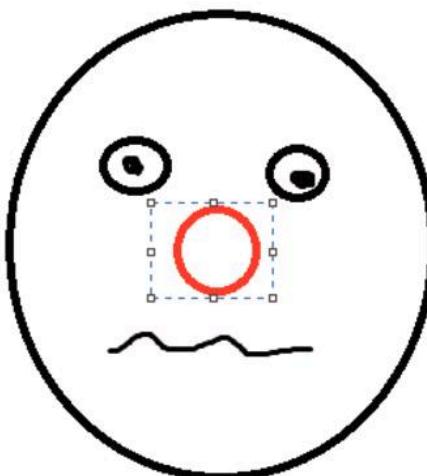


## Select

You can select part of the image that you made.  
Click on the 'Select' button.



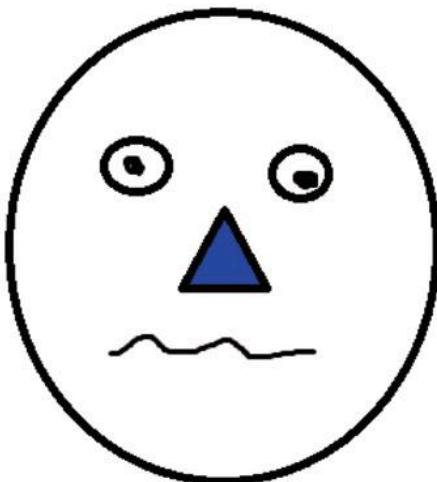
Now drag the mouse. You can drag a line around any part of the screen.



## Move

Now you can drag the selected part. You can move it to a new place. Or a new face!

The student swapped noses between the two faces.



## Activity

Draw two funny faces and swap noses like you see here.



## Extra challenge

Draw two animals, such as a cat and a mouse. Use select and move to swap the animals' tails.



## Explore more

Paint a funny face using lots of colours and shapes.  
Now try to make the face using computer software.  
Make a display in class of both types of image.

# Check what you know

## You have learned

- how to draw lines and shapes on a computer
- how to colour images on a computer
- how to move images around the screen.

## Test

Here is an image made by a student using a computer.



Show or tell to answer the questions.

- 1 Show or tell how to make a star shape.
- 2 Show or tell how you could rub out the blue star.
- 3 Show or tell how you could move the red star to a new place.



## Activities

This image shows a house. It is made of a triangle and a square.

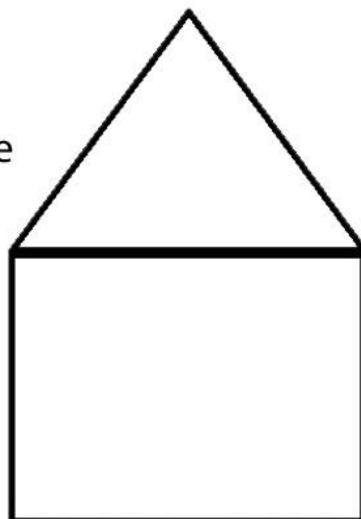
- 1 Draw the square shape of the house.

Draw a triangle roof.

- 2 Add windows and a door.

- 3 Make the image more colourful. If you have time, add something else to your house.

You could add a chimney, curtains or a door handle.



## Self-evaluation

- I answered test question 1.
- I did activity 1.
- I answered test questions 1 and 2.
- I did activities 1 and 2.
- I answered all the test questions.
- I did all the activities.

Re-read any parts of the unit you feel unsure about. Try the test and activities again – can you do more this time?

# 6

# Numbers and data: Toys long ago

## You will learn

- how to put words and numbers into the computer
- how to change words and numbers stored on the computer.

Computers can store numbers.

Computers can work out the answers to sums.



## Talk about...

What kinds of toys do you think children had long ago?





## Class activity

Your teacher will say the names of different toys children played with long ago. Put your hand up if you like the toy.

Which toy gets the most hands up?



cell spreadsheet  
label value data  
edit select



## Did you know?

The numbers we use in spreadsheets today, 1, 2, 3 and so on, were developed in India and Arabia over one thousand years ago.



# 6.1

# Toys from the past

## In this lesson

You will learn:

- how to find numbers using counting
- how to record your answers.

## Counting

Imagine you are an archaeologist.

An archaeologist is a person who finds out about the past by digging up things people have made. They go on digs to find old things.

Imagine you are on a dig and you find some old toys.





## Activity

Look at all these old toys you have found!



Write the word 'ball'. Next to it, write down how many balls you see.

Write the word 'bear'. Next to it, write down how many bears you see.

Write the word 'car'. Next to it, write down how many cars you see.



### Explore more

Count the toys you see in your home, or in a newspaper or magazine.

What different kinds of toys can you see?



### Digital citizen of the future

What sorts of jobs use numbers?

## 6.2 Cells

### In this lesson

You will learn:

- what a spreadsheet is
- how to choose a cell in a spreadsheet.

### A spreadsheet

A **spreadsheet** looks like a grid on the screen. There are lines and boxes.

File Home Insert Draw Page Layout Formulas Data

Paste Condition  
Clipboard Format  
Font Cell Sty

A1    fx

1	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Each box is a **cell**.

Here are letters.

Here are numbers.

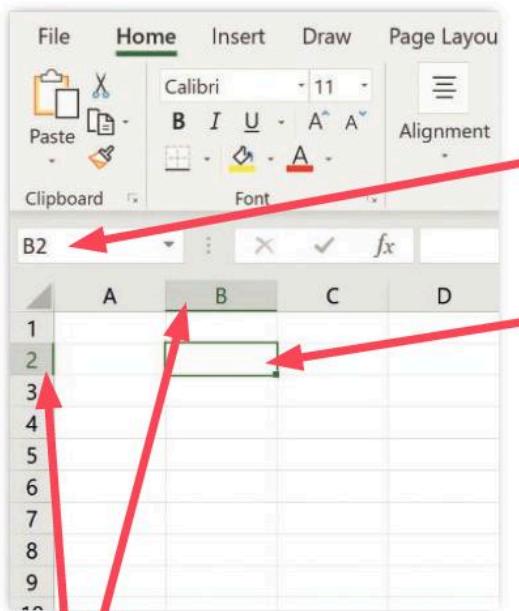
You can name each cell using letters and numbers.

The first cell is A1. The cell is in the A column. The cell is in row 1.

## Select a cell

Move the mouse pointer to a cell. The mouse pointer looks like a cross.

Click the left mouse button. You **select** the cell. Select means you have chosen the cell.



Here is the name of the cell.

Cell B2 is selected. Cell B2 has a dark border.

Column B and row 2 are shaded.



### Extra challenge

Select a cell and type your name into it.



### Activity

You will see a spreadsheet open on your screen.

Move the mouse pointer to these cells.

A1      C3      E8      B4      F10

Click to select each cell.

### Think again

**Data** is the name for information that we type into a computer. Names are one example of data. Can you think of any other types of data?

# 6.3 Labels

## In this lesson

You will learn:

- what labels are
- how to enter labels into a spreadsheet.

## Labels

You can use **labels** in a spreadsheet to talk about data.

A label is a word, or a small number of words.

The top of a spreadsheet looks like this.

The screenshot shows a spreadsheet interface with the following elements:

- Ribbon:** File, Home, Insert, Draw, Page Layout, Formulas, Data.
- Clipboard:** Paste, Cut, Copy, Undo, Redo.
- Font:** Calibri, Size 11, Bold (B), Italic (I), Underline (U), Alignment, Number, Conditional Formatting, Format as Table, Cell Styles.
- Cells:** A1 is the active cell, highlighted with a green border. Other cells A through F and rows 1 through 11 are visible.
- Toolbar:** A1, fx, etc.

A red arrow points from a callout bubble to the A1 cell, which is highlighted with a green border. The callout bubble contains the text "Cell A1 is selected."



## Activity

Imagine you are an archaeologist finding old toys.  
You want to make a list of the toys you have found.  
You can enter labels by typing them in a cell.

Click cell A1.

Type the label: 'Toys'.

Press 'Enter'.

Your spreadsheet should look like this.

Think  
again

Which cell in  
this spreadsheet  
has a label in it?

A screenshot of a Microsoft Excel spreadsheet. The ribbon at the top shows tabs for File, Home, Insert, Draw, Page Layout, Formulas, and Data. The 'Home' tab is selected. The toolbar below has buttons for Paste, Font (Calibri, size 11), Alignment, Number, and Conditional Formatting. The formula bar shows 'A1' and 'Toys'. The main area shows a single cell A1 containing the text 'Toys'. A red arrow points from a callout box labeled 'Here is the label.' to the cell A1.

	A	B	C	D	E	F
1	Toys					
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						

Save your spreadsheet as a file called: 'Toys'.

This is an example of an ancient toy.  
It is a dove on wheels from the  
5th century BCE.



## 6.4 Making a list

### In this lesson

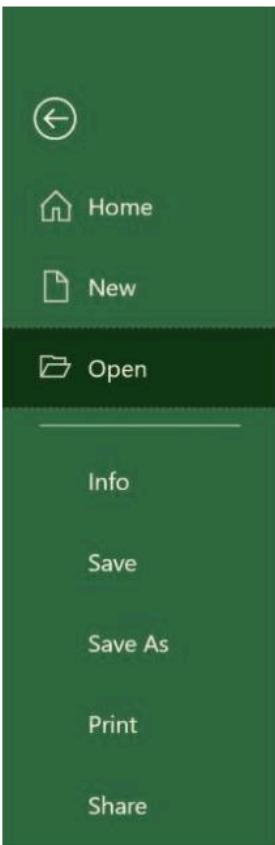
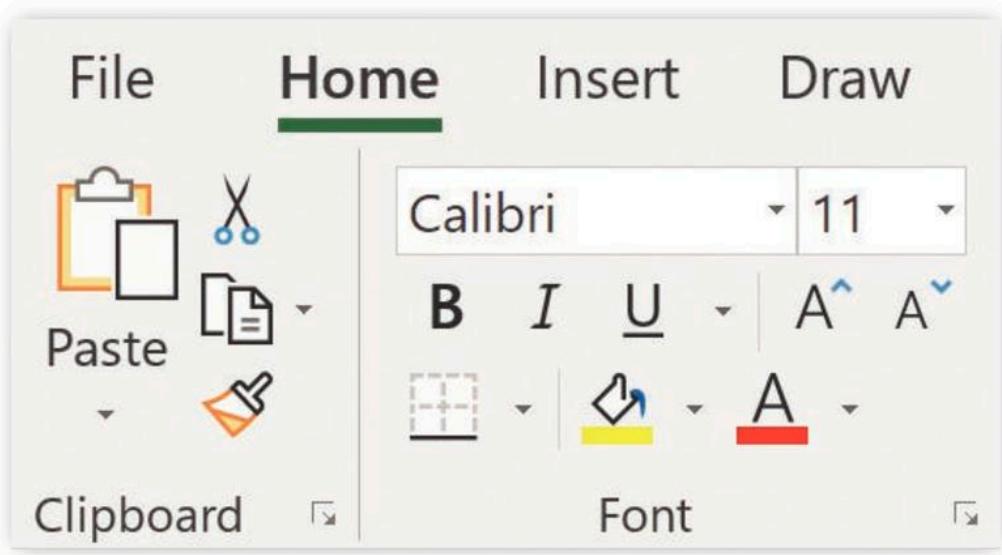
You will learn:

- how to make a list in a spreadsheet.

### Open a file

Open your file called 'Toys'.

Click 'File' with the left-hand mouse button.



Click 'Open' with the left-hand mouse button.

Click the file called 'Toys' with the left-hand mouse button. You might need to double-click. **Double-click** means click two times quickly.

Imagine you are an archaeologist. You will add the labels for toys you have found on your dig.



## Activity

Make a list in your spreadsheet of the types of toys that children played with long ago.

In cell A2 type: 'ball'.	
In cell A3 type: 'doll'.	
In cell A4 type: 'game'.	
In cell A5 type: 'animal'.	

Think again

Say one more type of toy you could add to this list.

## 6.5

# Number values

## In this lesson

You will learn:

- what spreadsheet values are
- how to enter values into a spreadsheet.

Numbers in a spreadsheet are called **values**.

Each cell holds a label or a value.

Now you are going to type in the values for each toy.

The screenshot shows a Microsoft Excel spreadsheet. The ribbon at the top has tabs for File, Home, Insert, Draw, and Page Layout. The Home tab is currently selected. The 'Clipboard' group contains Paste, Copy, and Paste Special buttons. The 'Font' group includes Calibri font, font size 11, bold (B), italic (I), underline (U), superscript (A<sup>1</sup>), subscript (A<sub>1</sub>), Alignment, and Font Color buttons. The formula bar shows 'B1' in the active cell. Below the formula bar are buttons for Undo (X), Redo (✓), and Enter (fx). The main area shows a table with columns A and B. Column A contains rows 1 through 5 with labels: Toys, ball, doll, game, and animal. Column B contains rows 1 through 5 with values: Number of toys, 1, 2, 3, and 4. Row 6 is empty. Red arrows point from two callout boxes to specific cells: one arrow points to cell B1 with the text '1 Click cell B1. Type: "Number of toys"', and another arrow points to cell B2 with the text '2 Click cell B2. Type any number of balls you like.'

	A	B
1	Toys	Number of toys
2	ball	1
3	doll	2
4	game	3
5	animal	4
6		
7		
8		
9		



## Activity

Type number values next to each label in your spreadsheet. You can choose any numbers you like. Think about how many toys children might have had long ago.

Remember to save your file.



### Digital citizen of the future

This is the type of ball children played with in Ancient Egypt.



Do you think children long ago had many toys? Or did they just have a few?

What kinds of toys can you imagine in the future?

Think again

Think of two more toys you could add to column A in the spreadsheet.

# 6.6 Editing

## In this lesson

You will learn:

- how to edit values in a spreadsheet.

## Changing values

Imagine you are an archaeologist. You have put information about old toys into a spreadsheet.

Now imagine you have found more toys!

You need to change the values in the spreadsheet. When you **edit**, you make changes to a file.

Open your file called 'Toys'.

Look at the labels and values in the spreadsheet.



		File	Home	Insert	Draw	Page Layout
		Paste	Calibri	Font	Font	Font
		Clipboard	B I U	A A	Font	Font
B5						
	A	B	C	D		
1	Toys	Number of toys				
2	ball	1				
3	doll	3				
4	game	6				
5	animal	2				
6						
7						
8						
9						

1 Click on a cell to select it.

2 Type in the new label or value.



## Activity

Change the values in your spreadsheet.

Add one ball.	
Add three dolls.	
Add two games.	
Add one marble.	
Add one animal.	

Save your file as: 'Found toys edited'.

Think  
again

How many toys are  
there altogether?

# Check what you know

## You have learned

- how to put words and numbers into the computer
- how to change words and numbers stored on the computer.



## Activities

This spreadsheet is called 'Toys Test'. Make sure it is open and ready to use.

The screenshot shows a Microsoft Excel spreadsheet titled 'Toys Test'. The ribbon at the top has tabs for File, Home, Insert, Draw, Page Layout, and Formulas. The 'Home' tab is selected. The toolbar below the ribbon includes buttons for Paste, Font (Calibri, size 11), Alignment, and Number. The formula bar shows cell B6 and the value 5. The spreadsheet contains the following data:

	A	B	C	D
1	Toys	Number of toys		
2	ball	3		
3	doll	2		
4	game	4		
5	marbles	1		
6	animal	5		
7				
8				
9				

- 1 Type the word 'Teddy' in cell A7.
- 2 Type the number '1' in cell B7.
- 3 Type your name in an empty cell.
- 4 Save the file with a new file name.

## Test

Show or tell how you work with a spreadsheet.

- 1 Draw the thing you use to select a cell.
- 2 Name the thing you use to type words.
- 3 A cell is called C3. Explain what that means.

## Self-evaluation

- I answered test question 1.
- I did the first activity.
- I answered test questions 1 and 2.
- I did activities 1 and 2.
- I answered all the test questions.
- I did all the activities.

Re-read any parts of the unit you feel unsure about. Try the test and activities again – can you do more this time?



# Glossary

**backdrop** the backdrop is the picture at the back of the stage when you make a program with Scratch

**block** a Scratch program is made of blocks. The blocks are shapes that fit together. Each block makes the computer do one thing

**browser** software that helps us find and see information on the internet

**canvas** the area of the screen where you draw and paint when you make a picture using software

**cell** each box in a spreadsheet

**computer** a machine that can work quickly to make changes to data



**content** anything we see or create, for example, on the internet

**costume** in the Scratch program the sprite can have different looks. For example, Scratch can have his legs in two different positions. Each different look is called a costume

**courteous** to be polite and think about other people

**data** pieces of information, for example, numbers stored in a spreadsheet

**double-click** to click twice quickly

**drag** to hold down the mouse button and move the mouse. When you drag, you move something across the screen

**drag and drop** to move something across the screen and place it somewhere else

**duplicate** to make two of something

**edit** to make changes to a file

**file** a place to keep information on a computer

**hyperlink** if you click on a hyperlink, you move to a different place in a website or on the internet

**icon** a little picture. When you click on an icon the computer does something



**image** a picture or part of a picture

**input** something you do to control the computer or put data into the computer. You can use the keyboard and mouse for input

**internet** computers all over the world are connected. We call all these connected computers the internet

**keyboard** buttons with letters, numbers and symbols that you use with your computer. When you press on the keyboard buttons, the letters, numbers and symbols show on the screen



**label** words in a spreadsheet



**laptop** a small computer you can carry

**menu** a list of things that you can choose from, for example, on a website

**mouse** a small tool you move with your hand or finger to move the mouse pointer on the screen. A mouse is used for input



**mouse pointer** a little arrow. When you move the mouse, the mouse pointer moves too

**output** something that comes out of the computer. The computer makes output, for example, sounds or pictures on the screen

**personal information** information about your life, for example, your name, your address or your school. Personal information can be words as well as pictures

**program** a set of instructions. The instructions tell the computer what to do

**right-click** click the right button of a mouse

**run** when you run a program the computer carries out the commands in the program

**Scratch** a programming language for children.

The programs are made of blocks. Each block stands for a command

when green flag clicked

**screen** the place on your computer where you can see the things you type, or other information

**scrolling** documents and web pages can be quite big. You can't see the whole page on the screen. Scrolling lets you look through the page a bit at a time

**search engine** software that searches for websites using words that you type into the computer



**select** you choose an item on the screen by clicking it with the mouse. Then you can work with that item. One example is a spreadsheet cell

**shape** the outline of something, for example, a circle or a square

**sound output** the computer makes sounds. These sounds are sound output

**spreadsheet** a grid of cells with rows and columns that you put words and numbers into

**sprite** a sprite is a picture on screen. A program makes the sprite move. Scratch the cat is a sprite

**stage** the stage is where a sprite moves

**start block** a type of Scratch block that shows what action will start the program

**technology** any machine that people use to do tasks or solve a problem

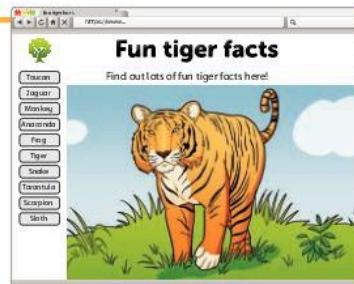
**title bar** the place that shows the name of the file you are working with, for example, the name of a web page

**toolbar** a collection of icons. If you click on an icon the computer will do something

**value** an item of data; a spreadsheet can hold number values

**visual output** the screen shows visual output

**web page** a page on the internet



**website** a set of web pages

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UNIVERSITY PRESS

Great Clarendon Street, Oxford, OX2 6DP, United Kingdom

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First published in 2019

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British Library Cataloguing in Publication Data

Data available

ISBN 978-0-19-849779-0

1 3 5 7 9 10 8 6 4 2

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Printed in China by Golden Cup

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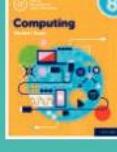


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ISBN978-0-19-849779-0



9 780198 497790