Barefoot

Unlock the future of your classroom

Recommended for **ages 9–11**

Unit: Pizza Party

Overview

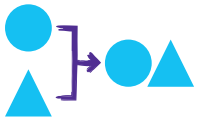
Principal partners

BT Computing at School

Concepts and approaches covered


Logic


Evaluation


Algorithms


Decomposition


Search Technologies

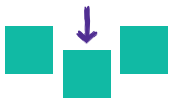

Creating


Debugging


Abstraction


Perseverance


Collaborating


Tinkering

Pizza party

This unit introduces pupils to data modelling using spreadsheets through a class pizza party theme. They develop their core computational thinking skills of abstraction, logic, decomposition, algorithms and evaluation and combine different types of software to present their work.

Software and hardware

You will need access to spreadsheet software such as Microsoft Excel, Apple Numbers or Google Sheets for this unit.
You will also need basic photography equipment and the space and equipment to make and cook pizzas.

National Curriculum Coverage (KS2)

- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms
- Use search technologies effectively, and be discerning in evaluating digital content
- Use technology safely, respectfully and responsibly

Useful websites for further research:

- **BBC Bitesize resources on Italy – https://www.bbc.com/bitesize/subjects/z9qmhyc**
- **Introduction to spreadsheet animations from HWB – https://hwb.gov.wales/repository/resource/88135d67-0564-4efc-b2b2-c8f693dbbd79/en**

Unit overview

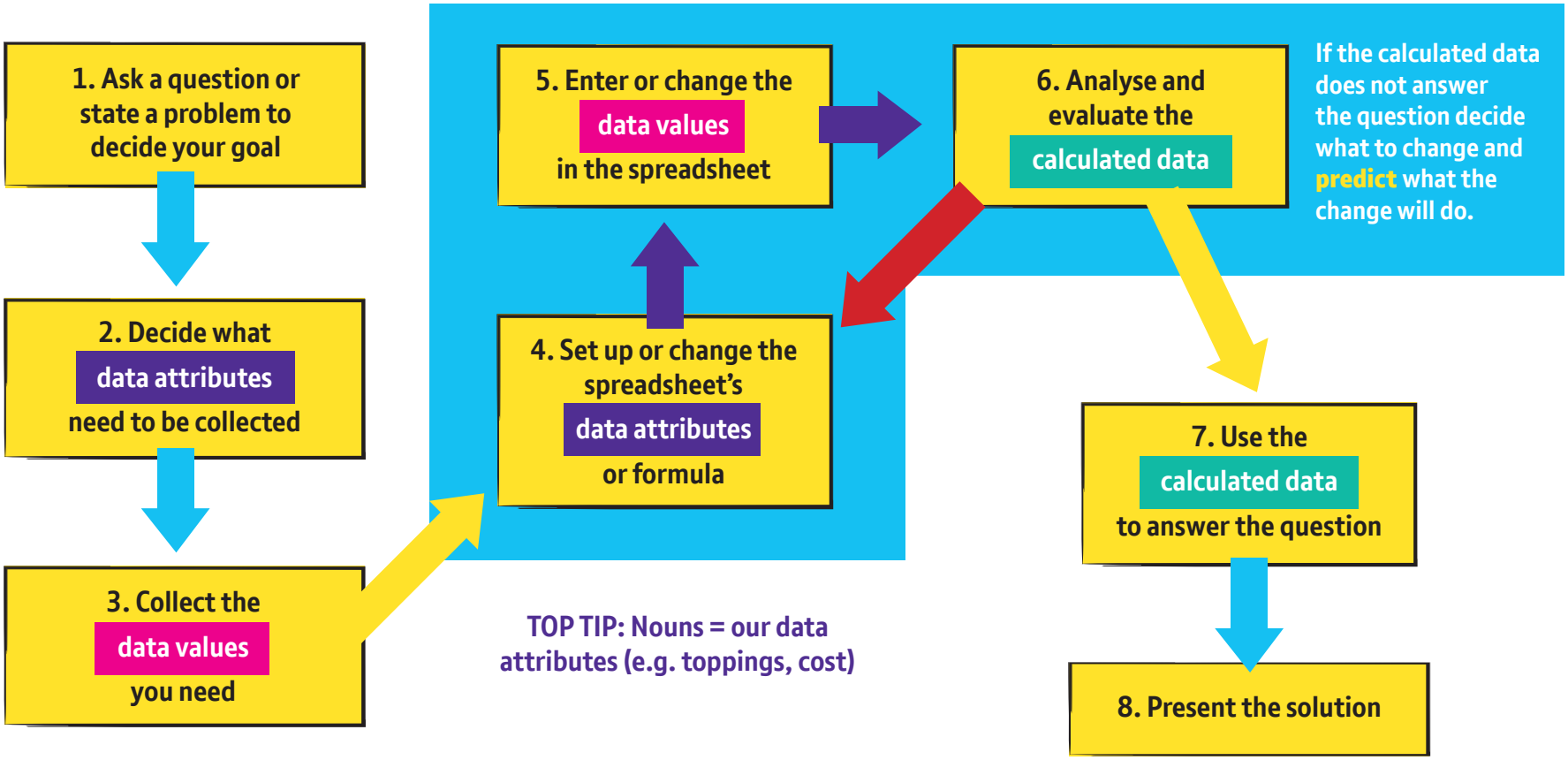
Lesson	Discover Italia!	Pizza Party Planning	Pizza Pricing	Pizza Making & Pizza Party	Evaluating & Presenting
Overview	In this introductory lesson, pupils research an aspect of Italy and present their information to the class. They generate a quiz about Italy and take this home to test their family.	In this lesson pupils start to prepare for their pizza party. They are introduced to data collection and spreadsheets as they choose their pizza toppings.	In this lesson pupils are introduced to data modelling as they work out the costs of their pizzas.	In this lesson pupils make their pizzas and the class enjoys a pizza party!	In this final session, pupils create a presentation to illustrate their learning from this unit and evaluate their work. This may take more than 1 lesson.

Computing concepts and approaches	• Pupils **collaborate** to **search** for information on their topic and present it to their audience
	• Pupils develop their understanding of copyright considerations and **evaluation** as they **create** their work and offer feedback
		• Pupils **decompose** the task of a planning a pizza party
		• To solve a problem or complete a task, pupils:
		  • **abstract** the problem to work out what data attributes are needed
		  • collect the data
		  • enter the data into a data structure (in this case the data structure is a simple table (array) in a spreadsheet)
		  • use **logical reasoning** to analyse the data
		  • use the data to solve the problem
		• Pupils use **logical reasoning** as they are introduced to the =SUM() function and basic spreadsheet features
			• Pupils start to develop an understanding of **data modelling** as they using **logical reasoning** to predict and evaluate changes to the data and formula in spreadsheets	• Pupils **debug** and follow a recipe **algorithm** to **create** their pizza	• Pupils **create a presentation** illustrating their learning in this unit and developing their **digital literacy** skills
					• Pupils collaborate with their peers to **evaluate** each other's work

Cross-curricular links	**Languages:** listen attentively to spoken language and show understanding by joining in and responding **Design and technology:** prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques **Mathematics:** recall multiplication and division facts for multiplication tables up to 12 × 12 **Mathematics:** Statistics attainment targets appropriate to your class such as complete, read and interpret information in tables, including timetables				

Data modelling in spreadsheets

Using data to answer a question with a spreadsheet



The diagram above illustrates the steps in problem solving using a spreadsheet.
These steps are described in the table below with examples from this unit of lessons.

The problem is defined (Step 1)	In this unit, the problems are pre-defined for pupils. In lesson 2, it is to determine how many pupils would like each topping and in lesson 3 it is to determine the cost of the ingredients and total cost.
We abstract the problem to work out what data attributes are needed (Step 2)	In lessons 2 and 3, pupils are asked to think-pair-share what data attributes are needed to solve the problem. Check to see if pupils arrive at the same attributes as in the spreadsheet.
We collect the data values to be entered (Step 3)	In lesson 2, pupils collect the data by asking their peers which toppings they would like to select. In lesson 3, the pupils do not collect any data – this data is provided in the lesson plan or collected by the teacher.
We implement, in a spreadsheet, a data structure – in this case rows and columns (an array) to hold our data. We also add formula into our spreadsheet to generate calculated data (Step 4)	In lesson 2, the Barefoot team have set up the spreadsheet with the data attributes and formula. In lesson 3, the Barefoot team have set up the spreadsheet with some of the data attributes, data values and formula.
We enter or change the data values in the spreadsheet (Step 5)	In lesson 2, pupils enter the data values into the spreadsheet such as their name and a 1 to indicate a topping has been selected. In lesson 3, pupils enter the data values of ingredient cost and the number of pizzas the ingredient will make.
We analyse and evaluate the calculated data (Step 6)	In lesson 2, the calculated data is the total number of pupils who have selected each topping. In lesson 3 the calculated data is the cost of each ingredient and the total cost of all ingredients.
If we are satisfied that our calculated data answers our problem, then we use this to answer the question (Step 7) and present our solution (Step 8).	In lesson 2, the calculated data gives us the answer to the original question which is the total number of pupils selecting each topping. In lesson 3, the calculated data gives us the answer to the original question which is the cost of each ingredient and the total cost.
If we are not yet satisfied our calculated data answers our problem decide what to change and predict what the change will do.	
Make repeated changes to our data attributes or formula (Step 4) or data values (Step 5) until we are satisfied our calculated data answers our problem – then we use our calculated data to answer the question (Step 7) and present our solution (Step 8)	If our calculated data doesn't yet answer the question we explore the model by deciding what to change and predicting what the change will do, for example: In lesson 2: - We might notice we have missed a pupil and therefore add the extra data value. - We might notice we have missed a topping and add the data attribute and data values for this new selection - We might suspect we've made an error in our =sum() formula and missed one of the values. In lesson 3: - We might notice we have missed an ingredient and add the data values - We might suspect there is an error in our formula which we need to explore.

Glossary of data terms

Data attribute	The data which needs to be collected (Top tip: this is usually a list of nouns, such as ‘pupil name’ and ‘cheese selected’ etc)
Data value	The values collected for data attributes
Data collection	Gathering data values
Data structure	The arrangement of the data attributes e.g. an array or rows and columns such as a spreadsheet
Raw data	The data we have entered into our data structure
Calculated data	The data that has been calculated from our raw data using formula in our spreadsheet

Get more **Barefoot**

Unlock the future of your classroom

Have you had a great Barefoot workshop, or delivered a fun computer science lesson? Send us your comments and pictures via our social channels to help get more teachers involved!

@BarefootComp

/barefootcomputing

barefootcomputing.org

You can start your journey here

Principal partners

BT

Computing at School

Supported by

bcs

openreach

Department for Education

Education Scotland Foghlam Alba

Gwelthio mewn partneriaeth gyda Llywodraeth Cymru
Working in partnership with Welsh Government

Department of Education
www.education-ni.gov.uk

Version 0518 Expires Dec 2021