

DigiTech Scheme of Work

Unit 6.9 -

Spreadsheets

(with Google Sheets)

Contents

Pre-requisites	4
Saving work	4
Printing.....	4
Mathematics skills	4
Vocabulary	4
Medium-Term Plan	5
Lesson 1 – What is a Spreadsheet?.....	7
Aims.....	7
Success Criteria	7
Resources.....	7
Activities	7
Lesson 2 – Basic Calculations	9
Aims.....	9
Success Criteria	9
Resources.....	9
Activities	9
Lesson 3 – Modelling	10
Aim.....	10
Success Criteria	10
Resources.....	10
Activities	10
Lesson 4 – Organising data	11
Aim.....	11
Success Criteria	11
Resources.....	11
Activities	11
Lesson 5 – Advanced Formulae and Big Data	13
Aim.....	13
Success Criteria	13
Resources.....	13

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Activities	13
Lesson 6 – Charts and Graphics	15
Aim.....	15
Success Criteria	15
Resources.....	15
Activities	15
Lesson 7 – Using a Spreadsheet to Plan a Cake Sale	16
Aim.....	16
Success Criteria	16
Resources.....	16
Activities	16
Lesson 8 Using a Spreadsheet to Solve Problems	18
Aim.....	18
Success Criteria	18
Resources.....	18
Activities	18
Assessment Guidance	19

Pre-requisites

Saving work

Have a clear idea about where children should save their work. The lessons assume that children know about folders and files on whichever network they are using. If they do not, it might be worth spending some time teaching about files and folders and the difference between saving in the cloud, saving on the school server or saving on the device itself where any of these methods are used within your setting. It would be useful for children to know how to create folders so that they can organise their files if they have the security rights to do this. These skills are not used much within the lesson plans but will be important for children's ongoing work with the files that they produce.

Printing

Children will not be routinely required to print during these lessons though lesson 8 does include considerations when printing. So, it is useful to have a connected printer available.

Mathematics skills

Children will be using their maths knowledge when working with spreadsheets in some lessons as spreadsheets have many mathematical applications. Children who struggle with maths might need additional support, however, the focus should be on support in using spreadsheets for the most part. In lesson 5, children will use averages, minimum and maximum values so familiarity with this in maths is useful.

Vocabulary

Children will be introduced to the following terms:

Alignment	Format	Row
Area	Formula(e)	Spreadsheet
Calculate	Function	Style
Cell	Graph	Sum
Cell reference	Graphics	Table
Chart	Model	Text Wrapping
Column	Open	Value
Data	Range	Workbook
Effects	Reference	

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Medium-Term Plan

Lesson	Title	Success Criteria
<u>1</u>	What is a Spreadsheet?	<ul style="list-style-type: none"> Children know some uses of a spreadsheet tool. Children can navigate around a spreadsheet using cell references. Children can enter data into cells. Children understand new vocabulary relating to spreadsheets: cells, columns, rows, cell names, sheets, workbook.
<u>2</u>	Basic Calculations	<ul style="list-style-type: none"> Children can use a spreadsheet to carry out basic calculations including addition, subtraction, multiplication and division formulae. Children can use the series fill function. Children recognise how using formulae allows the data to change and the calculations to update automatically.
<u>3</u>	Modelling	<ul style="list-style-type: none"> Children can use a spreadsheet to model a situation. Children can use a spreadsheet to solve a problem. Children can use the SUM function
<u>4</u>	Organising Data	<ul style="list-style-type: none"> Children can use a variety of methods including flash fill, convert text to tables and splitting cells for organising and presenting their data in a spreadsheet. Children know what is meant by a delimiter. Children understand how to sort data.
<u>5</u>	Advanced Formulae and Big Data	<ul style="list-style-type: none"> Children know how to incorporate formulae for percentages, averages, max and min into their spreadsheets. Children gain familiarity with range notation. Children know some shortcuts that help to make data meaningful. Children begin to develop a critical eye when it comes to the conclusions that can be made from data.

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<u>6</u>	Charts and Graphics	<ul style="list-style-type: none"> • Children know that there are ways to represent their data graphically and that spreadsheets can make the process of representing data easier. • Children gain an understanding of how a graphical representation can make data easier to interpret. • Children make a variety of charts using Sheets. • Children illustrate their data using sparklines and data bars.
<u>7</u>	Using a Spreadsheet to Plan a Cake Sale	<ul style="list-style-type: none"> • Children can understand how a spreadsheet can be used to plan an event. • Children understand the advantages of using formulae when data is subject to change. • Children have modelled a real-life situation using a spreadsheet.
<u>8</u>	Using a Spreadsheet to Solve Problems	<ul style="list-style-type: none"> • To apply all new spreadsheet skills to solving problems and presenting data. • To explore printing spreadsheets.

Lesson 1 – What is a Spreadsheet?

Aims

- To know what a spreadsheet looks like.
- To navigate and enter data into cells.

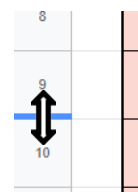
Success Criteria

- Children know some uses of a spreadsheet tool.
- Children can navigate around a spreadsheet using cell references.
- Children can enter data into cells.
- Children understand new vocabulary relating to spreadsheets: cells, columns, rows, cell names, sheets, workbook.

Resources

- Pupil Spreadsheet. This workbook contains examples that children will use in several lessons. These are in different sheets labelled by lesson number. Each child will need a copy of this to edit. Save the file somewhere accessible to all but ensure that each child saves their own copy before editing.
- Solutions and teacher demonstration spreadsheets are provided in **Teacher** Spreadsheet Examples.

NB Depending upon your display settings, the row heights of the rows in the example files might get compressed, you can drag the rows taller if you need to:



Activities

Introduction	Display slide 2 and outline the lesson aims.
	Display slide 3 and outline the success criteria
Using Google Sheets	Use slides 4-11 , clicking reveals further points and questions. Children could try out the actions on their own devices as the slides are used to demonstrate. Slide 11 - Navigation methods will vary if you are using the tablet version), check the version that children will use and demonstrate this version.
Activity: Cell References	Use slide 12 to explain the activity.

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Review Success Criteria	Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.
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Lesson 2 – Basic Calculations

Aims

- To introduce some basic data formulae in Sheets.
- To demonstrate how the use of Sheets can save time and effort when performing calculations.

Success Criteria

- Children can use a spreadsheet to carry out basic calculations including addition, subtraction, multiplication and division formulae.
- Children can use the series fill function.
- Children recognise how using formulae allows the data to change and the calculations to update automatically.

Resources

- Child and Teacher workbooks as previous lesson.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria
Vocabulary	Use slide 4 to recap the vocabulary, clicking reveals answers then matches them.
Performing Calculations	Use slides 5-7 .
Activity 1: Formulae	Use slide 8 . Once most children have finished, bring the class back together.
Copying Formulae	Use slides 9-12 . Children can try on their own devices.
Fill Series Functions	Slide 13
Activity 2: Fill Series	Use slide 14 to direct the activity.
Review Success Criteria	Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.

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Lesson 3 – Modelling

Aim

- To use a spreadsheet to model a situation.

Success Criteria

- Children can use a spreadsheet to model a situation.
- Children can use a spreadsheet to solve a problem.
- Children can use the SUM function.

Resources

- Workbooks as previous lessons.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria
Computational Modelling	Use slide 4 to clarify the meaning.
Party Planning Template	Use slides 5-12 , clicking reveals teaching and discussion points. Demonstrate on the board and allow children to explore on their own devices.
Activity 1: Prompts	Use slide 13 to explain the activity. Add further questions to discuss as a class: <ul style="list-style-type: none">• Set a budget lower than the average amount that children have budgeted for, ask children to revise their party to fit the new budget.• Can they reflect upon how it was easier to do this using their spreadsheet than if they had lists on paper or in a work document?• If there is time left, children could explore some of the other in-built templates in Sheets; these cover a wide variety of uses.
Review Success Criteria	Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.

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Lesson 4 – Organising data

NOTE: The full functionality used in this lesson is only available in the full version of Sheets not in the tablet app. Features of this lesson that can be achieved on the tablet version are included as discretely taught skills using the button navigation on the slides.

Aim

- To demonstrate how spreadsheets can make complex data clearer by manipulating the way it is presented.



Success Criteria

- Children can use a variety of methods including flash fill, convert text to tables and splitting cells for organising and presenting their data in a spreadsheet.
- Children know what is meant by a delimiter.
- Children understand how to sort data.

Resources

- Workbooks as previous lessons.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria
Navigation of the slides  Full version  Tablet version	Use slide 4 to decide upon the paths through the lesson depending upon the devices that children will use. The full functionality used in this lesson is only available in the online version of Sheets not in the tablet app. Features of this lesson that can be achieved on the tablet are included as discretely taught skills.
Organising Data	Display the Teacher spreadsheet, tab Lesson 4 (Teacher). Use slides 5- 10 to demonstrate how to organise a block of data into a spreadsheet. Clicking reveals each step.

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Activity 1: Organising Your Own Data	Use slide 11 to direct the activity. Once most children have finished or nearly finished. Bring the class back together to look at sorting data.
Sorting Data	Use slides 12-15 to illustrate sorting.
Fitting Columns	Use slide 16
Space for Headings	Use slide 17 and demonstrate adding some headings.
Sorting Data	Use slides 18-20 . On slide 19 , Children might suggest additional sorting by First name or you can try the other options e.g., birthday: Though the Lithium sisters have the same birthday as well. In answer to the birthdate sorting: Perhaps it would help Lucy plan who she needs to buy presents and card for over the year?
Review Success Criteria	Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.

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Lesson 5 – Advanced Formulae and Big Data

Aim

- To use formulae for percentages, averages, max and min into spreadsheets.

Success Criteria

- Children know how to incorporate formulae for percentages, averages, max and min into their spreadsheets.
- Children gain familiarity with range notation.
- Children know some shortcuts that help to make data meaningful.
- Children begin to develop a critical eye when it comes to the conclusions that can be made from data.

Resources

- Workbooks as previous lessons.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria
Looking at Data	Use slide 4 to introduce the lesson and start to look at the data.
Activity 1: Making Data Clearer: Level 1	Use slide 5 . Children can use their own devices to complete level 1 with some demonstration. Children who finish level 1 early, can try level 2 before the explanation on the following slide
Making Data Clearer: Level 2	Use slides 6-7 to explain level 2. Children could try out the actions while looking at the slides.
Making Data Clearer: Averages	Use slide 8 , select the path for the lesson depending upon the devices that children have.

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Activity 3: Making Data Clearer, Level 3	Use slide 11 to introduce and review the activity.
Making Data Clearer: Filters	Use slide 12 to introduce filtering.
Activity 4: Making Data Clearer: Level 4	Use slides 13-14 to introduce and review the activity. Not all children will have time to complete all tasks. <i>There are some questions posed which children can answer by clicking on the text drawings and editing then saving.</i> Ensure that there is time to complete the steps covered by slide 14 as a class, even if children have not finished Level 4.
Review Success Criteria	Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.

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Lesson 6 – Charts and Graphics

Aim

- To create a variety of charts and graphs to understand data.

Success Criteria

- Children know that there are ways to represent their data graphically and that spreadsheets can make the process of representing data easier.
- Children gain an understanding of how a graphical representation can make data easier to interpret.
- Children make a variety of charts using Sheets.
- Children illustrate their data using sparklines and data bars.

Resources

- Workbooks as previous lessons.

Note: The lesson plan includes demonstrating a variety of techniques before children try these on their own spreadsheet at the end. If you prefer, break the lesson up by asking children to complete parts of their own spreadsheet at the suggested stages see the *

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria
Vocabulary	Use slide 4 to recap the vocabulary of graphs and terms used within Excel.
Pie Charts	Use slides 5-6 . Demonstrate on the board using the Teacher spreadsheet.
Bar Chart	Use slides 7-8 . Demonstrate on the board using the Teacher spreadsheet.
Sparklines	Use slide 9 . Demonstrate on the board using the Teacher spreadsheet.
Line Graphs	Use slide 10 . Demonstrate on the board using the Teacher spreadsheet.
Color Scales	Use slides 11- 13 . Demonstrate on the board using the Teacher spreadsheet.
Activity: Creating Charts	Use slide 14 to direct the activity. Finish the lesson with a discussion of the point of displaying data in a graphical way. Can children make a list of positives and negatives? The aim is to help children start to discern what graphics are appropriate and which can actually misrepresent data or make it confusing.
Review Success Criteria	Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.

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Lesson 7 – Using a Spreadsheet to Plan a Cake Sale

Aim

- To use a spreadsheet to model a real-life situation.

Success Criteria

- Children can understand how a spreadsheet can be used to plan an event.
- Children understand the advantages of using formulae when data is subject to change
- Children have modelled a real-life situation using a spreadsheet.

Resources

- Example workbooks as used previously. The spreadsheet contains an example recipe, you could add variety by using additional recipes for children to work in small groups to plan e.g. some children could work with an egg or milk free recipe to cater for those with allergies, some could plan chocolate cupcakes or different decorations such as fruit. They could even design their cupcakes beforehand and research their own recipes to make the lesson more relevant to real life and combine with design and technology learning objectives. The spreadsheet uses example prices, but you might want to show children how to look up real prices for their local supermarket.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria
How to plan the spreadsheet	Use slides 4- 8 to introduce the activities for today and the spreadsheets.
Activity: Planning 1 – Quantities and Prices Activity: Planning 2 – Formulae Activity: Planning 3 – Putting it Together Activity: Planning 4 – Costs and Profits	Use slides 9-12 to direct children when completing the activity. You might wish to split this into stages. Advise children of suitable websites for supermarkets when looking up prices. The level of realism you wish to introduce will come down to the children' ability and time available. For example, if they need 750g flour, should they buy a 1kg pack or a 500g pack plus a

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	<p>250g pack? Which is better value? These questions will be too complex for many, but some children can be challenged with this.</p> <p>Once spreadsheets are complete, you could change the scenario for example, say that milk has increased by 10% and see how easily a spreadsheet can deal with the changing cost if you have used formulae. Other changes could be different quantity required therefore changing the numbers in cell C3 and C4.</p>
Review Success Criteria	<p>Review the success criteria from slide 3. Children could rate how well they achieved this using a show of hands.</p>

Lesson 8 Using a Spreadsheet to Solve Problems

Aim

- To apply spreadsheet skills to solving problems.

Success Criteria

- Children can apply new spreadsheet skills to solving problems and making data meaningful.
- Children have explored printing Excel sheets.

Resources

- Workbooks as previous lessons.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria
Activity	Use slides 4 & 5 to introduce the activity and some tips. Give children time to complete the problems. Not all children will finish all of them. If children are using the online or app versions, there will be some tasks that cannot be completed. Discuss the answers as a class.
Using Spreadsheets Offline	Slides 6-7 give tips for printing spreadsheets.
Review Success Criteria	Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.

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Assessment Guidance

The following information is an exemplar of what a child at an expected level would be able to demonstrate when completing this unit with additional exemplars to demonstrate how this would vary for a child with emerging or exceeding achievements.

Assessment Guidance	
Emerging	<p>With support, children can save and open workbooks and navigate to different sheets within a workbook (Lesson 1). Children can enter data into cells (Lesson 1) and find specific cell locations within a spreadsheet (lesson 1).</p> <p>Children understand some of the new vocabulary relating to spreadsheets: cells, columns, rows, cell names, sheets, workbook. Children might need support navigating the different menus and icons within the software.</p> <p>With specific guidance, children can use a spreadsheet to carry out basic calculations including some of the operators (addition, subtraction, multiplication and division) using formulae (lesson 2). They might need support when deciding where to use them and what the information shows.</p> <p>With step-by-step assistance, children can create a spreadsheet to model a specific situation and calculate the answer to a one-step problem (lesson 3 & lesson 7).</p> <p>Children have explored features such as flash fill, convert text to tables and splitting cells and have an understanding that this can make data clearer. They need support to use these functions and interpret the data (lesson 4).</p> <p>Children know that a spreadsheet can create graphs from data. With specific instructions, children can make a graph from data and use it to answer a simple question (lesson 6).</p> <p>NB Lesson 8 provides an opportunity for children to demonstrate many of the skills taught in the previous lessons and can be useful as the basis for assessment.</p>
Expected	<p>Children have a good understanding of a variety of purposes for using spreadsheets. Children appreciate the advantage of using a spreadsheet for certain tasks over a paper-based method.</p> <p>Children understand and use the new vocabulary relating to spreadsheets: cells, columns, rows, cell names, sheets, workbook. They can locate frequently used functions and tools and know how to find the functions that they need.</p> <p>Children can use a spreadsheet to carry out basic calculations including all the operators (addition, subtraction, multiplication and division) using formulae (lesson 2).</p> <p>Children know that tools such as series fill exist and can make use of the assistance they provide.</p>

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Assessment Guidance	
	<p>Children understand the idea of using a spreadsheet to model a situation. Given a precise situation and guidance on layout, they can create a useful model. They can use it to answer questions (lesson 3 & lesson 7).</p> <p>With direction, children can use flash fill, convert text to tables, splitting cells and sorting for organising and presenting their data in a spreadsheet (lesson 4).</p> <p>Children know how to incorporate formulae for percentages, averages, max and min into their spreadsheets (lesson 5). They are beginning to develop a critical eye when it comes to the conclusions that can be made from data (lesson 5).</p> <p>Children can use graphic functionality within a spreadsheet program to make their data clearer and use this to answer questions (lesson 6).</p> <p>NB Lesson 8 provides an opportunity for children to demonstrate many of the skills taught in the previous lessons and can be useful as the basis for assessment.</p>
Exceeding	<p>Children can suggest situations in which a spreadsheet would help them to model a situation and make decisions or accomplish a task.</p> <p>Children actively make use of the in-built functions of a spreadsheet such as series fill, mathematical formulae (lesson 2) and the SUM function (lesson 3) to help them accomplish a task without needing to be specifically instructed which functions to use where.</p> <p>Children understand the idea of using a spreadsheet to model a situation. They can make good attempts to create models using a spreadsheet and can use the relevant functions of the spreadsheet to answer questions (lesson 3 & lesson 7). They are self-motivated to extend the applicability of a spreadsheet model to explore factors of the situation that were not specifically directed by a teacher.</p> <p>Children' knowledge of methods such as flash fill, convert text to tables and splitting cells (lesson 4) formulae for percentages, averages, max and min (lesson 5) allows them to analyse their own data and helps them to make informed decisions about what data to collect and in what format.</p> <p>Children use a critical eye when it comes to the conclusions that can be made from data. (lesson 5).</p> <p>Children choose from the range of graphical representations within the spreadsheet software to choose the one that makes their data clearest to answer questions (Lesson 6).</p> <p>NB Lesson 8 provides an opportunity for children to demonstrate many of the skills taught in the previous lessons and can be useful as the basis for assessment.</p>

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